[2IMF25] Assignment part 2

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Contents

Question 1

We completed this question with Z3. To model this question such that Z3 can solve it, we have to create more variables for every step of time. First we let a variable tl_δ denote the location of the truck at step δ. We initialize tl_0 to village s. Then, we look at the number of pallets loaded in the truck. For every point in time, we create a variable. Let tp_δ denote the amount of pallets in the truck at step δ, where $0 \le \delta \le \infty$. For the given situation (in (a)), we initialize tp_0 to 300. The truck also has a maximum load, in this case 300. We then have the following constraints:

$$\bigwedge_{\delta=0}^{\infty} (tp_\delta \ge 0 \wedge tp_\delta \le 300) \qquad (1.1)$$

Next, we define variables for the amount of food pallets in each village's stock. We let $sb_{x,\delta}$ denote the amount of pallets in stock at village x, at step δ, *before* delivery, where $x \in V$ is a village in the given set of villages V that need food. Similarly, we also have $sa_{x,\delta}$ denote the amount of pallets in stock at village x, at step δ, *after* delivery. We want the villages to always be able to process one food pallet each time unit, and thus $sa_{x,\delta}$ should always be greater than 0, while $sb_{x,\delta}$ should always be greater than or equal to 0 as in this case village x can process its last food package just before the truck arrives. Thus we get the following constraints:

$$\bigwedge_{\delta=0}^{\infty} \left(\bigwedge_{x \in V} (sa_{x,\delta} > 0 \wedge sb_{x,\delta} \ge 0) \right) \qquad (1.2)$$

We also want to take into account the consumption of food pallets when the truck is traveling. Let $d(x,y)$ denote the time it takes for a truck to get from village x to village y. We create a variable td_δ that denotes the amount of time the

truck is traveling in step δ. Then we should have $sb_{x,\delta+1} = sa_{x,\delta} - td_\delta$ for every village x in V. Then we get the following constraints:

$$\bigwedge_{\delta=0}^{\infty} \left(\bigwedge_{x \in V} (sb_{x,\delta+1} = sa_{x,\delta} - td_\delta) \right) \qquad (1.3)$$

Let S denote the set of villages containing a supply point. Then, when the truck is at a village $x \in S$ at step δ, all villages y in V will have the same amount of food packages after delivery at δ and before the delivery at $\delta + 1$. More formally: $sa_{y,\delta} = sb_{y,\delta+1}$. The truck will be loaded up, such that $tp_\delta = 300$ in the given situation.

Next we also need to model the movement of the truck. If the truck is at some village $x \in V \cup S$, then the truck can move to any other connected village $y \in V \cup S$, such that $x \ne y$. We then set the trucks travel time to the distance between x and y, e.g. $td_\delta = d(x,y)$. Let $max(x)$ denote the maximum pallet storage for village x, and let $N(x)$ denote the set of villages connected to x. We model the previous implications as follows:

$$\bigwedge_{\delta=0}^{\infty} \left(\bigwedge_{x \in V} (tl = x) \Rightarrow \qquad (1.4)$$
$$sa_{x,\delta+1} \le max(x) \wedge \qquad (1.5)$$
$$(tp_{\delta+1} + sb_{x,\delta+1} = tp_\delta + sa_{x,\delta+1}) \wedge \qquad (1.6)$$
$$\bigwedge_{y \ne x \in V} (sa_{y,\delta+1} = sb_{y,\delta+1}) \wedge \qquad (1.7)$$
$$\bigvee_{z \in N(x)} (tl_{\delta+1} = z \wedge td_{\delta+1} = d(x,z)) \right) \qquad (1.8)$$

In other words, if the truck is in a village x that requires food (1.4), it can deliver food to x such that the food supply does not exceed the maximum

$max(x)$ (1.5), and the truck gets emptied to a certain extent (1.6). Then all other villages in V will not have any food delivered this step (1.7), and the truck must move to another village (1.8). The constraints for when a truck is in a village with a supply point is given below:

$$\bigwedge_{\delta=0}^{\infty} \left(\bigwedge_{x \in S} (tl = x) \Rightarrow \quad (1.9) \right.$$

$$\bigwedge_{y \in V} (sa_{y,\delta+1} = sb_{y,\delta+1}) \wedge \quad (1.10)$$

$$\left. \bigvee_{z \in N(x)} (tl_{\delta+1} = z \wedge td_{\delta+1} = d(x,z)) \right) \quad (1.11)$$

This is similar to the previous constraints, but all villages in V do not get resupplied (1.10) and the village with the supply point does not need to be resupplied.

When implemented in Z3, checking satisfiability under all these constraints still requires a maximum amount of steps to be set. When we set this to 200, Z3 returns not satisfiable. See Appendix 3 for the output of Z3. We omitted the input smt file in this document as that file contains over 300 pages of smt code. From the output we can conclude that there exists no "path" to step 200 such that at each point on that path (e.g. value of δ) all villages still have a food pallet. Then certainly there can not be a path to step 201 where each village always has food to consume.

For parts (b) and (c) of this question, we had to implement some extra constraints. Concluding that it is indeed possible to sustain the villages requires a finite loop to be found. For this we create the following additional variables. For every step δ we create a variable $loop_\delta$. This variable will indicate whether at the last step δ^+, the process can loop to this step δ such that the status of all villages and the truck is equal in both steps δ and δ^+. More formally, we get:

$$\bigwedge_{\delta=0}^{\delta^+-1} \left(loop_\delta \Longleftrightarrow \quad (1.12) \right.$$

$$(tl_\delta = tl_{\delta^+} \wedge tp_\delta = tp_{\delta^+}) \wedge \quad (1.13)$$

$$\left. \bigwedge_{x \in V} \left(sa_{x,\delta} = sa_{x,\delta^+} \right) \right) \quad (1.14)$$

We then add the constraint that we want to find (at least) one of these variables to be true, and thus we get:

$$\bigvee_{\delta=0}^{\delta^+-1} loop_\delta \quad (1.15)$$

We implemented the constraints for a total number of 10 steps (see Appendix 4) in Z3, and from this we retrieved the output shown in Appendix 5, which tells us that the model is satisfiable. This means that the truck traveled along 10 villages and then looped through some point in time. To clearly see where the loop occurs and what path the truck takes, we filtered the output on loops and truck location in Appendix 6 and Appendix 7 respectively. From these files we can tell that the truck first takes the path in (1.16) below, from s to a, and then continually loops the path in (1.17).

$$s \rightarrow b \rightarrow a \quad (1.16)$$

$$a \rightarrow b \rightarrow s \rightarrow a \rightarrow c \rightarrow b \rightarrow s \rightarrow a \quad (1.17)$$

For part (c) we again omitted the input smt file, and we show only the output file Appendix 9 which tells us that with a maximum load of 318 it is not possible to supply the villages continually.

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Question 2

This question was first approximated with Prolog to get some estimate on the number of steps required to reach the objective state. Prolog does not try to minimize the number of steps, so we took that output and then used NuSMV to very that number of steps.

The three given rules are easily implemented in Prolog. Rule 1 can be formulated as:

```
1  %Rule 1
2  step([0|T], [1|T]).
```

Rule 2 can be formulated as:

```
1  %Rule 2
2  step([A,B|T], [B,A|T]) :-
3    A \= B.
```

Finally, rule 3 can be formulated as:

```
1  %Rule 3
2  step(F, T) :-
3    rule3(F, T).
4  rule3([1,1,0|T], [0,0,1|T]).
5  rule3([H|Tf], [H|Tt]) :-
6    rule3(Tf, Tt).
```

We then still have to make sure that Prolog can chain these rules together, as well as keep track of the number of steps made. We get the following piece of code:

```
1  %Step chain
2  nsteps(X, X, 0).
3  nsteps(X, Z, N) :-
4    step(Y, Z),
5    nsteps(X, Y, M),
6    N is M + 1.
```

The Prolog query will contain the starting state and goal state:

```
1  %Query:
2  %gprolog --consult-file req.pl --query-goal "
        ↪ nsteps(
3  %[0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0],
        ↪ [0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,1], N
        ↪ )"
```

The full file can be found in Appendix 10. The output (found in Appendix 11) shows us that it is possible in 4180 steps. We will now use NuSMV to verify that this is the minimal number of steps needed.

We create a variable for each entry in the array a, such that we get 17 variables. We initialize $a[7]$ to True, and the rest to False. Next, we create a variable that keeps track of the amount of steps made, s. Then, as long as $s < 4180$, we allow one of the three rules to be applied to all the variables of a. We then check if it eventually holds that:

$$s > 0 \land a[7] \land a[16] \land s \leq 4180 \qquad (2.1)$$

Together with Equation 2.1 also the following should **not** hold:

$$s > 0 \land a[7] \land a[16] \land s \leq 4179 \qquad (2.2)$$

Then, if we specify both these constraints in NuSMV, the output will tell us whether it can be done in no less than 4180 steps. The input file can be found in Appendix 13, the output file can be found in Appendix 14. The output shows us that 4180 is indeed the minimal amount of steps required to get to the goal state.

Question 3

We implement the first part (a) of this question in Prover9 and Mace4. The input file for Mace4 can be seen in Appendix 17. In this file we only test $inv(x * y) = inv(x) * inv(y)$, as this is the only property that does not hold for all groups (we will see the others in Prover9). The output file from Mace4 (shown in Appendix 18) shows us that the smallest group for which this property does not hold is of size 6.

The input file for Prover9 can be seen in Appendix 15. In this file we test for the first three properties, alongside with the property $inv(x*y) = inv(y) * inv(x)$, which is a variation on the property that we have seen does not hold for all groups. The output (found in Appendix 16 shows us that both the first three properties and the additional property hold in all groups.

Part (b) was done using only Mace4 to find the smallest group size for which the property $x * y = y * x$ does not hold. The input file for this can be found in Appendix 19, and the output file can be found in Appendix 20. The output shows us that the smallest group that is not Abelian is of size 6.

Part (c) was also done using only Mace4. We once more refer to the input and output files of this question, as these show the rather simple answer to all three values of n. In all three cases ($n \in \{2, 3, 4\}$) we have that the smallest group for which the Abelian property $x * y = y * x$ does not hold, given that $x^n = I$ holds, is of size 6. The input and output files can be found in the list below:

- Input file for $n = 2$: Appendix 21
- Output file for $n = 2$: Appendix 22
- Input file for $n = 3$: Appendix 23
- Output file for $n = 3$: Appendix 24
- Input file for $n = 4$: Appendix 25
- Output file for $n = 4$: Appendix 26

Question 4

Consider the graph shown in Figure 4.1, where each node represents a Wireless Sensor Node and each edge represents that communication is possible between two nodes. The chosen communication protocol requires unique frequency channels in each 2-hop neighborhood. This means the following: for all nodes i, no nodes j and k with edges i-j and j-k may exist where the channel of j or k is equal to the channel of i.
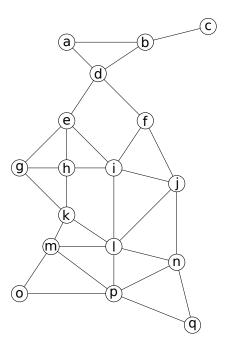

Figure 4.1: The graph depicting the connectedness of the Wireless Sensor Network under consideration.

(a) Suppose 9 frequency channels are available, can the chosen communication protocol be used in the shown network?

(b) Determine the minimum number of channels required to be able to use the chosen communication protocol in the shown network.

(c) Suppose a different communication protocol requires unique frequency channels in each 3-hop neighborhood instead and 11 channels are available. Determine if this other communication protocol can be used in the shown network. (This means for all nodes i, no nodes j, k and l with edges i-j, j-k and k-l may exist where the channel of j, k or l is equal to the channel of i.)

In order to solve this problem an SMT implementation is made which will be detailed below. For each set of two nodes x and y the variables $hop\_1\_x\_y$ and $hop\_1\_y\_x$ are defined. For each pair of nodes that are connected by an edge the constraint is added that the corresponding variables are true, for each pair of nodes that do not share an edge the requirement is added that the corresponding variables are false. This process defines all edges and therefore 1-hop neighbors in the network.

In order to define the i-hop neighbors the constraints $hop\_i\_x\_y \implies hop\_i+1\_x\_y$ and $hop\_i\_x\_y \lor hop\_1\_y\_z \implies hop\_i+1\_x\_z$ are implemented for all possible permutations of the nodes x, y and z. This process defines the i-hop neighbors from the $i-1$-hop neighbors and one extra edge.

(a) The requirement that the frequency channel should be unique in each 2-hop neighborhood can be expressed by the constraints $hop\_2\_x\_y \implies chan\_x \neq chan\_y$ for all permutations of the nodes x and y, while the requirement that only 9 channels are available can be expressed by the constraints $0 \leq chan\_x \leq 8$. Generating the conjunction of all constraints by the Python script listed in

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Node	Channel	Node	Channel
A	3	J	1
B	6	K	0
C	5	L	3
D	0	M	2
E	5	N	5
F	4	O	4
G	1	P	7
H	7	Q	6
I	8		

Node	Channel	Node	Channel
A	6	J	4
B	3	K	3
C	4	L	6
D	5	M	5
E	7	N	8
F	0	O	7
G	9	P	10
H	2	Q	9
I	1		

Node	Channel	Node	Channel
A	1	J	5
B	0	K	4
C	4	L	1
D	2	M	2
E	6	N	6
F	4	O	5
G	5	P	3
H	3	Q	4
I	0		

3-hop neighborhood can be represented by $hop\_3\_x\_y \implies chan\_x \neq chan\_y$ for all permutations of nodes x and y. This results in the SMT file listed in Appendix 34, while running Z3 on this file generates the output listed in Appendix 35. This output shows that the following channel assignment satisfies all requirements: From this it can be concluded that the alternative communication protocol can be used in the network if 11 channels are available.

Appendix 27 yields the SMT file listed in Appendix 28. Running Z3 on this file shows the satisfying assignment listed in Appendix 29 from which it can be concluded that the following channel assignment is a valid assignment: This shows that it is indeed possible to use the chosen protocol in the network with 9 channels available.

(b) Changing the requirements regarding the number of channels to $0 \leq chan\_x \leq 6$ and $0 \leq chan\_x \leq 5$ for all nodes x yields the SMT files listed in Appendix 30 and Appendix 31 respectively. Running Z3 on these files produces the outputs listed in Appendix 32 and Appendix 33 respectively. The fact that the constraints with $0 \leq chan\_x \leq 5$ are unsatisfiable means that there is no way to assign the frequency channels if only 6 channels are available, while for 7 available channels the following assignment is found: From this it can be concluded that the minimum number of available channels required is 7.

(c) The constraints concerning the number of available channels can be changed to $0 \leq chan\_x \leq 10$ for all nodes x, while the constraints that specify unique channels in a

Appendices

Appendix 1

Python script for generating the constraints file for Question 1

```python
1   #!/usr/bin/env python
2   from __future__ import print_function
3   import string
4
5   domain = "Int"
6   T = 6
7   aT = 4
8   cT = 8500
9   pT = 8
10  pallets = [
11    {"name": "C", "fullname": "Cheese"      , "w": 700 , "d": 4 , "max": -1, "a": False},
12    {"name": "B", "fullname": "Beer"        , "w": 1300, "d": -1, "max": -1, "a": True },
13    {"name": "W", "fullname": "Wine"        , "w": 1000, "d": 8 , "max": -1, "a": True },
14    {"name": "D", "fullname": "Soft drinks" , "w": 1500, "d": 10, "max": 2 , "a": False},
15    {"name": "P", "fullname": "Potato chips", "w": 100 , "d": 5 , "max": -1, "a": False},
16  ]
17  irange = range(1, T+1)
18
19  ########################
20  ### Declare constants ###
21  ########################
22  for j, p in enumerate(pallets):
23    for i in irange:
24      print("(declare-const %s%d %s)" % (p["name"], i, domain))
25    if p["d"] < 0:
26      print("(declare-const %s %s)" % (p["name"], domain))
27
28  ########################
29  ### Begin requirements ###
30  ########################
31  print("(assert")
32  print("(and")
33
34  #######################################
35  ### Max truck weights and pallet counts ###
36  #######################################
37  for i in irange:
38    fmtw = "(>= %d (+" + " (* %s%d %d)"*len(pallets) + "))"
39    valw = (cT,)
40    fmtc = "(>= %d (+" + " %s%d"*len(pallets) + "))"
```

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```
41    valc = (pT,)
42    for x in pallets:
43      valw += (x["name"], i, x["w"])
44      valc += (x["name"], i)
45    print(fmtw % valw)
46    print(fmtc % valc)
47
48  #############################
49  ### Delivery Requirements ###
50  #############################
51  fmt = "".join(["(= %d (+" ] + [" %s%%d" % x["name"] if x["d"] >= 0 else "" for x in pallets] +
     ↪  ["))" ])
52  for j, p in enumerate(pallets):
53    if p["d"] >= 0:
54      print("(= %d (+" % p["d"], end = "")
55    else:
56      print("(= %s (+" % p["name"], end = "")
57    for i in range(1, (T+1)):
58      print(" %s%d" % (p["name"], i), end = "")
59    print("))")
60
61  ##########################
62  ### Non-alcoholic trucks ###
63  ##########################
64  for i in range((aT+1), (T+1)):
65    for j, p in enumerate(pallets):
66      if p["a"]:
67        print("(= 0 %s%d)" % (p["name"], i))
68
69  ###############################
70  ### Non-negative pallet counts ###
71  ###############################
72  for i in irange:
73    for j, p in enumerate(pallets):
74      print("(>= %s%d 0)" % (p["name"], i))
75
76  ##########################
77  ### Pallet type max load ###
78  ##########################
79  print("; The following requirements belong to part (b) of the assignment")
80  for j, p in enumerate(pallets):
81    if p["max"] >= 0:
82      for i in irange:
83        print("(<= %s%d %d)" % (p["name"], i, p["max"]))
84
85  ########################
86  ### Close requirements ###
87  ########################
88  print("))")
89
90  print("(maximize B)")
91  print("(check-sat)")
92  print("(get-model)")
93  print("(get-objectives)")
```

Appendix 2

The generated requirements for Question 1(a)

```
1   (declare-const truck_stock_0 Int)
2   (declare-const truck_travel_time_0 Int)
3   (declare-const truck_loc_0 Int)
4   (declare-const s_stockb_0 Int)
5   (declare-const s_stocka_0 Int)
6   (declare-const a_stockb_0 Int)
7   (declare-const a_stocka_0 Int)
8   (declare-const b_stockb_0 Int)
9   (declare-const b_stocka_0 Int)
10  (declare-const c_stockb_0 Int)
11  (declare-const c_stocka_0 Int)
12  (declare-const loopto_0 Bool)
13  (declare-const truck_stock_1 Int)
14  (declare-const truck_travel_time_1 Int)
15  (declare-const truck_loc_1 Int)
16  (declare-const s_stockb_1 Int)
17  (declare-const s_stocka_1 Int)
18  (declare-const a_stockb_1 Int)
19  (declare-const a_stocka_1 Int)
20  (declare-const b_stockb_1 Int)
21  (declare-const b_stocka_1 Int)
22  (declare-const c_stockb_1 Int)
23  (declare-const c_stocka_1 Int)
24  (declare-const loopto_1 Bool)
25  (declare-const truck_stock_2 Int)
26  (declare-const truck_travel_time_2 Int)
27  (declare-const truck_loc_2 Int)
28  (declare-const s_stockb_2 Int)
29  (declare-const s_stocka_2 Int)
30  (declare-const a_stockb_2 Int)
31  (declare-const a_stocka_2 Int)
32  (declare-const b_stockb_2 Int)
33  (declare-const b_stocka_2 Int)
34  (declare-const c_stockb_2 Int)
35  (declare-const c_stocka_2 Int)
36  (declare-const loopto_2 Bool)
37  (declare-const truck_stock_3 Int)
38  (declare-const truck_travel_time_3 Int)
39  (declare-const truck_loc_3 Int)
40  (declare-const s_stockb_3 Int)
```

```
 41  (declare-const s_stocka_3 Int)
 42  (declare-const a_stockb_3 Int)
 43  (declare-const a_stocka_3 Int)
 44  (declare-const b_stockb_3 Int)
 45  (declare-const b_stocka_3 Int)
 46  (declare-const c_stockb_3 Int)
 47  (declare-const c_stocka_3 Int)
 48  (declare-const loopto_3 Bool)
 49  (declare-const truck_stock_4 Int)
 50  (declare-const truck_travel_time_4 Int)
 51  (declare-const truck_loc_4 Int)
 52  (declare-const s_stockb_4 Int)
 53  (declare-const s_stocka_4 Int)
 54  (declare-const a_stockb_4 Int)
 55  (declare-const a_stocka_4 Int)
 56  (declare-const b_stockb_4 Int)
 57  (declare-const b_stocka_4 Int)
 58  (declare-const c_stockb_4 Int)
 59  (declare-const c_stocka_4 Int)
 60  (declare-const loopto_4 Bool)
 61  (declare-const truck_stock_5 Int)
 62  (declare-const truck_travel_time_5 Int)
 63  (declare-const truck_loc_5 Int)
 64  (declare-const s_stockb_5 Int)
 65  (declare-const s_stocka_5 Int)
 66  (declare-const a_stockb_5 Int)
 67  (declare-const a_stocka_5 Int)
 68  (declare-const b_stockb_5 Int)
 69  (declare-const b_stocka_5 Int)
 70  (declare-const c_stockb_5 Int)
 71  (declare-const c_stocka_5 Int)
 72  (declare-const loopto_5 Bool)
 73  (declare-const truck_stock_6 Int)
 74  (declare-const truck_travel_time_6 Int)
 75  (declare-const truck_loc_6 Int)
 76  (declare-const s_stockb_6 Int)
 77  (declare-const s_stocka_6 Int)
 78  (declare-const a_stockb_6 Int)
 79  (declare-const a_stocka_6 Int)
 80  (declare-const b_stockb_6 Int)
 81  (declare-const b_stocka_6 Int)
 82  (declare-const c_stockb_6 Int)
 83  (declare-const c_stocka_6 Int)
 84  (declare-const loopto_6 Bool)
 85  (declare-const truck_stock_7 Int)
 86  (declare-const truck_travel_time_7 Int)
 87  (declare-const truck_loc_7 Int)
 88  (declare-const s_stockb_7 Int)
 89  (declare-const s_stocka_7 Int)
 90  (declare-const a_stockb_7 Int)
 91  (declare-const a_stocka_7 Int)
 92  (declare-const b_stockb_7 Int)
 93  (declare-const b_stocka_7 Int)
 94  (declare-const c_stockb_7 Int)
 95  (declare-const c_stocka_7 Int)
 96  (declare-const loopto_7 Bool)
 97  (declare-const truck_stock_8 Int)
 98  (declare-const truck_travel_time_8 Int)
 99  (declare-const truck_loc_8 Int)
100  (declare-const s_stockb_8 Int)
101  (declare-const s_stocka_8 Int)
102  (declare-const a_stockb_8 Int)
```

```
103    (declare-const a_stocka_8 Int)
104    (declare-const b_stockb_8 Int)
105    (declare-const b_stocka_8 Int)
106    (declare-const c_stockb_8 Int)
107    (declare-const c_stocka_8 Int)
108    (declare-const loopto_8 Bool)
109    (declare-const truck_stock_9 Int)
110    (declare-const truck_travel_time_9 Int)
111    (declare-const truck_loc_9 Int)
112    (declare-const s_stockb_9 Int)
113    (declare-const s_stocka_9 Int)
114    (declare-const a_stockb_9 Int)
115    (declare-const a_stocka_9 Int)
116    (declare-const b_stockb_9 Int)
117    (declare-const b_stocka_9 Int)
118    (declare-const c_stockb_9 Int)
119    (declare-const c_stocka_9 Int)
120    (declare-const loopto_9 Bool)
121    (declare-const truck_stock_10 Int)
122    (declare-const truck_travel_time_10 Int)
123    (declare-const truck_loc_10 Int)
124    (declare-const s_stockb_10 Int)
125    (declare-const s_stocka_10 Int)
126    (declare-const a_stockb_10 Int)
127    (declare-const a_stocka_10 Int)
128    (declare-const b_stockb_10 Int)
129    (declare-const b_stocka_10 Int)
130    (declare-const c_stockb_10 Int)
131    (declare-const c_stocka_10 Int)
132    (declare-const loopto_10 Bool)
133    (declare-const truck_stock_11 Int)
134    (declare-const truck_travel_time_11 Int)
135    (declare-const truck_loc_11 Int)
136    (declare-const s_stockb_11 Int)
137    (declare-const s_stocka_11 Int)
138    (declare-const a_stockb_11 Int)
139    (declare-const a_stocka_11 Int)
140    (declare-const b_stockb_11 Int)
141    (declare-const b_stocka_11 Int)
142    (declare-const c_stockb_11 Int)
143    (declare-const c_stocka_11 Int)
144    (declare-const loopto_11 Bool)
145    (declare-const truck_stock_12 Int)
146    (declare-const truck_travel_time_12 Int)
147    (declare-const truck_loc_12 Int)
148    (declare-const s_stockb_12 Int)
149    (declare-const s_stocka_12 Int)
150    (declare-const a_stockb_12 Int)
151    (declare-const a_stocka_12 Int)
152    (declare-const b_stockb_12 Int)
153    (declare-const b_stocka_12 Int)
154    (declare-const c_stockb_12 Int)
155    (declare-const c_stocka_12 Int)
156    (declare-const loopto_12 Bool)
157    (declare-const truck_stock_13 Int)
158    (declare-const truck_travel_time_13 Int)
159    (declare-const truck_loc_13 Int)
160    (declare-const s_stockb_13 Int)
161    (declare-const s_stocka_13 Int)
162    (declare-const a_stockb_13 Int)
163    (declare-const a_stocka_13 Int)
164    (declare-const b_stockb_13 Int)
```

```
165    (declare-const b_stocka_13 Int)
166    (declare-const c_stockb_13 Int)
167    (declare-const c_stocka_13 Int)
168    (declare-const loopto_13 Bool)
169    (declare-const truck_stock_14 Int)
170    (declare-const truck_travel_time_14 Int)
171    (declare-const truck_loc_14 Int)
172    (declare-const s_stockb_14 Int)
173    (declare-const s_stocka_14 Int)
174    (declare-const a_stockb_14 Int)
175    (declare-const a_stocka_14 Int)
176    (declare-const b_stockb_14 Int)
177    (declare-const b_stocka_14 Int)
178    (declare-const c_stockb_14 Int)
179    (declare-const c_stocka_14 Int)
180    (declare-const loopto_14 Bool)
181    (declare-const truck_stock_15 Int)
182    (declare-const truck_travel_time_15 Int)
183    (declare-const truck_loc_15 Int)
184    (declare-const s_stockb_15 Int)
185    (declare-const s_stocka_15 Int)
186    (declare-const a_stockb_15 Int)
187    (declare-const a_stocka_15 Int)
188    (declare-const b_stockb_15 Int)
189    (declare-const b_stocka_15 Int)
190    (declare-const c_stockb_15 Int)
191    (declare-const c_stocka_15 Int)
192    (declare-const loopto_15 Bool)
193    (declare-const truck_stock_16 Int)
194    (declare-const truck_travel_time_16 Int)
195    (declare-const truck_loc_16 Int)
196    (declare-const s_stockb_16 Int)
197    (declare-const s_stocka_16 Int)
198    (declare-const a_stockb_16 Int)
199    (declare-const a_stocka_16 Int)
200    (declare-const b_stockb_16 Int)
201    (declare-const b_stocka_16 Int)
202    (declare-const c_stockb_16 Int)
203    (declare-const c_stocka_16 Int)
204    (declare-const loopto_16 Bool)
205    (declare-const truck_stock_17 Int)
206    (declare-const truck_travel_time_17 Int)
207    (declare-const truck_loc_17 Int)
208    (declare-const s_stockb_17 Int)
209    (declare-const s_stocka_17 Int)
210    (declare-const a_stockb_17 Int)
211    (declare-const a_stocka_17 Int)
212    (declare-const b_stockb_17 Int)
213    (declare-const b_stocka_17 Int)
214    (declare-const c_stockb_17 Int)
215    (declare-const c_stocka_17 Int)
216    (declare-const loopto_17 Bool)
217    (declare-const truck_stock_18 Int)
218    (declare-const truck_travel_time_18 Int)
219    (declare-const truck_loc_18 Int)
220    (declare-const s_stockb_18 Int)
221    (declare-const s_stocka_18 Int)
222    (declare-const a_stockb_18 Int)
223    (declare-const a_stocka_18 Int)
224    (declare-const b_stockb_18 Int)
225    (declare-const b_stocka_18 Int)
226    (declare-const c_stockb_18 Int)
```

```
227    (declare-const c_stocka_18 Int)
228    (declare-const loopto_18 Bool)
229    (declare-const truck_stock_19 Int)
230    (declare-const truck_travel_time_19 Int)
231    (declare-const truck_loc_19 Int)
232    (declare-const s_stockb_19 Int)
233    (declare-const s_stocka_19 Int)
234    (declare-const a_stockb_19 Int)
235    (declare-const a_stocka_19 Int)
236    (declare-const b_stockb_19 Int)
237    (declare-const b_stocka_19 Int)
238    (declare-const c_stockb_19 Int)
239    (declare-const c_stocka_19 Int)
240    (declare-const loopto_19 Bool)
241    (declare-const truck_stock_20 Int)
242    (declare-const truck_travel_time_20 Int)
243    (declare-const truck_loc_20 Int)
244    (declare-const s_stockb_20 Int)
245    (declare-const s_stocka_20 Int)
246    (declare-const a_stockb_20 Int)
247    (declare-const a_stocka_20 Int)
248    (declare-const b_stockb_20 Int)
249    (declare-const b_stocka_20 Int)
250    (declare-const c_stockb_20 Int)
251    (declare-const c_stocka_20 Int)
252    (declare-const loopto_20 Bool)
253    (declare-const truck_stock_21 Int)
254    (declare-const truck_travel_time_21 Int)
255    (declare-const truck_loc_21 Int)
256    (declare-const s_stockb_21 Int)
257    (declare-const s_stocka_21 Int)
258    (declare-const a_stockb_21 Int)
259    (declare-const a_stocka_21 Int)
260    (declare-const b_stockb_21 Int)
261    (declare-const b_stocka_21 Int)
262    (declare-const c_stockb_21 Int)
263    (declare-const c_stocka_21 Int)
264    (declare-const loopto_21 Bool)
265    (declare-const truck_stock_22 Int)
266    (declare-const truck_travel_time_22 Int)
267    (declare-const truck_loc_22 Int)
268    (declare-const s_stockb_22 Int)
269    (declare-const s_stocka_22 Int)
270    (declare-const a_stockb_22 Int)
271    (declare-const a_stocka_22 Int)
272    (declare-const b_stockb_22 Int)
273    (declare-const b_stocka_22 Int)
274    (declare-const c_stockb_22 Int)
275    (declare-const c_stocka_22 Int)
276    (declare-const loopto_22 Bool)
277    (declare-const truck_stock_23 Int)
278    (declare-const truck_travel_time_23 Int)
279    (declare-const truck_loc_23 Int)
280    (declare-const s_stockb_23 Int)
281    (declare-const s_stocka_23 Int)
282    (declare-const a_stockb_23 Int)
283    (declare-const a_stocka_23 Int)
284    (declare-const b_stockb_23 Int)
285    (declare-const b_stocka_23 Int)
286    (declare-const c_stockb_23 Int)
287    (declare-const c_stocka_23 Int)
288    (declare-const loopto_23 Bool)
```

```
289  (declare-const truck_stock_24 Int)
290  (declare-const truck_travel_time_24 Int)
291  (declare-const truck_loc_24 Int)
292  (declare-const s_stockb_24 Int)
293  (declare-const s_stocka_24 Int)
294  (declare-const a_stockb_24 Int)
295  (declare-const a_stocka_24 Int)
296  (declare-const b_stockb_24 Int)
297  (declare-const b_stocka_24 Int)
298  (declare-const c_stockb_24 Int)
299  (declare-const c_stocka_24 Int)
300  (declare-const loopto_24 Bool)
301  (declare-const truck_stock_25 Int)
302  (declare-const truck_travel_time_25 Int)
303  (declare-const truck_loc_25 Int)
304  (declare-const s_stockb_25 Int)
305  (declare-const s_stocka_25 Int)
306  (declare-const a_stockb_25 Int)
307  (declare-const a_stocka_25 Int)
308  (declare-const b_stockb_25 Int)
309  (declare-const b_stocka_25 Int)
310  (declare-const c_stockb_25 Int)
311  (declare-const c_stocka_25 Int)
312  (declare-const loopto_25 Bool)
313  (declare-const truck_stock_26 Int)
314  (declare-const truck_travel_time_26 Int)
315  (declare-const truck_loc_26 Int)
316  (declare-const s_stockb_26 Int)
317  (declare-const s_stocka_26 Int)
318  (declare-const a_stockb_26 Int)
319  (declare-const a_stocka_26 Int)
320  (declare-const b_stockb_26 Int)
321  (declare-const b_stocka_26 Int)
322  (declare-const c_stockb_26 Int)
323  (declare-const c_stocka_26 Int)
324  (declare-const loopto_26 Bool)
325  (declare-const truck_stock_27 Int)
326  (declare-const truck_travel_time_27 Int)
327  (declare-const truck_loc_27 Int)
328  (declare-const s_stockb_27 Int)
329  (declare-const s_stocka_27 Int)
330  (declare-const a_stockb_27 Int)
331  (declare-const a_stocka_27 Int)
332  (declare-const b_stockb_27 Int)
333  (declare-const b_stocka_27 Int)
334  (declare-const c_stockb_27 Int)
335  (declare-const c_stocka_27 Int)
336  (declare-const loopto_27 Bool)
337  (declare-const truck_stock_28 Int)
338  (declare-const truck_travel_time_28 Int)
339  (declare-const truck_loc_28 Int)
340  (declare-const s_stockb_28 Int)
341  (declare-const s_stocka_28 Int)
342  (declare-const a_stockb_28 Int)
343  (declare-const a_stocka_28 Int)
344  (declare-const b_stockb_28 Int)
345  (declare-const b_stocka_28 Int)
346  (declare-const c_stockb_28 Int)
347  (declare-const c_stocka_28 Int)
348  (declare-const loopto_28 Bool)
349  (declare-const truck_stock_29 Int)
350  (declare-const truck_travel_time_29 Int)
```

```
351  (declare-const truck_loc_29 Int)
352  (declare-const s_stockb_29 Int)
353  (declare-const s_stocka_29 Int)
354  (declare-const a_stockb_29 Int)
355  (declare-const a_stocka_29 Int)
356  (declare-const b_stockb_29 Int)
357  (declare-const b_stocka_29 Int)
358  (declare-const c_stockb_29 Int)
359  (declare-const c_stocka_29 Int)
360  (declare-const loopto_29 Bool)
361  (declare-const truck_stock_30 Int)
362  (declare-const truck_travel_time_30 Int)
363  (declare-const truck_loc_30 Int)
364  (declare-const s_stockb_30 Int)
365  (declare-const s_stocka_30 Int)
366  (declare-const a_stockb_30 Int)
367  (declare-const a_stocka_30 Int)
368  (declare-const b_stockb_30 Int)
369  (declare-const b_stocka_30 Int)
370  (declare-const c_stockb_30 Int)
371  (declare-const c_stocka_30 Int)
372  (declare-const loopto_30 Bool)
373  (declare-const truck_stock_31 Int)
374  (declare-const truck_travel_time_31 Int)
375  (declare-const truck_loc_31 Int)
376  (declare-const s_stockb_31 Int)
377  (declare-const s_stocka_31 Int)
378  (declare-const a_stockb_31 Int)
379  (declare-const a_stocka_31 Int)
380  (declare-const b_stockb_31 Int)
381  (declare-const b_stocka_31 Int)
382  (declare-const c_stockb_31 Int)
383  (declare-const c_stocka_31 Int)
384  (declare-const loopto_31 Bool)
385  (declare-const truck_stock_32 Int)
386  (declare-const truck_travel_time_32 Int)
387  (declare-const truck_loc_32 Int)
388  (declare-const s_stockb_32 Int)
389  (declare-const s_stocka_32 Int)
390  (declare-const a_stockb_32 Int)
391  (declare-const a_stocka_32 Int)
392  (declare-const b_stockb_32 Int)
393  (declare-const b_stocka_32 Int)
394  (declare-const c_stockb_32 Int)
395  (declare-const c_stocka_32 Int)
396  (declare-const loopto_32 Bool)
397  (declare-const truck_stock_33 Int)
398  (declare-const truck_travel_time_33 Int)
399  (declare-const truck_loc_33 Int)
400  (declare-const s_stockb_33 Int)
401  (declare-const s_stocka_33 Int)
402  (declare-const a_stockb_33 Int)
403  (declare-const a_stocka_33 Int)
404  (declare-const b_stockb_33 Int)
405  (declare-const b_stocka_33 Int)
406  (declare-const c_stockb_33 Int)
407  (declare-const c_stocka_33 Int)
408  (declare-const loopto_33 Bool)
409  (declare-const truck_stock_34 Int)
410  (declare-const truck_travel_time_34 Int)
411  (declare-const truck_loc_34 Int)
412  (declare-const s_stockb_34 Int)
```

```
413  (declare-const s_stocka_34 Int)
414  (declare-const a_stockb_34 Int)
415  (declare-const a_stocka_34 Int)
416  (declare-const b_stockb_34 Int)
417  (declare-const b_stocka_34 Int)
418  (declare-const c_stockb_34 Int)
419  (declare-const c_stocka_34 Int)
420  (declare-const loopto_34 Bool)
421  (declare-const truck_stock_35 Int)
422  (declare-const truck_travel_time_35 Int)
423  (declare-const truck_loc_35 Int)
424  (declare-const s_stockb_35 Int)
425  (declare-const s_stocka_35 Int)
426  (declare-const a_stockb_35 Int)
427  (declare-const a_stocka_35 Int)
428  (declare-const b_stockb_35 Int)
429  (declare-const b_stocka_35 Int)
430  (declare-const c_stockb_35 Int)
431  (declare-const c_stocka_35 Int)
432  (declare-const loopto_35 Bool)
433  (declare-const truck_stock_36 Int)
434  (declare-const truck_travel_time_36 Int)
435  (declare-const truck_loc_36 Int)
436  (declare-const s_stockb_36 Int)
437  (declare-const s_stocka_36 Int)
438  (declare-const a_stockb_36 Int)
439  (declare-const a_stocka_36 Int)
440  (declare-const b_stockb_36 Int)
441  (declare-const b_stocka_36 Int)
442  (declare-const c_stockb_36 Int)
443  (declare-const c_stocka_36 Int)
444  (declare-const loopto_36 Bool)
445  (declare-const truck_stock_37 Int)
446  (declare-const truck_travel_time_37 Int)
447  (declare-const truck_loc_37 Int)
448  (declare-const s_stockb_37 Int)
449  (declare-const s_stocka_37 Int)
450  (declare-const a_stockb_37 Int)
451  (declare-const a_stocka_37 Int)
452  (declare-const b_stockb_37 Int)
453  (declare-const b_stocka_37 Int)
454  (declare-const c_stockb_37 Int)
455  (declare-const c_stocka_37 Int)
456  (declare-const loopto_37 Bool)
457  (declare-const truck_stock_38 Int)
458  (declare-const truck_travel_time_38 Int)
459  (declare-const truck_loc_38 Int)
460  (declare-const s_stockb_38 Int)
461  (declare-const s_stocka_38 Int)
462  (declare-const a_stockb_38 Int)
463  (declare-const a_stocka_38 Int)
464  (declare-const b_stockb_38 Int)
465  (declare-const b_stocka_38 Int)
466  (declare-const c_stockb_38 Int)
467  (declare-const c_stocka_38 Int)
468  (declare-const loopto_38 Bool)
469  (declare-const truck_stock_39 Int)
470  (declare-const truck_travel_time_39 Int)
471  (declare-const truck_loc_39 Int)
472  (declare-const s_stockb_39 Int)
473  (declare-const s_stocka_39 Int)
474  (declare-const a_stockb_39 Int)
```

```
475  (declare-const a_stocka_39 Int)
476  (declare-const b_stockb_39 Int)
477  (declare-const b_stocka_39 Int)
478  (declare-const c_stockb_39 Int)
479  (declare-const c_stocka_39 Int)
480  (declare-const loopto_39 Bool)
481  (declare-const truck_stock_40 Int)
482  (declare-const truck_travel_time_40 Int)
483  (declare-const truck_loc_40 Int)
484  (declare-const s_stockb_40 Int)
485  (declare-const s_stocka_40 Int)
486  (declare-const a_stockb_40 Int)
487  (declare-const a_stocka_40 Int)
488  (declare-const b_stockb_40 Int)
489  (declare-const b_stocka_40 Int)
490  (declare-const c_stockb_40 Int)
491  (declare-const c_stocka_40 Int)
492  (declare-const loopto_40 Bool)
493  (declare-const truck_stock_41 Int)
494  (declare-const truck_travel_time_41 Int)
495  (declare-const truck_loc_41 Int)
496  (declare-const s_stockb_41 Int)
497  (declare-const s_stocka_41 Int)
498  (declare-const a_stockb_41 Int)
499  (declare-const a_stocka_41 Int)
500  (declare-const b_stockb_41 Int)
501  (declare-const b_stocka_41 Int)
502  (declare-const c_stockb_41 Int)
503  (declare-const c_stocka_41 Int)
504  (declare-const loopto_41 Bool)
505  (declare-const truck_stock_42 Int)
506  (declare-const truck_travel_time_42 Int)
507  (declare-const truck_loc_42 Int)
508  (declare-const s_stockb_42 Int)
509  (declare-const s_stocka_42 Int)
510  (declare-const a_stockb_42 Int)
511  (declare-const a_stocka_42 Int)
512  (declare-const b_stockb_42 Int)
513  (declare-const b_stocka_42 Int)
514  (declare-const c_stockb_42 Int)
515  (declare-const c_stocka_42 Int)
516  (declare-const loopto_42 Bool)
517  (declare-const truck_stock_43 Int)
518  (declare-const truck_travel_time_43 Int)
519  (declare-const truck_loc_43 Int)
520  (declare-const s_stockb_43 Int)
521  (declare-const s_stocka_43 Int)
522  (declare-const a_stockb_43 Int)
523  (declare-const a_stocka_43 Int)
524  (declare-const b_stockb_43 Int)
525  (declare-const b_stocka_43 Int)
526  (declare-const c_stockb_43 Int)
527  (declare-const c_stocka_43 Int)
528  (declare-const loopto_43 Bool)
529  (declare-const truck_stock_44 Int)
530  (declare-const truck_travel_time_44 Int)
531  (declare-const truck_loc_44 Int)
532  (declare-const s_stockb_44 Int)
533  (declare-const s_stocka_44 Int)
534  (declare-const a_stockb_44 Int)
535  (declare-const a_stocka_44 Int)
536  (declare-const b_stockb_44 Int)
```

```
537    (declare-const b_stocka_44 Int)
538    (declare-const c_stockb_44 Int)
539    (declare-const c_stocka_44 Int)
540    (declare-const loopto_44 Bool)
541    (declare-const truck_stock_45 Int)
542    (declare-const truck_travel_time_45 Int)
543    (declare-const truck_loc_45 Int)
544    (declare-const s_stockb_45 Int)
545    (declare-const s_stocka_45 Int)
546    (declare-const a_stockb_45 Int)
547    (declare-const a_stocka_45 Int)
548    (declare-const b_stockb_45 Int)
549    (declare-const b_stocka_45 Int)
550    (declare-const c_stockb_45 Int)
551    (declare-const c_stocka_45 Int)
552    (declare-const loopto_45 Bool)
553    (declare-const truck_stock_46 Int)
554    (declare-const truck_travel_time_46 Int)
555    (declare-const truck_loc_46 Int)
556    (declare-const s_stockb_46 Int)
557    (declare-const s_stocka_46 Int)
558    (declare-const a_stockb_46 Int)
559    (declare-const a_stocka_46 Int)
560    (declare-const b_stockb_46 Int)
561    (declare-const b_stocka_46 Int)
562    (declare-const c_stockb_46 Int)
563    (declare-const c_stocka_46 Int)
564    (declare-const loopto_46 Bool)
565    (declare-const truck_stock_47 Int)
566    (declare-const truck_travel_time_47 Int)
567    (declare-const truck_loc_47 Int)
568    (declare-const s_stockb_47 Int)
569    (declare-const s_stocka_47 Int)
570    (declare-const a_stockb_47 Int)
571    (declare-const a_stocka_47 Int)
572    (declare-const b_stockb_47 Int)
573    (declare-const b_stocka_47 Int)
574    (declare-const c_stockb_47 Int)
575    (declare-const c_stocka_47 Int)
576    (declare-const loopto_47 Bool)
577    (declare-const truck_stock_48 Int)
578    (declare-const truck_travel_time_48 Int)
579    (declare-const truck_loc_48 Int)
580    (declare-const s_stockb_48 Int)
581    (declare-const s_stocka_48 Int)
582    (declare-const a_stockb_48 Int)
583    (declare-const a_stocka_48 Int)
584    (declare-const b_stockb_48 Int)
585    (declare-const b_stocka_48 Int)
586    (declare-const c_stockb_48 Int)
587    (declare-const c_stocka_48 Int)
588    (declare-const loopto_48 Bool)
589    (declare-const truck_stock_49 Int)
590    (declare-const truck_travel_time_49 Int)
591    (declare-const truck_loc_49 Int)
592    (declare-const s_stockb_49 Int)
593    (declare-const s_stocka_49 Int)
594    (declare-const a_stockb_49 Int)
595    (declare-const a_stocka_49 Int)
596    (declare-const b_stockb_49 Int)
597    (declare-const b_stocka_49 Int)
598    (declare-const c_stockb_49 Int)
```

```
599    (declare-const c_stocka_49 Int)
600    (declare-const loopto_49 Bool)
601    (declare-const truck_stock_50 Int)
602    (declare-const truck_travel_time_50 Int)
603    (declare-const truck_loc_50 Int)
604    (declare-const s_stockb_50 Int)
605    (declare-const s_stocka_50 Int)
606    (declare-const a_stockb_50 Int)
607    (declare-const a_stocka_50 Int)
608    (declare-const b_stockb_50 Int)
609    (declare-const b_stocka_50 Int)
610    (declare-const c_stockb_50 Int)
611    (declare-const c_stocka_50 Int)
612    (declare-const loopto_50 Bool)
613    (declare-const truck_stock_51 Int)
614    (declare-const truck_travel_time_51 Int)
615    (declare-const truck_loc_51 Int)
616    (declare-const s_stockb_51 Int)
617    (declare-const s_stocka_51 Int)
618    (declare-const a_stockb_51 Int)
619    (declare-const a_stocka_51 Int)
620    (declare-const b_stockb_51 Int)
621    (declare-const b_stocka_51 Int)
622    (declare-const c_stockb_51 Int)
623    (declare-const c_stocka_51 Int)
624    (declare-const loopto_51 Bool)
625    (declare-const truck_stock_52 Int)
626    (declare-const truck_travel_time_52 Int)
627    (declare-const truck_loc_52 Int)
628    (declare-const s_stockb_52 Int)
629    (declare-const s_stocka_52 Int)
630    (declare-const a_stockb_52 Int)
631    (declare-const a_stocka_52 Int)
632    (declare-const b_stockb_52 Int)
633    (declare-const b_stocka_52 Int)
634    (declare-const c_stockb_52 Int)
635    (declare-const c_stocka_52 Int)
636    (declare-const loopto_52 Bool)
637    (declare-const truck_stock_53 Int)
638    (declare-const truck_travel_time_53 Int)
639    (declare-const truck_loc_53 Int)
640    (declare-const s_stockb_53 Int)
641    (declare-const s_stocka_53 Int)
642    (declare-const a_stockb_53 Int)
643    (declare-const a_stocka_53 Int)
644    (declare-const b_stockb_53 Int)
645    (declare-const b_stocka_53 Int)
646    (declare-const c_stockb_53 Int)
647    (declare-const c_stocka_53 Int)
648    (declare-const loopto_53 Bool)
649    (declare-const truck_stock_54 Int)
650    (declare-const truck_travel_time_54 Int)
651    (declare-const truck_loc_54 Int)
652    (declare-const s_stockb_54 Int)
653    (declare-const s_stocka_54 Int)
654    (declare-const a_stockb_54 Int)
655    (declare-const a_stocka_54 Int)
656    (declare-const b_stockb_54 Int)
657    (declare-const b_stocka_54 Int)
658    (declare-const c_stockb_54 Int)
659    (declare-const c_stocka_54 Int)
660    (declare-const loopto_54 Bool)
```

```
661  (declare-const truck_stock_55 Int)
662  (declare-const truck_travel_time_55 Int)
663  (declare-const truck_loc_55 Int)
664  (declare-const s_stockb_55 Int)
665  (declare-const s_stocka_55 Int)
666  (declare-const a_stockb_55 Int)
667  (declare-const a_stocka_55 Int)
668  (declare-const b_stockb_55 Int)
669  (declare-const b_stocka_55 Int)
670  (declare-const c_stockb_55 Int)
671  (declare-const c_stocka_55 Int)
672  (declare-const loopto_55 Bool)
673  (declare-const truck_stock_56 Int)
674  (declare-const truck_travel_time_56 Int)
675  (declare-const truck_loc_56 Int)
676  (declare-const s_stockb_56 Int)
677  (declare-const s_stocka_56 Int)
678  (declare-const a_stockb_56 Int)
679  (declare-const a_stocka_56 Int)
680  (declare-const b_stockb_56 Int)
681  (declare-const b_stocka_56 Int)
682  (declare-const c_stockb_56 Int)
683  (declare-const c_stocka_56 Int)
684  (declare-const loopto_56 Bool)
685  (declare-const truck_stock_57 Int)
686  (declare-const truck_travel_time_57 Int)
687  (declare-const truck_loc_57 Int)
688  (declare-const s_stockb_57 Int)
689  (declare-const s_stocka_57 Int)
690  (declare-const a_stockb_57 Int)
691  (declare-const a_stocka_57 Int)
692  (declare-const b_stockb_57 Int)
693  (declare-const b_stocka_57 Int)
694  (declare-const c_stockb_57 Int)
695  (declare-const c_stocka_57 Int)
696  (declare-const loopto_57 Bool)
697  (declare-const truck_stock_58 Int)
698  (declare-const truck_travel_time_58 Int)
699  (declare-const truck_loc_58 Int)
700  (declare-const s_stockb_58 Int)
701  (declare-const s_stocka_58 Int)
702  (declare-const a_stockb_58 Int)
703  (declare-const a_stocka_58 Int)
704  (declare-const b_stockb_58 Int)
705  (declare-const b_stocka_58 Int)
706  (declare-const c_stockb_58 Int)
707  (declare-const c_stocka_58 Int)
708  (declare-const loopto_58 Bool)
709  (declare-const truck_stock_59 Int)
710  (declare-const truck_travel_time_59 Int)
711  (declare-const truck_loc_59 Int)
712  (declare-const s_stockb_59 Int)
713  (declare-const s_stocka_59 Int)
714  (declare-const a_stockb_59 Int)
715  (declare-const a_stocka_59 Int)
716  (declare-const b_stockb_59 Int)
717  (declare-const b_stocka_59 Int)
718  (declare-const c_stockb_59 Int)
719  (declare-const c_stocka_59 Int)
720  (declare-const loopto_59 Bool)
721  (declare-const truck_stock_60 Int)
722  (declare-const truck_travel_time_60 Int)
```

```
723  (declare-const truck_loc_60 Int)
724  (declare-const s_stockb_60 Int)
725  (declare-const s_stocka_60 Int)
726  (declare-const a_stockb_60 Int)
727  (declare-const a_stocka_60 Int)
728  (declare-const b_stockb_60 Int)
729  (declare-const b_stocka_60 Int)
730  (declare-const c_stockb_60 Int)
731  (declare-const c_stocka_60 Int)
732  (declare-const loopto_60 Bool)
733  (declare-const truck_stock_61 Int)
734  (declare-const truck_travel_time_61 Int)
735  (declare-const truck_loc_61 Int)
736  (declare-const s_stockb_61 Int)
737  (declare-const s_stocka_61 Int)
738  (declare-const a_stockb_61 Int)
739  (declare-const a_stocka_61 Int)
740  (declare-const b_stockb_61 Int)
741  (declare-const b_stocka_61 Int)
742  (declare-const c_stockb_61 Int)
743  (declare-const c_stocka_61 Int)
744  (declare-const loopto_61 Bool)
745  (declare-const truck_stock_62 Int)
746  (declare-const truck_travel_time_62 Int)
747  (declare-const truck_loc_62 Int)
748  (declare-const s_stockb_62 Int)
749  (declare-const s_stocka_62 Int)
750  (declare-const a_stockb_62 Int)
751  (declare-const a_stocka_62 Int)
752  (declare-const b_stockb_62 Int)
753  (declare-const b_stocka_62 Int)
754  (declare-const c_stockb_62 Int)
755  (declare-const c_stocka_62 Int)
756  (declare-const loopto_62 Bool)
757  (declare-const truck_stock_63 Int)
758  (declare-const truck_travel_time_63 Int)
759  (declare-const truck_loc_63 Int)
760  (declare-const s_stockb_63 Int)
761  (declare-const s_stocka_63 Int)
762  (declare-const a_stockb_63 Int)
763  (declare-const a_stocka_63 Int)
764  (declare-const b_stockb_63 Int)
765  (declare-const b_stocka_63 Int)
766  (declare-const c_stockb_63 Int)
767  (declare-const c_stocka_63 Int)
768  (declare-const loopto_63 Bool)
769  (declare-const truck_stock_64 Int)
770  (declare-const truck_travel_time_64 Int)
771  (declare-const truck_loc_64 Int)
772  (declare-const s_stockb_64 Int)
773  (declare-const s_stocka_64 Int)
774  (declare-const a_stockb_64 Int)
775  (declare-const a_stocka_64 Int)
776  (declare-const b_stockb_64 Int)
777  (declare-const b_stocka_64 Int)
778  (declare-const c_stockb_64 Int)
779  (declare-const c_stocka_64 Int)
780  (declare-const loopto_64 Bool)
781  (declare-const truck_stock_65 Int)
782  (declare-const truck_travel_time_65 Int)
783  (declare-const truck_loc_65 Int)
784  (declare-const s_stockb_65 Int)
```

```
785   (declare-const s_stocka_65 Int)
786   (declare-const a_stockb_65 Int)
787   (declare-const a_stocka_65 Int)
788   (declare-const b_stockb_65 Int)
789   (declare-const b_stocka_65 Int)
790   (declare-const c_stockb_65 Int)
791   (declare-const c_stocka_65 Int)
792   (declare-const loopto_65 Bool)
793   (declare-const truck_stock_66 Int)
794   (declare-const truck_travel_time_66 Int)
795   (declare-const truck_loc_66 Int)
796   (declare-const s_stockb_66 Int)
797   (declare-const s_stocka_66 Int)
798   (declare-const a_stockb_66 Int)
799   (declare-const a_stocka_66 Int)
800   (declare-const b_stockb_66 Int)
801   (declare-const b_stocka_66 Int)
802   (declare-const c_stockb_66 Int)
803   (declare-const c_stocka_66 Int)
804   (declare-const loopto_66 Bool)
805   (declare-const truck_stock_67 Int)
806   (declare-const truck_travel_time_67 Int)
807   (declare-const truck_loc_67 Int)
808   (declare-const s_stockb_67 Int)
809   (declare-const s_stocka_67 Int)
810   (declare-const a_stockb_67 Int)
811   (declare-const a_stocka_67 Int)
812   (declare-const b_stockb_67 Int)
813   (declare-const b_stocka_67 Int)
814   (declare-const c_stockb_67 Int)
815   (declare-const c_stocka_67 Int)
816   (declare-const loopto_67 Bool)
817   (declare-const truck_stock_68 Int)
818   (declare-const truck_travel_time_68 Int)
819   (declare-const truck_loc_68 Int)
820   (declare-const s_stockb_68 Int)
821   (declare-const s_stocka_68 Int)
822   (declare-const a_stockb_68 Int)
823   (declare-const a_stocka_68 Int)
824   (declare-const b_stockb_68 Int)
825   (declare-const b_stocka_68 Int)
826   (declare-const c_stockb_68 Int)
827   (declare-const c_stocka_68 Int)
828   (declare-const loopto_68 Bool)
829   (declare-const truck_stock_69 Int)
830   (declare-const truck_travel_time_69 Int)
831   (declare-const truck_loc_69 Int)
832   (declare-const s_stockb_69 Int)
833   (declare-const s_stocka_69 Int)
834   (declare-const a_stockb_69 Int)
835   (declare-const a_stocka_69 Int)
836   (declare-const b_stockb_69 Int)
837   (declare-const b_stocka_69 Int)
838   (declare-const c_stockb_69 Int)
839   (declare-const c_stocka_69 Int)
840   (declare-const loopto_69 Bool)
841   (declare-const truck_stock_70 Int)
842   (declare-const truck_travel_time_70 Int)
843   (declare-const truck_loc_70 Int)
844   (declare-const s_stockb_70 Int)
845   (declare-const s_stocka_70 Int)
846   (declare-const a_stockb_70 Int)
```

```
847  (declare-const a_stocka_70 Int)
848  (declare-const b_stockb_70 Int)
849  (declare-const b_stocka_70 Int)
850  (declare-const c_stockb_70 Int)
851  (declare-const c_stocka_70 Int)
852  (declare-const loopto_70 Bool)
853  (declare-const truck_stock_71 Int)
854  (declare-const truck_travel_time_71 Int)
855  (declare-const truck_loc_71 Int)
856  (declare-const s_stockb_71 Int)
857  (declare-const s_stocka_71 Int)
858  (declare-const a_stockb_71 Int)
859  (declare-const a_stocka_71 Int)
860  (declare-const b_stockb_71 Int)
861  (declare-const b_stocka_71 Int)
862  (declare-const c_stockb_71 Int)
863  (declare-const c_stocka_71 Int)
864  (declare-const loopto_71 Bool)
865  (declare-const truck_stock_72 Int)
866  (declare-const truck_travel_time_72 Int)
867  (declare-const truck_loc_72 Int)
868  (declare-const s_stockb_72 Int)
869  (declare-const s_stocka_72 Int)
870  (declare-const a_stockb_72 Int)
871  (declare-const a_stocka_72 Int)
872  (declare-const b_stockb_72 Int)
873  (declare-const b_stocka_72 Int)
874  (declare-const c_stockb_72 Int)
875  (declare-const c_stocka_72 Int)
876  (declare-const loopto_72 Bool)
877  (declare-const truck_stock_73 Int)
878  (declare-const truck_travel_time_73 Int)
879  (declare-const truck_loc_73 Int)
880  (declare-const s_stockb_73 Int)
881  (declare-const s_stocka_73 Int)
882  (declare-const a_stockb_73 Int)
883  (declare-const a_stocka_73 Int)
884  (declare-const b_stockb_73 Int)
885  (declare-const b_stocka_73 Int)
886  (declare-const c_stockb_73 Int)
887  (declare-const c_stocka_73 Int)
888  (declare-const loopto_73 Bool)
889  (declare-const truck_stock_74 Int)
890  (declare-const truck_travel_time_74 Int)
891  (declare-const truck_loc_74 Int)
892  (declare-const s_stockb_74 Int)
893  (declare-const s_stocka_74 Int)
894  (declare-const a_stockb_74 Int)
895  (declare-const a_stocka_74 Int)
896  (declare-const b_stockb_74 Int)
897  (declare-const b_stocka_74 Int)
898  (declare-const c_stockb_74 Int)
899  (declare-const c_stocka_74 Int)
900  (declare-const loopto_74 Bool)
901  (declare-const truck_stock_75 Int)
902  (declare-const truck_travel_time_75 Int)
903  (declare-const truck_loc_75 Int)
904  (declare-const s_stockb_75 Int)
905  (declare-const s_stocka_75 Int)
906  (declare-const a_stockb_75 Int)
907  (declare-const a_stocka_75 Int)
908  (declare-const b_stockb_75 Int)
```

```
909    (declare-const b_stocka_75 Int)
910    (declare-const c_stockb_75 Int)
911    (declare-const c_stocka_75 Int)
912    (declare-const loopto_75 Bool)
913    (declare-const truck_stock_76 Int)
914    (declare-const truck_travel_time_76 Int)
915    (declare-const truck_loc_76 Int)
916    (declare-const s_stockb_76 Int)
917    (declare-const s_stocka_76 Int)
918    (declare-const a_stockb_76 Int)
919    (declare-const a_stocka_76 Int)
920    (declare-const b_stockb_76 Int)
921    (declare-const b_stocka_76 Int)
922    (declare-const c_stockb_76 Int)
923    (declare-const c_stocka_76 Int)
924    (declare-const loopto_76 Bool)
925    (declare-const truck_stock_77 Int)
926    (declare-const truck_travel_time_77 Int)
927    (declare-const truck_loc_77 Int)
928    (declare-const s_stockb_77 Int)
929    (declare-const s_stocka_77 Int)
930    (declare-const a_stockb_77 Int)
931    (declare-const a_stocka_77 Int)
932    (declare-const b_stockb_77 Int)
933    (declare-const b_stocka_77 Int)
934    (declare-const c_stockb_77 Int)
935    (declare-const c_stocka_77 Int)
936    (declare-const loopto_77 Bool)
937    (declare-const truck_stock_78 Int)
938    (declare-const truck_travel_time_78 Int)
939    (declare-const truck_loc_78 Int)
940    (declare-const s_stockb_78 Int)
941    (declare-const s_stocka_78 Int)
942    (declare-const a_stockb_78 Int)
943    (declare-const a_stocka_78 Int)
944    (declare-const b_stockb_78 Int)
945    (declare-const b_stocka_78 Int)
946    (declare-const c_stockb_78 Int)
947    (declare-const c_stocka_78 Int)
948    (declare-const loopto_78 Bool)
949    (declare-const truck_stock_79 Int)
950    (declare-const truck_travel_time_79 Int)
951    (declare-const truck_loc_79 Int)
952    (declare-const s_stockb_79 Int)
953    (declare-const s_stocka_79 Int)
954    (declare-const a_stockb_79 Int)
955    (declare-const a_stocka_79 Int)
956    (declare-const b_stockb_79 Int)
957    (declare-const b_stocka_79 Int)
958    (declare-const c_stockb_79 Int)
959    (declare-const c_stocka_79 Int)
960    (declare-const loopto_79 Bool)
961    (declare-const truck_stock_80 Int)
962    (declare-const truck_travel_time_80 Int)
963    (declare-const truck_loc_80 Int)
964    (declare-const s_stockb_80 Int)
965    (declare-const s_stocka_80 Int)
966    (declare-const a_stockb_80 Int)
967    (declare-const a_stocka_80 Int)
968    (declare-const b_stockb_80 Int)
969    (declare-const b_stocka_80 Int)
970    (declare-const c_stockb_80 Int)
```

```
971   (declare-const c_stocka_80 Int)
972   (declare-const loopto_80 Bool)
973   (declare-const truck_stock_81 Int)
974   (declare-const truck_travel_time_81 Int)
975   (declare-const truck_loc_81 Int)
976   (declare-const s_stockb_81 Int)
977   (declare-const s_stocka_81 Int)
978   (declare-const a_stockb_81 Int)
979   (declare-const a_stocka_81 Int)
980   (declare-const b_stockb_81 Int)
981   (declare-const b_stocka_81 Int)
982   (declare-const c_stockb_81 Int)
983   (declare-const c_stocka_81 Int)
984   (declare-const loopto_81 Bool)
985   (declare-const truck_stock_82 Int)
986   (declare-const truck_travel_time_82 Int)
987   (declare-const truck_loc_82 Int)
988   (declare-const s_stockb_82 Int)
989   (declare-const s_stocka_82 Int)
990   (declare-const a_stockb_82 Int)
991   (declare-const a_stocka_82 Int)
992   (declare-const b_stockb_82 Int)
993   (declare-const b_stocka_82 Int)
994   (declare-const c_stockb_82 Int)
995   (declare-const c_stocka_82 Int)
996   (declare-const loopto_82 Bool)
997   (declare-const truck_stock_83 Int)
998   (declare-const truck_travel_time_83 Int)
999   (declare-const truck_loc_83 Int)
1000  (declare-const s_stockb_83 Int)
1001  (declare-const s_stocka_83 Int)
1002  (declare-const a_stockb_83 Int)
1003  (declare-const a_stocka_83 Int)
1004  (declare-const b_stockb_83 Int)
1005  (declare-const b_stocka_83 Int)
1006  (declare-const c_stockb_83 Int)
1007  (declare-const c_stocka_83 Int)
1008  (declare-const loopto_83 Bool)
1009  (declare-const truck_stock_84 Int)
1010  (declare-const truck_travel_time_84 Int)
1011  (declare-const truck_loc_84 Int)
1012  (declare-const s_stockb_84 Int)
1013  (declare-const s_stocka_84 Int)
1014  (declare-const a_stockb_84 Int)
1015  (declare-const a_stocka_84 Int)
1016  (declare-const b_stockb_84 Int)
1017  (declare-const b_stocka_84 Int)
1018  (declare-const c_stockb_84 Int)
1019  (declare-const c_stocka_84 Int)
1020  (declare-const loopto_84 Bool)
1021  (declare-const truck_stock_85 Int)
1022  (declare-const truck_travel_time_85 Int)
1023  (declare-const truck_loc_85 Int)
1024  (declare-const s_stockb_85 Int)
1025  (declare-const s_stocka_85 Int)
1026  (declare-const a_stockb_85 Int)
1027  (declare-const a_stocka_85 Int)
1028  (declare-const b_stockb_85 Int)
1029  (declare-const b_stocka_85 Int)
1030  (declare-const c_stockb_85 Int)
1031  (declare-const c_stocka_85 Int)
1032  (declare-const loopto_85 Bool)
```

```
1033  (declare-const truck_stock_86 Int)
1034  (declare-const truck_travel_time_86 Int)
1035  (declare-const truck_loc_86 Int)
1036  (declare-const s_stockb_86 Int)
1037  (declare-const s_stocka_86 Int)
1038  (declare-const a_stockb_86 Int)
1039  (declare-const a_stocka_86 Int)
1040  (declare-const b_stockb_86 Int)
1041  (declare-const b_stocka_86 Int)
1042  (declare-const c_stockb_86 Int)
1043  (declare-const c_stocka_86 Int)
1044  (declare-const loopto_86 Bool)
1045  (declare-const truck_stock_87 Int)
1046  (declare-const truck_travel_time_87 Int)
1047  (declare-const truck_loc_87 Int)
1048  (declare-const s_stockb_87 Int)
1049  (declare-const s_stocka_87 Int)
1050  (declare-const a_stockb_87 Int)
1051  (declare-const a_stocka_87 Int)
1052  (declare-const b_stockb_87 Int)
1053  (declare-const b_stocka_87 Int)
1054  (declare-const c_stockb_87 Int)
1055  (declare-const c_stocka_87 Int)
1056  (declare-const loopto_87 Bool)
1057  (declare-const truck_stock_88 Int)
1058  (declare-const truck_travel_time_88 Int)
1059  (declare-const truck_loc_88 Int)
1060  (declare-const s_stockb_88 Int)
1061  (declare-const s_stocka_88 Int)
1062  (declare-const a_stockb_88 Int)
1063  (declare-const a_stocka_88 Int)
1064  (declare-const b_stockb_88 Int)
1065  (declare-const b_stocka_88 Int)
1066  (declare-const c_stockb_88 Int)
1067  (declare-const c_stocka_88 Int)
1068  (declare-const loopto_88 Bool)
1069  (declare-const truck_stock_89 Int)
1070  (declare-const truck_travel_time_89 Int)
1071  (declare-const truck_loc_89 Int)
1072  (declare-const s_stockb_89 Int)
1073  (declare-const s_stocka_89 Int)
1074  (declare-const a_stockb_89 Int)
1075  (declare-const a_stocka_89 Int)
1076  (declare-const b_stockb_89 Int)
1077  (declare-const b_stocka_89 Int)
1078  (declare-const c_stockb_89 Int)
1079  (declare-const c_stocka_89 Int)
1080  (declare-const loopto_89 Bool)
1081  (declare-const truck_stock_90 Int)
1082  (declare-const truck_travel_time_90 Int)
1083  (declare-const truck_loc_90 Int)
1084  (declare-const s_stockb_90 Int)
1085  (declare-const s_stocka_90 Int)
1086  (declare-const a_stockb_90 Int)
1087  (declare-const a_stocka_90 Int)
1088  (declare-const b_stockb_90 Int)
1089  (declare-const b_stocka_90 Int)
1090  (declare-const c_stockb_90 Int)
1091  (declare-const c_stocka_90 Int)
1092  (declare-const loopto_90 Bool)
1093  (declare-const truck_stock_91 Int)
1094  (declare-const truck_travel_time_91 Int)
```

```
1095   (declare-const truck_loc_91 Int)
1096   (declare-const s_stockb_91 Int)
1097   (declare-const s_stocka_91 Int)
1098   (declare-const a_stockb_91 Int)
1099   (declare-const a_stocka_91 Int)
1100   (declare-const b_stockb_91 Int)
1101   (declare-const b_stocka_91 Int)
1102   (declare-const c_stockb_91 Int)
1103   (declare-const c_stocka_91 Int)
1104   (declare-const loopto_91 Bool)
1105   (declare-const truck_stock_92 Int)
1106   (declare-const truck_travel_time_92 Int)
1107   (declare-const truck_loc_92 Int)
1108   (declare-const s_stockb_92 Int)
1109   (declare-const s_stocka_92 Int)
1110   (declare-const a_stockb_92 Int)
1111   (declare-const a_stocka_92 Int)
1112   (declare-const b_stockb_92 Int)
1113   (declare-const b_stocka_92 Int)
1114   (declare-const c_stockb_92 Int)
1115   (declare-const c_stocka_92 Int)
1116   (declare-const loopto_92 Bool)
1117   (declare-const truck_stock_93 Int)
1118   (declare-const truck_travel_time_93 Int)
1119   (declare-const truck_loc_93 Int)
1120   (declare-const s_stockb_93 Int)
1121   (declare-const s_stocka_93 Int)
1122   (declare-const a_stockb_93 Int)
1123   (declare-const a_stocka_93 Int)
1124   (declare-const b_stockb_93 Int)
1125   (declare-const b_stocka_93 Int)
1126   (declare-const c_stockb_93 Int)
1127   (declare-const c_stocka_93 Int)
1128   (declare-const loopto_93 Bool)
1129   (declare-const truck_stock_94 Int)
1130   (declare-const truck_travel_time_94 Int)
1131   (declare-const truck_loc_94 Int)
1132   (declare-const s_stockb_94 Int)
1133   (declare-const s_stocka_94 Int)
1134   (declare-const a_stockb_94 Int)
1135   (declare-const a_stocka_94 Int)
1136   (declare-const b_stockb_94 Int)
1137   (declare-const b_stocka_94 Int)
1138   (declare-const c_stockb_94 Int)
1139   (declare-const c_stocka_94 Int)
1140   (declare-const loopto_94 Bool)
1141   (declare-const truck_stock_95 Int)
1142   (declare-const truck_travel_time_95 Int)
1143   (declare-const truck_loc_95 Int)
1144   (declare-const s_stockb_95 Int)
1145   (declare-const s_stocka_95 Int)
1146   (declare-const a_stockb_95 Int)
1147   (declare-const a_stocka_95 Int)
1148   (declare-const b_stockb_95 Int)
1149   (declare-const b_stocka_95 Int)
1150   (declare-const c_stockb_95 Int)
1151   (declare-const c_stocka_95 Int)
1152   (declare-const loopto_95 Bool)
1153   (declare-const truck_stock_96 Int)
1154   (declare-const truck_travel_time_96 Int)
1155   (declare-const truck_loc_96 Int)
1156   (declare-const s_stockb_96 Int)
```

```
1157  (declare-const s_stocka_96 Int)
1158  (declare-const a_stockb_96 Int)
1159  (declare-const a_stocka_96 Int)
1160  (declare-const b_stockb_96 Int)
1161  (declare-const b_stocka_96 Int)
1162  (declare-const c_stockb_96 Int)
1163  (declare-const c_stocka_96 Int)
1164  (declare-const loopto_96 Bool)
1165  (declare-const truck_stock_97 Int)
1166  (declare-const truck_travel_time_97 Int)
1167  (declare-const truck_loc_97 Int)
1168  (declare-const s_stockb_97 Int)
1169  (declare-const s_stocka_97 Int)
1170  (declare-const a_stockb_97 Int)
1171  (declare-const a_stocka_97 Int)
1172  (declare-const b_stockb_97 Int)
1173  (declare-const b_stocka_97 Int)
1174  (declare-const c_stockb_97 Int)
1175  (declare-const c_stocka_97 Int)
1176  (declare-const loopto_97 Bool)
1177  (declare-const truck_stock_98 Int)
1178  (declare-const truck_travel_time_98 Int)
1179  (declare-const truck_loc_98 Int)
1180  (declare-const s_stockb_98 Int)
1181  (declare-const s_stocka_98 Int)
1182  (declare-const a_stockb_98 Int)
1183  (declare-const a_stocka_98 Int)
1184  (declare-const b_stockb_98 Int)
1185  (declare-const b_stocka_98 Int)
1186  (declare-const c_stockb_98 Int)
1187  (declare-const c_stocka_98 Int)
1188  (declare-const loopto_98 Bool)
1189  (declare-const truck_stock_99 Int)
1190  (declare-const truck_travel_time_99 Int)
1191  (declare-const truck_loc_99 Int)
1192  (declare-const s_stockb_99 Int)
1193  (declare-const s_stocka_99 Int)
1194  (declare-const a_stockb_99 Int)
1195  (declare-const a_stocka_99 Int)
1196  (declare-const b_stockb_99 Int)
1197  (declare-const b_stocka_99 Int)
1198  (declare-const c_stockb_99 Int)
1199  (declare-const c_stocka_99 Int)
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1201  (declare-const truck_stock_100 Int)
1202  (declare-const truck_travel_time_100 Int)
1203  (declare-const truck_loc_100 Int)
1204  (declare-const s_stockb_100 Int)
1205  (declare-const s_stocka_100 Int)
1206  (declare-const a_stockb_100 Int)
1207  (declare-const a_stocka_100 Int)
1208  (declare-const b_stockb_100 Int)
1209  (declare-const b_stocka_100 Int)
1210  (declare-const c_stockb_100 Int)
1211  (declare-const c_stocka_100 Int)
1212  (declare-const loopto_100 Bool)
1213  (declare-const truck_stock_101 Int)
1214  (declare-const truck_travel_time_101 Int)
1215  (declare-const truck_loc_101 Int)
1216  (declare-const s_stockb_101 Int)
1217  (declare-const s_stocka_101 Int)
1218  (declare-const a_stockb_101 Int)
```

```
1219  (declare-const a_stocka_101 Int)
1220  (declare-const b_stockb_101 Int)
1221  (declare-const b_stocka_101 Int)
1222  (declare-const c_stockb_101 Int)
1223  (declare-const c_stocka_101 Int)
1224  (declare-const loopto_101 Bool)
1225  (declare-const truck_stock_102 Int)
1226  (declare-const truck_travel_time_102 Int)
1227  (declare-const truck_loc_102 Int)
1228  (declare-const s_stockb_102 Int)
1229  (declare-const s_stocka_102 Int)
1230  (declare-const a_stockb_102 Int)
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1232  (declare-const b_stockb_102 Int)
1233  (declare-const b_stocka_102 Int)
1234  (declare-const c_stockb_102 Int)
1235  (declare-const c_stocka_102 Int)
1236  (declare-const loopto_102 Bool)
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1238  (declare-const truck_travel_time_103 Int)
1239  (declare-const truck_loc_103 Int)
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1241  (declare-const s_stocka_103 Int)
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1244  (declare-const b_stockb_103 Int)
1245  (declare-const b_stocka_103 Int)
1246  (declare-const c_stockb_103 Int)
1247  (declare-const c_stocka_103 Int)
1248  (declare-const loopto_103 Bool)
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1250  (declare-const truck_travel_time_104 Int)
1251  (declare-const truck_loc_104 Int)
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1253  (declare-const s_stocka_104 Int)
1254  (declare-const a_stockb_104 Int)
1255  (declare-const a_stocka_104 Int)
1256  (declare-const b_stockb_104 Int)
1257  (declare-const b_stocka_104 Int)
1258  (declare-const c_stockb_104 Int)
1259  (declare-const c_stocka_104 Int)
1260  (declare-const loopto_104 Bool)
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1262  (declare-const truck_travel_time_105 Int)
1263  (declare-const truck_loc_105 Int)
1264  (declare-const s_stockb_105 Int)
1265  (declare-const s_stocka_105 Int)
1266  (declare-const a_stockb_105 Int)
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1268  (declare-const b_stockb_105 Int)
1269  (declare-const b_stocka_105 Int)
1270  (declare-const c_stockb_105 Int)
1271  (declare-const c_stocka_105 Int)
1272  (declare-const loopto_105 Bool)
1273  (declare-const truck_stock_106 Int)
1274  (declare-const truck_travel_time_106 Int)
1275  (declare-const truck_loc_106 Int)
1276  (declare-const s_stockb_106 Int)
1277  (declare-const s_stocka_106 Int)
1278  (declare-const a_stockb_106 Int)
1279  (declare-const a_stocka_106 Int)
1280  (declare-const b_stockb_106 Int)
```

```
1281   (declare-const b_stocka_106 Int)
1282   (declare-const c_stockb_106 Int)
1283   (declare-const c_stocka_106 Int)
1284   (declare-const loopto_106 Bool)
1285   (declare-const truck_stock_107 Int)
1286   (declare-const truck_travel_time_107 Int)
1287   (declare-const truck_loc_107 Int)
1288   (declare-const s_stockb_107 Int)
1289   (declare-const s_stocka_107 Int)
1290   (declare-const a_stockb_107 Int)
1291   (declare-const a_stocka_107 Int)
1292   (declare-const b_stockb_107 Int)
1293   (declare-const b_stocka_107 Int)
1294   (declare-const c_stockb_107 Int)
1295   (declare-const c_stocka_107 Int)
1296   (declare-const loopto_107 Bool)
1297   (declare-const truck_stock_108 Int)
1298   (declare-const truck_travel_time_108 Int)
1299   (declare-const truck_loc_108 Int)
1300   (declare-const s_stockb_108 Int)
1301   (declare-const s_stocka_108 Int)
1302   (declare-const a_stockb_108 Int)
1303   (declare-const a_stocka_108 Int)
1304   (declare-const b_stockb_108 Int)
1305   (declare-const b_stocka_108 Int)
1306   (declare-const c_stockb_108 Int)
1307   (declare-const c_stocka_108 Int)
1308   (declare-const loopto_108 Bool)
1309   (declare-const truck_stock_109 Int)
1310   (declare-const truck_travel_time_109 Int)
1311   (declare-const truck_loc_109 Int)
1312   (declare-const s_stockb_109 Int)
1313   (declare-const s_stocka_109 Int)
1314   (declare-const a_stockb_109 Int)
1315   (declare-const a_stocka_109 Int)
1316   (declare-const b_stockb_109 Int)
1317   (declare-const b_stocka_109 Int)
1318   (declare-const c_stockb_109 Int)
1319   (declare-const c_stocka_109 Int)
1320   (declare-const loopto_109 Bool)
1321   (declare-const truck_stock_110 Int)
1322   (declare-const truck_travel_time_110 Int)
1323   (declare-const truck_loc_110 Int)
1324   (declare-const s_stockb_110 Int)
1325   (declare-const s_stocka_110 Int)
1326   (declare-const a_stockb_110 Int)
1327   (declare-const a_stocka_110 Int)
1328   (declare-const b_stockb_110 Int)
1329   (declare-const b_stocka_110 Int)
1330   (declare-const c_stockb_110 Int)
1331   (declare-const c_stocka_110 Int)
1332   (declare-const loopto_110 Bool)
1333   (declare-const truck_stock_111 Int)
1334   (declare-const truck_travel_time_111 Int)
1335   (declare-const truck_loc_111 Int)
1336   (declare-const s_stockb_111 Int)
1337   (declare-const s_stocka_111 Int)
1338   (declare-const a_stockb_111 Int)
1339   (declare-const a_stocka_111 Int)
1340   (declare-const b_stockb_111 Int)
1341   (declare-const b_stocka_111 Int)
1342   (declare-const c_stockb_111 Int)
```

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1343  (declare-const c_stocka_111 Int)
1344  (declare-const loopto_111 Bool)
1345  (declare-const truck_stock_112 Int)
1346  (declare-const truck_travel_time_112 Int)
1347  (declare-const truck_loc_112 Int)
1348  (declare-const s_stockb_112 Int)
1349  (declare-const s_stocka_112 Int)
1350  (declare-const a_stockb_112 Int)
1351  (declare-const a_stocka_112 Int)
1352  (declare-const b_stockb_112 Int)
1353  (declare-const b_stocka_112 Int)
1354  (declare-const c_stockb_112 Int)
1355  (declare-const c_stocka_112 Int)
1356  (declare-const loopto_112 Bool)
1357  (declare-const truck_stock_113 Int)
1358  (declare-const truck_travel_time_113 Int)
1359  (declare-const truck_loc_113 Int)
1360  (declare-const s_stockb_113 Int)
1361  (declare-const s_stocka_113 Int)
1362  (declare-const a_stockb_113 Int)
1363  (declare-const a_stocka_113 Int)
1364  (declare-const b_stockb_113 Int)
1365  (declare-const b_stocka_113 Int)
1366  (declare-const c_stockb_113 Int)
1367  (declare-const c_stocka_113 Int)
1368  (declare-const loopto_113 Bool)
1369  (declare-const truck_stock_114 Int)
1370  (declare-const truck_travel_time_114 Int)
1371  (declare-const truck_loc_114 Int)
1372  (declare-const s_stockb_114 Int)
1373  (declare-const s_stocka_114 Int)
1374  (declare-const a_stockb_114 Int)
1375  (declare-const a_stocka_114 Int)
1376  (declare-const b_stockb_114 Int)
1377  (declare-const b_stocka_114 Int)
1378  (declare-const c_stockb_114 Int)
1379  (declare-const c_stocka_114 Int)
1380  (declare-const loopto_114 Bool)
1381  (declare-const truck_stock_115 Int)
1382  (declare-const truck_travel_time_115 Int)
1383  (declare-const truck_loc_115 Int)
1384  (declare-const s_stockb_115 Int)
1385  (declare-const s_stocka_115 Int)
1386  (declare-const a_stockb_115 Int)
1387  (declare-const a_stocka_115 Int)
1388  (declare-const b_stockb_115 Int)
1389  (declare-const b_stocka_115 Int)
1390  (declare-const c_stockb_115 Int)
1391  (declare-const c_stocka_115 Int)
1392  (declare-const loopto_115 Bool)
1393  (declare-const truck_stock_116 Int)
1394  (declare-const truck_travel_time_116 Int)
1395  (declare-const truck_loc_116 Int)
1396  (declare-const s_stockb_116 Int)
1397  (declare-const s_stocka_116 Int)
1398  (declare-const a_stockb_116 Int)
1399  (declare-const a_stocka_116 Int)
1400  (declare-const b_stockb_116 Int)
1401  (declare-const b_stocka_116 Int)
1402  (declare-const c_stockb_116 Int)
1403  (declare-const c_stocka_116 Int)
1404  (declare-const loopto_116 Bool)
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1405  (declare-const truck_stock_117 Int)
1406  (declare-const truck_travel_time_117 Int)
1407  (declare-const truck_loc_117 Int)
1408  (declare-const s_stockb_117 Int)
1409  (declare-const s_stocka_117 Int)
1410  (declare-const a_stockb_117 Int)
1411  (declare-const a_stocka_117 Int)
1412  (declare-const b_stockb_117 Int)
1413  (declare-const b_stocka_117 Int)
1414  (declare-const c_stockb_117 Int)
1415  (declare-const c_stocka_117 Int)
1416  (declare-const loopto_117 Bool)
1417  (declare-const truck_stock_118 Int)
1418  (declare-const truck_travel_time_118 Int)
1419  (declare-const truck_loc_118 Int)
1420  (declare-const s_stockb_118 Int)
1421  (declare-const s_stocka_118 Int)
1422  (declare-const a_stockb_118 Int)
1423  (declare-const a_stocka_118 Int)
1424  (declare-const b_stockb_118 Int)
1425  (declare-const b_stocka_118 Int)
1426  (declare-const c_stockb_118 Int)
1427  (declare-const c_stocka_118 Int)
1428  (declare-const loopto_118 Bool)
1429  (declare-const truck_stock_119 Int)
1430  (declare-const truck_travel_time_119 Int)
1431  (declare-const truck_loc_119 Int)
1432  (declare-const s_stockb_119 Int)
1433  (declare-const s_stocka_119 Int)
1434  (declare-const a_stockb_119 Int)
1435  (declare-const a_stocka_119 Int)
1436  (declare-const b_stockb_119 Int)
1437  (declare-const b_stocka_119 Int)
1438  (declare-const c_stockb_119 Int)
1439  (declare-const c_stocka_119 Int)
1440  (declare-const loopto_119 Bool)
1441  (declare-const truck_stock_120 Int)
1442  (declare-const truck_travel_time_120 Int)
1443  (declare-const truck_loc_120 Int)
1444  (declare-const s_stockb_120 Int)
1445  (declare-const s_stocka_120 Int)
1446  (declare-const a_stockb_120 Int)
1447  (declare-const a_stocka_120 Int)
1448  (declare-const b_stockb_120 Int)
1449  (declare-const b_stocka_120 Int)
1450  (declare-const c_stockb_120 Int)
1451  (declare-const c_stocka_120 Int)
1452  (declare-const loopto_120 Bool)
1453  (declare-const truck_stock_121 Int)
1454  (declare-const truck_travel_time_121 Int)
1455  (declare-const truck_loc_121 Int)
1456  (declare-const s_stockb_121 Int)
1457  (declare-const s_stocka_121 Int)
1458  (declare-const a_stockb_121 Int)
1459  (declare-const a_stocka_121 Int)
1460  (declare-const b_stockb_121 Int)
1461  (declare-const b_stocka_121 Int)
1462  (declare-const c_stockb_121 Int)
1463  (declare-const c_stocka_121 Int)
1464  (declare-const loopto_121 Bool)
1465  (declare-const truck_stock_122 Int)
1466  (declare-const truck_travel_time_122 Int)
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1467  (declare-const truck_loc_122 Int)
1468  (declare-const s_stockb_122 Int)
1469  (declare-const s_stocka_122 Int)
1470  (declare-const a_stockb_122 Int)
1471  (declare-const a_stocka_122 Int)
1472  (declare-const b_stockb_122 Int)
1473  (declare-const b_stocka_122 Int)
1474  (declare-const c_stockb_122 Int)
1475  (declare-const c_stocka_122 Int)
1476  (declare-const loopto_122 Bool)
1477  (declare-const truck_stock_123 Int)
1478  (declare-const truck_travel_time_123 Int)
1479  (declare-const truck_loc_123 Int)
1480  (declare-const s_stockb_123 Int)
1481  (declare-const s_stocka_123 Int)
1482  (declare-const a_stockb_123 Int)
1483  (declare-const a_stocka_123 Int)
1484  (declare-const b_stockb_123 Int)
1485  (declare-const b_stocka_123 Int)
1486  (declare-const c_stockb_123 Int)
1487  (declare-const c_stocka_123 Int)
1488  (declare-const loopto_123 Bool)
1489  (declare-const truck_stock_124 Int)
1490  (declare-const truck_travel_time_124 Int)
1491  (declare-const truck_loc_124 Int)
1492  (declare-const s_stockb_124 Int)
1493  (declare-const s_stocka_124 Int)
1494  (declare-const a_stockb_124 Int)
1495  (declare-const a_stocka_124 Int)
1496  (declare-const b_stockb_124 Int)
1497  (declare-const b_stocka_124 Int)
1498  (declare-const c_stockb_124 Int)
1499  (declare-const c_stocka_124 Int)
1500  (declare-const loopto_124 Bool)
1501  (declare-const truck_stock_125 Int)
1502  (declare-const truck_travel_time_125 Int)
1503  (declare-const truck_loc_125 Int)
1504  (declare-const s_stockb_125 Int)
1505  (declare-const s_stocka_125 Int)
1506  (declare-const a_stockb_125 Int)
1507  (declare-const a_stocka_125 Int)
1508  (declare-const b_stockb_125 Int)
1509  (declare-const b_stocka_125 Int)
1510  (declare-const c_stockb_125 Int)
1511  (declare-const c_stocka_125 Int)
1512  (declare-const loopto_125 Bool)
1513  (declare-const truck_stock_126 Int)
1514  (declare-const truck_travel_time_126 Int)
1515  (declare-const truck_loc_126 Int)
1516  (declare-const s_stockb_126 Int)
1517  (declare-const s_stocka_126 Int)
1518  (declare-const a_stockb_126 Int)
1519  (declare-const a_stocka_126 Int)
1520  (declare-const b_stockb_126 Int)
1521  (declare-const b_stocka_126 Int)
1522  (declare-const c_stockb_126 Int)
1523  (declare-const c_stocka_126 Int)
1524  (declare-const loopto_126 Bool)
1525  (declare-const truck_stock_127 Int)
1526  (declare-const truck_travel_time_127 Int)
1527  (declare-const truck_loc_127 Int)
1528  (declare-const s_stockb_127 Int)
```

```
1529  (declare-const s_stocka_127 Int)
1530  (declare-const a_stockb_127 Int)
1531  (declare-const a_stocka_127 Int)
1532  (declare-const b_stockb_127 Int)
1533  (declare-const b_stocka_127 Int)
1534  (declare-const c_stockb_127 Int)
1535  (declare-const c_stocka_127 Int)
1536  (declare-const loopto_127 Bool)
1537  (declare-const truck_stock_128 Int)
1538  (declare-const truck_travel_time_128 Int)
1539  (declare-const truck_loc_128 Int)
1540  (declare-const s_stockb_128 Int)
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1542  (declare-const a_stockb_128 Int)
1543  (declare-const a_stocka_128 Int)
1544  (declare-const b_stockb_128 Int)
1545  (declare-const b_stocka_128 Int)
1546  (declare-const c_stockb_128 Int)
1547  (declare-const c_stocka_128 Int)
1548  (declare-const loopto_128 Bool)
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1550  (declare-const truck_travel_time_129 Int)
1551  (declare-const truck_loc_129 Int)
1552  (declare-const s_stockb_129 Int)
1553  (declare-const s_stocka_129 Int)
1554  (declare-const a_stockb_129 Int)
1555  (declare-const a_stocka_129 Int)
1556  (declare-const b_stockb_129 Int)
1557  (declare-const b_stocka_129 Int)
1558  (declare-const c_stockb_129 Int)
1559  (declare-const c_stocka_129 Int)
1560  (declare-const loopto_129 Bool)
1561  (declare-const truck_stock_130 Int)
1562  (declare-const truck_travel_time_130 Int)
1563  (declare-const truck_loc_130 Int)
1564  (declare-const s_stockb_130 Int)
1565  (declare-const s_stocka_130 Int)
1566  (declare-const a_stockb_130 Int)
1567  (declare-const a_stocka_130 Int)
1568  (declare-const b_stockb_130 Int)
1569  (declare-const b_stocka_130 Int)
1570  (declare-const c_stockb_130 Int)
1571  (declare-const c_stocka_130 Int)
1572  (declare-const loopto_130 Bool)
1573  (declare-const truck_stock_131 Int)
1574  (declare-const truck_travel_time_131 Int)
1575  (declare-const truck_loc_131 Int)
1576  (declare-const s_stockb_131 Int)
1577  (declare-const s_stocka_131 Int)
1578  (declare-const a_stockb_131 Int)
1579  (declare-const a_stocka_131 Int)
1580  (declare-const b_stockb_131 Int)
1581  (declare-const b_stocka_131 Int)
1582  (declare-const c_stockb_131 Int)
1583  (declare-const c_stocka_131 Int)
1584  (declare-const loopto_131 Bool)
1585  (declare-const truck_stock_132 Int)
1586  (declare-const truck_travel_time_132 Int)
1587  (declare-const truck_loc_132 Int)
1588  (declare-const s_stockb_132 Int)
1589  (declare-const s_stocka_132 Int)
1590  (declare-const a_stockb_132 Int)
```

```
1591  (declare-const a_stocka_132 Int)
1592  (declare-const b_stockb_132 Int)
1593  (declare-const b_stocka_132 Int)
1594  (declare-const c_stockb_132 Int)
1595  (declare-const c_stocka_132 Int)
1596  (declare-const loopto_132 Bool)
1597  (declare-const truck_stock_133 Int)
1598  (declare-const truck_travel_time_133 Int)
1599  (declare-const truck_loc_133 Int)
1600  (declare-const s_stockb_133 Int)
1601  (declare-const s_stocka_133 Int)
1602  (declare-const a_stockb_133 Int)
1603  (declare-const a_stocka_133 Int)
1604  (declare-const b_stockb_133 Int)
1605  (declare-const b_stocka_133 Int)
1606  (declare-const c_stockb_133 Int)
1607  (declare-const c_stocka_133 Int)
1608  (declare-const loopto_133 Bool)
1609  (declare-const truck_stock_134 Int)
1610  (declare-const truck_travel_time_134 Int)
1611  (declare-const truck_loc_134 Int)
1612  (declare-const s_stockb_134 Int)
1613  (declare-const s_stocka_134 Int)
1614  (declare-const a_stockb_134 Int)
1615  (declare-const a_stocka_134 Int)
1616  (declare-const b_stockb_134 Int)
1617  (declare-const b_stocka_134 Int)
1618  (declare-const c_stockb_134 Int)
1619  (declare-const c_stocka_134 Int)
1620  (declare-const loopto_134 Bool)
1621  (declare-const truck_stock_135 Int)
1622  (declare-const truck_travel_time_135 Int)
1623  (declare-const truck_loc_135 Int)
1624  (declare-const s_stockb_135 Int)
1625  (declare-const s_stocka_135 Int)
1626  (declare-const a_stockb_135 Int)
1627  (declare-const a_stocka_135 Int)
1628  (declare-const b_stockb_135 Int)
1629  (declare-const b_stocka_135 Int)
1630  (declare-const c_stockb_135 Int)
1631  (declare-const c_stocka_135 Int)
1632  (declare-const loopto_135 Bool)
1633  (declare-const truck_stock_136 Int)
1634  (declare-const truck_travel_time_136 Int)
1635  (declare-const truck_loc_136 Int)
1636  (declare-const s_stockb_136 Int)
1637  (declare-const s_stocka_136 Int)
1638  (declare-const a_stockb_136 Int)
1639  (declare-const a_stocka_136 Int)
1640  (declare-const b_stockb_136 Int)
1641  (declare-const b_stocka_136 Int)
1642  (declare-const c_stockb_136 Int)
1643  (declare-const c_stocka_136 Int)
1644  (declare-const loopto_136 Bool)
1645  (declare-const truck_stock_137 Int)
1646  (declare-const truck_travel_time_137 Int)
1647  (declare-const truck_loc_137 Int)
1648  (declare-const s_stockb_137 Int)
1649  (declare-const s_stocka_137 Int)
1650  (declare-const a_stockb_137 Int)
1651  (declare-const a_stocka_137 Int)
1652  (declare-const b_stockb_137 Int)
```

```
1653  (declare-const b_stocka_137 Int)
1654  (declare-const c_stockb_137 Int)
1655  (declare-const c_stocka_137 Int)
1656  (declare-const loopto_137 Bool)
1657  (declare-const truck_stock_138 Int)
1658  (declare-const truck_travel_time_138 Int)
1659  (declare-const truck_loc_138 Int)
1660  (declare-const s_stockb_138 Int)
1661  (declare-const s_stocka_138 Int)
1662  (declare-const a_stockb_138 Int)
1663  (declare-const a_stocka_138 Int)
1664  (declare-const b_stockb_138 Int)
1665  (declare-const b_stocka_138 Int)
1666  (declare-const c_stockb_138 Int)
1667  (declare-const c_stocka_138 Int)
1668  (declare-const loopto_138 Bool)
1669  (declare-const truck_stock_139 Int)
1670  (declare-const truck_travel_time_139 Int)
1671  (declare-const truck_loc_139 Int)
1672  (declare-const s_stockb_139 Int)
1673  (declare-const s_stocka_139 Int)
1674  (declare-const a_stockb_139 Int)
1675  (declare-const a_stocka_139 Int)
1676  (declare-const b_stockb_139 Int)
1677  (declare-const b_stocka_139 Int)
1678  (declare-const c_stockb_139 Int)
1679  (declare-const c_stocka_139 Int)
1680  (declare-const loopto_139 Bool)
1681  (declare-const truck_stock_140 Int)
1682  (declare-const truck_travel_time_140 Int)
1683  (declare-const truck_loc_140 Int)
1684  (declare-const s_stockb_140 Int)
1685  (declare-const s_stocka_140 Int)
1686  (declare-const a_stockb_140 Int)
1687  (declare-const a_stocka_140 Int)
1688  (declare-const b_stockb_140 Int)
1689  (declare-const b_stocka_140 Int)
1690  (declare-const c_stockb_140 Int)
1691  (declare-const c_stocka_140 Int)
1692  (declare-const loopto_140 Bool)
1693  (declare-const truck_stock_141 Int)
1694  (declare-const truck_travel_time_141 Int)
1695  (declare-const truck_loc_141 Int)
1696  (declare-const s_stockb_141 Int)
1697  (declare-const s_stocka_141 Int)
1698  (declare-const a_stockb_141 Int)
1699  (declare-const a_stocka_141 Int)
1700  (declare-const b_stockb_141 Int)
1701  (declare-const b_stocka_141 Int)
1702  (declare-const c_stockb_141 Int)
1703  (declare-const c_stocka_141 Int)
1704  (declare-const loopto_141 Bool)
1705  (declare-const truck_stock_142 Int)
1706  (declare-const truck_travel_time_142 Int)
1707  (declare-const truck_loc_142 Int)
1708  (declare-const s_stockb_142 Int)
1709  (declare-const s_stocka_142 Int)
1710  (declare-const a_stockb_142 Int)
1711  (declare-const a_stocka_142 Int)
1712  (declare-const b_stockb_142 Int)
1713  (declare-const b_stocka_142 Int)
1714  (declare-const c_stockb_142 Int)
```

```
1715  (declare-const c_stocka_142 Int)
1716  (declare-const loopto_142 Bool)
1717  (declare-const truck_stock_143 Int)
1718  (declare-const truck_travel_time_143 Int)
1719  (declare-const truck_loc_143 Int)
1720  (declare-const s_stockb_143 Int)
1721  (declare-const s_stocka_143 Int)
1722  (declare-const a_stockb_143 Int)
1723  (declare-const a_stocka_143 Int)
1724  (declare-const b_stockb_143 Int)
1725  (declare-const b_stocka_143 Int)
1726  (declare-const c_stockb_143 Int)
1727  (declare-const c_stocka_143 Int)
1728  (declare-const loopto_143 Bool)
1729  (declare-const truck_stock_144 Int)
1730  (declare-const truck_travel_time_144 Int)
1731  (declare-const truck_loc_144 Int)
1732  (declare-const s_stockb_144 Int)
1733  (declare-const s_stocka_144 Int)
1734  (declare-const a_stockb_144 Int)
1735  (declare-const a_stocka_144 Int)
1736  (declare-const b_stockb_144 Int)
1737  (declare-const b_stocka_144 Int)
1738  (declare-const c_stockb_144 Int)
1739  (declare-const c_stocka_144 Int)
1740  (declare-const loopto_144 Bool)
1741  (declare-const truck_stock_145 Int)
1742  (declare-const truck_travel_time_145 Int)
1743  (declare-const truck_loc_145 Int)
1744  (declare-const s_stockb_145 Int)
1745  (declare-const s_stocka_145 Int)
1746  (declare-const a_stockb_145 Int)
1747  (declare-const a_stocka_145 Int)
1748  (declare-const b_stockb_145 Int)
1749  (declare-const b_stocka_145 Int)
1750  (declare-const c_stockb_145 Int)
1751  (declare-const c_stocka_145 Int)
1752  (declare-const loopto_145 Bool)
1753  (declare-const truck_stock_146 Int)
1754  (declare-const truck_travel_time_146 Int)
1755  (declare-const truck_loc_146 Int)
1756  (declare-const s_stockb_146 Int)
1757  (declare-const s_stocka_146 Int)
1758  (declare-const a_stockb_146 Int)
1759  (declare-const a_stocka_146 Int)
1760  (declare-const b_stockb_146 Int)
1761  (declare-const b_stocka_146 Int)
1762  (declare-const c_stockb_146 Int)
1763  (declare-const c_stocka_146 Int)
1764  (declare-const loopto_146 Bool)
1765  (declare-const truck_stock_147 Int)
1766  (declare-const truck_travel_time_147 Int)
1767  (declare-const truck_loc_147 Int)
1768  (declare-const s_stockb_147 Int)
1769  (declare-const s_stocka_147 Int)
1770  (declare-const a_stockb_147 Int)
1771  (declare-const a_stocka_147 Int)
1772  (declare-const b_stockb_147 Int)
1773  (declare-const b_stocka_147 Int)
1774  (declare-const c_stockb_147 Int)
1775  (declare-const c_stocka_147 Int)
1776  (declare-const loopto_147 Bool)
```

```
1777  (declare-const truck_stock_148 Int)
1778  (declare-const truck_travel_time_148 Int)
1779  (declare-const truck_loc_148 Int)
1780  (declare-const s_stockb_148 Int)
1781  (declare-const s_stocka_148 Int)
1782  (declare-const a_stockb_148 Int)
1783  (declare-const a_stocka_148 Int)
1784  (declare-const b_stockb_148 Int)
1785  (declare-const b_stocka_148 Int)
1786  (declare-const c_stockb_148 Int)
1787  (declare-const c_stocka_148 Int)
1788  (declare-const loopto_148 Bool)
1789  (declare-const truck_stock_149 Int)
1790  (declare-const truck_travel_time_149 Int)
1791  (declare-const truck_loc_149 Int)
1792  (declare-const s_stockb_149 Int)
1793  (declare-const s_stocka_149 Int)
1794  (declare-const a_stockb_149 Int)
1795  (declare-const a_stocka_149 Int)
1796  (declare-const b_stockb_149 Int)
1797  (declare-const b_stocka_149 Int)
1798  (declare-const c_stockb_149 Int)
1799  (declare-const c_stocka_149 Int)
1800  (declare-const loopto_149 Bool)
1801  (declare-const truck_stock_150 Int)
1802  (declare-const truck_travel_time_150 Int)
1803  (declare-const truck_loc_150 Int)
1804  (declare-const s_stockb_150 Int)
1805  (declare-const s_stocka_150 Int)
1806  (declare-const a_stockb_150 Int)
1807  (declare-const a_stocka_150 Int)
1808  (declare-const b_stockb_150 Int)
1809  (declare-const b_stocka_150 Int)
1810  (declare-const c_stockb_150 Int)
1811  (declare-const c_stocka_150 Int)
1812  (declare-const loopto_150 Bool)
1813  (declare-const truck_stock_151 Int)
1814  (declare-const truck_travel_time_151 Int)
1815  (declare-const truck_loc_151 Int)
1816  (declare-const s_stockb_151 Int)
1817  (declare-const s_stocka_151 Int)
1818  (declare-const a_stockb_151 Int)
1819  (declare-const a_stocka_151 Int)
1820  (declare-const b_stockb_151 Int)
1821  (declare-const b_stocka_151 Int)
1822  (declare-const c_stockb_151 Int)
1823  (declare-const c_stocka_151 Int)
1824  (declare-const loopto_151 Bool)
1825  (declare-const truck_stock_152 Int)
1826  (declare-const truck_travel_time_152 Int)
1827  (declare-const truck_loc_152 Int)
1828  (declare-const s_stockb_152 Int)
1829  (declare-const s_stocka_152 Int)
1830  (declare-const a_stockb_152 Int)
1831  (declare-const a_stocka_152 Int)
1832  (declare-const b_stockb_152 Int)
1833  (declare-const b_stocka_152 Int)
1834  (declare-const c_stockb_152 Int)
1835  (declare-const c_stocka_152 Int)
1836  (declare-const loopto_152 Bool)
1837  (declare-const truck_stock_153 Int)
1838  (declare-const truck_travel_time_153 Int)
```

```
1839   (declare-const truck_loc_153 Int)
1840   (declare-const s_stockb_153 Int)
1841   (declare-const s_stocka_153 Int)
1842   (declare-const a_stockb_153 Int)
1843   (declare-const a_stocka_153 Int)
1844   (declare-const b_stockb_153 Int)
1845   (declare-const b_stocka_153 Int)
1846   (declare-const c_stockb_153 Int)
1847   (declare-const c_stocka_153 Int)
1848   (declare-const loopto_153 Bool)
1849   (declare-const truck_stock_154 Int)
1850   (declare-const truck_travel_time_154 Int)
1851   (declare-const truck_loc_154 Int)
1852   (declare-const s_stockb_154 Int)
1853   (declare-const s_stocka_154 Int)
1854   (declare-const a_stockb_154 Int)
1855   (declare-const a_stocka_154 Int)
1856   (declare-const b_stockb_154 Int)
1857   (declare-const b_stocka_154 Int)
1858   (declare-const c_stockb_154 Int)
1859   (declare-const c_stocka_154 Int)
1860   (declare-const loopto_154 Bool)
1861   (declare-const truck_stock_155 Int)
1862   (declare-const truck_travel_time_155 Int)
1863   (declare-const truck_loc_155 Int)
1864   (declare-const s_stockb_155 Int)
1865   (declare-const s_stocka_155 Int)
1866   (declare-const a_stockb_155 Int)
1867   (declare-const a_stocka_155 Int)
1868   (declare-const b_stockb_155 Int)
1869   (declare-const b_stocka_155 Int)
1870   (declare-const c_stockb_155 Int)
1871   (declare-const c_stocka_155 Int)
1872   (declare-const loopto_155 Bool)
1873   (declare-const truck_stock_156 Int)
1874   (declare-const truck_travel_time_156 Int)
1875   (declare-const truck_loc_156 Int)
1876   (declare-const s_stockb_156 Int)
1877   (declare-const s_stocka_156 Int)
1878   (declare-const a_stockb_156 Int)
1879   (declare-const a_stocka_156 Int)
1880   (declare-const b_stockb_156 Int)
1881   (declare-const b_stocka_156 Int)
1882   (declare-const c_stockb_156 Int)
1883   (declare-const c_stocka_156 Int)
1884   (declare-const loopto_156 Bool)
1885   (declare-const truck_stock_157 Int)
1886   (declare-const truck_travel_time_157 Int)
1887   (declare-const truck_loc_157 Int)
1888   (declare-const s_stockb_157 Int)
1889   (declare-const s_stocka_157 Int)
1890   (declare-const a_stockb_157 Int)
1891   (declare-const a_stocka_157 Int)
1892   (declare-const b_stockb_157 Int)
1893   (declare-const b_stocka_157 Int)
1894   (declare-const c_stockb_157 Int)
1895   (declare-const c_stocka_157 Int)
1896   (declare-const loopto_157 Bool)
1897   (declare-const truck_stock_158 Int)
1898   (declare-const truck_travel_time_158 Int)
1899   (declare-const truck_loc_158 Int)
1900   (declare-const s_stockb_158 Int)
```

```
1901  (declare-const s_stocka_158 Int)
1902  (declare-const a_stockb_158 Int)
1903  (declare-const a_stocka_158 Int)
1904  (declare-const b_stockb_158 Int)
1905  (declare-const b_stocka_158 Int)
1906  (declare-const c_stockb_158 Int)
1907  (declare-const c_stocka_158 Int)
1908  (declare-const loopto_158 Bool)
1909  (declare-const truck_stock_159 Int)
1910  (declare-const truck_travel_time_159 Int)
1911  (declare-const truck_loc_159 Int)
1912  (declare-const s_stockb_159 Int)
1913  (declare-const s_stocka_159 Int)
1914  (declare-const a_stockb_159 Int)
1915  (declare-const a_stocka_159 Int)
1916  (declare-const b_stockb_159 Int)
1917  (declare-const b_stocka_159 Int)
1918  (declare-const c_stockb_159 Int)
1919  (declare-const c_stocka_159 Int)
1920  (declare-const loopto_159 Bool)
1921  (declare-const truck_stock_160 Int)
1922  (declare-const truck_travel_time_160 Int)
1923  (declare-const truck_loc_160 Int)
1924  (declare-const s_stockb_160 Int)
1925  (declare-const s_stocka_160 Int)
1926  (declare-const a_stockb_160 Int)
1927  (declare-const a_stocka_160 Int)
1928  (declare-const b_stockb_160 Int)
1929  (declare-const b_stocka_160 Int)
1930  (declare-const c_stockb_160 Int)
1931  (declare-const c_stocka_160 Int)
1932  (declare-const loopto_160 Bool)
1933  (declare-const truck_stock_161 Int)
1934  (declare-const truck_travel_time_161 Int)
1935  (declare-const truck_loc_161 Int)
1936  (declare-const s_stockb_161 Int)
1937  (declare-const s_stocka_161 Int)
1938  (declare-const a_stockb_161 Int)
1939  (declare-const a_stocka_161 Int)
1940  (declare-const b_stockb_161 Int)
1941  (declare-const b_stocka_161 Int)
1942  (declare-const c_stockb_161 Int)
1943  (declare-const c_stocka_161 Int)
1944  (declare-const loopto_161 Bool)
1945  (declare-const truck_stock_162 Int)
1946  (declare-const truck_travel_time_162 Int)
1947  (declare-const truck_loc_162 Int)
1948  (declare-const s_stockb_162 Int)
1949  (declare-const s_stocka_162 Int)
1950  (declare-const a_stockb_162 Int)
1951  (declare-const a_stocka_162 Int)
1952  (declare-const b_stockb_162 Int)
1953  (declare-const b_stocka_162 Int)
1954  (declare-const c_stockb_162 Int)
1955  (declare-const c_stocka_162 Int)
1956  (declare-const loopto_162 Bool)
1957  (declare-const truck_stock_163 Int)
1958  (declare-const truck_travel_time_163 Int)
1959  (declare-const truck_loc_163 Int)
1960  (declare-const s_stockb_163 Int)
1961  (declare-const s_stocka_163 Int)
1962  (declare-const a_stockb_163 Int)
```

```
1963  (declare-const a_stocka_163 Int)
1964  (declare-const b_stockb_163 Int)
1965  (declare-const b_stocka_163 Int)
1966  (declare-const c_stockb_163 Int)
1967  (declare-const c_stocka_163 Int)
1968  (declare-const loopto_163 Bool)
1969  (declare-const truck_stock_164 Int)
1970  (declare-const truck_travel_time_164 Int)
1971  (declare-const truck_loc_164 Int)
1972  (declare-const s_stockb_164 Int)
1973  (declare-const s_stocka_164 Int)
1974  (declare-const a_stockb_164 Int)
1975  (declare-const a_stocka_164 Int)
1976  (declare-const b_stockb_164 Int)
1977  (declare-const b_stocka_164 Int)
1978  (declare-const c_stockb_164 Int)
1979  (declare-const c_stocka_164 Int)
1980  (declare-const loopto_164 Bool)
1981  (declare-const truck_stock_165 Int)
1982  (declare-const truck_travel_time_165 Int)
1983  (declare-const truck_loc_165 Int)
1984  (declare-const s_stockb_165 Int)
1985  (declare-const s_stocka_165 Int)
1986  (declare-const a_stockb_165 Int)
1987  (declare-const a_stocka_165 Int)
1988  (declare-const b_stockb_165 Int)
1989  (declare-const b_stocka_165 Int)
1990  (declare-const c_stockb_165 Int)
1991  (declare-const c_stocka_165 Int)
1992  (declare-const loopto_165 Bool)
1993  (declare-const truck_stock_166 Int)
1994  (declare-const truck_travel_time_166 Int)
1995  (declare-const truck_loc_166 Int)
1996  (declare-const s_stockb_166 Int)
1997  (declare-const s_stocka_166 Int)
1998  (declare-const a_stockb_166 Int)
1999  (declare-const a_stocka_166 Int)
2000  (declare-const b_stockb_166 Int)
2001  (declare-const b_stocka_166 Int)
2002  (declare-const c_stockb_166 Int)
2003  (declare-const c_stocka_166 Int)
2004  (declare-const loopto_166 Bool)
2005  (declare-const truck_stock_167 Int)
2006  (declare-const truck_travel_time_167 Int)
2007  (declare-const truck_loc_167 Int)
2008  (declare-const s_stockb_167 Int)
2009  (declare-const s_stocka_167 Int)
2010  (declare-const a_stockb_167 Int)
2011  (declare-const a_stocka_167 Int)
2012  (declare-const b_stockb_167 Int)
2013  (declare-const b_stocka_167 Int)
2014  (declare-const c_stockb_167 Int)
2015  (declare-const c_stocka_167 Int)
2016  (declare-const loopto_167 Bool)
2017  (declare-const truck_stock_168 Int)
2018  (declare-const truck_travel_time_168 Int)
2019  (declare-const truck_loc_168 Int)
2020  (declare-const s_stockb_168 Int)
2021  (declare-const s_stocka_168 Int)
2022  (declare-const a_stockb_168 Int)
2023  (declare-const a_stocka_168 Int)
2024  (declare-const b_stockb_168 Int)
```

```
2025    (declare-const b_stocka_168 Int)
2026    (declare-const c_stockb_168 Int)
2027    (declare-const c_stocka_168 Int)
2028    (declare-const loopto_168 Bool)
2029    (declare-const truck_stock_169 Int)
2030    (declare-const truck_travel_time_169 Int)
2031    (declare-const truck_loc_169 Int)
2032    (declare-const s_stockb_169 Int)
2033    (declare-const s_stocka_169 Int)
2034    (declare-const a_stockb_169 Int)
2035    (declare-const a_stocka_169 Int)
2036    (declare-const b_stockb_169 Int)
2037    (declare-const b_stocka_169 Int)
2038    (declare-const c_stockb_169 Int)
2039    (declare-const c_stocka_169 Int)
2040    (declare-const loopto_169 Bool)
2041    (declare-const truck_stock_170 Int)
2042    (declare-const truck_travel_time_170 Int)
2043    (declare-const truck_loc_170 Int)
2044    (declare-const s_stockb_170 Int)
2045    (declare-const s_stocka_170 Int)
2046    (declare-const a_stockb_170 Int)
2047    (declare-const a_stocka_170 Int)
2048    (declare-const b_stockb_170 Int)
2049    (declare-const b_stocka_170 Int)
2050    (declare-const c_stockb_170 Int)
2051    (declare-const c_stocka_170 Int)
2052    (declare-const loopto_170 Bool)
2053    (declare-const truck_stock_171 Int)
2054    (declare-const truck_travel_time_171 Int)
2055    (declare-const truck_loc_171 Int)
2056    (declare-const s_stockb_171 Int)
2057    (declare-const s_stocka_171 Int)
2058    (declare-const a_stockb_171 Int)
2059    (declare-const a_stocka_171 Int)
2060    (declare-const b_stockb_171 Int)
2061    (declare-const b_stocka_171 Int)
2062    (declare-const c_stockb_171 Int)
2063    (declare-const c_stocka_171 Int)
2064    (declare-const loopto_171 Bool)
2065    (declare-const truck_stock_172 Int)
2066    (declare-const truck_travel_time_172 Int)
2067    (declare-const truck_loc_172 Int)
2068    (declare-const s_stockb_172 Int)
2069    (declare-const s_stocka_172 Int)
2070    (declare-const a_stockb_172 Int)
2071    (declare-const a_stocka_172 Int)
2072    (declare-const b_stockb_172 Int)
2073    (declare-const b_stocka_172 Int)
2074    (declare-const c_stockb_172 Int)
2075    (declare-const c_stocka_172 Int)
2076    (declare-const loopto_172 Bool)
2077    (declare-const truck_stock_173 Int)
2078    (declare-const truck_travel_time_173 Int)
2079    (declare-const truck_loc_173 Int)
2080    (declare-const s_stockb_173 Int)
2081    (declare-const s_stocka_173 Int)
2082    (declare-const a_stockb_173 Int)
2083    (declare-const a_stocka_173 Int)
2084    (declare-const b_stockb_173 Int)
2085    (declare-const b_stocka_173 Int)
2086    (declare-const c_stockb_173 Int)
```

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2087  (declare-const c_stocka_173 Int)
2088  (declare-const loopto_173 Bool)
2089  (declare-const truck_stock_174 Int)
2090  (declare-const truck_travel_time_174 Int)
2091  (declare-const truck_loc_174 Int)
2092  (declare-const s_stockb_174 Int)
2093  (declare-const s_stocka_174 Int)
2094  (declare-const a_stockb_174 Int)
2095  (declare-const a_stocka_174 Int)
2096  (declare-const b_stockb_174 Int)
2097  (declare-const b_stocka_174 Int)
2098  (declare-const c_stockb_174 Int)
2099  (declare-const c_stocka_174 Int)
2100  (declare-const loopto_174 Bool)
2101  (declare-const truck_stock_175 Int)
2102  (declare-const truck_travel_time_175 Int)
2103  (declare-const truck_loc_175 Int)
2104  (declare-const s_stockb_175 Int)
2105  (declare-const s_stocka_175 Int)
2106  (declare-const a_stockb_175 Int)
2107  (declare-const a_stocka_175 Int)
2108  (declare-const b_stockb_175 Int)
2109  (declare-const b_stocka_175 Int)
2110  (declare-const c_stockb_175 Int)
2111  (declare-const c_stocka_175 Int)
2112  (declare-const loopto_175 Bool)
2113  (declare-const truck_stock_176 Int)
2114  (declare-const truck_travel_time_176 Int)
2115  (declare-const truck_loc_176 Int)
2116  (declare-const s_stockb_176 Int)
2117  (declare-const s_stocka_176 Int)
2118  (declare-const a_stockb_176 Int)
2119  (declare-const a_stocka_176 Int)
2120  (declare-const b_stockb_176 Int)
2121  (declare-const b_stocka_176 Int)
2122  (declare-const c_stockb_176 Int)
2123  (declare-const c_stocka_176 Int)
2124  (declare-const loopto_176 Bool)
2125  (declare-const truck_stock_177 Int)
2126  (declare-const truck_travel_time_177 Int)
2127  (declare-const truck_loc_177 Int)
2128  (declare-const s_stockb_177 Int)
2129  (declare-const s_stocka_177 Int)
2130  (declare-const a_stockb_177 Int)
2131  (declare-const a_stocka_177 Int)
2132  (declare-const b_stockb_177 Int)
2133  (declare-const b_stocka_177 Int)
2134  (declare-const c_stockb_177 Int)
2135  (declare-const c_stocka_177 Int)
2136  (declare-const loopto_177 Bool)
2137  (declare-const truck_stock_178 Int)
2138  (declare-const truck_travel_time_178 Int)
2139  (declare-const truck_loc_178 Int)
2140  (declare-const s_stockb_178 Int)
2141  (declare-const s_stocka_178 Int)
2142  (declare-const a_stockb_178 Int)
2143  (declare-const a_stocka_178 Int)
2144  (declare-const b_stockb_178 Int)
2145  (declare-const b_stocka_178 Int)
2146  (declare-const c_stockb_178 Int)
2147  (declare-const c_stocka_178 Int)
2148  (declare-const loopto_178 Bool)
```

```
2149  (declare-const truck_stock_179 Int)
2150  (declare-const truck_travel_time_179 Int)
2151  (declare-const truck_loc_179 Int)
2152  (declare-const s_stockb_179 Int)
2153  (declare-const s_stocka_179 Int)
2154  (declare-const a_stockb_179 Int)
2155  (declare-const a_stocka_179 Int)
2156  (declare-const b_stockb_179 Int)
2157  (declare-const b_stocka_179 Int)
2158  (declare-const c_stockb_179 Int)
2159  (declare-const c_stocka_179 Int)
2160  (declare-const loopto_179 Bool)
2161  (declare-const truck_stock_180 Int)
2162  (declare-const truck_travel_time_180 Int)
2163  (declare-const truck_loc_180 Int)
2164  (declare-const s_stockb_180 Int)
2165  (declare-const s_stocka_180 Int)
2166  (declare-const a_stockb_180 Int)
2167  (declare-const a_stocka_180 Int)
2168  (declare-const b_stockb_180 Int)
2169  (declare-const b_stocka_180 Int)
2170  (declare-const c_stockb_180 Int)
2171  (declare-const c_stocka_180 Int)
2172  (declare-const loopto_180 Bool)
2173  (declare-const truck_stock_181 Int)
2174  (declare-const truck_travel_time_181 Int)
2175  (declare-const truck_loc_181 Int)
2176  (declare-const s_stockb_181 Int)
2177  (declare-const s_stocka_181 Int)
2178  (declare-const a_stockb_181 Int)
2179  (declare-const a_stocka_181 Int)
2180  (declare-const b_stockb_181 Int)
2181  (declare-const b_stocka_181 Int)
2182  (declare-const c_stockb_181 Int)
2183  (declare-const c_stocka_181 Int)
2184  (declare-const loopto_181 Bool)
2185  (declare-const truck_stock_182 Int)
2186  (declare-const truck_travel_time_182 Int)
2187  (declare-const truck_loc_182 Int)
2188  (declare-const s_stockb_182 Int)
2189  (declare-const s_stocka_182 Int)
2190  (declare-const a_stockb_182 Int)
2191  (declare-const a_stocka_182 Int)
2192  (declare-const b_stockb_182 Int)
2193  (declare-const b_stocka_182 Int)
2194  (declare-const c_stockb_182 Int)
2195  (declare-const c_stocka_182 Int)
2196  (declare-const loopto_182 Bool)
2197  (declare-const truck_stock_183 Int)
2198  (declare-const truck_travel_time_183 Int)
2199  (declare-const truck_loc_183 Int)
2200  (declare-const s_stockb_183 Int)
2201  (declare-const s_stocka_183 Int)
2202  (declare-const a_stockb_183 Int)
2203  (declare-const a_stocka_183 Int)
2204  (declare-const b_stockb_183 Int)
2205  (declare-const b_stocka_183 Int)
2206  (declare-const c_stockb_183 Int)
2207  (declare-const c_stocka_183 Int)
2208  (declare-const loopto_183 Bool)
2209  (declare-const truck_stock_184 Int)
2210  (declare-const truck_travel_time_184 Int)
```

```
2211  (declare-const truck_loc_184 Int)
2212  (declare-const s_stockb_184 Int)
2213  (declare-const s_stocka_184 Int)
2214  (declare-const a_stockb_184 Int)
2215  (declare-const a_stocka_184 Int)
2216  (declare-const b_stockb_184 Int)
2217  (declare-const b_stocka_184 Int)
2218  (declare-const c_stockb_184 Int)
2219  (declare-const c_stocka_184 Int)
2220  (declare-const loopto_184 Bool)
2221  (declare-const truck_stock_185 Int)
2222  (declare-const truck_travel_time_185 Int)
2223  (declare-const truck_loc_185 Int)
2224  (declare-const s_stockb_185 Int)
2225  (declare-const s_stocka_185 Int)
2226  (declare-const a_stockb_185 Int)
2227  (declare-const a_stocka_185 Int)
2228  (declare-const b_stockb_185 Int)
2229  (declare-const b_stocka_185 Int)
2230  (declare-const c_stockb_185 Int)
2231  (declare-const c_stocka_185 Int)
2232  (declare-const loopto_185 Bool)
2233  (declare-const truck_stock_186 Int)
2234  (declare-const truck_travel_time_186 Int)
2235  (declare-const truck_loc_186 Int)
2236  (declare-const s_stockb_186 Int)
2237  (declare-const s_stocka_186 Int)
2238  (declare-const a_stockb_186 Int)
2239  (declare-const a_stocka_186 Int)
2240  (declare-const b_stockb_186 Int)
2241  (declare-const b_stocka_186 Int)
2242  (declare-const c_stockb_186 Int)
2243  (declare-const c_stocka_186 Int)
2244  (declare-const loopto_186 Bool)
2245  (declare-const truck_stock_187 Int)
2246  (declare-const truck_travel_time_187 Int)
2247  (declare-const truck_loc_187 Int)
2248  (declare-const s_stockb_187 Int)
2249  (declare-const s_stocka_187 Int)
2250  (declare-const a_stockb_187 Int)
2251  (declare-const a_stocka_187 Int)
2252  (declare-const b_stockb_187 Int)
2253  (declare-const b_stocka_187 Int)
2254  (declare-const c_stockb_187 Int)
2255  (declare-const c_stocka_187 Int)
2256  (declare-const loopto_187 Bool)
2257  (declare-const truck_stock_188 Int)
2258  (declare-const truck_travel_time_188 Int)
2259  (declare-const truck_loc_188 Int)
2260  (declare-const s_stockb_188 Int)
2261  (declare-const s_stocka_188 Int)
2262  (declare-const a_stockb_188 Int)
2263  (declare-const a_stocka_188 Int)
2264  (declare-const b_stockb_188 Int)
2265  (declare-const b_stocka_188 Int)
2266  (declare-const c_stockb_188 Int)
2267  (declare-const c_stocka_188 Int)
2268  (declare-const loopto_188 Bool)
2269  (declare-const truck_stock_189 Int)
2270  (declare-const truck_travel_time_189 Int)
2271  (declare-const truck_loc_189 Int)
2272  (declare-const s_stockb_189 Int)
```

```
2273  (declare-const s_stocka_189 Int)
2274  (declare-const a_stockb_189 Int)
2275  (declare-const a_stocka_189 Int)
2276  (declare-const b_stockb_189 Int)
2277  (declare-const b_stocka_189 Int)
2278  (declare-const c_stockb_189 Int)
2279  (declare-const c_stocka_189 Int)
2280  (declare-const loopto_189 Bool)
2281  (declare-const truck_stock_190 Int)
2282  (declare-const truck_travel_time_190 Int)
2283  (declare-const truck_loc_190 Int)
2284  (declare-const s_stockb_190 Int)
2285  (declare-const s_stocka_190 Int)
2286  (declare-const a_stockb_190 Int)
2287  (declare-const a_stocka_190 Int)
2288  (declare-const b_stockb_190 Int)
2289  (declare-const b_stocka_190 Int)
2290  (declare-const c_stockb_190 Int)
2291  (declare-const c_stocka_190 Int)
2292  (declare-const loopto_190 Bool)
2293  (declare-const truck_stock_191 Int)
2294  (declare-const truck_travel_time_191 Int)
2295  (declare-const truck_loc_191 Int)
2296  (declare-const s_stockb_191 Int)
2297  (declare-const s_stocka_191 Int)
2298  (declare-const a_stockb_191 Int)
2299  (declare-const a_stocka_191 Int)
2300  (declare-const b_stockb_191 Int)
2301  (declare-const b_stocka_191 Int)
2302  (declare-const c_stockb_191 Int)
2303  (declare-const c_stocka_191 Int)
2304  (declare-const loopto_191 Bool)
2305  (declare-const truck_stock_192 Int)
2306  (declare-const truck_travel_time_192 Int)
2307  (declare-const truck_loc_192 Int)
2308  (declare-const s_stockb_192 Int)
2309  (declare-const s_stocka_192 Int)
2310  (declare-const a_stockb_192 Int)
2311  (declare-const a_stocka_192 Int)
2312  (declare-const b_stockb_192 Int)
2313  (declare-const b_stocka_192 Int)
2314  (declare-const c_stockb_192 Int)
2315  (declare-const c_stocka_192 Int)
2316  (declare-const loopto_192 Bool)
2317  (declare-const truck_stock_193 Int)
2318  (declare-const truck_travel_time_193 Int)
2319  (declare-const truck_loc_193 Int)
2320  (declare-const s_stockb_193 Int)
2321  (declare-const s_stocka_193 Int)
2322  (declare-const a_stockb_193 Int)
2323  (declare-const a_stocka_193 Int)
2324  (declare-const b_stockb_193 Int)
2325  (declare-const b_stocka_193 Int)
2326  (declare-const c_stockb_193 Int)
2327  (declare-const c_stocka_193 Int)
2328  (declare-const loopto_193 Bool)
2329  (declare-const truck_stock_194 Int)
2330  (declare-const truck_travel_time_194 Int)
2331  (declare-const truck_loc_194 Int)
2332  (declare-const s_stockb_194 Int)
2333  (declare-const s_stocka_194 Int)
2334  (declare-const a_stockb_194 Int)
```

```
2335  (declare-const a_stocka_194 Int)
2336  (declare-const b_stockb_194 Int)
2337  (declare-const b_stocka_194 Int)
2338  (declare-const c_stockb_194 Int)
2339  (declare-const c_stocka_194 Int)
2340  (declare-const loopto_194 Bool)
2341  (declare-const truck_stock_195 Int)
2342  (declare-const truck_travel_time_195 Int)
2343  (declare-const truck_loc_195 Int)
2344  (declare-const s_stockb_195 Int)
2345  (declare-const s_stocka_195 Int)
2346  (declare-const a_stockb_195 Int)
2347  (declare-const a_stocka_195 Int)
2348  (declare-const b_stockb_195 Int)
2349  (declare-const b_stocka_195 Int)
2350  (declare-const c_stockb_195 Int)
2351  (declare-const c_stocka_195 Int)
2352  (declare-const loopto_195 Bool)
2353  (declare-const truck_stock_196 Int)
2354  (declare-const truck_travel_time_196 Int)
2355  (declare-const truck_loc_196 Int)
2356  (declare-const s_stockb_196 Int)
2357  (declare-const s_stocka_196 Int)
2358  (declare-const a_stockb_196 Int)
2359  (declare-const a_stocka_196 Int)
2360  (declare-const b_stockb_196 Int)
2361  (declare-const b_stocka_196 Int)
2362  (declare-const c_stockb_196 Int)
2363  (declare-const c_stocka_196 Int)
2364  (declare-const loopto_196 Bool)
2365  (declare-const truck_stock_197 Int)
2366  (declare-const truck_travel_time_197 Int)
2367  (declare-const truck_loc_197 Int)
2368  (declare-const s_stockb_197 Int)
2369  (declare-const s_stocka_197 Int)
2370  (declare-const a_stockb_197 Int)
2371  (declare-const a_stocka_197 Int)
2372  (declare-const b_stockb_197 Int)
2373  (declare-const b_stocka_197 Int)
2374  (declare-const c_stockb_197 Int)
2375  (declare-const c_stocka_197 Int)
2376  (declare-const loopto_197 Bool)
2377  (declare-const truck_stock_198 Int)
2378  (declare-const truck_travel_time_198 Int)
2379  (declare-const truck_loc_198 Int)
2380  (declare-const s_stockb_198 Int)
2381  (declare-const s_stocka_198 Int)
2382  (declare-const a_stockb_198 Int)
2383  (declare-const a_stocka_198 Int)
2384  (declare-const b_stockb_198 Int)
2385  (declare-const b_stocka_198 Int)
2386  (declare-const c_stockb_198 Int)
2387  (declare-const c_stocka_198 Int)
2388  (declare-const loopto_198 Bool)
2389  (declare-const truck_stock_199 Int)
2390  (declare-const truck_travel_time_199 Int)
2391  (declare-const truck_loc_199 Int)
2392  (declare-const s_stockb_199 Int)
2393  (declare-const s_stocka_199 Int)
2394  (declare-const a_stockb_199 Int)
2395  (declare-const a_stocka_199 Int)
2396  (declare-const b_stockb_199 Int)
```

```
2397  (declare-const b_stocka_199 Int)
2398  (declare-const c_stockb_199 Int)
2399  (declare-const c_stocka_199 Int)
2400  (declare-const loopto_199 Bool)
2401  (assert
2402  (and
2403  (= truck_stock_0 300)
2404  (= truck_travel_time_0 0)
2405  (= truck_loc_0 0)
2406  (= a_stockb_0 40)
2407  (= a_stocka_0 40)
2408  (= b_stockb_0 30)
2409  (= b_stocka_0 30)
2410  (= c_stockb_0 145)
2411  (= c_stocka_0 145)
2412  (= a_stockb_1 (- a_stocka_0 truck_travel_time_0))
2413  (= b_stockb_1 (- b_stocka_0 truck_travel_time_0))
2414  (= c_stockb_1 (- c_stocka_0 truck_travel_time_0))
2415  (and
2416    (=> (= truck_loc_0 0)
2417      (and
2418        (= a_stocka_1 a_stockb_1)
2419        (= b_stocka_1 b_stockb_1)
2420        (= c_stocka_1 c_stockb_1)
2421        (or
2422          (and
2423            (= truck_loc_1 1)
2424            (= truck_travel_time_1 29)
2425          )
2426          (and
2427            (= truck_loc_1 2)
2428            (= truck_travel_time_1 21)
2429          )
2430        )
2431      )
2432    )
2433    (=> (= truck_loc_0 1)
2434      (and
2435        (<= a_stocka_1 120)
2436        (= (+ truck_stock_1 a_stocka_1) (+ truck_stock_0 a_stockb_1))
2437        (= b_stocka_1 b_stockb_1)
2438        (= c_stocka_1 c_stockb_1)
2439        (or
2440          (and
2441            (= truck_loc_1 0)
2442            (= truck_travel_time_1 29)
2443          )
2444          (and
2445            (= truck_loc_1 2)
2446            (= truck_travel_time_1 17)
2447          )
2448          (and
2449            (= truck_loc_1 3)
2450            (= truck_travel_time_1 32)
2451          )
2452        )
2453      )
2454    )
2455    (=> (= truck_loc_0 2)
2456      (and
2457        (<= b_stocka_1 120)
2458        (= (+ truck_stock_1 b_stocka_1) (+ truck_stock_0 b_stockb_1))
```

```
2459        (= a_stocka_1 a_stockb_1)
2460        (= c_stocka_1 c_stockb_1)
2461        (or
2462          (and
2463            (= truck_loc_1 1)
2464            (= truck_travel_time_1 17)
2465          )
2466          (and
2467            (= truck_loc_1 0)
2468            (= truck_travel_time_1 21)
2469          )
2470          (and
2471            (= truck_loc_1 3)
2472            (= truck_travel_time_1 37)
2473          )
2474        )
2475      )
2476    )
2477    (=> (= truck_loc_0 3)
2478      (and
2479        (<= c_stocka_1 200)
2480        (= (+ truck_stock_1 c_stocka_1) (+ truck_stock_0 c_stockb_1))
2481        (= a_stocka_1 a_stockb_1)
2482        (= b_stocka_1 b_stockb_1)
2483        (or
2484          (and
2485            (= truck_loc_1 1)
2486            (= truck_travel_time_1 32)
2487          )
2488          (and
2489            (= truck_loc_1 2)
2490            (= truck_travel_time_1 37)
2491          )
2492        )
2493      )
2494    )
2495  )
2496  (<= truck_stock_1 300)
2497  (>= truck_stock_1 0)
2498  (= a_stockb_2 (- a_stocka_1 truck_travel_time_1))
2499  (= b_stockb_2 (- b_stocka_1 truck_travel_time_1))
2500  (= c_stockb_2 (- c_stocka_1 truck_travel_time_1))
2501  (and
2502    (=> (= truck_loc_1 0)
2503      (and
2504        (= a_stocka_2 a_stockb_2)
2505        (= b_stocka_2 b_stockb_2)
2506        (= c_stocka_2 c_stockb_2)
2507        (or
2508          (and
2509            (= truck_loc_2 1)
2510            (= truck_travel_time_2 29)
2511          )
2512          (and
2513            (= truck_loc_2 2)
2514            (= truck_travel_time_2 21)
2515          )
2516        )
2517      )
2518    )
2519    (=> (= truck_loc_1 1)
2520      (and
```

```
2521        (<= a_stocka_2 120)
2522        (= (+ truck_stock_2 a_stocka_2) (+ truck_stock_1 a_stockb_2))
2523        (= b_stocka_2 b_stockb_2)
2524        (= c_stocka_2 c_stockb_2)
2525        (or
2526          (and
2527            (= truck_loc_2 0)
2528            (= truck_travel_time_2 29)
2529          )
2530          (and
2531            (= truck_loc_2 2)
2532            (= truck_travel_time_2 17)
2533          )
2534          (and
2535            (= truck_loc_2 3)
2536            (= truck_travel_time_2 32)
2537          )
2538        )
2539      )
2540    )
2541    (=> (= truck_loc_1 2)
2542      (and
2543        (<= b_stocka_2 120)
2544        (= (+ truck_stock_2 b_stocka_2) (+ truck_stock_1 b_stockb_2))
2545        (= a_stocka_2 a_stockb_2)
2546        (= c_stocka_2 c_stockb_2)
2547        (or
2548          (and
2549            (= truck_loc_2 1)
2550            (= truck_travel_time_2 17)
2551          )
2552          (and
2553            (= truck_loc_2 0)
2554            (= truck_travel_time_2 21)
2555          )
2556          (and
2557            (= truck_loc_2 3)
2558            (= truck_travel_time_2 37)
2559          )
2560        )
2561      )
2562    )
2563    (=> (= truck_loc_1 3)
2564      (and
2565        (<= c_stocka_2 200)
2566        (= (+ truck_stock_2 c_stocka_2) (+ truck_stock_1 c_stockb_2))
2567        (= a_stocka_2 a_stockb_2)
2568        (= b_stocka_2 b_stockb_2)
2569        (or
2570          (and
2571            (= truck_loc_2 1)
2572            (= truck_travel_time_2 32)
2573          )
2574          (and
2575            (= truck_loc_2 2)
2576            (= truck_travel_time_2 37)
2577          )
2578        )
2579      )
2580    )
2581  )
2582  (<= truck_stock_2 300)
```

```
2583  (>= truck_stock_2 0)
2584  (= a_stockb_3 (- a_stocka_2 truck_travel_time_2))
2585  (= b_stockb_3 (- b_stocka_2 truck_travel_time_2))
2586  (= c_stockb_3 (- c_stocka_2 truck_travel_time_2))
2587  (and
2588    (=> (= truck_loc_2 0)
2589      (and
2590        (= a_stocka_3 a_stockb_3)
2591        (= b_stocka_3 b_stockb_3)
2592        (= c_stocka_3 c_stockb_3)
2593        (or
2594          (and
2595            (= truck_loc_3 1)
2596            (= truck_travel_time_3 29)
2597          )
2598          (and
2599            (= truck_loc_3 2)
2600            (= truck_travel_time_3 21)
2601          )
2602        )
2603      )
2604    )
2605    (=> (= truck_loc_2 1)
2606      (and
2607        (<= a_stocka_3 120)
2608        (= (+ truck_stock_3 a_stocka_3) (+ truck_stock_2 a_stockb_3))
2609        (= b_stocka_3 b_stockb_3)
2610        (= c_stocka_3 c_stockb_3)
2611        (or
2612          (and
2613            (= truck_loc_3 0)
2614            (= truck_travel_time_3 29)
2615          )
2616          (and
2617            (= truck_loc_3 2)
2618            (= truck_travel_time_3 17)
2619          )
2620          (and
2621            (= truck_loc_3 3)
2622            (= truck_travel_time_3 32)
2623          )
2624        )
2625      )
2626    )
2627    (=> (= truck_loc_2 2)
2628      (and
2629        (<= b_stocka_3 120)
2630        (= (+ truck_stock_3 b_stocka_3) (+ truck_stock_2 b_stockb_3))
2631        (= a_stocka_3 a_stockb_3)
2632        (= c_stocka_3 c_stockb_3)
2633        (or
2634          (and
2635            (= truck_loc_3 1)
2636            (= truck_travel_time_3 17)
2637          )
2638          (and
2639            (= truck_loc_3 0)
2640            (= truck_travel_time_3 21)
2641          )
2642          (and
2643            (= truck_loc_3 3)
2644            (= truck_travel_time_3 37)
```

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```
2645              )
2646            )
2647          )
2648        )
2649      (=> (= truck_loc_2 3)
2650        (and
2651          (<= c_stocka_3 200)
2652          (= (+ truck_stock_3 c_stocka_3) (+ truck_stock_2 c_stockb_3))
2653          (= a_stocka_3 a_stockb_3)
2654          (= b_stocka_3 b_stockb_3)
2655          (or
2656            (and
2657              (= truck_loc_3 1)
2658              (= truck_travel_time_3 32)
2659            )
2660            (and
2661              (= truck_loc_3 2)
2662              (= truck_travel_time_3 37)
2663            )
2664          )
2665        )
2666      )
2667    )
2668    (<= truck_stock_3 300)
2669    (>= truck_stock_3 0)
2670    (= a_stockb_4 (- a_stocka_3 truck_travel_time_3))
2671    (= b_stockb_4 (- b_stocka_3 truck_travel_time_3))
2672    (= c_stockb_4 (- c_stocka_3 truck_travel_time_3))
2673    (and
2674      (=> (= truck_loc_3 0)
2675        (and
2676          (= a_stocka_4 a_stockb_4)
2677          (= b_stocka_4 b_stockb_4)
2678          (= c_stocka_4 c_stockb_4)
2679          (or
2680            (and
2681              (= truck_loc_4 1)
2682              (= truck_travel_time_4 29)
2683            )
2684            (and
2685              (= truck_loc_4 2)
2686              (= truck_travel_time_4 21)
2687            )
2688          )
2689        )
2690      )
2691      (=> (= truck_loc_3 1)
2692        (and
2693          (<= a_stocka_4 120)
2694          (= (+ truck_stock_4 a_stocka_4) (+ truck_stock_3 a_stockb_4))
2695          (= b_stocka_4 b_stockb_4)
2696          (= c_stocka_4 c_stockb_4)
2697          (or
2698            (and
2699              (= truck_loc_4 0)
2700              (= truck_travel_time_4 29)
2701            )
2702            (and
2703              (= truck_loc_4 2)
2704              (= truck_travel_time_4 17)
2705            )
2706            (and
```

```
2707              (= truck_loc_4 3)
2708              (= truck_travel_time_4 32)
2709            )
2710          )
2711        )
2712    )
2713    (=> (= truck_loc_3 2)
2714      (and
2715        (<= b_stocka_4 120)
2716        (= (+ truck_stock_4 b_stocka_4) (+ truck_stock_3 b_stockb_4))
2717        (= a_stocka_4 a_stockb_4)
2718        (= c_stocka_4 c_stockb_4)
2719        (or
2720          (and
2721            (= truck_loc_4 1)
2722            (= truck_travel_time_4 17)
2723          )
2724          (and
2725            (= truck_loc_4 0)
2726            (= truck_travel_time_4 21)
2727          )
2728          (and
2729            (= truck_loc_4 3)
2730            (= truck_travel_time_4 37)
2731          )
2732        )
2733      )
2734    )
2735    (=> (= truck_loc_3 3)
2736      (and
2737        (<= c_stocka_4 200)
2738        (= (+ truck_stock_4 c_stocka_4) (+ truck_stock_3 c_stockb_4))
2739        (= a_stocka_4 a_stockb_4)
2740        (= b_stocka_4 b_stockb_4)
2741        (or
2742          (and
2743            (= truck_loc_4 1)
2744            (= truck_travel_time_4 32)
2745          )
2746          (and
2747            (= truck_loc_4 2)
2748            (= truck_travel_time_4 37)
2749          )
2750        )
2751      )
2752    )
2753  )
2754  (<= truck_stock_4 300)
2755  (>= truck_stock_4 0)
2756  (= a_stockb_5 (- a_stocka_4 truck_travel_time_4))
2757  (= b_stockb_5 (- b_stocka_4 truck_travel_time_4))
2758  (= c_stockb_5 (- c_stocka_4 truck_travel_time_4))
2759  (and
2760    (=> (= truck_loc_4 0)
2761      (and
2762        (= a_stocka_5 a_stockb_5)
2763        (= b_stocka_5 b_stockb_5)
2764        (= c_stocka_5 c_stockb_5)
2765        (or
2766          (and
2767            (= truck_loc_5 1)
2768            (= truck_travel_time_5 29)
```

```
2769              )
2770          (and
2771            (= truck_loc_5 2)
2772            (= truck_travel_time_5 21)
2773          )
2774        )
2775      )
2776    )
2777    (=> (= truck_loc_4 1)
2778      (and
2779        (<= a_stocka_5 120)
2780        (= (+ truck_stock_5 a_stocka_5) (+ truck_stock_4 a_stockb_5))
2781        (= b_stocka_5 b_stockb_5)
2782        (= c_stocka_5 c_stockb_5)
2783        (or
2784          (and
2785            (= truck_loc_5 0)
2786            (= truck_travel_time_5 29)
2787          )
2788          (and
2789            (= truck_loc_5 2)
2790            (= truck_travel_time_5 17)
2791          )
2792          (and
2793            (= truck_loc_5 3)
2794            (= truck_travel_time_5 32)
2795          )
2796        )
2797      )
2798    )
2799    (=> (= truck_loc_4 2)
2800      (and
2801        (<= b_stocka_5 120)
2802        (= (+ truck_stock_5 b_stocka_5) (+ truck_stock_4 b_stockb_5))
2803        (= a_stocka_5 a_stockb_5)
2804        (= c_stocka_5 c_stockb_5)
2805        (or
2806          (and
2807            (= truck_loc_5 1)
2808            (= truck_travel_time_5 17)
2809          )
2810          (and
2811            (= truck_loc_5 0)
2812            (= truck_travel_time_5 21)
2813          )
2814          (and
2815            (= truck_loc_5 3)
2816            (= truck_travel_time_5 37)
2817          )
2818        )
2819      )
2820    )
2821    (=> (= truck_loc_4 3)
2822      (and
2823        (<= c_stocka_5 200)
2824        (= (+ truck_stock_5 c_stocka_5) (+ truck_stock_4 c_stockb_5))
2825        (= a_stocka_5 a_stockb_5)
2826        (= b_stocka_5 b_stockb_5)
2827        (or
2828          (and
2829            (= truck_loc_5 1)
2830            (= truck_travel_time_5 32)
```

```
2831              )
2832            (and
2833              (= truck_loc_5 2)
2834              (= truck_travel_time_5 37)
2835            )
2836          )
2837        )
2838      )
2839  )
2840  (<= truck_stock_5 300)
2841  (>= truck_stock_5 0)
2842  (= a_stockb_6 (- a_stocka_5 truck_travel_time_5))
2843  (= b_stockb_6 (- b_stocka_5 truck_travel_time_5))
2844  (= c_stockb_6 (- c_stocka_5 truck_travel_time_5))
2845  (and
2846    (=> (= truck_loc_5 0)
2847      (and
2848        (= a_stocka_6 a_stockb_6)
2849        (= b_stocka_6 b_stockb_6)
2850        (= c_stocka_6 c_stockb_6)
2851        (or
2852          (and
2853            (= truck_loc_6 1)
2854            (= truck_travel_time_6 29)
2855          )
2856          (and
2857            (= truck_loc_6 2)
2858            (= truck_travel_time_6 21)
2859          )
2860        )
2861      )
2862    )
2863    (=> (= truck_loc_5 1)
2864      (and
2865        (<= a_stocka_6 120)
2866        (= (+ truck_stock_6 a_stocka_6) (+ truck_stock_5 a_stockb_6))
2867        (= b_stocka_6 b_stockb_6)
2868        (= c_stocka_6 c_stockb_6)
2869        (or
2870          (and
2871            (= truck_loc_6 0)
2872            (= truck_travel_time_6 29)
2873          )
2874          (and
2875            (= truck_loc_6 2)
2876            (= truck_travel_time_6 17)
2877          )
2878          (and
2879            (= truck_loc_6 3)
2880            (= truck_travel_time_6 32)
2881          )
2882        )
2883      )
2884    )
2885    (=> (= truck_loc_5 2)
2886      (and
2887        (<= b_stocka_6 120)
2888        (= (+ truck_stock_6 b_stocka_6) (+ truck_stock_5 b_stockb_6))
2889        (= a_stocka_6 a_stockb_6)
2890        (= c_stocka_6 c_stockb_6)
2891        (or
2892          (and
```

```
2893              (= truck_loc_6 1)
2894              (= truck_travel_time_6 17)
2895            )
2896          (and
2897            (= truck_loc_6 0)
2898            (= truck_travel_time_6 21)
2899          )
2900          (and
2901            (= truck_loc_6 3)
2902            (= truck_travel_time_6 37)
2903          )
2904        )
2905      )
2906   )
2907   (=> (= truck_loc_5 3)
2908     (and
2909       (<= c_stocka_6 200)
2910       (= (+ truck_stock_6 c_stocka_6) (+ truck_stock_5 c_stockb_6))
2911       (= a_stocka_6 a_stockb_6)
2912       (= b_stocka_6 b_stockb_6)
2913       (or
2914         (and
2915           (= truck_loc_6 1)
2916           (= truck_travel_time_6 32)
2917         )
2918         (and
2919           (= truck_loc_6 2)
2920           (= truck_travel_time_6 37)
2921         )
2922       )
2923     )
2924   )
2925 )
2926 (<= truck_stock_6 300)
2927 (>= truck_stock_6 0)
2928 (= a_stockb_7 (- a_stocka_6 truck_travel_time_6))
2929 (= b_stockb_7 (- b_stocka_6 truck_travel_time_6))
2930 (= c_stockb_7 (- c_stocka_6 truck_travel_time_6))
2931 (and
2932   (=> (= truck_loc_6 0)
2933     (and
2934       (= a_stocka_7 a_stockb_7)
2935       (= b_stocka_7 b_stockb_7)
2936       (= c_stocka_7 c_stockb_7)
2937       (or
2938         (and
2939           (= truck_loc_7 1)
2940           (= truck_travel_time_7 29)
2941         )
2942         (and
2943           (= truck_loc_7 2)
2944           (= truck_travel_time_7 21)
2945         )
2946       )
2947     )
2948   )
2949   (=> (= truck_loc_6 1)
2950     (and
2951       (<= a_stocka_7 120)
2952       (= (+ truck_stock_7 a_stocka_7) (+ truck_stock_6 a_stockb_7))
2953       (= b_stocka_7 b_stockb_7)
2954       (= c_stocka_7 c_stockb_7)
```

```
2955        (or
2956          (and
2957            (= truck_loc_7 0)
2958            (= truck_travel_time_7 29)
2959          )
2960          (and
2961            (= truck_loc_7 2)
2962            (= truck_travel_time_7 17)
2963          )
2964          (and
2965            (= truck_loc_7 3)
2966            (= truck_travel_time_7 32)
2967          )
2968        )
2969      )
2970    )
2971    (=> (= truck_loc_6 2)
2972      (and
2973        (<= b_stocka_7 120)
2974        (= (+ truck_stock_7 b_stocka_7) (+ truck_stock_6 b_stockb_7))
2975        (= a_stocka_7 a_stockb_7)
2976        (= c_stocka_7 c_stockb_7)
2977        (or
2978          (and
2979            (= truck_loc_7 1)
2980            (= truck_travel_time_7 17)
2981          )
2982          (and
2983            (= truck_loc_7 0)
2984            (= truck_travel_time_7 21)
2985          )
2986          (and
2987            (= truck_loc_7 3)
2988            (= truck_travel_time_7 37)
2989          )
2990        )
2991      )
2992    )
2993    (=> (= truck_loc_6 3)
2994      (and
2995        (<= c_stocka_7 200)
2996        (= (+ truck_stock_7 c_stocka_7) (+ truck_stock_6 c_stockb_7))
2997        (= a_stocka_7 a_stockb_7)
2998        (= b_stocka_7 b_stockb_7)
2999        (or
3000          (and
3001            (= truck_loc_7 1)
3002            (= truck_travel_time_7 32)
3003          )
3004          (and
3005            (= truck_loc_7 2)
3006            (= truck_travel_time_7 37)
3007          )
3008        )
3009      )
3010    )
3011  )
3012  (<= truck_stock_7 300)
3013  (>= truck_stock_7 0)
3014  (= a_stockb_8 (- a_stocka_7 truck_travel_time_7))
3015  (= b_stockb_8 (- b_stocka_7 truck_travel_time_7))
3016  (= c_stockb_8 (- c_stocka_7 truck_travel_time_7))
```

```
3017    (and
3018      (=> (= truck_loc_7 0)
3019        (and
3020          (= a_stocka_8 a_stockb_8)
3021          (= b_stocka_8 b_stockb_8)
3022          (= c_stocka_8 c_stockb_8)
3023          (or
3024            (and
3025              (= truck_loc_8 1)
3026              (= truck_travel_time_8 29)
3027            )
3028            (and
3029              (= truck_loc_8 2)
3030              (= truck_travel_time_8 21)
3031            )
3032          )
3033        )
3034      )
3035      (=> (= truck_loc_7 1)
3036        (and
3037          (<= a_stocka_8 120)
3038          (= (+ truck_stock_8 a_stocka_8) (+ truck_stock_7 a_stockb_8))
3039          (= b_stocka_8 b_stockb_8)
3040          (= c_stocka_8 c_stockb_8)
3041          (or
3042            (and
3043              (= truck_loc_8 0)
3044              (= truck_travel_time_8 29)
3045            )
3046            (and
3047              (= truck_loc_8 2)
3048              (= truck_travel_time_8 17)
3049            )
3050            (and
3051              (= truck_loc_8 3)
3052              (= truck_travel_time_8 32)
3053            )
3054          )
3055        )
3056      )
3057      (=> (= truck_loc_7 2)
3058        (and
3059          (<= b_stocka_8 120)
3060          (= (+ truck_stock_8 b_stocka_8) (+ truck_stock_7 b_stockb_8))
3061          (= a_stocka_8 a_stockb_8)
3062          (= c_stocka_8 c_stockb_8)
3063          (or
3064            (and
3065              (= truck_loc_8 1)
3066              (= truck_travel_time_8 17)
3067            )
3068            (and
3069              (= truck_loc_8 0)
3070              (= truck_travel_time_8 21)
3071            )
3072            (and
3073              (= truck_loc_8 3)
3074              (= truck_travel_time_8 37)
3075            )
3076          )
3077        )
3078      )
```

```
3079    (=> (= truck_loc_7 3)
3080      (and
3081        (<= c_stocka_8 200)
3082        (= (+ truck_stock_8 c_stocka_8) (+ truck_stock_7 c_stockb_8))
3083        (= a_stocka_8 a_stockb_8)
3084        (= b_stocka_8 b_stockb_8)
3085        (or
3086          (and
3087            (= truck_loc_8 1)
3088            (= truck_travel_time_8 32)
3089          )
3090          (and
3091            (= truck_loc_8 2)
3092            (= truck_travel_time_8 37)
3093          )
3094        )
3095      )
3096    )
3097  )
3098  (<= truck_stock_8 300)
3099  (>= truck_stock_8 0)
3100  (= a_stockb_9 (- a_stocka_8 truck_travel_time_8))
3101  (= b_stockb_9 (- b_stocka_8 truck_travel_time_8))
3102  (= c_stockb_9 (- c_stocka_8 truck_travel_time_8))
3103  (and
3104    (=> (= truck_loc_8 0)
3105      (and
3106        (= a_stocka_9 a_stockb_9)
3107        (= b_stocka_9 b_stockb_9)
3108        (= c_stocka_9 c_stockb_9)
3109        (or
3110          (and
3111            (= truck_loc_9 1)
3112            (= truck_travel_time_9 29)
3113          )
3114          (and
3115            (= truck_loc_9 2)
3116            (= truck_travel_time_9 21)
3117          )
3118        )
3119      )
3120    )
3121    (=> (= truck_loc_8 1)
3122      (and
3123        (<= a_stocka_9 120)
3124        (= (+ truck_stock_9 a_stocka_9) (+ truck_stock_8 a_stockb_9))
3125        (= b_stocka_9 b_stockb_9)
3126        (= c_stocka_9 c_stockb_9)
3127        (or
3128          (and
3129            (= truck_loc_9 0)
3130            (= truck_travel_time_9 29)
3131          )
3132          (and
3133            (= truck_loc_9 2)
3134            (= truck_travel_time_9 17)
3135          )
3136          (and
3137            (= truck_loc_9 3)
3138            (= truck_travel_time_9 32)
3139          )
3140        )
```

```
3141            )
3142        )
3143    (=> (= truck_loc_8 2)
3144        (and
3145            (<= b_stocka_9 120)
3146            (= (+ truck_stock_9 b_stocka_9) (+ truck_stock_8 b_stockb_9))
3147            (= a_stocka_9 a_stockb_9)
3148            (= c_stocka_9 c_stockb_9)
3149            (or
3150                (and
3151                    (= truck_loc_9 1)
3152                    (= truck_travel_time_9 17)
3153                )
3154                (and
3155                    (= truck_loc_9 0)
3156                    (= truck_travel_time_9 21)
3157                )
3158                (and
3159                    (= truck_loc_9 3)
3160                    (= truck_travel_time_9 37)
3161                )
3162            )
3163        )
3164    )
3165    (=> (= truck_loc_8 3)
3166        (and
3167            (<= c_stocka_9 200)
3168            (= (+ truck_stock_9 c_stocka_9) (+ truck_stock_8 c_stockb_9))
3169            (= a_stocka_9 a_stockb_9)
3170            (= b_stocka_9 b_stockb_9)
3171            (or
3172                (and
3173                    (= truck_loc_9 1)
3174                    (= truck_travel_time_9 32)
3175                )
3176                (and
3177                    (= truck_loc_9 2)
3178                    (= truck_travel_time_9 37)
3179                )
3180            )
3181        )
3182    )
3183 )
3184 (<= truck_stock_9 300)
3185 (>= truck_stock_9 0)
3186 (= a_stockb_10 (- a_stocka_9 truck_travel_time_9))
3187 (= b_stockb_10 (- b_stocka_9 truck_travel_time_9))
3188 (= c_stockb_10 (- c_stocka_9 truck_travel_time_9))
3189 (and
3190    (=> (= truck_loc_9 0)
3191        (and
3192            (= a_stocka_10 a_stockb_10)
3193            (= b_stocka_10 b_stockb_10)
3194            (= c_stocka_10 c_stockb_10)
3195            (or
3196                (and
3197                    (= truck_loc_10 1)
3198                    (= truck_travel_time_10 29)
3199                )
3200                (and
3201                    (= truck_loc_10 2)
3202                    (= truck_travel_time_10 21)
```

```
3203              )
3204            )
3205          )
3206        )
3207        (=> (= truck_loc_9 1)
3208          (and
3209            (<= a_stocka_10 120)
3210            (= (+ truck_stock_10 a_stocka_10) (+ truck_stock_9 a_stockb_10))
3211            (= b_stocka_10 b_stockb_10)
3212            (= c_stocka_10 c_stockb_10)
3213            (or
3214              (and
3215                (= truck_loc_10 0)
3216                (= truck_travel_time_10 29)
3217              )
3218              (and
3219                (= truck_loc_10 2)
3220                (= truck_travel_time_10 17)
3221              )
3222              (and
3223                (= truck_loc_10 3)
3224                (= truck_travel_time_10 32)
3225              )
3226            )
3227          )
3228        )
3229        (=> (= truck_loc_9 2)
3230          (and
3231            (<= b_stocka_10 120)
3232            (= (+ truck_stock_10 b_stocka_10) (+ truck_stock_9 b_stockb_10))
3233            (= a_stocka_10 a_stockb_10)
3234            (= c_stocka_10 c_stockb_10)
3235            (or
3236              (and
3237                (= truck_loc_10 1)
3238                (= truck_travel_time_10 17)
3239              )
3240              (and
3241                (= truck_loc_10 0)
3242                (= truck_travel_time_10 21)
3243              )
3244              (and
3245                (= truck_loc_10 3)
3246                (= truck_travel_time_10 37)
3247              )
3248            )
3249          )
3250        )
3251        (=> (= truck_loc_9 3)
3252          (and
3253            (<= c_stocka_10 200)
3254            (= (+ truck_stock_10 c_stocka_10) (+ truck_stock_9 c_stockb_10))
3255            (= a_stocka_10 a_stockb_10)
3256            (= b_stocka_10 b_stockb_10)
3257            (or
3258              (and
3259                (= truck_loc_10 1)
3260                (= truck_travel_time_10 32)
3261              )
3262              (and
3263                (= truck_loc_10 2)
3264                (= truck_travel_time_10 37)
```

```
3265              )
3266            )
3267          )
3268       )
3269  )
3270  (<= truck_stock_10 300)
3271  (>= truck_stock_10 0)
3272  (= a_stockb_11 (- a_stocka_10 truck_travel_time_10))
3273  (= b_stockb_11 (- b_stocka_10 truck_travel_time_10))
3274  (= c_stockb_11 (- c_stocka_10 truck_travel_time_10))
3275  (and
3276     (=> (= truck_loc_10 0)
3277        (and
3278           (= a_stocka_11 a_stockb_11)
3279           (= b_stocka_11 b_stockb_11)
3280           (= c_stocka_11 c_stockb_11)
3281           (or
3282              (and
3283                 (= truck_loc_11 1)
3284                 (= truck_travel_time_11 29)
3285              )
3286              (and
3287                 (= truck_loc_11 2)
3288                 (= truck_travel_time_11 21)
3289              )
3290           )
3291        )
3292     )
3293     (=> (= truck_loc_10 1)
3294        (and
3295           (<= a_stocka_11 120)
3296           (= (+ truck_stock_11 a_stocka_11) (+ truck_stock_10 a_stockb_11))
3297           (= b_stocka_11 b_stockb_11)
3298           (= c_stocka_11 c_stockb_11)
3299           (or
3300              (and
3301                 (= truck_loc_11 0)
3302                 (= truck_travel_time_11 29)
3303              )
3304              (and
3305                 (= truck_loc_11 2)
3306                 (= truck_travel_time_11 17)
3307              )
3308              (and
3309                 (= truck_loc_11 3)
3310                 (= truck_travel_time_11 32)
3311              )
3312           )
3313        )
3314     )
3315     (=> (= truck_loc_10 2)
3316        (and
3317           (<= b_stocka_11 120)
3318           (= (+ truck_stock_11 b_stocka_11) (+ truck_stock_10 b_stockb_11))
3319           (= a_stocka_11 a_stockb_11)
3320           (= c_stocka_11 c_stockb_11)
3321           (or
3322              (and
3323                 (= truck_loc_11 1)
3324                 (= truck_travel_time_11 17)
3325              )
3326              (and
```

```
3327              (= truck_loc_11 0)
3328              (= truck_travel_time_11 21)
3329            )
3330          (and
3331              (= truck_loc_11 3)
3332              (= truck_travel_time_11 37)
3333          )
3334        )
3335      )
3336    )
3337    (=> (= truck_loc_10 3)
3338      (and
3339        (<= c_stocka_11 200)
3340        (= (+ truck_stock_11 c_stocka_11) (+ truck_stock_10 c_stockb_11))
3341        (= a_stocka_11 a_stockb_11)
3342        (= b_stocka_11 b_stockb_11)
3343        (or
3344          (and
3345              (= truck_loc_11 1)
3346              (= truck_travel_time_11 32)
3347          )
3348          (and
3349              (= truck_loc_11 2)
3350              (= truck_travel_time_11 37)
3351          )
3352        )
3353      )
3354    )
3355  )
3356  (<= truck_stock_11 300)
3357  (>= truck_stock_11 0)
3358  (= a_stockb_12 (- a_stocka_11 truck_travel_time_11))
3359  (= b_stockb_12 (- b_stocka_11 truck_travel_time_11))
3360  (= c_stockb_12 (- c_stocka_11 truck_travel_time_11))
3361  (and
3362    (=> (= truck_loc_11 0)
3363      (and
3364        (= a_stocka_12 a_stockb_12)
3365        (= b_stocka_12 b_stockb_12)
3366        (= c_stocka_12 c_stockb_12)
3367        (or
3368          (and
3369              (= truck_loc_12 1)
3370              (= truck_travel_time_12 29)
3371          )
3372          (and
3373              (= truck_loc_12 2)
3374              (= truck_travel_time_12 21)
3375          )
3376        )
3377      )
3378    )
3379    (=> (= truck_loc_11 1)
3380      (and
3381        (<= a_stocka_12 120)
3382        (= (+ truck_stock_12 a_stocka_12) (+ truck_stock_11 a_stockb_12))
3383        (= b_stocka_12 b_stockb_12)
3384        (= c_stocka_12 c_stockb_12)
3385        (or
3386          (and
3387              (= truck_loc_12 0)
3388              (= truck_travel_time_12 29)
```

```
3389              )
3390            (and
3391              (= truck_loc_12 2)
3392              (= truck_travel_time_12 17)
3393            )
3394            (and
3395              (= truck_loc_12 3)
3396              (= truck_travel_time_12 32)
3397            )
3398          )
3399        )
3400      )
3401    (=> (= truck_loc_11 2)
3402      (and
3403        (<= b_stocka_12 120)
3404        (= (+ truck_stock_12 b_stocka_12) (+ truck_stock_11 b_stockb_12))
3405        (= a_stocka_12 a_stockb_12)
3406        (= c_stocka_12 c_stockb_12)
3407        (or
3408          (and
3409            (= truck_loc_12 1)
3410            (= truck_travel_time_12 17)
3411          )
3412          (and
3413            (= truck_loc_12 0)
3414            (= truck_travel_time_12 21)
3415          )
3416          (and
3417            (= truck_loc_12 3)
3418            (= truck_travel_time_12 37)
3419          )
3420        )
3421      )
3422    )
3423    (=> (= truck_loc_11 3)
3424      (and
3425        (<= c_stocka_12 200)
3426        (= (+ truck_stock_12 c_stocka_12) (+ truck_stock_11 c_stockb_12))
3427        (= a_stocka_12 a_stockb_12)
3428        (= b_stocka_12 b_stockb_12)
3429        (or
3430          (and
3431            (= truck_loc_12 1)
3432            (= truck_travel_time_12 32)
3433          )
3434          (and
3435            (= truck_loc_12 2)
3436            (= truck_travel_time_12 37)
3437          )
3438        )
3439      )
3440    )
3441  )
3442  (<= truck_stock_12 300)
3443  (>= truck_stock_12 0)
3444  (= a_stockb_13 (- a_stocka_12 truck_travel_time_12))
3445  (= b_stockb_13 (- b_stocka_12 truck_travel_time_12))
3446  (= c_stockb_13 (- c_stocka_12 truck_travel_time_12))
3447  (and
3448    (=> (= truck_loc_12 0)
3449      (and
3450        (= a_stocka_13 a_stockb_13)
```

```
3451        (= b_stocka_13 b_stockb_13)
3452        (= c_stocka_13 c_stockb_13)
3453        (or
3454          (and
3455            (= truck_loc_13 1)
3456            (= truck_travel_time_13 29)
3457          )
3458          (and
3459            (= truck_loc_13 2)
3460            (= truck_travel_time_13 21)
3461          )
3462        )
3463      )
3464    )
3465    (=> (= truck_loc_12 1)
3466      (and
3467        (<= a_stocka_13 120)
3468        (= (+ truck_stock_13 a_stocka_13) (+ truck_stock_12 a_stockb_13))
3469        (= b_stocka_13 b_stockb_13)
3470        (= c_stocka_13 c_stockb_13)
3471        (or
3472          (and
3473            (= truck_loc_13 0)
3474            (= truck_travel_time_13 29)
3475          )
3476          (and
3477            (= truck_loc_13 2)
3478            (= truck_travel_time_13 17)
3479          )
3480          (and
3481            (= truck_loc_13 3)
3482            (= truck_travel_time_13 32)
3483          )
3484        )
3485      )
3486    )
3487    (=> (= truck_loc_12 2)
3488      (and
3489        (<= b_stocka_13 120)
3490        (= (+ truck_stock_13 b_stocka_13) (+ truck_stock_12 b_stockb_13))
3491        (= a_stocka_13 a_stockb_13)
3492        (= c_stocka_13 c_stockb_13)
3493        (or
3494          (and
3495            (= truck_loc_13 1)
3496            (= truck_travel_time_13 17)
3497          )
3498          (and
3499            (= truck_loc_13 0)
3500            (= truck_travel_time_13 21)
3501          )
3502          (and
3503            (= truck_loc_13 3)
3504            (= truck_travel_time_13 37)
3505          )
3506        )
3507      )
3508    )
3509    (=> (= truck_loc_12 3)
3510      (and
3511        (<= c_stocka_13 200)
3512        (= (+ truck_stock_13 c_stocka_13) (+ truck_stock_12 c_stockb_13))
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3513        (= a_stocka_13 a_stockb_13)
3514        (= b_stocka_13 b_stockb_13)
3515        (or
3516          (and
3517            (= truck_loc_13 1)
3518            (= truck_travel_time_13 32)
3519          )
3520          (and
3521            (= truck_loc_13 2)
3522            (= truck_travel_time_13 37)
3523          )
3524        )
3525      )
3526    )
3527 )
3528 (<= truck_stock_13 300)
3529 (>= truck_stock_13 0)
3530 (= a_stockb_14 (- a_stocka_13 truck_travel_time_13))
3531 (= b_stockb_14 (- b_stocka_13 truck_travel_time_13))
3532 (= c_stockb_14 (- c_stocka_13 truck_travel_time_13))
3533 (and
3534    (=> (= truck_loc_13 0)
3535      (and
3536        (= a_stocka_14 a_stockb_14)
3537        (= b_stocka_14 b_stockb_14)
3538        (= c_stocka_14 c_stockb_14)
3539        (or
3540          (and
3541            (= truck_loc_14 1)
3542            (= truck_travel_time_14 29)
3543          )
3544          (and
3545            (= truck_loc_14 2)
3546            (= truck_travel_time_14 21)
3547          )
3548        )
3549      )
3550    )
3551    (=> (= truck_loc_13 1)
3552      (and
3553        (<= a_stocka_14 120)
3554        (= (+ truck_stock_14 a_stocka_14) (+ truck_stock_13 a_stockb_14))
3555        (= b_stocka_14 b_stockb_14)
3556        (= c_stocka_14 c_stockb_14)
3557        (or
3558          (and
3559            (= truck_loc_14 0)
3560            (= truck_travel_time_14 29)
3561          )
3562          (and
3563            (= truck_loc_14 2)
3564            (= truck_travel_time_14 17)
3565          )
3566          (and
3567            (= truck_loc_14 3)
3568            (= truck_travel_time_14 32)
3569          )
3570        )
3571      )
3572    )
3573    (=> (= truck_loc_13 2)
3574      (and
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3575          (<= b_stocka_14 120)
3576          (= (+ truck_stock_14 b_stocka_14) (+ truck_stock_13 b_stockb_14))
3577          (= a_stocka_14 a_stockb_14)
3578          (= c_stocka_14 c_stockb_14)
3579          (or
3580            (and
3581              (= truck_loc_14 1)
3582              (= truck_travel_time_14 17)
3583            )
3584            (and
3585              (= truck_loc_14 0)
3586              (= truck_travel_time_14 21)
3587            )
3588            (and
3589              (= truck_loc_14 3)
3590              (= truck_travel_time_14 37)
3591            )
3592          )
3593        )
3594      )
3595      (=> (= truck_loc_13 3)
3596        (and
3597          (<= c_stocka_14 200)
3598          (= (+ truck_stock_14 c_stocka_14) (+ truck_stock_13 c_stockb_14))
3599          (= a_stocka_14 a_stockb_14)
3600          (= b_stocka_14 b_stockb_14)
3601          (or
3602            (and
3603              (= truck_loc_14 1)
3604              (= truck_travel_time_14 32)
3605            )
3606            (and
3607              (= truck_loc_14 2)
3608              (= truck_travel_time_14 37)
3609            )
3610          )
3611        )
3612      )
3613    )
3614    (<= truck_stock_14 300)
3615    (>= truck_stock_14 0)
3616    (= a_stockb_15 (- a_stocka_14 truck_travel_time_14))
3617    (= b_stockb_15 (- b_stocka_14 truck_travel_time_14))
3618    (= c_stockb_15 (- c_stocka_14 truck_travel_time_14))
3619    (and
3620      (=> (= truck_loc_14 0)
3621        (and
3622          (= a_stocka_15 a_stockb_15)
3623          (= b_stocka_15 b_stockb_15)
3624          (= c_stocka_15 c_stockb_15)
3625          (or
3626            (and
3627              (= truck_loc_15 1)
3628              (= truck_travel_time_15 29)
3629            )
3630            (and
3631              (= truck_loc_15 2)
3632              (= truck_travel_time_15 21)
3633            )
3634          )
3635        )
3636      )
```

```
3637    (=> (= truck_loc_14 1)
3638      (and
3639        (<= a_stocka_15 120)
3640        (= (+ truck_stock_15 a_stocka_15) (+ truck_stock_14 a_stockb_15))
3641        (= b_stocka_15 b_stockb_15)
3642        (= c_stocka_15 c_stockb_15)
3643        (or
3644          (and
3645            (= truck_loc_15 0)
3646            (= truck_travel_time_15 29)
3647          )
3648          (and
3649            (= truck_loc_15 2)
3650            (= truck_travel_time_15 17)
3651          )
3652          (and
3653            (= truck_loc_15 3)
3654            (= truck_travel_time_15 32)
3655          )
3656        )
3657      )
3658    )
3659    (=> (= truck_loc_14 2)
3660      (and
3661        (<= b_stocka_15 120)
3662        (= (+ truck_stock_15 b_stocka_15) (+ truck_stock_14 b_stockb_15))
3663        (= a_stocka_15 a_stockb_15)
3664        (= c_stocka_15 c_stockb_15)
3665        (or
3666          (and
3667            (= truck_loc_15 1)
3668            (= truck_travel_time_15 17)
3669          )
3670          (and
3671            (= truck_loc_15 0)
3672            (= truck_travel_time_15 21)
3673          )
3674          (and
3675            (= truck_loc_15 3)
3676            (= truck_travel_time_15 37)
3677          )
3678        )
3679      )
3680    )
3681    (=> (= truck_loc_14 3)
3682      (and
3683        (<= c_stocka_15 200)
3684        (= (+ truck_stock_15 c_stocka_15) (+ truck_stock_14 c_stockb_15))
3685        (= a_stocka_15 a_stockb_15)
3686        (= b_stocka_15 b_stockb_15)
3687        (or
3688          (and
3689            (= truck_loc_15 1)
3690            (= truck_travel_time_15 32)
3691          )
3692          (and
3693            (= truck_loc_15 2)
3694            (= truck_travel_time_15 37)
3695          )
3696        )
3697      )
3698    )
```

```
3699  )
3700  (<= truck_stock_15 300)
3701  (>= truck_stock_15 0)
3702  (= a_stockb_16 (- a_stocka_15 truck_travel_time_15))
3703  (= b_stockb_16 (- b_stocka_15 truck_travel_time_15))
3704  (= c_stockb_16 (- c_stocka_15 truck_travel_time_15))
3705  (and
3706    (=> (= truck_loc_15 0)
3707      (and
3708        (= a_stocka_16 a_stockb_16)
3709        (= b_stocka_16 b_stockb_16)
3710        (= c_stocka_16 c_stockb_16)
3711        (or
3712          (and
3713            (= truck_loc_16 1)
3714            (= truck_travel_time_16 29)
3715          )
3716          (and
3717            (= truck_loc_16 2)
3718            (= truck_travel_time_16 21)
3719          )
3720        )
3721      )
3722    )
3723    (=> (= truck_loc_15 1)
3724      (and
3725        (<= a_stocka_16 120)
3726        (= (+ truck_stock_16 a_stocka_16) (+ truck_stock_15 a_stockb_16))
3727        (= b_stocka_16 b_stockb_16)
3728        (= c_stocka_16 c_stockb_16)
3729        (or
3730          (and
3731            (= truck_loc_16 0)
3732            (= truck_travel_time_16 29)
3733          )
3734          (and
3735            (= truck_loc_16 2)
3736            (= truck_travel_time_16 17)
3737          )
3738          (and
3739            (= truck_loc_16 3)
3740            (= truck_travel_time_16 32)
3741          )
3742        )
3743      )
3744    )
3745    (=> (= truck_loc_15 2)
3746      (and
3747        (<= b_stocka_16 120)
3748        (= (+ truck_stock_16 b_stocka_16) (+ truck_stock_15 b_stockb_16))
3749        (= a_stocka_16 a_stockb_16)
3750        (= c_stocka_16 c_stockb_16)
3751        (or
3752          (and
3753            (= truck_loc_16 1)
3754            (= truck_travel_time_16 17)
3755          )
3756          (and
3757            (= truck_loc_16 0)
3758            (= truck_travel_time_16 21)
3759          )
3760          (and
```

```
3761              (= truck_loc_16 3)
3762              (= truck_travel_time_16 37)
3763            )
3764          )
3765        )
3766      )
3767    (=> (= truck_loc_15 3)
3768      (and
3769        (<= c_stocka_16 200)
3770        (= (+ truck_stock_16 c_stocka_16) (+ truck_stock_15 c_stockb_16))
3771        (= a_stocka_16 a_stockb_16)
3772        (= b_stocka_16 b_stockb_16)
3773        (or
3774          (and
3775            (= truck_loc_16 1)
3776            (= truck_travel_time_16 32)
3777          )
3778          (and
3779            (= truck_loc_16 2)
3780            (= truck_travel_time_16 37)
3781          )
3782        )
3783      )
3784    )
3785  )
3786  (<= truck_stock_16 300)
3787  (>= truck_stock_16 0)
3788  (= a_stockb_17 (- a_stocka_16 truck_travel_time_16))
3789  (= b_stockb_17 (- b_stocka_16 truck_travel_time_16))
3790  (= c_stockb_17 (- c_stocka_16 truck_travel_time_16))
3791  (and
3792    (=> (= truck_loc_16 0)
3793      (and
3794        (= a_stocka_17 a_stockb_17)
3795        (= b_stocka_17 b_stockb_17)
3796        (= c_stocka_17 c_stockb_17)
3797        (or
3798          (and
3799            (= truck_loc_17 1)
3800            (= truck_travel_time_17 29)
3801          )
3802          (and
3803            (= truck_loc_17 2)
3804            (= truck_travel_time_17 21)
3805          )
3806        )
3807      )
3808    )
3809    (=> (= truck_loc_16 1)
3810      (and
3811        (<= a_stocka_17 120)
3812        (= (+ truck_stock_17 a_stocka_17) (+ truck_stock_16 a_stockb_17))
3813        (= b_stocka_17 b_stockb_17)
3814        (= c_stocka_17 c_stockb_17)
3815        (or
3816          (and
3817            (= truck_loc_17 0)
3818            (= truck_travel_time_17 29)
3819          )
3820          (and
3821            (= truck_loc_17 2)
3822            (= truck_travel_time_17 17)
```

```
3823              )
3824          (and
3825             (= truck_loc_17 3)
3826             (= truck_travel_time_17 32)
3827          )
3828        )
3829      )
3830    )
3831    (=> (= truck_loc_16 2)
3832      (and
3833        (<= b_stocka_17 120)
3834        (= (+ truck_stock_17 b_stocka_17) (+ truck_stock_16 b_stockb_17))
3835        (= a_stocka_17 a_stockb_17)
3836        (= c_stocka_17 c_stockb_17)
3837        (or
3838          (and
3839             (= truck_loc_17 1)
3840             (= truck_travel_time_17 17)
3841          )
3842          (and
3843             (= truck_loc_17 0)
3844             (= truck_travel_time_17 21)
3845          )
3846          (and
3847             (= truck_loc_17 3)
3848             (= truck_travel_time_17 37)
3849          )
3850        )
3851      )
3852    )
3853    (=> (= truck_loc_16 3)
3854      (and
3855        (<= c_stocka_17 200)
3856        (= (+ truck_stock_17 c_stocka_17) (+ truck_stock_16 c_stockb_17))
3857        (= a_stocka_17 a_stockb_17)
3858        (= b_stocka_17 b_stockb_17)
3859        (or
3860          (and
3861             (= truck_loc_17 1)
3862             (= truck_travel_time_17 32)
3863          )
3864          (and
3865             (= truck_loc_17 2)
3866             (= truck_travel_time_17 37)
3867          )
3868        )
3869      )
3870    )
3871  )
3872  (<= truck_stock_17 300)
3873  (>= truck_stock_17 0)
3874  (= a_stockb_18 (- a_stocka_17 truck_travel_time_17))
3875  (= b_stockb_18 (- b_stocka_17 truck_travel_time_17))
3876  (= c_stockb_18 (- c_stocka_17 truck_travel_time_17))
3877  (and
3878    (=> (= truck_loc_17 0)
3879      (and
3880        (= a_stocka_18 a_stockb_18)
3881        (= b_stocka_18 b_stockb_18)
3882        (= c_stocka_18 c_stockb_18)
3883        (or
3884          (and
```

```
3885              (= truck_loc_18 1)
3886              (= truck_travel_time_18 29)
3887            )
3888          (and
3889              (= truck_loc_18 2)
3890              (= truck_travel_time_18 21)
3891          )
3892        )
3893      )
3894    )
3895    (=> (= truck_loc_17 1)
3896      (and
3897        (<= a_stocka_18 120)
3898        (= (+ truck_stock_18 a_stocka_18) (+ truck_stock_17 a_stockb_18))
3899        (= b_stocka_18 b_stockb_18)
3900        (= c_stocka_18 c_stockb_18)
3901        (or
3902          (and
3903              (= truck_loc_18 0)
3904              (= truck_travel_time_18 29)
3905          )
3906          (and
3907              (= truck_loc_18 2)
3908              (= truck_travel_time_18 17)
3909          )
3910          (and
3911              (= truck_loc_18 3)
3912              (= truck_travel_time_18 32)
3913          )
3914        )
3915      )
3916    )
3917    (=> (= truck_loc_17 2)
3918      (and
3919        (<= b_stocka_18 120)
3920        (= (+ truck_stock_18 b_stocka_18) (+ truck_stock_17 b_stockb_18))
3921        (= a_stocka_18 a_stockb_18)
3922        (= c_stocka_18 c_stockb_18)
3923        (or
3924          (and
3925              (= truck_loc_18 1)
3926              (= truck_travel_time_18 17)
3927          )
3928          (and
3929              (= truck_loc_18 0)
3930              (= truck_travel_time_18 21)
3931          )
3932          (and
3933              (= truck_loc_18 3)
3934              (= truck_travel_time_18 37)
3935          )
3936        )
3937      )
3938    )
3939    (=> (= truck_loc_17 3)
3940      (and
3941        (<= c_stocka_18 200)
3942        (= (+ truck_stock_18 c_stocka_18) (+ truck_stock_17 c_stockb_18))
3943        (= a_stocka_18 a_stockb_18)
3944        (= b_stocka_18 b_stockb_18)
3945        (or
3946          (and
```

```
3947          (= truck_loc_18 1)
3948          (= truck_travel_time_18 32)
3949        )
3950      (and
3951          (= truck_loc_18 2)
3952          (= truck_travel_time_18 37)
3953        )
3954      )
3955    )
3956  )
3957 )
3958 (<= truck_stock_18 300)
3959 (>= truck_stock_18 0)
3960 (= a_stockb_19 (- a_stocka_18 truck_travel_time_18))
3961 (= b_stockb_19 (- b_stocka_18 truck_travel_time_18))
3962 (= c_stockb_19 (- c_stocka_18 truck_travel_time_18))
3963 (and
3964   (=> (= truck_loc_18 0)
3965     (and
3966       (= a_stocka_19 a_stockb_19)
3967       (= b_stocka_19 b_stockb_19)
3968       (= c_stocka_19 c_stockb_19)
3969       (or
3970         (and
3971           (= truck_loc_19 1)
3972           (= truck_travel_time_19 29)
3973         )
3974         (and
3975           (= truck_loc_19 2)
3976           (= truck_travel_time_19 21)
3977         )
3978       )
3979     )
3980   )
3981   (=> (= truck_loc_18 1)
3982     (and
3983       (<= a_stocka_19 120)
3984       (= (+ truck_stock_19 a_stocka_19) (+ truck_stock_18 a_stockb_19))
3985       (= b_stocka_19 b_stockb_19)
3986       (= c_stocka_19 c_stockb_19)
3987       (or
3988         (and
3989           (= truck_loc_19 0)
3990           (= truck_travel_time_19 29)
3991         )
3992         (and
3993           (= truck_loc_19 2)
3994           (= truck_travel_time_19 17)
3995         )
3996         (and
3997           (= truck_loc_19 3)
3998           (= truck_travel_time_19 32)
3999         )
4000       )
4001     )
4002   )
4003   (=> (= truck_loc_18 2)
4004     (and
4005       (<= b_stocka_19 120)
4006       (= (+ truck_stock_19 b_stocka_19) (+ truck_stock_18 b_stockb_19))
4007       (= a_stocka_19 a_stockb_19)
4008       (= c_stocka_19 c_stockb_19)
```

```
4009        (or
4010          (and
4011            (= truck_loc_19 1)
4012            (= truck_travel_time_19 17)
4013          )
4014          (and
4015            (= truck_loc_19 0)
4016            (= truck_travel_time_19 21)
4017          )
4018          (and
4019            (= truck_loc_19 3)
4020            (= truck_travel_time_19 37)
4021          )
4022        )
4023      )
4024    )
4025    (=> (= truck_loc_18 3)
4026      (and
4027        (<= c_stocka_19 200)
4028        (= (+ truck_stock_19 c_stocka_19) (+ truck_stock_18 c_stockb_19))
4029        (= a_stocka_19 a_stockb_19)
4030        (= b_stocka_19 b_stockb_19)
4031        (or
4032          (and
4033            (= truck_loc_19 1)
4034            (= truck_travel_time_19 32)
4035          )
4036          (and
4037            (= truck_loc_19 2)
4038            (= truck_travel_time_19 37)
4039          )
4040        )
4041      )
4042    )
4043  )
4044  (<= truck_stock_19 300)
4045  (>= truck_stock_19 0)
4046  (= a_stockb_20 (- a_stocka_19 truck_travel_time_19))
4047  (= b_stockb_20 (- b_stocka_19 truck_travel_time_19))
4048  (= c_stockb_20 (- c_stocka_19 truck_travel_time_19))
4049  (and
4050    (=> (= truck_loc_19 0)
4051      (and
4052        (= a_stocka_20 a_stockb_20)
4053        (= b_stocka_20 b_stockb_20)
4054        (= c_stocka_20 c_stockb_20)
4055        (or
4056          (and
4057            (= truck_loc_20 1)
4058            (= truck_travel_time_20 29)
4059          )
4060          (and
4061            (= truck_loc_20 2)
4062            (= truck_travel_time_20 21)
4063          )
4064        )
4065      )
4066    )
4067    (=> (= truck_loc_19 1)
4068      (and
4069        (<= a_stocka_20 120)
4070        (= (+ truck_stock_20 a_stocka_20) (+ truck_stock_19 a_stockb_20))
```

```
4071        (= b_stocka_20 b_stockb_20)
4072        (= c_stocka_20 c_stockb_20)
4073        (or
4074          (and
4075            (= truck_loc_20 0)
4076            (= truck_travel_time_20 29)
4077          )
4078          (and
4079            (= truck_loc_20 2)
4080            (= truck_travel_time_20 17)
4081          )
4082          (and
4083            (= truck_loc_20 3)
4084            (= truck_travel_time_20 32)
4085          )
4086        )
4087      )
4088    )
4089    (=> (= truck_loc_19 2)
4090      (and
4091        (<= b_stocka_20 120)
4092        (= (+ truck_stock_20 b_stocka_20) (+ truck_stock_19 b_stockb_20))
4093        (= a_stocka_20 a_stockb_20)
4094        (= c_stocka_20 c_stockb_20)
4095        (or
4096          (and
4097            (= truck_loc_20 1)
4098            (= truck_travel_time_20 17)
4099          )
4100          (and
4101            (= truck_loc_20 0)
4102            (= truck_travel_time_20 21)
4103          )
4104          (and
4105            (= truck_loc_20 3)
4106            (= truck_travel_time_20 37)
4107          )
4108        )
4109      )
4110    )
4111    (=> (= truck_loc_19 3)
4112      (and
4113        (<= c_stocka_20 200)
4114        (= (+ truck_stock_20 c_stocka_20) (+ truck_stock_19 c_stockb_20))
4115        (= a_stocka_20 a_stockb_20)
4116        (= b_stocka_20 b_stockb_20)
4117        (or
4118          (and
4119            (= truck_loc_20 1)
4120            (= truck_travel_time_20 32)
4121          )
4122          (and
4123            (= truck_loc_20 2)
4124            (= truck_travel_time_20 37)
4125          )
4126        )
4127      )
4128    )
4129  )
4130  (<= truck_stock_20 300)
4131  (>= truck_stock_20 0)
4132  (= a_stockb_21 (- a_stocka_20 truck_travel_time_20))
```

```
4133    (= b_stockb_21 (- b_stocka_20 truck_travel_time_20))
4134    (= c_stockb_21 (- c_stocka_20 truck_travel_time_20))
4135    (and
4136      (=> (= truck_loc_20 0)
4137        (and
4138          (= a_stocka_21 a_stockb_21)
4139          (= b_stocka_21 b_stockb_21)
4140          (= c_stocka_21 c_stockb_21)
4141          (or
4142            (and
4143              (= truck_loc_21 1)
4144              (= truck_travel_time_21 29)
4145            )
4146            (and
4147              (= truck_loc_21 2)
4148              (= truck_travel_time_21 21)
4149            )
4150          )
4151        )
4152      )
4153      (=> (= truck_loc_20 1)
4154        (and
4155          (<= a_stocka_21 120)
4156          (= (+ truck_stock_21 a_stocka_21) (+ truck_stock_20 a_stockb_21))
4157          (= b_stocka_21 b_stockb_21)
4158          (= c_stocka_21 c_stockb_21)
4159          (or
4160            (and
4161              (= truck_loc_21 0)
4162              (= truck_travel_time_21 29)
4163            )
4164            (and
4165              (= truck_loc_21 2)
4166              (= truck_travel_time_21 17)
4167            )
4168            (and
4169              (= truck_loc_21 3)
4170              (= truck_travel_time_21 32)
4171            )
4172          )
4173        )
4174      )
4175      (=> (= truck_loc_20 2)
4176        (and
4177          (<= b_stocka_21 120)
4178          (= (+ truck_stock_21 b_stocka_21) (+ truck_stock_20 b_stockb_21))
4179          (= a_stocka_21 a_stockb_21)
4180          (= c_stocka_21 c_stockb_21)
4181          (or
4182            (and
4183              (= truck_loc_21 1)
4184              (= truck_travel_time_21 17)
4185            )
4186            (and
4187              (= truck_loc_21 0)
4188              (= truck_travel_time_21 21)
4189            )
4190            (and
4191              (= truck_loc_21 3)
4192              (= truck_travel_time_21 37)
4193            )
4194          )
```

```
4195          )
4196       )
4197     (=> (= truck_loc_20 3)
4198       (and
4199         (<= c_stocka_21 200)
4200         (= (+ truck_stock_21 c_stocka_21) (+ truck_stock_20 c_stockb_21))
4201         (= a_stocka_21 a_stockb_21)
4202         (= b_stocka_21 b_stockb_21)
4203         (or
4204           (and
4205             (= truck_loc_21 1)
4206             (= truck_travel_time_21 32)
4207           )
4208           (and
4209             (= truck_loc_21 2)
4210             (= truck_travel_time_21 37)
4211           )
4212         )
4213       )
4214   )
4215 )
4216 (<= truck_stock_21 300)
4217 (>= truck_stock_21 0)
4218 (= a_stockb_22 (- a_stocka_21 truck_travel_time_21))
4219 (= b_stockb_22 (- b_stocka_21 truck_travel_time_21))
4220 (= c_stockb_22 (- c_stocka_21 truck_travel_time_21))
4221 (and
4222   (=> (= truck_loc_21 0)
4223     (and
4224       (= a_stocka_22 a_stockb_22)
4225       (= b_stocka_22 b_stockb_22)
4226       (= c_stocka_22 c_stockb_22)
4227       (or
4228         (and
4229           (= truck_loc_22 1)
4230           (= truck_travel_time_22 29)
4231         )
4232         (and
4233           (= truck_loc_22 2)
4234           (= truck_travel_time_22 21)
4235         )
4236       )
4237     )
4238   )
4239   (=> (= truck_loc_21 1)
4240     (and
4241       (<= a_stocka_22 120)
4242       (= (+ truck_stock_22 a_stocka_22) (+ truck_stock_21 a_stockb_22))
4243       (= b_stocka_22 b_stockb_22)
4244       (= c_stocka_22 c_stockb_22)
4245       (or
4246         (and
4247           (= truck_loc_22 0)
4248           (= truck_travel_time_22 29)
4249         )
4250         (and
4251           (= truck_loc_22 2)
4252           (= truck_travel_time_22 17)
4253         )
4254         (and
4255           (= truck_loc_22 3)
4256           (= truck_travel_time_22 32)
```

```
4257              )
4258            )
4259          )
4260      )
4261      (=> (= truck_loc_21 2)
4262          (and
4263            (<= b_stocka_22 120)
4264            (= (+ truck_stock_22 b_stocka_22) (+ truck_stock_21 b_stockb_22))
4265            (= a_stocka_22 a_stockb_22)
4266            (= c_stocka_22 c_stockb_22)
4267            (or
4268              (and
4269                (= truck_loc_22 1)
4270                (= truck_travel_time_22 17)
4271              )
4272              (and
4273                (= truck_loc_22 0)
4274                (= truck_travel_time_22 21)
4275              )
4276              (and
4277                (= truck_loc_22 3)
4278                (= truck_travel_time_22 37)
4279              )
4280            )
4281          )
4282      )
4283      (=> (= truck_loc_21 3)
4284          (and
4285            (<= c_stocka_22 200)
4286            (= (+ truck_stock_22 c_stocka_22) (+ truck_stock_21 c_stockb_22))
4287            (= a_stocka_22 a_stockb_22)
4288            (= b_stocka_22 b_stockb_22)
4289            (or
4290              (and
4291                (= truck_loc_22 1)
4292                (= truck_travel_time_22 32)
4293              )
4294              (and
4295                (= truck_loc_22 2)
4296                (= truck_travel_time_22 37)
4297              )
4298            )
4299          )
4300      )
4301  )
4302  (<= truck_stock_22 300)
4303  (>= truck_stock_22 0)
4304  (= a_stockb_23 (- a_stocka_22 truck_travel_time_22))
4305  (= b_stockb_23 (- b_stocka_22 truck_travel_time_22))
4306  (= c_stockb_23 (- c_stocka_22 truck_travel_time_22))
4307  (and
4308    (=> (= truck_loc_22 0)
4309        (and
4310          (= a_stocka_23 a_stockb_23)
4311          (= b_stocka_23 b_stockb_23)
4312          (= c_stocka_23 c_stockb_23)
4313          (or
4314            (and
4315              (= truck_loc_23 1)
4316              (= truck_travel_time_23 29)
4317            )
4318            (and
```

```
4319              (= truck_loc_23 2)
4320              (= truck_travel_time_23 21)
4321            )
4322          )
4323        )
4324      )
4325      (=> (= truck_loc_22 1)
4326        (and
4327          (<= a_stocka_23 120)
4328          (= (+ truck_stock_23 a_stocka_23) (+ truck_stock_22 a_stockb_23))
4329          (= b_stocka_23 b_stockb_23)
4330          (= c_stocka_23 c_stockb_23)
4331          (or
4332            (and
4333              (= truck_loc_23 0)
4334              (= truck_travel_time_23 29)
4335            )
4336            (and
4337              (= truck_loc_23 2)
4338              (= truck_travel_time_23 17)
4339            )
4340            (and
4341              (= truck_loc_23 3)
4342              (= truck_travel_time_23 32)
4343            )
4344          )
4345        )
4346      )
4347      (=> (= truck_loc_22 2)
4348        (and
4349          (<= b_stocka_23 120)
4350          (= (+ truck_stock_23 b_stocka_23) (+ truck_stock_22 b_stockb_23))
4351          (= a_stocka_23 a_stockb_23)
4352          (= c_stocka_23 c_stockb_23)
4353          (or
4354            (and
4355              (= truck_loc_23 1)
4356              (= truck_travel_time_23 17)
4357            )
4358            (and
4359              (= truck_loc_23 0)
4360              (= truck_travel_time_23 21)
4361            )
4362            (and
4363              (= truck_loc_23 3)
4364              (= truck_travel_time_23 37)
4365            )
4366          )
4367        )
4368      )
4369      (=> (= truck_loc_22 3)
4370        (and
4371          (<= c_stocka_23 200)
4372          (= (+ truck_stock_23 c_stocka_23) (+ truck_stock_22 c_stockb_23))
4373          (= a_stocka_23 a_stockb_23)
4374          (= b_stocka_23 b_stockb_23)
4375          (or
4376            (and
4377              (= truck_loc_23 1)
4378              (= truck_travel_time_23 32)
4379            )
4380            (and
```

```
4381              (= truck_loc_23 2)
4382              (= truck_travel_time_23 37)
4383            )
4384          )
4385        )
4386      )
4387    )
4388    (<= truck_stock_23 300)
4389    (>= truck_stock_23 0)
4390    (= a_stockb_24 (- a_stocka_23 truck_travel_time_23))
4391    (= b_stockb_24 (- b_stocka_23 truck_travel_time_23))
4392    (= c_stockb_24 (- c_stocka_23 truck_travel_time_23))
4393    (and
4394      (=> (= truck_loc_23 0)
4395        (and
4396          (= a_stocka_24 a_stockb_24)
4397          (= b_stocka_24 b_stockb_24)
4398          (= c_stocka_24 c_stockb_24)
4399          (or
4400            (and
4401              (= truck_loc_24 1)
4402              (= truck_travel_time_24 29)
4403            )
4404            (and
4405              (= truck_loc_24 2)
4406              (= truck_travel_time_24 21)
4407            )
4408          )
4409        )
4410      )
4411      (=> (= truck_loc_23 1)
4412        (and
4413          (<= a_stocka_24 120)
4414          (= (+ truck_stock_24 a_stocka_24) (+ truck_stock_23 a_stockb_24))
4415          (= b_stocka_24 b_stockb_24)
4416          (= c_stocka_24 c_stockb_24)
4417          (or
4418            (and
4419              (= truck_loc_24 0)
4420              (= truck_travel_time_24 29)
4421            )
4422            (and
4423              (= truck_loc_24 2)
4424              (= truck_travel_time_24 17)
4425            )
4426            (and
4427              (= truck_loc_24 3)
4428              (= truck_travel_time_24 32)
4429            )
4430          )
4431        )
4432      )
4433      (=> (= truck_loc_23 2)
4434        (and
4435          (<= b_stocka_24 120)
4436          (= (+ truck_stock_24 b_stocka_24) (+ truck_stock_23 b_stockb_24))
4437          (= a_stocka_24 a_stockb_24)
4438          (= c_stocka_24 c_stockb_24)
4439          (or
4440            (and
4441              (= truck_loc_24 1)
4442              (= truck_travel_time_24 17)
```

```
4443           )
4444         (and
4445           (= truck_loc_24 0)
4446           (= truck_travel_time_24 21)
4447         )
4448         (and
4449           (= truck_loc_24 3)
4450           (= truck_travel_time_24 37)
4451         )
4452       )
4453     )
4454   )
4455   (=> (= truck_loc_23 3)
4456     (and
4457       (<= c_stocka_24 200)
4458       (= (+ truck_stock_24 c_stocka_24) (+ truck_stock_23 c_stockb_24))
4459       (= a_stocka_24 a_stockb_24)
4460       (= b_stocka_24 b_stockb_24)
4461       (or
4462         (and
4463           (= truck_loc_24 1)
4464           (= truck_travel_time_24 32)
4465         )
4466         (and
4467           (= truck_loc_24 2)
4468           (= truck_travel_time_24 37)
4469         )
4470       )
4471     )
4472   )
4473 )
4474 (<= truck_stock_24 300)
4475 (>= truck_stock_24 0)
4476 (= a_stockb_25 (- a_stocka_24 truck_travel_time_24))
4477 (= b_stockb_25 (- b_stocka_24 truck_travel_time_24))
4478 (= c_stockb_25 (- c_stocka_24 truck_travel_time_24))
4479 (and
4480   (=> (= truck_loc_24 0)
4481     (and
4482       (= a_stocka_25 a_stockb_25)
4483       (= b_stocka_25 b_stockb_25)
4484       (= c_stocka_25 c_stockb_25)
4485       (or
4486         (and
4487           (= truck_loc_25 1)
4488           (= truck_travel_time_25 29)
4489         )
4490         (and
4491           (= truck_loc_25 2)
4492           (= truck_travel_time_25 21)
4493         )
4494       )
4495     )
4496   )
4497   (=> (= truck_loc_24 1)
4498     (and
4499       (<= a_stocka_25 120)
4500       (= (+ truck_stock_25 a_stocka_25) (+ truck_stock_24 a_stockb_25))
4501       (= b_stocka_25 b_stockb_25)
4502       (= c_stocka_25 c_stockb_25)
4503       (or
4504         (and
```

```
4505          (= truck_loc_25 0)
4506          (= truck_travel_time_25 29)
4507        )
4508      (and
4509        (= truck_loc_25 2)
4510        (= truck_travel_time_25 17)
4511      )
4512      (and
4513        (= truck_loc_25 3)
4514        (= truck_travel_time_25 32)
4515      )
4516    )
4517    )
4518  )
4519  (=> (= truck_loc_24 2)
4520    (and
4521      (<= b_stocka_25 120)
4522      (= (+ truck_stock_25 b_stocka_25) (+ truck_stock_24 b_stockb_25))
4523      (= a_stocka_25 a_stockb_25)
4524      (= c_stocka_25 c_stockb_25)
4525      (or
4526        (and
4527          (= truck_loc_25 1)
4528          (= truck_travel_time_25 17)
4529        )
4530        (and
4531          (= truck_loc_25 0)
4532          (= truck_travel_time_25 21)
4533        )
4534        (and
4535          (= truck_loc_25 3)
4536          (= truck_travel_time_25 37)
4537        )
4538      )
4539    )
4540  )
4541  (=> (= truck_loc_24 3)
4542    (and
4543      (<= c_stocka_25 200)
4544      (= (+ truck_stock_25 c_stocka_25) (+ truck_stock_24 c_stockb_25))
4545      (= a_stocka_25 a_stockb_25)
4546      (= b_stocka_25 b_stockb_25)
4547      (or
4548        (and
4549          (= truck_loc_25 1)
4550          (= truck_travel_time_25 32)
4551        )
4552        (and
4553          (= truck_loc_25 2)
4554          (= truck_travel_time_25 37)
4555        )
4556      )
4557    )
4558  )
4559 )
4560 (<= truck_stock_25 300)
4561 (>= truck_stock_25 0)
4562 (= a_stockb_26 (- a_stocka_25 truck_travel_time_25))
4563 (= b_stockb_26 (- b_stocka_25 truck_travel_time_25))
4564 (= c_stockb_26 (- c_stocka_25 truck_travel_time_25))
4565 (and
4566    (=> (= truck_loc_25 0)
```

```
4567        (and
4568          (= a_stocka_26 a_stockb_26)
4569          (= b_stocka_26 b_stockb_26)
4570          (= c_stocka_26 c_stockb_26)
4571          (or
4572            (and
4573              (= truck_loc_26 1)
4574              (= truck_travel_time_26 29)
4575            )
4576            (and
4577              (= truck_loc_26 2)
4578              (= truck_travel_time_26 21)
4579            )
4580          )
4581        )
4582      )
4583      (=> (= truck_loc_25 1)
4584        (and
4585          (<= a_stocka_26 120)
4586          (= (+ truck_stock_26 a_stocka_26) (+ truck_stock_25 a_stockb_26))
4587          (= b_stocka_26 b_stockb_26)
4588          (= c_stocka_26 c_stockb_26)
4589          (or
4590            (and
4591              (= truck_loc_26 0)
4592              (= truck_travel_time_26 29)
4593            )
4594            (and
4595              (= truck_loc_26 2)
4596              (= truck_travel_time_26 17)
4597            )
4598            (and
4599              (= truck_loc_26 3)
4600              (= truck_travel_time_26 32)
4601            )
4602          )
4603        )
4604      )
4605      (=> (= truck_loc_25 2)
4606        (and
4607          (<= b_stocka_26 120)
4608          (= (+ truck_stock_26 b_stocka_26) (+ truck_stock_25 b_stockb_26))
4609          (= a_stocka_26 a_stockb_26)
4610          (= c_stocka_26 c_stockb_26)
4611          (or
4612            (and
4613              (= truck_loc_26 1)
4614              (= truck_travel_time_26 17)
4615            )
4616            (and
4617              (= truck_loc_26 0)
4618              (= truck_travel_time_26 21)
4619            )
4620            (and
4621              (= truck_loc_26 3)
4622              (= truck_travel_time_26 37)
4623            )
4624          )
4625        )
4626      )
4627      (=> (= truck_loc_25 3)
4628        (and
```

```
4629        (<= c_stocka_26 200)
4630        (= (+ truck_stock_26 c_stocka_26) (+ truck_stock_25 c_stockb_26))
4631        (= a_stocka_26 a_stockb_26)
4632        (= b_stocka_26 b_stockb_26)
4633        (or
4634          (and
4635            (= truck_loc_26 1)
4636            (= truck_travel_time_26 32)
4637          )
4638          (and
4639            (= truck_loc_26 2)
4640            (= truck_travel_time_26 37)
4641          )
4642        )
4643      )
4644    )
4645  )
4646  (<= truck_stock_26 300)
4647  (>= truck_stock_26 0)
4648  (= a_stockb_27 (- a_stocka_26 truck_travel_time_26))
4649  (= b_stockb_27 (- b_stocka_26 truck_travel_time_26))
4650  (= c_stockb_27 (- c_stocka_26 truck_travel_time_26))
4651  (and
4652    (=> (= truck_loc_26 0)
4653      (and
4654        (= a_stocka_27 a_stockb_27)
4655        (= b_stocka_27 b_stockb_27)
4656        (= c_stocka_27 c_stockb_27)
4657        (or
4658          (and
4659            (= truck_loc_27 1)
4660            (= truck_travel_time_27 29)
4661          )
4662          (and
4663            (= truck_loc_27 2)
4664            (= truck_travel_time_27 21)
4665          )
4666        )
4667      )
4668    )
4669    (=> (= truck_loc_26 1)
4670      (and
4671        (<= a_stocka_27 120)
4672        (= (+ truck_stock_27 a_stocka_27) (+ truck_stock_26 a_stockb_27))
4673        (= b_stocka_27 b_stockb_27)
4674        (= c_stocka_27 c_stockb_27)
4675        (or
4676          (and
4677            (= truck_loc_27 0)
4678            (= truck_travel_time_27 29)
4679          )
4680          (and
4681            (= truck_loc_27 2)
4682            (= truck_travel_time_27 17)
4683          )
4684          (and
4685            (= truck_loc_27 3)
4686            (= truck_travel_time_27 32)
4687          )
4688        )
4689      )
4690    )
```

```
4691    (=> (= truck_loc_26 2)
4692      (and
4693        (<= b_stocka_27 120)
4694        (= (+ truck_stock_27 b_stocka_27) (+ truck_stock_26 b_stockb_27))
4695        (= a_stocka_27 a_stockb_27)
4696        (= c_stocka_27 c_stockb_27)
4697        (or
4698          (and
4699            (= truck_loc_27 1)
4700            (= truck_travel_time_27 17)
4701          )
4702          (and
4703            (= truck_loc_27 0)
4704            (= truck_travel_time_27 21)
4705          )
4706          (and
4707            (= truck_loc_27 3)
4708            (= truck_travel_time_27 37)
4709          )
4710        )
4711      )
4712    )
4713    (=> (= truck_loc_26 3)
4714      (and
4715        (<= c_stocka_27 200)
4716        (= (+ truck_stock_27 c_stocka_27) (+ truck_stock_26 c_stockb_27))
4717        (= a_stocka_27 a_stockb_27)
4718        (= b_stocka_27 b_stockb_27)
4719        (or
4720          (and
4721            (= truck_loc_27 1)
4722            (= truck_travel_time_27 32)
4723          )
4724          (and
4725            (= truck_loc_27 2)
4726            (= truck_travel_time_27 37)
4727          )
4728        )
4729      )
4730    )
4731  )
4732  (<= truck_stock_27 300)
4733  (>= truck_stock_27 0)
4734  (= a_stockb_28 (- a_stocka_27 truck_travel_time_27))
4735  (= b_stockb_28 (- b_stocka_27 truck_travel_time_27))
4736  (= c_stockb_28 (- c_stocka_27 truck_travel_time_27))
4737  (and
4738    (=> (= truck_loc_27 0)
4739      (and
4740        (= a_stocka_28 a_stockb_28)
4741        (= b_stocka_28 b_stockb_28)
4742        (= c_stocka_28 c_stockb_28)
4743        (or
4744          (and
4745            (= truck_loc_28 1)
4746            (= truck_travel_time_28 29)
4747          )
4748          (and
4749            (= truck_loc_28 2)
4750            (= truck_travel_time_28 21)
4751          )
4752        )
```

```
4753        )
4754      )
4755      (=> (= truck_loc_27 1)
4756        (and
4757          (<= a_stocka_28 120)
4758          (= (+ truck_stock_28 a_stocka_28) (+ truck_stock_27 a_stockb_28))
4759          (= b_stocka_28 b_stockb_28)
4760          (= c_stocka_28 c_stockb_28)
4761          (or
4762            (and
4763              (= truck_loc_28 0)
4764              (= truck_travel_time_28 29)
4765            )
4766            (and
4767              (= truck_loc_28 2)
4768              (= truck_travel_time_28 17)
4769            )
4770            (and
4771              (= truck_loc_28 3)
4772              (= truck_travel_time_28 32)
4773            )
4774          )
4775        )
4776      )
4777      (=> (= truck_loc_27 2)
4778        (and
4779          (<= b_stocka_28 120)
4780          (= (+ truck_stock_28 b_stocka_28) (+ truck_stock_27 b_stockb_28))
4781          (= a_stocka_28 a_stockb_28)
4782          (= c_stocka_28 c_stockb_28)
4783          (or
4784            (and
4785              (= truck_loc_28 1)
4786              (= truck_travel_time_28 17)
4787            )
4788            (and
4789              (= truck_loc_28 0)
4790              (= truck_travel_time_28 21)
4791            )
4792            (and
4793              (= truck_loc_28 3)
4794              (= truck_travel_time_28 37)
4795            )
4796          )
4797        )
4798      )
4799      (=> (= truck_loc_27 3)
4800        (and
4801          (<= c_stocka_28 200)
4802          (= (+ truck_stock_28 c_stocka_28) (+ truck_stock_27 c_stockb_28))
4803          (= a_stocka_28 a_stockb_28)
4804          (= b_stocka_28 b_stockb_28)
4805          (or
4806            (and
4807              (= truck_loc_28 1)
4808              (= truck_travel_time_28 32)
4809            )
4810            (and
4811              (= truck_loc_28 2)
4812              (= truck_travel_time_28 37)
4813            )
4814          )
```

```
4815        )
4816      )
4817    )
4818    (<= truck_stock_28 300)
4819    (>= truck_stock_28 0)
4820    (= a_stockb_29 (- a_stocka_28 truck_travel_time_28))
4821    (= b_stockb_29 (- b_stocka_28 truck_travel_time_28))
4822    (= c_stockb_29 (- c_stocka_28 truck_travel_time_28))
4823    (and
4824      (=> (= truck_loc_28 0)
4825        (and
4826          (= a_stocka_29 a_stockb_29)
4827          (= b_stocka_29 b_stockb_29)
4828          (= c_stocka_29 c_stockb_29)
4829          (or
4830            (and
4831              (= truck_loc_29 1)
4832              (= truck_travel_time_29 29)
4833            )
4834            (and
4835              (= truck_loc_29 2)
4836              (= truck_travel_time_29 21)
4837            )
4838          )
4839        )
4840      )
4841      (=> (= truck_loc_28 1)
4842        (and
4843          (<= a_stocka_29 120)
4844          (= (+ truck_stock_29 a_stocka_29) (+ truck_stock_28 a_stockb_29))
4845          (= b_stocka_29 b_stockb_29)
4846          (= c_stocka_29 c_stockb_29)
4847          (or
4848            (and
4849              (= truck_loc_29 0)
4850              (= truck_travel_time_29 29)
4851            )
4852            (and
4853              (= truck_loc_29 2)
4854              (= truck_travel_time_29 17)
4855            )
4856            (and
4857              (= truck_loc_29 3)
4858              (= truck_travel_time_29 32)
4859            )
4860          )
4861        )
4862      )
4863      (=> (= truck_loc_28 2)
4864        (and
4865          (<= b_stocka_29 120)
4866          (= (+ truck_stock_29 b_stocka_29) (+ truck_stock_28 b_stockb_29))
4867          (= a_stocka_29 a_stockb_29)
4868          (= c_stocka_29 c_stockb_29)
4869          (or
4870            (and
4871              (= truck_loc_29 1)
4872              (= truck_travel_time_29 17)
4873            )
4874            (and
4875              (= truck_loc_29 0)
4876              (= truck_travel_time_29 21)
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```
4877            )
4878          (and
4879            (= truck_loc_29 3)
4880            (= truck_travel_time_29 37)
4881          )
4882        )
4883      )
4884    )
4885    (=> (= truck_loc_28 3)
4886      (and
4887        (<= c_stocka_29 200)
4888        (= (+ truck_stock_29 c_stocka_29) (+ truck_stock_28 c_stockb_29))
4889        (= a_stocka_29 a_stockb_29)
4890        (= b_stocka_29 b_stockb_29)
4891        (or
4892          (and
4893            (= truck_loc_29 1)
4894            (= truck_travel_time_29 32)
4895          )
4896          (and
4897            (= truck_loc_29 2)
4898            (= truck_travel_time_29 37)
4899          )
4900        )
4901      )
4902    )
4903  )
4904  (<= truck_stock_29 300)
4905  (>= truck_stock_29 0)
4906  (= a_stockb_30 (- a_stocka_29 truck_travel_time_29))
4907  (= b_stockb_30 (- b_stocka_29 truck_travel_time_29))
4908  (= c_stockb_30 (- c_stocka_29 truck_travel_time_29))
4909  (and
4910    (=> (= truck_loc_29 0)
4911      (and
4912        (= a_stocka_30 a_stockb_30)
4913        (= b_stocka_30 b_stockb_30)
4914        (= c_stocka_30 c_stockb_30)
4915        (or
4916          (and
4917            (= truck_loc_30 1)
4918            (= truck_travel_time_30 29)
4919          )
4920          (and
4921            (= truck_loc_30 2)
4922            (= truck_travel_time_30 21)
4923          )
4924        )
4925      )
4926    )
4927    (=> (= truck_loc_29 1)
4928      (and
4929        (<= a_stocka_30 120)
4930        (= (+ truck_stock_30 a_stocka_30) (+ truck_stock_29 a_stockb_30))
4931        (= b_stocka_30 b_stockb_30)
4932        (= c_stocka_30 c_stockb_30)
4933        (or
4934          (and
4935            (= truck_loc_30 0)
4936            (= truck_travel_time_30 29)
4937          )
4938          (and
```

```
4939          (= truck_loc_30 2)
4940          (= truck_travel_time_30 17)
4941        )
4942      (and
4943        (= truck_loc_30 3)
4944        (= truck_travel_time_30 32)
4945      )
4946    )
4947   )
4948  )
4949  (=> (= truck_loc_29 2)
4950    (and
4951      (<= b_stocka_30 120)
4952      (= (+ truck_stock_30 b_stocka_30) (+ truck_stock_29 b_stockb_30))
4953      (= a_stocka_30 a_stockb_30)
4954      (= c_stocka_30 c_stockb_30)
4955      (or
4956        (and
4957          (= truck_loc_30 1)
4958          (= truck_travel_time_30 17)
4959        )
4960        (and
4961          (= truck_loc_30 0)
4962          (= truck_travel_time_30 21)
4963        )
4964        (and
4965          (= truck_loc_30 3)
4966          (= truck_travel_time_30 37)
4967        )
4968      )
4969    )
4970  )
4971  (=> (= truck_loc_29 3)
4972    (and
4973      (<= c_stocka_30 200)
4974      (= (+ truck_stock_30 c_stocka_30) (+ truck_stock_29 c_stockb_30))
4975      (= a_stocka_30 a_stockb_30)
4976      (= b_stocka_30 b_stockb_30)
4977      (or
4978        (and
4979          (= truck_loc_30 1)
4980          (= truck_travel_time_30 32)
4981        )
4982        (and
4983          (= truck_loc_30 2)
4984          (= truck_travel_time_30 37)
4985        )
4986      )
4987    )
4988  )
4989 )
4990 (<= truck_stock_30 300)
4991 (>= truck_stock_30 0)
4992 (= a_stockb_31 (- a_stocka_30 truck_travel_time_30))
4993 (= b_stockb_31 (- b_stocka_30 truck_travel_time_30))
4994 (= c_stockb_31 (- c_stocka_30 truck_travel_time_30))
4995 (and
4996   (=> (= truck_loc_30 0)
4997     (and
4998       (= a_stocka_31 a_stockb_31)
4999       (= b_stocka_31 b_stockb_31)
5000       (= c_stocka_31 c_stockb_31)
```

```
5001        (or
5002          (and
5003            (= truck_loc_31 1)
5004            (= truck_travel_time_31 29)
5005          )
5006          (and
5007            (= truck_loc_31 2)
5008            (= truck_travel_time_31 21)
5009          )
5010        )
5011      )
5012    )
5013    (=> (= truck_loc_30 1)
5014      (and
5015        (<= a_stocka_31 120)
5016        (= (+ truck_stock_31 a_stocka_31) (+ truck_stock_30 a_stockb_31))
5017        (= b_stocka_31 b_stockb_31)
5018        (= c_stocka_31 c_stockb_31)
5019        (or
5020          (and
5021            (= truck_loc_31 0)
5022            (= truck_travel_time_31 29)
5023          )
5024          (and
5025            (= truck_loc_31 2)
5026            (= truck_travel_time_31 17)
5027          )
5028          (and
5029            (= truck_loc_31 3)
5030            (= truck_travel_time_31 32)
5031          )
5032        )
5033      )
5034    )
5035    (=> (= truck_loc_30 2)
5036      (and
5037        (<= b_stocka_31 120)
5038        (= (+ truck_stock_31 b_stocka_31) (+ truck_stock_30 b_stockb_31))
5039        (= a_stocka_31 a_stockb_31)
5040        (= c_stocka_31 c_stockb_31)
5041        (or
5042          (and
5043            (= truck_loc_31 1)
5044            (= truck_travel_time_31 17)
5045          )
5046          (and
5047            (= truck_loc_31 0)
5048            (= truck_travel_time_31 21)
5049          )
5050          (and
5051            (= truck_loc_31 3)
5052            (= truck_travel_time_31 37)
5053          )
5054        )
5055      )
5056    )
5057    (=> (= truck_loc_30 3)
5058      (and
5059        (<= c_stocka_31 200)
5060        (= (+ truck_stock_31 c_stocka_31) (+ truck_stock_30 c_stockb_31))
5061        (= a_stocka_31 a_stockb_31)
5062        (= b_stocka_31 b_stockb_31)
```

```
5063        (or
5064          (and
5065            (= truck_loc_31 1)
5066            (= truck_travel_time_31 32)
5067          )
5068          (and
5069            (= truck_loc_31 2)
5070            (= truck_travel_time_31 37)
5071          )
5072        )
5073      )
5074    )
5075  )
5076  (<= truck_stock_31 300)
5077  (>= truck_stock_31 0)
5078  (= a_stockb_32 (- a_stocka_31 truck_travel_time_31))
5079  (= b_stockb_32 (- b_stocka_31 truck_travel_time_31))
5080  (= c_stockb_32 (- c_stocka_31 truck_travel_time_31))
5081  (and
5082    (=> (= truck_loc_31 0)
5083      (and
5084        (= a_stocka_32 a_stockb_32)
5085        (= b_stocka_32 b_stockb_32)
5086        (= c_stocka_32 c_stockb_32)
5087        (or
5088          (and
5089            (= truck_loc_32 1)
5090            (= truck_travel_time_32 29)
5091          )
5092          (and
5093            (= truck_loc_32 2)
5094            (= truck_travel_time_32 21)
5095          )
5096        )
5097      )
5098    )
5099    (=> (= truck_loc_31 1)
5100      (and
5101        (<= a_stocka_32 120)
5102        (= (+ truck_stock_32 a_stocka_32) (+ truck_stock_31 a_stockb_32))
5103        (= b_stocka_32 b_stockb_32)
5104        (= c_stocka_32 c_stockb_32)
5105        (or
5106          (and
5107            (= truck_loc_32 0)
5108            (= truck_travel_time_32 29)
5109          )
5110          (and
5111            (= truck_loc_32 2)
5112            (= truck_travel_time_32 17)
5113          )
5114          (and
5115            (= truck_loc_32 3)
5116            (= truck_travel_time_32 32)
5117          )
5118        )
5119      )
5120    )
5121    (=> (= truck_loc_31 2)
5122      (and
5123        (<= b_stocka_32 120)
5124        (= (+ truck_stock_32 b_stocka_32) (+ truck_stock_31 b_stockb_32))
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```
5125        (= a_stocka_32 a_stockb_32)
5126        (= c_stocka_32 c_stockb_32)
5127        (or
5128          (and
5129            (= truck_loc_32 1)
5130            (= truck_travel_time_32 17)
5131          )
5132          (and
5133            (= truck_loc_32 0)
5134            (= truck_travel_time_32 21)
5135          )
5136          (and
5137            (= truck_loc_32 3)
5138            (= truck_travel_time_32 37)
5139          )
5140        )
5141      )
5142    )
5143    (=> (= truck_loc_31 3)
5144      (and
5145        (<= c_stocka_32 200)
5146        (= (+ truck_stock_32 c_stocka_32) (+ truck_stock_31 c_stockb_32))
5147        (= a_stocka_32 a_stockb_32)
5148        (= b_stocka_32 b_stockb_32)
5149        (or
5150          (and
5151            (= truck_loc_32 1)
5152            (= truck_travel_time_32 32)
5153          )
5154          (and
5155            (= truck_loc_32 2)
5156            (= truck_travel_time_32 37)
5157          )
5158        )
5159      )
5160    )
5161  )
5162  (<= truck_stock_32 300)
5163  (>= truck_stock_32 0)
5164  (= a_stockb_33 (- a_stocka_32 truck_travel_time_32))
5165  (= b_stockb_33 (- b_stocka_32 truck_travel_time_32))
5166  (= c_stockb_33 (- c_stocka_32 truck_travel_time_32))
5167  (and
5168    (=> (= truck_loc_32 0)
5169      (and
5170        (= a_stocka_33 a_stockb_33)
5171        (= b_stocka_33 b_stockb_33)
5172        (= c_stocka_33 c_stockb_33)
5173        (or
5174          (and
5175            (= truck_loc_33 1)
5176            (= truck_travel_time_33 29)
5177          )
5178          (and
5179            (= truck_loc_33 2)
5180            (= truck_travel_time_33 21)
5181          )
5182        )
5183      )
5184    )
5185    (=> (= truck_loc_32 1)
5186      (and
```

```
5187        (<= a_stocka_33 120)
5188        (= (+ truck_stock_33 a_stocka_33) (+ truck_stock_32 a_stockb_33))
5189        (= b_stocka_33 b_stockb_33)
5190        (= c_stocka_33 c_stockb_33)
5191        (or
5192          (and
5193            (= truck_loc_33 0)
5194            (= truck_travel_time_33 29)
5195          )
5196          (and
5197            (= truck_loc_33 2)
5198            (= truck_travel_time_33 17)
5199          )
5200          (and
5201            (= truck_loc_33 3)
5202            (= truck_travel_time_33 32)
5203          )
5204        )
5205      )
5206    )
5207    (=> (= truck_loc_32 2)
5208      (and
5209        (<= b_stocka_33 120)
5210        (= (+ truck_stock_33 b_stocka_33) (+ truck_stock_32 b_stockb_33))
5211        (= a_stocka_33 a_stockb_33)
5212        (= c_stocka_33 c_stockb_33)
5213        (or
5214          (and
5215            (= truck_loc_33 1)
5216            (= truck_travel_time_33 17)
5217          )
5218          (and
5219            (= truck_loc_33 0)
5220            (= truck_travel_time_33 21)
5221          )
5222          (and
5223            (= truck_loc_33 3)
5224            (= truck_travel_time_33 37)
5225          )
5226        )
5227      )
5228    )
5229    (=> (= truck_loc_32 3)
5230      (and
5231        (<= c_stocka_33 200)
5232        (= (+ truck_stock_33 c_stocka_33) (+ truck_stock_32 c_stockb_33))
5233        (= a_stocka_33 a_stockb_33)
5234        (= b_stocka_33 b_stockb_33)
5235        (or
5236          (and
5237            (= truck_loc_33 1)
5238            (= truck_travel_time_33 32)
5239          )
5240          (and
5241            (= truck_loc_33 2)
5242            (= truck_travel_time_33 37)
5243          )
5244        )
5245      )
5246    )
5247  )
5248  (<= truck_stock_33 300)
```

```
5249  (>= truck_stock_33 0)
5250  (= a_stockb_34 (- a_stocka_33 truck_travel_time_33))
5251  (= b_stockb_34 (- b_stocka_33 truck_travel_time_33))
5252  (= c_stockb_34 (- c_stocka_33 truck_travel_time_33))
5253  (and
5254    (=> (= truck_loc_33 0)
5255      (and
5256        (= a_stocka_34 a_stockb_34)
5257        (= b_stocka_34 b_stockb_34)
5258        (= c_stocka_34 c_stockb_34)
5259        (or
5260          (and
5261            (= truck_loc_34 1)
5262            (= truck_travel_time_34 29)
5263          )
5264          (and
5265            (= truck_loc_34 2)
5266            (= truck_travel_time_34 21)
5267          )
5268        )
5269      )
5270    )
5271    (=> (= truck_loc_33 1)
5272      (and
5273        (<= a_stocka_34 120)
5274        (= (+ truck_stock_34 a_stocka_34) (+ truck_stock_33 a_stockb_34))
5275        (= b_stocka_34 b_stockb_34)
5276        (= c_stocka_34 c_stockb_34)
5277        (or
5278          (and
5279            (= truck_loc_34 0)
5280            (= truck_travel_time_34 29)
5281          )
5282          (and
5283            (= truck_loc_34 2)
5284            (= truck_travel_time_34 17)
5285          )
5286          (and
5287            (= truck_loc_34 3)
5288            (= truck_travel_time_34 32)
5289          )
5290        )
5291      )
5292    )
5293    (=> (= truck_loc_33 2)
5294      (and
5295        (<= b_stocka_34 120)
5296        (= (+ truck_stock_34 b_stocka_34) (+ truck_stock_33 b_stockb_34))
5297        (= a_stocka_34 a_stockb_34)
5298        (= c_stocka_34 c_stockb_34)
5299        (or
5300          (and
5301            (= truck_loc_34 1)
5302            (= truck_travel_time_34 17)
5303          )
5304          (and
5305            (= truck_loc_34 0)
5306            (= truck_travel_time_34 21)
5307          )
5308          (and
5309            (= truck_loc_34 3)
5310            (= truck_travel_time_34 37)
```

```
5311             )
5312           )
5313         )
5314     )
5315     (=> (= truck_loc_33 3)
5316       (and
5317         (<= c_stocka_34 200)
5318         (= (+ truck_stock_34 c_stocka_34) (+ truck_stock_33 c_stockb_34))
5319         (= a_stocka_34 a_stockb_34)
5320         (= b_stocka_34 b_stockb_34)
5321         (or
5322           (and
5323             (= truck_loc_34 1)
5324             (= truck_travel_time_34 32)
5325           )
5326           (and
5327             (= truck_loc_34 2)
5328             (= truck_travel_time_34 37)
5329           )
5330         )
5331       )
5332     )
5333 )
5334 (<= truck_stock_34 300)
5335 (>= truck_stock_34 0)
5336 (= a_stockb_35 (- a_stocka_34 truck_travel_time_34))
5337 (= b_stockb_35 (- b_stocka_34 truck_travel_time_34))
5338 (= c_stockb_35 (- c_stocka_34 truck_travel_time_34))
5339 (and
5340   (=> (= truck_loc_34 0)
5341     (and
5342       (= a_stocka_35 a_stockb_35)
5343       (= b_stocka_35 b_stockb_35)
5344       (= c_stocka_35 c_stockb_35)
5345       (or
5346         (and
5347           (= truck_loc_35 1)
5348           (= truck_travel_time_35 29)
5349         )
5350         (and
5351           (= truck_loc_35 2)
5352           (= truck_travel_time_35 21)
5353         )
5354       )
5355     )
5356   )
5357   (=> (= truck_loc_34 1)
5358     (and
5359       (<= a_stocka_35 120)
5360       (= (+ truck_stock_35 a_stocka_35) (+ truck_stock_34 a_stockb_35))
5361       (= b_stocka_35 b_stockb_35)
5362       (= c_stocka_35 c_stockb_35)
5363       (or
5364         (and
5365           (= truck_loc_35 0)
5366           (= truck_travel_time_35 29)
5367         )
5368         (and
5369           (= truck_loc_35 2)
5370           (= truck_travel_time_35 17)
5371         )
5372         (and
```

```
5373              (= truck_loc_35 3)
5374              (= truck_travel_time_35 32)
5375            )
5376          )
5377        )
5378      )
5379      (=> (= truck_loc_34 2)
5380        (and
5381          (<= b_stocka_35 120)
5382          (= (+ truck_stock_35 b_stocka_35) (+ truck_stock_34 b_stockb_35))
5383          (= a_stocka_35 a_stockb_35)
5384          (= c_stocka_35 c_stockb_35)
5385          (or
5386            (and
5387              (= truck_loc_35 1)
5388              (= truck_travel_time_35 17)
5389            )
5390            (and
5391              (= truck_loc_35 0)
5392              (= truck_travel_time_35 21)
5393            )
5394            (and
5395              (= truck_loc_35 3)
5396              (= truck_travel_time_35 37)
5397            )
5398          )
5399        )
5400      )
5401      (=> (= truck_loc_34 3)
5402        (and
5403          (<= c_stocka_35 200)
5404          (= (+ truck_stock_35 c_stocka_35) (+ truck_stock_34 c_stockb_35))
5405          (= a_stocka_35 a_stockb_35)
5406          (= b_stocka_35 b_stockb_35)
5407          (or
5408            (and
5409              (= truck_loc_35 1)
5410              (= truck_travel_time_35 32)
5411            )
5412            (and
5413              (= truck_loc_35 2)
5414              (= truck_travel_time_35 37)
5415            )
5416          )
5417        )
5418      )
5419    )
5420    (<= truck_stock_35 300)
5421    (>= truck_stock_35 0)
5422    (= a_stockb_36 (- a_stocka_35 truck_travel_time_35))
5423    (= b_stockb_36 (- b_stocka_35 truck_travel_time_35))
5424    (= c_stockb_36 (- c_stocka_35 truck_travel_time_35))
5425    (and
5426      (=> (= truck_loc_35 0)
5427        (and
5428          (= a_stocka_36 a_stockb_36)
5429          (= b_stocka_36 b_stockb_36)
5430          (= c_stocka_36 c_stockb_36)
5431          (or
5432            (and
5433              (= truck_loc_36 1)
5434              (= truck_travel_time_36 29)
```

```
5435            )
5436          (and
5437            (= truck_loc_36 2)
5438            (= truck_travel_time_36 21)
5439          )
5440        )
5441      )
5442    )
5443    (=> (= truck_loc_35 1)
5444      (and
5445        (<= a_stocka_36 120)
5446        (= (+ truck_stock_36 a_stocka_36) (+ truck_stock_35 a_stockb_36))
5447        (= b_stocka_36 b_stockb_36)
5448        (= c_stocka_36 c_stockb_36)
5449        (or
5450          (and
5451            (= truck_loc_36 0)
5452            (= truck_travel_time_36 29)
5453          )
5454          (and
5455            (= truck_loc_36 2)
5456            (= truck_travel_time_36 17)
5457          )
5458          (and
5459            (= truck_loc_36 3)
5460            (= truck_travel_time_36 32)
5461          )
5462        )
5463      )
5464    )
5465    (=> (= truck_loc_35 2)
5466      (and
5467        (<= b_stocka_36 120)
5468        (= (+ truck_stock_36 b_stocka_36) (+ truck_stock_35 b_stockb_36))
5469        (= a_stocka_36 a_stockb_36)
5470        (= c_stocka_36 c_stockb_36)
5471        (or
5472          (and
5473            (= truck_loc_36 1)
5474            (= truck_travel_time_36 17)
5475          )
5476          (and
5477            (= truck_loc_36 0)
5478            (= truck_travel_time_36 21)
5479          )
5480          (and
5481            (= truck_loc_36 3)
5482            (= truck_travel_time_36 37)
5483          )
5484        )
5485      )
5486    )
5487    (=> (= truck_loc_35 3)
5488      (and
5489        (<= c_stocka_36 200)
5490        (= (+ truck_stock_36 c_stocka_36) (+ truck_stock_35 c_stockb_36))
5491        (= a_stocka_36 a_stockb_36)
5492        (= b_stocka_36 b_stockb_36)
5493        (or
5494          (and
5495            (= truck_loc_36 1)
5496            (= truck_travel_time_36 32)
```

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5497            )
5498          (and
5499            (= truck_loc_36 2)
5500            (= truck_travel_time_36 37)
5501          )
5502        )
5503      )
5504    )
5505  )
5506  (<= truck_stock_36 300)
5507  (>= truck_stock_36 0)
5508  (= a_stockb_37 (- a_stocka_36 truck_travel_time_36))
5509  (= b_stockb_37 (- b_stocka_36 truck_travel_time_36))
5510  (= c_stockb_37 (- c_stocka_36 truck_travel_time_36))
5511  (and
5512    (=> (= truck_loc_36 0)
5513      (and
5514        (= a_stocka_37 a_stockb_37)
5515        (= b_stocka_37 b_stockb_37)
5516        (= c_stocka_37 c_stockb_37)
5517        (or
5518          (and
5519            (= truck_loc_37 1)
5520            (= truck_travel_time_37 29)
5521          )
5522          (and
5523            (= truck_loc_37 2)
5524            (= truck_travel_time_37 21)
5525          )
5526        )
5527      )
5528    )
5529    (=> (= truck_loc_36 1)
5530      (and
5531        (<= a_stocka_37 120)
5532        (= (+ truck_stock_37 a_stocka_37) (+ truck_stock_36 a_stockb_37))
5533        (= b_stocka_37 b_stockb_37)
5534        (= c_stocka_37 c_stockb_37)
5535        (or
5536          (and
5537            (= truck_loc_37 0)
5538            (= truck_travel_time_37 29)
5539          )
5540          (and
5541            (= truck_loc_37 2)
5542            (= truck_travel_time_37 17)
5543          )
5544          (and
5545            (= truck_loc_37 3)
5546            (= truck_travel_time_37 32)
5547          )
5548        )
5549      )
5550    )
5551    (=> (= truck_loc_36 2)
5552      (and
5553        (<= b_stocka_37 120)
5554        (= (+ truck_stock_37 b_stocka_37) (+ truck_stock_36 b_stockb_37))
5555        (= a_stocka_37 a_stockb_37)
5556        (= c_stocka_37 c_stockb_37)
5557        (or
5558          (and
```

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```
5559        (= truck_loc_37 1)
5560        (= truck_travel_time_37 17)
5561      )
5562      (and
5563        (= truck_loc_37 0)
5564        (= truck_travel_time_37 21)
5565      )
5566      (and
5567        (= truck_loc_37 3)
5568        (= truck_travel_time_37 37)
5569      )
5570    )
5571  )
5572 )
5573 (=> (= truck_loc_36 3)
5574   (and
5575     (<= c_stocka_37 200)
5576     (= (+ truck_stock_37 c_stocka_37) (+ truck_stock_36 c_stockb_37))
5577     (= a_stocka_37 a_stockb_37)
5578     (= b_stocka_37 b_stockb_37)
5579     (or
5580       (and
5581         (= truck_loc_37 1)
5582         (= truck_travel_time_37 32)
5583       )
5584       (and
5585         (= truck_loc_37 2)
5586         (= truck_travel_time_37 37)
5587       )
5588     )
5589   )
5590 )
5591 )
5592 (<= truck_stock_37 300)
5593 (>= truck_stock_37 0)
5594 (= a_stockb_38 (- a_stocka_37 truck_travel_time_37))
5595 (= b_stockb_38 (- b_stocka_37 truck_travel_time_37))
5596 (= c_stockb_38 (- c_stocka_37 truck_travel_time_37))
5597 (and
5598   (=> (= truck_loc_37 0)
5599     (and
5600       (= a_stocka_38 a_stockb_38)
5601       (= b_stocka_38 b_stockb_38)
5602       (= c_stocka_38 c_stockb_38)
5603       (or
5604         (and
5605           (= truck_loc_38 1)
5606           (= truck_travel_time_38 29)
5607         )
5608         (and
5609           (= truck_loc_38 2)
5610           (= truck_travel_time_38 21)
5611         )
5612       )
5613     )
5614   )
5615   (=> (= truck_loc_37 1)
5616     (and
5617       (<= a_stocka_38 120)
5618       (= (+ truck_stock_38 a_stocka_38) (+ truck_stock_37 a_stockb_38))
5619       (= b_stocka_38 b_stockb_38)
5620       (= c_stocka_38 c_stockb_38)
```

```
5621        (or
5622          (and
5623            (= truck_loc_38 0)
5624            (= truck_travel_time_38 29)
5625          )
5626          (and
5627            (= truck_loc_38 2)
5628            (= truck_travel_time_38 17)
5629          )
5630          (and
5631            (= truck_loc_38 3)
5632            (= truck_travel_time_38 32)
5633          )
5634        )
5635      )
5636    )
5637    (=> (= truck_loc_37 2)
5638      (and
5639        (<= b_stocka_38 120)
5640        (= (+ truck_stock_38 b_stocka_38) (+ truck_stock_37 b_stockb_38))
5641        (= a_stocka_38 a_stockb_38)
5642        (= c_stocka_38 c_stockb_38)
5643        (or
5644          (and
5645            (= truck_loc_38 1)
5646            (= truck_travel_time_38 17)
5647          )
5648          (and
5649            (= truck_loc_38 0)
5650            (= truck_travel_time_38 21)
5651          )
5652          (and
5653            (= truck_loc_38 3)
5654            (= truck_travel_time_38 37)
5655          )
5656        )
5657      )
5658    )
5659    (=> (= truck_loc_37 3)
5660      (and
5661        (<= c_stocka_38 200)
5662        (= (+ truck_stock_38 c_stocka_38) (+ truck_stock_37 c_stockb_38))
5663        (= a_stocka_38 a_stockb_38)
5664        (= b_stocka_38 b_stockb_38)
5665        (or
5666          (and
5667            (= truck_loc_38 1)
5668            (= truck_travel_time_38 32)
5669          )
5670          (and
5671            (= truck_loc_38 2)
5672            (= truck_travel_time_38 37)
5673          )
5674        )
5675      )
5676    )
5677  )
5678  (<= truck_stock_38 300)
5679  (>= truck_stock_38 0)
5680  (= a_stockb_39 (- a_stocka_38 truck_travel_time_38))
5681  (= b_stockb_39 (- b_stocka_38 truck_travel_time_38))
5682  (= c_stockb_39 (- c_stocka_38 truck_travel_time_38))
```

```
5683    (and
5684      (=> (= truck_loc_38 0)
5685        (and
5686          (= a_stocka_39 a_stockb_39)
5687          (= b_stocka_39 b_stockb_39)
5688          (= c_stocka_39 c_stockb_39)
5689          (or
5690            (and
5691              (= truck_loc_39 1)
5692              (= truck_travel_time_39 29)
5693            )
5694            (and
5695              (= truck_loc_39 2)
5696              (= truck_travel_time_39 21)
5697            )
5698          )
5699        )
5700      )
5701      (=> (= truck_loc_38 1)
5702        (and
5703          (<= a_stocka_39 120)
5704          (= (+ truck_stock_39 a_stocka_39) (+ truck_stock_38 a_stockb_39))
5705          (= b_stocka_39 b_stockb_39)
5706          (= c_stocka_39 c_stockb_39)
5707          (or
5708            (and
5709              (= truck_loc_39 0)
5710              (= truck_travel_time_39 29)
5711            )
5712            (and
5713              (= truck_loc_39 2)
5714              (= truck_travel_time_39 17)
5715            )
5716            (and
5717              (= truck_loc_39 3)
5718              (= truck_travel_time_39 32)
5719            )
5720          )
5721        )
5722      )
5723      (=> (= truck_loc_38 2)
5724        (and
5725          (<= b_stocka_39 120)
5726          (= (+ truck_stock_39 b_stocka_39) (+ truck_stock_38 b_stockb_39))
5727          (= a_stocka_39 a_stockb_39)
5728          (= c_stocka_39 c_stockb_39)
5729          (or
5730            (and
5731              (= truck_loc_39 1)
5732              (= truck_travel_time_39 17)
5733            )
5734            (and
5735              (= truck_loc_39 0)
5736              (= truck_travel_time_39 21)
5737            )
5738            (and
5739              (= truck_loc_39 3)
5740              (= truck_travel_time_39 37)
5741            )
5742          )
5743        )
5744      )
```

```
5745    (=> (= truck_loc_38 3)
5746      (and
5747        (<= c_stocka_39 200)
5748        (= (+ truck_stock_39 c_stocka_39) (+ truck_stock_38 c_stockb_39))
5749        (= a_stocka_39 a_stockb_39)
5750        (= b_stocka_39 b_stockb_39)
5751        (or
5752          (and
5753            (= truck_loc_39 1)
5754            (= truck_travel_time_39 32)
5755          )
5756          (and
5757            (= truck_loc_39 2)
5758            (= truck_travel_time_39 37)
5759          )
5760        )
5761      )
5762    )
5763  )
5764  (<= truck_stock_39 300)
5765  (>= truck_stock_39 0)
5766  (= a_stockb_40 (- a_stocka_39 truck_travel_time_39))
5767  (= b_stockb_40 (- b_stocka_39 truck_travel_time_39))
5768  (= c_stockb_40 (- c_stocka_39 truck_travel_time_39))
5769  (and
5770    (=> (= truck_loc_39 0)
5771      (and
5772        (= a_stocka_40 a_stockb_40)
5773        (= b_stocka_40 b_stockb_40)
5774        (= c_stocka_40 c_stockb_40)
5775        (or
5776          (and
5777            (= truck_loc_40 1)
5778            (= truck_travel_time_40 29)
5779          )
5780          (and
5781            (= truck_loc_40 2)
5782            (= truck_travel_time_40 21)
5783          )
5784        )
5785      )
5786    )
5787    (=> (= truck_loc_39 1)
5788      (and
5789        (<= a_stocka_40 120)
5790        (= (+ truck_stock_40 a_stocka_40) (+ truck_stock_39 a_stockb_40))
5791        (= b_stocka_40 b_stockb_40)
5792        (= c_stocka_40 c_stockb_40)
5793        (or
5794          (and
5795            (= truck_loc_40 0)
5796            (= truck_travel_time_40 29)
5797          )
5798          (and
5799            (= truck_loc_40 2)
5800            (= truck_travel_time_40 17)
5801          )
5802          (and
5803            (= truck_loc_40 3)
5804            (= truck_travel_time_40 32)
5805          )
5806        )
```

```
5807        )
5808      )
5809      (=> (= truck_loc_39 2)
5810        (and
5811          (<= b_stocka_40 120)
5812          (= (+ truck_stock_40 b_stocka_40) (+ truck_stock_39 b_stockb_40))
5813          (= a_stocka_40 a_stockb_40)
5814          (= c_stocka_40 c_stockb_40)
5815          (or
5816            (and
5817              (= truck_loc_40 1)
5818              (= truck_travel_time_40 17)
5819            )
5820            (and
5821              (= truck_loc_40 0)
5822              (= truck_travel_time_40 21)
5823            )
5824            (and
5825              (= truck_loc_40 3)
5826              (= truck_travel_time_40 37)
5827            )
5828          )
5829        )
5830      )
5831      (=> (= truck_loc_39 3)
5832        (and
5833          (<= c_stocka_40 200)
5834          (= (+ truck_stock_40 c_stocka_40) (+ truck_stock_39 c_stockb_40))
5835          (= a_stocka_40 a_stockb_40)
5836          (= b_stocka_40 b_stockb_40)
5837          (or
5838            (and
5839              (= truck_loc_40 1)
5840              (= truck_travel_time_40 32)
5841            )
5842            (and
5843              (= truck_loc_40 2)
5844              (= truck_travel_time_40 37)
5845            )
5846          )
5847        )
5848      )
5849    )
5850    (<= truck_stock_40 300)
5851    (>= truck_stock_40 0)
5852    (= a_stockb_41 (- a_stocka_40 truck_travel_time_40))
5853    (= b_stockb_41 (- b_stocka_40 truck_travel_time_40))
5854    (= c_stockb_41 (- c_stocka_40 truck_travel_time_40))
5855    (and
5856      (=> (= truck_loc_40 0)
5857        (and
5858          (= a_stocka_41 a_stockb_41)
5859          (= b_stocka_41 b_stockb_41)
5860          (= c_stocka_41 c_stockb_41)
5861          (or
5862            (and
5863              (= truck_loc_41 1)
5864              (= truck_travel_time_41 29)
5865            )
5866            (and
5867              (= truck_loc_41 2)
5868              (= truck_travel_time_41 21)
```

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5869            )
5870          )
5871        )
5872    )
5873    (=> (= truck_loc_40 1)
5874      (and
5875        (<= a_stocka_41 120)
5876        (= (+ truck_stock_41 a_stocka_41) (+ truck_stock_40 a_stockb_41))
5877        (= b_stocka_41 b_stockb_41)
5878        (= c_stocka_41 c_stockb_41)
5879        (or
5880          (and
5881            (= truck_loc_41 0)
5882            (= truck_travel_time_41 29)
5883          )
5884          (and
5885            (= truck_loc_41 2)
5886            (= truck_travel_time_41 17)
5887          )
5888          (and
5889            (= truck_loc_41 3)
5890            (= truck_travel_time_41 32)
5891          )
5892        )
5893      )
5894    )
5895    (=> (= truck_loc_40 2)
5896      (and
5897        (<= b_stocka_41 120)
5898        (= (+ truck_stock_41 b_stocka_41) (+ truck_stock_40 b_stockb_41))
5899        (= a_stocka_41 a_stockb_41)
5900        (= c_stocka_41 c_stockb_41)
5901        (or
5902          (and
5903            (= truck_loc_41 1)
5904            (= truck_travel_time_41 17)
5905          )
5906          (and
5907            (= truck_loc_41 0)
5908            (= truck_travel_time_41 21)
5909          )
5910          (and
5911            (= truck_loc_41 3)
5912            (= truck_travel_time_41 37)
5913          )
5914        )
5915      )
5916    )
5917    (=> (= truck_loc_40 3)
5918      (and
5919        (<= c_stocka_41 200)
5920        (= (+ truck_stock_41 c_stocka_41) (+ truck_stock_40 c_stockb_41))
5921        (= a_stocka_41 a_stockb_41)
5922        (= b_stocka_41 b_stockb_41)
5923        (or
5924          (and
5925            (= truck_loc_41 1)
5926            (= truck_travel_time_41 32)
5927          )
5928          (and
5929            (= truck_loc_41 2)
5930            (= truck_travel_time_41 37)
```

```
5931              )
5932            )
5933          )
5934       )
5935    )
5936    (<= truck_stock_41 300)
5937    (>= truck_stock_41 0)
5938    (= a_stockb_42 (- a_stocka_41 truck_travel_time_41))
5939    (= b_stockb_42 (- b_stocka_41 truck_travel_time_41))
5940    (= c_stockb_42 (- c_stocka_41 truck_travel_time_41))
5941    (and
5942      (=> (= truck_loc_41 0)
5943        (and
5944          (= a_stocka_42 a_stockb_42)
5945          (= b_stocka_42 b_stockb_42)
5946          (= c_stocka_42 c_stockb_42)
5947          (or
5948            (and
5949              (= truck_loc_42 1)
5950              (= truck_travel_time_42 29)
5951            )
5952            (and
5953              (= truck_loc_42 2)
5954              (= truck_travel_time_42 21)
5955            )
5956          )
5957        )
5958      )
5959      (=> (= truck_loc_41 1)
5960        (and
5961          (<= a_stocka_42 120)
5962          (= (+ truck_stock_42 a_stocka_42) (+ truck_stock_41 a_stockb_42))
5963          (= b_stocka_42 b_stockb_42)
5964          (= c_stocka_42 c_stockb_42)
5965          (or
5966            (and
5967              (= truck_loc_42 0)
5968              (= truck_travel_time_42 29)
5969            )
5970            (and
5971              (= truck_loc_42 2)
5972              (= truck_travel_time_42 17)
5973            )
5974            (and
5975              (= truck_loc_42 3)
5976              (= truck_travel_time_42 32)
5977            )
5978          )
5979        )
5980      )
5981      (=> (= truck_loc_41 2)
5982        (and
5983          (<= b_stocka_42 120)
5984          (= (+ truck_stock_42 b_stocka_42) (+ truck_stock_41 b_stockb_42))
5985          (= a_stocka_42 a_stockb_42)
5986          (= c_stocka_42 c_stockb_42)
5987          (or
5988            (and
5989              (= truck_loc_42 1)
5990              (= truck_travel_time_42 17)
5991            )
5992            (and
```

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```
5993              (= truck_loc_42 0)
5994              (= truck_travel_time_42 21)
5995          )
5996        (and
5997          (= truck_loc_42 3)
5998          (= truck_travel_time_42 37)
5999        )
6000      )
6001    )
6002  )
6003  (=> (= truck_loc_41 3)
6004    (and
6005      (<= c_stocka_42 200)
6006      (= (+ truck_stock_42 c_stocka_42) (+ truck_stock_41 c_stockb_42))
6007      (= a_stocka_42 a_stockb_42)
6008      (= b_stocka_42 b_stockb_42)
6009      (or
6010        (and
6011          (= truck_loc_42 1)
6012          (= truck_travel_time_42 32)
6013        )
6014        (and
6015          (= truck_loc_42 2)
6016          (= truck_travel_time_42 37)
6017        )
6018      )
6019    )
6020  )
6021 )
6022 (<= truck_stock_42 300)
6023 (>= truck_stock_42 0)
6024 (= a_stockb_43 (- a_stocka_42 truck_travel_time_42))
6025 (= b_stockb_43 (- b_stocka_42 truck_travel_time_42))
6026 (= c_stockb_43 (- c_stocka_42 truck_travel_time_42))
6027 (and
6028   (=> (= truck_loc_42 0)
6029     (and
6030       (= a_stocka_43 a_stockb_43)
6031       (= b_stocka_43 b_stockb_43)
6032       (= c_stocka_43 c_stockb_43)
6033       (or
6034         (and
6035           (= truck_loc_43 1)
6036           (= truck_travel_time_43 29)
6037         )
6038         (and
6039           (= truck_loc_43 2)
6040           (= truck_travel_time_43 21)
6041         )
6042       )
6043     )
6044   )
6045   (=> (= truck_loc_42 1)
6046     (and
6047       (<= a_stocka_43 120)
6048       (= (+ truck_stock_43 a_stocka_43) (+ truck_stock_42 a_stockb_43))
6049       (= b_stocka_43 b_stockb_43)
6050       (= c_stocka_43 c_stockb_43)
6051       (or
6052         (and
6053           (= truck_loc_43 0)
6054           (= truck_travel_time_43 29)
```

```
6055              )
6056            (and
6057              (= truck_loc_43 2)
6058              (= truck_travel_time_43 17)
6059            )
6060            (and
6061              (= truck_loc_43 3)
6062              (= truck_travel_time_43 32)
6063            )
6064          )
6065        )
6066      )
6067      (=> (= truck_loc_42 2)
6068        (and
6069          (<= b_stocka_43 120)
6070          (= (+ truck_stock_43 b_stocka_43) (+ truck_stock_42 b_stockb_43))
6071          (= a_stocka_43 a_stockb_43)
6072          (= c_stocka_43 c_stockb_43)
6073          (or
6074            (and
6075              (= truck_loc_43 1)
6076              (= truck_travel_time_43 17)
6077            )
6078            (and
6079              (= truck_loc_43 0)
6080              (= truck_travel_time_43 21)
6081            )
6082            (and
6083              (= truck_loc_43 3)
6084              (= truck_travel_time_43 37)
6085            )
6086          )
6087        )
6088      )
6089      (=> (= truck_loc_42 3)
6090        (and
6091          (<= c_stocka_43 200)
6092          (= (+ truck_stock_43 c_stocka_43) (+ truck_stock_42 c_stockb_43))
6093          (= a_stocka_43 a_stockb_43)
6094          (= b_stocka_43 b_stockb_43)
6095          (or
6096            (and
6097              (= truck_loc_43 1)
6098              (= truck_travel_time_43 32)
6099            )
6100            (and
6101              (= truck_loc_43 2)
6102              (= truck_travel_time_43 37)
6103            )
6104          )
6105        )
6106      )
6107    )
6108    (<= truck_stock_43 300)
6109    (>= truck_stock_43 0)
6110    (= a_stockb_44 (- a_stocka_43 truck_travel_time_43))
6111    (= b_stockb_44 (- b_stocka_43 truck_travel_time_43))
6112    (= c_stockb_44 (- c_stocka_43 truck_travel_time_43))
6113    (and
6114      (=> (= truck_loc_43 0)
6115        (and
6116          (= a_stocka_44 a_stockb_44)
```

```
6117        (= b_stocka_44 b_stockb_44)
6118        (= c_stocka_44 c_stockb_44)
6119        (or
6120          (and
6121            (= truck_loc_44 1)
6122            (= truck_travel_time_44 29)
6123          )
6124          (and
6125            (= truck_loc_44 2)
6126            (= truck_travel_time_44 21)
6127          )
6128        )
6129      )
6130    )
6131    (=> (= truck_loc_43 1)
6132      (and
6133        (<= a_stocka_44 120)
6134        (= (+ truck_stock_44 a_stocka_44) (+ truck_stock_43 a_stockb_44))
6135        (= b_stocka_44 b_stockb_44)
6136        (= c_stocka_44 c_stockb_44)
6137        (or
6138          (and
6139            (= truck_loc_44 0)
6140            (= truck_travel_time_44 29)
6141          )
6142          (and
6143            (= truck_loc_44 2)
6144            (= truck_travel_time_44 17)
6145          )
6146          (and
6147            (= truck_loc_44 3)
6148            (= truck_travel_time_44 32)
6149          )
6150        )
6151      )
6152    )
6153    (=> (= truck_loc_43 2)
6154      (and
6155        (<= b_stocka_44 120)
6156        (= (+ truck_stock_44 b_stocka_44) (+ truck_stock_43 b_stockb_44))
6157        (= a_stocka_44 a_stockb_44)
6158        (= c_stocka_44 c_stockb_44)
6159        (or
6160          (and
6161            (= truck_loc_44 1)
6162            (= truck_travel_time_44 17)
6163          )
6164          (and
6165            (= truck_loc_44 0)
6166            (= truck_travel_time_44 21)
6167          )
6168          (and
6169            (= truck_loc_44 3)
6170            (= truck_travel_time_44 37)
6171          )
6172        )
6173      )
6174    )
6175    (=> (= truck_loc_43 3)
6176      (and
6177        (<= c_stocka_44 200)
6178        (= (+ truck_stock_44 c_stocka_44) (+ truck_stock_43 c_stockb_44))
```

```
6179        (= a_stocka_44 a_stockb_44)
6180        (= b_stocka_44 b_stockb_44)
6181        (or
6182          (and
6183            (= truck_loc_44 1)
6184            (= truck_travel_time_44 32)
6185          )
6186          (and
6187            (= truck_loc_44 2)
6188            (= truck_travel_time_44 37)
6189          )
6190        )
6191      )
6192    )
6193  )
6194  (<= truck_stock_44 300)
6195  (>= truck_stock_44 0)
6196  (= a_stockb_45 (- a_stocka_44 truck_travel_time_44))
6197  (= b_stockb_45 (- b_stocka_44 truck_travel_time_44))
6198  (= c_stockb_45 (- c_stocka_44 truck_travel_time_44))
6199  (and
6200    (=> (= truck_loc_44 0)
6201      (and
6202        (= a_stocka_45 a_stockb_45)
6203        (= b_stocka_45 b_stockb_45)
6204        (= c_stocka_45 c_stockb_45)
6205        (or
6206          (and
6207            (= truck_loc_45 1)
6208            (= truck_travel_time_45 29)
6209          )
6210          (and
6211            (= truck_loc_45 2)
6212            (= truck_travel_time_45 21)
6213          )
6214        )
6215      )
6216    )
6217    (=> (= truck_loc_44 1)
6218      (and
6219        (<= a_stocka_45 120)
6220        (= (+ truck_stock_45 a_stocka_45) (+ truck_stock_44 a_stockb_45))
6221        (= b_stocka_45 b_stockb_45)
6222        (= c_stocka_45 c_stockb_45)
6223        (or
6224          (and
6225            (= truck_loc_45 0)
6226            (= truck_travel_time_45 29)
6227          )
6228          (and
6229            (= truck_loc_45 2)
6230            (= truck_travel_time_45 17)
6231          )
6232          (and
6233            (= truck_loc_45 3)
6234            (= truck_travel_time_45 32)
6235          )
6236        )
6237      )
6238    )
6239    (=> (= truck_loc_44 2)
6240      (and
```

```
6241        (<= b_stocka_45 120)
6242        (= (+ truck_stock_45 b_stocka_45) (+ truck_stock_44 b_stockb_45))
6243        (= a_stocka_45 a_stockb_45)
6244        (= c_stocka_45 c_stockb_45)
6245        (or
6246          (and
6247            (= truck_loc_45 1)
6248            (= truck_travel_time_45 17)
6249          )
6250          (and
6251            (= truck_loc_45 0)
6252            (= truck_travel_time_45 21)
6253          )
6254          (and
6255            (= truck_loc_45 3)
6256            (= truck_travel_time_45 37)
6257          )
6258        )
6259      )
6260    )
6261    (=> (= truck_loc_44 3)
6262      (and
6263        (<= c_stocka_45 200)
6264        (= (+ truck_stock_45 c_stocka_45) (+ truck_stock_44 c_stockb_45))
6265        (= a_stocka_45 a_stockb_45)
6266        (= b_stocka_45 b_stockb_45)
6267        (or
6268          (and
6269            (= truck_loc_45 1)
6270            (= truck_travel_time_45 32)
6271          )
6272          (and
6273            (= truck_loc_45 2)
6274            (= truck_travel_time_45 37)
6275          )
6276        )
6277      )
6278    )
6279  )
6280  (<= truck_stock_45 300)
6281  (>= truck_stock_45 0)
6282  (= a_stockb_46 (- a_stocka_45 truck_travel_time_45))
6283  (= b_stockb_46 (- b_stocka_45 truck_travel_time_45))
6284  (= c_stockb_46 (- c_stocka_45 truck_travel_time_45))
6285  (and
6286    (=> (= truck_loc_45 0)
6287      (and
6288        (= a_stocka_46 a_stockb_46)
6289        (= b_stocka_46 b_stockb_46)
6290        (= c_stocka_46 c_stockb_46)
6291        (or
6292          (and
6293            (= truck_loc_46 1)
6294            (= truck_travel_time_46 29)
6295          )
6296          (and
6297            (= truck_loc_46 2)
6298            (= truck_travel_time_46 21)
6299          )
6300        )
6301      )
6302    )
```

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```
6303    (=> (= truck_loc_45 1)
6304      (and
6305        (<= a_stocka_46 120)
6306        (= (+ truck_stock_46 a_stocka_46) (+ truck_stock_45 a_stockb_46))
6307        (= b_stocka_46 b_stockb_46)
6308        (= c_stocka_46 c_stockb_46)
6309        (or
6310          (and
6311            (= truck_loc_46 0)
6312            (= truck_travel_time_46 29)
6313          )
6314          (and
6315            (= truck_loc_46 2)
6316            (= truck_travel_time_46 17)
6317          )
6318          (and
6319            (= truck_loc_46 3)
6320            (= truck_travel_time_46 32)
6321          )
6322        )
6323      )
6324    )
6325    (=> (= truck_loc_45 2)
6326      (and
6327        (<= b_stocka_46 120)
6328        (= (+ truck_stock_46 b_stocka_46) (+ truck_stock_45 b_stockb_46))
6329        (= a_stocka_46 a_stockb_46)
6330        (= c_stocka_46 c_stockb_46)
6331        (or
6332          (and
6333            (= truck_loc_46 1)
6334            (= truck_travel_time_46 17)
6335          )
6336          (and
6337            (= truck_loc_46 0)
6338            (= truck_travel_time_46 21)
6339          )
6340          (and
6341            (= truck_loc_46 3)
6342            (= truck_travel_time_46 37)
6343          )
6344        )
6345      )
6346    )
6347    (=> (= truck_loc_45 3)
6348      (and
6349        (<= c_stocka_46 200)
6350        (= (+ truck_stock_46 c_stocka_46) (+ truck_stock_45 c_stockb_46))
6351        (= a_stocka_46 a_stockb_46)
6352        (= b_stocka_46 b_stockb_46)
6353        (or
6354          (and
6355            (= truck_loc_46 1)
6356            (= truck_travel_time_46 32)
6357          )
6358          (and
6359            (= truck_loc_46 2)
6360            (= truck_travel_time_46 37)
6361          )
6362        )
6363      )
6364    )
```

```
6365  )
6366  (<= truck_stock_46 300)
6367  (>= truck_stock_46 0)
6368  (= a_stockb_47 (- a_stocka_46 truck_travel_time_46))
6369  (= b_stockb_47 (- b_stocka_46 truck_travel_time_46))
6370  (= c_stockb_47 (- c_stocka_46 truck_travel_time_46))
6371  (and
6372    (=> (= truck_loc_46 0)
6373      (and
6374        (= a_stocka_47 a_stockb_47)
6375        (= b_stocka_47 b_stockb_47)
6376        (= c_stocka_47 c_stockb_47)
6377        (or
6378          (and
6379            (= truck_loc_47 1)
6380            (= truck_travel_time_47 29)
6381          )
6382          (and
6383            (= truck_loc_47 2)
6384            (= truck_travel_time_47 21)
6385          )
6386        )
6387      )
6388    )
6389    (=> (= truck_loc_46 1)
6390      (and
6391        (<= a_stocka_47 120)
6392        (= (+ truck_stock_47 a_stocka_47) (+ truck_stock_46 a_stockb_47))
6393        (= b_stocka_47 b_stockb_47)
6394        (= c_stocka_47 c_stockb_47)
6395        (or
6396          (and
6397            (= truck_loc_47 0)
6398            (= truck_travel_time_47 29)
6399          )
6400          (and
6401            (= truck_loc_47 2)
6402            (= truck_travel_time_47 17)
6403          )
6404          (and
6405            (= truck_loc_47 3)
6406            (= truck_travel_time_47 32)
6407          )
6408        )
6409      )
6410    )
6411    (=> (= truck_loc_46 2)
6412      (and
6413        (<= b_stocka_47 120)
6414        (= (+ truck_stock_47 b_stocka_47) (+ truck_stock_46 b_stockb_47))
6415        (= a_stocka_47 a_stockb_47)
6416        (= c_stocka_47 c_stockb_47)
6417        (or
6418          (and
6419            (= truck_loc_47 1)
6420            (= truck_travel_time_47 17)
6421          )
6422          (and
6423            (= truck_loc_47 0)
6424            (= truck_travel_time_47 21)
6425          )
6426          (and
```

```
6427            (= truck_loc_47 3)
6428            (= truck_travel_time_47 37)
6429          )
6430        )
6431      )
6432    )
6433    (=> (= truck_loc_46 3)
6434      (and
6435        (<= c_stocka_47 200)
6436        (= (+ truck_stock_47 c_stocka_47) (+ truck_stock_46 c_stockb_47))
6437        (= a_stocka_47 a_stockb_47)
6438        (= b_stocka_47 b_stockb_47)
6439        (or
6440          (and
6441            (= truck_loc_47 1)
6442            (= truck_travel_time_47 32)
6443          )
6444          (and
6445            (= truck_loc_47 2)
6446            (= truck_travel_time_47 37)
6447          )
6448        )
6449      )
6450    )
6451  )
6452  (<= truck_stock_47 300)
6453  (>= truck_stock_47 0)
6454  (= a_stockb_48 (- a_stocka_47 truck_travel_time_47))
6455  (= b_stockb_48 (- b_stocka_47 truck_travel_time_47))
6456  (= c_stockb_48 (- c_stocka_47 truck_travel_time_47))
6457  (and
6458    (=> (= truck_loc_47 0)
6459      (and
6460        (= a_stocka_48 a_stockb_48)
6461        (= b_stocka_48 b_stockb_48)
6462        (= c_stocka_48 c_stockb_48)
6463        (or
6464          (and
6465            (= truck_loc_48 1)
6466            (= truck_travel_time_48 29)
6467          )
6468          (and
6469            (= truck_loc_48 2)
6470            (= truck_travel_time_48 21)
6471          )
6472        )
6473      )
6474    )
6475    (=> (= truck_loc_47 1)
6476      (and
6477        (<= a_stocka_48 120)
6478        (= (+ truck_stock_48 a_stocka_48) (+ truck_stock_47 a_stockb_48))
6479        (= b_stocka_48 b_stockb_48)
6480        (= c_stocka_48 c_stockb_48)
6481        (or
6482          (and
6483            (= truck_loc_48 0)
6484            (= truck_travel_time_48 29)
6485          )
6486          (and
6487            (= truck_loc_48 2)
6488            (= truck_travel_time_48 17)
```

```
6489            )
6490          (and
6491            (= truck_loc_48 3)
6492            (= truck_travel_time_48 32)
6493          )
6494        )
6495      )
6496    )
6497    (=> (= truck_loc_47 2)
6498      (and
6499        (<= b_stocka_48 120)
6500        (= (+ truck_stock_48 b_stocka_48) (+ truck_stock_47 b_stockb_48))
6501        (= a_stocka_48 a_stockb_48)
6502        (= c_stocka_48 c_stockb_48)
6503        (or
6504          (and
6505            (= truck_loc_48 1)
6506            (= truck_travel_time_48 17)
6507          )
6508          (and
6509            (= truck_loc_48 0)
6510            (= truck_travel_time_48 21)
6511          )
6512          (and
6513            (= truck_loc_48 3)
6514            (= truck_travel_time_48 37)
6515          )
6516        )
6517      )
6518    )
6519    (=> (= truck_loc_47 3)
6520      (and
6521        (<= c_stocka_48 200)
6522        (= (+ truck_stock_48 c_stocka_48) (+ truck_stock_47 c_stockb_48))
6523        (= a_stocka_48 a_stockb_48)
6524        (= b_stocka_48 b_stockb_48)
6525        (or
6526          (and
6527            (= truck_loc_48 1)
6528            (= truck_travel_time_48 32)
6529          )
6530          (and
6531            (= truck_loc_48 2)
6532            (= truck_travel_time_48 37)
6533          )
6534        )
6535      )
6536    )
6537  )
6538  (<= truck_stock_48 300)
6539  (>= truck_stock_48 0)
6540  (= a_stockb_49 (- a_stocka_48 truck_travel_time_48))
6541  (= b_stockb_49 (- b_stocka_48 truck_travel_time_48))
6542  (= c_stockb_49 (- c_stocka_48 truck_travel_time_48))
6543  (and
6544    (=> (= truck_loc_48 0)
6545      (and
6546        (= a_stocka_49 a_stockb_49)
6547        (= b_stocka_49 b_stockb_49)
6548        (= c_stocka_49 c_stockb_49)
6549        (or
6550          (and
```

```
6551            (= truck_loc_49 1)
6552            (= truck_travel_time_49 29)
6553          )
6554        (and
6555          (= truck_loc_49 2)
6556          (= truck_travel_time_49 21)
6557        )
6558      )
6559    )
6560  )
6561  (=> (= truck_loc_48 1)
6562    (and
6563      (<= a_stocka_49 120)
6564      (= (+ truck_stock_49 a_stocka_49) (+ truck_stock_48 a_stockb_49))
6565      (= b_stocka_49 b_stockb_49)
6566      (= c_stocka_49 c_stockb_49)
6567      (or
6568        (and
6569          (= truck_loc_49 0)
6570          (= truck_travel_time_49 29)
6571        )
6572        (and
6573          (= truck_loc_49 2)
6574          (= truck_travel_time_49 17)
6575        )
6576        (and
6577          (= truck_loc_49 3)
6578          (= truck_travel_time_49 32)
6579        )
6580      )
6581    )
6582  )
6583  (=> (= truck_loc_48 2)
6584    (and
6585      (<= b_stocka_49 120)
6586      (= (+ truck_stock_49 b_stocka_49) (+ truck_stock_48 b_stockb_49))
6587      (= a_stocka_49 a_stockb_49)
6588      (= c_stocka_49 c_stockb_49)
6589      (or
6590        (and
6591          (= truck_loc_49 1)
6592          (= truck_travel_time_49 17)
6593        )
6594        (and
6595          (= truck_loc_49 0)
6596          (= truck_travel_time_49 21)
6597        )
6598        (and
6599          (= truck_loc_49 3)
6600          (= truck_travel_time_49 37)
6601        )
6602      )
6603    )
6604  )
6605  (=> (= truck_loc_48 3)
6606    (and
6607      (<= c_stocka_49 200)
6608      (= (+ truck_stock_49 c_stocka_49) (+ truck_stock_48 c_stockb_49))
6609      (= a_stocka_49 a_stockb_49)
6610      (= b_stocka_49 b_stockb_49)
6611      (or
6612        (and
```

```
6613            (= truck_loc_49 1)
6614            (= truck_travel_time_49 32)
6615          )
6616          (and
6617            (= truck_loc_49 2)
6618            (= truck_travel_time_49 37)
6619          )
6620        )
6621      )
6622    )
6623  )
6624  (<= truck_stock_49 300)
6625  (>= truck_stock_49 0)
6626  (= a_stockb_50 (- a_stocka_49 truck_travel_time_49))
6627  (= b_stockb_50 (- b_stocka_49 truck_travel_time_49))
6628  (= c_stockb_50 (- c_stocka_49 truck_travel_time_49))
6629  (and
6630    (=> (= truck_loc_49 0)
6631      (and
6632        (= a_stocka_50 a_stockb_50)
6633        (= b_stocka_50 b_stockb_50)
6634        (= c_stocka_50 c_stockb_50)
6635        (or
6636          (and
6637            (= truck_loc_50 1)
6638            (= truck_travel_time_50 29)
6639          )
6640          (and
6641            (= truck_loc_50 2)
6642            (= truck_travel_time_50 21)
6643          )
6644        )
6645      )
6646    )
6647    (=> (= truck_loc_49 1)
6648      (and
6649        (<= a_stocka_50 120)
6650        (= (+ truck_stock_50 a_stocka_50) (+ truck_stock_49 a_stockb_50))
6651        (= b_stocka_50 b_stockb_50)
6652        (= c_stocka_50 c_stockb_50)
6653        (or
6654          (and
6655            (= truck_loc_50 0)
6656            (= truck_travel_time_50 29)
6657          )
6658          (and
6659            (= truck_loc_50 2)
6660            (= truck_travel_time_50 17)
6661          )
6662          (and
6663            (= truck_loc_50 3)
6664            (= truck_travel_time_50 32)
6665          )
6666        )
6667      )
6668    )
6669    (=> (= truck_loc_49 2)
6670      (and
6671        (<= b_stocka_50 120)
6672        (= (+ truck_stock_50 b_stocka_50) (+ truck_stock_49 b_stockb_50))
6673        (= a_stocka_50 a_stockb_50)
6674        (= c_stocka_50 c_stockb_50)
```

```
6675          (or
6676            (and
6677              (= truck_loc_50 1)
6678              (= truck_travel_time_50 17)
6679            )
6680            (and
6681              (= truck_loc_50 0)
6682              (= truck_travel_time_50 21)
6683            )
6684            (and
6685              (= truck_loc_50 3)
6686              (= truck_travel_time_50 37)
6687            )
6688          )
6689        )
6690    )
6691    (=> (= truck_loc_49 3)
6692      (and
6693        (<= c_stocka_50 200)
6694        (= (+ truck_stock_50 c_stocka_50) (+ truck_stock_49 c_stockb_50))
6695        (= a_stocka_50 a_stockb_50)
6696        (= b_stocka_50 b_stockb_50)
6697        (or
6698          (and
6699            (= truck_loc_50 1)
6700            (= truck_travel_time_50 32)
6701          )
6702          (and
6703            (= truck_loc_50 2)
6704            (= truck_travel_time_50 37)
6705          )
6706        )
6707      )
6708    )
6709  )
6710  (<= truck_stock_50 300)
6711  (>= truck_stock_50 0)
6712  (= a_stockb_51 (- a_stocka_50 truck_travel_time_50))
6713  (= b_stockb_51 (- b_stocka_50 truck_travel_time_50))
6714  (= c_stockb_51 (- c_stocka_50 truck_travel_time_50))
6715  (and
6716    (=> (= truck_loc_50 0)
6717      (and
6718        (= a_stocka_51 a_stockb_51)
6719        (= b_stocka_51 b_stockb_51)
6720        (= c_stocka_51 c_stockb_51)
6721        (or
6722          (and
6723            (= truck_loc_51 1)
6724            (= truck_travel_time_51 29)
6725          )
6726          (and
6727            (= truck_loc_51 2)
6728            (= truck_travel_time_51 21)
6729          )
6730        )
6731      )
6732    )
6733    (=> (= truck_loc_50 1)
6734      (and
6735        (<= a_stocka_51 120)
6736        (= (+ truck_stock_51 a_stocka_51) (+ truck_stock_50 a_stockb_51))
```

```
6737        (= b_stocka_51 b_stockb_51)
6738        (= c_stocka_51 c_stockb_51)
6739        (or
6740          (and
6741            (= truck_loc_51 0)
6742            (= truck_travel_time_51 29)
6743          )
6744          (and
6745            (= truck_loc_51 2)
6746            (= truck_travel_time_51 17)
6747          )
6748          (and
6749            (= truck_loc_51 3)
6750            (= truck_travel_time_51 32)
6751          )
6752        )
6753      )
6754    )
6755    (=> (= truck_loc_50 2)
6756      (and
6757        (<= b_stocka_51 120)
6758        (= (+ truck_stock_51 b_stocka_51) (+ truck_stock_50 b_stockb_51))
6759        (= a_stocka_51 a_stockb_51)
6760        (= c_stocka_51 c_stockb_51)
6761        (or
6762          (and
6763            (= truck_loc_51 1)
6764            (= truck_travel_time_51 17)
6765          )
6766          (and
6767            (= truck_loc_51 0)
6768            (= truck_travel_time_51 21)
6769          )
6770          (and
6771            (= truck_loc_51 3)
6772            (= truck_travel_time_51 37)
6773          )
6774        )
6775      )
6776    )
6777    (=> (= truck_loc_50 3)
6778      (and
6779        (<= c_stocka_51 200)
6780        (= (+ truck_stock_51 c_stocka_51) (+ truck_stock_50 c_stockb_51))
6781        (= a_stocka_51 a_stockb_51)
6782        (= b_stocka_51 b_stockb_51)
6783        (or
6784          (and
6785            (= truck_loc_51 1)
6786            (= truck_travel_time_51 32)
6787          )
6788          (and
6789            (= truck_loc_51 2)
6790            (= truck_travel_time_51 37)
6791          )
6792        )
6793      )
6794    )
6795  )
6796  (<= truck_stock_51 300)
6797  (>= truck_stock_51 0)
6798  (= a_stockb_52 (- a_stocka_51 truck_travel_time_51))
```

```
6799   (= b_stockb_52 (- b_stocka_51 truck_travel_time_51))
6800   (= c_stockb_52 (- c_stocka_51 truck_travel_time_51))
6801   (and
6802     (=> (= truck_loc_51 0)
6803       (and
6804         (= a_stocka_52 a_stockb_52)
6805         (= b_stocka_52 b_stockb_52)
6806         (= c_stocka_52 c_stockb_52)
6807         (or
6808           (and
6809             (= truck_loc_52 1)
6810             (= truck_travel_time_52 29)
6811           )
6812           (and
6813             (= truck_loc_52 2)
6814             (= truck_travel_time_52 21)
6815           )
6816         )
6817       )
6818     )
6819     (=> (= truck_loc_51 1)
6820       (and
6821         (<= a_stocka_52 120)
6822         (= (+ truck_stock_52 a_stocka_52) (+ truck_stock_51 a_stockb_52))
6823         (= b_stocka_52 b_stockb_52)
6824         (= c_stocka_52 c_stockb_52)
6825         (or
6826           (and
6827             (= truck_loc_52 0)
6828             (= truck_travel_time_52 29)
6829           )
6830           (and
6831             (= truck_loc_52 2)
6832             (= truck_travel_time_52 17)
6833           )
6834           (and
6835             (= truck_loc_52 3)
6836             (= truck_travel_time_52 32)
6837           )
6838         )
6839       )
6840     )
6841     (=> (= truck_loc_51 2)
6842       (and
6843         (<= b_stocka_52 120)
6844         (= (+ truck_stock_52 b_stocka_52) (+ truck_stock_51 b_stockb_52))
6845         (= a_stocka_52 a_stockb_52)
6846         (= c_stocka_52 c_stockb_52)
6847         (or
6848           (and
6849             (= truck_loc_52 1)
6850             (= truck_travel_time_52 17)
6851           )
6852           (and
6853             (= truck_loc_52 0)
6854             (= truck_travel_time_52 21)
6855           )
6856           (and
6857             (= truck_loc_52 3)
6858             (= truck_travel_time_52 37)
6859           )
6860         )
```

```
6861        )
6862      )
6863      (=> (= truck_loc_51 3)
6864        (and
6865          (<= c_stocka_52 200)
6866          (= (+ truck_stock_52 c_stocka_52) (+ truck_stock_51 c_stockb_52))
6867          (= a_stocka_52 a_stockb_52)
6868          (= b_stocka_52 b_stockb_52)
6869          (or
6870            (and
6871              (= truck_loc_52 1)
6872              (= truck_travel_time_52 32)
6873            )
6874            (and
6875              (= truck_loc_52 2)
6876              (= truck_travel_time_52 37)
6877            )
6878          )
6879        )
6880      )
6881    )
6882    (<= truck_stock_52 300)
6883    (>= truck_stock_52 0)
6884    (= a_stockb_53 (- a_stocka_52 truck_travel_time_52))
6885    (= b_stockb_53 (- b_stocka_52 truck_travel_time_52))
6886    (= c_stockb_53 (- c_stocka_52 truck_travel_time_52))
6887    (and
6888      (=> (= truck_loc_52 0)
6889        (and
6890          (= a_stocka_53 a_stockb_53)
6891          (= b_stocka_53 b_stockb_53)
6892          (= c_stocka_53 c_stockb_53)
6893          (or
6894            (and
6895              (= truck_loc_53 1)
6896              (= truck_travel_time_53 29)
6897            )
6898            (and
6899              (= truck_loc_53 2)
6900              (= truck_travel_time_53 21)
6901            )
6902          )
6903        )
6904      )
6905      (=> (= truck_loc_52 1)
6906        (and
6907          (<= a_stocka_53 120)
6908          (= (+ truck_stock_53 a_stocka_53) (+ truck_stock_52 a_stockb_53))
6909          (= b_stocka_53 b_stockb_53)
6910          (= c_stocka_53 c_stockb_53)
6911          (or
6912            (and
6913              (= truck_loc_53 0)
6914              (= truck_travel_time_53 29)
6915            )
6916            (and
6917              (= truck_loc_53 2)
6918              (= truck_travel_time_53 17)
6919            )
6920            (and
6921              (= truck_loc_53 3)
6922              (= truck_travel_time_53 32)
```

```
6923            )
6924          )
6925        )
6926    )
6927    (=> (= truck_loc_52 2)
6928      (and
6929        (<= b_stocka_53 120)
6930        (= (+ truck_stock_53 b_stocka_53) (+ truck_stock_52 b_stockb_53))
6931        (= a_stocka_53 a_stockb_53)
6932        (= c_stocka_53 c_stockb_53)
6933        (or
6934          (and
6935            (= truck_loc_53 1)
6936            (= truck_travel_time_53 17)
6937          )
6938          (and
6939            (= truck_loc_53 0)
6940            (= truck_travel_time_53 21)
6941          )
6942          (and
6943            (= truck_loc_53 3)
6944            (= truck_travel_time_53 37)
6945          )
6946        )
6947      )
6948    )
6949    (=> (= truck_loc_52 3)
6950      (and
6951        (<= c_stocka_53 200)
6952        (= (+ truck_stock_53 c_stocka_53) (+ truck_stock_52 c_stockb_53))
6953        (= a_stocka_53 a_stockb_53)
6954        (= b_stocka_53 b_stockb_53)
6955        (or
6956          (and
6957            (= truck_loc_53 1)
6958            (= truck_travel_time_53 32)
6959          )
6960          (and
6961            (= truck_loc_53 2)
6962            (= truck_travel_time_53 37)
6963          )
6964        )
6965      )
6966    )
6967 )
6968 (<= truck_stock_53 300)
6969 (>= truck_stock_53 0)
6970 (= a_stockb_54 (- a_stocka_53 truck_travel_time_53))
6971 (= b_stockb_54 (- b_stocka_53 truck_travel_time_53))
6972 (= c_stockb_54 (- c_stocka_53 truck_travel_time_53))
6973 (and
6974    (=> (= truck_loc_53 0)
6975      (and
6976        (= a_stocka_54 a_stockb_54)
6977        (= b_stocka_54 b_stockb_54)
6978        (= c_stocka_54 c_stockb_54)
6979        (or
6980          (and
6981            (= truck_loc_54 1)
6982            (= truck_travel_time_54 29)
6983          )
6984          (and
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```
6985            (= truck_loc_54 2)
6986            (= truck_travel_time_54 21)
6987          )
6988        )
6989      )
6990    )
6991    (=> (= truck_loc_53 1)
6992      (and
6993        (<= a_stocka_54 120)
6994        (= (+ truck_stock_54 a_stocka_54) (+ truck_stock_53 a_stockb_54))
6995        (= b_stocka_54 b_stockb_54)
6996        (= c_stocka_54 c_stockb_54)
6997        (or
6998          (and
6999            (= truck_loc_54 0)
7000            (= truck_travel_time_54 29)
7001          )
7002          (and
7003            (= truck_loc_54 2)
7004            (= truck_travel_time_54 17)
7005          )
7006          (and
7007            (= truck_loc_54 3)
7008            (= truck_travel_time_54 32)
7009          )
7010        )
7011      )
7012    )
7013    (=> (= truck_loc_53 2)
7014      (and
7015        (<= b_stocka_54 120)
7016        (= (+ truck_stock_54 b_stocka_54) (+ truck_stock_53 b_stockb_54))
7017        (= a_stocka_54 a_stockb_54)
7018        (= c_stocka_54 c_stockb_54)
7019        (or
7020          (and
7021            (= truck_loc_54 1)
7022            (= truck_travel_time_54 17)
7023          )
7024          (and
7025            (= truck_loc_54 0)
7026            (= truck_travel_time_54 21)
7027          )
7028          (and
7029            (= truck_loc_54 3)
7030            (= truck_travel_time_54 37)
7031          )
7032        )
7033      )
7034    )
7035    (=> (= truck_loc_53 3)
7036      (and
7037        (<= c_stocka_54 200)
7038        (= (+ truck_stock_54 c_stocka_54) (+ truck_stock_53 c_stockb_54))
7039        (= a_stocka_54 a_stockb_54)
7040        (= b_stocka_54 b_stockb_54)
7041        (or
7042          (and
7043            (= truck_loc_54 1)
7044            (= truck_travel_time_54 32)
7045          )
7046          (and
```

```
7047              (= truck_loc_54 2)
7048              (= truck_travel_time_54 37)
7049            )
7050          )
7051        )
7052      )
7053    )
7054    (<= truck_stock_54 300)
7055    (>= truck_stock_54 0)
7056    (= a_stockb_55 (- a_stocka_54 truck_travel_time_54))
7057    (= b_stockb_55 (- b_stocka_54 truck_travel_time_54))
7058    (= c_stockb_55 (- c_stocka_54 truck_travel_time_54))
7059    (and
7060      (=> (= truck_loc_54 0)
7061        (and
7062          (= a_stocka_55 a_stockb_55)
7063          (= b_stocka_55 b_stockb_55)
7064          (= c_stocka_55 c_stockb_55)
7065          (or
7066            (and
7067              (= truck_loc_55 1)
7068              (= truck_travel_time_55 29)
7069            )
7070            (and
7071              (= truck_loc_55 2)
7072              (= truck_travel_time_55 21)
7073            )
7074          )
7075        )
7076      )
7077      (=> (= truck_loc_54 1)
7078        (and
7079          (<= a_stocka_55 120)
7080          (= (+ truck_stock_55 a_stocka_55) (+ truck_stock_54 a_stockb_55))
7081          (= b_stocka_55 b_stockb_55)
7082          (= c_stocka_55 c_stockb_55)
7083          (or
7084            (and
7085              (= truck_loc_55 0)
7086              (= truck_travel_time_55 29)
7087            )
7088            (and
7089              (= truck_loc_55 2)
7090              (= truck_travel_time_55 17)
7091            )
7092            (and
7093              (= truck_loc_55 3)
7094              (= truck_travel_time_55 32)
7095            )
7096          )
7097        )
7098      )
7099      (=> (= truck_loc_54 2)
7100        (and
7101          (<= b_stocka_55 120)
7102          (= (+ truck_stock_55 b_stocka_55) (+ truck_stock_54 b_stockb_55))
7103          (= a_stocka_55 a_stockb_55)
7104          (= c_stocka_55 c_stockb_55)
7105          (or
7106            (and
7107              (= truck_loc_55 1)
7108              (= truck_travel_time_55 17)
```

```
7109            )
7110          (and
7111            (= truck_loc_55 0)
7112            (= truck_travel_time_55 21)
7113          )
7114          (and
7115            (= truck_loc_55 3)
7116            (= truck_travel_time_55 37)
7117          )
7118        )
7119      )
7120    )
7121    (=> (= truck_loc_54 3)
7122      (and
7123        (<= c_stocka_55 200)
7124        (= (+ truck_stock_55 c_stocka_55) (+ truck_stock_54 c_stockb_55))
7125        (= a_stocka_55 a_stockb_55)
7126        (= b_stocka_55 b_stockb_55)
7127        (or
7128          (and
7129            (= truck_loc_55 1)
7130            (= truck_travel_time_55 32)
7131          )
7132          (and
7133            (= truck_loc_55 2)
7134            (= truck_travel_time_55 37)
7135          )
7136        )
7137      )
7138    )
7139  )
7140  (<= truck_stock_55 300)
7141  (>= truck_stock_55 0)
7142  (= a_stockb_56 (- a_stocka_55 truck_travel_time_55))
7143  (= b_stockb_56 (- b_stocka_55 truck_travel_time_55))
7144  (= c_stockb_56 (- c_stocka_55 truck_travel_time_55))
7145  (and
7146    (=> (= truck_loc_55 0)
7147      (and
7148        (= a_stocka_56 a_stockb_56)
7149        (= b_stocka_56 b_stockb_56)
7150        (= c_stocka_56 c_stockb_56)
7151        (or
7152          (and
7153            (= truck_loc_56 1)
7154            (= truck_travel_time_56 29)
7155          )
7156          (and
7157            (= truck_loc_56 2)
7158            (= truck_travel_time_56 21)
7159          )
7160        )
7161      )
7162    )
7163    (=> (= truck_loc_55 1)
7164      (and
7165        (<= a_stocka_56 120)
7166        (= (+ truck_stock_56 a_stocka_56) (+ truck_stock_55 a_stockb_56))
7167        (= b_stocka_56 b_stockb_56)
7168        (= c_stocka_56 c_stockb_56)
7169        (or
7170          (and
```

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```
7171            (= truck_loc_56 0)
7172            (= truck_travel_time_56 29)
7173          )
7174        (and
7175            (= truck_loc_56 2)
7176            (= truck_travel_time_56 17)
7177          )
7178        (and
7179            (= truck_loc_56 3)
7180            (= truck_travel_time_56 32)
7181          )
7182        )
7183      )
7184    )
7185    (=> (= truck_loc_55 2)
7186      (and
7187        (<= b_stocka_56 120)
7188        (= (+ truck_stock_56 b_stocka_56) (+ truck_stock_55 b_stockb_56))
7189        (= a_stocka_56 a_stockb_56)
7190        (= c_stocka_56 c_stockb_56)
7191        (or
7192          (and
7193            (= truck_loc_56 1)
7194            (= truck_travel_time_56 17)
7195          )
7196          (and
7197            (= truck_loc_56 0)
7198            (= truck_travel_time_56 21)
7199          )
7200          (and
7201            (= truck_loc_56 3)
7202            (= truck_travel_time_56 37)
7203          )
7204        )
7205      )
7206    )
7207    (=> (= truck_loc_55 3)
7208      (and
7209        (<= c_stocka_56 200)
7210        (= (+ truck_stock_56 c_stocka_56) (+ truck_stock_55 c_stockb_56))
7211        (= a_stocka_56 a_stockb_56)
7212        (= b_stocka_56 b_stockb_56)
7213        (or
7214          (and
7215            (= truck_loc_56 1)
7216            (= truck_travel_time_56 32)
7217          )
7218          (and
7219            (= truck_loc_56 2)
7220            (= truck_travel_time_56 37)
7221          )
7222        )
7223      )
7224    )
7225  )
7226  (<= truck_stock_56 300)
7227  (>= truck_stock_56 0)
7228  (= a_stockb_57 (- a_stocka_56 truck_travel_time_56))
7229  (= b_stockb_57 (- b_stocka_56 truck_travel_time_56))
7230  (= c_stockb_57 (- c_stocka_56 truck_travel_time_56))
7231  (and
7232    (=> (= truck_loc_56 0)
```

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```
7233        (and
7234          (= a_stocka_57 a_stockb_57)
7235          (= b_stocka_57 b_stockb_57)
7236          (= c_stocka_57 c_stockb_57)
7237          (or
7238            (and
7239              (= truck_loc_57 1)
7240              (= truck_travel_time_57 29)
7241            )
7242            (and
7243              (= truck_loc_57 2)
7244              (= truck_travel_time_57 21)
7245            )
7246          )
7247        )
7248      )
7249      (=> (= truck_loc_56 1)
7250        (and
7251          (<= a_stocka_57 120)
7252          (= (+ truck_stock_57 a_stocka_57) (+ truck_stock_56 a_stockb_57))
7253          (= b_stocka_57 b_stockb_57)
7254          (= c_stocka_57 c_stockb_57)
7255          (or
7256            (and
7257              (= truck_loc_57 0)
7258              (= truck_travel_time_57 29)
7259            )
7260            (and
7261              (= truck_loc_57 2)
7262              (= truck_travel_time_57 17)
7263            )
7264            (and
7265              (= truck_loc_57 3)
7266              (= truck_travel_time_57 32)
7267            )
7268          )
7269        )
7270      )
7271      (=> (= truck_loc_56 2)
7272        (and
7273          (<= b_stocka_57 120)
7274          (= (+ truck_stock_57 b_stocka_57) (+ truck_stock_56 b_stockb_57))
7275          (= a_stocka_57 a_stockb_57)
7276          (= c_stocka_57 c_stockb_57)
7277          (or
7278            (and
7279              (= truck_loc_57 1)
7280              (= truck_travel_time_57 17)
7281            )
7282            (and
7283              (= truck_loc_57 0)
7284              (= truck_travel_time_57 21)
7285            )
7286            (and
7287              (= truck_loc_57 3)
7288              (= truck_travel_time_57 37)
7289            )
7290          )
7291        )
7292      )
7293      (=> (= truck_loc_56 3)
7294        (and
```

```
7295        (<= c_stocka_57 200)
7296        (= (+ truck_stock_57 c_stocka_57) (+ truck_stock_56 c_stockb_57))
7297        (= a_stocka_57 a_stockb_57)
7298        (= b_stocka_57 b_stockb_57)
7299        (or
7300          (and
7301            (= truck_loc_57 1)
7302            (= truck_travel_time_57 32)
7303          )
7304          (and
7305            (= truck_loc_57 2)
7306            (= truck_travel_time_57 37)
7307          )
7308        )
7309      )
7310    )
7311  )
7312  (<= truck_stock_57 300)
7313  (>= truck_stock_57 0)
7314  (= a_stockb_58 (- a_stocka_57 truck_travel_time_57))
7315  (= b_stockb_58 (- b_stocka_57 truck_travel_time_57))
7316  (= c_stockb_58 (- c_stocka_57 truck_travel_time_57))
7317  (and
7318    (=> (= truck_loc_57 0)
7319      (and
7320        (= a_stocka_58 a_stockb_58)
7321        (= b_stocka_58 b_stockb_58)
7322        (= c_stocka_58 c_stockb_58)
7323        (or
7324          (and
7325            (= truck_loc_58 1)
7326            (= truck_travel_time_58 29)
7327          )
7328          (and
7329            (= truck_loc_58 2)
7330            (= truck_travel_time_58 21)
7331          )
7332        )
7333      )
7334    )
7335    (=> (= truck_loc_57 1)
7336      (and
7337        (<= a_stocka_58 120)
7338        (= (+ truck_stock_58 a_stocka_58) (+ truck_stock_57 a_stockb_58))
7339        (= b_stocka_58 b_stockb_58)
7340        (= c_stocka_58 c_stockb_58)
7341        (or
7342          (and
7343            (= truck_loc_58 0)
7344            (= truck_travel_time_58 29)
7345          )
7346          (and
7347            (= truck_loc_58 2)
7348            (= truck_travel_time_58 17)
7349          )
7350          (and
7351            (= truck_loc_58 3)
7352            (= truck_travel_time_58 32)
7353          )
7354        )
7355      )
7356    )
```

```
7357    (=> (= truck_loc_57 2)
7358      (and
7359        (<= b_stocka_58 120)
7360        (= (+ truck_stock_58 b_stocka_58) (+ truck_stock_57 b_stockb_58))
7361        (= a_stocka_58 a_stockb_58)
7362        (= c_stocka_58 c_stockb_58)
7363        (or
7364          (and
7365            (= truck_loc_58 1)
7366            (= truck_travel_time_58 17)
7367          )
7368          (and
7369            (= truck_loc_58 0)
7370            (= truck_travel_time_58 21)
7371          )
7372          (and
7373            (= truck_loc_58 3)
7374            (= truck_travel_time_58 37)
7375          )
7376        )
7377      )
7378    )
7379    (=> (= truck_loc_57 3)
7380      (and
7381        (<= c_stocka_58 200)
7382        (= (+ truck_stock_58 c_stocka_58) (+ truck_stock_57 c_stockb_58))
7383        (= a_stocka_58 a_stockb_58)
7384        (= b_stocka_58 b_stockb_58)
7385        (or
7386          (and
7387            (= truck_loc_58 1)
7388            (= truck_travel_time_58 32)
7389          )
7390          (and
7391            (= truck_loc_58 2)
7392            (= truck_travel_time_58 37)
7393          )
7394        )
7395      )
7396    )
7397  )
7398  (<= truck_stock_58 300)
7399  (>= truck_stock_58 0)
7400  (= a_stockb_59 (- a_stocka_58 truck_travel_time_58))
7401  (= b_stockb_59 (- b_stocka_58 truck_travel_time_58))
7402  (= c_stockb_59 (- c_stocka_58 truck_travel_time_58))
7403  (and
7404    (=> (= truck_loc_58 0)
7405      (and
7406        (= a_stocka_59 a_stockb_59)
7407        (= b_stocka_59 b_stockb_59)
7408        (= c_stocka_59 c_stockb_59)
7409        (or
7410          (and
7411            (= truck_loc_59 1)
7412            (= truck_travel_time_59 29)
7413          )
7414          (and
7415            (= truck_loc_59 2)
7416            (= truck_travel_time_59 21)
7417          )
7418        )
```

```
7419          )
7420        )
7421        (=> (= truck_loc_58 1)
7422          (and
7423            (<= a_stocka_59 120)
7424            (= (+ truck_stock_59 a_stocka_59) (+ truck_stock_58 a_stockb_59))
7425            (= b_stocka_59 b_stockb_59)
7426            (= c_stocka_59 c_stockb_59)
7427            (or
7428              (and
7429                (= truck_loc_59 0)
7430                (= truck_travel_time_59 29)
7431              )
7432              (and
7433                (= truck_loc_59 2)
7434                (= truck_travel_time_59 17)
7435              )
7436              (and
7437                (= truck_loc_59 3)
7438                (= truck_travel_time_59 32)
7439              )
7440            )
7441          )
7442        )
7443        (=> (= truck_loc_58 2)
7444          (and
7445            (<= b_stocka_59 120)
7446            (= (+ truck_stock_59 b_stocka_59) (+ truck_stock_58 b_stockb_59))
7447            (= a_stocka_59 a_stockb_59)
7448            (= c_stocka_59 c_stockb_59)
7449            (or
7450              (and
7451                (= truck_loc_59 1)
7452                (= truck_travel_time_59 17)
7453              )
7454              (and
7455                (= truck_loc_59 0)
7456                (= truck_travel_time_59 21)
7457              )
7458              (and
7459                (= truck_loc_59 3)
7460                (= truck_travel_time_59 37)
7461              )
7462            )
7463          )
7464        )
7465        (=> (= truck_loc_58 3)
7466          (and
7467            (<= c_stocka_59 200)
7468            (= (+ truck_stock_59 c_stocka_59) (+ truck_stock_58 c_stockb_59))
7469            (= a_stocka_59 a_stockb_59)
7470            (= b_stocka_59 b_stockb_59)
7471            (or
7472              (and
7473                (= truck_loc_59 1)
7474                (= truck_travel_time_59 32)
7475              )
7476              (and
7477                (= truck_loc_59 2)
7478                (= truck_travel_time_59 37)
7479              )
7480            )
```

```
7481        )
7482      )
7483    )
7484    (<= truck_stock_59 300)
7485    (>= truck_stock_59 0)
7486    (= a_stockb_60 (- a_stocka_59 truck_travel_time_59))
7487    (= b_stockb_60 (- b_stocka_59 truck_travel_time_59))
7488    (= c_stockb_60 (- c_stocka_59 truck_travel_time_59))
7489    (and
7490      (=> (= truck_loc_59 0)
7491        (and
7492          (= a_stocka_60 a_stockb_60)
7493          (= b_stocka_60 b_stockb_60)
7494          (= c_stocka_60 c_stockb_60)
7495          (or
7496            (and
7497              (= truck_loc_60 1)
7498              (= truck_travel_time_60 29)
7499            )
7500            (and
7501              (= truck_loc_60 2)
7502              (= truck_travel_time_60 21)
7503            )
7504          )
7505        )
7506      )
7507      (=> (= truck_loc_59 1)
7508        (and
7509          (<= a_stocka_60 120)
7510          (= (+ truck_stock_60 a_stocka_60) (+ truck_stock_59 a_stockb_60))
7511          (= b_stocka_60 b_stockb_60)
7512          (= c_stocka_60 c_stockb_60)
7513          (or
7514            (and
7515              (= truck_loc_60 0)
7516              (= truck_travel_time_60 29)
7517            )
7518            (and
7519              (= truck_loc_60 2)
7520              (= truck_travel_time_60 17)
7521            )
7522            (and
7523              (= truck_loc_60 3)
7524              (= truck_travel_time_60 32)
7525            )
7526          )
7527        )
7528      )
7529      (=> (= truck_loc_59 2)
7530        (and
7531          (<= b_stocka_60 120)
7532          (= (+ truck_stock_60 b_stocka_60) (+ truck_stock_59 b_stockb_60))
7533          (= a_stocka_60 a_stockb_60)
7534          (= c_stocka_60 c_stockb_60)
7535          (or
7536            (and
7537              (= truck_loc_60 1)
7538              (= truck_travel_time_60 17)
7539            )
7540            (and
7541              (= truck_loc_60 0)
7542              (= truck_travel_time_60 21)
```

```
7543              )
7544           (and
7545              (= truck_loc_60 3)
7546              (= truck_travel_time_60 37)
7547           )
7548         )
7549       )
7550    )
7551    (=> (= truck_loc_59 3)
7552       (and
7553         (<= c_stocka_60 200)
7554         (= (+ truck_stock_60 c_stocka_60) (+ truck_stock_59 c_stockb_60))
7555         (= a_stocka_60 a_stockb_60)
7556         (= b_stocka_60 b_stockb_60)
7557         (or
7558           (and
7559              (= truck_loc_60 1)
7560              (= truck_travel_time_60 32)
7561           )
7562           (and
7563              (= truck_loc_60 2)
7564              (= truck_travel_time_60 37)
7565           )
7566         )
7567       )
7568    )
7569 )
7570 (<= truck_stock_60 300)
7571 (>= truck_stock_60 0)
7572 (= a_stockb_61 (- a_stocka_60 truck_travel_time_60))
7573 (= b_stockb_61 (- b_stocka_60 truck_travel_time_60))
7574 (= c_stockb_61 (- c_stocka_60 truck_travel_time_60))
7575 (and
7576    (=> (= truck_loc_60 0)
7577       (and
7578         (= a_stocka_61 a_stockb_61)
7579         (= b_stocka_61 b_stockb_61)
7580         (= c_stocka_61 c_stockb_61)
7581         (or
7582           (and
7583              (= truck_loc_61 1)
7584              (= truck_travel_time_61 29)
7585           )
7586           (and
7587              (= truck_loc_61 2)
7588              (= truck_travel_time_61 21)
7589           )
7590         )
7591       )
7592    )
7593    (=> (= truck_loc_60 1)
7594       (and
7595         (<= a_stocka_61 120)
7596         (= (+ truck_stock_61 a_stocka_61) (+ truck_stock_60 a_stockb_61))
7597         (= b_stocka_61 b_stockb_61)
7598         (= c_stocka_61 c_stockb_61)
7599         (or
7600           (and
7601              (= truck_loc_61 0)
7602              (= truck_travel_time_61 29)
7603           )
7604           (and
```

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```
7605          (= truck_loc_61 2)
7606          (= truck_travel_time_61 17)
7607        )
7608      (and
7609        (= truck_loc_61 3)
7610        (= truck_travel_time_61 32)
7611      )
7612    )
7613  )
7614  )
7615  (=> (= truck_loc_60 2)
7616    (and
7617      (<= b_stocka_61 120)
7618      (= (+ truck_stock_61 b_stocka_61) (+ truck_stock_60 b_stockb_61))
7619      (= a_stocka_61 a_stockb_61)
7620      (= c_stocka_61 c_stockb_61)
7621      (or
7622        (and
7623          (= truck_loc_61 1)
7624          (= truck_travel_time_61 17)
7625        )
7626        (and
7627          (= truck_loc_61 0)
7628          (= truck_travel_time_61 21)
7629        )
7630        (and
7631          (= truck_loc_61 3)
7632          (= truck_travel_time_61 37)
7633        )
7634      )
7635    )
7636  )
7637  (=> (= truck_loc_60 3)
7638    (and
7639      (<= c_stocka_61 200)
7640      (= (+ truck_stock_61 c_stocka_61) (+ truck_stock_60 c_stockb_61))
7641      (= a_stocka_61 a_stockb_61)
7642      (= b_stocka_61 b_stockb_61)
7643      (or
7644        (and
7645          (= truck_loc_61 1)
7646          (= truck_travel_time_61 32)
7647        )
7648        (and
7649          (= truck_loc_61 2)
7650          (= truck_travel_time_61 37)
7651        )
7652      )
7653    )
7654  )
7655  )
7656  (<= truck_stock_61 300)
7657  (>= truck_stock_61 0)
7658  (= a_stockb_62 (- a_stocka_61 truck_travel_time_61))
7659  (= b_stockb_62 (- b_stocka_61 truck_travel_time_61))
7660  (= c_stockb_62 (- c_stocka_61 truck_travel_time_61))
7661  (and
7662    (=> (= truck_loc_61 0)
7663      (and
7664        (= a_stocka_62 a_stockb_62)
7665        (= b_stocka_62 b_stockb_62)
7666        (= c_stocka_62 c_stockb_62)
```

```
7667        (or
7668          (and
7669            (= truck_loc_62 1)
7670            (= truck_travel_time_62 29)
7671          )
7672          (and
7673            (= truck_loc_62 2)
7674            (= truck_travel_time_62 21)
7675          )
7676        )
7677      )
7678    )
7679    (=> (= truck_loc_61 1)
7680      (and
7681        (<= a_stocka_62 120)
7682        (= (+ truck_stock_62 a_stocka_62) (+ truck_stock_61 a_stockb_62))
7683        (= b_stocka_62 b_stockb_62)
7684        (= c_stocka_62 c_stockb_62)
7685        (or
7686          (and
7687            (= truck_loc_62 0)
7688            (= truck_travel_time_62 29)
7689          )
7690          (and
7691            (= truck_loc_62 2)
7692            (= truck_travel_time_62 17)
7693          )
7694          (and
7695            (= truck_loc_62 3)
7696            (= truck_travel_time_62 32)
7697          )
7698        )
7699      )
7700    )
7701    (=> (= truck_loc_61 2)
7702      (and
7703        (<= b_stocka_62 120)
7704        (= (+ truck_stock_62 b_stocka_62) (+ truck_stock_61 b_stockb_62))
7705        (= a_stocka_62 a_stockb_62)
7706        (= c_stocka_62 c_stockb_62)
7707        (or
7708          (and
7709            (= truck_loc_62 1)
7710            (= truck_travel_time_62 17)
7711          )
7712          (and
7713            (= truck_loc_62 0)
7714            (= truck_travel_time_62 21)
7715          )
7716          (and
7717            (= truck_loc_62 3)
7718            (= truck_travel_time_62 37)
7719          )
7720        )
7721      )
7722    )
7723    (=> (= truck_loc_61 3)
7724      (and
7725        (<= c_stocka_62 200)
7726        (= (+ truck_stock_62 c_stocka_62) (+ truck_stock_61 c_stockb_62))
7727        (= a_stocka_62 a_stockb_62)
7728        (= b_stocka_62 b_stockb_62)
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```
7729        (or
7730          (and
7731            (= truck_loc_62 1)
7732            (= truck_travel_time_62 32)
7733          )
7734          (and
7735            (= truck_loc_62 2)
7736            (= truck_travel_time_62 37)
7737          )
7738        )
7739      )
7740    )
7741  )
7742  (<= truck_stock_62 300)
7743  (>= truck_stock_62 0)
7744  (= a_stockb_63 (- a_stocka_62 truck_travel_time_62))
7745  (= b_stockb_63 (- b_stocka_62 truck_travel_time_62))
7746  (= c_stockb_63 (- c_stocka_62 truck_travel_time_62))
7747  (and
7748    (=> (= truck_loc_62 0)
7749      (and
7750        (= a_stocka_63 a_stockb_63)
7751        (= b_stocka_63 b_stockb_63)
7752        (= c_stocka_63 c_stockb_63)
7753        (or
7754          (and
7755            (= truck_loc_63 1)
7756            (= truck_travel_time_63 29)
7757          )
7758          (and
7759            (= truck_loc_63 2)
7760            (= truck_travel_time_63 21)
7761          )
7762        )
7763      )
7764    )
7765    (=> (= truck_loc_62 1)
7766      (and
7767        (<= a_stocka_63 120)
7768        (= (+ truck_stock_63 a_stocka_63) (+ truck_stock_62 a_stockb_63))
7769        (= b_stocka_63 b_stockb_63)
7770        (= c_stocka_63 c_stockb_63)
7771        (or
7772          (and
7773            (= truck_loc_63 0)
7774            (= truck_travel_time_63 29)
7775          )
7776          (and
7777            (= truck_loc_63 2)
7778            (= truck_travel_time_63 17)
7779          )
7780          (and
7781            (= truck_loc_63 3)
7782            (= truck_travel_time_63 32)
7783          )
7784        )
7785      )
7786    )
7787    (=> (= truck_loc_62 2)
7788      (and
7789        (<= b_stocka_63 120)
7790        (= (+ truck_stock_63 b_stocka_63) (+ truck_stock_62 b_stockb_63))
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```
7791        (= a_stocka_63 a_stockb_63)
7792        (= c_stocka_63 c_stockb_63)
7793        (or
7794          (and
7795            (= truck_loc_63 1)
7796            (= truck_travel_time_63 17)
7797          )
7798          (and
7799            (= truck_loc_63 0)
7800            (= truck_travel_time_63 21)
7801          )
7802          (and
7803            (= truck_loc_63 3)
7804            (= truck_travel_time_63 37)
7805          )
7806        )
7807      )
7808    )
7809    (=> (= truck_loc_62 3)
7810      (and
7811        (<= c_stocka_63 200)
7812        (= (+ truck_stock_63 c_stocka_63) (+ truck_stock_62 c_stockb_63))
7813        (= a_stocka_63 a_stockb_63)
7814        (= b_stocka_63 b_stockb_63)
7815        (or
7816          (and
7817            (= truck_loc_63 1)
7818            (= truck_travel_time_63 32)
7819          )
7820          (and
7821            (= truck_loc_63 2)
7822            (= truck_travel_time_63 37)
7823          )
7824        )
7825      )
7826    )
7827  )
7828  (<= truck_stock_63 300)
7829  (>= truck_stock_63 0)
7830  (= a_stockb_64 (- a_stocka_63 truck_travel_time_63))
7831  (= b_stockb_64 (- b_stocka_63 truck_travel_time_63))
7832  (= c_stockb_64 (- c_stocka_63 truck_travel_time_63))
7833  (and
7834    (=> (= truck_loc_63 0)
7835      (and
7836        (= a_stocka_64 a_stockb_64)
7837        (= b_stocka_64 b_stockb_64)
7838        (= c_stocka_64 c_stockb_64)
7839        (or
7840          (and
7841            (= truck_loc_64 1)
7842            (= truck_travel_time_64 29)
7843          )
7844          (and
7845            (= truck_loc_64 2)
7846            (= truck_travel_time_64 21)
7847          )
7848        )
7849      )
7850    )
7851    (=> (= truck_loc_63 1)
7852      (and
```

```
7853        (<= a_stocka_64 120)
7854        (= (+ truck_stock_64 a_stocka_64) (+ truck_stock_63 a_stockb_64))
7855        (= b_stocka_64 b_stockb_64)
7856        (= c_stocka_64 c_stockb_64)
7857        (or
7858          (and
7859            (= truck_loc_64 0)
7860            (= truck_travel_time_64 29)
7861          )
7862          (and
7863            (= truck_loc_64 2)
7864            (= truck_travel_time_64 17)
7865          )
7866          (and
7867            (= truck_loc_64 3)
7868            (= truck_travel_time_64 32)
7869          )
7870        )
7871      )
7872    )
7873    (=> (= truck_loc_63 2)
7874      (and
7875        (<= b_stocka_64 120)
7876        (= (+ truck_stock_64 b_stocka_64) (+ truck_stock_63 b_stockb_64))
7877        (= a_stocka_64 a_stockb_64)
7878        (= c_stocka_64 c_stockb_64)
7879        (or
7880          (and
7881            (= truck_loc_64 1)
7882            (= truck_travel_time_64 17)
7883          )
7884          (and
7885            (= truck_loc_64 0)
7886            (= truck_travel_time_64 21)
7887          )
7888          (and
7889            (= truck_loc_64 3)
7890            (= truck_travel_time_64 37)
7891          )
7892        )
7893      )
7894    )
7895    (=> (= truck_loc_63 3)
7896      (and
7897        (<= c_stocka_64 200)
7898        (= (+ truck_stock_64 c_stocka_64) (+ truck_stock_63 c_stockb_64))
7899        (= a_stocka_64 a_stockb_64)
7900        (= b_stocka_64 b_stockb_64)
7901        (or
7902          (and
7903            (= truck_loc_64 1)
7904            (= truck_travel_time_64 32)
7905          )
7906          (and
7907            (= truck_loc_64 2)
7908            (= truck_travel_time_64 37)
7909          )
7910        )
7911      )
7912    )
7913  )
7914  (<= truck_stock_64 300)
```

```
7915  (>= truck_stock_64 0)
7916  (= a_stockb_65 (- a_stocka_64 truck_travel_time_64))
7917  (= b_stockb_65 (- b_stocka_64 truck_travel_time_64))
7918  (= c_stockb_65 (- c_stocka_64 truck_travel_time_64))
7919  (and
7920    (=> (= truck_loc_64 0)
7921      (and
7922        (= a_stocka_65 a_stockb_65)
7923        (= b_stocka_65 b_stockb_65)
7924        (= c_stocka_65 c_stockb_65)
7925        (or
7926          (and
7927            (= truck_loc_65 1)
7928            (= truck_travel_time_65 29)
7929          )
7930          (and
7931            (= truck_loc_65 2)
7932            (= truck_travel_time_65 21)
7933          )
7934        )
7935      )
7936    )
7937    (=> (= truck_loc_64 1)
7938      (and
7939        (<= a_stocka_65 120)
7940        (= (+ truck_stock_65 a_stocka_65) (+ truck_stock_64 a_stockb_65))
7941        (= b_stocka_65 b_stockb_65)
7942        (= c_stocka_65 c_stockb_65)
7943        (or
7944          (and
7945            (= truck_loc_65 0)
7946            (= truck_travel_time_65 29)
7947          )
7948          (and
7949            (= truck_loc_65 2)
7950            (= truck_travel_time_65 17)
7951          )
7952          (and
7953            (= truck_loc_65 3)
7954            (= truck_travel_time_65 32)
7955          )
7956        )
7957      )
7958    )
7959    (=> (= truck_loc_64 2)
7960      (and
7961        (<= b_stocka_65 120)
7962        (= (+ truck_stock_65 b_stocka_65) (+ truck_stock_64 b_stockb_65))
7963        (= a_stocka_65 a_stockb_65)
7964        (= c_stocka_65 c_stockb_65)
7965        (or
7966          (and
7967            (= truck_loc_65 1)
7968            (= truck_travel_time_65 17)
7969          )
7970          (and
7971            (= truck_loc_65 0)
7972            (= truck_travel_time_65 21)
7973          )
7974          (and
7975            (= truck_loc_65 3)
7976            (= truck_travel_time_65 37)
```

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7977            )
7978          )
7979        )
7980      )
7981      (=> (= truck_loc_64 3)
7982        (and
7983          (<= c_stocka_65 200)
7984          (= (+ truck_stock_65 c_stocka_65) (+ truck_stock_64 c_stockb_65))
7985          (= a_stocka_65 a_stockb_65)
7986          (= b_stocka_65 b_stockb_65)
7987          (or
7988            (and
7989              (= truck_loc_65 1)
7990              (= truck_travel_time_65 32)
7991            )
7992            (and
7993              (= truck_loc_65 2)
7994              (= truck_travel_time_65 37)
7995            )
7996          )
7997        )
7998      )
7999    )
8000    (<= truck_stock_65 300)
8001    (>= truck_stock_65 0)
8002    (= a_stockb_66 (- a_stocka_65 truck_travel_time_65))
8003    (= b_stockb_66 (- b_stocka_65 truck_travel_time_65))
8004    (= c_stockb_66 (- c_stocka_65 truck_travel_time_65))
8005    (and
8006      (=> (= truck_loc_65 0)
8007        (and
8008          (= a_stocka_66 a_stockb_66)
8009          (= b_stocka_66 b_stockb_66)
8010          (= c_stocka_66 c_stockb_66)
8011          (or
8012            (and
8013              (= truck_loc_66 1)
8014              (= truck_travel_time_66 29)
8015            )
8016            (and
8017              (= truck_loc_66 2)
8018              (= truck_travel_time_66 21)
8019            )
8020          )
8021        )
8022      )
8023      (=> (= truck_loc_65 1)
8024        (and
8025          (<= a_stocka_66 120)
8026          (= (+ truck_stock_66 a_stocka_66) (+ truck_stock_65 a_stockb_66))
8027          (= b_stocka_66 b_stockb_66)
8028          (= c_stocka_66 c_stockb_66)
8029          (or
8030            (and
8031              (= truck_loc_66 0)
8032              (= truck_travel_time_66 29)
8033            )
8034            (and
8035              (= truck_loc_66 2)
8036              (= truck_travel_time_66 17)
8037            )
8038            (and
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8039              (= truck_loc_66 3)
8040              (= truck_travel_time_66 32)
8041            )
8042          )
8043        )
8044      )
8045      (=> (= truck_loc_65 2)
8046        (and
8047          (<= b_stocka_66 120)
8048          (= (+ truck_stock_66 b_stocka_66) (+ truck_stock_65 b_stockb_66))
8049          (= a_stocka_66 a_stockb_66)
8050          (= c_stocka_66 c_stockb_66)
8051          (or
8052            (and
8053              (= truck_loc_66 1)
8054              (= truck_travel_time_66 17)
8055            )
8056            (and
8057              (= truck_loc_66 0)
8058              (= truck_travel_time_66 21)
8059            )
8060            (and
8061              (= truck_loc_66 3)
8062              (= truck_travel_time_66 37)
8063            )
8064          )
8065        )
8066      )
8067      (=> (= truck_loc_65 3)
8068        (and
8069          (<= c_stocka_66 200)
8070          (= (+ truck_stock_66 c_stocka_66) (+ truck_stock_65 c_stockb_66))
8071          (= a_stocka_66 a_stockb_66)
8072          (= b_stocka_66 b_stockb_66)
8073          (or
8074            (and
8075              (= truck_loc_66 1)
8076              (= truck_travel_time_66 32)
8077            )
8078            (and
8079              (= truck_loc_66 2)
8080              (= truck_travel_time_66 37)
8081            )
8082          )
8083        )
8084      )
8085    )
8086    (<= truck_stock_66 300)
8087    (>= truck_stock_66 0)
8088    (= a_stockb_67 (- a_stocka_66 truck_travel_time_66))
8089    (= b_stockb_67 (- b_stocka_66 truck_travel_time_66))
8090    (= c_stockb_67 (- c_stocka_66 truck_travel_time_66))
8091    (and
8092      (=> (= truck_loc_66 0)
8093        (and
8094          (= a_stocka_67 a_stockb_67)
8095          (= b_stocka_67 b_stockb_67)
8096          (= c_stocka_67 c_stockb_67)
8097          (or
8098            (and
8099              (= truck_loc_67 1)
8100              (= truck_travel_time_67 29)
```

```
8101             )
8102           (and
8103             (= truck_loc_67 2)
8104             (= truck_travel_time_67 21)
8105           )
8106         )
8107       )
8108   )
8109   (=> (= truck_loc_66 1)
8110     (and
8111       (<= a_stocka_67 120)
8112       (= (+ truck_stock_67 a_stocka_67) (+ truck_stock_66 a_stockb_67))
8113       (= b_stocka_67 b_stockb_67)
8114       (= c_stocka_67 c_stockb_67)
8115       (or
8116         (and
8117           (= truck_loc_67 0)
8118           (= truck_travel_time_67 29)
8119         )
8120         (and
8121           (= truck_loc_67 2)
8122           (= truck_travel_time_67 17)
8123         )
8124         (and
8125           (= truck_loc_67 3)
8126           (= truck_travel_time_67 32)
8127         )
8128       )
8129     )
8130   )
8131   (=> (= truck_loc_66 2)
8132     (and
8133       (<= b_stocka_67 120)
8134       (= (+ truck_stock_67 b_stocka_67) (+ truck_stock_66 b_stockb_67))
8135       (= a_stocka_67 a_stockb_67)
8136       (= c_stocka_67 c_stockb_67)
8137       (or
8138         (and
8139           (= truck_loc_67 1)
8140           (= truck_travel_time_67 17)
8141         )
8142         (and
8143           (= truck_loc_67 0)
8144           (= truck_travel_time_67 21)
8145         )
8146         (and
8147           (= truck_loc_67 3)
8148           (= truck_travel_time_67 37)
8149         )
8150       )
8151     )
8152   )
8153   (=> (= truck_loc_66 3)
8154     (and
8155       (<= c_stocka_67 200)
8156       (= (+ truck_stock_67 c_stocka_67) (+ truck_stock_66 c_stockb_67))
8157       (= a_stocka_67 a_stockb_67)
8158       (= b_stocka_67 b_stockb_67)
8159       (or
8160         (and
8161           (= truck_loc_67 1)
8162           (= truck_travel_time_67 32)
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8163                )
8164              (and
8165                (= truck_loc_67 2)
8166                (= truck_travel_time_67 37)
8167              )
8168            )
8169          )
8170        )
8171      )
8172      (<= truck_stock_67 300)
8173      (>= truck_stock_67 0)
8174      (= a_stockb_68 (- a_stocka_67 truck_travel_time_67))
8175      (= b_stockb_68 (- b_stocka_67 truck_travel_time_67))
8176      (= c_stockb_68 (- c_stocka_67 truck_travel_time_67))
8177      (and
8178        (=> (= truck_loc_67 0)
8179          (and
8180            (= a_stocka_68 a_stockb_68)
8181            (= b_stocka_68 b_stockb_68)
8182            (= c_stocka_68 c_stockb_68)
8183            (or
8184              (and
8185                (= truck_loc_68 1)
8186                (= truck_travel_time_68 29)
8187              )
8188              (and
8189                (= truck_loc_68 2)
8190                (= truck_travel_time_68 21)
8191              )
8192            )
8193          )
8194        )
8195        (=> (= truck_loc_67 1)
8196          (and
8197            (<= a_stocka_68 120)
8198            (= (+ truck_stock_68 a_stocka_68) (+ truck_stock_67 a_stockb_68))
8199            (= b_stocka_68 b_stockb_68)
8200            (= c_stocka_68 c_stockb_68)
8201            (or
8202              (and
8203                (= truck_loc_68 0)
8204                (= truck_travel_time_68 29)
8205              )
8206              (and
8207                (= truck_loc_68 2)
8208                (= truck_travel_time_68 17)
8209              )
8210              (and
8211                (= truck_loc_68 3)
8212                (= truck_travel_time_68 32)
8213              )
8214            )
8215          )
8216        )
8217        (=> (= truck_loc_67 2)
8218          (and
8219            (<= b_stocka_68 120)
8220            (= (+ truck_stock_68 b_stocka_68) (+ truck_stock_67 b_stockb_68))
8221            (= a_stocka_68 a_stockb_68)
8222            (= c_stocka_68 c_stockb_68)
8223            (or
8224              (and
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```
8225            (= truck_loc_68 1)
8226            (= truck_travel_time_68 17)
8227         )
8228       (and
8229         (= truck_loc_68 0)
8230         (= truck_travel_time_68 21)
8231       )
8232       (and
8233         (= truck_loc_68 3)
8234         (= truck_travel_time_68 37)
8235       )
8236     )
8237     )
8238   )
8239   (=> (= truck_loc_67 3)
8240     (and
8241       (<= c_stocka_68 200)
8242       (= (+ truck_stock_68 c_stocka_68) (+ truck_stock_67 c_stockb_68))
8243       (= a_stocka_68 a_stockb_68)
8244       (= b_stocka_68 b_stockb_68)
8245       (or
8246         (and
8247           (= truck_loc_68 1)
8248           (= truck_travel_time_68 32)
8249         )
8250         (and
8251           (= truck_loc_68 2)
8252           (= truck_travel_time_68 37)
8253         )
8254       )
8255     )
8256   )
8257 )
8258 (<= truck_stock_68 300)
8259 (>= truck_stock_68 0)
8260 (= a_stockb_69 (- a_stocka_68 truck_travel_time_68))
8261 (= b_stockb_69 (- b_stocka_68 truck_travel_time_68))
8262 (= c_stockb_69 (- c_stocka_68 truck_travel_time_68))
8263 (and
8264   (=> (= truck_loc_68 0)
8265     (and
8266       (= a_stocka_69 a_stockb_69)
8267       (= b_stocka_69 b_stockb_69)
8268       (= c_stocka_69 c_stockb_69)
8269       (or
8270         (and
8271           (= truck_loc_69 1)
8272           (= truck_travel_time_69 29)
8273         )
8274         (and
8275           (= truck_loc_69 2)
8276           (= truck_travel_time_69 21)
8277         )
8278       )
8279     )
8280   )
8281   (=> (= truck_loc_68 1)
8282     (and
8283       (<= a_stocka_69 120)
8284       (= (+ truck_stock_69 a_stocka_69) (+ truck_stock_68 a_stockb_69))
8285       (= b_stocka_69 b_stockb_69)
8286       (= c_stocka_69 c_stockb_69)
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```
8287        (or
8288          (and
8289            (= truck_loc_69 0)
8290            (= truck_travel_time_69 29)
8291          )
8292          (and
8293            (= truck_loc_69 2)
8294            (= truck_travel_time_69 17)
8295          )
8296          (and
8297            (= truck_loc_69 3)
8298            (= truck_travel_time_69 32)
8299          )
8300        )
8301      )
8302    )
8303    (=> (= truck_loc_68 2)
8304      (and
8305        (<= b_stocka_69 120)
8306        (= (+ truck_stock_69 b_stocka_69) (+ truck_stock_68 b_stockb_69))
8307        (= a_stocka_69 a_stockb_69)
8308        (= c_stocka_69 c_stockb_69)
8309        (or
8310          (and
8311            (= truck_loc_69 1)
8312            (= truck_travel_time_69 17)
8313          )
8314          (and
8315            (= truck_loc_69 0)
8316            (= truck_travel_time_69 21)
8317          )
8318          (and
8319            (= truck_loc_69 3)
8320            (= truck_travel_time_69 37)
8321          )
8322        )
8323      )
8324    )
8325    (=> (= truck_loc_68 3)
8326      (and
8327        (<= c_stocka_69 200)
8328        (= (+ truck_stock_69 c_stocka_69) (+ truck_stock_68 c_stockb_69))
8329        (= a_stocka_69 a_stockb_69)
8330        (= b_stocka_69 b_stockb_69)
8331        (or
8332          (and
8333            (= truck_loc_69 1)
8334            (= truck_travel_time_69 32)
8335          )
8336          (and
8337            (= truck_loc_69 2)
8338            (= truck_travel_time_69 37)
8339          )
8340        )
8341      )
8342    )
8343  )
8344  (<= truck_stock_69 300)
8345  (>= truck_stock_69 0)
8346  (= a_stockb_70 (- a_stocka_69 truck_travel_time_69))
8347  (= b_stockb_70 (- b_stocka_69 truck_travel_time_69))
8348  (= c_stockb_70 (- c_stocka_69 truck_travel_time_69))
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```
8349   (and
8350     (=> (= truck_loc_69 0)
8351       (and
8352         (= a_stocka_70 a_stockb_70)
8353         (= b_stocka_70 b_stockb_70)
8354         (= c_stocka_70 c_stockb_70)
8355         (or
8356           (and
8357             (= truck_loc_70 1)
8358             (= truck_travel_time_70 29)
8359           )
8360           (and
8361             (= truck_loc_70 2)
8362             (= truck_travel_time_70 21)
8363           )
8364         )
8365       )
8366     )
8367     (=> (= truck_loc_69 1)
8368       (and
8369         (<= a_stocka_70 120)
8370         (= (+ truck_stock_70 a_stocka_70) (+ truck_stock_69 a_stockb_70))
8371         (= b_stocka_70 b_stockb_70)
8372         (= c_stocka_70 c_stockb_70)
8373         (or
8374           (and
8375             (= truck_loc_70 0)
8376             (= truck_travel_time_70 29)
8377           )
8378           (and
8379             (= truck_loc_70 2)
8380             (= truck_travel_time_70 17)
8381           )
8382           (and
8383             (= truck_loc_70 3)
8384             (= truck_travel_time_70 32)
8385           )
8386         )
8387       )
8388     )
8389     (=> (= truck_loc_69 2)
8390       (and
8391         (<= b_stocka_70 120)
8392         (= (+ truck_stock_70 b_stocka_70) (+ truck_stock_69 b_stockb_70))
8393         (= a_stocka_70 a_stockb_70)
8394         (= c_stocka_70 c_stockb_70)
8395         (or
8396           (and
8397             (= truck_loc_70 1)
8398             (= truck_travel_time_70 17)
8399           )
8400           (and
8401             (= truck_loc_70 0)
8402             (= truck_travel_time_70 21)
8403           )
8404           (and
8405             (= truck_loc_70 3)
8406             (= truck_travel_time_70 37)
8407           )
8408         )
8409       )
8410     )
```

```
8411    (=> (= truck_loc_69 3)
8412      (and
8413        (<= c_stocka_70 200)
8414        (= (+ truck_stock_70 c_stocka_70) (+ truck_stock_69 c_stockb_70))
8415        (= a_stocka_70 a_stockb_70)
8416        (= b_stocka_70 b_stockb_70)
8417        (or
8418          (and
8419            (= truck_loc_70 1)
8420            (= truck_travel_time_70 32)
8421          )
8422          (and
8423            (= truck_loc_70 2)
8424            (= truck_travel_time_70 37)
8425          )
8426        )
8427      )
8428    )
8429  )
8430  (<= truck_stock_70 300)
8431  (>= truck_stock_70 0)
8432  (= a_stockb_71 (- a_stocka_70 truck_travel_time_70))
8433  (= b_stockb_71 (- b_stocka_70 truck_travel_time_70))
8434  (= c_stockb_71 (- c_stocka_70 truck_travel_time_70))
8435  (and
8436    (=> (= truck_loc_70 0)
8437      (and
8438        (= a_stocka_71 a_stockb_71)
8439        (= b_stocka_71 b_stockb_71)
8440        (= c_stocka_71 c_stockb_71)
8441        (or
8442          (and
8443            (= truck_loc_71 1)
8444            (= truck_travel_time_71 29)
8445          )
8446          (and
8447            (= truck_loc_71 2)
8448            (= truck_travel_time_71 21)
8449          )
8450        )
8451      )
8452    )
8453    (=> (= truck_loc_70 1)
8454      (and
8455        (<= a_stocka_71 120)
8456        (= (+ truck_stock_71 a_stocka_71) (+ truck_stock_70 a_stockb_71))
8457        (= b_stocka_71 b_stockb_71)
8458        (= c_stocka_71 c_stockb_71)
8459        (or
8460          (and
8461            (= truck_loc_71 0)
8462            (= truck_travel_time_71 29)
8463          )
8464          (and
8465            (= truck_loc_71 2)
8466            (= truck_travel_time_71 17)
8467          )
8468          (and
8469            (= truck_loc_71 3)
8470            (= truck_travel_time_71 32)
8471          )
8472        )
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8473          )
8474       )
8475    (=> (= truck_loc_70 2)
8476       (and
8477          (<= b_stocka_71 120)
8478          (= (+ truck_stock_71 b_stocka_71) (+ truck_stock_70 b_stockb_71))
8479          (= a_stocka_71 a_stockb_71)
8480          (= c_stocka_71 c_stockb_71)
8481          (or
8482             (and
8483                (= truck_loc_71 1)
8484                (= truck_travel_time_71 17)
8485             )
8486             (and
8487                (= truck_loc_71 0)
8488                (= truck_travel_time_71 21)
8489             )
8490             (and
8491                (= truck_loc_71 3)
8492                (= truck_travel_time_71 37)
8493             )
8494          )
8495       )
8496    )
8497    (=> (= truck_loc_70 3)
8498       (and
8499          (<= c_stocka_71 200)
8500          (= (+ truck_stock_71 c_stocka_71) (+ truck_stock_70 c_stockb_71))
8501          (= a_stocka_71 a_stockb_71)
8502          (= b_stocka_71 b_stockb_71)
8503          (or
8504             (and
8505                (= truck_loc_71 1)
8506                (= truck_travel_time_71 32)
8507             )
8508             (and
8509                (= truck_loc_71 2)
8510                (= truck_travel_time_71 37)
8511             )
8512          )
8513       )
8514    )
8515 )
8516 (<= truck_stock_71 300)
8517 (>= truck_stock_71 0)
8518 (= a_stockb_72 (- a_stocka_71 truck_travel_time_71))
8519 (= b_stockb_72 (- b_stocka_71 truck_travel_time_71))
8520 (= c_stockb_72 (- c_stocka_71 truck_travel_time_71))
8521 (and
8522    (=> (= truck_loc_71 0)
8523       (and
8524          (= a_stocka_72 a_stockb_72)
8525          (= b_stocka_72 b_stockb_72)
8526          (= c_stocka_72 c_stockb_72)
8527          (or
8528             (and
8529                (= truck_loc_72 1)
8530                (= truck_travel_time_72 29)
8531             )
8532             (and
8533                (= truck_loc_72 2)
8534                (= truck_travel_time_72 21)
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8535              )
8536            )
8537          )
8538        )
8539        (=> (= truck_loc_71 1)
8540          (and
8541            (<= a_stocka_72 120)
8542            (= (+ truck_stock_72 a_stocka_72) (+ truck_stock_71 a_stockb_72))
8543            (= b_stocka_72 b_stockb_72)
8544            (= c_stocka_72 c_stockb_72)
8545            (or
8546              (and
8547                (= truck_loc_72 0)
8548                (= truck_travel_time_72 29)
8549              )
8550              (and
8551                (= truck_loc_72 2)
8552                (= truck_travel_time_72 17)
8553              )
8554              (and
8555                (= truck_loc_72 3)
8556                (= truck_travel_time_72 32)
8557              )
8558            )
8559          )
8560        )
8561        (=> (= truck_loc_71 2)
8562          (and
8563            (<= b_stocka_72 120)
8564            (= (+ truck_stock_72 b_stocka_72) (+ truck_stock_71 b_stockb_72))
8565            (= a_stocka_72 a_stockb_72)
8566            (= c_stocka_72 c_stockb_72)
8567            (or
8568              (and
8569                (= truck_loc_72 1)
8570                (= truck_travel_time_72 17)
8571              )
8572              (and
8573                (= truck_loc_72 0)
8574                (= truck_travel_time_72 21)
8575              )
8576              (and
8577                (= truck_loc_72 3)
8578                (= truck_travel_time_72 37)
8579              )
8580            )
8581          )
8582        )
8583        (=> (= truck_loc_71 3)
8584          (and
8585            (<= c_stocka_72 200)
8586            (= (+ truck_stock_72 c_stocka_72) (+ truck_stock_71 c_stockb_72))
8587            (= a_stocka_72 a_stockb_72)
8588            (= b_stocka_72 b_stockb_72)
8589            (or
8590              (and
8591                (= truck_loc_72 1)
8592                (= truck_travel_time_72 32)
8593              )
8594              (and
8595                (= truck_loc_72 2)
8596                (= truck_travel_time_72 37)
```

```
8597              )
8598            )
8599          )
8600        )
8601      )
8602      (<= truck_stock_72 300)
8603      (>= truck_stock_72 0)
8604      (= a_stockb_73 (- a_stocka_72 truck_travel_time_72))
8605      (= b_stockb_73 (- b_stocka_72 truck_travel_time_72))
8606      (= c_stockb_73 (- c_stocka_72 truck_travel_time_72))
8607      (and
8608        (=> (= truck_loc_72 0)
8609          (and
8610            (= a_stocka_73 a_stockb_73)
8611            (= b_stocka_73 b_stockb_73)
8612            (= c_stocka_73 c_stockb_73)
8613            (or
8614              (and
8615                (= truck_loc_73 1)
8616                (= truck_travel_time_73 29)
8617              )
8618              (and
8619                (= truck_loc_73 2)
8620                (= truck_travel_time_73 21)
8621              )
8622            )
8623          )
8624        )
8625        (=> (= truck_loc_72 1)
8626          (and
8627            (<= a_stocka_73 120)
8628            (= (+ truck_stock_73 a_stocka_73) (+ truck_stock_72 a_stockb_73))
8629            (= b_stocka_73 b_stockb_73)
8630            (= c_stocka_73 c_stockb_73)
8631            (or
8632              (and
8633                (= truck_loc_73 0)
8634                (= truck_travel_time_73 29)
8635              )
8636              (and
8637                (= truck_loc_73 2)
8638                (= truck_travel_time_73 17)
8639              )
8640              (and
8641                (= truck_loc_73 3)
8642                (= truck_travel_time_73 32)
8643              )
8644            )
8645          )
8646        )
8647        (=> (= truck_loc_72 2)
8648          (and
8649            (<= b_stocka_73 120)
8650            (= (+ truck_stock_73 b_stocka_73) (+ truck_stock_72 b_stockb_73))
8651            (= a_stocka_73 a_stockb_73)
8652            (= c_stocka_73 c_stockb_73)
8653            (or
8654              (and
8655                (= truck_loc_73 1)
8656                (= truck_travel_time_73 17)
8657              )
8658              (and
```

```
8659            (= truck_loc_73 0)
8660            (= truck_travel_time_73 21)
8661          )
8662        (and
8663          (= truck_loc_73 3)
8664          (= truck_travel_time_73 37)
8665        )
8666      )
8667    )
8668   )
8669   (=> (= truck_loc_72 3)
8670     (and
8671       (<= c_stocka_73 200)
8672       (= (+ truck_stock_73 c_stocka_73) (+ truck_stock_72 c_stockb_73))
8673       (= a_stocka_73 a_stockb_73)
8674       (= b_stocka_73 b_stockb_73)
8675       (or
8676         (and
8677           (= truck_loc_73 1)
8678           (= truck_travel_time_73 32)
8679         )
8680         (and
8681           (= truck_loc_73 2)
8682           (= truck_travel_time_73 37)
8683         )
8684       )
8685     )
8686   )
8687 )
8688 (<= truck_stock_73 300)
8689 (>= truck_stock_73 0)
8690 (= a_stockb_74 (- a_stocka_73 truck_travel_time_73))
8691 (= b_stockb_74 (- b_stocka_73 truck_travel_time_73))
8692 (= c_stockb_74 (- c_stocka_73 truck_travel_time_73))
8693 (and
8694   (=> (= truck_loc_73 0)
8695     (and
8696       (= a_stocka_74 a_stockb_74)
8697       (= b_stocka_74 b_stockb_74)
8698       (= c_stocka_74 c_stockb_74)
8699       (or
8700         (and
8701           (= truck_loc_74 1)
8702           (= truck_travel_time_74 29)
8703         )
8704         (and
8705           (= truck_loc_74 2)
8706           (= truck_travel_time_74 21)
8707         )
8708       )
8709     )
8710   )
8711   (=> (= truck_loc_73 1)
8712     (and
8713       (<= a_stocka_74 120)
8714       (= (+ truck_stock_74 a_stocka_74) (+ truck_stock_73 a_stockb_74))
8715       (= b_stocka_74 b_stockb_74)
8716       (= c_stocka_74 c_stockb_74)
8717       (or
8718         (and
8719           (= truck_loc_74 0)
8720           (= truck_travel_time_74 29)
```

```
8721              )
8722            (and
8723              (= truck_loc_74 2)
8724              (= truck_travel_time_74 17)
8725            )
8726            (and
8727              (= truck_loc_74 3)
8728              (= truck_travel_time_74 32)
8729            )
8730          )
8731        )
8732    )
8733    (=> (= truck_loc_73 2)
8734      (and
8735        (<= b_stocka_74 120)
8736        (= (+ truck_stock_74 b_stocka_74) (+ truck_stock_73 b_stockb_74))
8737        (= a_stocka_74 a_stockb_74)
8738        (= c_stocka_74 c_stockb_74)
8739        (or
8740          (and
8741            (= truck_loc_74 1)
8742            (= truck_travel_time_74 17)
8743          )
8744          (and
8745            (= truck_loc_74 0)
8746            (= truck_travel_time_74 21)
8747          )
8748          (and
8749            (= truck_loc_74 3)
8750            (= truck_travel_time_74 37)
8751          )
8752        )
8753      )
8754    )
8755    (=> (= truck_loc_73 3)
8756      (and
8757        (<= c_stocka_74 200)
8758        (= (+ truck_stock_74 c_stocka_74) (+ truck_stock_73 c_stockb_74))
8759        (= a_stocka_74 a_stockb_74)
8760        (= b_stocka_74 b_stockb_74)
8761        (or
8762          (and
8763            (= truck_loc_74 1)
8764            (= truck_travel_time_74 32)
8765          )
8766          (and
8767            (= truck_loc_74 2)
8768            (= truck_travel_time_74 37)
8769          )
8770        )
8771      )
8772    )
8773  )
8774  (<= truck_stock_74 300)
8775  (>= truck_stock_74 0)
8776  (= a_stockb_75 (- a_stocka_74 truck_travel_time_74))
8777  (= b_stockb_75 (- b_stocka_74 truck_travel_time_74))
8778  (= c_stockb_75 (- c_stocka_74 truck_travel_time_74))
8779  (and
8780    (=> (= truck_loc_74 0)
8781      (and
8782        (= a_stocka_75 a_stockb_75)
```

```
8783        (= b_stocka_75 b_stockb_75)
8784        (= c_stocka_75 c_stockb_75)
8785        (or
8786          (and
8787            (= truck_loc_75 1)
8788            (= truck_travel_time_75 29)
8789          )
8790          (and
8791            (= truck_loc_75 2)
8792            (= truck_travel_time_75 21)
8793          )
8794        )
8795      )
8796    )
8797    (=> (= truck_loc_74 1)
8798      (and
8799        (<= a_stocka_75 120)
8800        (= (+ truck_stock_75 a_stocka_75) (+ truck_stock_74 a_stockb_75))
8801        (= b_stocka_75 b_stockb_75)
8802        (= c_stocka_75 c_stockb_75)
8803        (or
8804          (and
8805            (= truck_loc_75 0)
8806            (= truck_travel_time_75 29)
8807          )
8808          (and
8809            (= truck_loc_75 2)
8810            (= truck_travel_time_75 17)
8811          )
8812          (and
8813            (= truck_loc_75 3)
8814            (= truck_travel_time_75 32)
8815          )
8816        )
8817      )
8818    )
8819    (=> (= truck_loc_74 2)
8820      (and
8821        (<= b_stocka_75 120)
8822        (= (+ truck_stock_75 b_stocka_75) (+ truck_stock_74 b_stockb_75))
8823        (= a_stocka_75 a_stockb_75)
8824        (= c_stocka_75 c_stockb_75)
8825        (or
8826          (and
8827            (= truck_loc_75 1)
8828            (= truck_travel_time_75 17)
8829          )
8830          (and
8831            (= truck_loc_75 0)
8832            (= truck_travel_time_75 21)
8833          )
8834          (and
8835            (= truck_loc_75 3)
8836            (= truck_travel_time_75 37)
8837          )
8838        )
8839      )
8840    )
8841    (=> (= truck_loc_74 3)
8842      (and
8843        (<= c_stocka_75 200)
8844        (= (+ truck_stock_75 c_stocka_75) (+ truck_stock_74 c_stockb_75))
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8845        (= a_stocka_75 a_stockb_75)
8846        (= b_stocka_75 b_stockb_75)
8847        (or
8848          (and
8849            (= truck_loc_75 1)
8850            (= truck_travel_time_75 32)
8851          )
8852          (and
8853            (= truck_loc_75 2)
8854            (= truck_travel_time_75 37)
8855          )
8856        )
8857      )
8858    )
8859 )
8860 (<= truck_stock_75 300)
8861 (>= truck_stock_75 0)
8862 (= a_stockb_76 (- a_stocka_75 truck_travel_time_75))
8863 (= b_stockb_76 (- b_stocka_75 truck_travel_time_75))
8864 (= c_stockb_76 (- c_stocka_75 truck_travel_time_75))
8865 (and
8866    (=> (= truck_loc_75 0)
8867      (and
8868        (= a_stocka_76 a_stockb_76)
8869        (= b_stocka_76 b_stockb_76)
8870        (= c_stocka_76 c_stockb_76)
8871        (or
8872          (and
8873            (= truck_loc_76 1)
8874            (= truck_travel_time_76 29)
8875          )
8876          (and
8877            (= truck_loc_76 2)
8878            (= truck_travel_time_76 21)
8879          )
8880        )
8881      )
8882    )
8883    (=> (= truck_loc_75 1)
8884      (and
8885        (<= a_stocka_76 120)
8886        (= (+ truck_stock_76 a_stocka_76) (+ truck_stock_75 a_stockb_76))
8887        (= b_stocka_76 b_stockb_76)
8888        (= c_stocka_76 c_stockb_76)
8889        (or
8890          (and
8891            (= truck_loc_76 0)
8892            (= truck_travel_time_76 29)
8893          )
8894          (and
8895            (= truck_loc_76 2)
8896            (= truck_travel_time_76 17)
8897          )
8898          (and
8899            (= truck_loc_76 3)
8900            (= truck_travel_time_76 32)
8901          )
8902        )
8903      )
8904    )
8905    (=> (= truck_loc_75 2)
8906      (and
```

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8907          (<= b_stocka_76 120)
8908          (= (+ truck_stock_76 b_stocka_76) (+ truck_stock_75 b_stockb_76))
8909          (= a_stocka_76 a_stockb_76)
8910          (= c_stocka_76 c_stockb_76)
8911          (or
8912            (and
8913              (= truck_loc_76 1)
8914              (= truck_travel_time_76 17)
8915            )
8916            (and
8917              (= truck_loc_76 0)
8918              (= truck_travel_time_76 21)
8919            )
8920            (and
8921              (= truck_loc_76 3)
8922              (= truck_travel_time_76 37)
8923            )
8924          )
8925        )
8926      )
8927      (=> (= truck_loc_75 3)
8928        (and
8929          (<= c_stocka_76 200)
8930          (= (+ truck_stock_76 c_stocka_76) (+ truck_stock_75 c_stockb_76))
8931          (= a_stocka_76 a_stockb_76)
8932          (= b_stocka_76 b_stockb_76)
8933          (or
8934            (and
8935              (= truck_loc_76 1)
8936              (= truck_travel_time_76 32)
8937            )
8938            (and
8939              (= truck_loc_76 2)
8940              (= truck_travel_time_76 37)
8941            )
8942          )
8943        )
8944      )
8945  )
8946  (<= truck_stock_76 300)
8947  (>= truck_stock_76 0)
8948  (= a_stockb_77 (- a_stocka_76 truck_travel_time_76))
8949  (= b_stockb_77 (- b_stocka_76 truck_travel_time_76))
8950  (= c_stockb_77 (- c_stocka_76 truck_travel_time_76))
8951  (and
8952    (=> (= truck_loc_76 0)
8953      (and
8954        (= a_stocka_77 a_stockb_77)
8955        (= b_stocka_77 b_stockb_77)
8956        (= c_stocka_77 c_stockb_77)
8957        (or
8958          (and
8959            (= truck_loc_77 1)
8960            (= truck_travel_time_77 29)
8961          )
8962          (and
8963            (= truck_loc_77 2)
8964            (= truck_travel_time_77 21)
8965          )
8966        )
8967      )
8968    )
```

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8969    (=> (= truck_loc_76 1)
8970      (and
8971        (<= a_stocka_77 120)
8972        (= (+ truck_stock_77 a_stocka_77) (+ truck_stock_76 a_stockb_77))
8973        (= b_stocka_77 b_stockb_77)
8974        (= c_stocka_77 c_stockb_77)
8975        (or
8976          (and
8977            (= truck_loc_77 0)
8978            (= truck_travel_time_77 29)
8979          )
8980          (and
8981            (= truck_loc_77 2)
8982            (= truck_travel_time_77 17)
8983          )
8984          (and
8985            (= truck_loc_77 3)
8986            (= truck_travel_time_77 32)
8987          )
8988        )
8989      )
8990    )
8991    (=> (= truck_loc_76 2)
8992      (and
8993        (<= b_stocka_77 120)
8994        (= (+ truck_stock_77 b_stocka_77) (+ truck_stock_76 b_stockb_77))
8995        (= a_stocka_77 a_stockb_77)
8996        (= c_stocka_77 c_stockb_77)
8997        (or
8998          (and
8999            (= truck_loc_77 1)
9000            (= truck_travel_time_77 17)
9001          )
9002          (and
9003            (= truck_loc_77 0)
9004            (= truck_travel_time_77 21)
9005          )
9006          (and
9007            (= truck_loc_77 3)
9008            (= truck_travel_time_77 37)
9009          )
9010        )
9011      )
9012    )
9013    (=> (= truck_loc_76 3)
9014      (and
9015        (<= c_stocka_77 200)
9016        (= (+ truck_stock_77 c_stocka_77) (+ truck_stock_76 c_stockb_77))
9017        (= a_stocka_77 a_stockb_77)
9018        (= b_stocka_77 b_stockb_77)
9019        (or
9020          (and
9021            (= truck_loc_77 1)
9022            (= truck_travel_time_77 32)
9023          )
9024          (and
9025            (= truck_loc_77 2)
9026            (= truck_travel_time_77 37)
9027          )
9028        )
9029      )
9030    )
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9031  )
9032  (<= truck_stock_77 300)
9033  (>= truck_stock_77 0)
9034  (= a_stockb_78 (- a_stocka_77 truck_travel_time_77))
9035  (= b_stockb_78 (- b_stocka_77 truck_travel_time_77))
9036  (= c_stockb_78 (- c_stocka_77 truck_travel_time_77))
9037  (and
9038    (=> (= truck_loc_77 0)
9039      (and
9040        (= a_stocka_78 a_stockb_78)
9041        (= b_stocka_78 b_stockb_78)
9042        (= c_stocka_78 c_stockb_78)
9043        (or
9044          (and
9045            (= truck_loc_78 1)
9046            (= truck_travel_time_78 29)
9047          )
9048          (and
9049            (= truck_loc_78 2)
9050            (= truck_travel_time_78 21)
9051          )
9052        )
9053      )
9054    )
9055    (=> (= truck_loc_77 1)
9056      (and
9057        (<= a_stocka_78 120)
9058        (= (+ truck_stock_78 a_stocka_78) (+ truck_stock_77 a_stockb_78))
9059        (= b_stocka_78 b_stockb_78)
9060        (= c_stocka_78 c_stockb_78)
9061        (or
9062          (and
9063            (= truck_loc_78 0)
9064            (= truck_travel_time_78 29)
9065          )
9066          (and
9067            (= truck_loc_78 2)
9068            (= truck_travel_time_78 17)
9069          )
9070          (and
9071            (= truck_loc_78 3)
9072            (= truck_travel_time_78 32)
9073          )
9074        )
9075      )
9076    )
9077    (=> (= truck_loc_77 2)
9078      (and
9079        (<= b_stocka_78 120)
9080        (= (+ truck_stock_78 b_stocka_78) (+ truck_stock_77 b_stockb_78))
9081        (= a_stocka_78 a_stockb_78)
9082        (= c_stocka_78 c_stockb_78)
9083        (or
9084          (and
9085            (= truck_loc_78 1)
9086            (= truck_travel_time_78 17)
9087          )
9088          (and
9089            (= truck_loc_78 0)
9090            (= truck_travel_time_78 21)
9091          )
9092          (and
```

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9093              (= truck_loc_78 3)
9094              (= truck_travel_time_78 37)
9095            )
9096          )
9097        )
9098      )
9099      (=> (= truck_loc_77 3)
9100        (and
9101          (<= c_stocka_78 200)
9102          (= (+ truck_stock_78 c_stocka_78) (+ truck_stock_77 c_stockb_78))
9103          (= a_stocka_78 a_stockb_78)
9104          (= b_stocka_78 b_stockb_78)
9105          (or
9106            (and
9107              (= truck_loc_78 1)
9108              (= truck_travel_time_78 32)
9109            )
9110            (and
9111              (= truck_loc_78 2)
9112              (= truck_travel_time_78 37)
9113            )
9114          )
9115        )
9116      )
9117    )
9118    (<= truck_stock_78 300)
9119    (>= truck_stock_78 0)
9120    (= a_stockb_79 (- a_stocka_78 truck_travel_time_78))
9121    (= b_stockb_79 (- b_stocka_78 truck_travel_time_78))
9122    (= c_stockb_79 (- c_stocka_78 truck_travel_time_78))
9123    (and
9124      (=> (= truck_loc_78 0)
9125        (and
9126          (= a_stocka_79 a_stockb_79)
9127          (= b_stocka_79 b_stockb_79)
9128          (= c_stocka_79 c_stockb_79)
9129          (or
9130            (and
9131              (= truck_loc_79 1)
9132              (= truck_travel_time_79 29)
9133            )
9134            (and
9135              (= truck_loc_79 2)
9136              (= truck_travel_time_79 21)
9137            )
9138          )
9139        )
9140      )
9141      (=> (= truck_loc_78 1)
9142        (and
9143          (<= a_stocka_79 120)
9144          (= (+ truck_stock_79 a_stocka_79) (+ truck_stock_78 a_stockb_79))
9145          (= b_stocka_79 b_stockb_79)
9146          (= c_stocka_79 c_stockb_79)
9147          (or
9148            (and
9149              (= truck_loc_79 0)
9150              (= truck_travel_time_79 29)
9151            )
9152            (and
9153              (= truck_loc_79 2)
9154              (= truck_travel_time_79 17)
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9155            )
9156          (and
9157            (= truck_loc_79 3)
9158            (= truck_travel_time_79 32)
9159          )
9160        )
9161      )
9162    )
9163    (=> (= truck_loc_78 2)
9164      (and
9165        (<= b_stocka_79 120)
9166        (= (+ truck_stock_79 b_stocka_79) (+ truck_stock_78 b_stockb_79))
9167        (= a_stocka_79 a_stockb_79)
9168        (= c_stocka_79 c_stockb_79)
9169        (or
9170          (and
9171            (= truck_loc_79 1)
9172            (= truck_travel_time_79 17)
9173          )
9174          (and
9175            (= truck_loc_79 0)
9176            (= truck_travel_time_79 21)
9177          )
9178          (and
9179            (= truck_loc_79 3)
9180            (= truck_travel_time_79 37)
9181          )
9182        )
9183      )
9184    )
9185    (=> (= truck_loc_78 3)
9186      (and
9187        (<= c_stocka_79 200)
9188        (= (+ truck_stock_79 c_stocka_79) (+ truck_stock_78 c_stockb_79))
9189        (= a_stocka_79 a_stockb_79)
9190        (= b_stocka_79 b_stockb_79)
9191        (or
9192          (and
9193            (= truck_loc_79 1)
9194            (= truck_travel_time_79 32)
9195          )
9196          (and
9197            (= truck_loc_79 2)
9198            (= truck_travel_time_79 37)
9199          )
9200        )
9201      )
9202    )
9203  )
9204  (<= truck_stock_79 300)
9205  (>= truck_stock_79 0)
9206  (= a_stockb_80 (- a_stocka_79 truck_travel_time_79))
9207  (= b_stockb_80 (- b_stocka_79 truck_travel_time_79))
9208  (= c_stockb_80 (- c_stocka_79 truck_travel_time_79))
9209  (and
9210    (=> (= truck_loc_79 0)
9211      (and
9212        (= a_stocka_80 a_stockb_80)
9213        (= b_stocka_80 b_stockb_80)
9214        (= c_stocka_80 c_stockb_80)
9215        (or
9216          (and
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```
9217            (= truck_loc_80 1)
9218            (= truck_travel_time_80 29)
9219          )
9220        (and
9221          (= truck_loc_80 2)
9222          (= truck_travel_time_80 21)
9223        )
9224      )
9225    )
9226  )
9227  (=> (= truck_loc_79 1)
9228    (and
9229      (<= a_stocka_80 120)
9230      (= (+ truck_stock_80 a_stocka_80) (+ truck_stock_79 a_stockb_80))
9231      (= b_stocka_80 b_stockb_80)
9232      (= c_stocka_80 c_stockb_80)
9233      (or
9234        (and
9235          (= truck_loc_80 0)
9236          (= truck_travel_time_80 29)
9237        )
9238        (and
9239          (= truck_loc_80 2)
9240          (= truck_travel_time_80 17)
9241        )
9242        (and
9243          (= truck_loc_80 3)
9244          (= truck_travel_time_80 32)
9245        )
9246      )
9247    )
9248  )
9249  (=> (= truck_loc_79 2)
9250    (and
9251      (<= b_stocka_80 120)
9252      (= (+ truck_stock_80 b_stocka_80) (+ truck_stock_79 b_stockb_80))
9253      (= a_stocka_80 a_stockb_80)
9254      (= c_stocka_80 c_stockb_80)
9255      (or
9256        (and
9257          (= truck_loc_80 1)
9258          (= truck_travel_time_80 17)
9259        )
9260        (and
9261          (= truck_loc_80 0)
9262          (= truck_travel_time_80 21)
9263        )
9264        (and
9265          (= truck_loc_80 3)
9266          (= truck_travel_time_80 37)
9267        )
9268      )
9269    )
9270  )
9271  (=> (= truck_loc_79 3)
9272    (and
9273      (<= c_stocka_80 200)
9274      (= (+ truck_stock_80 c_stocka_80) (+ truck_stock_79 c_stockb_80))
9275      (= a_stocka_80 a_stockb_80)
9276      (= b_stocka_80 b_stockb_80)
9277      (or
9278        (and
```

```
9279            (= truck_loc_80 1)
9280            (= truck_travel_time_80 32)
9281          )
9282        (and
9283            (= truck_loc_80 2)
9284            (= truck_travel_time_80 37)
9285        )
9286      )
9287     )
9288   )
9289 )
9290 (<= truck_stock_80 300)
9291 (>= truck_stock_80 0)
9292 (= a_stockb_81 (- a_stocka_80 truck_travel_time_80))
9293 (= b_stockb_81 (- b_stocka_80 truck_travel_time_80))
9294 (= c_stockb_81 (- c_stocka_80 truck_travel_time_80))
9295 (and
9296   (=> (= truck_loc_80 0)
9297     (and
9298       (= a_stocka_81 a_stockb_81)
9299       (= b_stocka_81 b_stockb_81)
9300       (= c_stocka_81 c_stockb_81)
9301       (or
9302         (and
9303           (= truck_loc_81 1)
9304           (= truck_travel_time_81 29)
9305         )
9306         (and
9307           (= truck_loc_81 2)
9308           (= truck_travel_time_81 21)
9309         )
9310       )
9311     )
9312   )
9313   (=> (= truck_loc_80 1)
9314     (and
9315       (<= a_stocka_81 120)
9316       (= (+ truck_stock_81 a_stocka_81) (+ truck_stock_80 a_stockb_81))
9317       (= b_stocka_81 b_stockb_81)
9318       (= c_stocka_81 c_stockb_81)
9319       (or
9320         (and
9321           (= truck_loc_81 0)
9322           (= truck_travel_time_81 29)
9323         )
9324         (and
9325           (= truck_loc_81 2)
9326           (= truck_travel_time_81 17)
9327         )
9328         (and
9329           (= truck_loc_81 3)
9330           (= truck_travel_time_81 32)
9331         )
9332       )
9333     )
9334   )
9335   (=> (= truck_loc_80 2)
9336     (and
9337       (<= b_stocka_81 120)
9338       (= (+ truck_stock_81 b_stocka_81) (+ truck_stock_80 b_stockb_81))
9339       (= a_stocka_81 a_stockb_81)
9340       (= c_stocka_81 c_stockb_81)
```

```
9341          (or
9342            (and
9343              (= truck_loc_81 1)
9344              (= truck_travel_time_81 17)
9345            )
9346            (and
9347              (= truck_loc_81 0)
9348              (= truck_travel_time_81 21)
9349            )
9350            (and
9351              (= truck_loc_81 3)
9352              (= truck_travel_time_81 37)
9353            )
9354          )
9355        )
9356      )
9357      (=> (= truck_loc_80 3)
9358        (and
9359          (<= c_stocka_81 200)
9360          (= (+ truck_stock_81 c_stocka_81) (+ truck_stock_80 c_stockb_81))
9361          (= a_stocka_81 a_stockb_81)
9362          (= b_stocka_81 b_stockb_81)
9363          (or
9364            (and
9365              (= truck_loc_81 1)
9366              (= truck_travel_time_81 32)
9367            )
9368            (and
9369              (= truck_loc_81 2)
9370              (= truck_travel_time_81 37)
9371            )
9372          )
9373        )
9374      )
9375    )
9376    (<= truck_stock_81 300)
9377    (>= truck_stock_81 0)
9378    (= a_stockb_82 (- a_stocka_81 truck_travel_time_81))
9379    (= b_stockb_82 (- b_stocka_81 truck_travel_time_81))
9380    (= c_stockb_82 (- c_stocka_81 truck_travel_time_81))
9381    (and
9382      (=> (= truck_loc_81 0)
9383        (and
9384          (= a_stocka_82 a_stockb_82)
9385          (= b_stocka_82 b_stockb_82)
9386          (= c_stocka_82 c_stockb_82)
9387          (or
9388            (and
9389              (= truck_loc_82 1)
9390              (= truck_travel_time_82 29)
9391            )
9392            (and
9393              (= truck_loc_82 2)
9394              (= truck_travel_time_82 21)
9395            )
9396          )
9397        )
9398      )
9399      (=> (= truck_loc_81 1)
9400        (and
9401          (<= a_stocka_82 120)
9402          (= (+ truck_stock_82 a_stocka_82) (+ truck_stock_81 a_stockb_82))
```

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```
9403        (= b_stocka_82 b_stockb_82)
9404        (= c_stocka_82 c_stockb_82)
9405        (or
9406          (and
9407            (= truck_loc_82 0)
9408            (= truck_travel_time_82 29)
9409          )
9410          (and
9411            (= truck_loc_82 2)
9412            (= truck_travel_time_82 17)
9413          )
9414          (and
9415            (= truck_loc_82 3)
9416            (= truck_travel_time_82 32)
9417          )
9418        )
9419      )
9420    )
9421    (=> (= truck_loc_81 2)
9422      (and
9423        (<= b_stocka_82 120)
9424        (= (+ truck_stock_82 b_stocka_82) (+ truck_stock_81 b_stockb_82))
9425        (= a_stocka_82 a_stockb_82)
9426        (= c_stocka_82 c_stockb_82)
9427        (or
9428          (and
9429            (= truck_loc_82 1)
9430            (= truck_travel_time_82 17)
9431          )
9432          (and
9433            (= truck_loc_82 0)
9434            (= truck_travel_time_82 21)
9435          )
9436          (and
9437            (= truck_loc_82 3)
9438            (= truck_travel_time_82 37)
9439          )
9440        )
9441      )
9442    )
9443    (=> (= truck_loc_81 3)
9444      (and
9445        (<= c_stocka_82 200)
9446        (= (+ truck_stock_82 c_stocka_82) (+ truck_stock_81 c_stockb_82))
9447        (= a_stocka_82 a_stockb_82)
9448        (= b_stocka_82 b_stockb_82)
9449        (or
9450          (and
9451            (= truck_loc_82 1)
9452            (= truck_travel_time_82 32)
9453          )
9454          (and
9455            (= truck_loc_82 2)
9456            (= truck_travel_time_82 37)
9457          )
9458        )
9459      )
9460    )
9461  )
9462  (<= truck_stock_82 300)
9463  (>= truck_stock_82 0)
9464  (= a_stockb_83 (- a_stocka_82 truck_travel_time_82))
```

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```
9465   (= b_stockb_83 (- b_stocka_82 truck_travel_time_82))
9466   (= c_stockb_83 (- c_stocka_82 truck_travel_time_82))
9467   (and
9468     (=> (= truck_loc_82 0)
9469       (and
9470         (= a_stocka_83 a_stockb_83)
9471         (= b_stocka_83 b_stockb_83)
9472         (= c_stocka_83 c_stockb_83)
9473         (or
9474           (and
9475             (= truck_loc_83 1)
9476             (= truck_travel_time_83 29)
9477           )
9478           (and
9479             (= truck_loc_83 2)
9480             (= truck_travel_time_83 21)
9481           )
9482         )
9483       )
9484     )
9485     (=> (= truck_loc_82 1)
9486       (and
9487         (<= a_stocka_83 120)
9488         (= (+ truck_stock_83 a_stocka_83) (+ truck_stock_82 a_stockb_83))
9489         (= b_stocka_83 b_stockb_83)
9490         (= c_stocka_83 c_stockb_83)
9491         (or
9492           (and
9493             (= truck_loc_83 0)
9494             (= truck_travel_time_83 29)
9495           )
9496           (and
9497             (= truck_loc_83 2)
9498             (= truck_travel_time_83 17)
9499           )
9500           (and
9501             (= truck_loc_83 3)
9502             (= truck_travel_time_83 32)
9503           )
9504         )
9505       )
9506     )
9507     (=> (= truck_loc_82 2)
9508       (and
9509         (<= b_stocka_83 120)
9510         (= (+ truck_stock_83 b_stocka_83) (+ truck_stock_82 b_stockb_83))
9511         (= a_stocka_83 a_stockb_83)
9512         (= c_stocka_83 c_stockb_83)
9513         (or
9514           (and
9515             (= truck_loc_83 1)
9516             (= truck_travel_time_83 17)
9517           )
9518           (and
9519             (= truck_loc_83 0)
9520             (= truck_travel_time_83 21)
9521           )
9522           (and
9523             (= truck_loc_83 3)
9524             (= truck_travel_time_83 37)
9525           )
9526         )
```

```
9527          )
9528        )
9529      (=> (= truck_loc_82 3)
9530        (and
9531          (<= c_stocka_83 200)
9532          (= (+ truck_stock_83 c_stocka_83) (+ truck_stock_82 c_stockb_83))
9533          (= a_stocka_83 a_stockb_83)
9534          (= b_stocka_83 b_stockb_83)
9535          (or
9536            (and
9537              (= truck_loc_83 1)
9538              (= truck_travel_time_83 32)
9539            )
9540            (and
9541              (= truck_loc_83 2)
9542              (= truck_travel_time_83 37)
9543            )
9544          )
9545        )
9546      )
9547    )
9548    (<= truck_stock_83 300)
9549    (>= truck_stock_83 0)
9550    (= a_stockb_84 (- a_stocka_83 truck_travel_time_83))
9551    (= b_stockb_84 (- b_stocka_83 truck_travel_time_83))
9552    (= c_stockb_84 (- c_stocka_83 truck_travel_time_83))
9553    (and
9554      (=> (= truck_loc_83 0)
9555        (and
9556          (= a_stocka_84 a_stockb_84)
9557          (= b_stocka_84 b_stockb_84)
9558          (= c_stocka_84 c_stockb_84)
9559          (or
9560            (and
9561              (= truck_loc_84 1)
9562              (= truck_travel_time_84 29)
9563            )
9564            (and
9565              (= truck_loc_84 2)
9566              (= truck_travel_time_84 21)
9567            )
9568          )
9569        )
9570      )
9571      (=> (= truck_loc_83 1)
9572        (and
9573          (<= a_stocka_84 120)
9574          (= (+ truck_stock_84 a_stocka_84) (+ truck_stock_83 a_stockb_84))
9575          (= b_stocka_84 b_stockb_84)
9576          (= c_stocka_84 c_stockb_84)
9577          (or
9578            (and
9579              (= truck_loc_84 0)
9580              (= truck_travel_time_84 29)
9581            )
9582            (and
9583              (= truck_loc_84 2)
9584              (= truck_travel_time_84 17)
9585            )
9586            (and
9587              (= truck_loc_84 3)
9588              (= truck_travel_time_84 32)
```

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9589            )
9590          )
9591        )
9592    )
9593    (=> (= truck_loc_83 2)
9594      (and
9595        (<= b_stocka_84 120)
9596        (= (+ truck_stock_84 b_stocka_84) (+ truck_stock_83 b_stockb_84))
9597        (= a_stocka_84 a_stockb_84)
9598        (= c_stocka_84 c_stockb_84)
9599        (or
9600          (and
9601            (= truck_loc_84 1)
9602            (= truck_travel_time_84 17)
9603          )
9604          (and
9605            (= truck_loc_84 0)
9606            (= truck_travel_time_84 21)
9607          )
9608          (and
9609            (= truck_loc_84 3)
9610            (= truck_travel_time_84 37)
9611          )
9612        )
9613      )
9614    )
9615    (=> (= truck_loc_83 3)
9616      (and
9617        (<= c_stocka_84 200)
9618        (= (+ truck_stock_84 c_stocka_84) (+ truck_stock_83 c_stockb_84))
9619        (= a_stocka_84 a_stockb_84)
9620        (= b_stocka_84 b_stockb_84)
9621        (or
9622          (and
9623            (= truck_loc_84 1)
9624            (= truck_travel_time_84 32)
9625          )
9626          (and
9627            (= truck_loc_84 2)
9628            (= truck_travel_time_84 37)
9629          )
9630        )
9631      )
9632    )
9633  )
9634  (<= truck_stock_84 300)
9635  (>= truck_stock_84 0)
9636  (= a_stockb_85 (- a_stocka_84 truck_travel_time_84))
9637  (= b_stockb_85 (- b_stocka_84 truck_travel_time_84))
9638  (= c_stockb_85 (- c_stocka_84 truck_travel_time_84))
9639  (and
9640    (=> (= truck_loc_84 0)
9641      (and
9642        (= a_stocka_85 a_stockb_85)
9643        (= b_stocka_85 b_stockb_85)
9644        (= c_stocka_85 c_stockb_85)
9645        (or
9646          (and
9647            (= truck_loc_85 1)
9648            (= truck_travel_time_85 29)
9649          )
9650          (and
```

```
9651              (= truck_loc_85 2)
9652              (= truck_travel_time_85 21)
9653            )
9654          )
9655        )
9656      )
9657      (=> (= truck_loc_84 1)
9658        (and
9659          (<= a_stocka_85 120)
9660          (= (+ truck_stock_85 a_stocka_85) (+ truck_stock_84 a_stockb_85))
9661          (= b_stocka_85 b_stockb_85)
9662          (= c_stocka_85 c_stockb_85)
9663          (or
9664            (and
9665              (= truck_loc_85 0)
9666              (= truck_travel_time_85 29)
9667            )
9668            (and
9669              (= truck_loc_85 2)
9670              (= truck_travel_time_85 17)
9671            )
9672            (and
9673              (= truck_loc_85 3)
9674              (= truck_travel_time_85 32)
9675            )
9676          )
9677        )
9678      )
9679      (=> (= truck_loc_84 2)
9680        (and
9681          (<= b_stocka_85 120)
9682          (= (+ truck_stock_85 b_stocka_85) (+ truck_stock_84 b_stockb_85))
9683          (= a_stocka_85 a_stockb_85)
9684          (= c_stocka_85 c_stockb_85)
9685          (or
9686            (and
9687              (= truck_loc_85 1)
9688              (= truck_travel_time_85 17)
9689            )
9690            (and
9691              (= truck_loc_85 0)
9692              (= truck_travel_time_85 21)
9693            )
9694            (and
9695              (= truck_loc_85 3)
9696              (= truck_travel_time_85 37)
9697            )
9698          )
9699        )
9700      )
9701      (=> (= truck_loc_84 3)
9702        (and
9703          (<= c_stocka_85 200)
9704          (= (+ truck_stock_85 c_stocka_85) (+ truck_stock_84 c_stockb_85))
9705          (= a_stocka_85 a_stockb_85)
9706          (= b_stocka_85 b_stockb_85)
9707          (or
9708            (and
9709              (= truck_loc_85 1)
9710              (= truck_travel_time_85 32)
9711            )
9712            (and
```

```
9713              (= truck_loc_85 2)
9714              (= truck_travel_time_85 37)
9715            )
9716          )
9717        )
9718      )
9719    )
9720    (<= truck_stock_85 300)
9721    (>= truck_stock_85 0)
9722    (= a_stockb_86 (- a_stocka_85 truck_travel_time_85))
9723    (= b_stockb_86 (- b_stocka_85 truck_travel_time_85))
9724    (= c_stockb_86 (- c_stocka_85 truck_travel_time_85))
9725    (and
9726      (=> (= truck_loc_85 0)
9727        (and
9728          (= a_stocka_86 a_stockb_86)
9729          (= b_stocka_86 b_stockb_86)
9730          (= c_stocka_86 c_stockb_86)
9731          (or
9732            (and
9733              (= truck_loc_86 1)
9734              (= truck_travel_time_86 29)
9735            )
9736            (and
9737              (= truck_loc_86 2)
9738              (= truck_travel_time_86 21)
9739            )
9740          )
9741        )
9742      )
9743      (=> (= truck_loc_85 1)
9744        (and
9745          (<= a_stocka_86 120)
9746          (= (+ truck_stock_86 a_stocka_86) (+ truck_stock_85 a_stockb_86))
9747          (= b_stocka_86 b_stockb_86)
9748          (= c_stocka_86 c_stockb_86)
9749          (or
9750            (and
9751              (= truck_loc_86 0)
9752              (= truck_travel_time_86 29)
9753            )
9754            (and
9755              (= truck_loc_86 2)
9756              (= truck_travel_time_86 17)
9757            )
9758            (and
9759              (= truck_loc_86 3)
9760              (= truck_travel_time_86 32)
9761            )
9762          )
9763        )
9764      )
9765      (=> (= truck_loc_85 2)
9766        (and
9767          (<= b_stocka_86 120)
9768          (= (+ truck_stock_86 b_stocka_86) (+ truck_stock_85 b_stockb_86))
9769          (= a_stocka_86 a_stockb_86)
9770          (= c_stocka_86 c_stockb_86)
9771          (or
9772            (and
9773              (= truck_loc_86 1)
9774              (= truck_travel_time_86 17)
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```
9775          )
9776          (and
9777            (= truck_loc_86 0)
9778            (= truck_travel_time_86 21)
9779          )
9780          (and
9781            (= truck_loc_86 3)
9782            (= truck_travel_time_86 37)
9783          )
9784        )
9785      )
9786    )
9787    (=> (= truck_loc_85 3)
9788      (and
9789        (<= c_stocka_86 200)
9790        (= (+ truck_stock_86 c_stocka_86) (+ truck_stock_85 c_stockb_86))
9791        (= a_stocka_86 a_stockb_86)
9792        (= b_stocka_86 b_stockb_86)
9793        (or
9794          (and
9795            (= truck_loc_86 1)
9796            (= truck_travel_time_86 32)
9797          )
9798          (and
9799            (= truck_loc_86 2)
9800            (= truck_travel_time_86 37)
9801          )
9802        )
9803      )
9804    )
9805  )
9806  (<= truck_stock_86 300)
9807  (>= truck_stock_86 0)
9808  (= a_stockb_87 (- a_stocka_86 truck_travel_time_86))
9809  (= b_stockb_87 (- b_stocka_86 truck_travel_time_86))
9810  (= c_stockb_87 (- c_stocka_86 truck_travel_time_86))
9811  (and
9812    (=> (= truck_loc_86 0)
9813      (and
9814        (= a_stocka_87 a_stockb_87)
9815        (= b_stocka_87 b_stockb_87)
9816        (= c_stocka_87 c_stockb_87)
9817        (or
9818          (and
9819            (= truck_loc_87 1)
9820            (= truck_travel_time_87 29)
9821          )
9822          (and
9823            (= truck_loc_87 2)
9824            (= truck_travel_time_87 21)
9825          )
9826        )
9827      )
9828    )
9829    (=> (= truck_loc_86 1)
9830      (and
9831        (<= a_stocka_87 120)
9832        (= (+ truck_stock_87 a_stocka_87) (+ truck_stock_86 a_stockb_87))
9833        (= b_stocka_87 b_stockb_87)
9834        (= c_stocka_87 c_stockb_87)
9835        (or
9836          (and
```

```
9837            (= truck_loc_87 0)
9838            (= truck_travel_time_87 29)
9839          )
9840          (and
9841            (= truck_loc_87 2)
9842            (= truck_travel_time_87 17)
9843          )
9844          (and
9845            (= truck_loc_87 3)
9846            (= truck_travel_time_87 32)
9847          )
9848        )
9849      )
9850    )
9851    (=> (= truck_loc_86 2)
9852      (and
9853        (<= b_stocka_87 120)
9854        (= (+ truck_stock_87 b_stocka_87) (+ truck_stock_86 b_stockb_87))
9855        (= a_stocka_87 a_stockb_87)
9856        (= c_stocka_87 c_stockb_87)
9857        (or
9858          (and
9859            (= truck_loc_87 1)
9860            (= truck_travel_time_87 17)
9861          )
9862          (and
9863            (= truck_loc_87 0)
9864            (= truck_travel_time_87 21)
9865          )
9866          (and
9867            (= truck_loc_87 3)
9868            (= truck_travel_time_87 37)
9869          )
9870        )
9871      )
9872    )
9873    (=> (= truck_loc_86 3)
9874      (and
9875        (<= c_stocka_87 200)
9876        (= (+ truck_stock_87 c_stocka_87) (+ truck_stock_86 c_stockb_87))
9877        (= a_stocka_87 a_stockb_87)
9878        (= b_stocka_87 b_stockb_87)
9879        (or
9880          (and
9881            (= truck_loc_87 1)
9882            (= truck_travel_time_87 32)
9883          )
9884          (and
9885            (= truck_loc_87 2)
9886            (= truck_travel_time_87 37)
9887          )
9888        )
9889      )
9890    )
9891  )
9892  (<= truck_stock_87 300)
9893  (>= truck_stock_87 0)
9894  (= a_stockb_88 (- a_stocka_87 truck_travel_time_87))
9895  (= b_stockb_88 (- b_stocka_87 truck_travel_time_87))
9896  (= c_stockb_88 (- c_stocka_87 truck_travel_time_87))
9897  (and
9898    (=> (= truck_loc_87 0)
```

```
9899        (and
9900          (= a_stocka_88 a_stockb_88)
9901          (= b_stocka_88 b_stockb_88)
9902          (= c_stocka_88 c_stockb_88)
9903          (or
9904            (and
9905              (= truck_loc_88 1)
9906              (= truck_travel_time_88 29)
9907            )
9908            (and
9909              (= truck_loc_88 2)
9910              (= truck_travel_time_88 21)
9911            )
9912          )
9913        )
9914      )
9915      (=> (= truck_loc_87 1)
9916        (and
9917          (<= a_stocka_88 120)
9918          (= (+ truck_stock_88 a_stocka_88) (+ truck_stock_87 a_stockb_88))
9919          (= b_stocka_88 b_stockb_88)
9920          (= c_stocka_88 c_stockb_88)
9921          (or
9922            (and
9923              (= truck_loc_88 0)
9924              (= truck_travel_time_88 29)
9925            )
9926            (and
9927              (= truck_loc_88 2)
9928              (= truck_travel_time_88 17)
9929            )
9930            (and
9931              (= truck_loc_88 3)
9932              (= truck_travel_time_88 32)
9933            )
9934          )
9935        )
9936      )
9937      (=> (= truck_loc_87 2)
9938        (and
9939          (<= b_stocka_88 120)
9940          (= (+ truck_stock_88 b_stocka_88) (+ truck_stock_87 b_stockb_88))
9941          (= a_stocka_88 a_stockb_88)
9942          (= c_stocka_88 c_stockb_88)
9943          (or
9944            (and
9945              (= truck_loc_88 1)
9946              (= truck_travel_time_88 17)
9947            )
9948            (and
9949              (= truck_loc_88 0)
9950              (= truck_travel_time_88 21)
9951            )
9952            (and
9953              (= truck_loc_88 3)
9954              (= truck_travel_time_88 37)
9955            )
9956          )
9957        )
9958      )
9959      (=> (= truck_loc_87 3)
9960        (and
```

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```
9961        (<= c_stocka_88 200)
9962        (= (+ truck_stock_88 c_stocka_88) (+ truck_stock_87 c_stockb_88))
9963        (= a_stocka_88 a_stockb_88)
9964        (= b_stocka_88 b_stockb_88)
9965        (or
9966          (and
9967            (= truck_loc_88 1)
9968            (= truck_travel_time_88 32)
9969          )
9970          (and
9971            (= truck_loc_88 2)
9972            (= truck_travel_time_88 37)
9973          )
9974        )
9975      )
9976    )
9977  )
9978  (<= truck_stock_88 300)
9979  (>= truck_stock_88 0)
9980  (= a_stockb_89 (- a_stocka_88 truck_travel_time_88))
9981  (= b_stockb_89 (- b_stocka_88 truck_travel_time_88))
9982  (= c_stockb_89 (- c_stocka_88 truck_travel_time_88))
9983  (and
9984    (=> (= truck_loc_88 0)
9985      (and
9986        (= a_stocka_89 a_stockb_89)
9987        (= b_stocka_89 b_stockb_89)
9988        (= c_stocka_89 c_stockb_89)
9989        (or
9990          (and
9991            (= truck_loc_89 1)
9992            (= truck_travel_time_89 29)
9993          )
9994          (and
9995            (= truck_loc_89 2)
9996            (= truck_travel_time_89 21)
9997          )
9998        )
9999      )
10000    )
10001    (=> (= truck_loc_88 1)
10002      (and
10003        (<= a_stocka_89 120)
10004        (= (+ truck_stock_89 a_stocka_89) (+ truck_stock_88 a_stockb_89))
10005        (= b_stocka_89 b_stockb_89)
10006        (= c_stocka_89 c_stockb_89)
10007        (or
10008          (and
10009            (= truck_loc_89 0)
10010            (= truck_travel_time_89 29)
10011          )
10012          (and
10013            (= truck_loc_89 2)
10014            (= truck_travel_time_89 17)
10015          )
10016          (and
10017            (= truck_loc_89 3)
10018            (= truck_travel_time_89 32)
10019          )
10020        )
10021      )
10022    )
```

```
10023    (=> (= truck_loc_88 2)
10024      (and
10025        (<= b_stocka_89 120)
10026        (= (+ truck_stock_89 b_stocka_89) (+ truck_stock_88 b_stockb_89))
10027        (= a_stocka_89 a_stockb_89)
10028        (= c_stocka_89 c_stockb_89)
10029        (or
10030          (and
10031            (= truck_loc_89 1)
10032            (= truck_travel_time_89 17)
10033          )
10034          (and
10035            (= truck_loc_89 0)
10036            (= truck_travel_time_89 21)
10037          )
10038          (and
10039            (= truck_loc_89 3)
10040            (= truck_travel_time_89 37)
10041          )
10042        )
10043      )
10044    )
10045    (=> (= truck_loc_88 3)
10046      (and
10047        (<= c_stocka_89 200)
10048        (= (+ truck_stock_89 c_stocka_89) (+ truck_stock_88 c_stockb_89))
10049        (= a_stocka_89 a_stockb_89)
10050        (= b_stocka_89 b_stockb_89)
10051        (or
10052          (and
10053            (= truck_loc_89 1)
10054            (= truck_travel_time_89 32)
10055          )
10056          (and
10057            (= truck_loc_89 2)
10058            (= truck_travel_time_89 37)
10059          )
10060        )
10061      )
10062    )
10063  )
10064  (<= truck_stock_89 300)
10065  (>= truck_stock_89 0)
10066  (= a_stockb_90 (- a_stocka_89 truck_travel_time_89))
10067  (= b_stockb_90 (- b_stocka_89 truck_travel_time_89))
10068  (= c_stockb_90 (- c_stocka_89 truck_travel_time_89))
10069  (and
10070    (=> (= truck_loc_89 0)
10071      (and
10072        (= a_stocka_90 a_stockb_90)
10073        (= b_stocka_90 b_stockb_90)
10074        (= c_stocka_90 c_stockb_90)
10075        (or
10076          (and
10077            (= truck_loc_90 1)
10078            (= truck_travel_time_90 29)
10079          )
10080          (and
10081            (= truck_loc_90 2)
10082            (= truck_travel_time_90 21)
10083          )
10084        )
```

```
10085        )
10086      )
10087      (=> (= truck_loc_89 1)
10088        (and
10089          (<= a_stocka_90 120)
10090          (= (+ truck_stock_90 a_stocka_90) (+ truck_stock_89 a_stockb_90))
10091          (= b_stocka_90 b_stockb_90)
10092          (= c_stocka_90 c_stockb_90)
10093          (or
10094            (and
10095              (= truck_loc_90 0)
10096              (= truck_travel_time_90 29)
10097            )
10098            (and
10099              (= truck_loc_90 2)
10100              (= truck_travel_time_90 17)
10101            )
10102            (and
10103              (= truck_loc_90 3)
10104              (= truck_travel_time_90 32)
10105            )
10106          )
10107        )
10108      )
10109      (=> (= truck_loc_89 2)
10110        (and
10111          (<= b_stocka_90 120)
10112          (= (+ truck_stock_90 b_stocka_90) (+ truck_stock_89 b_stockb_90))
10113          (= a_stocka_90 a_stockb_90)
10114          (= c_stocka_90 c_stockb_90)
10115          (or
10116            (and
10117              (= truck_loc_90 1)
10118              (= truck_travel_time_90 17)
10119            )
10120            (and
10121              (= truck_loc_90 0)
10122              (= truck_travel_time_90 21)
10123            )
10124            (and
10125              (= truck_loc_90 3)
10126              (= truck_travel_time_90 37)
10127            )
10128          )
10129        )
10130      )
10131      (=> (= truck_loc_89 3)
10132        (and
10133          (<= c_stocka_90 200)
10134          (= (+ truck_stock_90 c_stocka_90) (+ truck_stock_89 c_stockb_90))
10135          (= a_stocka_90 a_stockb_90)
10136          (= b_stocka_90 b_stockb_90)
10137          (or
10138            (and
10139              (= truck_loc_90 1)
10140              (= truck_travel_time_90 32)
10141            )
10142            (and
10143              (= truck_loc_90 2)
10144              (= truck_travel_time_90 37)
10145            )
10146          )
```

```
10147        )
10148      )
10149    )
10150    (<= truck_stock_90 300)
10151    (>= truck_stock_90 0)
10152    (= a_stockb_91 (- a_stocka_90 truck_travel_time_90))
10153    (= b_stockb_91 (- b_stocka_90 truck_travel_time_90))
10154    (= c_stockb_91 (- c_stocka_90 truck_travel_time_90))
10155    (and
10156      (=> (= truck_loc_90 0)
10157        (and
10158          (= a_stocka_91 a_stockb_91)
10159          (= b_stocka_91 b_stockb_91)
10160          (= c_stocka_91 c_stockb_91)
10161          (or
10162            (and
10163              (= truck_loc_91 1)
10164              (= truck_travel_time_91 29)
10165            )
10166            (and
10167              (= truck_loc_91 2)
10168              (= truck_travel_time_91 21)
10169            )
10170          )
10171        )
10172      )
10173      (=> (= truck_loc_90 1)
10174        (and
10175          (<= a_stocka_91 120)
10176          (= (+ truck_stock_91 a_stocka_91) (+ truck_stock_90 a_stockb_91))
10177          (= b_stocka_91 b_stockb_91)
10178          (= c_stocka_91 c_stockb_91)
10179          (or
10180            (and
10181              (= truck_loc_91 0)
10182              (= truck_travel_time_91 29)
10183            )
10184            (and
10185              (= truck_loc_91 2)
10186              (= truck_travel_time_91 17)
10187            )
10188            (and
10189              (= truck_loc_91 3)
10190              (= truck_travel_time_91 32)
10191            )
10192          )
10193        )
10194      )
10195      (=> (= truck_loc_90 2)
10196        (and
10197          (<= b_stocka_91 120)
10198          (= (+ truck_stock_91 b_stocka_91) (+ truck_stock_90 b_stockb_91))
10199          (= a_stocka_91 a_stockb_91)
10200          (= c_stocka_91 c_stockb_91)
10201          (or
10202            (and
10203              (= truck_loc_91 1)
10204              (= truck_travel_time_91 17)
10205            )
10206            (and
10207              (= truck_loc_91 0)
10208              (= truck_travel_time_91 21)
```

```
10209              )
10210            (and
10211              (= truck_loc_91 3)
10212              (= truck_travel_time_91 37)
10213            )
10214          )
10215        )
10216    )
10217    (=> (= truck_loc_90 3)
10218      (and
10219        (<= c_stocka_91 200)
10220        (= (+ truck_stock_91 c_stocka_91) (+ truck_stock_90 c_stockb_91))
10221        (= a_stocka_91 a_stockb_91)
10222        (= b_stocka_91 b_stockb_91)
10223        (or
10224          (and
10225            (= truck_loc_91 1)
10226            (= truck_travel_time_91 32)
10227          )
10228          (and
10229            (= truck_loc_91 2)
10230            (= truck_travel_time_91 37)
10231          )
10232        )
10233      )
10234    )
10235  )
10236  (<= truck_stock_91 300)
10237  (>= truck_stock_91 0)
10238  (= a_stockb_92 (- a_stocka_91 truck_travel_time_91))
10239  (= b_stockb_92 (- b_stocka_91 truck_travel_time_91))
10240  (= c_stockb_92 (- c_stocka_91 truck_travel_time_91))
10241  (and
10242    (=> (= truck_loc_91 0)
10243      (and
10244        (= a_stocka_92 a_stockb_92)
10245        (= b_stocka_92 b_stockb_92)
10246        (= c_stocka_92 c_stockb_92)
10247        (or
10248          (and
10249            (= truck_loc_92 1)
10250            (= truck_travel_time_92 29)
10251          )
10252          (and
10253            (= truck_loc_92 2)
10254            (= truck_travel_time_92 21)
10255          )
10256        )
10257      )
10258    )
10259    (=> (= truck_loc_91 1)
10260      (and
10261        (<= a_stocka_92 120)
10262        (= (+ truck_stock_92 a_stocka_92) (+ truck_stock_91 a_stockb_92))
10263        (= b_stocka_92 b_stockb_92)
10264        (= c_stocka_92 c_stockb_92)
10265        (or
10266          (and
10267            (= truck_loc_92 0)
10268            (= truck_travel_time_92 29)
10269          )
10270          (and
```

```
10271              (= truck_loc_92 2)
10272              (= truck_travel_time_92 17)
10273            )
10274          (and
10275            (= truck_loc_92 3)
10276            (= truck_travel_time_92 32)
10277          )
10278        )
10279      )
10280    )
10281    (=> (= truck_loc_91 2)
10282      (and
10283        (<= b_stocka_92 120)
10284        (= (+ truck_stock_92 b_stocka_92) (+ truck_stock_91 b_stockb_92))
10285        (= a_stocka_92 a_stockb_92)
10286        (= c_stocka_92 c_stockb_92)
10287        (or
10288          (and
10289            (= truck_loc_92 1)
10290            (= truck_travel_time_92 17)
10291          )
10292          (and
10293            (= truck_loc_92 0)
10294            (= truck_travel_time_92 21)
10295          )
10296          (and
10297            (= truck_loc_92 3)
10298            (= truck_travel_time_92 37)
10299          )
10300        )
10301      )
10302    )
10303    (=> (= truck_loc_91 3)
10304      (and
10305        (<= c_stocka_92 200)
10306        (= (+ truck_stock_92 c_stocka_92) (+ truck_stock_91 c_stockb_92))
10307        (= a_stocka_92 a_stockb_92)
10308        (= b_stocka_92 b_stockb_92)
10309        (or
10310          (and
10311            (= truck_loc_92 1)
10312            (= truck_travel_time_92 32)
10313          )
10314          (and
10315            (= truck_loc_92 2)
10316            (= truck_travel_time_92 37)
10317          )
10318        )
10319      )
10320    )
10321  )
10322  (<= truck_stock_92 300)
10323  (>= truck_stock_92 0)
10324  (= a_stockb_93 (- a_stocka_92 truck_travel_time_92))
10325  (= b_stockb_93 (- b_stocka_92 truck_travel_time_92))
10326  (= c_stockb_93 (- c_stocka_92 truck_travel_time_92))
10327  (and
10328    (=> (= truck_loc_92 0)
10329      (and
10330        (= a_stocka_93 a_stockb_93)
10331        (= b_stocka_93 b_stockb_93)
10332        (= c_stocka_93 c_stockb_93)
```

```
10333          (or
10334            (and
10335              (= truck_loc_93 1)
10336              (= truck_travel_time_93 29)
10337            )
10338            (and
10339              (= truck_loc_93 2)
10340              (= truck_travel_time_93 21)
10341            )
10342          )
10343        )
10344      )
10345      (=> (= truck_loc_92 1)
10346        (and
10347          (<= a_stocka_93 120)
10348          (= (+ truck_stock_93 a_stocka_93) (+ truck_stock_92 a_stockb_93))
10349          (= b_stocka_93 b_stockb_93)
10350          (= c_stocka_93 c_stockb_93)
10351          (or
10352            (and
10353              (= truck_loc_93 0)
10354              (= truck_travel_time_93 29)
10355            )
10356            (and
10357              (= truck_loc_93 2)
10358              (= truck_travel_time_93 17)
10359            )
10360            (and
10361              (= truck_loc_93 3)
10362              (= truck_travel_time_93 32)
10363            )
10364          )
10365        )
10366      )
10367      (=> (= truck_loc_92 2)
10368        (and
10369          (<= b_stocka_93 120)
10370          (= (+ truck_stock_93 b_stocka_93) (+ truck_stock_92 b_stockb_93))
10371          (= a_stocka_93 a_stockb_93)
10372          (= c_stocka_93 c_stockb_93)
10373          (or
10374            (and
10375              (= truck_loc_93 1)
10376              (= truck_travel_time_93 17)
10377            )
10378            (and
10379              (= truck_loc_93 0)
10380              (= truck_travel_time_93 21)
10381            )
10382            (and
10383              (= truck_loc_93 3)
10384              (= truck_travel_time_93 37)
10385            )
10386          )
10387        )
10388      )
10389      (=> (= truck_loc_92 3)
10390        (and
10391          (<= c_stocka_93 200)
10392          (= (+ truck_stock_93 c_stocka_93) (+ truck_stock_92 c_stockb_93))
10393          (= a_stocka_93 a_stockb_93)
10394          (= b_stocka_93 b_stockb_93)
```

```
10395          (or
10396            (and
10397              (= truck_loc_93 1)
10398              (= truck_travel_time_93 32)
10399            )
10400            (and
10401              (= truck_loc_93 2)
10402              (= truck_travel_time_93 37)
10403            )
10404          )
10405        )
10406      )
10407  )
10408  (<= truck_stock_93 300)
10409  (>= truck_stock_93 0)
10410  (= a_stockb_94 (- a_stocka_93 truck_travel_time_93))
10411  (= b_stockb_94 (- b_stocka_93 truck_travel_time_93))
10412  (= c_stockb_94 (- c_stocka_93 truck_travel_time_93))
10413  (and
10414    (=> (= truck_loc_93 0)
10415      (and
10416        (= a_stocka_94 a_stockb_94)
10417        (= b_stocka_94 b_stockb_94)
10418        (= c_stocka_94 c_stockb_94)
10419        (or
10420          (and
10421            (= truck_loc_94 1)
10422            (= truck_travel_time_94 29)
10423          )
10424          (and
10425            (= truck_loc_94 2)
10426            (= truck_travel_time_94 21)
10427          )
10428        )
10429      )
10430    )
10431    (=> (= truck_loc_93 1)
10432      (and
10433        (<= a_stocka_94 120)
10434        (= (+ truck_stock_94 a_stocka_94) (+ truck_stock_93 a_stockb_94))
10435        (= b_stocka_94 b_stockb_94)
10436        (= c_stocka_94 c_stockb_94)
10437        (or
10438          (and
10439            (= truck_loc_94 0)
10440            (= truck_travel_time_94 29)
10441          )
10442          (and
10443            (= truck_loc_94 2)
10444            (= truck_travel_time_94 17)
10445          )
10446          (and
10447            (= truck_loc_94 3)
10448            (= truck_travel_time_94 32)
10449          )
10450        )
10451      )
10452    )
10453    (=> (= truck_loc_93 2)
10454      (and
10455        (<= b_stocka_94 120)
10456        (= (+ truck_stock_94 b_stocka_94) (+ truck_stock_93 b_stockb_94))
```

```
10457        (= a_stocka_94 a_stockb_94)
10458        (= c_stocka_94 c_stockb_94)
10459        (or
10460          (and
10461            (= truck_loc_94 1)
10462            (= truck_travel_time_94 17)
10463          )
10464          (and
10465            (= truck_loc_94 0)
10466            (= truck_travel_time_94 21)
10467          )
10468          (and
10469            (= truck_loc_94 3)
10470            (= truck_travel_time_94 37)
10471          )
10472        )
10473      )
10474    )
10475    (=> (= truck_loc_93 3)
10476      (and
10477        (<= c_stocka_94 200)
10478        (= (+ truck_stock_94 c_stocka_94) (+ truck_stock_93 c_stockb_94))
10479        (= a_stocka_94 a_stockb_94)
10480        (= b_stocka_94 b_stockb_94)
10481        (or
10482          (and
10483            (= truck_loc_94 1)
10484            (= truck_travel_time_94 32)
10485          )
10486          (and
10487            (= truck_loc_94 2)
10488            (= truck_travel_time_94 37)
10489          )
10490        )
10491      )
10492    )
10493  )
10494  (<= truck_stock_94 300)
10495  (>= truck_stock_94 0)
10496  (= a_stockb_95 (- a_stocka_94 truck_travel_time_94))
10497  (= b_stockb_95 (- b_stocka_94 truck_travel_time_94))
10498  (= c_stockb_95 (- c_stocka_94 truck_travel_time_94))
10499  (and
10500    (=> (= truck_loc_94 0)
10501      (and
10502        (= a_stocka_95 a_stockb_95)
10503        (= b_stocka_95 b_stockb_95)
10504        (= c_stocka_95 c_stockb_95)
10505        (or
10506          (and
10507            (= truck_loc_95 1)
10508            (= truck_travel_time_95 29)
10509          )
10510          (and
10511            (= truck_loc_95 2)
10512            (= truck_travel_time_95 21)
10513          )
10514        )
10515      )
10516    )
10517    (=> (= truck_loc_94 1)
10518      (and
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```
10519        (<= a_stocka_95 120)
10520        (= (+ truck_stock_95 a_stocka_95) (+ truck_stock_94 a_stockb_95))
10521        (= b_stocka_95 b_stockb_95)
10522        (= c_stocka_95 c_stockb_95)
10523        (or
10524          (and
10525            (= truck_loc_95 0)
10526            (= truck_travel_time_95 29)
10527          )
10528          (and
10529            (= truck_loc_95 2)
10530            (= truck_travel_time_95 17)
10531          )
10532          (and
10533            (= truck_loc_95 3)
10534            (= truck_travel_time_95 32)
10535          )
10536        )
10537      )
10538    )
10539    (=> (= truck_loc_94 2)
10540      (and
10541        (<= b_stocka_95 120)
10542        (= (+ truck_stock_95 b_stocka_95) (+ truck_stock_94 b_stockb_95))
10543        (= a_stocka_95 a_stockb_95)
10544        (= c_stocka_95 c_stockb_95)
10545        (or
10546          (and
10547            (= truck_loc_95 1)
10548            (= truck_travel_time_95 17)
10549          )
10550          (and
10551            (= truck_loc_95 0)
10552            (= truck_travel_time_95 21)
10553          )
10554          (and
10555            (= truck_loc_95 3)
10556            (= truck_travel_time_95 37)
10557          )
10558        )
10559      )
10560    )
10561    (=> (= truck_loc_94 3)
10562      (and
10563        (<= c_stocka_95 200)
10564        (= (+ truck_stock_95 c_stocka_95) (+ truck_stock_94 c_stockb_95))
10565        (= a_stocka_95 a_stockb_95)
10566        (= b_stocka_95 b_stockb_95)
10567        (or
10568          (and
10569            (= truck_loc_95 1)
10570            (= truck_travel_time_95 32)
10571          )
10572          (and
10573            (= truck_loc_95 2)
10574            (= truck_travel_time_95 37)
10575          )
10576        )
10577      )
10578    )
10579  )
10580  (<= truck_stock_95 300)
```

```
10581   (>= truck_stock_95 0)
10582   (= a_stockb_96 (- a_stocka_95 truck_travel_time_95))
10583   (= b_stockb_96 (- b_stocka_95 truck_travel_time_95))
10584   (= c_stockb_96 (- c_stocka_95 truck_travel_time_95))
10585   (and
10586     (=> (= truck_loc_95 0)
10587       (and
10588         (= a_stocka_96 a_stockb_96)
10589         (= b_stocka_96 b_stockb_96)
10590         (= c_stocka_96 c_stockb_96)
10591         (or
10592           (and
10593             (= truck_loc_96 1)
10594             (= truck_travel_time_96 29)
10595           )
10596           (and
10597             (= truck_loc_96 2)
10598             (= truck_travel_time_96 21)
10599           )
10600         )
10601       )
10602     )
10603     (=> (= truck_loc_95 1)
10604       (and
10605         (<= a_stocka_96 120)
10606         (= (+ truck_stock_96 a_stocka_96) (+ truck_stock_95 a_stockb_96))
10607         (= b_stocka_96 b_stockb_96)
10608         (= c_stocka_96 c_stockb_96)
10609         (or
10610           (and
10611             (= truck_loc_96 0)
10612             (= truck_travel_time_96 29)
10613           )
10614           (and
10615             (= truck_loc_96 2)
10616             (= truck_travel_time_96 17)
10617           )
10618           (and
10619             (= truck_loc_96 3)
10620             (= truck_travel_time_96 32)
10621           )
10622         )
10623       )
10624     )
10625     (=> (= truck_loc_95 2)
10626       (and
10627         (<= b_stocka_96 120)
10628         (= (+ truck_stock_96 b_stocka_96) (+ truck_stock_95 b_stockb_96))
10629         (= a_stocka_96 a_stockb_96)
10630         (= c_stocka_96 c_stockb_96)
10631         (or
10632           (and
10633             (= truck_loc_96 1)
10634             (= truck_travel_time_96 17)
10635           )
10636           (and
10637             (= truck_loc_96 0)
10638             (= truck_travel_time_96 21)
10639           )
10640           (and
10641             (= truck_loc_96 3)
10642             (= truck_travel_time_96 37)
```

```
10643              )
10644            )
10645          )
10646      )
10647      (=> (= truck_loc_95 3)
10648        (and
10649          (<= c_stocka_96 200)
10650          (= (+ truck_stock_96 c_stocka_96) (+ truck_stock_95 c_stockb_96))
10651          (= a_stocka_96 a_stockb_96)
10652          (= b_stocka_96 b_stockb_96)
10653          (or
10654            (and
10655              (= truck_loc_96 1)
10656              (= truck_travel_time_96 32)
10657            )
10658            (and
10659              (= truck_loc_96 2)
10660              (= truck_travel_time_96 37)
10661            )
10662          )
10663        )
10664      )
10665    )
10666    (<= truck_stock_96 300)
10667    (>= truck_stock_96 0)
10668    (= a_stockb_97 (- a_stocka_96 truck_travel_time_96))
10669    (= b_stockb_97 (- b_stocka_96 truck_travel_time_96))
10670    (= c_stockb_97 (- c_stocka_96 truck_travel_time_96))
10671    (and
10672      (=> (= truck_loc_96 0)
10673        (and
10674          (= a_stocka_97 a_stockb_97)
10675          (= b_stocka_97 b_stockb_97)
10676          (= c_stocka_97 c_stockb_97)
10677          (or
10678            (and
10679              (= truck_loc_97 1)
10680              (= truck_travel_time_97 29)
10681            )
10682            (and
10683              (= truck_loc_97 2)
10684              (= truck_travel_time_97 21)
10685            )
10686          )
10687        )
10688      )
10689      (=> (= truck_loc_96 1)
10690        (and
10691          (<= a_stocka_97 120)
10692          (= (+ truck_stock_97 a_stocka_97) (+ truck_stock_96 a_stockb_97))
10693          (= b_stocka_97 b_stockb_97)
10694          (= c_stocka_97 c_stockb_97)
10695          (or
10696            (and
10697              (= truck_loc_97 0)
10698              (= truck_travel_time_97 29)
10699            )
10700            (and
10701              (= truck_loc_97 2)
10702              (= truck_travel_time_97 17)
10703            )
10704            (and
```

```
10705              (= truck_loc_97 3)
10706              (= truck_travel_time_97 32)
10707            )
10708          )
10709        )
10710    )
10711    (=> (= truck_loc_96 2)
10712       (and
10713         (<= b_stocka_97 120)
10714         (= (+ truck_stock_97 b_stocka_97) (+ truck_stock_96 b_stockb_97))
10715         (= a_stocka_97 a_stockb_97)
10716         (= c_stocka_97 c_stockb_97)
10717         (or
10718           (and
10719             (= truck_loc_97 1)
10720             (= truck_travel_time_97 17)
10721           )
10722           (and
10723             (= truck_loc_97 0)
10724             (= truck_travel_time_97 21)
10725           )
10726           (and
10727             (= truck_loc_97 3)
10728             (= truck_travel_time_97 37)
10729           )
10730         )
10731       )
10732    )
10733    (=> (= truck_loc_96 3)
10734       (and
10735         (<= c_stocka_97 200)
10736         (= (+ truck_stock_97 c_stocka_97) (+ truck_stock_96 c_stockb_97))
10737         (= a_stocka_97 a_stockb_97)
10738         (= b_stocka_97 b_stockb_97)
10739         (or
10740           (and
10741             (= truck_loc_97 1)
10742             (= truck_travel_time_97 32)
10743           )
10744           (and
10745             (= truck_loc_97 2)
10746             (= truck_travel_time_97 37)
10747           )
10748         )
10749       )
10750    )
10751  )
10752  (<= truck_stock_97 300)
10753  (>= truck_stock_97 0)
10754  (= a_stockb_98 (- a_stocka_97 truck_travel_time_97))
10755  (= b_stockb_98 (- b_stocka_97 truck_travel_time_97))
10756  (= c_stockb_98 (- c_stocka_97 truck_travel_time_97))
10757  (and
10758    (=> (= truck_loc_97 0)
10759       (and
10760         (= a_stocka_98 a_stockb_98)
10761         (= b_stocka_98 b_stockb_98)
10762         (= c_stocka_98 c_stockb_98)
10763         (or
10764           (and
10765             (= truck_loc_98 1)
10766             (= truck_travel_time_98 29)
```

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```
10767            )
10768          (and
10769            (= truck_loc_98 2)
10770            (= truck_travel_time_98 21)
10771          )
10772        )
10773      )
10774    )
10775    (=> (= truck_loc_97 1)
10776      (and
10777        (<= a_stocka_98 120)
10778        (= (+ truck_stock_98 a_stocka_98) (+ truck_stock_97 a_stockb_98))
10779        (= b_stocka_98 b_stockb_98)
10780        (= c_stocka_98 c_stockb_98)
10781        (or
10782          (and
10783            (= truck_loc_98 0)
10784            (= truck_travel_time_98 29)
10785          )
10786          (and
10787            (= truck_loc_98 2)
10788            (= truck_travel_time_98 17)
10789          )
10790          (and
10791            (= truck_loc_98 3)
10792            (= truck_travel_time_98 32)
10793          )
10794        )
10795      )
10796    )
10797    (=> (= truck_loc_97 2)
10798      (and
10799        (<= b_stocka_98 120)
10800        (= (+ truck_stock_98 b_stocka_98) (+ truck_stock_97 b_stockb_98))
10801        (= a_stocka_98 a_stockb_98)
10802        (= c_stocka_98 c_stockb_98)
10803        (or
10804          (and
10805            (= truck_loc_98 1)
10806            (= truck_travel_time_98 17)
10807          )
10808          (and
10809            (= truck_loc_98 0)
10810            (= truck_travel_time_98 21)
10811          )
10812          (and
10813            (= truck_loc_98 3)
10814            (= truck_travel_time_98 37)
10815          )
10816        )
10817      )
10818    )
10819    (=> (= truck_loc_97 3)
10820      (and
10821        (<= c_stocka_98 200)
10822        (= (+ truck_stock_98 c_stocka_98) (+ truck_stock_97 c_stockb_98))
10823        (= a_stocka_98 a_stockb_98)
10824        (= b_stocka_98 b_stockb_98)
10825        (or
10826          (and
10827            (= truck_loc_98 1)
10828            (= truck_travel_time_98 32)
```

```
10829             )
10830           (and
10831             (= truck_loc_98 2)
10832             (= truck_travel_time_98 37)
10833           )
10834         )
10835       )
10836     )
10837   )
10838   (<= truck_stock_98 300)
10839   (>= truck_stock_98 0)
10840   (= a_stockb_99 (- a_stocka_98 truck_travel_time_98))
10841   (= b_stockb_99 (- b_stocka_98 truck_travel_time_98))
10842   (= c_stockb_99 (- c_stocka_98 truck_travel_time_98))
10843   (and
10844     (=> (= truck_loc_98 0)
10845       (and
10846         (= a_stocka_99 a_stockb_99)
10847         (= b_stocka_99 b_stockb_99)
10848         (= c_stocka_99 c_stockb_99)
10849         (or
10850           (and
10851             (= truck_loc_99 1)
10852             (= truck_travel_time_99 29)
10853           )
10854           (and
10855             (= truck_loc_99 2)
10856             (= truck_travel_time_99 21)
10857           )
10858         )
10859       )
10860     )
10861     (=> (= truck_loc_98 1)
10862       (and
10863         (<= a_stocka_99 120)
10864         (= (+ truck_stock_99 a_stocka_99) (+ truck_stock_98 a_stockb_99))
10865         (= b_stocka_99 b_stockb_99)
10866         (= c_stocka_99 c_stockb_99)
10867         (or
10868           (and
10869             (= truck_loc_99 0)
10870             (= truck_travel_time_99 29)
10871           )
10872           (and
10873             (= truck_loc_99 2)
10874             (= truck_travel_time_99 17)
10875           )
10876           (and
10877             (= truck_loc_99 3)
10878             (= truck_travel_time_99 32)
10879           )
10880         )
10881       )
10882     )
10883     (=> (= truck_loc_98 2)
10884       (and
10885         (<= b_stocka_99 120)
10886         (= (+ truck_stock_99 b_stocka_99) (+ truck_stock_98 b_stockb_99))
10887         (= a_stocka_99 a_stockb_99)
10888         (= c_stocka_99 c_stockb_99)
10889         (or
10890           (and
```

```
10891              (= truck_loc_99 1)
10892              (= truck_travel_time_99 17)
10893            )
10894          (and
10895              (= truck_loc_99 0)
10896              (= truck_travel_time_99 21)
10897          )
10898          (and
10899              (= truck_loc_99 3)
10900              (= truck_travel_time_99 37)
10901          )
10902        )
10903      )
10904    )
10905    (=> (= truck_loc_98 3)
10906      (and
10907        (<= c_stocka_99 200)
10908        (= (+ truck_stock_99 c_stocka_99) (+ truck_stock_98 c_stockb_99))
10909        (= a_stocka_99 a_stockb_99)
10910        (= b_stocka_99 b_stockb_99)
10911        (or
10912          (and
10913              (= truck_loc_99 1)
10914              (= truck_travel_time_99 32)
10915          )
10916          (and
10917              (= truck_loc_99 2)
10918              (= truck_travel_time_99 37)
10919          )
10920        )
10921      )
10922    )
10923  )
10924  (<= truck_stock_99 300)
10925  (>= truck_stock_99 0)
10926  (= a_stockb_100 (- a_stocka_99 truck_travel_time_99))
10927  (= b_stockb_100 (- b_stocka_99 truck_travel_time_99))
10928  (= c_stockb_100 (- c_stocka_99 truck_travel_time_99))
10929  (and
10930    (=> (= truck_loc_99 0)
10931      (and
10932        (= a_stocka_100 a_stockb_100)
10933        (= b_stocka_100 b_stockb_100)
10934        (= c_stocka_100 c_stockb_100)
10935        (or
10936          (and
10937              (= truck_loc_100 1)
10938              (= truck_travel_time_100 29)
10939          )
10940          (and
10941              (= truck_loc_100 2)
10942              (= truck_travel_time_100 21)
10943          )
10944        )
10945      )
10946    )
10947    (=> (= truck_loc_99 1)
10948      (and
10949        (<= a_stocka_100 120)
10950        (= (+ truck_stock_100 a_stocka_100) (+ truck_stock_99 a_stockb_100))
10951        (= b_stocka_100 b_stockb_100)
10952        (= c_stocka_100 c_stockb_100)
```

```
10953        (or
10954          (and
10955            (= truck_loc_100 0)
10956            (= truck_travel_time_100 29)
10957          )
10958          (and
10959            (= truck_loc_100 2)
10960            (= truck_travel_time_100 17)
10961          )
10962          (and
10963            (= truck_loc_100 3)
10964            (= truck_travel_time_100 32)
10965          )
10966        )
10967      )
10968    )
10969    (=> (= truck_loc_99 2)
10970      (and
10971        (<= b_stocka_100 120)
10972        (= (+ truck_stock_100 b_stocka_100) (+ truck_stock_99 b_stockb_100))
10973        (= a_stocka_100 a_stockb_100)
10974        (= c_stocka_100 c_stockb_100)
10975        (or
10976          (and
10977            (= truck_loc_100 1)
10978            (= truck_travel_time_100 17)
10979          )
10980          (and
10981            (= truck_loc_100 0)
10982            (= truck_travel_time_100 21)
10983          )
10984          (and
10985            (= truck_loc_100 3)
10986            (= truck_travel_time_100 37)
10987          )
10988        )
10989      )
10990    )
10991    (=> (= truck_loc_99 3)
10992      (and
10993        (<= c_stocka_100 200)
10994        (= (+ truck_stock_100 c_stocka_100) (+ truck_stock_99 c_stockb_100))
10995        (= a_stocka_100 a_stockb_100)
10996        (= b_stocka_100 b_stockb_100)
10997        (or
10998          (and
10999            (= truck_loc_100 1)
11000            (= truck_travel_time_100 32)
11001          )
11002          (and
11003            (= truck_loc_100 2)
11004            (= truck_travel_time_100 37)
11005          )
11006        )
11007      )
11008    )
11009  )
11010  (<= truck_stock_100 300)
11011  (>= truck_stock_100 0)
11012  (= a_stockb_101 (- a_stocka_100 truck_travel_time_100))
11013  (= b_stockb_101 (- b_stocka_100 truck_travel_time_100))
11014  (= c_stockb_101 (- c_stocka_100 truck_travel_time_100))
```

```
11015  (and
11016    (=> (= truck_loc_100 0)
11017      (and
11018        (= a_stocka_101 a_stockb_101)
11019        (= b_stocka_101 b_stockb_101)
11020        (= c_stocka_101 c_stockb_101)
11021        (or
11022          (and
11023            (= truck_loc_101 1)
11024            (= truck_travel_time_101 29)
11025          )
11026          (and
11027            (= truck_loc_101 2)
11028            (= truck_travel_time_101 21)
11029          )
11030        )
11031      )
11032    )
11033    (=> (= truck_loc_100 1)
11034      (and
11035        (<= a_stocka_101 120)
11036        (= (+ truck_stock_101 a_stocka_101) (+ truck_stock_100 a_stockb_101))
11037        (= b_stocka_101 b_stockb_101)
11038        (= c_stocka_101 c_stockb_101)
11039        (or
11040          (and
11041            (= truck_loc_101 0)
11042            (= truck_travel_time_101 29)
11043          )
11044          (and
11045            (= truck_loc_101 2)
11046            (= truck_travel_time_101 17)
11047          )
11048          (and
11049            (= truck_loc_101 3)
11050            (= truck_travel_time_101 32)
11051          )
11052        )
11053      )
11054    )
11055    (=> (= truck_loc_100 2)
11056      (and
11057        (<= b_stocka_101 120)
11058        (= (+ truck_stock_101 b_stocka_101) (+ truck_stock_100 b_stockb_101))
11059        (= a_stocka_101 a_stockb_101)
11060        (= c_stocka_101 c_stockb_101)
11061        (or
11062          (and
11063            (= truck_loc_101 1)
11064            (= truck_travel_time_101 17)
11065          )
11066          (and
11067            (= truck_loc_101 0)
11068            (= truck_travel_time_101 21)
11069          )
11070          (and
11071            (= truck_loc_101 3)
11072            (= truck_travel_time_101 37)
11073          )
11074        )
11075      )
11076    )
```

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```
11077    (=> (= truck_loc_100 3)
11078      (and
11079        (<= c_stocka_101 200)
11080        (= (+ truck_stock_101 c_stocka_101) (+ truck_stock_100 c_stockb_101))
11081        (= a_stocka_101 a_stockb_101)
11082        (= b_stocka_101 b_stockb_101)
11083        (or
11084          (and
11085            (= truck_loc_101 1)
11086            (= truck_travel_time_101 32)
11087          )
11088          (and
11089            (= truck_loc_101 2)
11090            (= truck_travel_time_101 37)
11091          )
11092        )
11093      )
11094    )
11095  )
11096  (<= truck_stock_101 300)
11097  (>= truck_stock_101 0)
11098  (= a_stockb_102 (- a_stocka_101 truck_travel_time_101))
11099  (= b_stockb_102 (- b_stocka_101 truck_travel_time_101))
11100  (= c_stockb_102 (- c_stocka_101 truck_travel_time_101))
11101  (and
11102    (=> (= truck_loc_101 0)
11103      (and
11104        (= a_stocka_102 a_stockb_102)
11105        (= b_stocka_102 b_stockb_102)
11106        (= c_stocka_102 c_stockb_102)
11107        (or
11108          (and
11109            (= truck_loc_102 1)
11110            (= truck_travel_time_102 29)
11111          )
11112          (and
11113            (= truck_loc_102 2)
11114            (= truck_travel_time_102 21)
11115          )
11116        )
11117      )
11118    )
11119    (=> (= truck_loc_101 1)
11120      (and
11121        (<= a_stocka_102 120)
11122        (= (+ truck_stock_102 a_stocka_102) (+ truck_stock_101 a_stockb_102))
11123        (= b_stocka_102 b_stockb_102)
11124        (= c_stocka_102 c_stockb_102)
11125        (or
11126          (and
11127            (= truck_loc_102 0)
11128            (= truck_travel_time_102 29)
11129          )
11130          (and
11131            (= truck_loc_102 2)
11132            (= truck_travel_time_102 17)
11133          )
11134          (and
11135            (= truck_loc_102 3)
11136            (= truck_travel_time_102 32)
11137          )
11138        )
```

```
11139        )
11140      )
11141    (=> (= truck_loc_101 2)
11142      (and
11143        (<= b_stocka_102 120)
11144        (= (+ truck_stock_102 b_stocka_102) (+ truck_stock_101 b_stockb_102))
11145        (= a_stocka_102 a_stockb_102)
11146        (= c_stocka_102 c_stockb_102)
11147        (or
11148          (and
11149            (= truck_loc_102 1)
11150            (= truck_travel_time_102 17)
11151          )
11152          (and
11153            (= truck_loc_102 0)
11154            (= truck_travel_time_102 21)
11155          )
11156          (and
11157            (= truck_loc_102 3)
11158            (= truck_travel_time_102 37)
11159          )
11160        )
11161      )
11162    )
11163    (=> (= truck_loc_101 3)
11164      (and
11165        (<= c_stocka_102 200)
11166        (= (+ truck_stock_102 c_stocka_102) (+ truck_stock_101 c_stockb_102))
11167        (= a_stocka_102 a_stockb_102)
11168        (= b_stocka_102 b_stockb_102)
11169        (or
11170          (and
11171            (= truck_loc_102 1)
11172            (= truck_travel_time_102 32)
11173          )
11174          (and
11175            (= truck_loc_102 2)
11176            (= truck_travel_time_102 37)
11177          )
11178        )
11179      )
11180    )
11181  )
11182  (<= truck_stock_102 300)
11183  (>= truck_stock_102 0)
11184  (= a_stockb_103 (- a_stocka_102 truck_travel_time_102))
11185  (= b_stockb_103 (- b_stocka_102 truck_travel_time_102))
11186  (= c_stockb_103 (- c_stocka_102 truck_travel_time_102))
11187  (and
11188    (=> (= truck_loc_102 0)
11189      (and
11190        (= a_stocka_103 a_stockb_103)
11191        (= b_stocka_103 b_stockb_103)
11192        (= c_stocka_103 c_stockb_103)
11193        (or
11194          (and
11195            (= truck_loc_103 1)
11196            (= truck_travel_time_103 29)
11197          )
11198          (and
11199            (= truck_loc_103 2)
11200            (= truck_travel_time_103 21)
```

```
11201              )
11202            )
11203          )
11204        )
11205        (=> (= truck_loc_102 1)
11206          (and
11207            (<= a_stocka_103 120)
11208            (= (+ truck_stock_103 a_stocka_103) (+ truck_stock_102 a_stockb_103))
11209            (= b_stocka_103 b_stockb_103)
11210            (= c_stocka_103 c_stockb_103)
11211            (or
11212              (and
11213                (= truck_loc_103 0)
11214                (= truck_travel_time_103 29)
11215              )
11216              (and
11217                (= truck_loc_103 2)
11218                (= truck_travel_time_103 17)
11219              )
11220              (and
11221                (= truck_loc_103 3)
11222                (= truck_travel_time_103 32)
11223              )
11224            )
11225          )
11226        )
11227        (=> (= truck_loc_102 2)
11228          (and
11229            (<= b_stocka_103 120)
11230            (= (+ truck_stock_103 b_stocka_103) (+ truck_stock_102 b_stockb_103))
11231            (= a_stocka_103 a_stockb_103)
11232            (= c_stocka_103 c_stockb_103)
11233            (or
11234              (and
11235                (= truck_loc_103 1)
11236                (= truck_travel_time_103 17)
11237              )
11238              (and
11239                (= truck_loc_103 0)
11240                (= truck_travel_time_103 21)
11241              )
11242              (and
11243                (= truck_loc_103 3)
11244                (= truck_travel_time_103 37)
11245              )
11246            )
11247          )
11248        )
11249        (=> (= truck_loc_102 3)
11250          (and
11251            (<= c_stocka_103 200)
11252            (= (+ truck_stock_103 c_stocka_103) (+ truck_stock_102 c_stockb_103))
11253            (= a_stocka_103 a_stockb_103)
11254            (= b_stocka_103 b_stockb_103)
11255            (or
11256              (and
11257                (= truck_loc_103 1)
11258                (= truck_travel_time_103 32)
11259              )
11260              (and
11261                (= truck_loc_103 2)
11262                (= truck_travel_time_103 37)
```

```
11263             )
11264           )
11265         )
11266     )
11267 )
11268 (<= truck_stock_103 300)
11269 (>= truck_stock_103 0)
11270 (= a_stockb_104 (- a_stocka_103 truck_travel_time_103))
11271 (= b_stockb_104 (- b_stocka_103 truck_travel_time_103))
11272 (= c_stockb_104 (- c_stocka_103 truck_travel_time_103))
11273 (and
11274     (=> (= truck_loc_103 0)
11275         (and
11276             (= a_stocka_104 a_stockb_104)
11277             (= b_stocka_104 b_stockb_104)
11278             (= c_stocka_104 c_stockb_104)
11279             (or
11280                 (and
11281                     (= truck_loc_104 1)
11282                     (= truck_travel_time_104 29)
11283                 )
11284                 (and
11285                     (= truck_loc_104 2)
11286                     (= truck_travel_time_104 21)
11287                 )
11288             )
11289         )
11290     )
11291     (=> (= truck_loc_103 1)
11292         (and
11293             (<= a_stocka_104 120)
11294             (= (+ truck_stock_104 a_stocka_104) (+ truck_stock_103 a_stockb_104))
11295             (= b_stocka_104 b_stockb_104)
11296             (= c_stocka_104 c_stockb_104)
11297             (or
11298                 (and
11299                     (= truck_loc_104 0)
11300                     (= truck_travel_time_104 29)
11301                 )
11302                 (and
11303                     (= truck_loc_104 2)
11304                     (= truck_travel_time_104 17)
11305                 )
11306                 (and
11307                     (= truck_loc_104 3)
11308                     (= truck_travel_time_104 32)
11309                 )
11310             )
11311         )
11312     )
11313     (=> (= truck_loc_103 2)
11314         (and
11315             (<= b_stocka_104 120)
11316             (= (+ truck_stock_104 b_stocka_104) (+ truck_stock_103 b_stockb_104))
11317             (= a_stocka_104 a_stockb_104)
11318             (= c_stocka_104 c_stockb_104)
11319             (or
11320                 (and
11321                     (= truck_loc_104 1)
11322                     (= truck_travel_time_104 17)
11323                 )
11324                 (and
```

```
11325              (= truck_loc_104 0)
11326              (= truck_travel_time_104 21)
11327            )
11328          (and
11329            (= truck_loc_104 3)
11330            (= truck_travel_time_104 37)
11331          )
11332        )
11333      )
11334    )
11335    (=> (= truck_loc_103 3)
11336      (and
11337        (<= c_stocka_104 200)
11338        (= (+ truck_stock_104 c_stocka_104) (+ truck_stock_103 c_stockb_104))
11339        (= a_stocka_104 a_stockb_104)
11340        (= b_stocka_104 b_stockb_104)
11341        (or
11342          (and
11343            (= truck_loc_104 1)
11344            (= truck_travel_time_104 32)
11345          )
11346          (and
11347            (= truck_loc_104 2)
11348            (= truck_travel_time_104 37)
11349          )
11350        )
11351      )
11352    )
11353  )
11354  (<= truck_stock_104 300)
11355  (>= truck_stock_104 0)
11356  (= a_stockb_105 (- a_stocka_104 truck_travel_time_104))
11357  (= b_stockb_105 (- b_stocka_104 truck_travel_time_104))
11358  (= c_stockb_105 (- c_stocka_104 truck_travel_time_104))
11359  (and
11360    (=> (= truck_loc_104 0)
11361      (and
11362        (= a_stocka_105 a_stockb_105)
11363        (= b_stocka_105 b_stockb_105)
11364        (= c_stocka_105 c_stockb_105)
11365        (or
11366          (and
11367            (= truck_loc_105 1)
11368            (= truck_travel_time_105 29)
11369          )
11370          (and
11371            (= truck_loc_105 2)
11372            (= truck_travel_time_105 21)
11373          )
11374        )
11375      )
11376    )
11377    (=> (= truck_loc_104 1)
11378      (and
11379        (<= a_stocka_105 120)
11380        (= (+ truck_stock_105 a_stocka_105) (+ truck_stock_104 a_stockb_105))
11381        (= b_stocka_105 b_stockb_105)
11382        (= c_stocka_105 c_stockb_105)
11383        (or
11384          (and
11385            (= truck_loc_105 0)
11386            (= truck_travel_time_105 29)
```

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11387          )
11388        (and
11389          (= truck_loc_105 2)
11390          (= truck_travel_time_105 17)
11391        )
11392        (and
11393          (= truck_loc_105 3)
11394          (= truck_travel_time_105 32)
11395        )
11396      )
11397    )
11398  )
11399  (=> (= truck_loc_104 2)
11400    (and
11401      (<= b_stocka_105 120)
11402      (= (+ truck_stock_105 b_stocka_105) (+ truck_stock_104 b_stockb_105))
11403      (= a_stocka_105 a_stockb_105)
11404      (= c_stocka_105 c_stockb_105)
11405      (or
11406        (and
11407          (= truck_loc_105 1)
11408          (= truck_travel_time_105 17)
11409        )
11410        (and
11411          (= truck_loc_105 0)
11412          (= truck_travel_time_105 21)
11413        )
11414        (and
11415          (= truck_loc_105 3)
11416          (= truck_travel_time_105 37)
11417        )
11418      )
11419    )
11420  )
11421  (=> (= truck_loc_104 3)
11422    (and
11423      (<= c_stocka_105 200)
11424      (= (+ truck_stock_105 c_stocka_105) (+ truck_stock_104 c_stockb_105))
11425      (= a_stocka_105 a_stockb_105)
11426      (= b_stocka_105 b_stockb_105)
11427      (or
11428        (and
11429          (= truck_loc_105 1)
11430          (= truck_travel_time_105 32)
11431        )
11432        (and
11433          (= truck_loc_105 2)
11434          (= truck_travel_time_105 37)
11435        )
11436      )
11437    )
11438  )
11439  )
11440  (<= truck_stock_105 300)
11441  (>= truck_stock_105 0)
11442  (= a_stockb_106 (- a_stocka_105 truck_travel_time_105))
11443  (= b_stockb_106 (- b_stocka_105 truck_travel_time_105))
11444  (= c_stockb_106 (- c_stocka_105 truck_travel_time_105))
11445  (and
11446    (=> (= truck_loc_105 0)
11447      (and
11448        (= a_stocka_106 a_stockb_106)
```

```
11449        (= b_stocka_106 b_stockb_106)
11450        (= c_stocka_106 c_stockb_106)
11451        (or
11452          (and
11453            (= truck_loc_106 1)
11454            (= truck_travel_time_106 29)
11455          )
11456          (and
11457            (= truck_loc_106 2)
11458            (= truck_travel_time_106 21)
11459          )
11460        )
11461      )
11462    )
11463    (=> (= truck_loc_105 1)
11464      (and
11465        (<= a_stocka_106 120)
11466        (= (+ truck_stock_106 a_stocka_106) (+ truck_stock_105 a_stockb_106))
11467        (= b_stocka_106 b_stockb_106)
11468        (= c_stocka_106 c_stockb_106)
11469        (or
11470          (and
11471            (= truck_loc_106 0)
11472            (= truck_travel_time_106 29)
11473          )
11474          (and
11475            (= truck_loc_106 2)
11476            (= truck_travel_time_106 17)
11477          )
11478          (and
11479            (= truck_loc_106 3)
11480            (= truck_travel_time_106 32)
11481          )
11482        )
11483      )
11484    )
11485    (=> (= truck_loc_105 2)
11486      (and
11487        (<= b_stocka_106 120)
11488        (= (+ truck_stock_106 b_stocka_106) (+ truck_stock_105 b_stockb_106))
11489        (= a_stocka_106 a_stockb_106)
11490        (= c_stocka_106 c_stockb_106)
11491        (or
11492          (and
11493            (= truck_loc_106 1)
11494            (= truck_travel_time_106 17)
11495          )
11496          (and
11497            (= truck_loc_106 0)
11498            (= truck_travel_time_106 21)
11499          )
11500          (and
11501            (= truck_loc_106 3)
11502            (= truck_travel_time_106 37)
11503          )
11504        )
11505      )
11506    )
11507    (=> (= truck_loc_105 3)
11508      (and
11509        (<= c_stocka_106 200)
11510        (= (+ truck_stock_106 c_stocka_106) (+ truck_stock_105 c_stockb_106))
```

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11511        (= a_stocka_106 a_stockb_106)
11512        (= b_stocka_106 b_stockb_106)
11513        (or
11514          (and
11515            (= truck_loc_106 1)
11516            (= truck_travel_time_106 32)
11517          )
11518          (and
11519            (= truck_loc_106 2)
11520            (= truck_travel_time_106 37)
11521          )
11522        )
11523      )
11524    )
11525  )
11526  (<= truck_stock_106 300)
11527  (>= truck_stock_106 0)
11528  (= a_stockb_107 (- a_stocka_106 truck_travel_time_106))
11529  (= b_stockb_107 (- b_stocka_106 truck_travel_time_106))
11530  (= c_stockb_107 (- c_stocka_106 truck_travel_time_106))
11531  (and
11532    (=> (= truck_loc_106 0)
11533      (and
11534        (= a_stocka_107 a_stockb_107)
11535        (= b_stocka_107 b_stockb_107)
11536        (= c_stocka_107 c_stockb_107)
11537        (or
11538          (and
11539            (= truck_loc_107 1)
11540            (= truck_travel_time_107 29)
11541          )
11542          (and
11543            (= truck_loc_107 2)
11544            (= truck_travel_time_107 21)
11545          )
11546        )
11547      )
11548    )
11549    (=> (= truck_loc_106 1)
11550      (and
11551        (<= a_stocka_107 120)
11552        (= (+ truck_stock_107 a_stocka_107) (+ truck_stock_106 a_stockb_107))
11553        (= b_stocka_107 b_stockb_107)
11554        (= c_stocka_107 c_stockb_107)
11555        (or
11556          (and
11557            (= truck_loc_107 0)
11558            (= truck_travel_time_107 29)
11559          )
11560          (and
11561            (= truck_loc_107 2)
11562            (= truck_travel_time_107 17)
11563          )
11564          (and
11565            (= truck_loc_107 3)
11566            (= truck_travel_time_107 32)
11567          )
11568        )
11569      )
11570    )
11571    (=> (= truck_loc_106 2)
11572      (and
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```
11573        (<= b_stocka_107 120)
11574        (= (+ truck_stock_107 b_stocka_107) (+ truck_stock_106 b_stockb_107))
11575        (= a_stocka_107 a_stockb_107)
11576        (= c_stocka_107 c_stockb_107)
11577        (or
11578          (and
11579            (= truck_loc_107 1)
11580            (= truck_travel_time_107 17)
11581          )
11582          (and
11583            (= truck_loc_107 0)
11584            (= truck_travel_time_107 21)
11585          )
11586          (and
11587            (= truck_loc_107 3)
11588            (= truck_travel_time_107 37)
11589          )
11590        )
11591      )
11592    )
11593    (=> (= truck_loc_106 3)
11594      (and
11595        (<= c_stocka_107 200)
11596        (= (+ truck_stock_107 c_stocka_107) (+ truck_stock_106 c_stockb_107))
11597        (= a_stocka_107 a_stockb_107)
11598        (= b_stocka_107 b_stockb_107)
11599        (or
11600          (and
11601            (= truck_loc_107 1)
11602            (= truck_travel_time_107 32)
11603          )
11604          (and
11605            (= truck_loc_107 2)
11606            (= truck_travel_time_107 37)
11607          )
11608        )
11609      )
11610    )
11611  )
11612  (<= truck_stock_107 300)
11613  (>= truck_stock_107 0)
11614  (= a_stockb_108 (- a_stocka_107 truck_travel_time_107))
11615  (= b_stockb_108 (- b_stocka_107 truck_travel_time_107))
11616  (= c_stockb_108 (- c_stocka_107 truck_travel_time_107))
11617  (and
11618    (=> (= truck_loc_107 0)
11619      (and
11620        (= a_stocka_108 a_stockb_108)
11621        (= b_stocka_108 b_stockb_108)
11622        (= c_stocka_108 c_stockb_108)
11623        (or
11624          (and
11625            (= truck_loc_108 1)
11626            (= truck_travel_time_108 29)
11627          )
11628          (and
11629            (= truck_loc_108 2)
11630            (= truck_travel_time_108 21)
11631          )
11632        )
11633      )
11634    )
```

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```
11635    (=> (= truck_loc_107 1)
11636      (and
11637        (<= a_stocka_108 120)
11638        (= (+ truck_stock_108 a_stocka_108) (+ truck_stock_107 a_stockb_108))
11639        (= b_stocka_108 b_stockb_108)
11640        (= c_stocka_108 c_stockb_108)
11641        (or
11642          (and
11643            (= truck_loc_108 0)
11644            (= truck_travel_time_108 29)
11645          )
11646          (and
11647            (= truck_loc_108 2)
11648            (= truck_travel_time_108 17)
11649          )
11650          (and
11651            (= truck_loc_108 3)
11652            (= truck_travel_time_108 32)
11653          )
11654        )
11655      )
11656    )
11657    (=> (= truck_loc_107 2)
11658      (and
11659        (<= b_stocka_108 120)
11660        (= (+ truck_stock_108 b_stocka_108) (+ truck_stock_107 b_stockb_108))
11661        (= a_stocka_108 a_stockb_108)
11662        (= c_stocka_108 c_stockb_108)
11663        (or
11664          (and
11665            (= truck_loc_108 1)
11666            (= truck_travel_time_108 17)
11667          )
11668          (and
11669            (= truck_loc_108 0)
11670            (= truck_travel_time_108 21)
11671          )
11672          (and
11673            (= truck_loc_108 3)
11674            (= truck_travel_time_108 37)
11675          )
11676        )
11677      )
11678    )
11679    (=> (= truck_loc_107 3)
11680      (and
11681        (<= c_stocka_108 200)
11682        (= (+ truck_stock_108 c_stocka_108) (+ truck_stock_107 c_stockb_108))
11683        (= a_stocka_108 a_stockb_108)
11684        (= b_stocka_108 b_stockb_108)
11685        (or
11686          (and
11687            (= truck_loc_108 1)
11688            (= truck_travel_time_108 32)
11689          )
11690          (and
11691            (= truck_loc_108 2)
11692            (= truck_travel_time_108 37)
11693          )
11694        )
11695      )
11696    )
```

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```
11697  )
11698  (<= truck_stock_108 300)
11699  (>= truck_stock_108 0)
11700  (= a_stockb_109 (- a_stocka_108 truck_travel_time_108))
11701  (= b_stockb_109 (- b_stocka_108 truck_travel_time_108))
11702  (= c_stockb_109 (- c_stocka_108 truck_travel_time_108))
11703  (and
11704    (=> (= truck_loc_108 0)
11705      (and
11706        (= a_stocka_109 a_stockb_109)
11707        (= b_stocka_109 b_stockb_109)
11708        (= c_stocka_109 c_stockb_109)
11709        (or
11710          (and
11711            (= truck_loc_109 1)
11712            (= truck_travel_time_109 29)
11713          )
11714          (and
11715            (= truck_loc_109 2)
11716            (= truck_travel_time_109 21)
11717          )
11718        )
11719      )
11720    )
11721    (=> (= truck_loc_108 1)
11722      (and
11723        (<= a_stocka_109 120)
11724        (= (+ truck_stock_109 a_stocka_109) (+ truck_stock_108 a_stockb_109))
11725        (= b_stocka_109 b_stockb_109)
11726        (= c_stocka_109 c_stockb_109)
11727        (or
11728          (and
11729            (= truck_loc_109 0)
11730            (= truck_travel_time_109 29)
11731          )
11732          (and
11733            (= truck_loc_109 2)
11734            (= truck_travel_time_109 17)
11735          )
11736          (and
11737            (= truck_loc_109 3)
11738            (= truck_travel_time_109 32)
11739          )
11740        )
11741      )
11742    )
11743    (=> (= truck_loc_108 2)
11744      (and
11745        (<= b_stocka_109 120)
11746        (= (+ truck_stock_109 b_stocka_109) (+ truck_stock_108 b_stockb_109))
11747        (= a_stocka_109 a_stockb_109)
11748        (= c_stocka_109 c_stockb_109)
11749        (or
11750          (and
11751            (= truck_loc_109 1)
11752            (= truck_travel_time_109 17)
11753          )
11754          (and
11755            (= truck_loc_109 0)
11756            (= truck_travel_time_109 21)
11757          )
11758          (and
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```
11759              (= truck_loc_109 3)
11760              (= truck_travel_time_109 37)
11761            )
11762          )
11763        )
11764    )
11765    (=> (= truck_loc_108 3)
11766      (and
11767        (<= c_stocka_109 200)
11768        (= (+ truck_stock_109 c_stocka_109) (+ truck_stock_108 c_stockb_109))
11769        (= a_stocka_109 a_stockb_109)
11770        (= b_stocka_109 b_stockb_109)
11771        (or
11772          (and
11773            (= truck_loc_109 1)
11774            (= truck_travel_time_109 32)
11775          )
11776          (and
11777            (= truck_loc_109 2)
11778            (= truck_travel_time_109 37)
11779          )
11780        )
11781      )
11782    )
11783 )
11784 (<= truck_stock_109 300)
11785 (>= truck_stock_109 0)
11786 (= a_stockb_110 (- a_stocka_109 truck_travel_time_109))
11787 (= b_stockb_110 (- b_stocka_109 truck_travel_time_109))
11788 (= c_stockb_110 (- c_stocka_109 truck_travel_time_109))
11789 (and
11790    (=> (= truck_loc_109 0)
11791      (and
11792        (= a_stocka_110 a_stockb_110)
11793        (= b_stocka_110 b_stockb_110)
11794        (= c_stocka_110 c_stockb_110)
11795        (or
11796          (and
11797            (= truck_loc_110 1)
11798            (= truck_travel_time_110 29)
11799          )
11800          (and
11801            (= truck_loc_110 2)
11802            (= truck_travel_time_110 21)
11803          )
11804        )
11805      )
11806    )
11807    (=> (= truck_loc_109 1)
11808      (and
11809        (<= a_stocka_110 120)
11810        (= (+ truck_stock_110 a_stocka_110) (+ truck_stock_109 a_stockb_110))
11811        (= b_stocka_110 b_stockb_110)
11812        (= c_stocka_110 c_stockb_110)
11813        (or
11814          (and
11815            (= truck_loc_110 0)
11816            (= truck_travel_time_110 29)
11817          )
11818          (and
11819            (= truck_loc_110 2)
11820            (= truck_travel_time_110 17)
```

```
11821              )
11822          (and
11823            (= truck_loc_110 3)
11824            (= truck_travel_time_110 32)
11825          )
11826        )
11827      )
11828    )
11829    (=> (= truck_loc_109 2)
11830      (and
11831        (<= b_stocka_110 120)
11832        (= (+ truck_stock_110 b_stocka_110) (+ truck_stock_109 b_stockb_110))
11833        (= a_stocka_110 a_stockb_110)
11834        (= c_stocka_110 c_stockb_110)
11835        (or
11836          (and
11837            (= truck_loc_110 1)
11838            (= truck_travel_time_110 17)
11839          )
11840          (and
11841            (= truck_loc_110 0)
11842            (= truck_travel_time_110 21)
11843          )
11844          (and
11845            (= truck_loc_110 3)
11846            (= truck_travel_time_110 37)
11847          )
11848        )
11849      )
11850    )
11851    (=> (= truck_loc_109 3)
11852      (and
11853        (<= c_stocka_110 200)
11854        (= (+ truck_stock_110 c_stocka_110) (+ truck_stock_109 c_stockb_110))
11855        (= a_stocka_110 a_stockb_110)
11856        (= b_stocka_110 b_stockb_110)
11857        (or
11858          (and
11859            (= truck_loc_110 1)
11860            (= truck_travel_time_110 32)
11861          )
11862          (and
11863            (= truck_loc_110 2)
11864            (= truck_travel_time_110 37)
11865          )
11866        )
11867      )
11868    )
11869  )
11870  (<= truck_stock_110 300)
11871  (>= truck_stock_110 0)
11872  (= a_stockb_111 (- a_stocka_110 truck_travel_time_110))
11873  (= b_stockb_111 (- b_stocka_110 truck_travel_time_110))
11874  (= c_stockb_111 (- c_stocka_110 truck_travel_time_110))
11875  (and
11876    (=> (= truck_loc_110 0)
11877      (and
11878        (= a_stocka_111 a_stockb_111)
11879        (= b_stocka_111 b_stockb_111)
11880        (= c_stocka_111 c_stockb_111)
11881        (or
11882          (and
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```
11883              (= truck_loc_111 1)
11884              (= truck_travel_time_111 29)
11885            )
11886          (and
11887            (= truck_loc_111 2)
11888            (= truck_travel_time_111 21)
11889          )
11890        )
11891      )
11892    )
11893    (=> (= truck_loc_110 1)
11894      (and
11895        (<= a_stocka_111 120)
11896        (= (+ truck_stock_111 a_stocka_111) (+ truck_stock_110 a_stockb_111))
11897        (= b_stocka_111 b_stockb_111)
11898        (= c_stocka_111 c_stockb_111)
11899        (or
11900          (and
11901            (= truck_loc_111 0)
11902            (= truck_travel_time_111 29)
11903          )
11904          (and
11905            (= truck_loc_111 2)
11906            (= truck_travel_time_111 17)
11907          )
11908          (and
11909            (= truck_loc_111 3)
11910            (= truck_travel_time_111 32)
11911          )
11912        )
11913      )
11914    )
11915    (=> (= truck_loc_110 2)
11916      (and
11917        (<= b_stocka_111 120)
11918        (= (+ truck_stock_111 b_stocka_111) (+ truck_stock_110 b_stockb_111))
11919        (= a_stocka_111 a_stockb_111)
11920        (= c_stocka_111 c_stockb_111)
11921        (or
11922          (and
11923            (= truck_loc_111 1)
11924            (= truck_travel_time_111 17)
11925          )
11926          (and
11927            (= truck_loc_111 0)
11928            (= truck_travel_time_111 21)
11929          )
11930          (and
11931            (= truck_loc_111 3)
11932            (= truck_travel_time_111 37)
11933          )
11934        )
11935      )
11936    )
11937    (=> (= truck_loc_110 3)
11938      (and
11939        (<= c_stocka_111 200)
11940        (= (+ truck_stock_111 c_stocka_111) (+ truck_stock_110 c_stockb_111))
11941        (= a_stocka_111 a_stockb_111)
11942        (= b_stocka_111 b_stockb_111)
11943        (or
11944          (and
```

```
11945            (= truck_loc_111 1)
11946            (= truck_travel_time_111 32)
11947          )
11948        (and
11949          (= truck_loc_111 2)
11950          (= truck_travel_time_111 37)
11951        )
11952      )
11953    )
11954  )
11955 )
11956 (<= truck_stock_111 300)
11957 (>= truck_stock_111 0)
11958 (= a_stockb_112 (- a_stocka_111 truck_travel_time_111))
11959 (= b_stockb_112 (- b_stocka_111 truck_travel_time_111))
11960 (= c_stockb_112 (- c_stocka_111 truck_travel_time_111))
11961 (and
11962   (=> (= truck_loc_111 0)
11963     (and
11964       (= a_stocka_112 a_stockb_112)
11965       (= b_stocka_112 b_stockb_112)
11966       (= c_stocka_112 c_stockb_112)
11967       (or
11968         (and
11969           (= truck_loc_112 1)
11970           (= truck_travel_time_112 29)
11971         )
11972         (and
11973           (= truck_loc_112 2)
11974           (= truck_travel_time_112 21)
11975         )
11976       )
11977     )
11978   )
11979   (=> (= truck_loc_111 1)
11980     (and
11981       (<= a_stocka_112 120)
11982       (= (+ truck_stock_112 a_stocka_112) (+ truck_stock_111 a_stockb_112))
11983       (= b_stocka_112 b_stockb_112)
11984       (= c_stocka_112 c_stockb_112)
11985       (or
11986         (and
11987           (= truck_loc_112 0)
11988           (= truck_travel_time_112 29)
11989         )
11990         (and
11991           (= truck_loc_112 2)
11992           (= truck_travel_time_112 17)
11993         )
11994         (and
11995           (= truck_loc_112 3)
11996           (= truck_travel_time_112 32)
11997         )
11998       )
11999     )
12000   )
12001   (=> (= truck_loc_111 2)
12002     (and
12003       (<= b_stocka_112 120)
12004       (= (+ truck_stock_112 b_stocka_112) (+ truck_stock_111 b_stockb_112))
12005       (= a_stocka_112 a_stockb_112)
12006       (= c_stocka_112 c_stockb_112)
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```
12007          (or
12008            (and
12009              (= truck_loc_112 1)
12010              (= truck_travel_time_112 17)
12011            )
12012            (and
12013              (= truck_loc_112 0)
12014              (= truck_travel_time_112 21)
12015            )
12016            (and
12017              (= truck_loc_112 3)
12018              (= truck_travel_time_112 37)
12019            )
12020          )
12021        )
12022      )
12023      (=> (= truck_loc_111 3)
12024        (and
12025          (<= c_stocka_112 200)
12026          (= (+ truck_stock_112 c_stocka_112) (+ truck_stock_111 c_stockb_112))
12027          (= a_stocka_112 a_stockb_112)
12028          (= b_stocka_112 b_stockb_112)
12029          (or
12030            (and
12031              (= truck_loc_112 1)
12032              (= truck_travel_time_112 32)
12033            )
12034            (and
12035              (= truck_loc_112 2)
12036              (= truck_travel_time_112 37)
12037            )
12038          )
12039        )
12040      )
12041    )
12042    (<= truck_stock_112 300)
12043    (>= truck_stock_112 0)
12044    (= a_stockb_113 (- a_stocka_112 truck_travel_time_112))
12045    (= b_stockb_113 (- b_stocka_112 truck_travel_time_112))
12046    (= c_stockb_113 (- c_stocka_112 truck_travel_time_112))
12047    (and
12048      (=> (= truck_loc_112 0)
12049        (and
12050          (= a_stocka_113 a_stockb_113)
12051          (= b_stocka_113 b_stockb_113)
12052          (= c_stocka_113 c_stockb_113)
12053          (or
12054            (and
12055              (= truck_loc_113 1)
12056              (= truck_travel_time_113 29)
12057            )
12058            (and
12059              (= truck_loc_113 2)
12060              (= truck_travel_time_113 21)
12061            )
12062          )
12063        )
12064      )
12065      (=> (= truck_loc_112 1)
12066        (and
12067          (<= a_stocka_113 120)
12068          (= (+ truck_stock_113 a_stocka_113) (+ truck_stock_112 a_stockb_113))
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```
12069        (= b_stocka_113 b_stockb_113)
12070        (= c_stocka_113 c_stockb_113)
12071        (or
12072          (and
12073            (= truck_loc_113 0)
12074            (= truck_travel_time_113 29)
12075          )
12076          (and
12077            (= truck_loc_113 2)
12078            (= truck_travel_time_113 17)
12079          )
12080          (and
12081            (= truck_loc_113 3)
12082            (= truck_travel_time_113 32)
12083          )
12084        )
12085      )
12086    )
12087    (=> (= truck_loc_112 2)
12088      (and
12089        (<= b_stocka_113 120)
12090        (= (+ truck_stock_113 b_stocka_113) (+ truck_stock_112 b_stockb_113))
12091        (= a_stocka_113 a_stockb_113)
12092        (= c_stocka_113 c_stockb_113)
12093        (or
12094          (and
12095            (= truck_loc_113 1)
12096            (= truck_travel_time_113 17)
12097          )
12098          (and
12099            (= truck_loc_113 0)
12100            (= truck_travel_time_113 21)
12101          )
12102          (and
12103            (= truck_loc_113 3)
12104            (= truck_travel_time_113 37)
12105          )
12106        )
12107      )
12108    )
12109    (=> (= truck_loc_112 3)
12110      (and
12111        (<= c_stocka_113 200)
12112        (= (+ truck_stock_113 c_stocka_113) (+ truck_stock_112 c_stockb_113))
12113        (= a_stocka_113 a_stockb_113)
12114        (= b_stocka_113 b_stockb_113)
12115        (or
12116          (and
12117            (= truck_loc_113 1)
12118            (= truck_travel_time_113 32)
12119          )
12120          (and
12121            (= truck_loc_113 2)
12122            (= truck_travel_time_113 37)
12123          )
12124        )
12125      )
12126    )
12127  )
12128  (<= truck_stock_113 300)
12129  (>= truck_stock_113 0)
12130  (= a_stockb_114 (- a_stocka_113 truck_travel_time_113))
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12131  (= b_stockb_114 (- b_stocka_113 truck_travel_time_113))
12132  (= c_stockb_114 (- c_stocka_113 truck_travel_time_113))
12133  (and
12134    (=> (= truck_loc_113 0)
12135      (and
12136        (= a_stocka_114 a_stockb_114)
12137        (= b_stocka_114 b_stockb_114)
12138        (= c_stocka_114 c_stockb_114)
12139        (or
12140          (and
12141            (= truck_loc_114 1)
12142            (= truck_travel_time_114 29)
12143          )
12144          (and
12145            (= truck_loc_114 2)
12146            (= truck_travel_time_114 21)
12147          )
12148        )
12149      )
12150    )
12151    (=> (= truck_loc_113 1)
12152      (and
12153        (<= a_stocka_114 120)
12154        (= (+ truck_stock_114 a_stocka_114) (+ truck_stock_113 a_stockb_114))
12155        (= b_stocka_114 b_stockb_114)
12156        (= c_stocka_114 c_stockb_114)
12157        (or
12158          (and
12159            (= truck_loc_114 0)
12160            (= truck_travel_time_114 29)
12161          )
12162          (and
12163            (= truck_loc_114 2)
12164            (= truck_travel_time_114 17)
12165          )
12166          (and
12167            (= truck_loc_114 3)
12168            (= truck_travel_time_114 32)
12169          )
12170        )
12171      )
12172    )
12173    (=> (= truck_loc_113 2)
12174      (and
12175        (<= b_stocka_114 120)
12176        (= (+ truck_stock_114 b_stocka_114) (+ truck_stock_113 b_stockb_114))
12177        (= a_stocka_114 a_stockb_114)
12178        (= c_stocka_114 c_stockb_114)
12179        (or
12180          (and
12181            (= truck_loc_114 1)
12182            (= truck_travel_time_114 17)
12183          )
12184          (and
12185            (= truck_loc_114 0)
12186            (= truck_travel_time_114 21)
12187          )
12188          (and
12189            (= truck_loc_114 3)
12190            (= truck_travel_time_114 37)
12191          )
12192        )
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12193          )
12194      )
12195      (=> (= truck_loc_113 3)
12196        (and
12197          (<= c_stocka_114 200)
12198          (= (+ truck_stock_114 c_stocka_114) (+ truck_stock_113 c_stockb_114))
12199          (= a_stocka_114 a_stockb_114)
12200          (= b_stocka_114 b_stockb_114)
12201          (or
12202            (and
12203              (= truck_loc_114 1)
12204              (= truck_travel_time_114 32)
12205            )
12206            (and
12207              (= truck_loc_114 2)
12208              (= truck_travel_time_114 37)
12209            )
12210          )
12211        )
12212      )
12213  )
12214  (<= truck_stock_114 300)
12215  (>= truck_stock_114 0)
12216  (= a_stockb_115 (- a_stocka_114 truck_travel_time_114))
12217  (= b_stockb_115 (- b_stocka_114 truck_travel_time_114))
12218  (= c_stockb_115 (- c_stocka_114 truck_travel_time_114))
12219  (and
12220    (=> (= truck_loc_114 0)
12221      (and
12222        (= a_stocka_115 a_stockb_115)
12223        (= b_stocka_115 b_stockb_115)
12224        (= c_stocka_115 c_stockb_115)
12225        (or
12226          (and
12227            (= truck_loc_115 1)
12228            (= truck_travel_time_115 29)
12229          )
12230          (and
12231            (= truck_loc_115 2)
12232            (= truck_travel_time_115 21)
12233          )
12234        )
12235      )
12236    )
12237    (=> (= truck_loc_114 1)
12238      (and
12239        (<= a_stocka_115 120)
12240        (= (+ truck_stock_115 a_stocka_115) (+ truck_stock_114 a_stockb_115))
12241        (= b_stocka_115 b_stockb_115)
12242        (= c_stocka_115 c_stockb_115)
12243        (or
12244          (and
12245            (= truck_loc_115 0)
12246            (= truck_travel_time_115 29)
12247          )
12248          (and
12249            (= truck_loc_115 2)
12250            (= truck_travel_time_115 17)
12251          )
12252          (and
12253            (= truck_loc_115 3)
12254            (= truck_travel_time_115 32)
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12255            )
12256          )
12257        )
12258    )
12259    (=> (= truck_loc_114 2)
12260      (and
12261        (<= b_stocka_115 120)
12262        (= (+ truck_stock_115 b_stocka_115) (+ truck_stock_114 b_stockb_115))
12263        (= a_stocka_115 a_stockb_115)
12264        (= c_stocka_115 c_stockb_115)
12265        (or
12266          (and
12267            (= truck_loc_115 1)
12268            (= truck_travel_time_115 17)
12269          )
12270          (and
12271            (= truck_loc_115 0)
12272            (= truck_travel_time_115 21)
12273          )
12274          (and
12275            (= truck_loc_115 3)
12276            (= truck_travel_time_115 37)
12277          )
12278        )
12279      )
12280    )
12281    (=> (= truck_loc_114 3)
12282      (and
12283        (<= c_stocka_115 200)
12284        (= (+ truck_stock_115 c_stocka_115) (+ truck_stock_114 c_stockb_115))
12285        (= a_stocka_115 a_stockb_115)
12286        (= b_stocka_115 b_stockb_115)
12287        (or
12288          (and
12289            (= truck_loc_115 1)
12290            (= truck_travel_time_115 32)
12291          )
12292          (and
12293            (= truck_loc_115 2)
12294            (= truck_travel_time_115 37)
12295          )
12296        )
12297      )
12298    )
12299  )
12300  (<= truck_stock_115 300)
12301  (>= truck_stock_115 0)
12302  (= a_stockb_116 (- a_stocka_115 truck_travel_time_115))
12303  (= b_stockb_116 (- b_stocka_115 truck_travel_time_115))
12304  (= c_stockb_116 (- c_stocka_115 truck_travel_time_115))
12305  (and
12306    (=> (= truck_loc_115 0)
12307      (and
12308        (= a_stocka_116 a_stockb_116)
12309        (= b_stocka_116 b_stockb_116)
12310        (= c_stocka_116 c_stockb_116)
12311        (or
12312          (and
12313            (= truck_loc_116 1)
12314            (= truck_travel_time_116 29)
12315          )
12316          (and
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12317              (= truck_loc_116 2)
12318              (= truck_travel_time_116 21)
12319            )
12320          )
12321        )
12322      )
12323      (=> (= truck_loc_115 1)
12324        (and
12325          (<= a_stocka_116 120)
12326          (= (+ truck_stock_116 a_stocka_116) (+ truck_stock_115 a_stockb_116))
12327          (= b_stocka_116 b_stockb_116)
12328          (= c_stocka_116 c_stockb_116)
12329          (or
12330            (and
12331              (= truck_loc_116 0)
12332              (= truck_travel_time_116 29)
12333            )
12334            (and
12335              (= truck_loc_116 2)
12336              (= truck_travel_time_116 17)
12337            )
12338            (and
12339              (= truck_loc_116 3)
12340              (= truck_travel_time_116 32)
12341            )
12342          )
12343        )
12344      )
12345      (=> (= truck_loc_115 2)
12346        (and
12347          (<= b_stocka_116 120)
12348          (= (+ truck_stock_116 b_stocka_116) (+ truck_stock_115 b_stockb_116))
12349          (= a_stocka_116 a_stockb_116)
12350          (= c_stocka_116 c_stockb_116)
12351          (or
12352            (and
12353              (= truck_loc_116 1)
12354              (= truck_travel_time_116 17)
12355            )
12356            (and
12357              (= truck_loc_116 0)
12358              (= truck_travel_time_116 21)
12359            )
12360            (and
12361              (= truck_loc_116 3)
12362              (= truck_travel_time_116 37)
12363            )
12364          )
12365        )
12366      )
12367      (=> (= truck_loc_115 3)
12368        (and
12369          (<= c_stocka_116 200)
12370          (= (+ truck_stock_116 c_stocka_116) (+ truck_stock_115 c_stockb_116))
12371          (= a_stocka_116 a_stockb_116)
12372          (= b_stocka_116 b_stockb_116)
12373          (or
12374            (and
12375              (= truck_loc_116 1)
12376              (= truck_travel_time_116 32)
12377            )
12378            (and
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12379              (= truck_loc_116 2)
12380              (= truck_travel_time_116 37)
12381            )
12382          )
12383        )
12384      )
12385    )
12386    (<= truck_stock_116 300)
12387    (>= truck_stock_116 0)
12388    (= a_stockb_117 (- a_stocka_116 truck_travel_time_116))
12389    (= b_stockb_117 (- b_stocka_116 truck_travel_time_116))
12390    (= c_stockb_117 (- c_stocka_116 truck_travel_time_116))
12391    (and
12392      (=> (= truck_loc_116 0)
12393        (and
12394          (= a_stocka_117 a_stockb_117)
12395          (= b_stocka_117 b_stockb_117)
12396          (= c_stocka_117 c_stockb_117)
12397          (or
12398            (and
12399              (= truck_loc_117 1)
12400              (= truck_travel_time_117 29)
12401            )
12402            (and
12403              (= truck_loc_117 2)
12404              (= truck_travel_time_117 21)
12405            )
12406          )
12407        )
12408      )
12409      (=> (= truck_loc_116 1)
12410        (and
12411          (<= a_stocka_117 120)
12412          (= (+ truck_stock_117 a_stocka_117) (+ truck_stock_116 a_stockb_117))
12413          (= b_stocka_117 b_stockb_117)
12414          (= c_stocka_117 c_stockb_117)
12415          (or
12416            (and
12417              (= truck_loc_117 0)
12418              (= truck_travel_time_117 29)
12419            )
12420            (and
12421              (= truck_loc_117 2)
12422              (= truck_travel_time_117 17)
12423            )
12424            (and
12425              (= truck_loc_117 3)
12426              (= truck_travel_time_117 32)
12427            )
12428          )
12429        )
12430      )
12431      (=> (= truck_loc_116 2)
12432        (and
12433          (<= b_stocka_117 120)
12434          (= (+ truck_stock_117 b_stocka_117) (+ truck_stock_116 b_stockb_117))
12435          (= a_stocka_117 a_stockb_117)
12436          (= c_stocka_117 c_stockb_117)
12437          (or
12438            (and
12439              (= truck_loc_117 1)
12440              (= truck_travel_time_117 17)
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12441            )
12442          (and
12443            (= truck_loc_117 0)
12444            (= truck_travel_time_117 21)
12445          )
12446          (and
12447            (= truck_loc_117 3)
12448            (= truck_travel_time_117 37)
12449          )
12450        )
12451      )
12452    )
12453    (=> (= truck_loc_116 3)
12454      (and
12455        (<= c_stocka_117 200)
12456        (= (+ truck_stock_117 c_stocka_117) (+ truck_stock_116 c_stockb_117))
12457        (= a_stocka_117 a_stockb_117)
12458        (= b_stocka_117 b_stockb_117)
12459        (or
12460          (and
12461            (= truck_loc_117 1)
12462            (= truck_travel_time_117 32)
12463          )
12464          (and
12465            (= truck_loc_117 2)
12466            (= truck_travel_time_117 37)
12467          )
12468        )
12469      )
12470    )
12471  )
12472  (<= truck_stock_117 300)
12473  (>= truck_stock_117 0)
12474  (= a_stockb_118 (- a_stocka_117 truck_travel_time_117))
12475  (= b_stockb_118 (- b_stocka_117 truck_travel_time_117))
12476  (= c_stockb_118 (- c_stocka_117 truck_travel_time_117))
12477  (and
12478    (=> (= truck_loc_117 0)
12479      (and
12480        (= a_stocka_118 a_stockb_118)
12481        (= b_stocka_118 b_stockb_118)
12482        (= c_stocka_118 c_stockb_118)
12483        (or
12484          (and
12485            (= truck_loc_118 1)
12486            (= truck_travel_time_118 29)
12487          )
12488          (and
12489            (= truck_loc_118 2)
12490            (= truck_travel_time_118 21)
12491          )
12492        )
12493      )
12494    )
12495    (=> (= truck_loc_117 1)
12496      (and
12497        (<= a_stocka_118 120)
12498        (= (+ truck_stock_118 a_stocka_118) (+ truck_stock_117 a_stockb_118))
12499        (= b_stocka_118 b_stockb_118)
12500        (= c_stocka_118 c_stockb_118)
12501        (or
12502          (and
```

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```
12503            (= truck_loc_118 0)
12504            (= truck_travel_time_118 29)
12505          )
12506         (and
12507            (= truck_loc_118 2)
12508            (= truck_travel_time_118 17)
12509          )
12510         (and
12511            (= truck_loc_118 3)
12512            (= truck_travel_time_118 32)
12513          )
12514        )
12515      )
12516    )
12517    (=> (= truck_loc_117 2)
12518      (and
12519        (<= b_stocka_118 120)
12520        (= (+ truck_stock_118 b_stocka_118) (+ truck_stock_117 b_stockb_118))
12521        (= a_stocka_118 a_stockb_118)
12522        (= c_stocka_118 c_stockb_118)
12523        (or
12524          (and
12525            (= truck_loc_118 1)
12526            (= truck_travel_time_118 17)
12527          )
12528         (and
12529            (= truck_loc_118 0)
12530            (= truck_travel_time_118 21)
12531          )
12532         (and
12533            (= truck_loc_118 3)
12534            (= truck_travel_time_118 37)
12535          )
12536        )
12537      )
12538    )
12539    (=> (= truck_loc_117 3)
12540      (and
12541        (<= c_stocka_118 200)
12542        (= (+ truck_stock_118 c_stocka_118) (+ truck_stock_117 c_stockb_118))
12543        (= a_stocka_118 a_stockb_118)
12544        (= b_stocka_118 b_stockb_118)
12545        (or
12546          (and
12547            (= truck_loc_118 1)
12548            (= truck_travel_time_118 32)
12549          )
12550         (and
12551            (= truck_loc_118 2)
12552            (= truck_travel_time_118 37)
12553          )
12554        )
12555      )
12556    )
12557  )
12558  (<= truck_stock_118 300)
12559  (>= truck_stock_118 0)
12560  (= a_stockb_119 (- a_stocka_118 truck_travel_time_118))
12561  (= b_stockb_119 (- b_stocka_118 truck_travel_time_118))
12562  (= c_stockb_119 (- c_stocka_118 truck_travel_time_118))
12563  (and
12564    (=> (= truck_loc_118 0)
```

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```
12565        (and
12566          (= a_stocka_119 a_stockb_119)
12567          (= b_stocka_119 b_stockb_119)
12568          (= c_stocka_119 c_stockb_119)
12569          (or
12570            (and
12571              (= truck_loc_119 1)
12572              (= truck_travel_time_119 29)
12573            )
12574            (and
12575              (= truck_loc_119 2)
12576              (= truck_travel_time_119 21)
12577            )
12578          )
12579        )
12580      )
12581      (=> (= truck_loc_118 1)
12582        (and
12583          (<= a_stocka_119 120)
12584          (= (+ truck_stock_119 a_stocka_119) (+ truck_stock_118 a_stockb_119))
12585          (= b_stocka_119 b_stockb_119)
12586          (= c_stocka_119 c_stockb_119)
12587          (or
12588            (and
12589              (= truck_loc_119 0)
12590              (= truck_travel_time_119 29)
12591            )
12592            (and
12593              (= truck_loc_119 2)
12594              (= truck_travel_time_119 17)
12595            )
12596            (and
12597              (= truck_loc_119 3)
12598              (= truck_travel_time_119 32)
12599            )
12600          )
12601        )
12602      )
12603      (=> (= truck_loc_118 2)
12604        (and
12605          (<= b_stocka_119 120)
12606          (= (+ truck_stock_119 b_stocka_119) (+ truck_stock_118 b_stockb_119))
12607          (= a_stocka_119 a_stockb_119)
12608          (= c_stocka_119 c_stockb_119)
12609          (or
12610            (and
12611              (= truck_loc_119 1)
12612              (= truck_travel_time_119 17)
12613            )
12614            (and
12615              (= truck_loc_119 0)
12616              (= truck_travel_time_119 21)
12617            )
12618            (and
12619              (= truck_loc_119 3)
12620              (= truck_travel_time_119 37)
12621            )
12622          )
12623        )
12624      )
12625      (=> (= truck_loc_118 3)
12626        (and
```

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```
12627        (<= c_stocka_119 200)
12628        (= (+ truck_stock_119 c_stocka_119) (+ truck_stock_118 c_stockb_119))
12629        (= a_stocka_119 a_stockb_119)
12630        (= b_stocka_119 b_stockb_119)
12631        (or
12632          (and
12633            (= truck_loc_119 1)
12634            (= truck_travel_time_119 32)
12635          )
12636          (and
12637            (= truck_loc_119 2)
12638            (= truck_travel_time_119 37)
12639          )
12640        )
12641      )
12642    )
12643  )
12644  (<= truck_stock_119 300)
12645  (>= truck_stock_119 0)
12646  (= a_stockb_120 (- a_stocka_119 truck_travel_time_119))
12647  (= b_stockb_120 (- b_stocka_119 truck_travel_time_119))
12648  (= c_stockb_120 (- c_stocka_119 truck_travel_time_119))
12649  (and
12650    (=> (= truck_loc_119 0)
12651      (and
12652        (= a_stocka_120 a_stockb_120)
12653        (= b_stocka_120 b_stockb_120)
12654        (= c_stocka_120 c_stockb_120)
12655        (or
12656          (and
12657            (= truck_loc_120 1)
12658            (= truck_travel_time_120 29)
12659          )
12660          (and
12661            (= truck_loc_120 2)
12662            (= truck_travel_time_120 21)
12663          )
12664        )
12665      )
12666    )
12667    (=> (= truck_loc_119 1)
12668      (and
12669        (<= a_stocka_120 120)
12670        (= (+ truck_stock_120 a_stocka_120) (+ truck_stock_119 a_stockb_120))
12671        (= b_stocka_120 b_stockb_120)
12672        (= c_stocka_120 c_stockb_120)
12673        (or
12674          (and
12675            (= truck_loc_120 0)
12676            (= truck_travel_time_120 29)
12677          )
12678          (and
12679            (= truck_loc_120 2)
12680            (= truck_travel_time_120 17)
12681          )
12682          (and
12683            (= truck_loc_120 3)
12684            (= truck_travel_time_120 32)
12685          )
12686        )
12687      )
12688    )
```

```
12689    (=> (= truck_loc_119 2)
12690      (and
12691        (<= b_stocka_120 120)
12692        (= (+ truck_stock_120 b_stocka_120) (+ truck_stock_119 b_stockb_120))
12693        (= a_stocka_120 a_stockb_120)
12694        (= c_stocka_120 c_stockb_120)
12695        (or
12696          (and
12697            (= truck_loc_120 1)
12698            (= truck_travel_time_120 17)
12699          )
12700          (and
12701            (= truck_loc_120 0)
12702            (= truck_travel_time_120 21)
12703          )
12704          (and
12705            (= truck_loc_120 3)
12706            (= truck_travel_time_120 37)
12707          )
12708        )
12709      )
12710    )
12711    (=> (= truck_loc_119 3)
12712      (and
12713        (<= c_stocka_120 200)
12714        (= (+ truck_stock_120 c_stocka_120) (+ truck_stock_119 c_stockb_120))
12715        (= a_stocka_120 a_stockb_120)
12716        (= b_stocka_120 b_stockb_120)
12717        (or
12718          (and
12719            (= truck_loc_120 1)
12720            (= truck_travel_time_120 32)
12721          )
12722          (and
12723            (= truck_loc_120 2)
12724            (= truck_travel_time_120 37)
12725          )
12726        )
12727      )
12728    )
12729  )
12730  (<= truck_stock_120 300)
12731  (>= truck_stock_120 0)
12732  (= a_stockb_121 (- a_stocka_120 truck_travel_time_120))
12733  (= b_stockb_121 (- b_stocka_120 truck_travel_time_120))
12734  (= c_stockb_121 (- c_stocka_120 truck_travel_time_120))
12735  (and
12736    (=> (= truck_loc_120 0)
12737      (and
12738        (= a_stocka_121 a_stockb_121)
12739        (= b_stocka_121 b_stockb_121)
12740        (= c_stocka_121 c_stockb_121)
12741        (or
12742          (and
12743            (= truck_loc_121 1)
12744            (= truck_travel_time_121 29)
12745          )
12746          (and
12747            (= truck_loc_121 2)
12748            (= truck_travel_time_121 21)
12749          )
12750        )
```

```
12751        )
12752      )
12753      (=> (= truck_loc_120 1)
12754        (and
12755          (<= a_stocka_121 120)
12756          (= (+ truck_stock_121 a_stocka_121) (+ truck_stock_120 a_stockb_121))
12757          (= b_stocka_121 b_stockb_121)
12758          (= c_stocka_121 c_stockb_121)
12759          (or
12760            (and
12761              (= truck_loc_121 0)
12762              (= truck_travel_time_121 29)
12763            )
12764            (and
12765              (= truck_loc_121 2)
12766              (= truck_travel_time_121 17)
12767            )
12768            (and
12769              (= truck_loc_121 3)
12770              (= truck_travel_time_121 32)
12771            )
12772          )
12773        )
12774      )
12775      (=> (= truck_loc_120 2)
12776        (and
12777          (<= b_stocka_121 120)
12778          (= (+ truck_stock_121 b_stocka_121) (+ truck_stock_120 b_stockb_121))
12779          (= a_stocka_121 a_stockb_121)
12780          (= c_stocka_121 c_stockb_121)
12781          (or
12782            (and
12783              (= truck_loc_121 1)
12784              (= truck_travel_time_121 17)
12785            )
12786            (and
12787              (= truck_loc_121 0)
12788              (= truck_travel_time_121 21)
12789            )
12790            (and
12791              (= truck_loc_121 3)
12792              (= truck_travel_time_121 37)
12793            )
12794          )
12795        )
12796      )
12797      (=> (= truck_loc_120 3)
12798        (and
12799          (<= c_stocka_121 200)
12800          (= (+ truck_stock_121 c_stocka_121) (+ truck_stock_120 c_stockb_121))
12801          (= a_stocka_121 a_stockb_121)
12802          (= b_stocka_121 b_stockb_121)
12803          (or
12804            (and
12805              (= truck_loc_121 1)
12806              (= truck_travel_time_121 32)
12807            )
12808            (and
12809              (= truck_loc_121 2)
12810              (= truck_travel_time_121 37)
12811            )
12812          )
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12813        )
12814      )
12815    )
12816    (<= truck_stock_121 300)
12817    (>= truck_stock_121 0)
12818    (= a_stockb_122 (- a_stocka_121 truck_travel_time_121))
12819    (= b_stockb_122 (- b_stocka_121 truck_travel_time_121))
12820    (= c_stockb_122 (- c_stocka_121 truck_travel_time_121))
12821    (and
12822      (=> (= truck_loc_121 0)
12823        (and
12824          (= a_stocka_122 a_stockb_122)
12825          (= b_stocka_122 b_stockb_122)
12826          (= c_stocka_122 c_stockb_122)
12827          (or
12828            (and
12829              (= truck_loc_122 1)
12830              (= truck_travel_time_122 29)
12831            )
12832            (and
12833              (= truck_loc_122 2)
12834              (= truck_travel_time_122 21)
12835            )
12836          )
12837        )
12838      )
12839      (=> (= truck_loc_121 1)
12840        (and
12841          (<= a_stocka_122 120)
12842          (= (+ truck_stock_122 a_stocka_122) (+ truck_stock_121 a_stockb_122))
12843          (= b_stocka_122 b_stockb_122)
12844          (= c_stocka_122 c_stockb_122)
12845          (or
12846            (and
12847              (= truck_loc_122 0)
12848              (= truck_travel_time_122 29)
12849            )
12850            (and
12851              (= truck_loc_122 2)
12852              (= truck_travel_time_122 17)
12853            )
12854            (and
12855              (= truck_loc_122 3)
12856              (= truck_travel_time_122 32)
12857            )
12858          )
12859        )
12860      )
12861      (=> (= truck_loc_121 2)
12862        (and
12863          (<= b_stocka_122 120)
12864          (= (+ truck_stock_122 b_stocka_122) (+ truck_stock_121 b_stockb_122))
12865          (= a_stocka_122 a_stockb_122)
12866          (= c_stocka_122 c_stockb_122)
12867          (or
12868            (and
12869              (= truck_loc_122 1)
12870              (= truck_travel_time_122 17)
12871            )
12872            (and
12873              (= truck_loc_122 0)
12874              (= truck_travel_time_122 21)
```

```
12875            )
12876          (and
12877            (= truck_loc_122 3)
12878            (= truck_travel_time_122 37)
12879          )
12880        )
12881      )
12882    )
12883    (=> (= truck_loc_121 3)
12884      (and
12885        (<= c_stocka_122 200)
12886        (= (+ truck_stock_122 c_stocka_122) (+ truck_stock_121 c_stockb_122))
12887        (= a_stocka_122 a_stockb_122)
12888        (= b_stocka_122 b_stockb_122)
12889        (or
12890          (and
12891            (= truck_loc_122 1)
12892            (= truck_travel_time_122 32)
12893          )
12894          (and
12895            (= truck_loc_122 2)
12896            (= truck_travel_time_122 37)
12897          )
12898        )
12899      )
12900    )
12901  )
12902  (<= truck_stock_122 300)
12903  (>= truck_stock_122 0)
12904  (= a_stockb_123 (- a_stocka_122 truck_travel_time_122))
12905  (= b_stockb_123 (- b_stocka_122 truck_travel_time_122))
12906  (= c_stockb_123 (- c_stocka_122 truck_travel_time_122))
12907  (and
12908    (=> (= truck_loc_122 0)
12909      (and
12910        (= a_stocka_123 a_stockb_123)
12911        (= b_stocka_123 b_stockb_123)
12912        (= c_stocka_123 c_stockb_123)
12913        (or
12914          (and
12915            (= truck_loc_123 1)
12916            (= truck_travel_time_123 29)
12917          )
12918          (and
12919            (= truck_loc_123 2)
12920            (= truck_travel_time_123 21)
12921          )
12922        )
12923      )
12924    )
12925    (=> (= truck_loc_122 1)
12926      (and
12927        (<= a_stocka_123 120)
12928        (= (+ truck_stock_123 a_stocka_123) (+ truck_stock_122 a_stockb_123))
12929        (= b_stocka_123 b_stockb_123)
12930        (= c_stocka_123 c_stockb_123)
12931        (or
12932          (and
12933            (= truck_loc_123 0)
12934            (= truck_travel_time_123 29)
12935          )
12936          (and
```

```
12937              (= truck_loc_123 2)
12938              (= truck_travel_time_123 17)
12939            )
12940          (and
12941              (= truck_loc_123 3)
12942              (= truck_travel_time_123 32)
12943          )
12944        )
12945      )
12946    )
12947    (=> (= truck_loc_122 2)
12948      (and
12949        (<= b_stocka_123 120)
12950        (= (+ truck_stock_123 b_stocka_123) (+ truck_stock_122 b_stockb_123))
12951        (= a_stocka_123 a_stockb_123)
12952        (= c_stocka_123 c_stockb_123)
12953        (or
12954          (and
12955              (= truck_loc_123 1)
12956              (= truck_travel_time_123 17)
12957          )
12958          (and
12959              (= truck_loc_123 0)
12960              (= truck_travel_time_123 21)
12961          )
12962          (and
12963              (= truck_loc_123 3)
12964              (= truck_travel_time_123 37)
12965          )
12966        )
12967      )
12968    )
12969    (=> (= truck_loc_122 3)
12970      (and
12971        (<= c_stocka_123 200)
12972        (= (+ truck_stock_123 c_stocka_123) (+ truck_stock_122 c_stockb_123))
12973        (= a_stocka_123 a_stockb_123)
12974        (= b_stocka_123 b_stockb_123)
12975        (or
12976          (and
12977              (= truck_loc_123 1)
12978              (= truck_travel_time_123 32)
12979          )
12980          (and
12981              (= truck_loc_123 2)
12982              (= truck_travel_time_123 37)
12983          )
12984        )
12985      )
12986    )
12987  )
12988  (<= truck_stock_123 300)
12989  (>= truck_stock_123 0)
12990  (= a_stockb_124 (- a_stocka_123 truck_travel_time_123))
12991  (= b_stockb_124 (- b_stocka_123 truck_travel_time_123))
12992  (= c_stockb_124 (- c_stocka_123 truck_travel_time_123))
12993  (and
12994    (=> (= truck_loc_123 0)
12995      (and
12996        (= a_stocka_124 a_stockb_124)
12997        (= b_stocka_124 b_stockb_124)
12998        (= c_stocka_124 c_stockb_124)
```

```
12999        (or
13000          (and
13001            (= truck_loc_124 1)
13002            (= truck_travel_time_124 29)
13003          )
13004          (and
13005            (= truck_loc_124 2)
13006            (= truck_travel_time_124 21)
13007          )
13008        )
13009      )
13010    )
13011    (=> (= truck_loc_123 1)
13012      (and
13013        (<= a_stocka_124 120)
13014        (= (+ truck_stock_124 a_stocka_124) (+ truck_stock_123 a_stockb_124))
13015        (= b_stocka_124 b_stockb_124)
13016        (= c_stocka_124 c_stockb_124)
13017        (or
13018          (and
13019            (= truck_loc_124 0)
13020            (= truck_travel_time_124 29)
13021          )
13022          (and
13023            (= truck_loc_124 2)
13024            (= truck_travel_time_124 17)
13025          )
13026          (and
13027            (= truck_loc_124 3)
13028            (= truck_travel_time_124 32)
13029          )
13030        )
13031      )
13032    )
13033    (=> (= truck_loc_123 2)
13034      (and
13035        (<= b_stocka_124 120)
13036        (= (+ truck_stock_124 b_stocka_124) (+ truck_stock_123 b_stockb_124))
13037        (= a_stocka_124 a_stockb_124)
13038        (= c_stocka_124 c_stockb_124)
13039        (or
13040          (and
13041            (= truck_loc_124 1)
13042            (= truck_travel_time_124 17)
13043          )
13044          (and
13045            (= truck_loc_124 0)
13046            (= truck_travel_time_124 21)
13047          )
13048          (and
13049            (= truck_loc_124 3)
13050            (= truck_travel_time_124 37)
13051          )
13052        )
13053      )
13054    )
13055    (=> (= truck_loc_123 3)
13056      (and
13057        (<= c_stocka_124 200)
13058        (= (+ truck_stock_124 c_stocka_124) (+ truck_stock_123 c_stockb_124))
13059        (= a_stocka_124 a_stockb_124)
13060        (= b_stocka_124 b_stockb_124)
```

```
13061        (or
13062          (and
13063            (= truck_loc_124 1)
13064            (= truck_travel_time_124 32)
13065          )
13066          (and
13067            (= truck_loc_124 2)
13068            (= truck_travel_time_124 37)
13069          )
13070        )
13071      )
13072    )
13073  )
13074  (<= truck_stock_124 300)
13075  (>= truck_stock_124 0)
13076  (= a_stockb_125 (- a_stocka_124 truck_travel_time_124))
13077  (= b_stockb_125 (- b_stocka_124 truck_travel_time_124))
13078  (= c_stockb_125 (- c_stocka_124 truck_travel_time_124))
13079  (and
13080    (=> (= truck_loc_124 0)
13081      (and
13082        (= a_stocka_125 a_stockb_125)
13083        (= b_stocka_125 b_stockb_125)
13084        (= c_stocka_125 c_stockb_125)
13085        (or
13086          (and
13087            (= truck_loc_125 1)
13088            (= truck_travel_time_125 29)
13089          )
13090          (and
13091            (= truck_loc_125 2)
13092            (= truck_travel_time_125 21)
13093          )
13094        )
13095      )
13096    )
13097    (=> (= truck_loc_124 1)
13098      (and
13099        (<= a_stocka_125 120)
13100        (= (+ truck_stock_125 a_stocka_125) (+ truck_stock_124 a_stockb_125))
13101        (= b_stocka_125 b_stockb_125)
13102        (= c_stocka_125 c_stockb_125)
13103        (or
13104          (and
13105            (= truck_loc_125 0)
13106            (= truck_travel_time_125 29)
13107          )
13108          (and
13109            (= truck_loc_125 2)
13110            (= truck_travel_time_125 17)
13111          )
13112          (and
13113            (= truck_loc_125 3)
13114            (= truck_travel_time_125 32)
13115          )
13116        )
13117      )
13118    )
13119    (=> (= truck_loc_124 2)
13120      (and
13121        (<= b_stocka_125 120)
13122        (= (+ truck_stock_125 b_stocka_125) (+ truck_stock_124 b_stockb_125))
```

```
13123        (= a_stocka_125 a_stockb_125)
13124        (= c_stocka_125 c_stockb_125)
13125        (or
13126          (and
13127            (= truck_loc_125 1)
13128            (= truck_travel_time_125 17)
13129          )
13130          (and
13131            (= truck_loc_125 0)
13132            (= truck_travel_time_125 21)
13133          )
13134          (and
13135            (= truck_loc_125 3)
13136            (= truck_travel_time_125 37)
13137          )
13138        )
13139      )
13140    )
13141    (=> (= truck_loc_124 3)
13142      (and
13143        (<= c_stocka_125 200)
13144        (= (+ truck_stock_125 c_stocka_125) (+ truck_stock_124 c_stockb_125))
13145        (= a_stocka_125 a_stockb_125)
13146        (= b_stocka_125 b_stockb_125)
13147        (or
13148          (and
13149            (= truck_loc_125 1)
13150            (= truck_travel_time_125 32)
13151          )
13152          (and
13153            (= truck_loc_125 2)
13154            (= truck_travel_time_125 37)
13155          )
13156        )
13157      )
13158    )
13159  )
13160  (<= truck_stock_125 300)
13161  (>= truck_stock_125 0)
13162  (= a_stockb_126 (- a_stocka_125 truck_travel_time_125))
13163  (= b_stockb_126 (- b_stocka_125 truck_travel_time_125))
13164  (= c_stockb_126 (- c_stocka_125 truck_travel_time_125))
13165  (and
13166    (=> (= truck_loc_125 0)
13167      (and
13168        (= a_stocka_126 a_stockb_126)
13169        (= b_stocka_126 b_stockb_126)
13170        (= c_stocka_126 c_stockb_126)
13171        (or
13172          (and
13173            (= truck_loc_126 1)
13174            (= truck_travel_time_126 29)
13175          )
13176          (and
13177            (= truck_loc_126 2)
13178            (= truck_travel_time_126 21)
13179          )
13180        )
13181      )
13182    )
13183    (=> (= truck_loc_125 1)
13184      (and
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13185        (<= a_stocka_126 120)
13186        (= (+ truck_stock_126 a_stocka_126) (+ truck_stock_125 a_stockb_126))
13187        (= b_stocka_126 b_stockb_126)
13188        (= c_stocka_126 c_stockb_126)
13189        (or
13190          (and
13191            (= truck_loc_126 0)
13192            (= truck_travel_time_126 29)
13193          )
13194          (and
13195            (= truck_loc_126 2)
13196            (= truck_travel_time_126 17)
13197          )
13198          (and
13199            (= truck_loc_126 3)
13200            (= truck_travel_time_126 32)
13201          )
13202        )
13203      )
13204    )
13205    (=> (= truck_loc_125 2)
13206      (and
13207        (<= b_stocka_126 120)
13208        (= (+ truck_stock_126 b_stocka_126) (+ truck_stock_125 b_stockb_126))
13209        (= a_stocka_126 a_stockb_126)
13210        (= c_stocka_126 c_stockb_126)
13211        (or
13212          (and
13213            (= truck_loc_126 1)
13214            (= truck_travel_time_126 17)
13215          )
13216          (and
13217            (= truck_loc_126 0)
13218            (= truck_travel_time_126 21)
13219          )
13220          (and
13221            (= truck_loc_126 3)
13222            (= truck_travel_time_126 37)
13223          )
13224        )
13225      )
13226    )
13227    (=> (= truck_loc_125 3)
13228      (and
13229        (<= c_stocka_126 200)
13230        (= (+ truck_stock_126 c_stocka_126) (+ truck_stock_125 c_stockb_126))
13231        (= a_stocka_126 a_stockb_126)
13232        (= b_stocka_126 b_stockb_126)
13233        (or
13234          (and
13235            (= truck_loc_126 1)
13236            (= truck_travel_time_126 32)
13237          )
13238          (and
13239            (= truck_loc_126 2)
13240            (= truck_travel_time_126 37)
13241          )
13242        )
13243      )
13244    )
13245  )
13246  (<= truck_stock_126 300)
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13247  (>= truck_stock_126 0)
13248  (= a_stockb_127 (- a_stocka_126 truck_travel_time_126))
13249  (= b_stockb_127 (- b_stocka_126 truck_travel_time_126))
13250  (= c_stockb_127 (- c_stocka_126 truck_travel_time_126))
13251  (and
13252    (=> (= truck_loc_126 0)
13253      (and
13254        (= a_stocka_127 a_stockb_127)
13255        (= b_stocka_127 b_stockb_127)
13256        (= c_stocka_127 c_stockb_127)
13257        (or
13258          (and
13259            (= truck_loc_127 1)
13260            (= truck_travel_time_127 29)
13261          )
13262          (and
13263            (= truck_loc_127 2)
13264            (= truck_travel_time_127 21)
13265          )
13266        )
13267      )
13268    )
13269    (=> (= truck_loc_126 1)
13270      (and
13271        (<= a_stocka_127 120)
13272        (= (+ truck_stock_127 a_stocka_127) (+ truck_stock_126 a_stockb_127))
13273        (= b_stocka_127 b_stockb_127)
13274        (= c_stocka_127 c_stockb_127)
13275        (or
13276          (and
13277            (= truck_loc_127 0)
13278            (= truck_travel_time_127 29)
13279          )
13280          (and
13281            (= truck_loc_127 2)
13282            (= truck_travel_time_127 17)
13283          )
13284          (and
13285            (= truck_loc_127 3)
13286            (= truck_travel_time_127 32)
13287          )
13288        )
13289      )
13290    )
13291    (=> (= truck_loc_126 2)
13292      (and
13293        (<= b_stocka_127 120)
13294        (= (+ truck_stock_127 b_stocka_127) (+ truck_stock_126 b_stockb_127))
13295        (= a_stocka_127 a_stockb_127)
13296        (= c_stocka_127 c_stockb_127)
13297        (or
13298          (and
13299            (= truck_loc_127 1)
13300            (= truck_travel_time_127 17)
13301          )
13302          (and
13303            (= truck_loc_127 0)
13304            (= truck_travel_time_127 21)
13305          )
13306          (and
13307            (= truck_loc_127 3)
13308            (= truck_travel_time_127 37)
```

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13309              )
13310            )
13311          )
13312        )
13313      (=> (= truck_loc_126 3)
13314        (and
13315          (<= c_stocka_127 200)
13316          (= (+ truck_stock_127 c_stocka_127) (+ truck_stock_126 c_stockb_127))
13317          (= a_stocka_127 a_stockb_127)
13318          (= b_stocka_127 b_stockb_127)
13319          (or
13320            (and
13321              (= truck_loc_127 1)
13322              (= truck_travel_time_127 32)
13323            )
13324            (and
13325              (= truck_loc_127 2)
13326              (= truck_travel_time_127 37)
13327            )
13328          )
13329        )
13330      )
13331    )
13332    (<= truck_stock_127 300)
13333    (>= truck_stock_127 0)
13334    (= a_stockb_128 (- a_stocka_127 truck_travel_time_127))
13335    (= b_stockb_128 (- b_stocka_127 truck_travel_time_127))
13336    (= c_stockb_128 (- c_stocka_127 truck_travel_time_127))
13337    (and
13338      (=> (= truck_loc_127 0)
13339        (and
13340          (= a_stocka_128 a_stockb_128)
13341          (= b_stocka_128 b_stockb_128)
13342          (= c_stocka_128 c_stockb_128)
13343          (or
13344            (and
13345              (= truck_loc_128 1)
13346              (= truck_travel_time_128 29)
13347            )
13348            (and
13349              (= truck_loc_128 2)
13350              (= truck_travel_time_128 21)
13351            )
13352          )
13353        )
13354      )
13355      (=> (= truck_loc_127 1)
13356        (and
13357          (<= a_stocka_128 120)
13358          (= (+ truck_stock_128 a_stocka_128) (+ truck_stock_127 a_stockb_128))
13359          (= b_stocka_128 b_stockb_128)
13360          (= c_stocka_128 c_stockb_128)
13361          (or
13362            (and
13363              (= truck_loc_128 0)
13364              (= truck_travel_time_128 29)
13365            )
13366            (and
13367              (= truck_loc_128 2)
13368              (= truck_travel_time_128 17)
13369            )
13370            (and
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13371              (= truck_loc_128 3)
13372              (= truck_travel_time_128 32)
13373            )
13374          )
13375        )
13376    )
13377    (=> (= truck_loc_127 2)
13378      (and
13379        (<= b_stocka_128 120)
13380        (= (+ truck_stock_128 b_stocka_128) (+ truck_stock_127 b_stockb_128))
13381        (= a_stocka_128 a_stockb_128)
13382        (= c_stocka_128 c_stockb_128)
13383        (or
13384          (and
13385            (= truck_loc_128 1)
13386            (= truck_travel_time_128 17)
13387          )
13388          (and
13389            (= truck_loc_128 0)
13390            (= truck_travel_time_128 21)
13391          )
13392          (and
13393            (= truck_loc_128 3)
13394            (= truck_travel_time_128 37)
13395          )
13396        )
13397      )
13398    )
13399    (=> (= truck_loc_127 3)
13400      (and
13401        (<= c_stocka_128 200)
13402        (= (+ truck_stock_128 c_stocka_128) (+ truck_stock_127 c_stockb_128))
13403        (= a_stocka_128 a_stockb_128)
13404        (= b_stocka_128 b_stockb_128)
13405        (or
13406          (and
13407            (= truck_loc_128 1)
13408            (= truck_travel_time_128 32)
13409          )
13410          (and
13411            (= truck_loc_128 2)
13412            (= truck_travel_time_128 37)
13413          )
13414        )
13415      )
13416    )
13417  )
13418  (<= truck_stock_128 300)
13419  (>= truck_stock_128 0)
13420  (= a_stockb_129 (- a_stocka_128 truck_travel_time_128))
13421  (= b_stockb_129 (- b_stocka_128 truck_travel_time_128))
13422  (= c_stockb_129 (- c_stocka_128 truck_travel_time_128))
13423  (and
13424    (=> (= truck_loc_128 0)
13425      (and
13426        (= a_stocka_129 a_stockb_129)
13427        (= b_stocka_129 b_stockb_129)
13428        (= c_stocka_129 c_stockb_129)
13429        (or
13430          (and
13431            (= truck_loc_129 1)
13432            (= truck_travel_time_129 29)
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13433            )
13434          (and
13435            (= truck_loc_129 2)
13436            (= truck_travel_time_129 21)
13437          )
13438        )
13439      )
13440    )
13441    (=> (= truck_loc_128 1)
13442      (and
13443        (<= a_stocka_129 120)
13444        (= (+ truck_stock_129 a_stocka_129) (+ truck_stock_128 a_stockb_129))
13445        (= b_stocka_129 b_stockb_129)
13446        (= c_stocka_129 c_stockb_129)
13447        (or
13448          (and
13449            (= truck_loc_129 0)
13450            (= truck_travel_time_129 29)
13451          )
13452          (and
13453            (= truck_loc_129 2)
13454            (= truck_travel_time_129 17)
13455          )
13456          (and
13457            (= truck_loc_129 3)
13458            (= truck_travel_time_129 32)
13459          )
13460        )
13461      )
13462    )
13463    (=> (= truck_loc_128 2)
13464      (and
13465        (<= b_stocka_129 120)
13466        (= (+ truck_stock_129 b_stocka_129) (+ truck_stock_128 b_stockb_129))
13467        (= a_stocka_129 a_stockb_129)
13468        (= c_stocka_129 c_stockb_129)
13469        (or
13470          (and
13471            (= truck_loc_129 1)
13472            (= truck_travel_time_129 17)
13473          )
13474          (and
13475            (= truck_loc_129 0)
13476            (= truck_travel_time_129 21)
13477          )
13478          (and
13479            (= truck_loc_129 3)
13480            (= truck_travel_time_129 37)
13481          )
13482        )
13483      )
13484    )
13485    (=> (= truck_loc_128 3)
13486      (and
13487        (<= c_stocka_129 200)
13488        (= (+ truck_stock_129 c_stocka_129) (+ truck_stock_128 c_stockb_129))
13489        (= a_stocka_129 a_stockb_129)
13490        (= b_stocka_129 b_stockb_129)
13491        (or
13492          (and
13493            (= truck_loc_129 1)
13494            (= truck_travel_time_129 32)
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```
13495           )
13496         (and
13497           (= truck_loc_129 2)
13498           (= truck_travel_time_129 37)
13499         )
13500       )
13501     )
13502   )
13503 )
13504 (<= truck_stock_129 300)
13505 (>= truck_stock_129 0)
13506 (= a_stockb_130 (- a_stocka_129 truck_travel_time_129))
13507 (= b_stockb_130 (- b_stocka_129 truck_travel_time_129))
13508 (= c_stockb_130 (- c_stocka_129 truck_travel_time_129))
13509 (and
13510   (=> (= truck_loc_129 0)
13511     (and
13512       (= a_stocka_130 a_stockb_130)
13513       (= b_stocka_130 b_stockb_130)
13514       (= c_stocka_130 c_stockb_130)
13515       (or
13516         (and
13517           (= truck_loc_130 1)
13518           (= truck_travel_time_130 29)
13519         )
13520         (and
13521           (= truck_loc_130 2)
13522           (= truck_travel_time_130 21)
13523         )
13524       )
13525     )
13526   )
13527   (=> (= truck_loc_129 1)
13528     (and
13529       (<= a_stocka_130 120)
13530       (= (+ truck_stock_130 a_stocka_130) (+ truck_stock_129 a_stockb_130))
13531       (= b_stocka_130 b_stockb_130)
13532       (= c_stocka_130 c_stockb_130)
13533       (or
13534         (and
13535           (= truck_loc_130 0)
13536           (= truck_travel_time_130 29)
13537         )
13538         (and
13539           (= truck_loc_130 2)
13540           (= truck_travel_time_130 17)
13541         )
13542         (and
13543           (= truck_loc_130 3)
13544           (= truck_travel_time_130 32)
13545         )
13546       )
13547     )
13548   )
13549   (=> (= truck_loc_129 2)
13550     (and
13551       (<= b_stocka_130 120)
13552       (= (+ truck_stock_130 b_stocka_130) (+ truck_stock_129 b_stockb_130))
13553       (= a_stocka_130 a_stockb_130)
13554       (= c_stocka_130 c_stockb_130)
13555       (or
13556         (and
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```
13557            (= truck_loc_130 1)
13558            (= truck_travel_time_130 17)
13559          )
13560        (and
13561          (= truck_loc_130 0)
13562          (= truck_travel_time_130 21)
13563        )
13564        (and
13565          (= truck_loc_130 3)
13566          (= truck_travel_time_130 37)
13567        )
13568      )
13569    )
13570  )
13571  (=> (= truck_loc_129 3)
13572    (and
13573      (<= c_stocka_130 200)
13574      (= (+ truck_stock_130 c_stocka_130) (+ truck_stock_129 c_stockb_130))
13575      (= a_stocka_130 a_stockb_130)
13576      (= b_stocka_130 b_stockb_130)
13577      (or
13578        (and
13579          (= truck_loc_130 1)
13580          (= truck_travel_time_130 32)
13581        )
13582        (and
13583          (= truck_loc_130 2)
13584          (= truck_travel_time_130 37)
13585        )
13586      )
13587    )
13588  )
13589 )
13590 (<= truck_stock_130 300)
13591 (>= truck_stock_130 0)
13592 (= a_stockb_131 (- a_stocka_130 truck_travel_time_130))
13593 (= b_stockb_131 (- b_stocka_130 truck_travel_time_130))
13594 (= c_stockb_131 (- c_stocka_130 truck_travel_time_130))
13595 (and
13596   (=> (= truck_loc_130 0)
13597     (and
13598       (= a_stocka_131 a_stockb_131)
13599       (= b_stocka_131 b_stockb_131)
13600       (= c_stocka_131 c_stockb_131)
13601       (or
13602         (and
13603           (= truck_loc_131 1)
13604           (= truck_travel_time_131 29)
13605         )
13606         (and
13607           (= truck_loc_131 2)
13608           (= truck_travel_time_131 21)
13609         )
13610       )
13611     )
13612   )
13613   (=> (= truck_loc_130 1)
13614     (and
13615       (<= a_stocka_131 120)
13616       (= (+ truck_stock_131 a_stocka_131) (+ truck_stock_130 a_stockb_131))
13617       (= b_stocka_131 b_stockb_131)
13618       (= c_stocka_131 c_stockb_131)
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```
13619        (or
13620          (and
13621            (= truck_loc_131 0)
13622            (= truck_travel_time_131 29)
13623          )
13624          (and
13625            (= truck_loc_131 2)
13626            (= truck_travel_time_131 17)
13627          )
13628          (and
13629            (= truck_loc_131 3)
13630            (= truck_travel_time_131 32)
13631          )
13632        )
13633      )
13634    )
13635    (=> (= truck_loc_130 2)
13636      (and
13637        (<= b_stocka_131 120)
13638        (= (+ truck_stock_131 b_stocka_131) (+ truck_stock_130 b_stockb_131))
13639        (= a_stocka_131 a_stockb_131)
13640        (= c_stocka_131 c_stockb_131)
13641        (or
13642          (and
13643            (= truck_loc_131 1)
13644            (= truck_travel_time_131 17)
13645          )
13646          (and
13647            (= truck_loc_131 0)
13648            (= truck_travel_time_131 21)
13649          )
13650          (and
13651            (= truck_loc_131 3)
13652            (= truck_travel_time_131 37)
13653          )
13654        )
13655      )
13656    )
13657    (=> (= truck_loc_130 3)
13658      (and
13659        (<= c_stocka_131 200)
13660        (= (+ truck_stock_131 c_stocka_131) (+ truck_stock_130 c_stockb_131))
13661        (= a_stocka_131 a_stockb_131)
13662        (= b_stocka_131 b_stockb_131)
13663        (or
13664          (and
13665            (= truck_loc_131 1)
13666            (= truck_travel_time_131 32)
13667          )
13668          (and
13669            (= truck_loc_131 2)
13670            (= truck_travel_time_131 37)
13671          )
13672        )
13673      )
13674    )
13675  )
13676  (<= truck_stock_131 300)
13677  (>= truck_stock_131 0)
13678  (= a_stockb_132 (- a_stocka_131 truck_travel_time_131))
13679  (= b_stockb_132 (- b_stocka_131 truck_travel_time_131))
13680  (= c_stockb_132 (- c_stocka_131 truck_travel_time_131))
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```
13681   (and
13682     (=> (= truck_loc_131 0)
13683       (and
13684         (= a_stocka_132 a_stockb_132)
13685         (= b_stocka_132 b_stockb_132)
13686         (= c_stocka_132 c_stockb_132)
13687         (or
13688           (and
13689             (= truck_loc_132 1)
13690             (= truck_travel_time_132 29)
13691           )
13692           (and
13693             (= truck_loc_132 2)
13694             (= truck_travel_time_132 21)
13695           )
13696         )
13697       )
13698     )
13699     (=> (= truck_loc_131 1)
13700       (and
13701         (<= a_stocka_132 120)
13702         (= (+ truck_stock_132 a_stocka_132) (+ truck_stock_131 a_stockb_132))
13703         (= b_stocka_132 b_stockb_132)
13704         (= c_stocka_132 c_stockb_132)
13705         (or
13706           (and
13707             (= truck_loc_132 0)
13708             (= truck_travel_time_132 29)
13709           )
13710           (and
13711             (= truck_loc_132 2)
13712             (= truck_travel_time_132 17)
13713           )
13714           (and
13715             (= truck_loc_132 3)
13716             (= truck_travel_time_132 32)
13717           )
13718         )
13719       )
13720     )
13721     (=> (= truck_loc_131 2)
13722       (and
13723         (<= b_stocka_132 120)
13724         (= (+ truck_stock_132 b_stocka_132) (+ truck_stock_131 b_stockb_132))
13725         (= a_stocka_132 a_stockb_132)
13726         (= c_stocka_132 c_stockb_132)
13727         (or
13728           (and
13729             (= truck_loc_132 1)
13730             (= truck_travel_time_132 17)
13731           )
13732           (and
13733             (= truck_loc_132 0)
13734             (= truck_travel_time_132 21)
13735           )
13736           (and
13737             (= truck_loc_132 3)
13738             (= truck_travel_time_132 37)
13739           )
13740         )
13741       )
13742     )
```

```
13743    (=> (= truck_loc_131 3)
13744      (and
13745        (<= c_stocka_132 200)
13746        (= (+ truck_stock_132 c_stocka_132) (+ truck_stock_131 c_stockb_132))
13747        (= a_stocka_132 a_stockb_132)
13748        (= b_stocka_132 b_stockb_132)
13749        (or
13750          (and
13751            (= truck_loc_132 1)
13752            (= truck_travel_time_132 32)
13753          )
13754          (and
13755            (= truck_loc_132 2)
13756            (= truck_travel_time_132 37)
13757          )
13758        )
13759      )
13760    )
13761  )
13762  (<= truck_stock_132 300)
13763  (>= truck_stock_132 0)
13764  (= a_stockb_133 (- a_stocka_132 truck_travel_time_132))
13765  (= b_stockb_133 (- b_stocka_132 truck_travel_time_132))
13766  (= c_stockb_133 (- c_stocka_132 truck_travel_time_132))
13767  (and
13768    (=> (= truck_loc_132 0)
13769      (and
13770        (= a_stocka_133 a_stockb_133)
13771        (= b_stocka_133 b_stockb_133)
13772        (= c_stocka_133 c_stockb_133)
13773        (or
13774          (and
13775            (= truck_loc_133 1)
13776            (= truck_travel_time_133 29)
13777          )
13778          (and
13779            (= truck_loc_133 2)
13780            (= truck_travel_time_133 21)
13781          )
13782        )
13783      )
13784    )
13785    (=> (= truck_loc_132 1)
13786      (and
13787        (<= a_stocka_133 120)
13788        (= (+ truck_stock_133 a_stocka_133) (+ truck_stock_132 a_stockb_133))
13789        (= b_stocka_133 b_stockb_133)
13790        (= c_stocka_133 c_stockb_133)
13791        (or
13792          (and
13793            (= truck_loc_133 0)
13794            (= truck_travel_time_133 29)
13795          )
13796          (and
13797            (= truck_loc_133 2)
13798            (= truck_travel_time_133 17)
13799          )
13800          (and
13801            (= truck_loc_133 3)
13802            (= truck_travel_time_133 32)
13803          )
13804        )
```

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13805        )
13806      )
13807      (=> (= truck_loc_132 2)
13808        (and
13809          (<= b_stocka_133 120)
13810          (= (+ truck_stock_133 b_stocka_133) (+ truck_stock_132 b_stockb_133))
13811          (= a_stocka_133 a_stockb_133)
13812          (= c_stocka_133 c_stockb_133)
13813          (or
13814            (and
13815              (= truck_loc_133 1)
13816              (= truck_travel_time_133 17)
13817            )
13818            (and
13819              (= truck_loc_133 0)
13820              (= truck_travel_time_133 21)
13821            )
13822            (and
13823              (= truck_loc_133 3)
13824              (= truck_travel_time_133 37)
13825            )
13826          )
13827        )
13828      )
13829      (=> (= truck_loc_132 3)
13830        (and
13831          (<= c_stocka_133 200)
13832          (= (+ truck_stock_133 c_stocka_133) (+ truck_stock_132 c_stockb_133))
13833          (= a_stocka_133 a_stockb_133)
13834          (= b_stocka_133 b_stockb_133)
13835          (or
13836            (and
13837              (= truck_loc_133 1)
13838              (= truck_travel_time_133 32)
13839            )
13840            (and
13841              (= truck_loc_133 2)
13842              (= truck_travel_time_133 37)
13843            )
13844          )
13845        )
13846      )
13847    )
13848    (<= truck_stock_133 300)
13849    (>= truck_stock_133 0)
13850    (= a_stockb_134 (- a_stocka_133 truck_travel_time_133))
13851    (= b_stockb_134 (- b_stocka_133 truck_travel_time_133))
13852    (= c_stockb_134 (- c_stocka_133 truck_travel_time_133))
13853    (and
13854      (=> (= truck_loc_133 0)
13855        (and
13856          (= a_stocka_134 a_stockb_134)
13857          (= b_stocka_134 b_stockb_134)
13858          (= c_stocka_134 c_stockb_134)
13859          (or
13860            (and
13861              (= truck_loc_134 1)
13862              (= truck_travel_time_134 29)
13863            )
13864            (and
13865              (= truck_loc_134 2)
13866              (= truck_travel_time_134 21)
```

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13867              )
13868            )
13869          )
13870        )
13871      (=> (= truck_loc_133 1)
13872        (and
13873          (<= a_stocka_134 120)
13874          (= (+ truck_stock_134 a_stocka_134) (+ truck_stock_133 a_stockb_134))
13875          (= b_stocka_134 b_stockb_134)
13876          (= c_stocka_134 c_stockb_134)
13877          (or
13878            (and
13879              (= truck_loc_134 0)
13880              (= truck_travel_time_134 29)
13881            )
13882            (and
13883              (= truck_loc_134 2)
13884              (= truck_travel_time_134 17)
13885            )
13886            (and
13887              (= truck_loc_134 3)
13888              (= truck_travel_time_134 32)
13889            )
13890          )
13891        )
13892      )
13893      (=> (= truck_loc_133 2)
13894        (and
13895          (<= b_stocka_134 120)
13896          (= (+ truck_stock_134 b_stocka_134) (+ truck_stock_133 b_stockb_134))
13897          (= a_stocka_134 a_stockb_134)
13898          (= c_stocka_134 c_stockb_134)
13899          (or
13900            (and
13901              (= truck_loc_134 1)
13902              (= truck_travel_time_134 17)
13903            )
13904            (and
13905              (= truck_loc_134 0)
13906              (= truck_travel_time_134 21)
13907            )
13908            (and
13909              (= truck_loc_134 3)
13910              (= truck_travel_time_134 37)
13911            )
13912          )
13913        )
13914      )
13915      (=> (= truck_loc_133 3)
13916        (and
13917          (<= c_stocka_134 200)
13918          (= (+ truck_stock_134 c_stocka_134) (+ truck_stock_133 c_stockb_134))
13919          (= a_stocka_134 a_stockb_134)
13920          (= b_stocka_134 b_stockb_134)
13921          (or
13922            (and
13923              (= truck_loc_134 1)
13924              (= truck_travel_time_134 32)
13925            )
13926            (and
13927              (= truck_loc_134 2)
13928              (= truck_travel_time_134 37)
```

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13929              )
13930            )
13931          )
13932        )
13933    )
13934    (<= truck_stock_134 300)
13935    (>= truck_stock_134 0)
13936    (= a_stockb_135 (- a_stocka_134 truck_travel_time_134))
13937    (= b_stockb_135 (- b_stocka_134 truck_travel_time_134))
13938    (= c_stockb_135 (- c_stocka_134 truck_travel_time_134))
13939    (and
13940      (=> (= truck_loc_134 0)
13941        (and
13942          (= a_stocka_135 a_stockb_135)
13943          (= b_stocka_135 b_stockb_135)
13944          (= c_stocka_135 c_stockb_135)
13945          (or
13946            (and
13947              (= truck_loc_135 1)
13948              (= truck_travel_time_135 29)
13949            )
13950            (and
13951              (= truck_loc_135 2)
13952              (= truck_travel_time_135 21)
13953            )
13954          )
13955        )
13956      )
13957      (=> (= truck_loc_134 1)
13958        (and
13959          (<= a_stocka_135 120)
13960          (= (+ truck_stock_135 a_stocka_135) (+ truck_stock_134 a_stockb_135))
13961          (= b_stocka_135 b_stockb_135)
13962          (= c_stocka_135 c_stockb_135)
13963          (or
13964            (and
13965              (= truck_loc_135 0)
13966              (= truck_travel_time_135 29)
13967            )
13968            (and
13969              (= truck_loc_135 2)
13970              (= truck_travel_time_135 17)
13971            )
13972            (and
13973              (= truck_loc_135 3)
13974              (= truck_travel_time_135 32)
13975            )
13976          )
13977        )
13978      )
13979      (=> (= truck_loc_134 2)
13980        (and
13981          (<= b_stocka_135 120)
13982          (= (+ truck_stock_135 b_stocka_135) (+ truck_stock_134 b_stockb_135))
13983          (= a_stocka_135 a_stockb_135)
13984          (= c_stocka_135 c_stockb_135)
13985          (or
13986            (and
13987              (= truck_loc_135 1)
13988              (= truck_travel_time_135 17)
13989            )
13990            (and
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```
13991              (= truck_loc_135 0)
13992              (= truck_travel_time_135 21)
13993            )
13994          (and
13995              (= truck_loc_135 3)
13996              (= truck_travel_time_135 37)
13997          )
13998        )
13999      )
14000    )
14001    (=> (= truck_loc_134 3)
14002      (and
14003        (<= c_stocka_135 200)
14004        (= (+ truck_stock_135 c_stocka_135) (+ truck_stock_134 c_stockb_135))
14005        (= a_stocka_135 a_stockb_135)
14006        (= b_stocka_135 b_stockb_135)
14007        (or
14008          (and
14009              (= truck_loc_135 1)
14010              (= truck_travel_time_135 32)
14011          )
14012          (and
14013              (= truck_loc_135 2)
14014              (= truck_travel_time_135 37)
14015          )
14016        )
14017      )
14018    )
14019  )
14020  (<= truck_stock_135 300)
14021  (>= truck_stock_135 0)
14022  (= a_stockb_136 (- a_stocka_135 truck_travel_time_135))
14023  (= b_stockb_136 (- b_stocka_135 truck_travel_time_135))
14024  (= c_stockb_136 (- c_stocka_135 truck_travel_time_135))
14025  (and
14026    (=> (= truck_loc_135 0)
14027      (and
14028        (= a_stocka_136 a_stockb_136)
14029        (= b_stocka_136 b_stockb_136)
14030        (= c_stocka_136 c_stockb_136)
14031        (or
14032          (and
14033              (= truck_loc_136 1)
14034              (= truck_travel_time_136 29)
14035          )
14036          (and
14037              (= truck_loc_136 2)
14038              (= truck_travel_time_136 21)
14039          )
14040        )
14041      )
14042    )
14043    (=> (= truck_loc_135 1)
14044      (and
14045        (<= a_stocka_136 120)
14046        (= (+ truck_stock_136 a_stocka_136) (+ truck_stock_135 a_stockb_136))
14047        (= b_stocka_136 b_stockb_136)
14048        (= c_stocka_136 c_stockb_136)
14049        (or
14050          (and
14051              (= truck_loc_136 0)
14052              (= truck_travel_time_136 29)
```

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14053            )
14054          (and
14055            (= truck_loc_136 2)
14056            (= truck_travel_time_136 17)
14057          )
14058          (and
14059            (= truck_loc_136 3)
14060            (= truck_travel_time_136 32)
14061          )
14062        )
14063      )
14064    )
14065    (=> (= truck_loc_135 2)
14066      (and
14067        (<= b_stocka_136 120)
14068        (= (+ truck_stock_136 b_stocka_136) (+ truck_stock_135 b_stockb_136))
14069        (= a_stocka_136 a_stockb_136)
14070        (= c_stocka_136 c_stockb_136)
14071        (or
14072          (and
14073            (= truck_loc_136 1)
14074            (= truck_travel_time_136 17)
14075          )
14076          (and
14077            (= truck_loc_136 0)
14078            (= truck_travel_time_136 21)
14079          )
14080          (and
14081            (= truck_loc_136 3)
14082            (= truck_travel_time_136 37)
14083          )
14084        )
14085      )
14086    )
14087    (=> (= truck_loc_135 3)
14088      (and
14089        (<= c_stocka_136 200)
14090        (= (+ truck_stock_136 c_stocka_136) (+ truck_stock_135 c_stockb_136))
14091        (= a_stocka_136 a_stockb_136)
14092        (= b_stocka_136 b_stockb_136)
14093        (or
14094          (and
14095            (= truck_loc_136 1)
14096            (= truck_travel_time_136 32)
14097          )
14098          (and
14099            (= truck_loc_136 2)
14100            (= truck_travel_time_136 37)
14101          )
14102        )
14103      )
14104    )
14105  )
14106  (<= truck_stock_136 300)
14107  (>= truck_stock_136 0)
14108  (= a_stockb_137 (- a_stocka_136 truck_travel_time_136))
14109  (= b_stockb_137 (- b_stocka_136 truck_travel_time_136))
14110  (= c_stockb_137 (- c_stocka_136 truck_travel_time_136))
14111  (and
14112    (=> (= truck_loc_136 0)
14113      (and
14114        (= a_stocka_137 a_stockb_137)
```

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14115        (= b_stocka_137 b_stockb_137)
14116        (= c_stocka_137 c_stockb_137)
14117        (or
14118          (and
14119            (= truck_loc_137 1)
14120            (= truck_travel_time_137 29)
14121          )
14122          (and
14123            (= truck_loc_137 2)
14124            (= truck_travel_time_137 21)
14125          )
14126        )
14127      )
14128    )
14129    (=> (= truck_loc_136 1)
14130      (and
14131        (<= a_stocka_137 120)
14132        (= (+ truck_stock_137 a_stocka_137) (+ truck_stock_136 a_stockb_137))
14133        (= b_stocka_137 b_stockb_137)
14134        (= c_stocka_137 c_stockb_137)
14135        (or
14136          (and
14137            (= truck_loc_137 0)
14138            (= truck_travel_time_137 29)
14139          )
14140          (and
14141            (= truck_loc_137 2)
14142            (= truck_travel_time_137 17)
14143          )
14144          (and
14145            (= truck_loc_137 3)
14146            (= truck_travel_time_137 32)
14147          )
14148        )
14149      )
14150    )
14151    (=> (= truck_loc_136 2)
14152      (and
14153        (<= b_stocka_137 120)
14154        (= (+ truck_stock_137 b_stocka_137) (+ truck_stock_136 b_stockb_137))
14155        (= a_stocka_137 a_stockb_137)
14156        (= c_stocka_137 c_stockb_137)
14157        (or
14158          (and
14159            (= truck_loc_137 1)
14160            (= truck_travel_time_137 17)
14161          )
14162          (and
14163            (= truck_loc_137 0)
14164            (= truck_travel_time_137 21)
14165          )
14166          (and
14167            (= truck_loc_137 3)
14168            (= truck_travel_time_137 37)
14169          )
14170        )
14171      )
14172    )
14173    (=> (= truck_loc_136 3)
14174      (and
14175        (<= c_stocka_137 200)
14176        (= (+ truck_stock_137 c_stocka_137) (+ truck_stock_136 c_stockb_137))
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14177        (= a_stocka_137 a_stockb_137)
14178        (= b_stocka_137 b_stockb_137)
14179        (or
14180          (and
14181            (= truck_loc_137 1)
14182            (= truck_travel_time_137 32)
14183          )
14184          (and
14185            (= truck_loc_137 2)
14186            (= truck_travel_time_137 37)
14187          )
14188        )
14189      )
14190    )
14191  )
14192  (<= truck_stock_137 300)
14193  (>= truck_stock_137 0)
14194  (= a_stockb_138 (- a_stocka_137 truck_travel_time_137))
14195  (= b_stockb_138 (- b_stocka_137 truck_travel_time_137))
14196  (= c_stockb_138 (- c_stocka_137 truck_travel_time_137))
14197  (and
14198    (=> (= truck_loc_137 0)
14199      (and
14200        (= a_stocka_138 a_stockb_138)
14201        (= b_stocka_138 b_stockb_138)
14202        (= c_stocka_138 c_stockb_138)
14203        (or
14204          (and
14205            (= truck_loc_138 1)
14206            (= truck_travel_time_138 29)
14207          )
14208          (and
14209            (= truck_loc_138 2)
14210            (= truck_travel_time_138 21)
14211          )
14212        )
14213      )
14214    )
14215    (=> (= truck_loc_137 1)
14216      (and
14217        (<= a_stocka_138 120)
14218        (= (+ truck_stock_138 a_stocka_138) (+ truck_stock_137 a_stockb_138))
14219        (= b_stocka_138 b_stockb_138)
14220        (= c_stocka_138 c_stockb_138)
14221        (or
14222          (and
14223            (= truck_loc_138 0)
14224            (= truck_travel_time_138 29)
14225          )
14226          (and
14227            (= truck_loc_138 2)
14228            (= truck_travel_time_138 17)
14229          )
14230          (and
14231            (= truck_loc_138 3)
14232            (= truck_travel_time_138 32)
14233          )
14234        )
14235      )
14236    )
14237    (=> (= truck_loc_137 2)
14238      (and
```

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14239          (<= b_stocka_138 120)
14240          (= (+ truck_stock_138 b_stocka_138) (+ truck_stock_137 b_stockb_138))
14241          (= a_stocka_138 a_stockb_138)
14242          (= c_stocka_138 c_stockb_138)
14243          (or
14244            (and
14245              (= truck_loc_138 1)
14246              (= truck_travel_time_138 17)
14247            )
14248            (and
14249              (= truck_loc_138 0)
14250              (= truck_travel_time_138 21)
14251            )
14252            (and
14253              (= truck_loc_138 3)
14254              (= truck_travel_time_138 37)
14255            )
14256          )
14257        )
14258    )
14259    (=> (= truck_loc_137 3)
14260      (and
14261        (<= c_stocka_138 200)
14262        (= (+ truck_stock_138 c_stocka_138) (+ truck_stock_137 c_stockb_138))
14263        (= a_stocka_138 a_stockb_138)
14264        (= b_stocka_138 b_stockb_138)
14265        (or
14266          (and
14267            (= truck_loc_138 1)
14268            (= truck_travel_time_138 32)
14269          )
14270          (and
14271            (= truck_loc_138 2)
14272            (= truck_travel_time_138 37)
14273          )
14274        )
14275      )
14276    )
14277  )
14278  (<= truck_stock_138 300)
14279  (>= truck_stock_138 0)
14280  (= a_stockb_139 (- a_stocka_138 truck_travel_time_138))
14281  (= b_stockb_139 (- b_stocka_138 truck_travel_time_138))
14282  (= c_stockb_139 (- c_stocka_138 truck_travel_time_138))
14283  (and
14284    (=> (= truck_loc_138 0)
14285      (and
14286        (= a_stocka_139 a_stockb_139)
14287        (= b_stocka_139 b_stockb_139)
14288        (= c_stocka_139 c_stockb_139)
14289        (or
14290          (and
14291            (= truck_loc_139 1)
14292            (= truck_travel_time_139 29)
14293          )
14294          (and
14295            (= truck_loc_139 2)
14296            (= truck_travel_time_139 21)
14297          )
14298        )
14299      )
14300    )
```

```
14301    (=> (= truck_loc_138 1)
14302      (and
14303        (<= a_stocka_139 120)
14304        (= (+ truck_stock_139 a_stocka_139) (+ truck_stock_138 a_stockb_139))
14305        (= b_stocka_139 b_stockb_139)
14306        (= c_stocka_139 c_stockb_139)
14307        (or
14308          (and
14309            (= truck_loc_139 0)
14310            (= truck_travel_time_139 29)
14311          )
14312          (and
14313            (= truck_loc_139 2)
14314            (= truck_travel_time_139 17)
14315          )
14316          (and
14317            (= truck_loc_139 3)
14318            (= truck_travel_time_139 32)
14319          )
14320        )
14321      )
14322    )
14323    (=> (= truck_loc_138 2)
14324      (and
14325        (<= b_stocka_139 120)
14326        (= (+ truck_stock_139 b_stocka_139) (+ truck_stock_138 b_stockb_139))
14327        (= a_stocka_139 a_stockb_139)
14328        (= c_stocka_139 c_stockb_139)
14329        (or
14330          (and
14331            (= truck_loc_139 1)
14332            (= truck_travel_time_139 17)
14333          )
14334          (and
14335            (= truck_loc_139 0)
14336            (= truck_travel_time_139 21)
14337          )
14338          (and
14339            (= truck_loc_139 3)
14340            (= truck_travel_time_139 37)
14341          )
14342        )
14343      )
14344    )
14345    (=> (= truck_loc_138 3)
14346      (and
14347        (<= c_stocka_139 200)
14348        (= (+ truck_stock_139 c_stocka_139) (+ truck_stock_138 c_stockb_139))
14349        (= a_stocka_139 a_stockb_139)
14350        (= b_stocka_139 b_stockb_139)
14351        (or
14352          (and
14353            (= truck_loc_139 1)
14354            (= truck_travel_time_139 32)
14355          )
14356          (and
14357            (= truck_loc_139 2)
14358            (= truck_travel_time_139 37)
14359          )
14360        )
14361      )
14362    )
```

```
14363  )
14364  (<= truck_stock_139 300)
14365  (>= truck_stock_139 0)
14366  (= a_stockb_140 (- a_stocka_139 truck_travel_time_139))
14367  (= b_stockb_140 (- b_stocka_139 truck_travel_time_139))
14368  (= c_stockb_140 (- c_stocka_139 truck_travel_time_139))
14369  (and
14370    (=> (= truck_loc_139 0)
14371      (and
14372        (= a_stocka_140 a_stockb_140)
14373        (= b_stocka_140 b_stockb_140)
14374        (= c_stocka_140 c_stockb_140)
14375        (or
14376          (and
14377            (= truck_loc_140 1)
14378            (= truck_travel_time_140 29)
14379          )
14380          (and
14381            (= truck_loc_140 2)
14382            (= truck_travel_time_140 21)
14383          )
14384        )
14385      )
14386    )
14387    (=> (= truck_loc_139 1)
14388      (and
14389        (<= a_stocka_140 120)
14390        (= (+ truck_stock_140 a_stocka_140) (+ truck_stock_139 a_stockb_140))
14391        (= b_stocka_140 b_stockb_140)
14392        (= c_stocka_140 c_stockb_140)
14393        (or
14394          (and
14395            (= truck_loc_140 0)
14396            (= truck_travel_time_140 29)
14397          )
14398          (and
14399            (= truck_loc_140 2)
14400            (= truck_travel_time_140 17)
14401          )
14402          (and
14403            (= truck_loc_140 3)
14404            (= truck_travel_time_140 32)
14405          )
14406        )
14407      )
14408    )
14409    (=> (= truck_loc_139 2)
14410      (and
14411        (<= b_stocka_140 120)
14412        (= (+ truck_stock_140 b_stocka_140) (+ truck_stock_139 b_stockb_140))
14413        (= a_stocka_140 a_stockb_140)
14414        (= c_stocka_140 c_stockb_140)
14415        (or
14416          (and
14417            (= truck_loc_140 1)
14418            (= truck_travel_time_140 17)
14419          )
14420          (and
14421            (= truck_loc_140 0)
14422            (= truck_travel_time_140 21)
14423          )
14424          (and
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```
14425              (= truck_loc_140 3)
14426              (= truck_travel_time_140 37)
14427            )
14428          )
14429        )
14430      )
14431      (=> (= truck_loc_139 3)
14432        (and
14433          (<= c_stocka_140 200)
14434          (= (+ truck_stock_140 c_stocka_140) (+ truck_stock_139 c_stockb_140))
14435          (= a_stocka_140 a_stockb_140)
14436          (= b_stocka_140 b_stockb_140)
14437          (or
14438            (and
14439              (= truck_loc_140 1)
14440              (= truck_travel_time_140 32)
14441            )
14442            (and
14443              (= truck_loc_140 2)
14444              (= truck_travel_time_140 37)
14445            )
14446          )
14447        )
14448      )
14449  )
14450  (<= truck_stock_140 300)
14451  (>= truck_stock_140 0)
14452  (= a_stockb_141 (- a_stocka_140 truck_travel_time_140))
14453  (= b_stockb_141 (- b_stocka_140 truck_travel_time_140))
14454  (= c_stockb_141 (- c_stocka_140 truck_travel_time_140))
14455  (and
14456      (=> (= truck_loc_140 0)
14457        (and
14458          (= a_stocka_141 a_stockb_141)
14459          (= b_stocka_141 b_stockb_141)
14460          (= c_stocka_141 c_stockb_141)
14461          (or
14462            (and
14463              (= truck_loc_141 1)
14464              (= truck_travel_time_141 29)
14465            )
14466            (and
14467              (= truck_loc_141 2)
14468              (= truck_travel_time_141 21)
14469            )
14470          )
14471        )
14472      )
14473      (=> (= truck_loc_140 1)
14474        (and
14475          (<= a_stocka_141 120)
14476          (= (+ truck_stock_141 a_stocka_141) (+ truck_stock_140 a_stockb_141))
14477          (= b_stocka_141 b_stockb_141)
14478          (= c_stocka_141 c_stockb_141)
14479          (or
14480            (and
14481              (= truck_loc_141 0)
14482              (= truck_travel_time_141 29)
14483            )
14484            (and
14485              (= truck_loc_141 2)
14486              (= truck_travel_time_141 17)
```

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14487          )
14488        (and
14489          (= truck_loc_141 3)
14490          (= truck_travel_time_141 32)
14491        )
14492      )
14493    )
14494  )
14495  (=> (= truck_loc_140 2)
14496    (and
14497      (<= b_stocka_141 120)
14498      (= (+ truck_stock_141 b_stocka_141) (+ truck_stock_140 b_stockb_141))
14499      (= a_stocka_141 a_stockb_141)
14500      (= c_stocka_141 c_stockb_141)
14501      (or
14502        (and
14503          (= truck_loc_141 1)
14504          (= truck_travel_time_141 17)
14505        )
14506        (and
14507          (= truck_loc_141 0)
14508          (= truck_travel_time_141 21)
14509        )
14510        (and
14511          (= truck_loc_141 3)
14512          (= truck_travel_time_141 37)
14513        )
14514      )
14515    )
14516  )
14517  (=> (= truck_loc_140 3)
14518    (and
14519      (<= c_stocka_141 200)
14520      (= (+ truck_stock_141 c_stocka_141) (+ truck_stock_140 c_stockb_141))
14521      (= a_stocka_141 a_stockb_141)
14522      (= b_stocka_141 b_stockb_141)
14523      (or
14524        (and
14525          (= truck_loc_141 1)
14526          (= truck_travel_time_141 32)
14527        )
14528        (and
14529          (= truck_loc_141 2)
14530          (= truck_travel_time_141 37)
14531        )
14532      )
14533    )
14534  )
14535  )
14536  (<= truck_stock_141 300)
14537  (>= truck_stock_141 0)
14538  (= a_stockb_142 (- a_stocka_141 truck_travel_time_141))
14539  (= b_stockb_142 (- b_stocka_141 truck_travel_time_141))
14540  (= c_stockb_142 (- c_stocka_141 truck_travel_time_141))
14541  (and
14542    (=> (= truck_loc_141 0)
14543      (and
14544        (= a_stocka_142 a_stockb_142)
14545        (= b_stocka_142 b_stockb_142)
14546        (= c_stocka_142 c_stockb_142)
14547        (or
14548          (and
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14549          (= truck_loc_142 1)
14550          (= truck_travel_time_142 29)
14551        )
14552      (and
14553        (= truck_loc_142 2)
14554        (= truck_travel_time_142 21)
14555      )
14556    )
14557  )
14558 )
14559 (=> (= truck_loc_141 1)
14560   (and
14561     (<= a_stocka_142 120)
14562     (= (+ truck_stock_142 a_stocka_142) (+ truck_stock_141 a_stockb_142))
14563     (= b_stocka_142 b_stockb_142)
14564     (= c_stocka_142 c_stockb_142)
14565     (or
14566       (and
14567         (= truck_loc_142 0)
14568         (= truck_travel_time_142 29)
14569       )
14570       (and
14571         (= truck_loc_142 2)
14572         (= truck_travel_time_142 17)
14573       )
14574       (and
14575         (= truck_loc_142 3)
14576         (= truck_travel_time_142 32)
14577       )
14578     )
14579   )
14580 )
14581 (=> (= truck_loc_141 2)
14582   (and
14583     (<= b_stocka_142 120)
14584     (= (+ truck_stock_142 b_stocka_142) (+ truck_stock_141 b_stockb_142))
14585     (= a_stocka_142 a_stockb_142)
14586     (= c_stocka_142 c_stockb_142)
14587     (or
14588       (and
14589         (= truck_loc_142 1)
14590         (= truck_travel_time_142 17)
14591       )
14592       (and
14593         (= truck_loc_142 0)
14594         (= truck_travel_time_142 21)
14595       )
14596       (and
14597         (= truck_loc_142 3)
14598         (= truck_travel_time_142 37)
14599       )
14600     )
14601   )
14602 )
14603 (=> (= truck_loc_141 3)
14604   (and
14605     (<= c_stocka_142 200)
14606     (= (+ truck_stock_142 c_stocka_142) (+ truck_stock_141 c_stockb_142))
14607     (= a_stocka_142 a_stockb_142)
14608     (= b_stocka_142 b_stockb_142)
14609     (or
14610       (and
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14611              (= truck_loc_142 1)
14612              (= truck_travel_time_142 32)
14613           )
14614         (and
14615            (= truck_loc_142 2)
14616            (= truck_travel_time_142 37)
14617         )
14618       )
14619     )
14620   )
14621 )
14622 (<= truck_stock_142 300)
14623 (>= truck_stock_142 0)
14624 (= a_stockb_143 (- a_stocka_142 truck_travel_time_142))
14625 (= b_stockb_143 (- b_stocka_142 truck_travel_time_142))
14626 (= c_stockb_143 (- c_stocka_142 truck_travel_time_142))
14627 (and
14628   (=> (= truck_loc_142 0)
14629     (and
14630       (= a_stocka_143 a_stockb_143)
14631       (= b_stocka_143 b_stockb_143)
14632       (= c_stocka_143 c_stockb_143)
14633       (or
14634         (and
14635           (= truck_loc_143 1)
14636           (= truck_travel_time_143 29)
14637         )
14638         (and
14639           (= truck_loc_143 2)
14640           (= truck_travel_time_143 21)
14641         )
14642       )
14643     )
14644   )
14645   (=> (= truck_loc_142 1)
14646     (and
14647       (<= a_stocka_143 120)
14648       (= (+ truck_stock_143 a_stocka_143) (+ truck_stock_142 a_stockb_143))
14649       (= b_stocka_143 b_stockb_143)
14650       (= c_stocka_143 c_stockb_143)
14651       (or
14652         (and
14653           (= truck_loc_143 0)
14654           (= truck_travel_time_143 29)
14655         )
14656         (and
14657           (= truck_loc_143 2)
14658           (= truck_travel_time_143 17)
14659         )
14660         (and
14661           (= truck_loc_143 3)
14662           (= truck_travel_time_143 32)
14663         )
14664       )
14665     )
14666   )
14667   (=> (= truck_loc_142 2)
14668     (and
14669       (<= b_stocka_143 120)
14670       (= (+ truck_stock_143 b_stocka_143) (+ truck_stock_142 b_stockb_143))
14671       (= a_stocka_143 a_stockb_143)
14672       (= c_stocka_143 c_stockb_143)
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14673          (or
14674            (and
14675              (= truck_loc_143 1)
14676              (= truck_travel_time_143 17)
14677            )
14678            (and
14679              (= truck_loc_143 0)
14680              (= truck_travel_time_143 21)
14681            )
14682            (and
14683              (= truck_loc_143 3)
14684              (= truck_travel_time_143 37)
14685            )
14686          )
14687        )
14688      )
14689      (=> (= truck_loc_142 3)
14690        (and
14691          (<= c_stocka_143 200)
14692          (= (+ truck_stock_143 c_stocka_143) (+ truck_stock_142 c_stockb_143))
14693          (= a_stocka_143 a_stockb_143)
14694          (= b_stocka_143 b_stockb_143)
14695          (or
14696            (and
14697              (= truck_loc_143 1)
14698              (= truck_travel_time_143 32)
14699            )
14700            (and
14701              (= truck_loc_143 2)
14702              (= truck_travel_time_143 37)
14703            )
14704          )
14705        )
14706      )
14707    )
14708    (<= truck_stock_143 300)
14709    (>= truck_stock_143 0)
14710    (= a_stockb_144 (- a_stocka_143 truck_travel_time_143))
14711    (= b_stockb_144 (- b_stocka_143 truck_travel_time_143))
14712    (= c_stockb_144 (- c_stocka_143 truck_travel_time_143))
14713    (and
14714      (=> (= truck_loc_143 0)
14715        (and
14716          (= a_stocka_144 a_stockb_144)
14717          (= b_stocka_144 b_stockb_144)
14718          (= c_stocka_144 c_stockb_144)
14719          (or
14720            (and
14721              (= truck_loc_144 1)
14722              (= truck_travel_time_144 29)
14723            )
14724            (and
14725              (= truck_loc_144 2)
14726              (= truck_travel_time_144 21)
14727            )
14728          )
14729        )
14730      )
14731      (=> (= truck_loc_143 1)
14732        (and
14733          (<= a_stocka_144 120)
14734          (= (+ truck_stock_144 a_stocka_144) (+ truck_stock_143 a_stockb_144))
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14735        (= b_stocka_144 b_stockb_144)
14736        (= c_stocka_144 c_stockb_144)
14737        (or
14738          (and
14739            (= truck_loc_144 0)
14740            (= truck_travel_time_144 29)
14741          )
14742          (and
14743            (= truck_loc_144 2)
14744            (= truck_travel_time_144 17)
14745          )
14746          (and
14747            (= truck_loc_144 3)
14748            (= truck_travel_time_144 32)
14749          )
14750        )
14751      )
14752    )
14753    (=> (= truck_loc_143 2)
14754      (and
14755        (<= b_stocka_144 120)
14756        (= (+ truck_stock_144 b_stocka_144) (+ truck_stock_143 b_stockb_144))
14757        (= a_stocka_144 a_stockb_144)
14758        (= c_stocka_144 c_stockb_144)
14759        (or
14760          (and
14761            (= truck_loc_144 1)
14762            (= truck_travel_time_144 17)
14763          )
14764          (and
14765            (= truck_loc_144 0)
14766            (= truck_travel_time_144 21)
14767          )
14768          (and
14769            (= truck_loc_144 3)
14770            (= truck_travel_time_144 37)
14771          )
14772        )
14773      )
14774    )
14775    (=> (= truck_loc_143 3)
14776      (and
14777        (<= c_stocka_144 200)
14778        (= (+ truck_stock_144 c_stocka_144) (+ truck_stock_143 c_stockb_144))
14779        (= a_stocka_144 a_stockb_144)
14780        (= b_stocka_144 b_stockb_144)
14781        (or
14782          (and
14783            (= truck_loc_144 1)
14784            (= truck_travel_time_144 32)
14785          )
14786          (and
14787            (= truck_loc_144 2)
14788            (= truck_travel_time_144 37)
14789          )
14790        )
14791      )
14792    )
14793  )
14794  (<= truck_stock_144 300)
14795  (>= truck_stock_144 0)
14796  (= a_stockb_145 (- a_stocka_144 truck_travel_time_144))
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14797  (= b_stockb_145 (- b_stocka_144 truck_travel_time_144))
14798  (= c_stockb_145 (- c_stocka_144 truck_travel_time_144))
14799  (and
14800    (=> (= truck_loc_144 0)
14801      (and
14802        (= a_stocka_145 a_stockb_145)
14803        (= b_stocka_145 b_stockb_145)
14804        (= c_stocka_145 c_stockb_145)
14805        (or
14806          (and
14807            (= truck_loc_145 1)
14808            (= truck_travel_time_145 29)
14809          )
14810          (and
14811            (= truck_loc_145 2)
14812            (= truck_travel_time_145 21)
14813          )
14814        )
14815      )
14816    )
14817    (=> (= truck_loc_144 1)
14818      (and
14819        (<= a_stocka_145 120)
14820        (= (+ truck_stock_145 a_stocka_145) (+ truck_stock_144 a_stockb_145))
14821        (= b_stocka_145 b_stockb_145)
14822        (= c_stocka_145 c_stockb_145)
14823        (or
14824          (and
14825            (= truck_loc_145 0)
14826            (= truck_travel_time_145 29)
14827          )
14828          (and
14829            (= truck_loc_145 2)
14830            (= truck_travel_time_145 17)
14831          )
14832          (and
14833            (= truck_loc_145 3)
14834            (= truck_travel_time_145 32)
14835          )
14836        )
14837      )
14838    )
14839    (=> (= truck_loc_144 2)
14840      (and
14841        (<= b_stocka_145 120)
14842        (= (+ truck_stock_145 b_stocka_145) (+ truck_stock_144 b_stockb_145))
14843        (= a_stocka_145 a_stockb_145)
14844        (= c_stocka_145 c_stockb_145)
14845        (or
14846          (and
14847            (= truck_loc_145 1)
14848            (= truck_travel_time_145 17)
14849          )
14850          (and
14851            (= truck_loc_145 0)
14852            (= truck_travel_time_145 21)
14853          )
14854          (and
14855            (= truck_loc_145 3)
14856            (= truck_travel_time_145 37)
14857          )
14858        )
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14859        )
14860      )
14861      (=> (= truck_loc_144 3)
14862        (and
14863          (<= c_stocka_145 200)
14864          (= (+ truck_stock_145 c_stocka_145) (+ truck_stock_144 c_stockb_145))
14865          (= a_stocka_145 a_stockb_145)
14866          (= b_stocka_145 b_stockb_145)
14867          (or
14868            (and
14869              (= truck_loc_145 1)
14870              (= truck_travel_time_145 32)
14871            )
14872            (and
14873              (= truck_loc_145 2)
14874              (= truck_travel_time_145 37)
14875            )
14876          )
14877        )
14878      )
14879    )
14880    (<= truck_stock_145 300)
14881    (>= truck_stock_145 0)
14882    (= a_stockb_146 (- a_stocka_145 truck_travel_time_145))
14883    (= b_stockb_146 (- b_stocka_145 truck_travel_time_145))
14884    (= c_stockb_146 (- c_stocka_145 truck_travel_time_145))
14885    (and
14886      (=> (= truck_loc_145 0)
14887        (and
14888          (= a_stocka_146 a_stockb_146)
14889          (= b_stocka_146 b_stockb_146)
14890          (= c_stocka_146 c_stockb_146)
14891          (or
14892            (and
14893              (= truck_loc_146 1)
14894              (= truck_travel_time_146 29)
14895            )
14896            (and
14897              (= truck_loc_146 2)
14898              (= truck_travel_time_146 21)
14899            )
14900          )
14901        )
14902      )
14903      (=> (= truck_loc_145 1)
14904        (and
14905          (<= a_stocka_146 120)
14906          (= (+ truck_stock_146 a_stocka_146) (+ truck_stock_145 a_stockb_146))
14907          (= b_stocka_146 b_stockb_146)
14908          (= c_stocka_146 c_stockb_146)
14909          (or
14910            (and
14911              (= truck_loc_146 0)
14912              (= truck_travel_time_146 29)
14913            )
14914            (and
14915              (= truck_loc_146 2)
14916              (= truck_travel_time_146 17)
14917            )
14918            (and
14919              (= truck_loc_146 3)
14920              (= truck_travel_time_146 32)
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14921              )
14922            )
14923          )
14924      )
14925      (=> (= truck_loc_145 2)
14926        (and
14927          (<= b_stocka_146 120)
14928          (= (+ truck_stock_146 b_stocka_146) (+ truck_stock_145 b_stockb_146))
14929          (= a_stocka_146 a_stockb_146)
14930          (= c_stocka_146 c_stockb_146)
14931          (or
14932            (and
14933              (= truck_loc_146 1)
14934              (= truck_travel_time_146 17)
14935            )
14936            (and
14937              (= truck_loc_146 0)
14938              (= truck_travel_time_146 21)
14939            )
14940            (and
14941              (= truck_loc_146 3)
14942              (= truck_travel_time_146 37)
14943            )
14944          )
14945        )
14946      )
14947      (=> (= truck_loc_145 3)
14948        (and
14949          (<= c_stocka_146 200)
14950          (= (+ truck_stock_146 c_stocka_146) (+ truck_stock_145 c_stockb_146))
14951          (= a_stocka_146 a_stockb_146)
14952          (= b_stocka_146 b_stockb_146)
14953          (or
14954            (and
14955              (= truck_loc_146 1)
14956              (= truck_travel_time_146 32)
14957            )
14958            (and
14959              (= truck_loc_146 2)
14960              (= truck_travel_time_146 37)
14961            )
14962          )
14963        )
14964      )
14965  )
14966  (<= truck_stock_146 300)
14967  (>= truck_stock_146 0)
14968  (= a_stockb_147 (- a_stocka_146 truck_travel_time_146))
14969  (= b_stockb_147 (- b_stocka_146 truck_travel_time_146))
14970  (= c_stockb_147 (- c_stocka_146 truck_travel_time_146))
14971  (and
14972    (=> (= truck_loc_146 0)
14973      (and
14974        (= a_stocka_147 a_stockb_147)
14975        (= b_stocka_147 b_stockb_147)
14976        (= c_stocka_147 c_stockb_147)
14977        (or
14978          (and
14979            (= truck_loc_147 1)
14980            (= truck_travel_time_147 29)
14981          )
14982          (and
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14983            (= truck_loc_147 2)
14984            (= truck_travel_time_147 21)
14985          )
14986        )
14987      )
14988    )
14989    (=> (= truck_loc_146 1)
14990      (and
14991        (<= a_stocka_147 120)
14992        (= (+ truck_stock_147 a_stocka_147) (+ truck_stock_146 a_stockb_147))
14993        (= b_stocka_147 b_stockb_147)
14994        (= c_stocka_147 c_stockb_147)
14995        (or
14996          (and
14997            (= truck_loc_147 0)
14998            (= truck_travel_time_147 29)
14999          )
15000          (and
15001            (= truck_loc_147 2)
15002            (= truck_travel_time_147 17)
15003          )
15004          (and
15005            (= truck_loc_147 3)
15006            (= truck_travel_time_147 32)
15007          )
15008        )
15009      )
15010    )
15011    (=> (= truck_loc_146 2)
15012      (and
15013        (<= b_stocka_147 120)
15014        (= (+ truck_stock_147 b_stocka_147) (+ truck_stock_146 b_stockb_147))
15015        (= a_stocka_147 a_stockb_147)
15016        (= c_stocka_147 c_stockb_147)
15017        (or
15018          (and
15019            (= truck_loc_147 1)
15020            (= truck_travel_time_147 17)
15021          )
15022          (and
15023            (= truck_loc_147 0)
15024            (= truck_travel_time_147 21)
15025          )
15026          (and
15027            (= truck_loc_147 3)
15028            (= truck_travel_time_147 37)
15029          )
15030        )
15031      )
15032    )
15033    (=> (= truck_loc_146 3)
15034      (and
15035        (<= c_stocka_147 200)
15036        (= (+ truck_stock_147 c_stocka_147) (+ truck_stock_146 c_stockb_147))
15037        (= a_stocka_147 a_stockb_147)
15038        (= b_stocka_147 b_stockb_147)
15039        (or
15040          (and
15041            (= truck_loc_147 1)
15042            (= truck_travel_time_147 32)
15043          )
15044          (and
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```
15045            (= truck_loc_147 2)
15046            (= truck_travel_time_147 37)
15047          )
15048        )
15049      )
15050    )
15051  )
15052  (<= truck_stock_147 300)
15053  (>= truck_stock_147 0)
15054  (= a_stockb_148 (- a_stocka_147 truck_travel_time_147))
15055  (= b_stockb_148 (- b_stocka_147 truck_travel_time_147))
15056  (= c_stockb_148 (- c_stocka_147 truck_travel_time_147))
15057  (and
15058    (=> (= truck_loc_147 0)
15059      (and
15060        (= a_stocka_148 a_stockb_148)
15061        (= b_stocka_148 b_stockb_148)
15062        (= c_stocka_148 c_stockb_148)
15063        (or
15064          (and
15065            (= truck_loc_148 1)
15066            (= truck_travel_time_148 29)
15067          )
15068          (and
15069            (= truck_loc_148 2)
15070            (= truck_travel_time_148 21)
15071          )
15072        )
15073      )
15074    )
15075    (=> (= truck_loc_147 1)
15076      (and
15077        (<= a_stocka_148 120)
15078        (= (+ truck_stock_148 a_stocka_148) (+ truck_stock_147 a_stockb_148))
15079        (= b_stocka_148 b_stockb_148)
15080        (= c_stocka_148 c_stockb_148)
15081        (or
15082          (and
15083            (= truck_loc_148 0)
15084            (= truck_travel_time_148 29)
15085          )
15086          (and
15087            (= truck_loc_148 2)
15088            (= truck_travel_time_148 17)
15089          )
15090          (and
15091            (= truck_loc_148 3)
15092            (= truck_travel_time_148 32)
15093          )
15094        )
15095      )
15096    )
15097    (=> (= truck_loc_147 2)
15098      (and
15099        (<= b_stocka_148 120)
15100        (= (+ truck_stock_148 b_stocka_148) (+ truck_stock_147 b_stockb_148))
15101        (= a_stocka_148 a_stockb_148)
15102        (= c_stocka_148 c_stockb_148)
15103        (or
15104          (and
15105            (= truck_loc_148 1)
15106            (= truck_travel_time_148 17)
```

```
15107          )
15108        (and
15109          (= truck_loc_148 0)
15110          (= truck_travel_time_148 21)
15111        )
15112        (and
15113          (= truck_loc_148 3)
15114          (= truck_travel_time_148 37)
15115        )
15116      )
15117    )
15118  )
15119  (=> (= truck_loc_147 3)
15120    (and
15121      (<= c_stocka_148 200)
15122      (= (+ truck_stock_148 c_stocka_148) (+ truck_stock_147 c_stockb_148))
15123      (= a_stocka_148 a_stockb_148)
15124      (= b_stocka_148 b_stockb_148)
15125      (or
15126        (and
15127          (= truck_loc_148 1)
15128          (= truck_travel_time_148 32)
15129        )
15130        (and
15131          (= truck_loc_148 2)
15132          (= truck_travel_time_148 37)
15133        )
15134      )
15135    )
15136  )
15137 )
15138 (<= truck_stock_148 300)
15139 (>= truck_stock_148 0)
15140 (= a_stockb_149 (- a_stocka_148 truck_travel_time_148))
15141 (= b_stockb_149 (- b_stocka_148 truck_travel_time_148))
15142 (= c_stockb_149 (- c_stocka_148 truck_travel_time_148))
15143 (and
15144  (=> (= truck_loc_148 0)
15145    (and
15146      (= a_stocka_149 a_stockb_149)
15147      (= b_stocka_149 b_stockb_149)
15148      (= c_stocka_149 c_stockb_149)
15149      (or
15150        (and
15151          (= truck_loc_149 1)
15152          (= truck_travel_time_149 29)
15153        )
15154        (and
15155          (= truck_loc_149 2)
15156          (= truck_travel_time_149 21)
15157        )
15158      )
15159    )
15160  )
15161  (=> (= truck_loc_148 1)
15162    (and
15163      (<= a_stocka_149 120)
15164      (= (+ truck_stock_149 a_stocka_149) (+ truck_stock_148 a_stockb_149))
15165      (= b_stocka_149 b_stockb_149)
15166      (= c_stocka_149 c_stockb_149)
15167      (or
15168        (and
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15169            (= truck_loc_149 0)
15170            (= truck_travel_time_149 29)
15171          )
15172        (and
15173          (= truck_loc_149 2)
15174          (= truck_travel_time_149 17)
15175        )
15176        (and
15177          (= truck_loc_149 3)
15178          (= truck_travel_time_149 32)
15179        )
15180      )
15181    )
15182  )
15183  (=> (= truck_loc_148 2)
15184    (and
15185      (<= b_stocka_149 120)
15186      (= (+ truck_stock_149 b_stocka_149) (+ truck_stock_148 b_stockb_149))
15187      (= a_stocka_149 a_stockb_149)
15188      (= c_stocka_149 c_stockb_149)
15189      (or
15190        (and
15191          (= truck_loc_149 1)
15192          (= truck_travel_time_149 17)
15193        )
15194        (and
15195          (= truck_loc_149 0)
15196          (= truck_travel_time_149 21)
15197        )
15198        (and
15199          (= truck_loc_149 3)
15200          (= truck_travel_time_149 37)
15201        )
15202      )
15203    )
15204  )
15205  (=> (= truck_loc_148 3)
15206    (and
15207      (<= c_stocka_149 200)
15208      (= (+ truck_stock_149 c_stocka_149) (+ truck_stock_148 c_stockb_149))
15209      (= a_stocka_149 a_stockb_149)
15210      (= b_stocka_149 b_stockb_149)
15211      (or
15212        (and
15213          (= truck_loc_149 1)
15214          (= truck_travel_time_149 32)
15215        )
15216        (and
15217          (= truck_loc_149 2)
15218          (= truck_travel_time_149 37)
15219        )
15220      )
15221    )
15222  )
15223 )
15224 (<= truck_stock_149 300)
15225 (>= truck_stock_149 0)
15226 (= a_stockb_150 (- a_stocka_149 truck_travel_time_149))
15227 (= b_stockb_150 (- b_stocka_149 truck_travel_time_149))
15228 (= c_stockb_150 (- c_stocka_149 truck_travel_time_149))
15229 (and
15230    (=> (= truck_loc_149 0)
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15231      (and
15232        (= a_stocka_150 a_stockb_150)
15233        (= b_stocka_150 b_stockb_150)
15234        (= c_stocka_150 c_stockb_150)
15235        (or
15236          (and
15237            (= truck_loc_150 1)
15238            (= truck_travel_time_150 29)
15239          )
15240          (and
15241            (= truck_loc_150 2)
15242            (= truck_travel_time_150 21)
15243          )
15244        )
15245      )
15246    )
15247    (=> (= truck_loc_149 1)
15248      (and
15249        (<= a_stocka_150 120)
15250        (= (+ truck_stock_150 a_stocka_150) (+ truck_stock_149 a_stockb_150))
15251        (= b_stocka_150 b_stockb_150)
15252        (= c_stocka_150 c_stockb_150)
15253        (or
15254          (and
15255            (= truck_loc_150 0)
15256            (= truck_travel_time_150 29)
15257          )
15258          (and
15259            (= truck_loc_150 2)
15260            (= truck_travel_time_150 17)
15261          )
15262          (and
15263            (= truck_loc_150 3)
15264            (= truck_travel_time_150 32)
15265          )
15266        )
15267      )
15268    )
15269    (=> (= truck_loc_149 2)
15270      (and
15271        (<= b_stocka_150 120)
15272        (= (+ truck_stock_150 b_stocka_150) (+ truck_stock_149 b_stockb_150))
15273        (= a_stocka_150 a_stockb_150)
15274        (= c_stocka_150 c_stockb_150)
15275        (or
15276          (and
15277            (= truck_loc_150 1)
15278            (= truck_travel_time_150 17)
15279          )
15280          (and
15281            (= truck_loc_150 0)
15282            (= truck_travel_time_150 21)
15283          )
15284          (and
15285            (= truck_loc_150 3)
15286            (= truck_travel_time_150 37)
15287          )
15288        )
15289      )
15290    )
15291    (=> (= truck_loc_149 3)
15292      (and
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15293        (<= c_stocka_150 200)
15294        (= (+ truck_stock_150 c_stocka_150) (+ truck_stock_149 c_stockb_150))
15295        (= a_stocka_150 a_stockb_150)
15296        (= b_stocka_150 b_stockb_150)
15297        (or
15298          (and
15299            (= truck_loc_150 1)
15300            (= truck_travel_time_150 32)
15301          )
15302          (and
15303            (= truck_loc_150 2)
15304            (= truck_travel_time_150 37)
15305          )
15306        )
15307      )
15308    )
15309  )
15310  (<= truck_stock_150 300)
15311  (>= truck_stock_150 0)
15312  (= a_stockb_151 (- a_stocka_150 truck_travel_time_150))
15313  (= b_stockb_151 (- b_stocka_150 truck_travel_time_150))
15314  (= c_stockb_151 (- c_stocka_150 truck_travel_time_150))
15315  (and
15316    (=> (= truck_loc_150 0)
15317      (and
15318        (= a_stocka_151 a_stockb_151)
15319        (= b_stocka_151 b_stockb_151)
15320        (= c_stocka_151 c_stockb_151)
15321        (or
15322          (and
15323            (= truck_loc_151 1)
15324            (= truck_travel_time_151 29)
15325          )
15326          (and
15327            (= truck_loc_151 2)
15328            (= truck_travel_time_151 21)
15329          )
15330        )
15331      )
15332    )
15333    (=> (= truck_loc_150 1)
15334      (and
15335        (<= a_stocka_151 120)
15336        (= (+ truck_stock_151 a_stocka_151) (+ truck_stock_150 a_stockb_151))
15337        (= b_stocka_151 b_stockb_151)
15338        (= c_stocka_151 c_stockb_151)
15339        (or
15340          (and
15341            (= truck_loc_151 0)
15342            (= truck_travel_time_151 29)
15343          )
15344          (and
15345            (= truck_loc_151 2)
15346            (= truck_travel_time_151 17)
15347          )
15348          (and
15349            (= truck_loc_151 3)
15350            (= truck_travel_time_151 32)
15351          )
15352        )
15353      )
15354    )
```

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15355    (=> (= truck_loc_150 2)
15356      (and
15357        (<= b_stocka_151 120)
15358        (= (+ truck_stock_151 b_stocka_151) (+ truck_stock_150 b_stockb_151))
15359        (= a_stocka_151 a_stockb_151)
15360        (= c_stocka_151 c_stockb_151)
15361        (or
15362          (and
15363            (= truck_loc_151 1)
15364            (= truck_travel_time_151 17)
15365          )
15366          (and
15367            (= truck_loc_151 0)
15368            (= truck_travel_time_151 21)
15369          )
15370          (and
15371            (= truck_loc_151 3)
15372            (= truck_travel_time_151 37)
15373          )
15374        )
15375      )
15376    )
15377    (=> (= truck_loc_150 3)
15378      (and
15379        (<= c_stocka_151 200)
15380        (= (+ truck_stock_151 c_stocka_151) (+ truck_stock_150 c_stockb_151))
15381        (= a_stocka_151 a_stockb_151)
15382        (= b_stocka_151 b_stockb_151)
15383        (or
15384          (and
15385            (= truck_loc_151 1)
15386            (= truck_travel_time_151 32)
15387          )
15388          (and
15389            (= truck_loc_151 2)
15390            (= truck_travel_time_151 37)
15391          )
15392        )
15393      )
15394    )
15395  )
15396  (<= truck_stock_151 300)
15397  (>= truck_stock_151 0)
15398  (= a_stockb_152 (- a_stocka_151 truck_travel_time_151))
15399  (= b_stockb_152 (- b_stocka_151 truck_travel_time_151))
15400  (= c_stockb_152 (- c_stocka_151 truck_travel_time_151))
15401  (and
15402    (=> (= truck_loc_151 0)
15403      (and
15404        (= a_stocka_152 a_stockb_152)
15405        (= b_stocka_152 b_stockb_152)
15406        (= c_stocka_152 c_stockb_152)
15407        (or
15408          (and
15409            (= truck_loc_152 1)
15410            (= truck_travel_time_152 29)
15411          )
15412          (and
15413            (= truck_loc_152 2)
15414            (= truck_travel_time_152 21)
15415          )
15416        )
```

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15417        )
15418      )
15419      (=> (= truck_loc_151 1)
15420        (and
15421          (<= a_stocka_152 120)
15422          (= (+ truck_stock_152 a_stocka_152) (+ truck_stock_151 a_stockb_152))
15423          (= b_stocka_152 b_stockb_152)
15424          (= c_stocka_152 c_stockb_152)
15425          (or
15426            (and
15427              (= truck_loc_152 0)
15428              (= truck_travel_time_152 29)
15429            )
15430            (and
15431              (= truck_loc_152 2)
15432              (= truck_travel_time_152 17)
15433            )
15434            (and
15435              (= truck_loc_152 3)
15436              (= truck_travel_time_152 32)
15437            )
15438          )
15439        )
15440      )
15441      (=> (= truck_loc_151 2)
15442        (and
15443          (<= b_stocka_152 120)
15444          (= (+ truck_stock_152 b_stocka_152) (+ truck_stock_151 b_stockb_152))
15445          (= a_stocka_152 a_stockb_152)
15446          (= c_stocka_152 c_stockb_152)
15447          (or
15448            (and
15449              (= truck_loc_152 1)
15450              (= truck_travel_time_152 17)
15451            )
15452            (and
15453              (= truck_loc_152 0)
15454              (= truck_travel_time_152 21)
15455            )
15456            (and
15457              (= truck_loc_152 3)
15458              (= truck_travel_time_152 37)
15459            )
15460          )
15461        )
15462      )
15463      (=> (= truck_loc_151 3)
15464        (and
15465          (<= c_stocka_152 200)
15466          (= (+ truck_stock_152 c_stocka_152) (+ truck_stock_151 c_stockb_152))
15467          (= a_stocka_152 a_stockb_152)
15468          (= b_stocka_152 b_stockb_152)
15469          (or
15470            (and
15471              (= truck_loc_152 1)
15472              (= truck_travel_time_152 32)
15473            )
15474            (and
15475              (= truck_loc_152 2)
15476              (= truck_travel_time_152 37)
15477            )
15478          )
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15479         )
15480       )
15481   )
15482   (<= truck_stock_152 300)
15483   (>= truck_stock_152 0)
15484   (= a_stockb_153 (- a_stocka_152 truck_travel_time_152))
15485   (= b_stockb_153 (- b_stocka_152 truck_travel_time_152))
15486   (= c_stockb_153 (- c_stocka_152 truck_travel_time_152))
15487   (and
15488       (=> (= truck_loc_152 0)
15489           (and
15490               (= a_stocka_153 a_stockb_153)
15491               (= b_stocka_153 b_stockb_153)
15492               (= c_stocka_153 c_stockb_153)
15493               (or
15494                   (and
15495                       (= truck_loc_153 1)
15496                       (= truck_travel_time_153 29)
15497                   )
15498                   (and
15499                       (= truck_loc_153 2)
15500                       (= truck_travel_time_153 21)
15501                   )
15502               )
15503           )
15504       )
15505       (=> (= truck_loc_152 1)
15506           (and
15507               (<= a_stocka_153 120)
15508               (= (+ truck_stock_153 a_stocka_153) (+ truck_stock_152 a_stockb_153))
15509               (= b_stocka_153 b_stockb_153)
15510               (= c_stocka_153 c_stockb_153)
15511               (or
15512                   (and
15513                       (= truck_loc_153 0)
15514                       (= truck_travel_time_153 29)
15515                   )
15516                   (and
15517                       (= truck_loc_153 2)
15518                       (= truck_travel_time_153 17)
15519                   )
15520                   (and
15521                       (= truck_loc_153 3)
15522                       (= truck_travel_time_153 32)
15523                   )
15524               )
15525           )
15526       )
15527       (=> (= truck_loc_152 2)
15528           (and
15529               (<= b_stocka_153 120)
15530               (= (+ truck_stock_153 b_stocka_153) (+ truck_stock_152 b_stockb_153))
15531               (= a_stocka_153 a_stockb_153)
15532               (= c_stocka_153 c_stockb_153)
15533               (or
15534                   (and
15535                       (= truck_loc_153 1)
15536                       (= truck_travel_time_153 17)
15537                   )
15538                   (and
15539                       (= truck_loc_153 0)
15540                       (= truck_travel_time_153 21)
```

```
15541            )
15542          (and
15543            (= truck_loc_153 3)
15544            (= truck_travel_time_153 37)
15545          )
15546        )
15547      )
15548    )
15549    (=> (= truck_loc_152 3)
15550      (and
15551        (<= c_stocka_153 200)
15552        (= (+ truck_stock_153 c_stocka_153) (+ truck_stock_152 c_stockb_153))
15553        (= a_stocka_153 a_stockb_153)
15554        (= b_stocka_153 b_stockb_153)
15555        (or
15556          (and
15557            (= truck_loc_153 1)
15558            (= truck_travel_time_153 32)
15559          )
15560          (and
15561            (= truck_loc_153 2)
15562            (= truck_travel_time_153 37)
15563          )
15564        )
15565      )
15566    )
15567  )
15568  (<= truck_stock_153 300)
15569  (>= truck_stock_153 0)
15570  (= a_stockb_154 (- a_stocka_153 truck_travel_time_153))
15571  (= b_stockb_154 (- b_stocka_153 truck_travel_time_153))
15572  (= c_stockb_154 (- c_stocka_153 truck_travel_time_153))
15573  (and
15574    (=> (= truck_loc_153 0)
15575      (and
15576        (= a_stocka_154 a_stockb_154)
15577        (= b_stocka_154 b_stockb_154)
15578        (= c_stocka_154 c_stockb_154)
15579        (or
15580          (and
15581            (= truck_loc_154 1)
15582            (= truck_travel_time_154 29)
15583          )
15584          (and
15585            (= truck_loc_154 2)
15586            (= truck_travel_time_154 21)
15587          )
15588        )
15589      )
15590    )
15591    (=> (= truck_loc_153 1)
15592      (and
15593        (<= a_stocka_154 120)
15594        (= (+ truck_stock_154 a_stocka_154) (+ truck_stock_153 a_stockb_154))
15595        (= b_stocka_154 b_stockb_154)
15596        (= c_stocka_154 c_stockb_154)
15597        (or
15598          (and
15599            (= truck_loc_154 0)
15600            (= truck_travel_time_154 29)
15601          )
15602          (and
```

```
15603            (= truck_loc_154 2)
15604            (= truck_travel_time_154 17)
15605          )
15606        (and
15607          (= truck_loc_154 3)
15608          (= truck_travel_time_154 32)
15609        )
15610      )
15611    )
15612  )
15613  (=> (= truck_loc_153 2)
15614    (and
15615      (<= b_stocka_154 120)
15616      (= (+ truck_stock_154 b_stocka_154) (+ truck_stock_153 b_stockb_154))
15617      (= a_stocka_154 a_stockb_154)
15618      (= c_stocka_154 c_stockb_154)
15619      (or
15620        (and
15621          (= truck_loc_154 1)
15622          (= truck_travel_time_154 17)
15623        )
15624        (and
15625          (= truck_loc_154 0)
15626          (= truck_travel_time_154 21)
15627        )
15628        (and
15629          (= truck_loc_154 3)
15630          (= truck_travel_time_154 37)
15631        )
15632      )
15633    )
15634  )
15635  (=> (= truck_loc_153 3)
15636    (and
15637      (<= c_stocka_154 200)
15638      (= (+ truck_stock_154 c_stocka_154) (+ truck_stock_153 c_stockb_154))
15639      (= a_stocka_154 a_stockb_154)
15640      (= b_stocka_154 b_stockb_154)
15641      (or
15642        (and
15643          (= truck_loc_154 1)
15644          (= truck_travel_time_154 32)
15645        )
15646        (and
15647          (= truck_loc_154 2)
15648          (= truck_travel_time_154 37)
15649        )
15650      )
15651    )
15652  )
15653 )
15654 (<= truck_stock_154 300)
15655 (>= truck_stock_154 0)
15656 (= a_stockb_155 (- a_stocka_154 truck_travel_time_154))
15657 (= b_stockb_155 (- b_stocka_154 truck_travel_time_154))
15658 (= c_stockb_155 (- c_stocka_154 truck_travel_time_154))
15659 (and
15660   (=> (= truck_loc_154 0)
15661     (and
15662       (= a_stocka_155 a_stockb_155)
15663       (= b_stocka_155 b_stockb_155)
15664       (= c_stocka_155 c_stockb_155)
```

```
15665          (or
15666            (and
15667              (= truck_loc_155 1)
15668              (= truck_travel_time_155 29)
15669            )
15670            (and
15671              (= truck_loc_155 2)
15672              (= truck_travel_time_155 21)
15673            )
15674          )
15675        )
15676      )
15677      (=> (= truck_loc_154 1)
15678        (and
15679          (<= a_stocka_155 120)
15680          (= (+ truck_stock_155 a_stocka_155) (+ truck_stock_154 a_stockb_155))
15681          (= b_stocka_155 b_stockb_155)
15682          (= c_stocka_155 c_stockb_155)
15683          (or
15684            (and
15685              (= truck_loc_155 0)
15686              (= truck_travel_time_155 29)
15687            )
15688            (and
15689              (= truck_loc_155 2)
15690              (= truck_travel_time_155 17)
15691            )
15692            (and
15693              (= truck_loc_155 3)
15694              (= truck_travel_time_155 32)
15695            )
15696          )
15697        )
15698      )
15699      (=> (= truck_loc_154 2)
15700        (and
15701          (<= b_stocka_155 120)
15702          (= (+ truck_stock_155 b_stocka_155) (+ truck_stock_154 b_stockb_155))
15703          (= a_stocka_155 a_stockb_155)
15704          (= c_stocka_155 c_stockb_155)
15705          (or
15706            (and
15707              (= truck_loc_155 1)
15708              (= truck_travel_time_155 17)
15709            )
15710            (and
15711              (= truck_loc_155 0)
15712              (= truck_travel_time_155 21)
15713            )
15714            (and
15715              (= truck_loc_155 3)
15716              (= truck_travel_time_155 37)
15717            )
15718          )
15719        )
15720      )
15721      (=> (= truck_loc_154 3)
15722        (and
15723          (<= c_stocka_155 200)
15724          (= (+ truck_stock_155 c_stocka_155) (+ truck_stock_154 c_stockb_155))
15725          (= a_stocka_155 a_stockb_155)
15726          (= b_stocka_155 b_stockb_155)
```

```
15727        (or
15728          (and
15729            (= truck_loc_155 1)
15730            (= truck_travel_time_155 32)
15731          )
15732          (and
15733            (= truck_loc_155 2)
15734            (= truck_travel_time_155 37)
15735          )
15736        )
15737      )
15738    )
15739  )
15740  (<= truck_stock_155 300)
15741  (>= truck_stock_155 0)
15742  (= a_stockb_156 (- a_stocka_155 truck_travel_time_155))
15743  (= b_stockb_156 (- b_stocka_155 truck_travel_time_155))
15744  (= c_stockb_156 (- c_stocka_155 truck_travel_time_155))
15745  (and
15746    (=> (= truck_loc_155 0)
15747      (and
15748        (= a_stocka_156 a_stockb_156)
15749        (= b_stocka_156 b_stockb_156)
15750        (= c_stocka_156 c_stockb_156)
15751        (or
15752          (and
15753            (= truck_loc_156 1)
15754            (= truck_travel_time_156 29)
15755          )
15756          (and
15757            (= truck_loc_156 2)
15758            (= truck_travel_time_156 21)
15759          )
15760        )
15761      )
15762    )
15763    (=> (= truck_loc_155 1)
15764      (and
15765        (<= a_stocka_156 120)
15766        (= (+ truck_stock_156 a_stocka_156) (+ truck_stock_155 a_stockb_156))
15767        (= b_stocka_156 b_stockb_156)
15768        (= c_stocka_156 c_stockb_156)
15769        (or
15770          (and
15771            (= truck_loc_156 0)
15772            (= truck_travel_time_156 29)
15773          )
15774          (and
15775            (= truck_loc_156 2)
15776            (= truck_travel_time_156 17)
15777          )
15778          (and
15779            (= truck_loc_156 3)
15780            (= truck_travel_time_156 32)
15781          )
15782        )
15783      )
15784    )
15785    (=> (= truck_loc_155 2)
15786      (and
15787        (<= b_stocka_156 120)
15788        (= (+ truck_stock_156 b_stocka_156) (+ truck_stock_155 b_stockb_156))
```

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```
15789        (= a_stocka_156 a_stockb_156)
15790        (= c_stocka_156 c_stockb_156)
15791        (or
15792          (and
15793            (= truck_loc_156 1)
15794            (= truck_travel_time_156 17)
15795          )
15796          (and
15797            (= truck_loc_156 0)
15798            (= truck_travel_time_156 21)
15799          )
15800          (and
15801            (= truck_loc_156 3)
15802            (= truck_travel_time_156 37)
15803          )
15804        )
15805      )
15806    )
15807    (=> (= truck_loc_155 3)
15808      (and
15809        (<= c_stocka_156 200)
15810        (= (+ truck_stock_156 c_stocka_156) (+ truck_stock_155 c_stockb_156))
15811        (= a_stocka_156 a_stockb_156)
15812        (= b_stocka_156 b_stockb_156)
15813        (or
15814          (and
15815            (= truck_loc_156 1)
15816            (= truck_travel_time_156 32)
15817          )
15818          (and
15819            (= truck_loc_156 2)
15820            (= truck_travel_time_156 37)
15821          )
15822        )
15823      )
15824    )
15825  )
15826  (<= truck_stock_156 300)
15827  (>= truck_stock_156 0)
15828  (= a_stockb_157 (- a_stocka_156 truck_travel_time_156))
15829  (= b_stockb_157 (- b_stocka_156 truck_travel_time_156))
15830  (= c_stockb_157 (- c_stocka_156 truck_travel_time_156))
15831  (and
15832    (=> (= truck_loc_156 0)
15833      (and
15834        (= a_stocka_157 a_stockb_157)
15835        (= b_stocka_157 b_stockb_157)
15836        (= c_stocka_157 c_stockb_157)
15837        (or
15838          (and
15839            (= truck_loc_157 1)
15840            (= truck_travel_time_157 29)
15841          )
15842          (and
15843            (= truck_loc_157 2)
15844            (= truck_travel_time_157 21)
15845          )
15846        )
15847      )
15848    )
15849    (=> (= truck_loc_156 1)
15850      (and
```

```
15851          (<= a_stocka_157 120)
15852          (= (+ truck_stock_157 a_stocka_157) (+ truck_stock_156 a_stockb_157))
15853          (= b_stocka_157 b_stockb_157)
15854          (= c_stocka_157 c_stockb_157)
15855          (or
15856            (and
15857              (= truck_loc_157 0)
15858              (= truck_travel_time_157 29)
15859            )
15860            (and
15861              (= truck_loc_157 2)
15862              (= truck_travel_time_157 17)
15863            )
15864            (and
15865              (= truck_loc_157 3)
15866              (= truck_travel_time_157 32)
15867            )
15868          )
15869        )
15870      )
15871      (=> (= truck_loc_156 2)
15872        (and
15873          (<= b_stocka_157 120)
15874          (= (+ truck_stock_157 b_stocka_157) (+ truck_stock_156 b_stockb_157))
15875          (= a_stocka_157 a_stockb_157)
15876          (= c_stocka_157 c_stockb_157)
15877          (or
15878            (and
15879              (= truck_loc_157 1)
15880              (= truck_travel_time_157 17)
15881            )
15882            (and
15883              (= truck_loc_157 0)
15884              (= truck_travel_time_157 21)
15885            )
15886            (and
15887              (= truck_loc_157 3)
15888              (= truck_travel_time_157 37)
15889            )
15890          )
15891        )
15892      )
15893      (=> (= truck_loc_156 3)
15894        (and
15895          (<= c_stocka_157 200)
15896          (= (+ truck_stock_157 c_stocka_157) (+ truck_stock_156 c_stockb_157))
15897          (= a_stocka_157 a_stockb_157)
15898          (= b_stocka_157 b_stockb_157)
15899          (or
15900            (and
15901              (= truck_loc_157 1)
15902              (= truck_travel_time_157 32)
15903            )
15904            (and
15905              (= truck_loc_157 2)
15906              (= truck_travel_time_157 37)
15907            )
15908          )
15909        )
15910      )
15911  )
15912  (<= truck_stock_157 300)
```

```
15913  (>= truck_stock_157 0)
15914  (= a_stockb_158 (- a_stocka_157 truck_travel_time_157))
15915  (= b_stockb_158 (- b_stocka_157 truck_travel_time_157))
15916  (= c_stockb_158 (- c_stocka_157 truck_travel_time_157))
15917  (and
15918    (=> (= truck_loc_157 0)
15919      (and
15920        (= a_stocka_158 a_stockb_158)
15921        (= b_stocka_158 b_stockb_158)
15922        (= c_stocka_158 c_stockb_158)
15923        (or
15924          (and
15925            (= truck_loc_158 1)
15926            (= truck_travel_time_158 29)
15927          )
15928          (and
15929            (= truck_loc_158 2)
15930            (= truck_travel_time_158 21)
15931          )
15932        )
15933      )
15934    )
15935    (=> (= truck_loc_157 1)
15936      (and
15937        (<= a_stocka_158 120)
15938        (= (+ truck_stock_158 a_stocka_158) (+ truck_stock_157 a_stockb_158))
15939        (= b_stocka_158 b_stockb_158)
15940        (= c_stocka_158 c_stockb_158)
15941        (or
15942          (and
15943            (= truck_loc_158 0)
15944            (= truck_travel_time_158 29)
15945          )
15946          (and
15947            (= truck_loc_158 2)
15948            (= truck_travel_time_158 17)
15949          )
15950          (and
15951            (= truck_loc_158 3)
15952            (= truck_travel_time_158 32)
15953          )
15954        )
15955      )
15956    )
15957    (=> (= truck_loc_157 2)
15958      (and
15959        (<= b_stocka_158 120)
15960        (= (+ truck_stock_158 b_stocka_158) (+ truck_stock_157 b_stockb_158))
15961        (= a_stocka_158 a_stockb_158)
15962        (= c_stocka_158 c_stockb_158)
15963        (or
15964          (and
15965            (= truck_loc_158 1)
15966            (= truck_travel_time_158 17)
15967          )
15968          (and
15969            (= truck_loc_158 0)
15970            (= truck_travel_time_158 21)
15971          )
15972          (and
15973            (= truck_loc_158 3)
15974            (= truck_travel_time_158 37)
```

```
15975            )
15976          )
15977        )
15978      )
15979    (=> (= truck_loc_157 3)
15980      (and
15981        (<= c_stocka_158 200)
15982        (= (+ truck_stock_158 c_stocka_158) (+ truck_stock_157 c_stockb_158))
15983        (= a_stocka_158 a_stockb_158)
15984        (= b_stocka_158 b_stockb_158)
15985        (or
15986          (and
15987            (= truck_loc_158 1)
15988            (= truck_travel_time_158 32)
15989          )
15990          (and
15991            (= truck_loc_158 2)
15992            (= truck_travel_time_158 37)
15993          )
15994        )
15995      )
15996    )
15997  )
15998  (<= truck_stock_158 300)
15999  (>= truck_stock_158 0)
16000  (= a_stockb_159 (- a_stocka_158 truck_travel_time_158))
16001  (= b_stockb_159 (- b_stocka_158 truck_travel_time_158))
16002  (= c_stockb_159 (- c_stocka_158 truck_travel_time_158))
16003  (and
16004    (=> (= truck_loc_158 0)
16005      (and
16006        (= a_stocka_159 a_stockb_159)
16007        (= b_stocka_159 b_stockb_159)
16008        (= c_stocka_159 c_stockb_159)
16009        (or
16010          (and
16011            (= truck_loc_159 1)
16012            (= truck_travel_time_159 29)
16013          )
16014          (and
16015            (= truck_loc_159 2)
16016            (= truck_travel_time_159 21)
16017          )
16018        )
16019      )
16020    )
16021    (=> (= truck_loc_158 1)
16022      (and
16023        (<= a_stocka_159 120)
16024        (= (+ truck_stock_159 a_stocka_159) (+ truck_stock_158 a_stockb_159))
16025        (= b_stocka_159 b_stockb_159)
16026        (= c_stocka_159 c_stockb_159)
16027        (or
16028          (and
16029            (= truck_loc_159 0)
16030            (= truck_travel_time_159 29)
16031          )
16032          (and
16033            (= truck_loc_159 2)
16034            (= truck_travel_time_159 17)
16035          )
16036          (and
```

```
16037              (= truck_loc_159 3)
16038              (= truck_travel_time_159 32)
16039            )
16040          )
16041        )
16042      )
16043      (=> (= truck_loc_158 2)
16044        (and
16045          (<= b_stocka_159 120)
16046          (= (+ truck_stock_159 b_stocka_159) (+ truck_stock_158 b_stockb_159))
16047          (= a_stocka_159 a_stockb_159)
16048          (= c_stocka_159 c_stockb_159)
16049          (or
16050            (and
16051              (= truck_loc_159 1)
16052              (= truck_travel_time_159 17)
16053            )
16054            (and
16055              (= truck_loc_159 0)
16056              (= truck_travel_time_159 21)
16057            )
16058            (and
16059              (= truck_loc_159 3)
16060              (= truck_travel_time_159 37)
16061            )
16062          )
16063        )
16064      )
16065      (=> (= truck_loc_158 3)
16066        (and
16067          (<= c_stocka_159 200)
16068          (= (+ truck_stock_159 c_stocka_159) (+ truck_stock_158 c_stockb_159))
16069          (= a_stocka_159 a_stockb_159)
16070          (= b_stocka_159 b_stockb_159)
16071          (or
16072            (and
16073              (= truck_loc_159 1)
16074              (= truck_travel_time_159 32)
16075            )
16076            (and
16077              (= truck_loc_159 2)
16078              (= truck_travel_time_159 37)
16079            )
16080          )
16081        )
16082      )
16083    )
16084    (<= truck_stock_159 300)
16085    (>= truck_stock_159 0)
16086    (= a_stockb_160 (- a_stocka_159 truck_travel_time_159))
16087    (= b_stockb_160 (- b_stocka_159 truck_travel_time_159))
16088    (= c_stockb_160 (- c_stocka_159 truck_travel_time_159))
16089    (and
16090      (=> (= truck_loc_159 0)
16091        (and
16092          (= a_stocka_160 a_stockb_160)
16093          (= b_stocka_160 b_stockb_160)
16094          (= c_stocka_160 c_stockb_160)
16095          (or
16096            (and
16097              (= truck_loc_160 1)
16098              (= truck_travel_time_160 29)
```

```
16099              )
16100           (and
16101             (= truck_loc_160 2)
16102             (= truck_travel_time_160 21)
16103           )
16104         )
16105       )
16106    )
16107    (=> (= truck_loc_159 1)
16108       (and
16109         (<= a_stocka_160 120)
16110         (= (+ truck_stock_160 a_stocka_160) (+ truck_stock_159 a_stockb_160))
16111         (= b_stocka_160 b_stockb_160)
16112         (= c_stocka_160 c_stockb_160)
16113         (or
16114           (and
16115             (= truck_loc_160 0)
16116             (= truck_travel_time_160 29)
16117           )
16118           (and
16119             (= truck_loc_160 2)
16120             (= truck_travel_time_160 17)
16121           )
16122           (and
16123             (= truck_loc_160 3)
16124             (= truck_travel_time_160 32)
16125           )
16126         )
16127       )
16128    )
16129    (=> (= truck_loc_159 2)
16130       (and
16131         (<= b_stocka_160 120)
16132         (= (+ truck_stock_160 b_stocka_160) (+ truck_stock_159 b_stockb_160))
16133         (= a_stocka_160 a_stockb_160)
16134         (= c_stocka_160 c_stockb_160)
16135         (or
16136           (and
16137             (= truck_loc_160 1)
16138             (= truck_travel_time_160 17)
16139           )
16140           (and
16141             (= truck_loc_160 0)
16142             (= truck_travel_time_160 21)
16143           )
16144           (and
16145             (= truck_loc_160 3)
16146             (= truck_travel_time_160 37)
16147           )
16148         )
16149       )
16150    )
16151    (=> (= truck_loc_159 3)
16152       (and
16153         (<= c_stocka_160 200)
16154         (= (+ truck_stock_160 c_stocka_160) (+ truck_stock_159 c_stockb_160))
16155         (= a_stocka_160 a_stockb_160)
16156         (= b_stocka_160 b_stockb_160)
16157         (or
16158           (and
16159             (= truck_loc_160 1)
16160             (= truck_travel_time_160 32)
```

```
16161            )
16162          (and
16163            (= truck_loc_160 2)
16164            (= truck_travel_time_160 37)
16165          )
16166        )
16167      )
16168    )
16169  )
16170  (<= truck_stock_160 300)
16171  (>= truck_stock_160 0)
16172  (= a_stockb_161 (- a_stocka_160 truck_travel_time_160))
16173  (= b_stockb_161 (- b_stocka_160 truck_travel_time_160))
16174  (= c_stockb_161 (- c_stocka_160 truck_travel_time_160))
16175  (and
16176    (=> (= truck_loc_160 0)
16177      (and
16178        (= a_stocka_161 a_stockb_161)
16179        (= b_stocka_161 b_stockb_161)
16180        (= c_stocka_161 c_stockb_161)
16181        (or
16182          (and
16183            (= truck_loc_161 1)
16184            (= truck_travel_time_161 29)
16185          )
16186          (and
16187            (= truck_loc_161 2)
16188            (= truck_travel_time_161 21)
16189          )
16190        )
16191      )
16192    )
16193    (=> (= truck_loc_160 1)
16194      (and
16195        (<= a_stocka_161 120)
16196        (= (+ truck_stock_161 a_stocka_161) (+ truck_stock_160 a_stockb_161))
16197        (= b_stocka_161 b_stockb_161)
16198        (= c_stocka_161 c_stockb_161)
16199        (or
16200          (and
16201            (= truck_loc_161 0)
16202            (= truck_travel_time_161 29)
16203          )
16204          (and
16205            (= truck_loc_161 2)
16206            (= truck_travel_time_161 17)
16207          )
16208          (and
16209            (= truck_loc_161 3)
16210            (= truck_travel_time_161 32)
16211          )
16212        )
16213      )
16214    )
16215    (=> (= truck_loc_160 2)
16216      (and
16217        (<= b_stocka_161 120)
16218        (= (+ truck_stock_161 b_stocka_161) (+ truck_stock_160 b_stockb_161))
16219        (= a_stocka_161 a_stockb_161)
16220        (= c_stocka_161 c_stockb_161)
16221        (or
16222          (and
```

```
16223              (= truck_loc_161 1)
16224              (= truck_travel_time_161 17)
16225            )
16226          (and
16227              (= truck_loc_161 0)
16228              (= truck_travel_time_161 21)
16229            )
16230          (and
16231              (= truck_loc_161 3)
16232              (= truck_travel_time_161 37)
16233            )
16234          )
16235        )
16236    )
16237    (=> (= truck_loc_160 3)
16238      (and
16239        (<= c_stocka_161 200)
16240        (= (+ truck_stock_161 c_stocka_161) (+ truck_stock_160 c_stockb_161))
16241        (= a_stocka_161 a_stockb_161)
16242        (= b_stocka_161 b_stockb_161)
16243        (or
16244          (and
16245              (= truck_loc_161 1)
16246              (= truck_travel_time_161 32)
16247            )
16248          (and
16249              (= truck_loc_161 2)
16250              (= truck_travel_time_161 37)
16251            )
16252        )
16253      )
16254    )
16255  )
16256  (<= truck_stock_161 300)
16257  (>= truck_stock_161 0)
16258  (= a_stockb_162 (- a_stocka_161 truck_travel_time_161))
16259  (= b_stockb_162 (- b_stocka_161 truck_travel_time_161))
16260  (= c_stockb_162 (- c_stocka_161 truck_travel_time_161))
16261  (and
16262    (=> (= truck_loc_161 0)
16263      (and
16264        (= a_stocka_162 a_stockb_162)
16265        (= b_stocka_162 b_stockb_162)
16266        (= c_stocka_162 c_stockb_162)
16267        (or
16268          (and
16269              (= truck_loc_162 1)
16270              (= truck_travel_time_162 29)
16271            )
16272          (and
16273              (= truck_loc_162 2)
16274              (= truck_travel_time_162 21)
16275            )
16276        )
16277      )
16278    )
16279    (=> (= truck_loc_161 1)
16280      (and
16281        (<= a_stocka_162 120)
16282        (= (+ truck_stock_162 a_stocka_162) (+ truck_stock_161 a_stockb_162))
16283        (= b_stocka_162 b_stockb_162)
16284        (= c_stocka_162 c_stockb_162)
```

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```
16285          (or
16286            (and
16287              (= truck_loc_162 0)
16288              (= truck_travel_time_162 29)
16289            )
16290            (and
16291              (= truck_loc_162 2)
16292              (= truck_travel_time_162 17)
16293            )
16294            (and
16295              (= truck_loc_162 3)
16296              (= truck_travel_time_162 32)
16297            )
16298          )
16299        )
16300      )
16301      (=> (= truck_loc_161 2)
16302        (and
16303          (<= b_stocka_162 120)
16304          (= (+ truck_stock_162 b_stocka_162) (+ truck_stock_161 b_stockb_162))
16305          (= a_stocka_162 a_stockb_162)
16306          (= c_stocka_162 c_stockb_162)
16307          (or
16308            (and
16309              (= truck_loc_162 1)
16310              (= truck_travel_time_162 17)
16311            )
16312            (and
16313              (= truck_loc_162 0)
16314              (= truck_travel_time_162 21)
16315            )
16316            (and
16317              (= truck_loc_162 3)
16318              (= truck_travel_time_162 37)
16319            )
16320          )
16321        )
16322      )
16323      (=> (= truck_loc_161 3)
16324        (and
16325          (<= c_stocka_162 200)
16326          (= (+ truck_stock_162 c_stocka_162) (+ truck_stock_161 c_stockb_162))
16327          (= a_stocka_162 a_stockb_162)
16328          (= b_stocka_162 b_stockb_162)
16329          (or
16330            (and
16331              (= truck_loc_162 1)
16332              (= truck_travel_time_162 32)
16333            )
16334            (and
16335              (= truck_loc_162 2)
16336              (= truck_travel_time_162 37)
16337            )
16338          )
16339        )
16340      )
16341   )
16342   (<= truck_stock_162 300)
16343   (>= truck_stock_162 0)
16344   (= a_stockb_163 (- a_stocka_162 truck_travel_time_162))
16345   (= b_stockb_163 (- b_stocka_162 truck_travel_time_162))
16346   (= c_stockb_163 (- c_stocka_162 truck_travel_time_162))
```

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```
16347  (and
16348    (=> (= truck_loc_162 0)
16349      (and
16350        (= a_stocka_163 a_stockb_163)
16351        (= b_stocka_163 b_stockb_163)
16352        (= c_stocka_163 c_stockb_163)
16353        (or
16354          (and
16355            (= truck_loc_163 1)
16356            (= truck_travel_time_163 29)
16357          )
16358          (and
16359            (= truck_loc_163 2)
16360            (= truck_travel_time_163 21)
16361          )
16362        )
16363      )
16364    )
16365    (=> (= truck_loc_162 1)
16366      (and
16367        (<= a_stocka_163 120)
16368        (= (+ truck_stock_163 a_stocka_163) (+ truck_stock_162 a_stockb_163))
16369        (= b_stocka_163 b_stockb_163)
16370        (= c_stocka_163 c_stockb_163)
16371        (or
16372          (and
16373            (= truck_loc_163 0)
16374            (= truck_travel_time_163 29)
16375          )
16376          (and
16377            (= truck_loc_163 2)
16378            (= truck_travel_time_163 17)
16379          )
16380          (and
16381            (= truck_loc_163 3)
16382            (= truck_travel_time_163 32)
16383          )
16384        )
16385      )
16386    )
16387    (=> (= truck_loc_162 2)
16388      (and
16389        (<= b_stocka_163 120)
16390        (= (+ truck_stock_163 b_stocka_163) (+ truck_stock_162 b_stockb_163))
16391        (= a_stocka_163 a_stockb_163)
16392        (= c_stocka_163 c_stockb_163)
16393        (or
16394          (and
16395            (= truck_loc_163 1)
16396            (= truck_travel_time_163 17)
16397          )
16398          (and
16399            (= truck_loc_163 0)
16400            (= truck_travel_time_163 21)
16401          )
16402          (and
16403            (= truck_loc_163 3)
16404            (= truck_travel_time_163 37)
16405          )
16406        )
16407      )
16408    )
```

```
16409    (=> (= truck_loc_162 3)
16410      (and
16411        (<= c_stocka_163 200)
16412        (= (+ truck_stock_163 c_stocka_163) (+ truck_stock_162 c_stockb_163))
16413        (= a_stocka_163 a_stockb_163)
16414        (= b_stocka_163 b_stockb_163)
16415        (or
16416          (and
16417            (= truck_loc_163 1)
16418            (= truck_travel_time_163 32)
16419          )
16420          (and
16421            (= truck_loc_163 2)
16422            (= truck_travel_time_163 37)
16423          )
16424        )
16425      )
16426    )
16427  )
16428  (<= truck_stock_163 300)
16429  (>= truck_stock_163 0)
16430  (= a_stockb_164 (- a_stocka_163 truck_travel_time_163))
16431  (= b_stockb_164 (- b_stocka_163 truck_travel_time_163))
16432  (= c_stockb_164 (- c_stocka_163 truck_travel_time_163))
16433  (and
16434    (=> (= truck_loc_163 0)
16435      (and
16436        (= a_stocka_164 a_stockb_164)
16437        (= b_stocka_164 b_stockb_164)
16438        (= c_stocka_164 c_stockb_164)
16439        (or
16440          (and
16441            (= truck_loc_164 1)
16442            (= truck_travel_time_164 29)
16443          )
16444          (and
16445            (= truck_loc_164 2)
16446            (= truck_travel_time_164 21)
16447          )
16448        )
16449      )
16450    )
16451    (=> (= truck_loc_163 1)
16452      (and
16453        (<= a_stocka_164 120)
16454        (= (+ truck_stock_164 a_stocka_164) (+ truck_stock_163 a_stockb_164))
16455        (= b_stocka_164 b_stockb_164)
16456        (= c_stocka_164 c_stockb_164)
16457        (or
16458          (and
16459            (= truck_loc_164 0)
16460            (= truck_travel_time_164 29)
16461          )
16462          (and
16463            (= truck_loc_164 2)
16464            (= truck_travel_time_164 17)
16465          )
16466          (and
16467            (= truck_loc_164 3)
16468            (= truck_travel_time_164 32)
16469          )
16470        )
```

```
16471          )
16472        )
16473      (=> (= truck_loc_163 2)
16474        (and
16475          (<= b_stocka_164 120)
16476          (= (+ truck_stock_164 b_stocka_164) (+ truck_stock_163 b_stockb_164))
16477          (= a_stocka_164 a_stockb_164)
16478          (= c_stocka_164 c_stockb_164)
16479          (or
16480            (and
16481              (= truck_loc_164 1)
16482              (= truck_travel_time_164 17)
16483            )
16484            (and
16485              (= truck_loc_164 0)
16486              (= truck_travel_time_164 21)
16487            )
16488            (and
16489              (= truck_loc_164 3)
16490              (= truck_travel_time_164 37)
16491            )
16492          )
16493        )
16494      )
16495      (=> (= truck_loc_163 3)
16496        (and
16497          (<= c_stocka_164 200)
16498          (= (+ truck_stock_164 c_stocka_164) (+ truck_stock_163 c_stockb_164))
16499          (= a_stocka_164 a_stockb_164)
16500          (= b_stocka_164 b_stockb_164)
16501          (or
16502            (and
16503              (= truck_loc_164 1)
16504              (= truck_travel_time_164 32)
16505            )
16506            (and
16507              (= truck_loc_164 2)
16508              (= truck_travel_time_164 37)
16509            )
16510          )
16511        )
16512      )
16513    )
16514    (<= truck_stock_164 300)
16515    (>= truck_stock_164 0)
16516    (= a_stockb_165 (- a_stocka_164 truck_travel_time_164))
16517    (= b_stockb_165 (- b_stocka_164 truck_travel_time_164))
16518    (= c_stockb_165 (- c_stocka_164 truck_travel_time_164))
16519    (and
16520      (=> (= truck_loc_164 0)
16521        (and
16522          (= a_stocka_165 a_stockb_165)
16523          (= b_stocka_165 b_stockb_165)
16524          (= c_stocka_165 c_stockb_165)
16525          (or
16526            (and
16527              (= truck_loc_165 1)
16528              (= truck_travel_time_165 29)
16529            )
16530            (and
16531              (= truck_loc_165 2)
16532              (= truck_travel_time_165 21)
```

```
16533              )
16534          )
16535        )
16536    )
16537    (=> (= truck_loc_164 1)
16538      (and
16539        (<= a_stocka_165 120)
16540        (= (+ truck_stock_165 a_stocka_165) (+ truck_stock_164 a_stockb_165))
16541        (= b_stocka_165 b_stockb_165)
16542        (= c_stocka_165 c_stockb_165)
16543        (or
16544          (and
16545            (= truck_loc_165 0)
16546            (= truck_travel_time_165 29)
16547          )
16548          (and
16549            (= truck_loc_165 2)
16550            (= truck_travel_time_165 17)
16551          )
16552          (and
16553            (= truck_loc_165 3)
16554            (= truck_travel_time_165 32)
16555          )
16556        )
16557      )
16558    )
16559    (=> (= truck_loc_164 2)
16560      (and
16561        (<= b_stocka_165 120)
16562        (= (+ truck_stock_165 b_stocka_165) (+ truck_stock_164 b_stockb_165))
16563        (= a_stocka_165 a_stockb_165)
16564        (= c_stocka_165 c_stockb_165)
16565        (or
16566          (and
16567            (= truck_loc_165 1)
16568            (= truck_travel_time_165 17)
16569          )
16570          (and
16571            (= truck_loc_165 0)
16572            (= truck_travel_time_165 21)
16573          )
16574          (and
16575            (= truck_loc_165 3)
16576            (= truck_travel_time_165 37)
16577          )
16578        )
16579      )
16580    )
16581    (=> (= truck_loc_164 3)
16582      (and
16583        (<= c_stocka_165 200)
16584        (= (+ truck_stock_165 c_stocka_165) (+ truck_stock_164 c_stockb_165))
16585        (= a_stocka_165 a_stockb_165)
16586        (= b_stocka_165 b_stockb_165)
16587        (or
16588          (and
16589            (= truck_loc_165 1)
16590            (= truck_travel_time_165 32)
16591          )
16592          (and
16593            (= truck_loc_165 2)
16594            (= truck_travel_time_165 37)
```

```
16595            )
16596          )
16597        )
16598      )
16599    )
16600    (<= truck_stock_165 300)
16601    (>= truck_stock_165 0)
16602    (= a_stockb_166 (- a_stocka_165 truck_travel_time_165))
16603    (= b_stockb_166 (- b_stocka_165 truck_travel_time_165))
16604    (= c_stockb_166 (- c_stocka_165 truck_travel_time_165))
16605    (and
16606      (=> (= truck_loc_165 0)
16607        (and
16608          (= a_stocka_166 a_stockb_166)
16609          (= b_stocka_166 b_stockb_166)
16610          (= c_stocka_166 c_stockb_166)
16611          (or
16612            (and
16613              (= truck_loc_166 1)
16614              (= truck_travel_time_166 29)
16615            )
16616            (and
16617              (= truck_loc_166 2)
16618              (= truck_travel_time_166 21)
16619            )
16620          )
16621        )
16622      )
16623      (=> (= truck_loc_165 1)
16624        (and
16625          (<= a_stocka_166 120)
16626          (= (+ truck_stock_166 a_stocka_166) (+ truck_stock_165 a_stockb_166))
16627          (= b_stocka_166 b_stockb_166)
16628          (= c_stocka_166 c_stockb_166)
16629          (or
16630            (and
16631              (= truck_loc_166 0)
16632              (= truck_travel_time_166 29)
16633            )
16634            (and
16635              (= truck_loc_166 2)
16636              (= truck_travel_time_166 17)
16637            )
16638            (and
16639              (= truck_loc_166 3)
16640              (= truck_travel_time_166 32)
16641            )
16642          )
16643        )
16644      )
16645      (=> (= truck_loc_165 2)
16646        (and
16647          (<= b_stocka_166 120)
16648          (= (+ truck_stock_166 b_stocka_166) (+ truck_stock_165 b_stockb_166))
16649          (= a_stocka_166 a_stockb_166)
16650          (= c_stocka_166 c_stockb_166)
16651          (or
16652            (and
16653              (= truck_loc_166 1)
16654              (= truck_travel_time_166 17)
16655            )
16656            (and
```

```
16657              (= truck_loc_166 0)
16658              (= truck_travel_time_166 21)
16659           )
16660         (and
16661           (= truck_loc_166 3)
16662           (= truck_travel_time_166 37)
16663         )
16664       )
16665     )
16666   )
16667   (=> (= truck_loc_165 3)
16668     (and
16669       (<= c_stocka_166 200)
16670       (= (+ truck_stock_166 c_stocka_166) (+ truck_stock_165 c_stockb_166))
16671       (= a_stocka_166 a_stockb_166)
16672       (= b_stocka_166 b_stockb_166)
16673       (or
16674         (and
16675           (= truck_loc_166 1)
16676           (= truck_travel_time_166 32)
16677         )
16678         (and
16679           (= truck_loc_166 2)
16680           (= truck_travel_time_166 37)
16681         )
16682       )
16683     )
16684   )
16685 )
16686 (<= truck_stock_166 300)
16687 (>= truck_stock_166 0)
16688 (= a_stockb_167 (- a_stocka_166 truck_travel_time_166))
16689 (= b_stockb_167 (- b_stocka_166 truck_travel_time_166))
16690 (= c_stockb_167 (- c_stocka_166 truck_travel_time_166))
16691 (and
16692   (=> (= truck_loc_166 0)
16693     (and
16694       (= a_stocka_167 a_stockb_167)
16695       (= b_stocka_167 b_stockb_167)
16696       (= c_stocka_167 c_stockb_167)
16697       (or
16698         (and
16699           (= truck_loc_167 1)
16700           (= truck_travel_time_167 29)
16701         )
16702         (and
16703           (= truck_loc_167 2)
16704           (= truck_travel_time_167 21)
16705         )
16706       )
16707     )
16708   )
16709   (=> (= truck_loc_166 1)
16710     (and
16711       (<= a_stocka_167 120)
16712       (= (+ truck_stock_167 a_stocka_167) (+ truck_stock_166 a_stockb_167))
16713       (= b_stocka_167 b_stockb_167)
16714       (= c_stocka_167 c_stockb_167)
16715       (or
16716         (and
16717           (= truck_loc_167 0)
16718           (= truck_travel_time_167 29)
```

```
16719            )
16720          (and
16721            (= truck_loc_167 2)
16722            (= truck_travel_time_167 17)
16723          )
16724          (and
16725            (= truck_loc_167 3)
16726            (= truck_travel_time_167 32)
16727          )
16728        )
16729      )
16730    )
16731    (=> (= truck_loc_166 2)
16732      (and
16733        (<= b_stocka_167 120)
16734        (= (+ truck_stock_167 b_stocka_167) (+ truck_stock_166 b_stockb_167))
16735        (= a_stocka_167 a_stockb_167)
16736        (= c_stocka_167 c_stockb_167)
16737        (or
16738          (and
16739            (= truck_loc_167 1)
16740            (= truck_travel_time_167 17)
16741          )
16742          (and
16743            (= truck_loc_167 0)
16744            (= truck_travel_time_167 21)
16745          )
16746          (and
16747            (= truck_loc_167 3)
16748            (= truck_travel_time_167 37)
16749          )
16750        )
16751      )
16752    )
16753    (=> (= truck_loc_166 3)
16754      (and
16755        (<= c_stocka_167 200)
16756        (= (+ truck_stock_167 c_stocka_167) (+ truck_stock_166 c_stockb_167))
16757        (= a_stocka_167 a_stockb_167)
16758        (= b_stocka_167 b_stockb_167)
16759        (or
16760          (and
16761            (= truck_loc_167 1)
16762            (= truck_travel_time_167 32)
16763          )
16764          (and
16765            (= truck_loc_167 2)
16766            (= truck_travel_time_167 37)
16767          )
16768        )
16769      )
16770    )
16771  )
16772  (<= truck_stock_167 300)
16773  (>= truck_stock_167 0)
16774  (= a_stockb_168 (- a_stocka_167 truck_travel_time_167))
16775  (= b_stockb_168 (- b_stocka_167 truck_travel_time_167))
16776  (= c_stockb_168 (- c_stocka_167 truck_travel_time_167))
16777  (and
16778    (=> (= truck_loc_167 0)
16779      (and
16780        (= a_stocka_168 a_stockb_168)
```

```
16781        (= b_stocka_168 b_stockb_168)
16782        (= c_stocka_168 c_stockb_168)
16783        (or
16784          (and
16785            (= truck_loc_168 1)
16786            (= truck_travel_time_168 29)
16787          )
16788          (and
16789            (= truck_loc_168 2)
16790            (= truck_travel_time_168 21)
16791          )
16792        )
16793      )
16794    )
16795    (=> (= truck_loc_167 1)
16796      (and
16797        (<= a_stocka_168 120)
16798        (= (+ truck_stock_168 a_stocka_168) (+ truck_stock_167 a_stockb_168))
16799        (= b_stocka_168 b_stockb_168)
16800        (= c_stocka_168 c_stockb_168)
16801        (or
16802          (and
16803            (= truck_loc_168 0)
16804            (= truck_travel_time_168 29)
16805          )
16806          (and
16807            (= truck_loc_168 2)
16808            (= truck_travel_time_168 17)
16809          )
16810          (and
16811            (= truck_loc_168 3)
16812            (= truck_travel_time_168 32)
16813          )
16814        )
16815      )
16816    )
16817    (=> (= truck_loc_167 2)
16818      (and
16819        (<= b_stocka_168 120)
16820        (= (+ truck_stock_168 b_stocka_168) (+ truck_stock_167 b_stockb_168))
16821        (= a_stocka_168 a_stockb_168)
16822        (= c_stocka_168 c_stockb_168)
16823        (or
16824          (and
16825            (= truck_loc_168 1)
16826            (= truck_travel_time_168 17)
16827          )
16828          (and
16829            (= truck_loc_168 0)
16830            (= truck_travel_time_168 21)
16831          )
16832          (and
16833            (= truck_loc_168 3)
16834            (= truck_travel_time_168 37)
16835          )
16836        )
16837      )
16838    )
16839    (=> (= truck_loc_167 3)
16840      (and
16841        (<= c_stocka_168 200)
16842        (= (+ truck_stock_168 c_stocka_168) (+ truck_stock_167 c_stockb_168))
```

```
16843        (= a_stocka_168 a_stockb_168)
16844        (= b_stocka_168 b_stockb_168)
16845        (or
16846          (and
16847            (= truck_loc_168 1)
16848            (= truck_travel_time_168 32)
16849          )
16850          (and
16851            (= truck_loc_168 2)
16852            (= truck_travel_time_168 37)
16853          )
16854        )
16855      )
16856    )
16857  )
16858  (<= truck_stock_168 300)
16859  (>= truck_stock_168 0)
16860  (= a_stockb_169 (- a_stocka_168 truck_travel_time_168))
16861  (= b_stockb_169 (- b_stocka_168 truck_travel_time_168))
16862  (= c_stockb_169 (- c_stocka_168 truck_travel_time_168))
16863  (and
16864    (=> (= truck_loc_168 0)
16865      (and
16866        (= a_stocka_169 a_stockb_169)
16867        (= b_stocka_169 b_stockb_169)
16868        (= c_stocka_169 c_stockb_169)
16869        (or
16870          (and
16871            (= truck_loc_169 1)
16872            (= truck_travel_time_169 29)
16873          )
16874          (and
16875            (= truck_loc_169 2)
16876            (= truck_travel_time_169 21)
16877          )
16878        )
16879      )
16880    )
16881    (=> (= truck_loc_168 1)
16882      (and
16883        (<= a_stocka_169 120)
16884        (= (+ truck_stock_169 a_stocka_169) (+ truck_stock_168 a_stockb_169))
16885        (= b_stocka_169 b_stockb_169)
16886        (= c_stocka_169 c_stockb_169)
16887        (or
16888          (and
16889            (= truck_loc_169 0)
16890            (= truck_travel_time_169 29)
16891          )
16892          (and
16893            (= truck_loc_169 2)
16894            (= truck_travel_time_169 17)
16895          )
16896          (and
16897            (= truck_loc_169 3)
16898            (= truck_travel_time_169 32)
16899          )
16900        )
16901      )
16902    )
16903    (=> (= truck_loc_168 2)
16904      (and
```

```
16905          (<= b_stocka_169 120)
16906          (= (+ truck_stock_169 b_stocka_169) (+ truck_stock_168 b_stockb_169))
16907          (= a_stocka_169 a_stockb_169)
16908          (= c_stocka_169 c_stockb_169)
16909          (or
16910            (and
16911              (= truck_loc_169 1)
16912              (= truck_travel_time_169 17)
16913            )
16914            (and
16915              (= truck_loc_169 0)
16916              (= truck_travel_time_169 21)
16917            )
16918            (and
16919              (= truck_loc_169 3)
16920              (= truck_travel_time_169 37)
16921            )
16922          )
16923        )
16924    )
16925    (=> (= truck_loc_168 3)
16926        (and
16927          (<= c_stocka_169 200)
16928          (= (+ truck_stock_169 c_stocka_169) (+ truck_stock_168 c_stockb_169))
16929          (= a_stocka_169 a_stockb_169)
16930          (= b_stocka_169 b_stockb_169)
16931          (or
16932            (and
16933              (= truck_loc_169 1)
16934              (= truck_travel_time_169 32)
16935            )
16936            (and
16937              (= truck_loc_169 2)
16938              (= truck_travel_time_169 37)
16939            )
16940          )
16941        )
16942    )
16943  )
16944  (<= truck_stock_169 300)
16945  (>= truck_stock_169 0)
16946  (= a_stockb_170 (- a_stocka_169 truck_travel_time_169))
16947  (= b_stockb_170 (- b_stocka_169 truck_travel_time_169))
16948  (= c_stockb_170 (- c_stocka_169 truck_travel_time_169))
16949  (and
16950    (=> (= truck_loc_169 0)
16951        (and
16952          (= a_stocka_170 a_stockb_170)
16953          (= b_stocka_170 b_stockb_170)
16954          (= c_stocka_170 c_stockb_170)
16955          (or
16956            (and
16957              (= truck_loc_170 1)
16958              (= truck_travel_time_170 29)
16959            )
16960            (and
16961              (= truck_loc_170 2)
16962              (= truck_travel_time_170 21)
16963            )
16964          )
16965        )
16966    )
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```
16967    (=> (= truck_loc_169 1)
16968      (and
16969        (<= a_stocka_170 120)
16970        (= (+ truck_stock_170 a_stocka_170) (+ truck_stock_169 a_stockb_170))
16971        (= b_stocka_170 b_stockb_170)
16972        (= c_stocka_170 c_stockb_170)
16973        (or
16974          (and
16975            (= truck_loc_170 0)
16976            (= truck_travel_time_170 29)
16977          )
16978          (and
16979            (= truck_loc_170 2)
16980            (= truck_travel_time_170 17)
16981          )
16982          (and
16983            (= truck_loc_170 3)
16984            (= truck_travel_time_170 32)
16985          )
16986        )
16987      )
16988    )
16989    (=> (= truck_loc_169 2)
16990      (and
16991        (<= b_stocka_170 120)
16992        (= (+ truck_stock_170 b_stocka_170) (+ truck_stock_169 b_stockb_170))
16993        (= a_stocka_170 a_stockb_170)
16994        (= c_stocka_170 c_stockb_170)
16995        (or
16996          (and
16997            (= truck_loc_170 1)
16998            (= truck_travel_time_170 17)
16999          )
17000          (and
17001            (= truck_loc_170 0)
17002            (= truck_travel_time_170 21)
17003          )
17004          (and
17005            (= truck_loc_170 3)
17006            (= truck_travel_time_170 37)
17007          )
17008        )
17009      )
17010    )
17011    (=> (= truck_loc_169 3)
17012      (and
17013        (<= c_stocka_170 200)
17014        (= (+ truck_stock_170 c_stocka_170) (+ truck_stock_169 c_stockb_170))
17015        (= a_stocka_170 a_stockb_170)
17016        (= b_stocka_170 b_stockb_170)
17017        (or
17018          (and
17019            (= truck_loc_170 1)
17020            (= truck_travel_time_170 32)
17021          )
17022          (and
17023            (= truck_loc_170 2)
17024            (= truck_travel_time_170 37)
17025          )
17026        )
17027      )
17028    )
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```
17029  )
17030  (<= truck_stock_170 300)
17031  (>= truck_stock_170 0)
17032  (= a_stockb_171 (- a_stocka_170 truck_travel_time_170))
17033  (= b_stockb_171 (- b_stocka_170 truck_travel_time_170))
17034  (= c_stockb_171 (- c_stocka_170 truck_travel_time_170))
17035  (and
17036    (=> (= truck_loc_170 0)
17037      (and
17038        (= a_stocka_171 a_stockb_171)
17039        (= b_stocka_171 b_stockb_171)
17040        (= c_stocka_171 c_stockb_171)
17041        (or
17042          (and
17043            (= truck_loc_171 1)
17044            (= truck_travel_time_171 29)
17045          )
17046          (and
17047            (= truck_loc_171 2)
17048            (= truck_travel_time_171 21)
17049          )
17050        )
17051      )
17052    )
17053    (=> (= truck_loc_170 1)
17054      (and
17055        (<= a_stocka_171 120)
17056        (= (+ truck_stock_171 a_stocka_171) (+ truck_stock_170 a_stockb_171))
17057        (= b_stocka_171 b_stockb_171)
17058        (= c_stocka_171 c_stockb_171)
17059        (or
17060          (and
17061            (= truck_loc_171 0)
17062            (= truck_travel_time_171 29)
17063          )
17064          (and
17065            (= truck_loc_171 2)
17066            (= truck_travel_time_171 17)
17067          )
17068          (and
17069            (= truck_loc_171 3)
17070            (= truck_travel_time_171 32)
17071          )
17072        )
17073      )
17074    )
17075    (=> (= truck_loc_170 2)
17076      (and
17077        (<= b_stocka_171 120)
17078        (= (+ truck_stock_171 b_stocka_171) (+ truck_stock_170 b_stockb_171))
17079        (= a_stocka_171 a_stockb_171)
17080        (= c_stocka_171 c_stockb_171)
17081        (or
17082          (and
17083            (= truck_loc_171 1)
17084            (= truck_travel_time_171 17)
17085          )
17086          (and
17087            (= truck_loc_171 0)
17088            (= truck_travel_time_171 21)
17089          )
17090          (and
```

```
17091          (= truck_loc_171 3)
17092          (= truck_travel_time_171 37)
17093        )
17094      )
17095     )
17096   )
17097   (=> (= truck_loc_170 3)
17098     (and
17099       (<= c_stocka_171 200)
17100       (= (+ truck_stock_171 c_stocka_171) (+ truck_stock_170 c_stockb_171))
17101       (= a_stocka_171 a_stockb_171)
17102       (= b_stocka_171 b_stockb_171)
17103       (or
17104         (and
17105           (= truck_loc_171 1)
17106           (= truck_travel_time_171 32)
17107         )
17108         (and
17109           (= truck_loc_171 2)
17110           (= truck_travel_time_171 37)
17111         )
17112       )
17113     )
17114   )
17115 )
17116 (<= truck_stock_171 300)
17117 (>= truck_stock_171 0)
17118 (= a_stockb_172 (- a_stocka_171 truck_travel_time_171))
17119 (= b_stockb_172 (- b_stocka_171 truck_travel_time_171))
17120 (= c_stockb_172 (- c_stocka_171 truck_travel_time_171))
17121 (and
17122   (=> (= truck_loc_171 0)
17123     (and
17124       (= a_stocka_172 a_stockb_172)
17125       (= b_stocka_172 b_stockb_172)
17126       (= c_stocka_172 c_stockb_172)
17127       (or
17128         (and
17129           (= truck_loc_172 1)
17130           (= truck_travel_time_172 29)
17131         )
17132         (and
17133           (= truck_loc_172 2)
17134           (= truck_travel_time_172 21)
17135         )
17136       )
17137     )
17138   )
17139   (=> (= truck_loc_171 1)
17140     (and
17141       (<= a_stocka_172 120)
17142       (= (+ truck_stock_172 a_stocka_172) (+ truck_stock_171 a_stockb_172))
17143       (= b_stocka_172 b_stockb_172)
17144       (= c_stocka_172 c_stockb_172)
17145       (or
17146         (and
17147           (= truck_loc_172 0)
17148           (= truck_travel_time_172 29)
17149         )
17150         (and
17151           (= truck_loc_172 2)
17152           (= truck_travel_time_172 17)
```

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17153            )
17154         (and
17155            (= truck_loc_172 3)
17156            (= truck_travel_time_172 32)
17157         )
17158      )
17159    )
17160   )
17161  (=> (= truck_loc_171 2)
17162    (and
17163      (<= b_stocka_172 120)
17164      (= (+ truck_stock_172 b_stocka_172) (+ truck_stock_171 b_stockb_172))
17165      (= a_stocka_172 a_stockb_172)
17166      (= c_stocka_172 c_stockb_172)
17167      (or
17168         (and
17169            (= truck_loc_172 1)
17170            (= truck_travel_time_172 17)
17171         )
17172         (and
17173            (= truck_loc_172 0)
17174            (= truck_travel_time_172 21)
17175         )
17176         (and
17177            (= truck_loc_172 3)
17178            (= truck_travel_time_172 37)
17179         )
17180      )
17181    )
17182   )
17183  (=> (= truck_loc_171 3)
17184    (and
17185      (<= c_stocka_172 200)
17186      (= (+ truck_stock_172 c_stocka_172) (+ truck_stock_171 c_stockb_172))
17187      (= a_stocka_172 a_stockb_172)
17188      (= b_stocka_172 b_stockb_172)
17189      (or
17190         (and
17191            (= truck_loc_172 1)
17192            (= truck_travel_time_172 32)
17193         )
17194         (and
17195            (= truck_loc_172 2)
17196            (= truck_travel_time_172 37)
17197         )
17198      )
17199    )
17200   )
17201  )
17202  (<= truck_stock_172 300)
17203  (>= truck_stock_172 0)
17204  (= a_stockb_173 (- a_stocka_172 truck_travel_time_172))
17205  (= b_stockb_173 (- b_stocka_172 truck_travel_time_172))
17206  (= c_stockb_173 (- c_stocka_172 truck_travel_time_172))
17207  (and
17208    (=> (= truck_loc_172 0)
17209      (and
17210         (= a_stocka_173 a_stockb_173)
17211         (= b_stocka_173 b_stockb_173)
17212         (= c_stocka_173 c_stockb_173)
17213         (or
17214            (and
```

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17215          (= truck_loc_173 1)
17216          (= truck_travel_time_173 29)
17217        )
17218      (and
17219          (= truck_loc_173 2)
17220          (= truck_travel_time_173 21)
17221        )
17222      )
17223    )
17224  )
17225  (=> (= truck_loc_172 1)
17226    (and
17227      (<= a_stocka_173 120)
17228      (= (+ truck_stock_173 a_stocka_173) (+ truck_stock_172 a_stockb_173))
17229      (= b_stocka_173 b_stockb_173)
17230      (= c_stocka_173 c_stockb_173)
17231      (or
17232        (and
17233          (= truck_loc_173 0)
17234          (= truck_travel_time_173 29)
17235        )
17236        (and
17237          (= truck_loc_173 2)
17238          (= truck_travel_time_173 17)
17239        )
17240        (and
17241          (= truck_loc_173 3)
17242          (= truck_travel_time_173 32)
17243        )
17244      )
17245    )
17246  )
17247  (=> (= truck_loc_172 2)
17248    (and
17249      (<= b_stocka_173 120)
17250      (= (+ truck_stock_173 b_stocka_173) (+ truck_stock_172 b_stockb_173))
17251      (= a_stocka_173 a_stockb_173)
17252      (= c_stocka_173 c_stockb_173)
17253      (or
17254        (and
17255          (= truck_loc_173 1)
17256          (= truck_travel_time_173 17)
17257        )
17258        (and
17259          (= truck_loc_173 0)
17260          (= truck_travel_time_173 21)
17261        )
17262        (and
17263          (= truck_loc_173 3)
17264          (= truck_travel_time_173 37)
17265        )
17266      )
17267    )
17268  )
17269  (=> (= truck_loc_172 3)
17270    (and
17271      (<= c_stocka_173 200)
17272      (= (+ truck_stock_173 c_stocka_173) (+ truck_stock_172 c_stockb_173))
17273      (= a_stocka_173 a_stockb_173)
17274      (= b_stocka_173 b_stockb_173)
17275      (or
17276        (and
```

```
17277              (= truck_loc_173 1)
17278              (= truck_travel_time_173 32)
17279            )
17280          (and
17281            (= truck_loc_173 2)
17282            (= truck_travel_time_173 37)
17283          )
17284        )
17285      )
17286    )
17287  )
17288  (<= truck_stock_173 300)
17289  (>= truck_stock_173 0)
17290  (= a_stockb_174 (- a_stocka_173 truck_travel_time_173))
17291  (= b_stockb_174 (- b_stocka_173 truck_travel_time_173))
17292  (= c_stockb_174 (- c_stocka_173 truck_travel_time_173))
17293  (and
17294    (=> (= truck_loc_173 0)
17295      (and
17296        (= a_stocka_174 a_stockb_174)
17297        (= b_stocka_174 b_stockb_174)
17298        (= c_stocka_174 c_stockb_174)
17299        (or
17300          (and
17301            (= truck_loc_174 1)
17302            (= truck_travel_time_174 29)
17303          )
17304          (and
17305            (= truck_loc_174 2)
17306            (= truck_travel_time_174 21)
17307          )
17308        )
17309      )
17310    )
17311    (=> (= truck_loc_173 1)
17312      (and
17313        (<= a_stocka_174 120)
17314        (= (+ truck_stock_174 a_stocka_174) (+ truck_stock_173 a_stockb_174))
17315        (= b_stocka_174 b_stockb_174)
17316        (= c_stocka_174 c_stockb_174)
17317        (or
17318          (and
17319            (= truck_loc_174 0)
17320            (= truck_travel_time_174 29)
17321          )
17322          (and
17323            (= truck_loc_174 2)
17324            (= truck_travel_time_174 17)
17325          )
17326          (and
17327            (= truck_loc_174 3)
17328            (= truck_travel_time_174 32)
17329          )
17330        )
17331      )
17332    )
17333    (=> (= truck_loc_173 2)
17334      (and
17335        (<= b_stocka_174 120)
17336        (= (+ truck_stock_174 b_stocka_174) (+ truck_stock_173 b_stockb_174))
17337        (= a_stocka_174 a_stockb_174)
17338        (= c_stocka_174 c_stockb_174)
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```
17339        (or
17340          (and
17341            (= truck_loc_174 1)
17342            (= truck_travel_time_174 17)
17343          )
17344          (and
17345            (= truck_loc_174 0)
17346            (= truck_travel_time_174 21)
17347          )
17348          (and
17349            (= truck_loc_174 3)
17350            (= truck_travel_time_174 37)
17351          )
17352        )
17353      )
17354    )
17355    (=> (= truck_loc_173 3)
17356      (and
17357        (<= c_stocka_174 200)
17358        (= (+ truck_stock_174 c_stocka_174) (+ truck_stock_173 c_stockb_174))
17359        (= a_stocka_174 a_stockb_174)
17360        (= b_stocka_174 b_stockb_174)
17361        (or
17362          (and
17363            (= truck_loc_174 1)
17364            (= truck_travel_time_174 32)
17365          )
17366          (and
17367            (= truck_loc_174 2)
17368            (= truck_travel_time_174 37)
17369          )
17370        )
17371      )
17372    )
17373  )
17374  (<= truck_stock_174 300)
17375  (>= truck_stock_174 0)
17376  (= a_stockb_175 (- a_stocka_174 truck_travel_time_174))
17377  (= b_stockb_175 (- b_stocka_174 truck_travel_time_174))
17378  (= c_stockb_175 (- c_stocka_174 truck_travel_time_174))
17379  (and
17380    (=> (= truck_loc_174 0)
17381      (and
17382        (= a_stocka_175 a_stockb_175)
17383        (= b_stocka_175 b_stockb_175)
17384        (= c_stocka_175 c_stockb_175)
17385        (or
17386          (and
17387            (= truck_loc_175 1)
17388            (= truck_travel_time_175 29)
17389          )
17390          (and
17391            (= truck_loc_175 2)
17392            (= truck_travel_time_175 21)
17393          )
17394        )
17395      )
17396    )
17397    (=> (= truck_loc_174 1)
17398      (and
17399        (<= a_stocka_175 120)
17400        (= (+ truck_stock_175 a_stocka_175) (+ truck_stock_174 a_stockb_175))
```

```
17401        (= b_stocka_175 b_stockb_175)
17402        (= c_stocka_175 c_stockb_175)
17403        (or
17404          (and
17405            (= truck_loc_175 0)
17406            (= truck_travel_time_175 29)
17407          )
17408          (and
17409            (= truck_loc_175 2)
17410            (= truck_travel_time_175 17)
17411          )
17412          (and
17413            (= truck_loc_175 3)
17414            (= truck_travel_time_175 32)
17415          )
17416        )
17417      )
17418    )
17419    (=> (= truck_loc_174 2)
17420      (and
17421        (<= b_stocka_175 120)
17422        (= (+ truck_stock_175 b_stocka_175) (+ truck_stock_174 b_stockb_175))
17423        (= a_stocka_175 a_stockb_175)
17424        (= c_stocka_175 c_stockb_175)
17425        (or
17426          (and
17427            (= truck_loc_175 1)
17428            (= truck_travel_time_175 17)
17429          )
17430          (and
17431            (= truck_loc_175 0)
17432            (= truck_travel_time_175 21)
17433          )
17434          (and
17435            (= truck_loc_175 3)
17436            (= truck_travel_time_175 37)
17437          )
17438        )
17439      )
17440    )
17441    (=> (= truck_loc_174 3)
17442      (and
17443        (<= c_stocka_175 200)
17444        (= (+ truck_stock_175 c_stocka_175) (+ truck_stock_174 c_stockb_175))
17445        (= a_stocka_175 a_stockb_175)
17446        (= b_stocka_175 b_stockb_175)
17447        (or
17448          (and
17449            (= truck_loc_175 1)
17450            (= truck_travel_time_175 32)
17451          )
17452          (and
17453            (= truck_loc_175 2)
17454            (= truck_travel_time_175 37)
17455          )
17456        )
17457      )
17458    )
17459  )
17460  (<= truck_stock_175 300)
17461  (>= truck_stock_175 0)
17462  (= a_stockb_176 (- a_stocka_175 truck_travel_time_175))
```

```
17463   (= b_stockb_176 (- b_stocka_175 truck_travel_time_175))
17464   (= c_stockb_176 (- c_stocka_175 truck_travel_time_175))
17465   (and
17466     (=> (= truck_loc_175 0)
17467       (and
17468         (= a_stocka_176 a_stockb_176)
17469         (= b_stocka_176 b_stockb_176)
17470         (= c_stocka_176 c_stockb_176)
17471         (or
17472           (and
17473             (= truck_loc_176 1)
17474             (= truck_travel_time_176 29)
17475           )
17476           (and
17477             (= truck_loc_176 2)
17478             (= truck_travel_time_176 21)
17479           )
17480         )
17481       )
17482     )
17483     (=> (= truck_loc_175 1)
17484       (and
17485         (<= a_stocka_176 120)
17486         (= (+ truck_stock_176 a_stocka_176) (+ truck_stock_175 a_stockb_176))
17487         (= b_stocka_176 b_stockb_176)
17488         (= c_stocka_176 c_stockb_176)
17489         (or
17490           (and
17491             (= truck_loc_176 0)
17492             (= truck_travel_time_176 29)
17493           )
17494           (and
17495             (= truck_loc_176 2)
17496             (= truck_travel_time_176 17)
17497           )
17498           (and
17499             (= truck_loc_176 3)
17500             (= truck_travel_time_176 32)
17501           )
17502         )
17503       )
17504     )
17505     (=> (= truck_loc_175 2)
17506       (and
17507         (<= b_stocka_176 120)
17508         (= (+ truck_stock_176 b_stocka_176) (+ truck_stock_175 b_stockb_176))
17509         (= a_stocka_176 a_stockb_176)
17510         (= c_stocka_176 c_stockb_176)
17511         (or
17512           (and
17513             (= truck_loc_176 1)
17514             (= truck_travel_time_176 17)
17515           )
17516           (and
17517             (= truck_loc_176 0)
17518             (= truck_travel_time_176 21)
17519           )
17520           (and
17521             (= truck_loc_176 3)
17522             (= truck_travel_time_176 37)
17523           )
17524         )
```

```
17525        )
17526     )
17527     (=> (= truck_loc_175 3)
17528        (and
17529          (<= c_stocka_176 200)
17530          (= (+ truck_stock_176 c_stocka_176) (+ truck_stock_175 c_stockb_176))
17531          (= a_stocka_176 a_stockb_176)
17532          (= b_stocka_176 b_stockb_176)
17533          (or
17534            (and
17535              (= truck_loc_176 1)
17536              (= truck_travel_time_176 32)
17537            )
17538            (and
17539              (= truck_loc_176 2)
17540              (= truck_travel_time_176 37)
17541            )
17542          )
17543        )
17544     )
17545 )
17546 (<= truck_stock_176 300)
17547 (>= truck_stock_176 0)
17548 (= a_stockb_177 (- a_stocka_176 truck_travel_time_176))
17549 (= b_stockb_177 (- b_stocka_176 truck_travel_time_176))
17550 (= c_stockb_177 (- c_stocka_176 truck_travel_time_176))
17551 (and
17552     (=> (= truck_loc_176 0)
17553        (and
17554          (= a_stocka_177 a_stockb_177)
17555          (= b_stocka_177 b_stockb_177)
17556          (= c_stocka_177 c_stockb_177)
17557          (or
17558            (and
17559              (= truck_loc_177 1)
17560              (= truck_travel_time_177 29)
17561            )
17562            (and
17563              (= truck_loc_177 2)
17564              (= truck_travel_time_177 21)
17565            )
17566          )
17567        )
17568     )
17569     (=> (= truck_loc_176 1)
17570        (and
17571          (<= a_stocka_177 120)
17572          (= (+ truck_stock_177 a_stocka_177) (+ truck_stock_176 a_stockb_177))
17573          (= b_stocka_177 b_stockb_177)
17574          (= c_stocka_177 c_stockb_177)
17575          (or
17576            (and
17577              (= truck_loc_177 0)
17578              (= truck_travel_time_177 29)
17579            )
17580            (and
17581              (= truck_loc_177 2)
17582              (= truck_travel_time_177 17)
17583            )
17584            (and
17585              (= truck_loc_177 3)
17586              (= truck_travel_time_177 32)
```

```
17587             )
17588           )
17589         )
17590       )
17591     (=> (= truck_loc_176 2)
17592       (and
17593         (<= b_stocka_177 120)
17594         (= (+ truck_stock_177 b_stocka_177) (+ truck_stock_176 b_stockb_177))
17595         (= a_stocka_177 a_stockb_177)
17596         (= c_stocka_177 c_stockb_177)
17597         (or
17598           (and
17599             (= truck_loc_177 1)
17600             (= truck_travel_time_177 17)
17601           )
17602           (and
17603             (= truck_loc_177 0)
17604             (= truck_travel_time_177 21)
17605           )
17606           (and
17607             (= truck_loc_177 3)
17608             (= truck_travel_time_177 37)
17609           )
17610         )
17611       )
17612     )
17613     (=> (= truck_loc_176 3)
17614       (and
17615         (<= c_stocka_177 200)
17616         (= (+ truck_stock_177 c_stocka_177) (+ truck_stock_176 c_stockb_177))
17617         (= a_stocka_177 a_stockb_177)
17618         (= b_stocka_177 b_stockb_177)
17619         (or
17620           (and
17621             (= truck_loc_177 1)
17622             (= truck_travel_time_177 32)
17623           )
17624           (and
17625             (= truck_loc_177 2)
17626             (= truck_travel_time_177 37)
17627           )
17628         )
17629       )
17630     )
17631   )
17632   (<= truck_stock_177 300)
17633   (>= truck_stock_177 0)
17634   (= a_stockb_178 (- a_stocka_177 truck_travel_time_177))
17635   (= b_stockb_178 (- b_stocka_177 truck_travel_time_177))
17636   (= c_stockb_178 (- c_stocka_177 truck_travel_time_177))
17637   (and
17638     (=> (= truck_loc_177 0)
17639       (and
17640         (= a_stocka_178 a_stockb_178)
17641         (= b_stocka_178 b_stockb_178)
17642         (= c_stocka_178 c_stockb_178)
17643         (or
17644           (and
17645             (= truck_loc_178 1)
17646             (= truck_travel_time_178 29)
17647           )
17648           (and
```

```
17649            (= truck_loc_178 2)
17650            (= truck_travel_time_178 21)
17651          )
17652        )
17653      )
17654    )
17655    (=> (= truck_loc_177 1)
17656      (and
17657        (<= a_stocka_178 120)
17658        (= (+ truck_stock_178 a_stocka_178) (+ truck_stock_177 a_stockb_178))
17659        (= b_stocka_178 b_stockb_178)
17660        (= c_stocka_178 c_stockb_178)
17661        (or
17662          (and
17663            (= truck_loc_178 0)
17664            (= truck_travel_time_178 29)
17665          )
17666          (and
17667            (= truck_loc_178 2)
17668            (= truck_travel_time_178 17)
17669          )
17670          (and
17671            (= truck_loc_178 3)
17672            (= truck_travel_time_178 32)
17673          )
17674        )
17675      )
17676    )
17677    (=> (= truck_loc_177 2)
17678      (and
17679        (<= b_stocka_178 120)
17680        (= (+ truck_stock_178 b_stocka_178) (+ truck_stock_177 b_stockb_178))
17681        (= a_stocka_178 a_stockb_178)
17682        (= c_stocka_178 c_stockb_178)
17683        (or
17684          (and
17685            (= truck_loc_178 1)
17686            (= truck_travel_time_178 17)
17687          )
17688          (and
17689            (= truck_loc_178 0)
17690            (= truck_travel_time_178 21)
17691          )
17692          (and
17693            (= truck_loc_178 3)
17694            (= truck_travel_time_178 37)
17695          )
17696        )
17697      )
17698    )
17699    (=> (= truck_loc_177 3)
17700      (and
17701        (<= c_stocka_178 200)
17702        (= (+ truck_stock_178 c_stocka_178) (+ truck_stock_177 c_stockb_178))
17703        (= a_stocka_178 a_stockb_178)
17704        (= b_stocka_178 b_stockb_178)
17705        (or
17706          (and
17707            (= truck_loc_178 1)
17708            (= truck_travel_time_178 32)
17709          )
17710          (and
```

```
17711            (= truck_loc_178 2)
17712            (= truck_travel_time_178 37)
17713          )
17714        )
17715      )
17716    )
17717  )
17718  (<= truck_stock_178 300)
17719  (>= truck_stock_178 0)
17720  (= a_stockb_179 (- a_stocka_178 truck_travel_time_178))
17721  (= b_stockb_179 (- b_stocka_178 truck_travel_time_178))
17722  (= c_stockb_179 (- c_stocka_178 truck_travel_time_178))
17723  (and
17724    (=> (= truck_loc_178 0)
17725      (and
17726        (= a_stocka_179 a_stockb_179)
17727        (= b_stocka_179 b_stockb_179)
17728        (= c_stocka_179 c_stockb_179)
17729        (or
17730          (and
17731            (= truck_loc_179 1)
17732            (= truck_travel_time_179 29)
17733          )
17734          (and
17735            (= truck_loc_179 2)
17736            (= truck_travel_time_179 21)
17737          )
17738        )
17739      )
17740    )
17741    (=> (= truck_loc_178 1)
17742      (and
17743        (<= a_stocka_179 120)
17744        (= (+ truck_stock_179 a_stocka_179) (+ truck_stock_178 a_stockb_179))
17745        (= b_stocka_179 b_stockb_179)
17746        (= c_stocka_179 c_stockb_179)
17747        (or
17748          (and
17749            (= truck_loc_179 0)
17750            (= truck_travel_time_179 29)
17751          )
17752          (and
17753            (= truck_loc_179 2)
17754            (= truck_travel_time_179 17)
17755          )
17756          (and
17757            (= truck_loc_179 3)
17758            (= truck_travel_time_179 32)
17759          )
17760        )
17761      )
17762    )
17763    (=> (= truck_loc_178 2)
17764      (and
17765        (<= b_stocka_179 120)
17766        (= (+ truck_stock_179 b_stocka_179) (+ truck_stock_178 b_stockb_179))
17767        (= a_stocka_179 a_stockb_179)
17768        (= c_stocka_179 c_stockb_179)
17769        (or
17770          (and
17771            (= truck_loc_179 1)
17772            (= truck_travel_time_179 17)
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17773            )
17774          (and
17775            (= truck_loc_179 0)
17776            (= truck_travel_time_179 21)
17777          )
17778          (and
17779            (= truck_loc_179 3)
17780            (= truck_travel_time_179 37)
17781          )
17782        )
17783      )
17784    )
17785    (=> (= truck_loc_178 3)
17786      (and
17787        (<= c_stocka_179 200)
17788        (= (+ truck_stock_179 c_stocka_179) (+ truck_stock_178 c_stockb_179))
17789        (= a_stocka_179 a_stockb_179)
17790        (= b_stocka_179 b_stockb_179)
17791        (or
17792          (and
17793            (= truck_loc_179 1)
17794            (= truck_travel_time_179 32)
17795          )
17796          (and
17797            (= truck_loc_179 2)
17798            (= truck_travel_time_179 37)
17799          )
17800        )
17801      )
17802    )
17803  )
17804  (<= truck_stock_179 300)
17805  (>= truck_stock_179 0)
17806  (= a_stockb_180 (- a_stocka_179 truck_travel_time_179))
17807  (= b_stockb_180 (- b_stocka_179 truck_travel_time_179))
17808  (= c_stockb_180 (- c_stocka_179 truck_travel_time_179))
17809  (and
17810    (=> (= truck_loc_179 0)
17811      (and
17812        (= a_stocka_180 a_stockb_180)
17813        (= b_stocka_180 b_stockb_180)
17814        (= c_stocka_180 c_stockb_180)
17815        (or
17816          (and
17817            (= truck_loc_180 1)
17818            (= truck_travel_time_180 29)
17819          )
17820          (and
17821            (= truck_loc_180 2)
17822            (= truck_travel_time_180 21)
17823          )
17824        )
17825      )
17826    )
17827    (=> (= truck_loc_179 1)
17828      (and
17829        (<= a_stocka_180 120)
17830        (= (+ truck_stock_180 a_stocka_180) (+ truck_stock_179 a_stockb_180))
17831        (= b_stocka_180 b_stockb_180)
17832        (= c_stocka_180 c_stockb_180)
17833        (or
17834          (and
```

```
17835              (= truck_loc_180 0)
17836              (= truck_travel_time_180 29)
17837            )
17838          (and
17839            (= truck_loc_180 2)
17840            (= truck_travel_time_180 17)
17841          )
17842          (and
17843            (= truck_loc_180 3)
17844            (= truck_travel_time_180 32)
17845          )
17846        )
17847      )
17848    )
17849    (=> (= truck_loc_179 2)
17850      (and
17851        (<= b_stocka_180 120)
17852        (= (+ truck_stock_180 b_stocka_180) (+ truck_stock_179 b_stockb_180))
17853        (= a_stocka_180 a_stockb_180)
17854        (= c_stocka_180 c_stockb_180)
17855        (or
17856          (and
17857            (= truck_loc_180 1)
17858            (= truck_travel_time_180 17)
17859          )
17860          (and
17861            (= truck_loc_180 0)
17862            (= truck_travel_time_180 21)
17863          )
17864          (and
17865            (= truck_loc_180 3)
17866            (= truck_travel_time_180 37)
17867          )
17868        )
17869      )
17870    )
17871    (=> (= truck_loc_179 3)
17872      (and
17873        (<= c_stocka_180 200)
17874        (= (+ truck_stock_180 c_stocka_180) (+ truck_stock_179 c_stockb_180))
17875        (= a_stocka_180 a_stockb_180)
17876        (= b_stocka_180 b_stockb_180)
17877        (or
17878          (and
17879            (= truck_loc_180 1)
17880            (= truck_travel_time_180 32)
17881          )
17882          (and
17883            (= truck_loc_180 2)
17884            (= truck_travel_time_180 37)
17885          )
17886        )
17887      )
17888    )
17889  )
17890  (<= truck_stock_180 300)
17891  (>= truck_stock_180 0)
17892  (= a_stockb_181 (- a_stocka_180 truck_travel_time_180))
17893  (= b_stockb_181 (- b_stocka_180 truck_travel_time_180))
17894  (= c_stockb_181 (- c_stocka_180 truck_travel_time_180))
17895  (and
17896    (=> (= truck_loc_180 0)
```

```
17897        (and
17898          (= a_stocka_181 a_stockb_181)
17899          (= b_stocka_181 b_stockb_181)
17900          (= c_stocka_181 c_stockb_181)
17901          (or
17902            (and
17903              (= truck_loc_181 1)
17904              (= truck_travel_time_181 29)
17905            )
17906            (and
17907              (= truck_loc_181 2)
17908              (= truck_travel_time_181 21)
17909            )
17910          )
17911        )
17912      )
17913      (=> (= truck_loc_180 1)
17914        (and
17915          (<= a_stocka_181 120)
17916          (= (+ truck_stock_181 a_stocka_181) (+ truck_stock_180 a_stockb_181))
17917          (= b_stocka_181 b_stockb_181)
17918          (= c_stocka_181 c_stockb_181)
17919          (or
17920            (and
17921              (= truck_loc_181 0)
17922              (= truck_travel_time_181 29)
17923            )
17924            (and
17925              (= truck_loc_181 2)
17926              (= truck_travel_time_181 17)
17927            )
17928            (and
17929              (= truck_loc_181 3)
17930              (= truck_travel_time_181 32)
17931            )
17932          )
17933        )
17934      )
17935      (=> (= truck_loc_180 2)
17936        (and
17937          (<= b_stocka_181 120)
17938          (= (+ truck_stock_181 b_stocka_181) (+ truck_stock_180 b_stockb_181))
17939          (= a_stocka_181 a_stockb_181)
17940          (= c_stocka_181 c_stockb_181)
17941          (or
17942            (and
17943              (= truck_loc_181 1)
17944              (= truck_travel_time_181 17)
17945            )
17946            (and
17947              (= truck_loc_181 0)
17948              (= truck_travel_time_181 21)
17949            )
17950            (and
17951              (= truck_loc_181 3)
17952              (= truck_travel_time_181 37)
17953            )
17954          )
17955        )
17956      )
17957      (=> (= truck_loc_180 3)
17958        (and
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17959        (<= c_stocka_181 200)
17960        (= (+ truck_stock_181 c_stocka_181) (+ truck_stock_180 c_stockb_181))
17961        (= a_stocka_181 a_stockb_181)
17962        (= b_stocka_181 b_stockb_181)
17963        (or
17964          (and
17965            (= truck_loc_181 1)
17966            (= truck_travel_time_181 32)
17967          )
17968          (and
17969            (= truck_loc_181 2)
17970            (= truck_travel_time_181 37)
17971          )
17972        )
17973      )
17974    )
17975 )
17976 (<= truck_stock_181 300)
17977 (>= truck_stock_181 0)
17978 (= a_stockb_182 (- a_stocka_181 truck_travel_time_181))
17979 (= b_stockb_182 (- b_stocka_181 truck_travel_time_181))
17980 (= c_stockb_182 (- c_stocka_181 truck_travel_time_181))
17981 (and
17982    (=> (= truck_loc_181 0)
17983      (and
17984        (= a_stocka_182 a_stockb_182)
17985        (= b_stocka_182 b_stockb_182)
17986        (= c_stocka_182 c_stockb_182)
17987        (or
17988          (and
17989            (= truck_loc_182 1)
17990            (= truck_travel_time_182 29)
17991          )
17992          (and
17993            (= truck_loc_182 2)
17994            (= truck_travel_time_182 21)
17995          )
17996        )
17997      )
17998    )
17999    (=> (= truck_loc_181 1)
18000      (and
18001        (<= a_stocka_182 120)
18002        (= (+ truck_stock_182 a_stocka_182) (+ truck_stock_181 a_stockb_182))
18003        (= b_stocka_182 b_stockb_182)
18004        (= c_stocka_182 c_stockb_182)
18005        (or
18006          (and
18007            (= truck_loc_182 0)
18008            (= truck_travel_time_182 29)
18009          )
18010          (and
18011            (= truck_loc_182 2)
18012            (= truck_travel_time_182 17)
18013          )
18014          (and
18015            (= truck_loc_182 3)
18016            (= truck_travel_time_182 32)
18017          )
18018        )
18019      )
18020    )
```

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18021    (=> (= truck_loc_181 2)
18022      (and
18023        (<= b_stocka_182 120)
18024        (= (+ truck_stock_182 b_stocka_182) (+ truck_stock_181 b_stockb_182))
18025        (= a_stocka_182 a_stockb_182)
18026        (= c_stocka_182 c_stockb_182)
18027        (or
18028          (and
18029            (= truck_loc_182 1)
18030            (= truck_travel_time_182 17)
18031          )
18032          (and
18033            (= truck_loc_182 0)
18034            (= truck_travel_time_182 21)
18035          )
18036          (and
18037            (= truck_loc_182 3)
18038            (= truck_travel_time_182 37)
18039          )
18040        )
18041      )
18042    )
18043    (=> (= truck_loc_181 3)
18044      (and
18045        (<= c_stocka_182 200)
18046        (= (+ truck_stock_182 c_stocka_182) (+ truck_stock_181 c_stockb_182))
18047        (= a_stocka_182 a_stockb_182)
18048        (= b_stocka_182 b_stockb_182)
18049        (or
18050          (and
18051            (= truck_loc_182 1)
18052            (= truck_travel_time_182 32)
18053          )
18054          (and
18055            (= truck_loc_182 2)
18056            (= truck_travel_time_182 37)
18057          )
18058        )
18059      )
18060    )
18061  )
18062  (<= truck_stock_182 300)
18063  (>= truck_stock_182 0)
18064  (= a_stockb_183 (- a_stocka_182 truck_travel_time_182))
18065  (= b_stockb_183 (- b_stocka_182 truck_travel_time_182))
18066  (= c_stockb_183 (- c_stocka_182 truck_travel_time_182))
18067  (and
18068    (=> (= truck_loc_182 0)
18069      (and
18070        (= a_stocka_183 a_stockb_183)
18071        (= b_stocka_183 b_stockb_183)
18072        (= c_stocka_183 c_stockb_183)
18073        (or
18074          (and
18075            (= truck_loc_183 1)
18076            (= truck_travel_time_183 29)
18077          )
18078          (and
18079            (= truck_loc_183 2)
18080            (= truck_travel_time_183 21)
18081          )
18082        )
```

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18083        )
18084      )
18085      (=> (= truck_loc_182 1)
18086        (and
18087          (<= a_stocka_183 120)
18088          (= (+ truck_stock_183 a_stocka_183) (+ truck_stock_182 a_stockb_183))
18089          (= b_stocka_183 b_stockb_183)
18090          (= c_stocka_183 c_stockb_183)
18091          (or
18092            (and
18093              (= truck_loc_183 0)
18094              (= truck_travel_time_183 29)
18095            )
18096            (and
18097              (= truck_loc_183 2)
18098              (= truck_travel_time_183 17)
18099            )
18100            (and
18101              (= truck_loc_183 3)
18102              (= truck_travel_time_183 32)
18103            )
18104          )
18105        )
18106      )
18107      (=> (= truck_loc_182 2)
18108        (and
18109          (<= b_stocka_183 120)
18110          (= (+ truck_stock_183 b_stocka_183) (+ truck_stock_182 b_stockb_183))
18111          (= a_stocka_183 a_stockb_183)
18112          (= c_stocka_183 c_stockb_183)
18113          (or
18114            (and
18115              (= truck_loc_183 1)
18116              (= truck_travel_time_183 17)
18117            )
18118            (and
18119              (= truck_loc_183 0)
18120              (= truck_travel_time_183 21)
18121            )
18122            (and
18123              (= truck_loc_183 3)
18124              (= truck_travel_time_183 37)
18125            )
18126          )
18127        )
18128      )
18129      (=> (= truck_loc_182 3)
18130        (and
18131          (<= c_stocka_183 200)
18132          (= (+ truck_stock_183 c_stocka_183) (+ truck_stock_182 c_stockb_183))
18133          (= a_stocka_183 a_stockb_183)
18134          (= b_stocka_183 b_stockb_183)
18135          (or
18136            (and
18137              (= truck_loc_183 1)
18138              (= truck_travel_time_183 32)
18139            )
18140            (and
18141              (= truck_loc_183 2)
18142              (= truck_travel_time_183 37)
18143            )
18144          )
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18145        )
18146      )
18147  )
18148  (<= truck_stock_183 300)
18149  (>= truck_stock_183 0)
18150  (= a_stockb_184 (- a_stocka_183 truck_travel_time_183))
18151  (= b_stockb_184 (- b_stocka_183 truck_travel_time_183))
18152  (= c_stockb_184 (- c_stocka_183 truck_travel_time_183))
18153  (and
18154    (=> (= truck_loc_183 0)
18155      (and
18156        (= a_stocka_184 a_stockb_184)
18157        (= b_stocka_184 b_stockb_184)
18158        (= c_stocka_184 c_stockb_184)
18159        (or
18160          (and
18161            (= truck_loc_184 1)
18162            (= truck_travel_time_184 29)
18163          )
18164          (and
18165            (= truck_loc_184 2)
18166            (= truck_travel_time_184 21)
18167          )
18168        )
18169      )
18170    )
18171    (=> (= truck_loc_183 1)
18172      (and
18173        (<= a_stocka_184 120)
18174        (= (+ truck_stock_184 a_stocka_184) (+ truck_stock_183 a_stockb_184))
18175        (= b_stocka_184 b_stockb_184)
18176        (= c_stocka_184 c_stockb_184)
18177        (or
18178          (and
18179            (= truck_loc_184 0)
18180            (= truck_travel_time_184 29)
18181          )
18182          (and
18183            (= truck_loc_184 2)
18184            (= truck_travel_time_184 17)
18185          )
18186          (and
18187            (= truck_loc_184 3)
18188            (= truck_travel_time_184 32)
18189          )
18190        )
18191      )
18192    )
18193    (=> (= truck_loc_183 2)
18194      (and
18195        (<= b_stocka_184 120)
18196        (= (+ truck_stock_184 b_stocka_184) (+ truck_stock_183 b_stockb_184))
18197        (= a_stocka_184 a_stockb_184)
18198        (= c_stocka_184 c_stockb_184)
18199        (or
18200          (and
18201            (= truck_loc_184 1)
18202            (= truck_travel_time_184 17)
18203          )
18204          (and
18205            (= truck_loc_184 0)
18206            (= truck_travel_time_184 21)
```

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18207            )
18208          (and
18209            (= truck_loc_184 3)
18210            (= truck_travel_time_184 37)
18211          )
18212        )
18213      )
18214    )
18215    (=> (= truck_loc_183 3)
18216      (and
18217        (<= c_stocka_184 200)
18218        (= (+ truck_stock_184 c_stocka_184) (+ truck_stock_183 c_stockb_184))
18219        (= a_stocka_184 a_stockb_184)
18220        (= b_stocka_184 b_stockb_184)
18221        (or
18222          (and
18223            (= truck_loc_184 1)
18224            (= truck_travel_time_184 32)
18225          )
18226          (and
18227            (= truck_loc_184 2)
18228            (= truck_travel_time_184 37)
18229          )
18230        )
18231      )
18232    )
18233  )
18234  (<= truck_stock_184 300)
18235  (>= truck_stock_184 0)
18236  (= a_stockb_185 (- a_stocka_184 truck_travel_time_184))
18237  (= b_stockb_185 (- b_stocka_184 truck_travel_time_184))
18238  (= c_stockb_185 (- c_stocka_184 truck_travel_time_184))
18239  (and
18240    (=> (= truck_loc_184 0)
18241      (and
18242        (= a_stocka_185 a_stockb_185)
18243        (= b_stocka_185 b_stockb_185)
18244        (= c_stocka_185 c_stockb_185)
18245        (or
18246          (and
18247            (= truck_loc_185 1)
18248            (= truck_travel_time_185 29)
18249          )
18250          (and
18251            (= truck_loc_185 2)
18252            (= truck_travel_time_185 21)
18253          )
18254        )
18255      )
18256    )
18257    (=> (= truck_loc_184 1)
18258      (and
18259        (<= a_stocka_185 120)
18260        (= (+ truck_stock_185 a_stocka_185) (+ truck_stock_184 a_stockb_185))
18261        (= b_stocka_185 b_stockb_185)
18262        (= c_stocka_185 c_stockb_185)
18263        (or
18264          (and
18265            (= truck_loc_185 0)
18266            (= truck_travel_time_185 29)
18267          )
18268          (and
```

```
18269              (= truck_loc_185 2)
18270              (= truck_travel_time_185 17)
18271           )
18272          (and
18273              (= truck_loc_185 3)
18274              (= truck_travel_time_185 32)
18275           )
18276          )
18277       )
18278     )
18279     (=> (= truck_loc_184 2)
18280        (and
18281          (<= b_stocka_185 120)
18282          (= (+ truck_stock_185 b_stocka_185) (+ truck_stock_184 b_stockb_185))
18283          (= a_stocka_185 a_stockb_185)
18284          (= c_stocka_185 c_stockb_185)
18285          (or
18286            (and
18287              (= truck_loc_185 1)
18288              (= truck_travel_time_185 17)
18289           )
18290            (and
18291              (= truck_loc_185 0)
18292              (= truck_travel_time_185 21)
18293           )
18294            (and
18295              (= truck_loc_185 3)
18296              (= truck_travel_time_185 37)
18297           )
18298          )
18299       )
18300     )
18301     (=> (= truck_loc_184 3)
18302        (and
18303          (<= c_stocka_185 200)
18304          (= (+ truck_stock_185 c_stocka_185) (+ truck_stock_184 c_stockb_185))
18305          (= a_stocka_185 a_stockb_185)
18306          (= b_stocka_185 b_stockb_185)
18307          (or
18308            (and
18309              (= truck_loc_185 1)
18310              (= truck_travel_time_185 32)
18311           )
18312            (and
18313              (= truck_loc_185 2)
18314              (= truck_travel_time_185 37)
18315           )
18316          )
18317       )
18318     )
18319  )
18320  (<= truck_stock_185 300)
18321  (>= truck_stock_185 0)
18322  (= a_stockb_186 (- a_stocka_185 truck_travel_time_185))
18323  (= b_stockb_186 (- b_stocka_185 truck_travel_time_185))
18324  (= c_stockb_186 (- c_stocka_185 truck_travel_time_185))
18325  (and
18326     (=> (= truck_loc_185 0)
18327        (and
18328          (= a_stocka_186 a_stockb_186)
18329          (= b_stocka_186 b_stockb_186)
18330          (= c_stocka_186 c_stockb_186)
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```
18331          (or
18332            (and
18333              (= truck_loc_186 1)
18334              (= truck_travel_time_186 29)
18335            )
18336            (and
18337              (= truck_loc_186 2)
18338              (= truck_travel_time_186 21)
18339            )
18340          )
18341        )
18342      )
18343      (=> (= truck_loc_185 1)
18344        (and
18345          (<= a_stocka_186 120)
18346          (= (+ truck_stock_186 a_stocka_186) (+ truck_stock_185 a_stockb_186))
18347          (= b_stocka_186 b_stockb_186)
18348          (= c_stocka_186 c_stockb_186)
18349          (or
18350            (and
18351              (= truck_loc_186 0)
18352              (= truck_travel_time_186 29)
18353            )
18354            (and
18355              (= truck_loc_186 2)
18356              (= truck_travel_time_186 17)
18357            )
18358            (and
18359              (= truck_loc_186 3)
18360              (= truck_travel_time_186 32)
18361            )
18362          )
18363        )
18364      )
18365      (=> (= truck_loc_185 2)
18366        (and
18367          (<= b_stocka_186 120)
18368          (= (+ truck_stock_186 b_stocka_186) (+ truck_stock_185 b_stockb_186))
18369          (= a_stocka_186 a_stockb_186)
18370          (= c_stocka_186 c_stockb_186)
18371          (or
18372            (and
18373              (= truck_loc_186 1)
18374              (= truck_travel_time_186 17)
18375            )
18376            (and
18377              (= truck_loc_186 0)
18378              (= truck_travel_time_186 21)
18379            )
18380            (and
18381              (= truck_loc_186 3)
18382              (= truck_travel_time_186 37)
18383            )
18384          )
18385        )
18386      )
18387      (=> (= truck_loc_185 3)
18388        (and
18389          (<= c_stocka_186 200)
18390          (= (+ truck_stock_186 c_stocka_186) (+ truck_stock_185 c_stockb_186))
18391          (= a_stocka_186 a_stockb_186)
18392          (= b_stocka_186 b_stockb_186)
```

```
18393          (or
18394            (and
18395              (= truck_loc_186 1)
18396              (= truck_travel_time_186 32)
18397            )
18398            (and
18399              (= truck_loc_186 2)
18400              (= truck_travel_time_186 37)
18401            )
18402          )
18403        )
18404    )
18405  )
18406  (<= truck_stock_186 300)
18407  (>= truck_stock_186 0)
18408  (= a_stockb_187 (- a_stocka_186 truck_travel_time_186))
18409  (= b_stockb_187 (- b_stocka_186 truck_travel_time_186))
18410  (= c_stockb_187 (- c_stocka_186 truck_travel_time_186))
18411  (and
18412    (=> (= truck_loc_186 0)
18413      (and
18414        (= a_stocka_187 a_stockb_187)
18415        (= b_stocka_187 b_stockb_187)
18416        (= c_stocka_187 c_stockb_187)
18417        (or
18418          (and
18419            (= truck_loc_187 1)
18420            (= truck_travel_time_187 29)
18421          )
18422          (and
18423            (= truck_loc_187 2)
18424            (= truck_travel_time_187 21)
18425          )
18426        )
18427      )
18428    )
18429    (=> (= truck_loc_186 1)
18430      (and
18431        (<= a_stocka_187 120)
18432        (= (+ truck_stock_187 a_stocka_187) (+ truck_stock_186 a_stockb_187))
18433        (= b_stocka_187 b_stockb_187)
18434        (= c_stocka_187 c_stockb_187)
18435        (or
18436          (and
18437            (= truck_loc_187 0)
18438            (= truck_travel_time_187 29)
18439          )
18440          (and
18441            (= truck_loc_187 2)
18442            (= truck_travel_time_187 17)
18443          )
18444          (and
18445            (= truck_loc_187 3)
18446            (= truck_travel_time_187 32)
18447          )
18448        )
18449      )
18450    )
18451    (=> (= truck_loc_186 2)
18452      (and
18453        (<= b_stocka_187 120)
18454        (= (+ truck_stock_187 b_stocka_187) (+ truck_stock_186 b_stockb_187))
```

```
18455        (= a_stocka_187 a_stockb_187)
18456        (= c_stocka_187 c_stockb_187)
18457        (or
18458          (and
18459            (= truck_loc_187 1)
18460            (= truck_travel_time_187 17)
18461          )
18462          (and
18463            (= truck_loc_187 0)
18464            (= truck_travel_time_187 21)
18465          )
18466          (and
18467            (= truck_loc_187 3)
18468            (= truck_travel_time_187 37)
18469          )
18470        )
18471      )
18472    )
18473    (=> (= truck_loc_186 3)
18474      (and
18475        (<= c_stocka_187 200)
18476        (= (+ truck_stock_187 c_stocka_187) (+ truck_stock_186 c_stockb_187))
18477        (= a_stocka_187 a_stockb_187)
18478        (= b_stocka_187 b_stockb_187)
18479        (or
18480          (and
18481            (= truck_loc_187 1)
18482            (= truck_travel_time_187 32)
18483          )
18484          (and
18485            (= truck_loc_187 2)
18486            (= truck_travel_time_187 37)
18487          )
18488        )
18489      )
18490    )
18491  )
18492  (<= truck_stock_187 300)
18493  (>= truck_stock_187 0)
18494  (= a_stockb_188 (- a_stocka_187 truck_travel_time_187))
18495  (= b_stockb_188 (- b_stocka_187 truck_travel_time_187))
18496  (= c_stockb_188 (- c_stocka_187 truck_travel_time_187))
18497  (and
18498    (=> (= truck_loc_187 0)
18499      (and
18500        (= a_stocka_188 a_stockb_188)
18501        (= b_stocka_188 b_stockb_188)
18502        (= c_stocka_188 c_stockb_188)
18503        (or
18504          (and
18505            (= truck_loc_188 1)
18506            (= truck_travel_time_188 29)
18507          )
18508          (and
18509            (= truck_loc_188 2)
18510            (= truck_travel_time_188 21)
18511          )
18512        )
18513      )
18514    )
18515    (=> (= truck_loc_187 1)
18516      (and
```

```
18517          (<= a_stocka_188 120)
18518          (= (+ truck_stock_188 a_stocka_188) (+ truck_stock_187 a_stockb_188))
18519          (= b_stocka_188 b_stockb_188)
18520          (= c_stocka_188 c_stockb_188)
18521          (or
18522            (and
18523              (= truck_loc_188 0)
18524              (= truck_travel_time_188 29)
18525            )
18526            (and
18527              (= truck_loc_188 2)
18528              (= truck_travel_time_188 17)
18529            )
18530            (and
18531              (= truck_loc_188 3)
18532              (= truck_travel_time_188 32)
18533            )
18534          )
18535        )
18536      )
18537      (=> (= truck_loc_187 2)
18538        (and
18539          (<= b_stocka_188 120)
18540          (= (+ truck_stock_188 b_stocka_188) (+ truck_stock_187 b_stockb_188))
18541          (= a_stocka_188 a_stockb_188)
18542          (= c_stocka_188 c_stockb_188)
18543          (or
18544            (and
18545              (= truck_loc_188 1)
18546              (= truck_travel_time_188 17)
18547            )
18548            (and
18549              (= truck_loc_188 0)
18550              (= truck_travel_time_188 21)
18551            )
18552            (and
18553              (= truck_loc_188 3)
18554              (= truck_travel_time_188 37)
18555            )
18556          )
18557        )
18558      )
18559      (=> (= truck_loc_187 3)
18560        (and
18561          (<= c_stocka_188 200)
18562          (= (+ truck_stock_188 c_stocka_188) (+ truck_stock_187 c_stockb_188))
18563          (= a_stocka_188 a_stockb_188)
18564          (= b_stocka_188 b_stockb_188)
18565          (or
18566            (and
18567              (= truck_loc_188 1)
18568              (= truck_travel_time_188 32)
18569            )
18570            (and
18571              (= truck_loc_188 2)
18572              (= truck_travel_time_188 37)
18573            )
18574          )
18575        )
18576      )
18577    )
18578    (<= truck_stock_188 300)
```

```
18579  (>= truck_stock_188 0)
18580  (= a_stockb_189 (- a_stocka_188 truck_travel_time_188))
18581  (= b_stockb_189 (- b_stocka_188 truck_travel_time_188))
18582  (= c_stockb_189 (- c_stocka_188 truck_travel_time_188))
18583  (and
18584    (=> (= truck_loc_188 0)
18585      (and
18586        (= a_stocka_189 a_stockb_189)
18587        (= b_stocka_189 b_stockb_189)
18588        (= c_stocka_189 c_stockb_189)
18589        (or
18590          (and
18591            (= truck_loc_189 1)
18592            (= truck_travel_time_189 29)
18593          )
18594          (and
18595            (= truck_loc_189 2)
18596            (= truck_travel_time_189 21)
18597          )
18598        )
18599      )
18600    )
18601    (=> (= truck_loc_188 1)
18602      (and
18603        (<= a_stocka_189 120)
18604        (= (+ truck_stock_189 a_stocka_189) (+ truck_stock_188 a_stockb_189))
18605        (= b_stocka_189 b_stockb_189)
18606        (= c_stocka_189 c_stockb_189)
18607        (or
18608          (and
18609            (= truck_loc_189 0)
18610            (= truck_travel_time_189 29)
18611          )
18612          (and
18613            (= truck_loc_189 2)
18614            (= truck_travel_time_189 17)
18615          )
18616          (and
18617            (= truck_loc_189 3)
18618            (= truck_travel_time_189 32)
18619          )
18620        )
18621      )
18622    )
18623    (=> (= truck_loc_188 2)
18624      (and
18625        (<= b_stocka_189 120)
18626        (= (+ truck_stock_189 b_stocka_189) (+ truck_stock_188 b_stockb_189))
18627        (= a_stocka_189 a_stockb_189)
18628        (= c_stocka_189 c_stockb_189)
18629        (or
18630          (and
18631            (= truck_loc_189 1)
18632            (= truck_travel_time_189 17)
18633          )
18634          (and
18635            (= truck_loc_189 0)
18636            (= truck_travel_time_189 21)
18637          )
18638          (and
18639            (= truck_loc_189 3)
18640            (= truck_travel_time_189 37)
```

```
18641            )
18642          )
18643        )
18644    )
18645    (=> (= truck_loc_188 3)
18646      (and
18647        (<= c_stocka_189 200)
18648        (= (+ truck_stock_189 c_stocka_189) (+ truck_stock_188 c_stockb_189))
18649        (= a_stocka_189 a_stockb_189)
18650        (= b_stocka_189 b_stockb_189)
18651        (or
18652          (and
18653            (= truck_loc_189 1)
18654            (= truck_travel_time_189 32)
18655          )
18656          (and
18657            (= truck_loc_189 2)
18658            (= truck_travel_time_189 37)
18659          )
18660        )
18661      )
18662    )
18663  )
18664  (<= truck_stock_189 300)
18665  (>= truck_stock_189 0)
18666  (= a_stockb_190 (- a_stocka_189 truck_travel_time_189))
18667  (= b_stockb_190 (- b_stocka_189 truck_travel_time_189))
18668  (= c_stockb_190 (- c_stocka_189 truck_travel_time_189))
18669  (and
18670    (=> (= truck_loc_189 0)
18671      (and
18672        (= a_stocka_190 a_stockb_190)
18673        (= b_stocka_190 b_stockb_190)
18674        (= c_stocka_190 c_stockb_190)
18675        (or
18676          (and
18677            (= truck_loc_190 1)
18678            (= truck_travel_time_190 29)
18679          )
18680          (and
18681            (= truck_loc_190 2)
18682            (= truck_travel_time_190 21)
18683          )
18684        )
18685      )
18686    )
18687    (=> (= truck_loc_189 1)
18688      (and
18689        (<= a_stocka_190 120)
18690        (= (+ truck_stock_190 a_stocka_190) (+ truck_stock_189 a_stockb_190))
18691        (= b_stocka_190 b_stockb_190)
18692        (= c_stocka_190 c_stockb_190)
18693        (or
18694          (and
18695            (= truck_loc_190 0)
18696            (= truck_travel_time_190 29)
18697          )
18698          (and
18699            (= truck_loc_190 2)
18700            (= truck_travel_time_190 17)
18701          )
18702          (and
```

```
18703              (= truck_loc_190 3)
18704              (= truck_travel_time_190 32)
18705            )
18706          )
18707        )
18708      )
18709      (=> (= truck_loc_189 2)
18710        (and
18711          (<= b_stocka_190 120)
18712          (= (+ truck_stock_190 b_stocka_190) (+ truck_stock_189 b_stockb_190))
18713          (= a_stocka_190 a_stockb_190)
18714          (= c_stocka_190 c_stockb_190)
18715          (or
18716            (and
18717              (= truck_loc_190 1)
18718              (= truck_travel_time_190 17)
18719            )
18720            (and
18721              (= truck_loc_190 0)
18722              (= truck_travel_time_190 21)
18723            )
18724            (and
18725              (= truck_loc_190 3)
18726              (= truck_travel_time_190 37)
18727            )
18728          )
18729        )
18730      )
18731      (=> (= truck_loc_189 3)
18732        (and
18733          (<= c_stocka_190 200)
18734          (= (+ truck_stock_190 c_stocka_190) (+ truck_stock_189 c_stockb_190))
18735          (= a_stocka_190 a_stockb_190)
18736          (= b_stocka_190 b_stockb_190)
18737          (or
18738            (and
18739              (= truck_loc_190 1)
18740              (= truck_travel_time_190 32)
18741            )
18742            (and
18743              (= truck_loc_190 2)
18744              (= truck_travel_time_190 37)
18745            )
18746          )
18747        )
18748      )
18749    )
18750    (<= truck_stock_190 300)
18751    (>= truck_stock_190 0)
18752    (= a_stockb_191 (- a_stocka_190 truck_travel_time_190))
18753    (= b_stockb_191 (- b_stocka_190 truck_travel_time_190))
18754    (= c_stockb_191 (- c_stocka_190 truck_travel_time_190))
18755    (and
18756      (=> (= truck_loc_190 0)
18757        (and
18758          (= a_stocka_191 a_stockb_191)
18759          (= b_stocka_191 b_stockb_191)
18760          (= c_stocka_191 c_stockb_191)
18761          (or
18762            (and
18763              (= truck_loc_191 1)
18764              (= truck_travel_time_191 29)
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```
18765              )
18766          (and
18767            (= truck_loc_191 2)
18768            (= truck_travel_time_191 21)
18769          )
18770        )
18771      )
18772    )
18773    (=> (= truck_loc_190 1)
18774      (and
18775        (<= a_stocka_191 120)
18776        (= (+ truck_stock_191 a_stocka_191) (+ truck_stock_190 a_stockb_191))
18777        (= b_stocka_191 b_stockb_191)
18778        (= c_stocka_191 c_stockb_191)
18779        (or
18780          (and
18781            (= truck_loc_191 0)
18782            (= truck_travel_time_191 29)
18783          )
18784          (and
18785            (= truck_loc_191 2)
18786            (= truck_travel_time_191 17)
18787          )
18788          (and
18789            (= truck_loc_191 3)
18790            (= truck_travel_time_191 32)
18791          )
18792        )
18793      )
18794    )
18795    (=> (= truck_loc_190 2)
18796      (and
18797        (<= b_stocka_191 120)
18798        (= (+ truck_stock_191 b_stocka_191) (+ truck_stock_190 b_stockb_191))
18799        (= a_stocka_191 a_stockb_191)
18800        (= c_stocka_191 c_stockb_191)
18801        (or
18802          (and
18803            (= truck_loc_191 1)
18804            (= truck_travel_time_191 17)
18805          )
18806          (and
18807            (= truck_loc_191 0)
18808            (= truck_travel_time_191 21)
18809          )
18810          (and
18811            (= truck_loc_191 3)
18812            (= truck_travel_time_191 37)
18813          )
18814        )
18815      )
18816    )
18817    (=> (= truck_loc_190 3)
18818      (and
18819        (<= c_stocka_191 200)
18820        (= (+ truck_stock_191 c_stocka_191) (+ truck_stock_190 c_stockb_191))
18821        (= a_stocka_191 a_stockb_191)
18822        (= b_stocka_191 b_stockb_191)
18823        (or
18824          (and
18825            (= truck_loc_191 1)
18826            (= truck_travel_time_191 32)
```

```
18827            )
18828          (and
18829            (= truck_loc_191 2)
18830            (= truck_travel_time_191 37)
18831          )
18832        )
18833      )
18834    )
18835  )
18836  (<= truck_stock_191 300)
18837  (>= truck_stock_191 0)
18838  (= a_stockb_192 (- a_stocka_191 truck_travel_time_191))
18839  (= b_stockb_192 (- b_stocka_191 truck_travel_time_191))
18840  (= c_stockb_192 (- c_stocka_191 truck_travel_time_191))
18841  (and
18842    (=> (= truck_loc_191 0)
18843      (and
18844        (= a_stocka_192 a_stockb_192)
18845        (= b_stocka_192 b_stockb_192)
18846        (= c_stocka_192 c_stockb_192)
18847        (or
18848          (and
18849            (= truck_loc_192 1)
18850            (= truck_travel_time_192 29)
18851          )
18852          (and
18853            (= truck_loc_192 2)
18854            (= truck_travel_time_192 21)
18855          )
18856        )
18857      )
18858    )
18859    (=> (= truck_loc_191 1)
18860      (and
18861        (<= a_stocka_192 120)
18862        (= (+ truck_stock_192 a_stocka_192) (+ truck_stock_191 a_stockb_192))
18863        (= b_stocka_192 b_stockb_192)
18864        (= c_stocka_192 c_stockb_192)
18865        (or
18866          (and
18867            (= truck_loc_192 0)
18868            (= truck_travel_time_192 29)
18869          )
18870          (and
18871            (= truck_loc_192 2)
18872            (= truck_travel_time_192 17)
18873          )
18874          (and
18875            (= truck_loc_192 3)
18876            (= truck_travel_time_192 32)
18877          )
18878        )
18879      )
18880    )
18881    (=> (= truck_loc_191 2)
18882      (and
18883        (<= b_stocka_192 120)
18884        (= (+ truck_stock_192 b_stocka_192) (+ truck_stock_191 b_stockb_192))
18885        (= a_stocka_192 a_stockb_192)
18886        (= c_stocka_192 c_stockb_192)
18887        (or
18888          (and
```

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```
18889          (= truck_loc_192 1)
18890          (= truck_travel_time_192 17)
18891        )
18892      (and
18893        (= truck_loc_192 0)
18894        (= truck_travel_time_192 21)
18895      )
18896      (and
18897        (= truck_loc_192 3)
18898        (= truck_travel_time_192 37)
18899      )
18900    )
18901   )
18902  )
18903  (=> (= truck_loc_191 3)
18904    (and
18905      (<= c_stocka_192 200)
18906      (= (+ truck_stock_192 c_stocka_192) (+ truck_stock_191 c_stockb_192))
18907      (= a_stocka_192 a_stockb_192)
18908      (= b_stocka_192 b_stockb_192)
18909      (or
18910        (and
18911          (= truck_loc_192 1)
18912          (= truck_travel_time_192 32)
18913        )
18914        (and
18915          (= truck_loc_192 2)
18916          (= truck_travel_time_192 37)
18917        )
18918      )
18919    )
18920  )
18921 )
18922 (<= truck_stock_192 300)
18923 (>= truck_stock_192 0)
18924 (= a_stockb_193 (- a_stocka_192 truck_travel_time_192))
18925 (= b_stockb_193 (- b_stocka_192 truck_travel_time_192))
18926 (= c_stockb_193 (- c_stocka_192 truck_travel_time_192))
18927 (and
18928   (=> (= truck_loc_192 0)
18929     (and
18930       (= a_stocka_193 a_stockb_193)
18931       (= b_stocka_193 b_stockb_193)
18932       (= c_stocka_193 c_stockb_193)
18933       (or
18934         (and
18935           (= truck_loc_193 1)
18936           (= truck_travel_time_193 29)
18937         )
18938         (and
18939           (= truck_loc_193 2)
18940           (= truck_travel_time_193 21)
18941         )
18942       )
18943     )
18944   )
18945   (=> (= truck_loc_192 1)
18946     (and
18947       (<= a_stocka_193 120)
18948       (= (+ truck_stock_193 a_stocka_193) (+ truck_stock_192 a_stockb_193))
18949       (= b_stocka_193 b_stockb_193)
18950       (= c_stocka_193 c_stockb_193)
```

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```
18951        (or
18952          (and
18953            (= truck_loc_193 0)
18954            (= truck_travel_time_193 29)
18955          )
18956          (and
18957            (= truck_loc_193 2)
18958            (= truck_travel_time_193 17)
18959          )
18960          (and
18961            (= truck_loc_193 3)
18962            (= truck_travel_time_193 32)
18963          )
18964        )
18965      )
18966    )
18967    (=> (= truck_loc_192 2)
18968      (and
18969        (<= b_stocka_193 120)
18970        (= (+ truck_stock_193 b_stocka_193) (+ truck_stock_192 b_stockb_193))
18971        (= a_stocka_193 a_stockb_193)
18972        (= c_stocka_193 c_stockb_193)
18973        (or
18974          (and
18975            (= truck_loc_193 1)
18976            (= truck_travel_time_193 17)
18977          )
18978          (and
18979            (= truck_loc_193 0)
18980            (= truck_travel_time_193 21)
18981          )
18982          (and
18983            (= truck_loc_193 3)
18984            (= truck_travel_time_193 37)
18985          )
18986        )
18987      )
18988    )
18989    (=> (= truck_loc_192 3)
18990      (and
18991        (<= c_stocka_193 200)
18992        (= (+ truck_stock_193 c_stocka_193) (+ truck_stock_192 c_stockb_193))
18993        (= a_stocka_193 a_stockb_193)
18994        (= b_stocka_193 b_stockb_193)
18995        (or
18996          (and
18997            (= truck_loc_193 1)
18998            (= truck_travel_time_193 32)
18999          )
19000          (and
19001            (= truck_loc_193 2)
19002            (= truck_travel_time_193 37)
19003          )
19004        )
19005      )
19006    )
19007  )
19008  (<= truck_stock_193 300)
19009  (>= truck_stock_193 0)
19010  (= a_stockb_194 (- a_stocka_193 truck_travel_time_193))
19011  (= b_stockb_194 (- b_stocka_193 truck_travel_time_193))
19012  (= c_stockb_194 (- c_stocka_193 truck_travel_time_193))
```

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```
19013  (and
19014    (=> (= truck_loc_193 0)
19015      (and
19016        (= a_stocka_194 a_stockb_194)
19017        (= b_stocka_194 b_stockb_194)
19018        (= c_stocka_194 c_stockb_194)
19019        (or
19020          (and
19021            (= truck_loc_194 1)
19022            (= truck_travel_time_194 29)
19023          )
19024          (and
19025            (= truck_loc_194 2)
19026            (= truck_travel_time_194 21)
19027          )
19028        )
19029      )
19030    )
19031    (=> (= truck_loc_193 1)
19032      (and
19033        (<= a_stocka_194 120)
19034        (= (+ truck_stock_194 a_stocka_194) (+ truck_stock_193 a_stockb_194))
19035        (= b_stocka_194 b_stockb_194)
19036        (= c_stocka_194 c_stockb_194)
19037        (or
19038          (and
19039            (= truck_loc_194 0)
19040            (= truck_travel_time_194 29)
19041          )
19042          (and
19043            (= truck_loc_194 2)
19044            (= truck_travel_time_194 17)
19045          )
19046          (and
19047            (= truck_loc_194 3)
19048            (= truck_travel_time_194 32)
19049          )
19050        )
19051      )
19052    )
19053    (=> (= truck_loc_193 2)
19054      (and
19055        (<= b_stocka_194 120)
19056        (= (+ truck_stock_194 b_stocka_194) (+ truck_stock_193 b_stockb_194))
19057        (= a_stocka_194 a_stockb_194)
19058        (= c_stocka_194 c_stockb_194)
19059        (or
19060          (and
19061            (= truck_loc_194 1)
19062            (= truck_travel_time_194 17)
19063          )
19064          (and
19065            (= truck_loc_194 0)
19066            (= truck_travel_time_194 21)
19067          )
19068          (and
19069            (= truck_loc_194 3)
19070            (= truck_travel_time_194 37)
19071          )
19072        )
19073      )
19074    )
```

```
19075    (=> (= truck_loc_193 3)
19076      (and
19077        (<= c_stocka_194 200)
19078        (= (+ truck_stock_194 c_stocka_194) (+ truck_stock_193 c_stockb_194))
19079        (= a_stocka_194 a_stockb_194)
19080        (= b_stocka_194 b_stockb_194)
19081        (or
19082          (and
19083            (= truck_loc_194 1)
19084            (= truck_travel_time_194 32)
19085          )
19086          (and
19087            (= truck_loc_194 2)
19088            (= truck_travel_time_194 37)
19089          )
19090        )
19091      )
19092    )
19093  )
19094  (<= truck_stock_194 300)
19095  (>= truck_stock_194 0)
19096  (= a_stockb_195 (- a_stocka_194 truck_travel_time_194))
19097  (= b_stockb_195 (- b_stocka_194 truck_travel_time_194))
19098  (= c_stockb_195 (- c_stocka_194 truck_travel_time_194))
19099  (and
19100    (=> (= truck_loc_194 0)
19101      (and
19102        (= a_stocka_195 a_stockb_195)
19103        (= b_stocka_195 b_stockb_195)
19104        (= c_stocka_195 c_stockb_195)
19105        (or
19106          (and
19107            (= truck_loc_195 1)
19108            (= truck_travel_time_195 29)
19109          )
19110          (and
19111            (= truck_loc_195 2)
19112            (= truck_travel_time_195 21)
19113          )
19114        )
19115      )
19116    )
19117    (=> (= truck_loc_194 1)
19118      (and
19119        (<= a_stocka_195 120)
19120        (= (+ truck_stock_195 a_stocka_195) (+ truck_stock_194 a_stockb_195))
19121        (= b_stocka_195 b_stockb_195)
19122        (= c_stocka_195 c_stockb_195)
19123        (or
19124          (and
19125            (= truck_loc_195 0)
19126            (= truck_travel_time_195 29)
19127          )
19128          (and
19129            (= truck_loc_195 2)
19130            (= truck_travel_time_195 17)
19131          )
19132          (and
19133            (= truck_loc_195 3)
19134            (= truck_travel_time_195 32)
19135          )
19136        )
```

```
19137         )
19138     )
19139     (=> (= truck_loc_194 2)
19140       (and
19141         (<= b_stocka_195 120)
19142         (= (+ truck_stock_195 b_stocka_195) (+ truck_stock_194 b_stockb_195))
19143         (= a_stocka_195 a_stockb_195)
19144         (= c_stocka_195 c_stockb_195)
19145         (or
19146           (and
19147             (= truck_loc_195 1)
19148             (= truck_travel_time_195 17)
19149           )
19150           (and
19151             (= truck_loc_195 0)
19152             (= truck_travel_time_195 21)
19153           )
19154           (and
19155             (= truck_loc_195 3)
19156             (= truck_travel_time_195 37)
19157           )
19158         )
19159     )
19160   )
19161     (=> (= truck_loc_194 3)
19162       (and
19163         (<= c_stocka_195 200)
19164         (= (+ truck_stock_195 c_stocka_195) (+ truck_stock_194 c_stockb_195))
19165         (= a_stocka_195 a_stockb_195)
19166         (= b_stocka_195 b_stockb_195)
19167         (or
19168           (and
19169             (= truck_loc_195 1)
19170             (= truck_travel_time_195 32)
19171           )
19172           (and
19173             (= truck_loc_195 2)
19174             (= truck_travel_time_195 37)
19175           )
19176         )
19177     )
19178   )
19179 )
19180 (<= truck_stock_195 300)
19181 (>= truck_stock_195 0)
19182 (= a_stockb_196 (- a_stocka_195 truck_travel_time_195))
19183 (= b_stockb_196 (- b_stocka_195 truck_travel_time_195))
19184 (= c_stockb_196 (- c_stocka_195 truck_travel_time_195))
19185 (and
19186   (=> (= truck_loc_195 0)
19187     (and
19188       (= a_stocka_196 a_stockb_196)
19189       (= b_stocka_196 b_stockb_196)
19190       (= c_stocka_196 c_stockb_196)
19191       (or
19192         (and
19193           (= truck_loc_196 1)
19194           (= truck_travel_time_196 29)
19195         )
19196         (and
19197           (= truck_loc_196 2)
19198           (= truck_travel_time_196 21)
```

```
19199            )
19200          )
19201        )
19202    )
19203    (=> (= truck_loc_195 1)
19204      (and
19205        (<= a_stocka_196 120)
19206        (= (+ truck_stock_196 a_stocka_196) (+ truck_stock_195 a_stockb_196))
19207        (= b_stocka_196 b_stockb_196)
19208        (= c_stocka_196 c_stockb_196)
19209        (or
19210          (and
19211            (= truck_loc_196 0)
19212            (= truck_travel_time_196 29)
19213          )
19214          (and
19215            (= truck_loc_196 2)
19216            (= truck_travel_time_196 17)
19217          )
19218          (and
19219            (= truck_loc_196 3)
19220            (= truck_travel_time_196 32)
19221          )
19222        )
19223      )
19224    )
19225    (=> (= truck_loc_195 2)
19226      (and
19227        (<= b_stocka_196 120)
19228        (= (+ truck_stock_196 b_stocka_196) (+ truck_stock_195 b_stockb_196))
19229        (= a_stocka_196 a_stockb_196)
19230        (= c_stocka_196 c_stockb_196)
19231        (or
19232          (and
19233            (= truck_loc_196 1)
19234            (= truck_travel_time_196 17)
19235          )
19236          (and
19237            (= truck_loc_196 0)
19238            (= truck_travel_time_196 21)
19239          )
19240          (and
19241            (= truck_loc_196 3)
19242            (= truck_travel_time_196 37)
19243          )
19244        )
19245      )
19246    )
19247    (=> (= truck_loc_195 3)
19248      (and
19249        (<= c_stocka_196 200)
19250        (= (+ truck_stock_196 c_stocka_196) (+ truck_stock_195 c_stockb_196))
19251        (= a_stocka_196 a_stockb_196)
19252        (= b_stocka_196 b_stockb_196)
19253        (or
19254          (and
19255            (= truck_loc_196 1)
19256            (= truck_travel_time_196 32)
19257          )
19258          (and
19259            (= truck_loc_196 2)
19260            (= truck_travel_time_196 37)
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19261                    )
19262                  )
19263                )
19264            )
19265    )
19266    (<= truck_stock_196 300)
19267    (>= truck_stock_196 0)
19268    (= a_stockb_197 (- a_stocka_196 truck_travel_time_196))
19269    (= b_stockb_197 (- b_stocka_196 truck_travel_time_196))
19270    (= c_stockb_197 (- c_stocka_196 truck_travel_time_196))
19271    (and
19272      (=> (= truck_loc_196 0)
19273        (and
19274          (= a_stocka_197 a_stockb_197)
19275          (= b_stocka_197 b_stockb_197)
19276          (= c_stocka_197 c_stockb_197)
19277          (or
19278            (and
19279              (= truck_loc_197 1)
19280              (= truck_travel_time_197 29)
19281            )
19282            (and
19283              (= truck_loc_197 2)
19284              (= truck_travel_time_197 21)
19285            )
19286          )
19287        )
19288      )
19289      (=> (= truck_loc_196 1)
19290        (and
19291          (<= a_stocka_197 120)
19292          (= (+ truck_stock_197 a_stocka_197) (+ truck_stock_196 a_stockb_197))
19293          (= b_stocka_197 b_stockb_197)
19294          (= c_stocka_197 c_stockb_197)
19295          (or
19296            (and
19297              (= truck_loc_197 0)
19298              (= truck_travel_time_197 29)
19299            )
19300            (and
19301              (= truck_loc_197 2)
19302              (= truck_travel_time_197 17)
19303            )
19304            (and
19305              (= truck_loc_197 3)
19306              (= truck_travel_time_197 32)
19307            )
19308          )
19309        )
19310      )
19311      (=> (= truck_loc_196 2)
19312        (and
19313          (<= b_stocka_197 120)
19314          (= (+ truck_stock_197 b_stocka_197) (+ truck_stock_196 b_stockb_197))
19315          (= a_stocka_197 a_stockb_197)
19316          (= c_stocka_197 c_stockb_197)
19317          (or
19318            (and
19319              (= truck_loc_197 1)
19320              (= truck_travel_time_197 17)
19321            )
19322            (and
```

```
19323              (= truck_loc_197 0)
19324              (= truck_travel_time_197 21)
19325            )
19326          (and
19327              (= truck_loc_197 3)
19328              (= truck_travel_time_197 37)
19329          )
19330        )
19331      )
19332    )
19333    (=> (= truck_loc_196 3)
19334      (and
19335        (<= c_stocka_197 200)
19336        (= (+ truck_stock_197 c_stocka_197) (+ truck_stock_196 c_stockb_197))
19337        (= a_stocka_197 a_stockb_197)
19338        (= b_stocka_197 b_stockb_197)
19339        (or
19340          (and
19341              (= truck_loc_197 1)
19342              (= truck_travel_time_197 32)
19343          )
19344          (and
19345              (= truck_loc_197 2)
19346              (= truck_travel_time_197 37)
19347          )
19348        )
19349      )
19350    )
19351  )
19352  (<= truck_stock_197 300)
19353  (>= truck_stock_197 0)
19354  (= a_stockb_198 (- a_stocka_197 truck_travel_time_197))
19355  (= b_stockb_198 (- b_stocka_197 truck_travel_time_197))
19356  (= c_stockb_198 (- c_stocka_197 truck_travel_time_197))
19357  (and
19358    (=> (= truck_loc_197 0)
19359      (and
19360        (= a_stocka_198 a_stockb_198)
19361        (= b_stocka_198 b_stockb_198)
19362        (= c_stocka_198 c_stockb_198)
19363        (or
19364          (and
19365              (= truck_loc_198 1)
19366              (= truck_travel_time_198 29)
19367          )
19368          (and
19369              (= truck_loc_198 2)
19370              (= truck_travel_time_198 21)
19371          )
19372        )
19373      )
19374    )
19375    (=> (= truck_loc_197 1)
19376      (and
19377        (<= a_stocka_198 120)
19378        (= (+ truck_stock_198 a_stocka_198) (+ truck_stock_197 a_stockb_198))
19379        (= b_stocka_198 b_stockb_198)
19380        (= c_stocka_198 c_stockb_198)
19381        (or
19382          (and
19383              (= truck_loc_198 0)
19384              (= truck_travel_time_198 29)
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19385            )
19386          (and
19387            (= truck_loc_198 2)
19388            (= truck_travel_time_198 17)
19389          )
19390          (and
19391            (= truck_loc_198 3)
19392            (= truck_travel_time_198 32)
19393          )
19394        )
19395      )
19396    )
19397    (=> (= truck_loc_197 2)
19398      (and
19399        (<= b_stocka_198 120)
19400        (= (+ truck_stock_198 b_stocka_198) (+ truck_stock_197 b_stockb_198))
19401        (= a_stocka_198 a_stockb_198)
19402        (= c_stocka_198 c_stockb_198)
19403        (or
19404          (and
19405            (= truck_loc_198 1)
19406            (= truck_travel_time_198 17)
19407          )
19408          (and
19409            (= truck_loc_198 0)
19410            (= truck_travel_time_198 21)
19411          )
19412          (and
19413            (= truck_loc_198 3)
19414            (= truck_travel_time_198 37)
19415          )
19416        )
19417      )
19418    )
19419    (=> (= truck_loc_197 3)
19420      (and
19421        (<= c_stocka_198 200)
19422        (= (+ truck_stock_198 c_stocka_198) (+ truck_stock_197 c_stockb_198))
19423        (= a_stocka_198 a_stockb_198)
19424        (= b_stocka_198 b_stockb_198)
19425        (or
19426          (and
19427            (= truck_loc_198 1)
19428            (= truck_travel_time_198 32)
19429          )
19430          (and
19431            (= truck_loc_198 2)
19432            (= truck_travel_time_198 37)
19433          )
19434        )
19435      )
19436    )
19437  )
19438  (<= truck_stock_198 300)
19439  (>= truck_stock_198 0)
19440  (= a_stockb_199 (- a_stocka_198 truck_travel_time_198))
19441  (= b_stockb_199 (- b_stocka_198 truck_travel_time_198))
19442  (= c_stockb_199 (- c_stocka_198 truck_travel_time_198))
19443  (and
19444    (=> (= truck_loc_198 0)
19445      (and
19446        (= a_stocka_199 a_stockb_199)
```

```
19447        (= b_stocka_199 b_stockb_199)
19448        (= c_stocka_199 c_stockb_199)
19449        (or
19450          (and
19451            (= truck_loc_199 1)
19452            (= truck_travel_time_199 29)
19453          )
19454          (and
19455            (= truck_loc_199 2)
19456            (= truck_travel_time_199 21)
19457          )
19458        )
19459      )
19460    )
19461    (=> (= truck_loc_198 1)
19462      (and
19463        (<= a_stocka_199 120)
19464        (= (+ truck_stock_199 a_stocka_199) (+ truck_stock_198 a_stockb_199))
19465        (= b_stocka_199 b_stockb_199)
19466        (= c_stocka_199 c_stockb_199)
19467        (or
19468          (and
19469            (= truck_loc_199 0)
19470            (= truck_travel_time_199 29)
19471          )
19472          (and
19473            (= truck_loc_199 2)
19474            (= truck_travel_time_199 17)
19475          )
19476          (and
19477            (= truck_loc_199 3)
19478            (= truck_travel_time_199 32)
19479          )
19480        )
19481      )
19482    )
19483    (=> (= truck_loc_198 2)
19484      (and
19485        (<= b_stocka_199 120)
19486        (= (+ truck_stock_199 b_stocka_199) (+ truck_stock_198 b_stockb_199))
19487        (= a_stocka_199 a_stockb_199)
19488        (= c_stocka_199 c_stockb_199)
19489        (or
19490          (and
19491            (= truck_loc_199 1)
19492            (= truck_travel_time_199 17)
19493          )
19494          (and
19495            (= truck_loc_199 0)
19496            (= truck_travel_time_199 21)
19497          )
19498          (and
19499            (= truck_loc_199 3)
19500            (= truck_travel_time_199 37)
19501          )
19502        )
19503      )
19504    )
19505    (=> (= truck_loc_198 3)
19506      (and
19507        (<= c_stocka_199 200)
19508        (= (+ truck_stock_199 c_stocka_199) (+ truck_stock_198 c_stockb_199))
```

```
19509          (= a_stocka_199 a_stockb_199)
19510          (= b_stocka_199 b_stockb_199)
19511          (or
19512            (and
19513              (= truck_loc_199 1)
19514              (= truck_travel_time_199 32)
19515            )
19516            (and
19517              (= truck_loc_199 2)
19518              (= truck_travel_time_199 37)
19519            )
19520          )
19521        )
19522      )
19523  )
19524  (<= truck_stock_199 300)
19525  (>= truck_stock_199 0)
19526  (> s_stockb_0 0)
19527  (> s_stocka_0 0)
19528  (> a_stockb_0 0)
19529  (> a_stocka_0 0)
19530  (> b_stockb_0 0)
19531  (> b_stocka_0 0)
19532  (> c_stockb_0 0)
19533  (> c_stocka_0 0)
19534  (> s_stockb_1 0)
19535  (> s_stocka_1 0)
19536  (> a_stockb_1 0)
19537  (> a_stocka_1 0)
19538  (> b_stockb_1 0)
19539  (> b_stocka_1 0)
19540  (> c_stockb_1 0)
19541  (> c_stocka_1 0)
19542  (> s_stockb_2 0)
19543  (> s_stocka_2 0)
19544  (> a_stockb_2 0)
19545  (> a_stocka_2 0)
19546  (> b_stockb_2 0)
19547  (> b_stocka_2 0)
19548  (> c_stockb_2 0)
19549  (> c_stocka_2 0)
19550  (> s_stockb_3 0)
19551  (> s_stocka_3 0)
19552  (> a_stockb_3 0)
19553  (> a_stocka_3 0)
19554  (> b_stockb_3 0)
19555  (> b_stocka_3 0)
19556  (> c_stockb_3 0)
19557  (> c_stocka_3 0)
19558  (> s_stockb_4 0)
19559  (> s_stocka_4 0)
19560  (> a_stockb_4 0)
19561  (> a_stocka_4 0)
19562  (> b_stockb_4 0)
19563  (> b_stocka_4 0)
19564  (> c_stockb_4 0)
19565  (> c_stocka_4 0)
19566  (> s_stockb_5 0)
19567  (> s_stocka_5 0)
19568  (> a_stockb_5 0)
19569  (> a_stocka_5 0)
19570  (> b_stockb_5 0)
```

```
19571    (> b_stocka_5 0)
19572    (> c_stockb_5 0)
19573    (> c_stocka_5 0)
19574    (> s_stockb_6 0)
19575    (> s_stocka_6 0)
19576    (> a_stockb_6 0)
19577    (> a_stocka_6 0)
19578    (> b_stockb_6 0)
19579    (> b_stocka_6 0)
19580    (> c_stockb_6 0)
19581    (> c_stocka_6 0)
19582    (> s_stockb_7 0)
19583    (> s_stocka_7 0)
19584    (> a_stockb_7 0)
19585    (> a_stocka_7 0)
19586    (> b_stockb_7 0)
19587    (> b_stocka_7 0)
19588    (> c_stockb_7 0)
19589    (> c_stocka_7 0)
19590    (> s_stockb_8 0)
19591    (> s_stocka_8 0)
19592    (> a_stockb_8 0)
19593    (> a_stocka_8 0)
19594    (> b_stockb_8 0)
19595    (> b_stocka_8 0)
19596    (> c_stockb_8 0)
19597    (> c_stocka_8 0)
19598    (> s_stockb_9 0)
19599    (> s_stocka_9 0)
19600    (> a_stockb_9 0)
19601    (> a_stocka_9 0)
19602    (> b_stockb_9 0)
19603    (> b_stocka_9 0)
19604    (> c_stockb_9 0)
19605    (> c_stocka_9 0)
19606    (> s_stockb_10 0)
19607    (> s_stocka_10 0)
19608    (> a_stockb_10 0)
19609    (> a_stocka_10 0)
19610    (> b_stockb_10 0)
19611    (> b_stocka_10 0)
19612    (> c_stockb_10 0)
19613    (> c_stocka_10 0)
19614    (> s_stockb_11 0)
19615    (> s_stocka_11 0)
19616    (> a_stockb_11 0)
19617    (> a_stocka_11 0)
19618    (> b_stockb_11 0)
19619    (> b_stocka_11 0)
19620    (> c_stockb_11 0)
19621    (> c_stocka_11 0)
19622    (> s_stockb_12 0)
19623    (> s_stocka_12 0)
19624    (> a_stockb_12 0)
19625    (> a_stocka_12 0)
19626    (> b_stockb_12 0)
19627    (> b_stocka_12 0)
19628    (> c_stockb_12 0)
19629    (> c_stocka_12 0)
19630    (> s_stockb_13 0)
19631    (> s_stocka_13 0)
19632    (> a_stockb_13 0)
```

```
19633    (> a_stocka_13 0)
19634    (> b_stockb_13 0)
19635    (> b_stocka_13 0)
19636    (> c_stockb_13 0)
19637    (> c_stocka_13 0)
19638    (> s_stockb_14 0)
19639    (> s_stocka_14 0)
19640    (> a_stockb_14 0)
19641    (> a_stocka_14 0)
19642    (> b_stockb_14 0)
19643    (> b_stocka_14 0)
19644    (> c_stockb_14 0)
19645    (> c_stocka_14 0)
19646    (> s_stockb_15 0)
19647    (> s_stocka_15 0)
19648    (> a_stockb_15 0)
19649    (> a_stocka_15 0)
19650    (> b_stockb_15 0)
19651    (> b_stocka_15 0)
19652    (> c_stockb_15 0)
19653    (> c_stocka_15 0)
19654    (> s_stockb_16 0)
19655    (> s_stocka_16 0)
19656    (> a_stockb_16 0)
19657    (> a_stocka_16 0)
19658    (> b_stockb_16 0)
19659    (> b_stocka_16 0)
19660    (> c_stockb_16 0)
19661    (> c_stocka_16 0)
19662    (> s_stockb_17 0)
19663    (> s_stocka_17 0)
19664    (> a_stockb_17 0)
19665    (> a_stocka_17 0)
19666    (> b_stockb_17 0)
19667    (> b_stocka_17 0)
19668    (> c_stockb_17 0)
19669    (> c_stocka_17 0)
19670    (> s_stockb_18 0)
19671    (> s_stocka_18 0)
19672    (> a_stockb_18 0)
19673    (> a_stocka_18 0)
19674    (> b_stockb_18 0)
19675    (> b_stocka_18 0)
19676    (> c_stockb_18 0)
19677    (> c_stocka_18 0)
19678    (> s_stockb_19 0)
19679    (> s_stocka_19 0)
19680    (> a_stockb_19 0)
19681    (> a_stocka_19 0)
19682    (> b_stockb_19 0)
19683    (> b_stocka_19 0)
19684    (> c_stockb_19 0)
19685    (> c_stocka_19 0)
19686    (> s_stockb_20 0)
19687    (> s_stocka_20 0)
19688    (> a_stockb_20 0)
19689    (> a_stocka_20 0)
19690    (> b_stockb_20 0)
19691    (> b_stocka_20 0)
19692    (> c_stockb_20 0)
19693    (> c_stocka_20 0)
19694    (> s_stockb_21 0)
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329

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19695    (> s_stocka_21 0)
19696    (> a_stockb_21 0)
19697    (> a_stocka_21 0)
19698    (> b_stockb_21 0)
19699    (> b_stocka_21 0)
19700    (> c_stockb_21 0)
19701    (> c_stocka_21 0)
19702    (> s_stockb_22 0)
19703    (> s_stocka_22 0)
19704    (> a_stockb_22 0)
19705    (> a_stocka_22 0)
19706    (> b_stockb_22 0)
19707    (> b_stocka_22 0)
19708    (> c_stockb_22 0)
19709    (> c_stocka_22 0)
19710    (> s_stockb_23 0)
19711    (> s_stocka_23 0)
19712    (> a_stockb_23 0)
19713    (> a_stocka_23 0)
19714    (> b_stockb_23 0)
19715    (> b_stocka_23 0)
19716    (> c_stockb_23 0)
19717    (> c_stocka_23 0)
19718    (> s_stockb_24 0)
19719    (> s_stocka_24 0)
19720    (> a_stockb_24 0)
19721    (> a_stocka_24 0)
19722    (> b_stockb_24 0)
19723    (> b_stocka_24 0)
19724    (> c_stockb_24 0)
19725    (> c_stocka_24 0)
19726    (> s_stockb_25 0)
19727    (> s_stocka_25 0)
19728    (> a_stockb_25 0)
19729    (> a_stocka_25 0)
19730    (> b_stockb_25 0)
19731    (> b_stocka_25 0)
19732    (> c_stockb_25 0)
19733    (> c_stocka_25 0)
19734    (> s_stockb_26 0)
19735    (> s_stocka_26 0)
19736    (> a_stockb_26 0)
19737    (> a_stocka_26 0)
19738    (> b_stockb_26 0)
19739    (> b_stocka_26 0)
19740    (> c_stockb_26 0)
19741    (> c_stocka_26 0)
19742    (> s_stockb_27 0)
19743    (> s_stocka_27 0)
19744    (> a_stockb_27 0)
19745    (> a_stocka_27 0)
19746    (> b_stockb_27 0)
19747    (> b_stocka_27 0)
19748    (> c_stockb_27 0)
19749    (> c_stocka_27 0)
19750    (> s_stockb_28 0)
19751    (> s_stocka_28 0)
19752    (> a_stockb_28 0)
19753    (> a_stocka_28 0)
19754    (> b_stockb_28 0)
19755    (> b_stocka_28 0)
19756    (> c_stockb_28 0)
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19757    (> c_stocka_28 0)
19758    (> s_stockb_29 0)
19759    (> s_stocka_29 0)
19760    (> a_stockb_29 0)
19761    (> a_stocka_29 0)
19762    (> b_stockb_29 0)
19763    (> b_stocka_29 0)
19764    (> c_stockb_29 0)
19765    (> c_stocka_29 0)
19766    (> s_stockb_30 0)
19767    (> s_stocka_30 0)
19768    (> a_stockb_30 0)
19769    (> a_stocka_30 0)
19770    (> b_stockb_30 0)
19771    (> b_stocka_30 0)
19772    (> c_stockb_30 0)
19773    (> c_stocka_30 0)
19774    (> s_stockb_31 0)
19775    (> s_stocka_31 0)
19776    (> a_stockb_31 0)
19777    (> a_stocka_31 0)
19778    (> b_stockb_31 0)
19779    (> b_stocka_31 0)
19780    (> c_stockb_31 0)
19781    (> c_stocka_31 0)
19782    (> s_stockb_32 0)
19783    (> s_stocka_32 0)
19784    (> a_stockb_32 0)
19785    (> a_stocka_32 0)
19786    (> b_stockb_32 0)
19787    (> b_stocka_32 0)
19788    (> c_stockb_32 0)
19789    (> c_stocka_32 0)
19790    (> s_stockb_33 0)
19791    (> s_stocka_33 0)
19792    (> a_stockb_33 0)
19793    (> a_stocka_33 0)
19794    (> b_stockb_33 0)
19795    (> b_stocka_33 0)
19796    (> c_stockb_33 0)
19797    (> c_stocka_33 0)
19798    (> s_stockb_34 0)
19799    (> s_stocka_34 0)
19800    (> a_stockb_34 0)
19801    (> a_stocka_34 0)
19802    (> b_stockb_34 0)
19803    (> b_stocka_34 0)
19804    (> c_stockb_34 0)
19805    (> c_stocka_34 0)
19806    (> s_stockb_35 0)
19807    (> s_stocka_35 0)
19808    (> a_stockb_35 0)
19809    (> a_stocka_35 0)
19810    (> b_stockb_35 0)
19811    (> b_stocka_35 0)
19812    (> c_stockb_35 0)
19813    (> c_stocka_35 0)
19814    (> s_stockb_36 0)
19815    (> s_stocka_36 0)
19816    (> a_stockb_36 0)
19817    (> a_stocka_36 0)
19818    (> b_stockb_36 0)
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19819    (> b_stocka_36 0)
19820    (> c_stockb_36 0)
19821    (> c_stocka_36 0)
19822    (> s_stockb_37 0)
19823    (> s_stocka_37 0)
19824    (> a_stockb_37 0)
19825    (> a_stocka_37 0)
19826    (> b_stockb_37 0)
19827    (> b_stocka_37 0)
19828    (> c_stockb_37 0)
19829    (> c_stocka_37 0)
19830    (> s_stockb_38 0)
19831    (> s_stocka_38 0)
19832    (> a_stockb_38 0)
19833    (> a_stocka_38 0)
19834    (> b_stockb_38 0)
19835    (> b_stocka_38 0)
19836    (> c_stockb_38 0)
19837    (> c_stocka_38 0)
19838    (> s_stockb_39 0)
19839    (> s_stocka_39 0)
19840    (> a_stockb_39 0)
19841    (> a_stocka_39 0)
19842    (> b_stockb_39 0)
19843    (> b_stocka_39 0)
19844    (> c_stockb_39 0)
19845    (> c_stocka_39 0)
19846    (> s_stockb_40 0)
19847    (> s_stocka_40 0)
19848    (> a_stockb_40 0)
19849    (> a_stocka_40 0)
19850    (> b_stockb_40 0)
19851    (> b_stocka_40 0)
19852    (> c_stockb_40 0)
19853    (> c_stocka_40 0)
19854    (> s_stockb_41 0)
19855    (> s_stocka_41 0)
19856    (> a_stockb_41 0)
19857    (> a_stocka_41 0)
19858    (> b_stockb_41 0)
19859    (> b_stocka_41 0)
19860    (> c_stockb_41 0)
19861    (> c_stocka_41 0)
19862    (> s_stockb_42 0)
19863    (> s_stocka_42 0)
19864    (> a_stockb_42 0)
19865    (> a_stocka_42 0)
19866    (> b_stockb_42 0)
19867    (> b_stocka_42 0)
19868    (> c_stockb_42 0)
19869    (> c_stocka_42 0)
19870    (> s_stockb_43 0)
19871    (> s_stocka_43 0)
19872    (> a_stockb_43 0)
19873    (> a_stocka_43 0)
19874    (> b_stockb_43 0)
19875    (> b_stocka_43 0)
19876    (> c_stockb_43 0)
19877    (> c_stocka_43 0)
19878    (> s_stockb_44 0)
19879    (> s_stocka_44 0)
19880    (> a_stockb_44 0)
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19881   (> a_stocka_44 0)
19882   (> b_stockb_44 0)
19883   (> b_stocka_44 0)
19884   (> c_stockb_44 0)
19885   (> c_stocka_44 0)
19886   (> s_stockb_45 0)
19887   (> s_stocka_45 0)
19888   (> a_stockb_45 0)
19889   (> a_stocka_45 0)
19890   (> b_stockb_45 0)
19891   (> b_stocka_45 0)
19892   (> c_stockb_45 0)
19893   (> c_stocka_45 0)
19894   (> s_stockb_46 0)
19895   (> s_stocka_46 0)
19896   (> a_stockb_46 0)
19897   (> a_stocka_46 0)
19898   (> b_stockb_46 0)
19899   (> b_stocka_46 0)
19900   (> c_stockb_46 0)
19901   (> c_stocka_46 0)
19902   (> s_stockb_47 0)
19903   (> s_stocka_47 0)
19904   (> a_stockb_47 0)
19905   (> a_stocka_47 0)
19906   (> b_stockb_47 0)
19907   (> b_stocka_47 0)
19908   (> c_stockb_47 0)
19909   (> c_stocka_47 0)
19910   (> s_stockb_48 0)
19911   (> s_stocka_48 0)
19912   (> a_stockb_48 0)
19913   (> a_stocka_48 0)
19914   (> b_stockb_48 0)
19915   (> b_stocka_48 0)
19916   (> c_stockb_48 0)
19917   (> c_stocka_48 0)
19918   (> s_stockb_49 0)
19919   (> s_stocka_49 0)
19920   (> a_stockb_49 0)
19921   (> a_stocka_49 0)
19922   (> b_stockb_49 0)
19923   (> b_stocka_49 0)
19924   (> c_stockb_49 0)
19925   (> c_stocka_49 0)
19926   (> s_stockb_50 0)
19927   (> s_stocka_50 0)
19928   (> a_stockb_50 0)
19929   (> a_stocka_50 0)
19930   (> b_stockb_50 0)
19931   (> b_stocka_50 0)
19932   (> c_stockb_50 0)
19933   (> c_stocka_50 0)
19934   (> s_stockb_51 0)
19935   (> s_stocka_51 0)
19936   (> a_stockb_51 0)
19937   (> a_stocka_51 0)
19938   (> b_stockb_51 0)
19939   (> b_stocka_51 0)
19940   (> c_stockb_51 0)
19941   (> c_stocka_51 0)
19942   (> s_stockb_52 0)
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19943    (> s_stocka_52 0)
19944    (> a_stockb_52 0)
19945    (> a_stocka_52 0)
19946    (> b_stockb_52 0)
19947    (> b_stocka_52 0)
19948    (> c_stockb_52 0)
19949    (> c_stocka_52 0)
19950    (> s_stockb_53 0)
19951    (> s_stocka_53 0)
19952    (> a_stockb_53 0)
19953    (> a_stocka_53 0)
19954    (> b_stockb_53 0)
19955    (> b_stocka_53 0)
19956    (> c_stockb_53 0)
19957    (> c_stocka_53 0)
19958    (> s_stockb_54 0)
19959    (> s_stocka_54 0)
19960    (> a_stockb_54 0)
19961    (> a_stocka_54 0)
19962    (> b_stockb_54 0)
19963    (> b_stocka_54 0)
19964    (> c_stockb_54 0)
19965    (> c_stocka_54 0)
19966    (> s_stockb_55 0)
19967    (> s_stocka_55 0)
19968    (> a_stockb_55 0)
19969    (> a_stocka_55 0)
19970    (> b_stockb_55 0)
19971    (> b_stocka_55 0)
19972    (> c_stockb_55 0)
19973    (> c_stocka_55 0)
19974    (> s_stockb_56 0)
19975    (> s_stocka_56 0)
19976    (> a_stockb_56 0)
19977    (> a_stocka_56 0)
19978    (> b_stockb_56 0)
19979    (> b_stocka_56 0)
19980    (> c_stockb_56 0)
19981    (> c_stocka_56 0)
19982    (> s_stockb_57 0)
19983    (> s_stocka_57 0)
19984    (> a_stockb_57 0)
19985    (> a_stocka_57 0)
19986    (> b_stockb_57 0)
19987    (> b_stocka_57 0)
19988    (> c_stockb_57 0)
19989    (> c_stocka_57 0)
19990    (> s_stockb_58 0)
19991    (> s_stocka_58 0)
19992    (> a_stockb_58 0)
19993    (> a_stocka_58 0)
19994    (> b_stockb_58 0)
19995    (> b_stocka_58 0)
19996    (> c_stockb_58 0)
19997    (> c_stocka_58 0)
19998    (> s_stockb_59 0)
19999    (> s_stocka_59 0)
20000    (> a_stockb_59 0)
20001    (> a_stocka_59 0)
20002    (> b_stockb_59 0)
20003    (> b_stocka_59 0)
20004    (> c_stockb_59 0)
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20005    (> c_stocka_59 0)
20006    (> s_stockb_60 0)
20007    (> s_stocka_60 0)
20008    (> a_stockb_60 0)
20009    (> a_stocka_60 0)
20010    (> b_stockb_60 0)
20011    (> b_stocka_60 0)
20012    (> c_stockb_60 0)
20013    (> c_stocka_60 0)
20014    (> s_stockb_61 0)
20015    (> s_stocka_61 0)
20016    (> a_stockb_61 0)
20017    (> a_stocka_61 0)
20018    (> b_stockb_61 0)
20019    (> b_stocka_61 0)
20020    (> c_stockb_61 0)
20021    (> c_stocka_61 0)
20022    (> s_stockb_62 0)
20023    (> s_stocka_62 0)
20024    (> a_stockb_62 0)
20025    (> a_stocka_62 0)
20026    (> b_stockb_62 0)
20027    (> b_stocka_62 0)
20028    (> c_stockb_62 0)
20029    (> c_stocka_62 0)
20030    (> s_stockb_63 0)
20031    (> s_stocka_63 0)
20032    (> a_stockb_63 0)
20033    (> a_stocka_63 0)
20034    (> b_stockb_63 0)
20035    (> b_stocka_63 0)
20036    (> c_stockb_63 0)
20037    (> c_stocka_63 0)
20038    (> s_stockb_64 0)
20039    (> s_stocka_64 0)
20040    (> a_stockb_64 0)
20041    (> a_stocka_64 0)
20042    (> b_stockb_64 0)
20043    (> b_stocka_64 0)
20044    (> c_stockb_64 0)
20045    (> c_stocka_64 0)
20046    (> s_stockb_65 0)
20047    (> s_stocka_65 0)
20048    (> a_stockb_65 0)
20049    (> a_stocka_65 0)
20050    (> b_stockb_65 0)
20051    (> b_stocka_65 0)
20052    (> c_stockb_65 0)
20053    (> c_stocka_65 0)
20054    (> s_stockb_66 0)
20055    (> s_stocka_66 0)
20056    (> a_stockb_66 0)
20057    (> a_stocka_66 0)
20058    (> b_stockb_66 0)
20059    (> b_stocka_66 0)
20060    (> c_stockb_66 0)
20061    (> c_stocka_66 0)
20062    (> s_stockb_67 0)
20063    (> s_stocka_67 0)
20064    (> a_stockb_67 0)
20065    (> a_stocka_67 0)
20066    (> b_stockb_67 0)
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20067   (> b_stocka_67 0)
20068   (> c_stockb_67 0)
20069   (> c_stocka_67 0)
20070   (> s_stockb_68 0)
20071   (> s_stocka_68 0)
20072   (> a_stockb_68 0)
20073   (> a_stocka_68 0)
20074   (> b_stockb_68 0)
20075   (> b_stocka_68 0)
20076   (> c_stockb_68 0)
20077   (> c_stocka_68 0)
20078   (> s_stockb_69 0)
20079   (> s_stocka_69 0)
20080   (> a_stockb_69 0)
20081   (> a_stocka_69 0)
20082   (> b_stockb_69 0)
20083   (> b_stocka_69 0)
20084   (> c_stockb_69 0)
20085   (> c_stocka_69 0)
20086   (> s_stockb_70 0)
20087   (> s_stocka_70 0)
20088   (> a_stockb_70 0)
20089   (> a_stocka_70 0)
20090   (> b_stockb_70 0)
20091   (> b_stocka_70 0)
20092   (> c_stockb_70 0)
20093   (> c_stocka_70 0)
20094   (> s_stockb_71 0)
20095   (> s_stocka_71 0)
20096   (> a_stockb_71 0)
20097   (> a_stocka_71 0)
20098   (> b_stockb_71 0)
20099   (> b_stocka_71 0)
20100   (> c_stockb_71 0)
20101   (> c_stocka_71 0)
20102   (> s_stockb_72 0)
20103   (> s_stocka_72 0)
20104   (> a_stockb_72 0)
20105   (> a_stocka_72 0)
20106   (> b_stockb_72 0)
20107   (> b_stocka_72 0)
20108   (> c_stockb_72 0)
20109   (> c_stocka_72 0)
20110   (> s_stockb_73 0)
20111   (> s_stocka_73 0)
20112   (> a_stockb_73 0)
20113   (> a_stocka_73 0)
20114   (> b_stockb_73 0)
20115   (> b_stocka_73 0)
20116   (> c_stockb_73 0)
20117   (> c_stocka_73 0)
20118   (> s_stockb_74 0)
20119   (> s_stocka_74 0)
20120   (> a_stockb_74 0)
20121   (> a_stocka_74 0)
20122   (> b_stockb_74 0)
20123   (> b_stocka_74 0)
20124   (> c_stockb_74 0)
20125   (> c_stocka_74 0)
20126   (> s_stockb_75 0)
20127   (> s_stocka_75 0)
20128   (> a_stockb_75 0)
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20129   (> a_stocka_75 0)
20130   (> b_stockb_75 0)
20131   (> b_stocka_75 0)
20132   (> c_stockb_75 0)
20133   (> c_stocka_75 0)
20134   (> s_stockb_76 0)
20135   (> s_stocka_76 0)
20136   (> a_stockb_76 0)
20137   (> a_stocka_76 0)
20138   (> b_stockb_76 0)
20139   (> b_stocka_76 0)
20140   (> c_stockb_76 0)
20141   (> c_stocka_76 0)
20142   (> s_stockb_77 0)
20143   (> s_stocka_77 0)
20144   (> a_stockb_77 0)
20145   (> a_stocka_77 0)
20146   (> b_stockb_77 0)
20147   (> b_stocka_77 0)
20148   (> c_stockb_77 0)
20149   (> c_stocka_77 0)
20150   (> s_stockb_78 0)
20151   (> s_stocka_78 0)
20152   (> a_stockb_78 0)
20153   (> a_stocka_78 0)
20154   (> b_stockb_78 0)
20155   (> b_stocka_78 0)
20156   (> c_stockb_78 0)
20157   (> c_stocka_78 0)
20158   (> s_stockb_79 0)
20159   (> s_stocka_79 0)
20160   (> a_stockb_79 0)
20161   (> a_stocka_79 0)
20162   (> b_stockb_79 0)
20163   (> b_stocka_79 0)
20164   (> c_stockb_79 0)
20165   (> c_stocka_79 0)
20166   (> s_stockb_80 0)
20167   (> s_stocka_80 0)
20168   (> a_stockb_80 0)
20169   (> a_stocka_80 0)
20170   (> b_stockb_80 0)
20171   (> b_stocka_80 0)
20172   (> c_stockb_80 0)
20173   (> c_stocka_80 0)
20174   (> s_stockb_81 0)
20175   (> s_stocka_81 0)
20176   (> a_stockb_81 0)
20177   (> a_stocka_81 0)
20178   (> b_stockb_81 0)
20179   (> b_stocka_81 0)
20180   (> c_stockb_81 0)
20181   (> c_stocka_81 0)
20182   (> s_stockb_82 0)
20183   (> s_stocka_82 0)
20184   (> a_stockb_82 0)
20185   (> a_stocka_82 0)
20186   (> b_stockb_82 0)
20187   (> b_stocka_82 0)
20188   (> c_stockb_82 0)
20189   (> c_stocka_82 0)
20190   (> s_stockb_83 0)
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20191    (> s_stocka_83 0)
20192    (> a_stockb_83 0)
20193    (> a_stocka_83 0)
20194    (> b_stockb_83 0)
20195    (> b_stocka_83 0)
20196    (> c_stockb_83 0)
20197    (> c_stocka_83 0)
20198    (> s_stockb_84 0)
20199    (> s_stocka_84 0)
20200    (> a_stockb_84 0)
20201    (> a_stocka_84 0)
20202    (> b_stockb_84 0)
20203    (> b_stocka_84 0)
20204    (> c_stockb_84 0)
20205    (> c_stocka_84 0)
20206    (> s_stockb_85 0)
20207    (> s_stocka_85 0)
20208    (> a_stockb_85 0)
20209    (> a_stocka_85 0)
20210    (> b_stockb_85 0)
20211    (> b_stocka_85 0)
20212    (> c_stockb_85 0)
20213    (> c_stocka_85 0)
20214    (> s_stockb_86 0)
20215    (> s_stocka_86 0)
20216    (> a_stockb_86 0)
20217    (> a_stocka_86 0)
20218    (> b_stockb_86 0)
20219    (> b_stocka_86 0)
20220    (> c_stockb_86 0)
20221    (> c_stocka_86 0)
20222    (> s_stockb_87 0)
20223    (> s_stocka_87 0)
20224    (> a_stockb_87 0)
20225    (> a_stocka_87 0)
20226    (> b_stockb_87 0)
20227    (> b_stocka_87 0)
20228    (> c_stockb_87 0)
20229    (> c_stocka_87 0)
20230    (> s_stockb_88 0)
20231    (> s_stocka_88 0)
20232    (> a_stockb_88 0)
20233    (> a_stocka_88 0)
20234    (> b_stockb_88 0)
20235    (> b_stocka_88 0)
20236    (> c_stockb_88 0)
20237    (> c_stocka_88 0)
20238    (> s_stockb_89 0)
20239    (> s_stocka_89 0)
20240    (> a_stockb_89 0)
20241    (> a_stocka_89 0)
20242    (> b_stockb_89 0)
20243    (> b_stocka_89 0)
20244    (> c_stockb_89 0)
20245    (> c_stocka_89 0)
20246    (> s_stockb_90 0)
20247    (> s_stocka_90 0)
20248    (> a_stockb_90 0)
20249    (> a_stocka_90 0)
20250    (> b_stockb_90 0)
20251    (> b_stocka_90 0)
20252    (> c_stockb_90 0)
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20253    (> c_stocka_90 0)
20254    (> s_stockb_91 0)
20255    (> s_stocka_91 0)
20256    (> a_stockb_91 0)
20257    (> a_stocka_91 0)
20258    (> b_stockb_91 0)
20259    (> b_stocka_91 0)
20260    (> c_stockb_91 0)
20261    (> c_stocka_91 0)
20262    (> s_stockb_92 0)
20263    (> s_stocka_92 0)
20264    (> a_stockb_92 0)
20265    (> a_stocka_92 0)
20266    (> b_stockb_92 0)
20267    (> b_stocka_92 0)
20268    (> c_stockb_92 0)
20269    (> c_stocka_92 0)
20270    (> s_stockb_93 0)
20271    (> s_stocka_93 0)
20272    (> a_stockb_93 0)
20273    (> a_stocka_93 0)
20274    (> b_stockb_93 0)
20275    (> b_stocka_93 0)
20276    (> c_stockb_93 0)
20277    (> c_stocka_93 0)
20278    (> s_stockb_94 0)
20279    (> s_stocka_94 0)
20280    (> a_stockb_94 0)
20281    (> a_stocka_94 0)
20282    (> b_stockb_94 0)
20283    (> b_stocka_94 0)
20284    (> c_stockb_94 0)
20285    (> c_stocka_94 0)
20286    (> s_stockb_95 0)
20287    (> s_stocka_95 0)
20288    (> a_stockb_95 0)
20289    (> a_stocka_95 0)
20290    (> b_stockb_95 0)
20291    (> b_stocka_95 0)
20292    (> c_stockb_95 0)
20293    (> c_stocka_95 0)
20294    (> s_stockb_96 0)
20295    (> s_stocka_96 0)
20296    (> a_stockb_96 0)
20297    (> a_stocka_96 0)
20298    (> b_stockb_96 0)
20299    (> b_stocka_96 0)
20300    (> c_stockb_96 0)
20301    (> c_stocka_96 0)
20302    (> s_stockb_97 0)
20303    (> s_stocka_97 0)
20304    (> a_stockb_97 0)
20305    (> a_stocka_97 0)
20306    (> b_stockb_97 0)
20307    (> b_stocka_97 0)
20308    (> c_stockb_97 0)
20309    (> c_stocka_97 0)
20310    (> s_stockb_98 0)
20311    (> s_stocka_98 0)
20312    (> a_stockb_98 0)
20313    (> a_stocka_98 0)
20314    (> b_stockb_98 0)
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20315    (> b_stocka_98 0)
20316    (> c_stockb_98 0)
20317    (> c_stocka_98 0)
20318    (> s_stockb_99 0)
20319    (> s_stocka_99 0)
20320    (> a_stockb_99 0)
20321    (> a_stocka_99 0)
20322    (> b_stockb_99 0)
20323    (> b_stocka_99 0)
20324    (> c_stockb_99 0)
20325    (> c_stocka_99 0)
20326    (> s_stockb_100 0)
20327    (> s_stocka_100 0)
20328    (> a_stockb_100 0)
20329    (> a_stocka_100 0)
20330    (> b_stockb_100 0)
20331    (> b_stocka_100 0)
20332    (> c_stockb_100 0)
20333    (> c_stocka_100 0)
20334    (> s_stockb_101 0)
20335    (> s_stocka_101 0)
20336    (> a_stockb_101 0)
20337    (> a_stocka_101 0)
20338    (> b_stockb_101 0)
20339    (> b_stocka_101 0)
20340    (> c_stockb_101 0)
20341    (> c_stocka_101 0)
20342    (> s_stockb_102 0)
20343    (> s_stocka_102 0)
20344    (> a_stockb_102 0)
20345    (> a_stocka_102 0)
20346    (> b_stockb_102 0)
20347    (> b_stocka_102 0)
20348    (> c_stockb_102 0)
20349    (> c_stocka_102 0)
20350    (> s_stockb_103 0)
20351    (> s_stocka_103 0)
20352    (> a_stockb_103 0)
20353    (> a_stocka_103 0)
20354    (> b_stockb_103 0)
20355    (> b_stocka_103 0)
20356    (> c_stockb_103 0)
20357    (> c_stocka_103 0)
20358    (> s_stockb_104 0)
20359    (> s_stocka_104 0)
20360    (> a_stockb_104 0)
20361    (> a_stocka_104 0)
20362    (> b_stockb_104 0)
20363    (> b_stocka_104 0)
20364    (> c_stockb_104 0)
20365    (> c_stocka_104 0)
20366    (> s_stockb_105 0)
20367    (> s_stocka_105 0)
20368    (> a_stockb_105 0)
20369    (> a_stocka_105 0)
20370    (> b_stockb_105 0)
20371    (> b_stocka_105 0)
20372    (> c_stockb_105 0)
20373    (> c_stocka_105 0)
20374    (> s_stockb_106 0)
20375    (> s_stocka_106 0)
20376    (> a_stockb_106 0)
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20377    (> a_stocka_106 0)
20378    (> b_stockb_106 0)
20379    (> b_stocka_106 0)
20380    (> c_stockb_106 0)
20381    (> c_stocka_106 0)
20382    (> s_stockb_107 0)
20383    (> s_stocka_107 0)
20384    (> a_stockb_107 0)
20385    (> a_stocka_107 0)
20386    (> b_stockb_107 0)
20387    (> b_stocka_107 0)
20388    (> c_stockb_107 0)
20389    (> c_stocka_107 0)
20390    (> s_stockb_108 0)
20391    (> s_stocka_108 0)
20392    (> a_stockb_108 0)
20393    (> a_stocka_108 0)
20394    (> b_stockb_108 0)
20395    (> b_stocka_108 0)
20396    (> c_stockb_108 0)
20397    (> c_stocka_108 0)
20398    (> s_stockb_109 0)
20399    (> s_stocka_109 0)
20400    (> a_stockb_109 0)
20401    (> a_stocka_109 0)
20402    (> b_stockb_109 0)
20403    (> b_stocka_109 0)
20404    (> c_stockb_109 0)
20405    (> c_stocka_109 0)
20406    (> s_stockb_110 0)
20407    (> s_stocka_110 0)
20408    (> a_stockb_110 0)
20409    (> a_stocka_110 0)
20410    (> b_stockb_110 0)
20411    (> b_stocka_110 0)
20412    (> c_stockb_110 0)
20413    (> c_stocka_110 0)
20414    (> s_stockb_111 0)
20415    (> s_stocka_111 0)
20416    (> a_stockb_111 0)
20417    (> a_stocka_111 0)
20418    (> b_stockb_111 0)
20419    (> b_stocka_111 0)
20420    (> c_stockb_111 0)
20421    (> c_stocka_111 0)
20422    (> s_stockb_112 0)
20423    (> s_stocka_112 0)
20424    (> a_stockb_112 0)
20425    (> a_stocka_112 0)
20426    (> b_stockb_112 0)
20427    (> b_stocka_112 0)
20428    (> c_stockb_112 0)
20429    (> c_stocka_112 0)
20430    (> s_stockb_113 0)
20431    (> s_stocka_113 0)
20432    (> a_stockb_113 0)
20433    (> a_stocka_113 0)
20434    (> b_stockb_113 0)
20435    (> b_stocka_113 0)
20436    (> c_stockb_113 0)
20437    (> c_stocka_113 0)
20438    (> s_stockb_114 0)
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20439    (> s_stocka_114 0)
20440    (> a_stockb_114 0)
20441    (> a_stocka_114 0)
20442    (> b_stockb_114 0)
20443    (> b_stocka_114 0)
20444    (> c_stockb_114 0)
20445    (> c_stocka_114 0)
20446    (> s_stockb_115 0)
20447    (> s_stocka_115 0)
20448    (> a_stockb_115 0)
20449    (> a_stocka_115 0)
20450    (> b_stockb_115 0)
20451    (> b_stocka_115 0)
20452    (> c_stockb_115 0)
20453    (> c_stocka_115 0)
20454    (> s_stockb_116 0)
20455    (> s_stocka_116 0)
20456    (> a_stockb_116 0)
20457    (> a_stocka_116 0)
20458    (> b_stockb_116 0)
20459    (> b_stocka_116 0)
20460    (> c_stockb_116 0)
20461    (> c_stocka_116 0)
20462    (> s_stockb_117 0)
20463    (> s_stocka_117 0)
20464    (> a_stockb_117 0)
20465    (> a_stocka_117 0)
20466    (> b_stockb_117 0)
20467    (> b_stocka_117 0)
20468    (> c_stockb_117 0)
20469    (> c_stocka_117 0)
20470    (> s_stockb_118 0)
20471    (> s_stocka_118 0)
20472    (> a_stockb_118 0)
20473    (> a_stocka_118 0)
20474    (> b_stockb_118 0)
20475    (> b_stocka_118 0)
20476    (> c_stockb_118 0)
20477    (> c_stocka_118 0)
20478    (> s_stockb_119 0)
20479    (> s_stocka_119 0)
20480    (> a_stockb_119 0)
20481    (> a_stocka_119 0)
20482    (> b_stockb_119 0)
20483    (> b_stocka_119 0)
20484    (> c_stockb_119 0)
20485    (> c_stocka_119 0)
20486    (> s_stockb_120 0)
20487    (> s_stocka_120 0)
20488    (> a_stockb_120 0)
20489    (> a_stocka_120 0)
20490    (> b_stockb_120 0)
20491    (> b_stocka_120 0)
20492    (> c_stockb_120 0)
20493    (> c_stocka_120 0)
20494    (> s_stockb_121 0)
20495    (> s_stocka_121 0)
20496    (> a_stockb_121 0)
20497    (> a_stocka_121 0)
20498    (> b_stockb_121 0)
20499    (> b_stocka_121 0)
20500    (> c_stockb_121 0)
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20501   (> c_stocka_121 0)
20502   (> s_stockb_122 0)
20503   (> s_stocka_122 0)
20504   (> a_stockb_122 0)
20505   (> a_stocka_122 0)
20506   (> b_stockb_122 0)
20507   (> b_stocka_122 0)
20508   (> c_stockb_122 0)
20509   (> c_stocka_122 0)
20510   (> s_stockb_123 0)
20511   (> s_stocka_123 0)
20512   (> a_stockb_123 0)
20513   (> a_stocka_123 0)
20514   (> b_stockb_123 0)
20515   (> b_stocka_123 0)
20516   (> c_stockb_123 0)
20517   (> c_stocka_123 0)
20518   (> s_stockb_124 0)
20519   (> s_stocka_124 0)
20520   (> a_stockb_124 0)
20521   (> a_stocka_124 0)
20522   (> b_stockb_124 0)
20523   (> b_stocka_124 0)
20524   (> c_stockb_124 0)
20525   (> c_stocka_124 0)
20526   (> s_stockb_125 0)
20527   (> s_stocka_125 0)
20528   (> a_stockb_125 0)
20529   (> a_stocka_125 0)
20530   (> b_stockb_125 0)
20531   (> b_stocka_125 0)
20532   (> c_stockb_125 0)
20533   (> c_stocka_125 0)
20534   (> s_stockb_126 0)
20535   (> s_stocka_126 0)
20536   (> a_stockb_126 0)
20537   (> a_stocka_126 0)
20538   (> b_stockb_126 0)
20539   (> b_stocka_126 0)
20540   (> c_stockb_126 0)
20541   (> c_stocka_126 0)
20542   (> s_stockb_127 0)
20543   (> s_stocka_127 0)
20544   (> a_stockb_127 0)
20545   (> a_stocka_127 0)
20546   (> b_stockb_127 0)
20547   (> b_stocka_127 0)
20548   (> c_stockb_127 0)
20549   (> c_stocka_127 0)
20550   (> s_stockb_128 0)
20551   (> s_stocka_128 0)
20552   (> a_stockb_128 0)
20553   (> a_stocka_128 0)
20554   (> b_stockb_128 0)
20555   (> b_stocka_128 0)
20556   (> c_stockb_128 0)
20557   (> c_stocka_128 0)
20558   (> s_stockb_129 0)
20559   (> s_stocka_129 0)
20560   (> a_stockb_129 0)
20561   (> a_stocka_129 0)
20562   (> b_stockb_129 0)
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20563    (> b_stocka_129 0)
20564    (> c_stockb_129 0)
20565    (> c_stocka_129 0)
20566    (> s_stockb_130 0)
20567    (> s_stocka_130 0)
20568    (> a_stockb_130 0)
20569    (> a_stocka_130 0)
20570    (> b_stockb_130 0)
20571    (> b_stocka_130 0)
20572    (> c_stockb_130 0)
20573    (> c_stocka_130 0)
20574    (> s_stockb_131 0)
20575    (> s_stocka_131 0)
20576    (> a_stockb_131 0)
20577    (> a_stocka_131 0)
20578    (> b_stockb_131 0)
20579    (> b_stocka_131 0)
20580    (> c_stockb_131 0)
20581    (> c_stocka_131 0)
20582    (> s_stockb_132 0)
20583    (> s_stocka_132 0)
20584    (> a_stockb_132 0)
20585    (> a_stocka_132 0)
20586    (> b_stockb_132 0)
20587    (> b_stocka_132 0)
20588    (> c_stockb_132 0)
20589    (> c_stocka_132 0)
20590    (> s_stockb_133 0)
20591    (> s_stocka_133 0)
20592    (> a_stockb_133 0)
20593    (> a_stocka_133 0)
20594    (> b_stockb_133 0)
20595    (> b_stocka_133 0)
20596    (> c_stockb_133 0)
20597    (> c_stocka_133 0)
20598    (> s_stockb_134 0)
20599    (> s_stocka_134 0)
20600    (> a_stockb_134 0)
20601    (> a_stocka_134 0)
20602    (> b_stockb_134 0)
20603    (> b_stocka_134 0)
20604    (> c_stockb_134 0)
20605    (> c_stocka_134 0)
20606    (> s_stockb_135 0)
20607    (> s_stocka_135 0)
20608    (> a_stockb_135 0)
20609    (> a_stocka_135 0)
20610    (> b_stockb_135 0)
20611    (> b_stocka_135 0)
20612    (> c_stockb_135 0)
20613    (> c_stocka_135 0)
20614    (> s_stockb_136 0)
20615    (> s_stocka_136 0)
20616    (> a_stockb_136 0)
20617    (> a_stocka_136 0)
20618    (> b_stockb_136 0)
20619    (> b_stocka_136 0)
20620    (> c_stockb_136 0)
20621    (> c_stocka_136 0)
20622    (> s_stockb_137 0)
20623    (> s_stocka_137 0)
20624    (> a_stockb_137 0)
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20625    (> a_stocka_137 0)
20626    (> b_stockb_137 0)
20627    (> b_stocka_137 0)
20628    (> c_stockb_137 0)
20629    (> c_stocka_137 0)
20630    (> s_stockb_138 0)
20631    (> s_stocka_138 0)
20632    (> a_stockb_138 0)
20633    (> a_stocka_138 0)
20634    (> b_stockb_138 0)
20635    (> b_stocka_138 0)
20636    (> c_stockb_138 0)
20637    (> c_stocka_138 0)
20638    (> s_stockb_139 0)
20639    (> s_stocka_139 0)
20640    (> a_stockb_139 0)
20641    (> a_stocka_139 0)
20642    (> b_stockb_139 0)
20643    (> b_stocka_139 0)
20644    (> c_stockb_139 0)
20645    (> c_stocka_139 0)
20646    (> s_stockb_140 0)
20647    (> s_stocka_140 0)
20648    (> a_stockb_140 0)
20649    (> a_stocka_140 0)
20650    (> b_stockb_140 0)
20651    (> b_stocka_140 0)
20652    (> c_stockb_140 0)
20653    (> c_stocka_140 0)
20654    (> s_stockb_141 0)
20655    (> s_stocka_141 0)
20656    (> a_stockb_141 0)
20657    (> a_stocka_141 0)
20658    (> b_stockb_141 0)
20659    (> b_stocka_141 0)
20660    (> c_stockb_141 0)
20661    (> c_stocka_141 0)
20662    (> s_stockb_142 0)
20663    (> s_stocka_142 0)
20664    (> a_stockb_142 0)
20665    (> a_stocka_142 0)
20666    (> b_stockb_142 0)
20667    (> b_stocka_142 0)
20668    (> c_stockb_142 0)
20669    (> c_stocka_142 0)
20670    (> s_stockb_143 0)
20671    (> s_stocka_143 0)
20672    (> a_stockb_143 0)
20673    (> a_stocka_143 0)
20674    (> b_stockb_143 0)
20675    (> b_stocka_143 0)
20676    (> c_stockb_143 0)
20677    (> c_stocka_143 0)
20678    (> s_stockb_144 0)
20679    (> s_stocka_144 0)
20680    (> a_stockb_144 0)
20681    (> a_stocka_144 0)
20682    (> b_stockb_144 0)
20683    (> b_stocka_144 0)
20684    (> c_stockb_144 0)
20685    (> c_stocka_144 0)
20686    (> s_stockb_145 0)
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20687   (> s_stocka_145 0)
20688   (> a_stockb_145 0)
20689   (> a_stocka_145 0)
20690   (> b_stockb_145 0)
20691   (> b_stocka_145 0)
20692   (> c_stockb_145 0)
20693   (> c_stocka_145 0)
20694   (> s_stockb_146 0)
20695   (> s_stocka_146 0)
20696   (> a_stockb_146 0)
20697   (> a_stocka_146 0)
20698   (> b_stockb_146 0)
20699   (> b_stocka_146 0)
20700   (> c_stockb_146 0)
20701   (> c_stocka_146 0)
20702   (> s_stockb_147 0)
20703   (> s_stocka_147 0)
20704   (> a_stockb_147 0)
20705   (> a_stocka_147 0)
20706   (> b_stockb_147 0)
20707   (> b_stocka_147 0)
20708   (> c_stockb_147 0)
20709   (> c_stocka_147 0)
20710   (> s_stockb_148 0)
20711   (> s_stocka_148 0)
20712   (> a_stockb_148 0)
20713   (> a_stocka_148 0)
20714   (> b_stockb_148 0)
20715   (> b_stocka_148 0)
20716   (> c_stockb_148 0)
20717   (> c_stocka_148 0)
20718   (> s_stockb_149 0)
20719   (> s_stocka_149 0)
20720   (> a_stockb_149 0)
20721   (> a_stocka_149 0)
20722   (> b_stockb_149 0)
20723   (> b_stocka_149 0)
20724   (> c_stockb_149 0)
20725   (> c_stocka_149 0)
20726   (> s_stockb_150 0)
20727   (> s_stocka_150 0)
20728   (> a_stockb_150 0)
20729   (> a_stocka_150 0)
20730   (> b_stockb_150 0)
20731   (> b_stocka_150 0)
20732   (> c_stockb_150 0)
20733   (> c_stocka_150 0)
20734   (> s_stockb_151 0)
20735   (> s_stocka_151 0)
20736   (> a_stockb_151 0)
20737   (> a_stocka_151 0)
20738   (> b_stockb_151 0)
20739   (> b_stocka_151 0)
20740   (> c_stockb_151 0)
20741   (> c_stocka_151 0)
20742   (> s_stockb_152 0)
20743   (> s_stocka_152 0)
20744   (> a_stockb_152 0)
20745   (> a_stocka_152 0)
20746   (> b_stockb_152 0)
20747   (> b_stocka_152 0)
20748   (> c_stockb_152 0)
```

```
20749  (> c_stocka_152 0)
20750  (> s_stockb_153 0)
20751  (> s_stocka_153 0)
20752  (> a_stockb_153 0)
20753  (> a_stocka_153 0)
20754  (> b_stockb_153 0)
20755  (> b_stocka_153 0)
20756  (> c_stockb_153 0)
20757  (> c_stocka_153 0)
20758  (> s_stockb_154 0)
20759  (> s_stocka_154 0)
20760  (> a_stockb_154 0)
20761  (> a_stocka_154 0)
20762  (> b_stockb_154 0)
20763  (> b_stocka_154 0)
20764  (> c_stockb_154 0)
20765  (> c_stocka_154 0)
20766  (> s_stockb_155 0)
20767  (> s_stocka_155 0)
20768  (> a_stockb_155 0)
20769  (> a_stocka_155 0)
20770  (> b_stockb_155 0)
20771  (> b_stocka_155 0)
20772  (> c_stockb_155 0)
20773  (> c_stocka_155 0)
20774  (> s_stockb_156 0)
20775  (> s_stocka_156 0)
20776  (> a_stockb_156 0)
20777  (> a_stocka_156 0)
20778  (> b_stockb_156 0)
20779  (> b_stocka_156 0)
20780  (> c_stockb_156 0)
20781  (> c_stocka_156 0)
20782  (> s_stockb_157 0)
20783  (> s_stocka_157 0)
20784  (> a_stockb_157 0)
20785  (> a_stocka_157 0)
20786  (> b_stockb_157 0)
20787  (> b_stocka_157 0)
20788  (> c_stockb_157 0)
20789  (> c_stocka_157 0)
20790  (> s_stockb_158 0)
20791  (> s_stocka_158 0)
20792  (> a_stockb_158 0)
20793  (> a_stocka_158 0)
20794  (> b_stockb_158 0)
20795  (> b_stocka_158 0)
20796  (> c_stockb_158 0)
20797  (> c_stocka_158 0)
20798  (> s_stockb_159 0)
20799  (> s_stocka_159 0)
20800  (> a_stockb_159 0)
20801  (> a_stocka_159 0)
20802  (> b_stockb_159 0)
20803  (> b_stocka_159 0)
20804  (> c_stockb_159 0)
20805  (> c_stocka_159 0)
20806  (> s_stockb_160 0)
20807  (> s_stocka_160 0)
20808  (> a_stockb_160 0)
20809  (> a_stocka_160 0)
20810  (> b_stockb_160 0)
```

```
20811  (> b_stocka_160 0)
20812  (> c_stockb_160 0)
20813  (> c_stocka_160 0)
20814  (> s_stockb_161 0)
20815  (> s_stocka_161 0)
20816  (> a_stockb_161 0)
20817  (> a_stocka_161 0)
20818  (> b_stockb_161 0)
20819  (> b_stocka_161 0)
20820  (> c_stockb_161 0)
20821  (> c_stocka_161 0)
20822  (> s_stockb_162 0)
20823  (> s_stocka_162 0)
20824  (> a_stockb_162 0)
20825  (> a_stocka_162 0)
20826  (> b_stockb_162 0)
20827  (> b_stocka_162 0)
20828  (> c_stockb_162 0)
20829  (> c_stocka_162 0)
20830  (> s_stockb_163 0)
20831  (> s_stocka_163 0)
20832  (> a_stockb_163 0)
20833  (> a_stocka_163 0)
20834  (> b_stockb_163 0)
20835  (> b_stocka_163 0)
20836  (> c_stockb_163 0)
20837  (> c_stocka_163 0)
20838  (> s_stockb_164 0)
20839  (> s_stocka_164 0)
20840  (> a_stockb_164 0)
20841  (> a_stocka_164 0)
20842  (> b_stockb_164 0)
20843  (> b_stocka_164 0)
20844  (> c_stockb_164 0)
20845  (> c_stocka_164 0)
20846  (> s_stockb_165 0)
20847  (> s_stocka_165 0)
20848  (> a_stockb_165 0)
20849  (> a_stocka_165 0)
20850  (> b_stockb_165 0)
20851  (> b_stocka_165 0)
20852  (> c_stockb_165 0)
20853  (> c_stocka_165 0)
20854  (> s_stockb_166 0)
20855  (> s_stocka_166 0)
20856  (> a_stockb_166 0)
20857  (> a_stocka_166 0)
20858  (> b_stockb_166 0)
20859  (> b_stocka_166 0)
20860  (> c_stockb_166 0)
20861  (> c_stocka_166 0)
20862  (> s_stockb_167 0)
20863  (> s_stocka_167 0)
20864  (> a_stockb_167 0)
20865  (> a_stocka_167 0)
20866  (> b_stockb_167 0)
20867  (> b_stocka_167 0)
20868  (> c_stockb_167 0)
20869  (> c_stocka_167 0)
20870  (> s_stockb_168 0)
20871  (> s_stocka_168 0)
20872  (> a_stockb_168 0)
```

```
20873    (> a_stocka_168 0)
20874    (> b_stockb_168 0)
20875    (> b_stocka_168 0)
20876    (> c_stockb_168 0)
20877    (> c_stocka_168 0)
20878    (> s_stockb_169 0)
20879    (> s_stocka_169 0)
20880    (> a_stockb_169 0)
20881    (> a_stocka_169 0)
20882    (> b_stockb_169 0)
20883    (> b_stocka_169 0)
20884    (> c_stockb_169 0)
20885    (> c_stocka_169 0)
20886    (> s_stockb_170 0)
20887    (> s_stocka_170 0)
20888    (> a_stockb_170 0)
20889    (> a_stocka_170 0)
20890    (> b_stockb_170 0)
20891    (> b_stocka_170 0)
20892    (> c_stockb_170 0)
20893    (> c_stocka_170 0)
20894    (> s_stockb_171 0)
20895    (> s_stocka_171 0)
20896    (> a_stockb_171 0)
20897    (> a_stocka_171 0)
20898    (> b_stockb_171 0)
20899    (> b_stocka_171 0)
20900    (> c_stockb_171 0)
20901    (> c_stocka_171 0)
20902    (> s_stockb_172 0)
20903    (> s_stocka_172 0)
20904    (> a_stockb_172 0)
20905    (> a_stocka_172 0)
20906    (> b_stockb_172 0)
20907    (> b_stocka_172 0)
20908    (> c_stockb_172 0)
20909    (> c_stocka_172 0)
20910    (> s_stockb_173 0)
20911    (> s_stocka_173 0)
20912    (> a_stockb_173 0)
20913    (> a_stocka_173 0)
20914    (> b_stockb_173 0)
20915    (> b_stocka_173 0)
20916    (> c_stockb_173 0)
20917    (> c_stocka_173 0)
20918    (> s_stockb_174 0)
20919    (> s_stocka_174 0)
20920    (> a_stockb_174 0)
20921    (> a_stocka_174 0)
20922    (> b_stockb_174 0)
20923    (> b_stocka_174 0)
20924    (> c_stockb_174 0)
20925    (> c_stocka_174 0)
20926    (> s_stockb_175 0)
20927    (> s_stocka_175 0)
20928    (> a_stockb_175 0)
20929    (> a_stocka_175 0)
20930    (> b_stockb_175 0)
20931    (> b_stocka_175 0)
20932    (> c_stockb_175 0)
20933    (> c_stocka_175 0)
20934    (> s_stockb_176 0)
```

```
20935   (> s_stocka_176 0)
20936   (> a_stockb_176 0)
20937   (> a_stocka_176 0)
20938   (> b_stockb_176 0)
20939   (> b_stocka_176 0)
20940   (> c_stockb_176 0)
20941   (> c_stocka_176 0)
20942   (> s_stockb_177 0)
20943   (> s_stocka_177 0)
20944   (> a_stockb_177 0)
20945   (> a_stocka_177 0)
20946   (> b_stockb_177 0)
20947   (> b_stocka_177 0)
20948   (> c_stockb_177 0)
20949   (> c_stocka_177 0)
20950   (> s_stockb_178 0)
20951   (> s_stocka_178 0)
20952   (> a_stockb_178 0)
20953   (> a_stocka_178 0)
20954   (> b_stockb_178 0)
20955   (> b_stocka_178 0)
20956   (> c_stockb_178 0)
20957   (> c_stocka_178 0)
20958   (> s_stockb_179 0)
20959   (> s_stocka_179 0)
20960   (> a_stockb_179 0)
20961   (> a_stocka_179 0)
20962   (> b_stockb_179 0)
20963   (> b_stocka_179 0)
20964   (> c_stockb_179 0)
20965   (> c_stocka_179 0)
20966   (> s_stockb_180 0)
20967   (> s_stocka_180 0)
20968   (> a_stockb_180 0)
20969   (> a_stocka_180 0)
20970   (> b_stockb_180 0)
20971   (> b_stocka_180 0)
20972   (> c_stockb_180 0)
20973   (> c_stocka_180 0)
20974   (> s_stockb_181 0)
20975   (> s_stocka_181 0)
20976   (> a_stockb_181 0)
20977   (> a_stocka_181 0)
20978   (> b_stockb_181 0)
20979   (> b_stocka_181 0)
20980   (> c_stockb_181 0)
20981   (> c_stocka_181 0)
20982   (> s_stockb_182 0)
20983   (> s_stocka_182 0)
20984   (> a_stockb_182 0)
20985   (> a_stocka_182 0)
20986   (> b_stockb_182 0)
20987   (> b_stocka_182 0)
20988   (> c_stockb_182 0)
20989   (> c_stocka_182 0)
20990   (> s_stockb_183 0)
20991   (> s_stocka_183 0)
20992   (> a_stockb_183 0)
20993   (> a_stocka_183 0)
20994   (> b_stockb_183 0)
20995   (> b_stocka_183 0)
20996   (> c_stockb_183 0)
```

```
20997    (> c_stocka_183 0)
20998    (> s_stockb_184 0)
20999    (> s_stocka_184 0)
21000    (> a_stockb_184 0)
21001    (> a_stocka_184 0)
21002    (> b_stockb_184 0)
21003    (> b_stocka_184 0)
21004    (> c_stockb_184 0)
21005    (> c_stocka_184 0)
21006    (> s_stockb_185 0)
21007    (> s_stocka_185 0)
21008    (> a_stockb_185 0)
21009    (> a_stocka_185 0)
21010    (> b_stockb_185 0)
21011    (> b_stocka_185 0)
21012    (> c_stockb_185 0)
21013    (> c_stocka_185 0)
21014    (> s_stockb_186 0)
21015    (> s_stocka_186 0)
21016    (> a_stockb_186 0)
21017    (> a_stocka_186 0)
21018    (> b_stockb_186 0)
21019    (> b_stocka_186 0)
21020    (> c_stockb_186 0)
21021    (> c_stocka_186 0)
21022    (> s_stockb_187 0)
21023    (> s_stocka_187 0)
21024    (> a_stockb_187 0)
21025    (> a_stocka_187 0)
21026    (> b_stockb_187 0)
21027    (> b_stocka_187 0)
21028    (> c_stockb_187 0)
21029    (> c_stocka_187 0)
21030    (> s_stockb_188 0)
21031    (> s_stocka_188 0)
21032    (> a_stockb_188 0)
21033    (> a_stocka_188 0)
21034    (> b_stockb_188 0)
21035    (> b_stocka_188 0)
21036    (> c_stockb_188 0)
21037    (> c_stocka_188 0)
21038    (> s_stockb_189 0)
21039    (> s_stocka_189 0)
21040    (> a_stockb_189 0)
21041    (> a_stocka_189 0)
21042    (> b_stockb_189 0)
21043    (> b_stocka_189 0)
21044    (> c_stockb_189 0)
21045    (> c_stocka_189 0)
21046    (> s_stockb_190 0)
21047    (> s_stocka_190 0)
21048    (> a_stockb_190 0)
21049    (> a_stocka_190 0)
21050    (> b_stockb_190 0)
21051    (> b_stocka_190 0)
21052    (> c_stockb_190 0)
21053    (> c_stocka_190 0)
21054    (> s_stockb_191 0)
21055    (> s_stocka_191 0)
21056    (> a_stockb_191 0)
21057    (> a_stocka_191 0)
21058    (> b_stockb_191 0)
```

```
21059   (> b_stocka_191 0)
21060   (> c_stockb_191 0)
21061   (> c_stocka_191 0)
21062   (> s_stockb_192 0)
21063   (> s_stocka_192 0)
21064   (> a_stockb_192 0)
21065   (> a_stocka_192 0)
21066   (> b_stockb_192 0)
21067   (> b_stocka_192 0)
21068   (> c_stockb_192 0)
21069   (> c_stocka_192 0)
21070   (> s_stockb_193 0)
21071   (> s_stocka_193 0)
21072   (> a_stockb_193 0)
21073   (> a_stocka_193 0)
21074   (> b_stockb_193 0)
21075   (> b_stocka_193 0)
21076   (> c_stockb_193 0)
21077   (> c_stocka_193 0)
21078   (> s_stockb_194 0)
21079   (> s_stocka_194 0)
21080   (> a_stockb_194 0)
21081   (> a_stocka_194 0)
21082   (> b_stockb_194 0)
21083   (> b_stocka_194 0)
21084   (> c_stockb_194 0)
21085   (> c_stocka_194 0)
21086   (> s_stockb_195 0)
21087   (> s_stocka_195 0)
21088   (> a_stockb_195 0)
21089   (> a_stocka_195 0)
21090   (> b_stockb_195 0)
21091   (> b_stocka_195 0)
21092   (> c_stockb_195 0)
21093   (> c_stocka_195 0)
21094   (> s_stockb_196 0)
21095   (> s_stocka_196 0)
21096   (> a_stockb_196 0)
21097   (> a_stocka_196 0)
21098   (> b_stockb_196 0)
21099   (> b_stocka_196 0)
21100   (> c_stockb_196 0)
21101   (> c_stocka_196 0)
21102   (> s_stockb_197 0)
21103   (> s_stocka_197 0)
21104   (> a_stockb_197 0)
21105   (> a_stocka_197 0)
21106   (> b_stockb_197 0)
21107   (> b_stocka_197 0)
21108   (> c_stockb_197 0)
21109   (> c_stocka_197 0)
21110   (> s_stockb_198 0)
21111   (> s_stocka_198 0)
21112   (> a_stockb_198 0)
21113   (> a_stocka_198 0)
21114   (> b_stockb_198 0)
21115   (> b_stocka_198 0)
21116   (> c_stockb_198 0)
21117   (> c_stocka_198 0)
21118   (> s_stockb_199 0)
21119   (> s_stocka_199 0)
21120   (> a_stockb_199 0)
```

```
21121  (> a_stocka_199 0)
21122  (> b_stockb_199 0)
21123  (> b_stocka_199 0)
21124  (> c_stockb_199 0)
21125  (> c_stocka_199 0)
21126  ))
21127  (check-sat)
21128  (get-model)
```

Appendix 3

The generated output for Question 1(a)

```
1   unsat
2   (error "line 21128 column 10: model is not available")
```

Appendix 4

The generated requirements for Question 1(b)

```
 1  (declare-const truck_stock_0 Int)
 2  (declare-const truck_travel_time_0 Int)
 3  (declare-const truck_loc_0 Int)
 4  (declare-const s_stockb_0 Int)
 5  (declare-const s_stocka_0 Int)
 6  (declare-const a_stockb_0 Int)
 7  (declare-const a_stocka_0 Int)
 8  (declare-const b_stockb_0 Int)
 9  (declare-const b_stocka_0 Int)
10  (declare-const c_stockb_0 Int)
11  (declare-const c_stocka_0 Int)
12  (declare-const loopto_0 Bool)
13  (declare-const truck_stock_1 Int)
14  (declare-const truck_travel_time_1 Int)
15  (declare-const truck_loc_1 Int)
16  (declare-const s_stockb_1 Int)
17  (declare-const s_stocka_1 Int)
18  (declare-const a_stockb_1 Int)
19  (declare-const a_stocka_1 Int)
20  (declare-const b_stockb_1 Int)
21  (declare-const b_stocka_1 Int)
22  (declare-const c_stockb_1 Int)
23  (declare-const c_stocka_1 Int)
24  (declare-const loopto_1 Bool)
25  (declare-const truck_stock_2 Int)
26  (declare-const truck_travel_time_2 Int)
27  (declare-const truck_loc_2 Int)
28  (declare-const s_stockb_2 Int)
29  (declare-const s_stocka_2 Int)
30  (declare-const a_stockb_2 Int)
31  (declare-const a_stocka_2 Int)
32  (declare-const b_stockb_2 Int)
33  (declare-const b_stocka_2 Int)
34  (declare-const c_stockb_2 Int)
35  (declare-const c_stocka_2 Int)
36  (declare-const loopto_2 Bool)
37  (declare-const truck_stock_3 Int)
38  (declare-const truck_travel_time_3 Int)
39  (declare-const truck_loc_3 Int)
40  (declare-const s_stockb_3 Int)
```

```
41   (declare-const s_stocka_3 Int)
42   (declare-const a_stockb_3 Int)
43   (declare-const a_stocka_3 Int)
44   (declare-const b_stockb_3 Int)
45   (declare-const b_stocka_3 Int)
46   (declare-const c_stockb_3 Int)
47   (declare-const c_stocka_3 Int)
48   (declare-const loopto_3 Bool)
49   (declare-const truck_stock_4 Int)
50   (declare-const truck_travel_time_4 Int)
51   (declare-const truck_loc_4 Int)
52   (declare-const s_stockb_4 Int)
53   (declare-const s_stocka_4 Int)
54   (declare-const a_stockb_4 Int)
55   (declare-const a_stocka_4 Int)
56   (declare-const b_stockb_4 Int)
57   (declare-const b_stocka_4 Int)
58   (declare-const c_stockb_4 Int)
59   (declare-const c_stocka_4 Int)
60   (declare-const loopto_4 Bool)
61   (declare-const truck_stock_5 Int)
62   (declare-const truck_travel_time_5 Int)
63   (declare-const truck_loc_5 Int)
64   (declare-const s_stockb_5 Int)
65   (declare-const s_stocka_5 Int)
66   (declare-const a_stockb_5 Int)
67   (declare-const a_stocka_5 Int)
68   (declare-const b_stockb_5 Int)
69   (declare-const b_stocka_5 Int)
70   (declare-const c_stockb_5 Int)
71   (declare-const c_stocka_5 Int)
72   (declare-const loopto_5 Bool)
73   (declare-const truck_stock_6 Int)
74   (declare-const truck_travel_time_6 Int)
75   (declare-const truck_loc_6 Int)
76   (declare-const s_stockb_6 Int)
77   (declare-const s_stocka_6 Int)
78   (declare-const a_stockb_6 Int)
79   (declare-const a_stocka_6 Int)
80   (declare-const b_stockb_6 Int)
81   (declare-const b_stocka_6 Int)
82   (declare-const c_stockb_6 Int)
83   (declare-const c_stocka_6 Int)
84   (declare-const loopto_6 Bool)
85   (declare-const truck_stock_7 Int)
86   (declare-const truck_travel_time_7 Int)
87   (declare-const truck_loc_7 Int)
88   (declare-const s_stockb_7 Int)
89   (declare-const s_stocka_7 Int)
90   (declare-const a_stockb_7 Int)
91   (declare-const a_stocka_7 Int)
92   (declare-const b_stockb_7 Int)
93   (declare-const b_stocka_7 Int)
94   (declare-const c_stockb_7 Int)
95   (declare-const c_stocka_7 Int)
96   (declare-const loopto_7 Bool)
97   (declare-const truck_stock_8 Int)
98   (declare-const truck_travel_time_8 Int)
99   (declare-const truck_loc_8 Int)
100  (declare-const s_stockb_8 Int)
101  (declare-const s_stocka_8 Int)
102  (declare-const a_stockb_8 Int)
```

```
103  (declare-const a_stocka_8 Int)
104  (declare-const b_stockb_8 Int)
105  (declare-const b_stocka_8 Int)
106  (declare-const c_stockb_8 Int)
107  (declare-const c_stocka_8 Int)
108  (declare-const loopto_8 Bool)
109  (declare-const truck_stock_9 Int)
110  (declare-const truck_travel_time_9 Int)
111  (declare-const truck_loc_9 Int)
112  (declare-const s_stockb_9 Int)
113  (declare-const s_stocka_9 Int)
114  (declare-const a_stockb_9 Int)
115  (declare-const a_stocka_9 Int)
116  (declare-const b_stockb_9 Int)
117  (declare-const b_stocka_9 Int)
118  (declare-const c_stockb_9 Int)
119  (declare-const c_stocka_9 Int)
120  (declare-const loopto_9 Bool)
121  (assert
122  (and
123  (= truck_stock_0 320)
124  (= truck_travel_time_0 0)
125  (= truck_loc_0 0)
126  (= a_stockb_0 40)
127  (= a_stocka_0 40)
128  (= b_stockb_0 30)
129  (= b_stocka_0 30)
130  (= c_stockb_0 145)
131  (= c_stocka_0 145)
132  (= a_stockb_1 (- a_stocka_0 truck_travel_time_0))
133  (= b_stockb_1 (- b_stocka_0 truck_travel_time_0))
134  (= c_stockb_1 (- c_stocka_0 truck_travel_time_0))
135  (and
136    (=> (= truck_loc_0 0)
137      (and
138        (= a_stocka_1 a_stockb_1)
139        (= b_stocka_1 b_stockb_1)
140        (= c_stocka_1 c_stockb_1)
141        (or
142          (and
143            (= truck_loc_1 1)
144            (= truck_travel_time_1 29)
145          )
146          (and
147            (= truck_loc_1 2)
148            (= truck_travel_time_1 21)
149          )
150        )
151      )
152    )
153    (=> (= truck_loc_0 1)
154      (and
155        (<= a_stocka_1 120)
156        (= (+ truck_stock_1 a_stocka_1) (+ truck_stock_0 a_stockb_1))
157        (= b_stocka_1 b_stockb_1)
158        (= c_stocka_1 c_stockb_1)
159        (or
160          (and
161            (= truck_loc_1 0)
162            (= truck_travel_time_1 29)
163          )
164          (and
```

```
165            (= truck_loc_1 2)
166            (= truck_travel_time_1 17)
167          )
168          (and
169            (= truck_loc_1 3)
170            (= truck_travel_time_1 32)
171          )
172        )
173      )
174    )
175    (=> (= truck_loc_0 2)
176      (and
177        (<= b_stocka_1 120)
178        (= (+ truck_stock_1 b_stocka_1) (+ truck_stock_0 b_stockb_1))
179        (= a_stocka_1 a_stockb_1)
180        (= c_stocka_1 c_stockb_1)
181        (or
182          (and
183            (= truck_loc_1 1)
184            (= truck_travel_time_1 17)
185          )
186          (and
187            (= truck_loc_1 0)
188            (= truck_travel_time_1 21)
189          )
190          (and
191            (= truck_loc_1 3)
192            (= truck_travel_time_1 37)
193          )
194        )
195      )
196    )
197    (=> (= truck_loc_0 3)
198      (and
199        (<= c_stocka_1 200)
200        (= (+ truck_stock_1 c_stocka_1) (+ truck_stock_0 c_stockb_1))
201        (= a_stocka_1 a_stockb_1)
202        (= b_stocka_1 b_stockb_1)
203        (or
204          (and
205            (= truck_loc_1 1)
206            (= truck_travel_time_1 32)
207          )
208          (and
209            (= truck_loc_1 2)
210            (= truck_travel_time_1 37)
211          )
212        )
213      )
214    )
215  )
216  (<= truck_stock_1 320)
217  (>= truck_stock_1 0)
218  (= a_stockb_2 (- a_stocka_1 truck_travel_time_1))
219  (= b_stockb_2 (- b_stocka_1 truck_travel_time_1))
220  (= c_stockb_2 (- c_stocka_1 truck_travel_time_1))
221  (and
222    (=> (= truck_loc_1 0)
223      (and
224        (= a_stocka_2 a_stockb_2)
225        (= b_stocka_2 b_stockb_2)
226        (= c_stocka_2 c_stockb_2)
```

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```
227          (or
228            (and
229              (= truck_loc_2 1)
230              (= truck_travel_time_2 29)
231            )
232            (and
233              (= truck_loc_2 2)
234              (= truck_travel_time_2 21)
235            )
236          )
237        )
238    )
239    (=> (= truck_loc_1 1)
240      (and
241        (<= a_stocka_2 120)
242        (= (+ truck_stock_2 a_stocka_2) (+ truck_stock_1 a_stockb_2))
243        (= b_stocka_2 b_stockb_2)
244        (= c_stocka_2 c_stockb_2)
245        (or
246          (and
247            (= truck_loc_2 0)
248            (= truck_travel_time_2 29)
249          )
250          (and
251            (= truck_loc_2 2)
252            (= truck_travel_time_2 17)
253          )
254          (and
255            (= truck_loc_2 3)
256            (= truck_travel_time_2 32)
257          )
258        )
259      )
260    )
261    (=> (= truck_loc_1 2)
262      (and
263        (<= b_stocka_2 120)
264        (= (+ truck_stock_2 b_stocka_2) (+ truck_stock_1 b_stockb_2))
265        (= a_stocka_2 a_stockb_2)
266        (= c_stocka_2 c_stockb_2)
267        (or
268          (and
269            (= truck_loc_2 1)
270            (= truck_travel_time_2 17)
271          )
272          (and
273            (= truck_loc_2 0)
274            (= truck_travel_time_2 21)
275          )
276          (and
277            (= truck_loc_2 3)
278            (= truck_travel_time_2 37)
279          )
280        )
281      )
282    )
283    (=> (= truck_loc_1 3)
284      (and
285        (<= c_stocka_2 200)
286        (= (+ truck_stock_2 c_stocka_2) (+ truck_stock_1 c_stockb_2))
287        (= a_stocka_2 a_stockb_2)
288        (= b_stocka_2 b_stockb_2)
```

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```
289          (or
290            (and
291              (= truck_loc_2 1)
292              (= truck_travel_time_2 32)
293            )
294            (and
295              (= truck_loc_2 2)
296              (= truck_travel_time_2 37)
297            )
298          )
299        )
300      )
301    )
302    (<= truck_stock_2 320)
303    (>= truck_stock_2 0)
304    (= a_stockb_3 (- a_stocka_2 truck_travel_time_2))
305    (= b_stockb_3 (- b_stocka_2 truck_travel_time_2))
306    (= c_stockb_3 (- c_stocka_2 truck_travel_time_2))
307    (and
308      (=> (= truck_loc_2 0)
309        (and
310          (= a_stocka_3 a_stockb_3)
311          (= b_stocka_3 b_stockb_3)
312          (= c_stocka_3 c_stockb_3)
313          (or
314            (and
315              (= truck_loc_3 1)
316              (= truck_travel_time_3 29)
317            )
318            (and
319              (= truck_loc_3 2)
320              (= truck_travel_time_3 21)
321            )
322          )
323        )
324      )
325      (=> (= truck_loc_2 1)
326        (and
327          (<= a_stocka_3 120)
328          (= (+ truck_stock_3 a_stocka_3) (+ truck_stock_2 a_stockb_3))
329          (= b_stocka_3 b_stockb_3)
330          (= c_stocka_3 c_stockb_3)
331          (or
332            (and
333              (= truck_loc_3 0)
334              (= truck_travel_time_3 29)
335            )
336            (and
337              (= truck_loc_3 2)
338              (= truck_travel_time_3 17)
339            )
340            (and
341              (= truck_loc_3 3)
342              (= truck_travel_time_3 32)
343            )
344          )
345        )
346      )
347      (=> (= truck_loc_2 2)
348        (and
349          (<= b_stocka_3 120)
350          (= (+ truck_stock_3 b_stocka_3) (+ truck_stock_2 b_stockb_3))
```

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```
351        (= a_stocka_3 a_stockb_3)
352        (= c_stocka_3 c_stockb_3)
353        (or
354          (and
355            (= truck_loc_3 1)
356            (= truck_travel_time_3 17)
357          )
358          (and
359            (= truck_loc_3 0)
360            (= truck_travel_time_3 21)
361          )
362          (and
363            (= truck_loc_3 3)
364            (= truck_travel_time_3 37)
365          )
366        )
367      )
368    )
369    (=> (= truck_loc_2 3)
370      (and
371        (<= c_stocka_3 200)
372        (= (+ truck_stock_3 c_stocka_3) (+ truck_stock_2 c_stockb_3))
373        (= a_stocka_3 a_stockb_3)
374        (= b_stocka_3 b_stockb_3)
375        (or
376          (and
377            (= truck_loc_3 1)
378            (= truck_travel_time_3 32)
379          )
380          (and
381            (= truck_loc_3 2)
382            (= truck_travel_time_3 37)
383          )
384        )
385      )
386    )
387  )
388  (<= truck_stock_3 320)
389  (>= truck_stock_3 0)
390  (= a_stockb_4 (- a_stocka_3 truck_travel_time_3))
391  (= b_stockb_4 (- b_stocka_3 truck_travel_time_3))
392  (= c_stockb_4 (- c_stocka_3 truck_travel_time_3))
393  (and
394    (=> (= truck_loc_3 0)
395      (and
396        (= a_stocka_4 a_stockb_4)
397        (= b_stocka_4 b_stockb_4)
398        (= c_stocka_4 c_stockb_4)
399        (or
400          (and
401            (= truck_loc_4 1)
402            (= truck_travel_time_4 29)
403          )
404          (and
405            (= truck_loc_4 2)
406            (= truck_travel_time_4 21)
407          )
408        )
409      )
410    )
411    (=> (= truck_loc_3 1)
412      (and
```

```
413        (<= a_stocka_4 120)
414        (= (+ truck_stock_4 a_stocka_4) (+ truck_stock_3 a_stockb_4))
415        (= b_stocka_4 b_stockb_4)
416        (= c_stocka_4 c_stockb_4)
417        (or
418          (and
419            (= truck_loc_4 0)
420            (= truck_travel_time_4 29)
421          )
422          (and
423            (= truck_loc_4 2)
424            (= truck_travel_time_4 17)
425          )
426          (and
427            (= truck_loc_4 3)
428            (= truck_travel_time_4 32)
429          )
430        )
431      )
432    )
433    (=> (= truck_loc_3 2)
434      (and
435        (<= b_stocka_4 120)
436        (= (+ truck_stock_4 b_stocka_4) (+ truck_stock_3 b_stockb_4))
437        (= a_stocka_4 a_stockb_4)
438        (= c_stocka_4 c_stockb_4)
439        (or
440          (and
441            (= truck_loc_4 1)
442            (= truck_travel_time_4 17)
443          )
444          (and
445            (= truck_loc_4 0)
446            (= truck_travel_time_4 21)
447          )
448          (and
449            (= truck_loc_4 3)
450            (= truck_travel_time_4 37)
451          )
452        )
453      )
454    )
455    (=> (= truck_loc_3 3)
456      (and
457        (<= c_stocka_4 200)
458        (= (+ truck_stock_4 c_stocka_4) (+ truck_stock_3 c_stockb_4))
459        (= a_stocka_4 a_stockb_4)
460        (= b_stocka_4 b_stockb_4)
461        (or
462          (and
463            (= truck_loc_4 1)
464            (= truck_travel_time_4 32)
465          )
466          (and
467            (= truck_loc_4 2)
468            (= truck_travel_time_4 37)
469          )
470        )
471      )
472    )
473  )
474  (<= truck_stock_4 320)
```

```
475  (>= truck_stock_4 0)
476  (= a_stockb_5 (- a_stocka_4 truck_travel_time_4))
477  (= b_stockb_5 (- b_stocka_4 truck_travel_time_4))
478  (= c_stockb_5 (- c_stocka_4 truck_travel_time_4))
479  (and
480    (=> (= truck_loc_4 0)
481      (and
482        (= a_stocka_5 a_stockb_5)
483        (= b_stocka_5 b_stockb_5)
484        (= c_stocka_5 c_stockb_5)
485        (or
486          (and
487            (= truck_loc_5 1)
488            (= truck_travel_time_5 29)
489          )
490          (and
491            (= truck_loc_5 2)
492            (= truck_travel_time_5 21)
493          )
494        )
495      )
496    )
497    (=> (= truck_loc_4 1)
498      (and
499        (<= a_stocka_5 120)
500        (= (+ truck_stock_5 a_stocka_5) (+ truck_stock_4 a_stockb_5))
501        (= b_stocka_5 b_stockb_5)
502        (= c_stocka_5 c_stockb_5)
503        (or
504          (and
505            (= truck_loc_5 0)
506            (= truck_travel_time_5 29)
507          )
508          (and
509            (= truck_loc_5 2)
510            (= truck_travel_time_5 17)
511          )
512          (and
513            (= truck_loc_5 3)
514            (= truck_travel_time_5 32)
515          )
516        )
517      )
518    )
519    (=> (= truck_loc_4 2)
520      (and
521        (<= b_stocka_5 120)
522        (= (+ truck_stock_5 b_stocka_5) (+ truck_stock_4 b_stockb_5))
523        (= a_stocka_5 a_stockb_5)
524        (= c_stocka_5 c_stockb_5)
525        (or
526          (and
527            (= truck_loc_5 1)
528            (= truck_travel_time_5 17)
529          )
530          (and
531            (= truck_loc_5 0)
532            (= truck_travel_time_5 21)
533          )
534          (and
535            (= truck_loc_5 3)
536            (= truck_travel_time_5 37)
```

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```
537            )
538          )
539        )
540      )
541      (=> (= truck_loc_4 3)
542        (and
543          (<= c_stocka_5 200)
544          (= (+ truck_stock_5 c_stocka_5) (+ truck_stock_4 c_stockb_5))
545          (= a_stocka_5 a_stockb_5)
546          (= b_stocka_5 b_stockb_5)
547          (or
548            (and
549              (= truck_loc_5 1)
550              (= truck_travel_time_5 32)
551            )
552            (and
553              (= truck_loc_5 2)
554              (= truck_travel_time_5 37)
555            )
556          )
557        )
558      )
559    )
560    (<= truck_stock_5 320)
561    (>= truck_stock_5 0)
562    (= a_stockb_6 (- a_stocka_5 truck_travel_time_5))
563    (= b_stockb_6 (- b_stocka_5 truck_travel_time_5))
564    (= c_stockb_6 (- c_stocka_5 truck_travel_time_5))
565    (and
566      (=> (= truck_loc_5 0)
567        (and
568          (= a_stocka_6 a_stockb_6)
569          (= b_stocka_6 b_stockb_6)
570          (= c_stocka_6 c_stockb_6)
571          (or
572            (and
573              (= truck_loc_6 1)
574              (= truck_travel_time_6 29)
575            )
576            (and
577              (= truck_loc_6 2)
578              (= truck_travel_time_6 21)
579            )
580          )
581        )
582      )
583      (=> (= truck_loc_5 1)
584        (and
585          (<= a_stocka_6 120)
586          (= (+ truck_stock_6 a_stocka_6) (+ truck_stock_5 a_stockb_6))
587          (= b_stocka_6 b_stockb_6)
588          (= c_stocka_6 c_stockb_6)
589          (or
590            (and
591              (= truck_loc_6 0)
592              (= truck_travel_time_6 29)
593            )
594            (and
595              (= truck_loc_6 2)
596              (= truck_travel_time_6 17)
597            )
598            (and
```

```
599              (= truck_loc_6 3)
600              (= truck_travel_time_6 32)
601            )
602          )
603        )
604      )
605      (=> (= truck_loc_5 2)
606        (and
607          (<= b_stocka_6 120)
608          (= (+ truck_stock_6 b_stocka_6) (+ truck_stock_5 b_stockb_6))
609          (= a_stocka_6 a_stockb_6)
610          (= c_stocka_6 c_stockb_6)
611          (or
612            (and
613              (= truck_loc_6 1)
614              (= truck_travel_time_6 17)
615            )
616            (and
617              (= truck_loc_6 0)
618              (= truck_travel_time_6 21)
619            )
620            (and
621              (= truck_loc_6 3)
622              (= truck_travel_time_6 37)
623            )
624          )
625        )
626      )
627      (=> (= truck_loc_5 3)
628        (and
629          (<= c_stocka_6 200)
630          (= (+ truck_stock_6 c_stocka_6) (+ truck_stock_5 c_stockb_6))
631          (= a_stocka_6 a_stockb_6)
632          (= b_stocka_6 b_stockb_6)
633          (or
634            (and
635              (= truck_loc_6 1)
636              (= truck_travel_time_6 32)
637            )
638            (and
639              (= truck_loc_6 2)
640              (= truck_travel_time_6 37)
641            )
642          )
643        )
644      )
645    )
646    (<= truck_stock_6 320)
647    (>= truck_stock_6 0)
648    (= a_stockb_7 (- a_stocka_6 truck_travel_time_6))
649    (= b_stockb_7 (- b_stocka_6 truck_travel_time_6))
650    (= c_stockb_7 (- c_stocka_6 truck_travel_time_6))
651    (and
652      (=> (= truck_loc_6 0)
653        (and
654          (= a_stocka_7 a_stockb_7)
655          (= b_stocka_7 b_stockb_7)
656          (= c_stocka_7 c_stockb_7)
657          (or
658            (and
659              (= truck_loc_7 1)
660              (= truck_travel_time_7 29)
```

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```
661              )
662            (and
663              (= truck_loc_7 2)
664              (= truck_travel_time_7 21)
665            )
666          )
667        )
668      )
669      (=> (= truck_loc_6 1)
670        (and
671          (<= a_stocka_7 120)
672          (= (+ truck_stock_7 a_stocka_7) (+ truck_stock_6 a_stockb_7))
673          (= b_stocka_7 b_stockb_7)
674          (= c_stocka_7 c_stockb_7)
675          (or
676            (and
677              (= truck_loc_7 0)
678              (= truck_travel_time_7 29)
679            )
680            (and
681              (= truck_loc_7 2)
682              (= truck_travel_time_7 17)
683            )
684            (and
685              (= truck_loc_7 3)
686              (= truck_travel_time_7 32)
687            )
688          )
689        )
690      )
691      (=> (= truck_loc_6 2)
692        (and
693          (<= b_stocka_7 120)
694          (= (+ truck_stock_7 b_stocka_7) (+ truck_stock_6 b_stockb_7))
695          (= a_stocka_7 a_stockb_7)
696          (= c_stocka_7 c_stockb_7)
697          (or
698            (and
699              (= truck_loc_7 1)
700              (= truck_travel_time_7 17)
701            )
702            (and
703              (= truck_loc_7 0)
704              (= truck_travel_time_7 21)
705            )
706            (and
707              (= truck_loc_7 3)
708              (= truck_travel_time_7 37)
709            )
710          )
711        )
712      )
713      (=> (= truck_loc_6 3)
714        (and
715          (<= c_stocka_7 200)
716          (= (+ truck_stock_7 c_stocka_7) (+ truck_stock_6 c_stockb_7))
717          (= a_stocka_7 a_stockb_7)
718          (= b_stocka_7 b_stockb_7)
719          (or
720            (and
721              (= truck_loc_7 1)
722              (= truck_travel_time_7 32)
```

```
723          )
724              (and
725                (= truck_loc_7 2)
726                (= truck_travel_time_7 37)
727              )
728            )
729          )
730        )
731    )
732    (<= truck_stock_7 320)
733    (>= truck_stock_7 0)
734    (= a_stockb_8 (- a_stocka_7 truck_travel_time_7))
735    (= b_stockb_8 (- b_stocka_7 truck_travel_time_7))
736    (= c_stockb_8 (- c_stocka_7 truck_travel_time_7))
737    (and
738      (=> (= truck_loc_7 0)
739        (and
740          (= a_stocka_8 a_stockb_8)
741          (= b_stocka_8 b_stockb_8)
742          (= c_stocka_8 c_stockb_8)
743          (or
744            (and
745              (= truck_loc_8 1)
746              (= truck_travel_time_8 29)
747            )
748            (and
749              (= truck_loc_8 2)
750              (= truck_travel_time_8 21)
751            )
752          )
753        )
754      )
755      (=> (= truck_loc_7 1)
756        (and
757          (<= a_stocka_8 120)
758          (= (+ truck_stock_8 a_stocka_8) (+ truck_stock_7 a_stockb_8))
759          (= b_stocka_8 b_stockb_8)
760          (= c_stocka_8 c_stockb_8)
761          (or
762            (and
763              (= truck_loc_8 0)
764              (= truck_travel_time_8 29)
765            )
766            (and
767              (= truck_loc_8 2)
768              (= truck_travel_time_8 17)
769            )
770            (and
771              (= truck_loc_8 3)
772              (= truck_travel_time_8 32)
773            )
774          )
775        )
776      )
777      (=> (= truck_loc_7 2)
778        (and
779          (<= b_stocka_8 120)
780          (= (+ truck_stock_8 b_stocka_8) (+ truck_stock_7 b_stockb_8))
781          (= a_stocka_8 a_stockb_8)
782          (= c_stocka_8 c_stockb_8)
783          (or
784            (and
```

```
785            (= truck_loc_8 1)
786            (= truck_travel_time_8 17)
787          )
788          (and
789            (= truck_loc_8 0)
790            (= truck_travel_time_8 21)
791          )
792          (and
793            (= truck_loc_8 3)
794            (= truck_travel_time_8 37)
795          )
796        )
797      )
798    )
799    (=> (= truck_loc_7 3)
800      (and
801        (<= c_stocka_8 200)
802        (= (+ truck_stock_8 c_stocka_8) (+ truck_stock_7 c_stockb_8))
803        (= a_stocka_8 a_stockb_8)
804        (= b_stocka_8 b_stockb_8)
805        (or
806          (and
807            (= truck_loc_8 1)
808            (= truck_travel_time_8 32)
809          )
810          (and
811            (= truck_loc_8 2)
812            (= truck_travel_time_8 37)
813          )
814        )
815      )
816    )
817  )
818  (<= truck_stock_8 320)
819  (>= truck_stock_8 0)
820  (= a_stockb_9 (- a_stocka_8 truck_travel_time_8))
821  (= b_stockb_9 (- b_stocka_8 truck_travel_time_8))
822  (= c_stockb_9 (- c_stocka_8 truck_travel_time_8))
823  (and
824    (=> (= truck_loc_8 0)
825      (and
826        (= a_stocka_9 a_stockb_9)
827        (= b_stocka_9 b_stockb_9)
828        (= c_stocka_9 c_stockb_9)
829        (or
830          (and
831            (= truck_loc_9 1)
832            (= truck_travel_time_9 29)
833          )
834          (and
835            (= truck_loc_9 2)
836            (= truck_travel_time_9 21)
837          )
838        )
839      )
840    )
841    (=> (= truck_loc_8 1)
842      (and
843        (<= a_stocka_9 120)
844        (= (+ truck_stock_9 a_stocka_9) (+ truck_stock_8 a_stockb_9))
845        (= b_stocka_9 b_stockb_9)
846        (= c_stocka_9 c_stockb_9)
```

```
847        (or
848          (and
849            (= truck_loc_9 0)
850            (= truck_travel_time_9 29)
851          )
852          (and
853            (= truck_loc_9 2)
854            (= truck_travel_time_9 17)
855          )
856          (and
857            (= truck_loc_9 3)
858            (= truck_travel_time_9 32)
859          )
860        )
861      )
862    )
863    (=> (= truck_loc_8 2)
864      (and
865        (<= b_stocka_9 120)
866        (= (+ truck_stock_9 b_stocka_9) (+ truck_stock_8 b_stockb_9))
867        (= a_stocka_9 a_stockb_9)
868        (= c_stocka_9 c_stockb_9)
869        (or
870          (and
871            (= truck_loc_9 1)
872            (= truck_travel_time_9 17)
873          )
874          (and
875            (= truck_loc_9 0)
876            (= truck_travel_time_9 21)
877          )
878          (and
879            (= truck_loc_9 3)
880            (= truck_travel_time_9 37)
881          )
882        )
883      )
884    )
885    (=> (= truck_loc_8 3)
886      (and
887        (<= c_stocka_9 200)
888        (= (+ truck_stock_9 c_stocka_9) (+ truck_stock_8 c_stockb_9))
889        (= a_stocka_9 a_stockb_9)
890        (= b_stocka_9 b_stockb_9)
891        (or
892          (and
893            (= truck_loc_9 1)
894            (= truck_travel_time_9 32)
895          )
896          (and
897            (= truck_loc_9 2)
898            (= truck_travel_time_9 37)
899          )
900        )
901      )
902    )
903  )
904  (<= truck_stock_9 320)
905  (>= truck_stock_9 0)
906  (> s_stockb_0 0)
907  (> s_stocka_0 0)
908  (> a_stockb_0 0)
```

```
909    (> a_stocka_0 0)
910    (> b_stockb_0 0)
911    (> b_stocka_0 0)
912    (> c_stockb_0 0)
913    (> c_stocka_0 0)
914    (> s_stockb_1 0)
915    (> s_stocka_1 0)
916    (> a_stockb_1 0)
917    (> a_stocka_1 0)
918    (> b_stockb_1 0)
919    (> b_stocka_1 0)
920    (> c_stockb_1 0)
921    (> c_stocka_1 0)
922    (> s_stockb_2 0)
923    (> s_stocka_2 0)
924    (> a_stockb_2 0)
925    (> a_stocka_2 0)
926    (> b_stockb_2 0)
927    (> b_stocka_2 0)
928    (> c_stockb_2 0)
929    (> c_stocka_2 0)
930    (> s_stockb_3 0)
931    (> s_stocka_3 0)
932    (> a_stockb_3 0)
933    (> a_stocka_3 0)
934    (> b_stockb_3 0)
935    (> b_stocka_3 0)
936    (> c_stockb_3 0)
937    (> c_stocka_3 0)
938    (> s_stockb_4 0)
939    (> s_stocka_4 0)
940    (> a_stockb_4 0)
941    (> a_stocka_4 0)
942    (> b_stockb_4 0)
943    (> b_stocka_4 0)
944    (> c_stockb_4 0)
945    (> c_stocka_4 0)
946    (> s_stockb_5 0)
947    (> s_stocka_5 0)
948    (> a_stockb_5 0)
949    (> a_stocka_5 0)
950    (> b_stockb_5 0)
951    (> b_stocka_5 0)
952    (> c_stockb_5 0)
953    (> c_stocka_5 0)
954    (> s_stockb_6 0)
955    (> s_stocka_6 0)
956    (> a_stockb_6 0)
957    (> a_stocka_6 0)
958    (> b_stockb_6 0)
959    (> b_stocka_6 0)
960    (> c_stockb_6 0)
961    (> c_stocka_6 0)
962    (> s_stockb_7 0)
963    (> s_stocka_7 0)
964    (> a_stockb_7 0)
965    (> a_stocka_7 0)
966    (> b_stockb_7 0)
967    (> b_stocka_7 0)
968    (> c_stockb_7 0)
969    (> c_stocka_7 0)
970    (> s_stockb_8 0)
```

```
971   (> s_stocka_8 0)
972   (> a_stockb_8 0)
973   (> a_stocka_8 0)
974   (> b_stockb_8 0)
975   (> b_stocka_8 0)
976   (> c_stockb_8 0)
977   (> c_stocka_8 0)
978   (> s_stockb_9 0)
979   (> s_stocka_9 0)
980   (> a_stockb_9 0)
981   (> a_stocka_9 0)
982   (> b_stockb_9 0)
983   (> b_stocka_9 0)
984   (> c_stockb_9 0)
985   (> c_stocka_9 0)
986   (iff loopto_0
987     (and
988       (= truck_loc_0 truck_loc_9)
989       (= truck_stock_0 truck_stock_9)
990       (= a_stocka_0 a_stocka_9)
991       (= b_stocka_0 b_stocka_9)
992       (= c_stocka_0 c_stocka_9)
993     )
994   )
995   (iff loopto_1
996     (and
997       (= truck_loc_1 truck_loc_9)
998       (= truck_stock_1 truck_stock_9)
999       (= a_stocka_1 a_stocka_9)
1000      (= b_stocka_1 b_stocka_9)
1001      (= c_stocka_1 c_stocka_9)
1002    )
1003  )
1004  (iff loopto_2
1005    (and
1006      (= truck_loc_2 truck_loc_9)
1007      (= truck_stock_2 truck_stock_9)
1008      (= a_stocka_2 a_stocka_9)
1009      (= b_stocka_2 b_stocka_9)
1010      (= c_stocka_2 c_stocka_9)
1011    )
1012  )
1013  (iff loopto_3
1014    (and
1015      (= truck_loc_3 truck_loc_9)
1016      (= truck_stock_3 truck_stock_9)
1017      (= a_stocka_3 a_stocka_9)
1018      (= b_stocka_3 b_stocka_9)
1019      (= c_stocka_3 c_stocka_9)
1020    )
1021  )
1022  (iff loopto_4
1023    (and
1024      (= truck_loc_4 truck_loc_9)
1025      (= truck_stock_4 truck_stock_9)
1026      (= a_stocka_4 a_stocka_9)
1027      (= b_stocka_4 b_stocka_9)
1028      (= c_stocka_4 c_stocka_9)
1029    )
1030  )
1031  (iff loopto_5
1032    (and
```

```
1033      (= truck_loc_5 truck_loc_9)
1034      (= truck_stock_5 truck_stock_9)
1035      (= a_stocka_5 a_stocka_9)
1036      (= b_stocka_5 b_stocka_9)
1037      (= c_stocka_5 c_stocka_9)
1038    )
1039  )
1040  (iff loopto_6
1041    (and
1042      (= truck_loc_6 truck_loc_9)
1043      (= truck_stock_6 truck_stock_9)
1044      (= a_stocka_6 a_stocka_9)
1045      (= b_stocka_6 b_stocka_9)
1046      (= c_stocka_6 c_stocka_9)
1047    )
1048  )
1049  (iff loopto_7
1050    (and
1051      (= truck_loc_7 truck_loc_9)
1052      (= truck_stock_7 truck_stock_9)
1053      (= a_stocka_7 a_stocka_9)
1054      (= b_stocka_7 b_stocka_9)
1055      (= c_stocka_7 c_stocka_9)
1056    )
1057  )
1058  (iff loopto_8
1059    (and
1060      (= truck_loc_8 truck_loc_9)
1061      (= truck_stock_8 truck_stock_9)
1062      (= a_stocka_8 a_stocka_9)
1063      (= b_stocka_8 b_stocka_9)
1064      (= c_stocka_8 c_stocka_9)
1065    )
1066  )
1067  (or
1068    loopto_0
1069    loopto_1
1070    loopto_2
1071    loopto_3
1072    loopto_4
1073    loopto_5
1074    loopto_6
1075    loopto_7
1076    loopto_8
1077  )
1078  ))
1079  (check-sat)
1080  (get-model)
```

Appendix 5

The generated output for Question 1(b)

```
1   sat
2   (model
3     (define-fun b_stocka_7 () Int
4       38)
5     (define-fun truck_loc_9 () Int
6       1)
7     (define-fun truck_travel_time_4 () Int
8       21)
9     (define-fun a_stocka_4 () Int
10      103)
11    (define-fun a_stocka_2 () Int
12      19)
13    (define-fun c_stocka_9 () Int
14      124)
15    (define-fun truck_travel_time_9 () Int
16      29)
17    (define-fun c_stocka_3 () Int
18      107)
19    (define-fun truck_travel_time_3 () Int
20      17)
21    (define-fun truck_travel_time_5 () Int
22      29)
23    (define-fun truck_loc_6 () Int
24      3)
25    (define-fun truck_loc_7 () Int
26      2)
27    (define-fun c_stocka_6 () Int
28      40)
29    (define-fun truck_loc_1 () Int
30      2)
31    (define-fun truck_loc_4 () Int
32      0)
33    (define-fun c_stocka_2 () Int
34      124)
35    (define-fun truck_travel_time_6 () Int
36      32)
37    (define-fun truck_loc_5 () Int
38      1)
39    (define-fun truck_stock_6 () Int
40      264)
```

```
41      (define-fun b_stocka_8 () Int
42        91)
43      (define-fun truck_stock_1 () Int
44        320)
45      (define-fun b_stocka_5 () Int
46        99)
47      (define-fun b_stocka_6 () Int
48        70)
49      (define-fun truck_stock_7 () Int
50        90)
51      (define-fun c_stocka_4 () Int
52        90)
53      (define-fun truck_travel_time_7 () Int
54        37)
55      (define-fun truck_stock_2 () Int
56        259)
57      (define-fun truck_stock_4 () Int
58        57)
59      (define-fun truck_travel_time_1 () Int
60        21)
61      (define-fun b_stocka_4 () Int
62        120)
63      (define-fun truck_stock_3 () Int
64        141)
65      (define-fun truck_stock_9 () Int
66        259)
67      (define-fun truck_loc_2 () Int
68        1)
69      (define-fun c_stocka_5 () Int
70        69)
71      (define-fun truck_stock_8 () Int
72        0)
73      (define-fun a_stocka_3 () Int
74        120)
75      (define-fun truck_loc_3 () Int
76        2)
77      (define-fun c_stocka_8 () Int
78        145)
79      (define-fun b_stocka_2 () Int
80        70)
81      (define-fun c_stocka_7 () Int
82        182)
83      (define-fun truck_travel_time_2 () Int
84        17)
85      (define-fun b_stocka_3 () Int
86        53)
87      (define-fun a_stocka_9 () Int
88        19)
89      (define-fun a_stocka_5 () Int
90        82)
91      (define-fun truck_travel_time_8 () Int
92        21)
93      (define-fun truck_stock_5 () Int
94        320)
95      (define-fun b_stocka_9 () Int
96        70)
97      (define-fun a_stocka_7 () Int
98        77)
99      (define-fun truck_loc_8 () Int
100       0)
101     (define-fun a_stocka_8 () Int
102       40)
```

```
103    (define-fun a_stocka_6 () Int
104      109)
105    (define-fun s_stocka_9 () Int
106      1)
107    (define-fun s_stockb_9 () Int
108      1)
109    (define-fun s_stocka_8 () Int
110      1)
111    (define-fun s_stockb_8 () Int
112      1)
113    (define-fun s_stocka_7 () Int
114      1)
115    (define-fun s_stockb_7 () Int
116      1)
117    (define-fun s_stocka_6 () Int
118      1)
119    (define-fun s_stockb_6 () Int
120      1)
121    (define-fun s_stocka_5 () Int
122      1)
123    (define-fun s_stockb_5 () Int
124      1)
125    (define-fun s_stocka_4 () Int
126      1)
127    (define-fun s_stockb_4 () Int
128      1)
129    (define-fun s_stocka_3 () Int
130      1)
131    (define-fun s_stockb_3 () Int
132      1)
133    (define-fun s_stocka_2 () Int
134      1)
135    (define-fun s_stockb_2 () Int
136      1)
137    (define-fun s_stocka_1 () Int
138      1)
139    (define-fun s_stockb_1 () Int
140      1)
141    (define-fun s_stocka_0 () Int
142      1)
143    (define-fun s_stockb_0 () Int
144      1)
145    (define-fun c_stocka_1 () Int
146      145)
147    (define-fun b_stocka_1 () Int
148      30)
149    (define-fun loopto_8 () Bool
150      false)
151    (define-fun loopto_7 () Bool
152      false)
153    (define-fun loopto_6 () Bool
154      false)
155    (define-fun loopto_5 () Bool
156      false)
157    (define-fun loopto_4 () Bool
158      false)
159    (define-fun loopto_3 () Bool
160      false)
161    (define-fun loopto_2 () Bool
162      true)
163    (define-fun loopto_1 () Bool
164      false)
```

```
165    (define-fun loopto_0 () Bool
166      false)
167    (define-fun c_stockb_9 () Int
168      124)
169    (define-fun b_stockb_9 () Int
170      70)
171    (define-fun a_stockb_9 () Int
172      19)
173    (define-fun c_stockb_8 () Int
174      145)
175    (define-fun b_stockb_8 () Int
176      1)
177    (define-fun a_stockb_8 () Int
178      40)
179    (define-fun c_stockb_7 () Int
180      8)
181    (define-fun b_stockb_7 () Int
182      38)
183    (define-fun a_stockb_7 () Int
184      77)
185    (define-fun c_stockb_6 () Int
186      40)
187    (define-fun b_stockb_6 () Int
188      70)
189    (define-fun a_stockb_6 () Int
190      53)
191    (define-fun c_stockb_5 () Int
192      69)
193    (define-fun b_stockb_5 () Int
194      99)
195    (define-fun a_stockb_5 () Int
196      82)
197    (define-fun c_stockb_4 () Int
198      90)
199    (define-fun b_stockb_4 () Int
200      36)
201    (define-fun a_stockb_4 () Int
202      103)
203    (define-fun c_stockb_3 () Int
204      107)
205    (define-fun b_stockb_3 () Int
206      53)
207    (define-fun a_stockb_3 () Int
208      2)
209    (define-fun c_stockb_2 () Int
210      124)
211    (define-fun b_stockb_2 () Int
212      9)
213    (define-fun a_stockb_2 () Int
214      19)
215    (define-fun a_stocka_1 () Int
216      40)
217    (define-fun c_stockb_1 () Int
218      145)
219    (define-fun b_stockb_1 () Int
220      30)
221    (define-fun a_stockb_1 () Int
222      40)
223    (define-fun c_stocka_0 () Int
224      145)
225    (define-fun c_stockb_0 () Int
226      145)
```

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```
227    (define-fun b_stocka_0 () Int
228      30)
229    (define-fun b_stockb_0 () Int
230      30)
231    (define-fun a_stocka_0 () Int
232      40)
233    (define-fun a_stockb_0 () Int
234      40)
235    (define-fun truck_loc_0 () Int
236      0)
237    (define-fun truck_travel_time_0 () Int
238      0)
239    (define-fun truck_stock_0 () Int
240      320)
241  )
```

Appendix 6

The generated output, filtering only the loops, for Question 1(b)

```
1    (define-fun loopto_8 () Bool
2      false)
3    (define-fun loopto_7 () Bool
4      false)
5    (define-fun loopto_6 () Bool
6      false)
7    (define-fun loopto_5 () Bool
8      false)
9    (define-fun loopto_4 () Bool
10     false)
11   (define-fun loopto_3 () Bool
12     false)
13   (define-fun loopto_2 () Bool
14     true)
15   (define-fun loopto_1 () Bool
16     false)
17   (define-fun loopto_0 () Bool
18     false)
```

Appendix 7

The generated output, filtering only the truck's location, for Question 1(b)

```
1    (define-fun truck_loc_9 () Int
2       1)
3  --
4    (define-fun truck_loc_6 () Int
5       3)
6    (define-fun truck_loc_7 () Int
7       2)
8  --
9    (define-fun truck_loc_1 () Int
10      2)
11   (define-fun truck_loc_4 () Int
12      0)
13 --
14   (define-fun truck_loc_5 () Int
15      1)
16 --
17   (define-fun truck_loc_2 () Int
18      1)
19 --
20   (define-fun truck_loc_3 () Int
21      2)
22 --
23   (define-fun truck_loc_8 () Int
24      0)
25 --
26   (define-fun truck_loc_0 () Int
27      0)
```

Appendix 8

The generated constraints for Question 1(c)

```
1   (declare-const truck_stock_0 Int)
2   (declare-const truck_travel_time_0 Int)
3   (declare-const truck_loc_0 Int)
4   (declare-const s_stockb_0 Int)
5   (declare-const s_stocka_0 Int)
6   (declare-const a_stockb_0 Int)
7   (declare-const a_stocka_0 Int)
8   (declare-const b_stockb_0 Int)
9   (declare-const b_stocka_0 Int)
10  (declare-const c_stockb_0 Int)
11  (declare-const c_stocka_0 Int)
12  (declare-const loopto_0 Bool)
13  (declare-const truck_stock_1 Int)
14  (declare-const truck_travel_time_1 Int)
15  (declare-const truck_loc_1 Int)
16  (declare-const s_stockb_1 Int)
17  (declare-const s_stocka_1 Int)
18  (declare-const a_stockb_1 Int)
19  (declare-const a_stocka_1 Int)
20  (declare-const b_stockb_1 Int)
21  (declare-const b_stocka_1 Int)
22  (declare-const c_stockb_1 Int)
23  (declare-const c_stocka_1 Int)
24  (declare-const loopto_1 Bool)
25  (declare-const truck_stock_2 Int)
26  (declare-const truck_travel_time_2 Int)
27  (declare-const truck_loc_2 Int)
28  (declare-const s_stockb_2 Int)
29  (declare-const s_stocka_2 Int)
30  (declare-const a_stockb_2 Int)
31  (declare-const a_stocka_2 Int)
32  (declare-const b_stockb_2 Int)
33  (declare-const b_stocka_2 Int)
34  (declare-const c_stockb_2 Int)
35  (declare-const c_stocka_2 Int)
36  (declare-const loopto_2 Bool)
37  (declare-const truck_stock_3 Int)
38  (declare-const truck_travel_time_3 Int)
39  (declare-const truck_loc_3 Int)
40  (declare-const s_stockb_3 Int)
```

```
41   (declare-const s_stocka_3 Int)
42   (declare-const a_stockb_3 Int)
43   (declare-const a_stocka_3 Int)
44   (declare-const b_stockb_3 Int)
45   (declare-const b_stocka_3 Int)
46   (declare-const c_stockb_3 Int)
47   (declare-const c_stocka_3 Int)
48   (declare-const loopto_3 Bool)
49   (declare-const truck_stock_4 Int)
50   (declare-const truck_travel_time_4 Int)
51   (declare-const truck_loc_4 Int)
52   (declare-const s_stockb_4 Int)
53   (declare-const s_stocka_4 Int)
54   (declare-const a_stockb_4 Int)
55   (declare-const a_stocka_4 Int)
56   (declare-const b_stockb_4 Int)
57   (declare-const b_stocka_4 Int)
58   (declare-const c_stockb_4 Int)
59   (declare-const c_stocka_4 Int)
60   (declare-const loopto_4 Bool)
61   (declare-const truck_stock_5 Int)
62   (declare-const truck_travel_time_5 Int)
63   (declare-const truck_loc_5 Int)
64   (declare-const s_stockb_5 Int)
65   (declare-const s_stocka_5 Int)
66   (declare-const a_stockb_5 Int)
67   (declare-const a_stocka_5 Int)
68   (declare-const b_stockb_5 Int)
69   (declare-const b_stocka_5 Int)
70   (declare-const c_stockb_5 Int)
71   (declare-const c_stocka_5 Int)
72   (declare-const loopto_5 Bool)
73   (declare-const truck_stock_6 Int)
74   (declare-const truck_travel_time_6 Int)
75   (declare-const truck_loc_6 Int)
76   (declare-const s_stockb_6 Int)
77   (declare-const s_stocka_6 Int)
78   (declare-const a_stockb_6 Int)
79   (declare-const a_stocka_6 Int)
80   (declare-const b_stockb_6 Int)
81   (declare-const b_stocka_6 Int)
82   (declare-const c_stockb_6 Int)
83   (declare-const c_stocka_6 Int)
84   (declare-const loopto_6 Bool)
85   (declare-const truck_stock_7 Int)
86   (declare-const truck_travel_time_7 Int)
87   (declare-const truck_loc_7 Int)
88   (declare-const s_stockb_7 Int)
89   (declare-const s_stocka_7 Int)
90   (declare-const a_stockb_7 Int)
91   (declare-const a_stocka_7 Int)
92   (declare-const b_stockb_7 Int)
93   (declare-const b_stocka_7 Int)
94   (declare-const c_stockb_7 Int)
95   (declare-const c_stocka_7 Int)
96   (declare-const loopto_7 Bool)
97   (declare-const truck_stock_8 Int)
98   (declare-const truck_travel_time_8 Int)
99   (declare-const truck_loc_8 Int)
100  (declare-const s_stockb_8 Int)
101  (declare-const s_stocka_8 Int)
102  (declare-const a_stockb_8 Int)
```

```
103  (declare-const a_stocka_8 Int)
104  (declare-const b_stockb_8 Int)
105  (declare-const b_stocka_8 Int)
106  (declare-const c_stockb_8 Int)
107  (declare-const c_stocka_8 Int)
108  (declare-const loopto_8 Bool)
109  (declare-const truck_stock_9 Int)
110  (declare-const truck_travel_time_9 Int)
111  (declare-const truck_loc_9 Int)
112  (declare-const s_stockb_9 Int)
113  (declare-const s_stocka_9 Int)
114  (declare-const a_stockb_9 Int)
115  (declare-const a_stocka_9 Int)
116  (declare-const b_stockb_9 Int)
117  (declare-const b_stocka_9 Int)
118  (declare-const c_stockb_9 Int)
119  (declare-const c_stocka_9 Int)
120  (declare-const loopto_9 Bool)
121  (declare-const truck_stock_10 Int)
122  (declare-const truck_travel_time_10 Int)
123  (declare-const truck_loc_10 Int)
124  (declare-const s_stockb_10 Int)
125  (declare-const s_stocka_10 Int)
126  (declare-const a_stockb_10 Int)
127  (declare-const a_stocka_10 Int)
128  (declare-const b_stockb_10 Int)
129  (declare-const b_stocka_10 Int)
130  (declare-const c_stockb_10 Int)
131  (declare-const c_stocka_10 Int)
132  (declare-const loopto_10 Bool)
133  (declare-const truck_stock_11 Int)
134  (declare-const truck_travel_time_11 Int)
135  (declare-const truck_loc_11 Int)
136  (declare-const s_stockb_11 Int)
137  (declare-const s_stocka_11 Int)
138  (declare-const a_stockb_11 Int)
139  (declare-const a_stocka_11 Int)
140  (declare-const b_stockb_11 Int)
141  (declare-const b_stocka_11 Int)
142  (declare-const c_stockb_11 Int)
143  (declare-const c_stocka_11 Int)
144  (declare-const loopto_11 Bool)
145  (declare-const truck_stock_12 Int)
146  (declare-const truck_travel_time_12 Int)
147  (declare-const truck_loc_12 Int)
148  (declare-const s_stockb_12 Int)
149  (declare-const s_stocka_12 Int)
150  (declare-const a_stockb_12 Int)
151  (declare-const a_stocka_12 Int)
152  (declare-const b_stockb_12 Int)
153  (declare-const b_stocka_12 Int)
154  (declare-const c_stockb_12 Int)
155  (declare-const c_stocka_12 Int)
156  (declare-const loopto_12 Bool)
157  (declare-const truck_stock_13 Int)
158  (declare-const truck_travel_time_13 Int)
159  (declare-const truck_loc_13 Int)
160  (declare-const s_stockb_13 Int)
161  (declare-const s_stocka_13 Int)
162  (declare-const a_stockb_13 Int)
163  (declare-const a_stocka_13 Int)
164  (declare-const b_stockb_13 Int)
```

```
165  (declare-const b_stocka_13 Int)
166  (declare-const c_stockb_13 Int)
167  (declare-const c_stocka_13 Int)
168  (declare-const loopto_13 Bool)
169  (declare-const truck_stock_14 Int)
170  (declare-const truck_travel_time_14 Int)
171  (declare-const truck_loc_14 Int)
172  (declare-const s_stockb_14 Int)
173  (declare-const s_stocka_14 Int)
174  (declare-const a_stockb_14 Int)
175  (declare-const a_stocka_14 Int)
176  (declare-const b_stockb_14 Int)
177  (declare-const b_stocka_14 Int)
178  (declare-const c_stockb_14 Int)
179  (declare-const c_stocka_14 Int)
180  (declare-const loopto_14 Bool)
181  (declare-const truck_stock_15 Int)
182  (declare-const truck_travel_time_15 Int)
183  (declare-const truck_loc_15 Int)
184  (declare-const s_stockb_15 Int)
185  (declare-const s_stocka_15 Int)
186  (declare-const a_stockb_15 Int)
187  (declare-const a_stocka_15 Int)
188  (declare-const b_stockb_15 Int)
189  (declare-const b_stocka_15 Int)
190  (declare-const c_stockb_15 Int)
191  (declare-const c_stocka_15 Int)
192  (declare-const loopto_15 Bool)
193  (declare-const truck_stock_16 Int)
194  (declare-const truck_travel_time_16 Int)
195  (declare-const truck_loc_16 Int)
196  (declare-const s_stockb_16 Int)
197  (declare-const s_stocka_16 Int)
198  (declare-const a_stockb_16 Int)
199  (declare-const a_stocka_16 Int)
200  (declare-const b_stockb_16 Int)
201  (declare-const b_stocka_16 Int)
202  (declare-const c_stockb_16 Int)
203  (declare-const c_stocka_16 Int)
204  (declare-const loopto_16 Bool)
205  (declare-const truck_stock_17 Int)
206  (declare-const truck_travel_time_17 Int)
207  (declare-const truck_loc_17 Int)
208  (declare-const s_stockb_17 Int)
209  (declare-const s_stocka_17 Int)
210  (declare-const a_stockb_17 Int)
211  (declare-const a_stocka_17 Int)
212  (declare-const b_stockb_17 Int)
213  (declare-const b_stocka_17 Int)
214  (declare-const c_stockb_17 Int)
215  (declare-const c_stocka_17 Int)
216  (declare-const loopto_17 Bool)
217  (declare-const truck_stock_18 Int)
218  (declare-const truck_travel_time_18 Int)
219  (declare-const truck_loc_18 Int)
220  (declare-const s_stockb_18 Int)
221  (declare-const s_stocka_18 Int)
222  (declare-const a_stockb_18 Int)
223  (declare-const a_stocka_18 Int)
224  (declare-const b_stockb_18 Int)
225  (declare-const b_stocka_18 Int)
226  (declare-const c_stockb_18 Int)
```

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```
227   (declare-const c_stocka_18 Int)
228   (declare-const loopto_18 Bool)
229   (declare-const truck_stock_19 Int)
230   (declare-const truck_travel_time_19 Int)
231   (declare-const truck_loc_19 Int)
232   (declare-const s_stockb_19 Int)
233   (declare-const s_stocka_19 Int)
234   (declare-const a_stockb_19 Int)
235   (declare-const a_stocka_19 Int)
236   (declare-const b_stockb_19 Int)
237   (declare-const b_stocka_19 Int)
238   (declare-const c_stockb_19 Int)
239   (declare-const c_stocka_19 Int)
240   (declare-const loopto_19 Bool)
241   (declare-const truck_stock_20 Int)
242   (declare-const truck_travel_time_20 Int)
243   (declare-const truck_loc_20 Int)
244   (declare-const s_stockb_20 Int)
245   (declare-const s_stocka_20 Int)
246   (declare-const a_stockb_20 Int)
247   (declare-const a_stocka_20 Int)
248   (declare-const b_stockb_20 Int)
249   (declare-const b_stocka_20 Int)
250   (declare-const c_stockb_20 Int)
251   (declare-const c_stocka_20 Int)
252   (declare-const loopto_20 Bool)
253   (declare-const truck_stock_21 Int)
254   (declare-const truck_travel_time_21 Int)
255   (declare-const truck_loc_21 Int)
256   (declare-const s_stockb_21 Int)
257   (declare-const s_stocka_21 Int)
258   (declare-const a_stockb_21 Int)
259   (declare-const a_stocka_21 Int)
260   (declare-const b_stockb_21 Int)
261   (declare-const b_stocka_21 Int)
262   (declare-const c_stockb_21 Int)
263   (declare-const c_stocka_21 Int)
264   (declare-const loopto_21 Bool)
265   (declare-const truck_stock_22 Int)
266   (declare-const truck_travel_time_22 Int)
267   (declare-const truck_loc_22 Int)
268   (declare-const s_stockb_22 Int)
269   (declare-const s_stocka_22 Int)
270   (declare-const a_stockb_22 Int)
271   (declare-const a_stocka_22 Int)
272   (declare-const b_stockb_22 Int)
273   (declare-const b_stocka_22 Int)
274   (declare-const c_stockb_22 Int)
275   (declare-const c_stocka_22 Int)
276   (declare-const loopto_22 Bool)
277   (declare-const truck_stock_23 Int)
278   (declare-const truck_travel_time_23 Int)
279   (declare-const truck_loc_23 Int)
280   (declare-const s_stockb_23 Int)
281   (declare-const s_stocka_23 Int)
282   (declare-const a_stockb_23 Int)
283   (declare-const a_stocka_23 Int)
284   (declare-const b_stockb_23 Int)
285   (declare-const b_stocka_23 Int)
286   (declare-const c_stockb_23 Int)
287   (declare-const c_stocka_23 Int)
288   (declare-const loopto_23 Bool)
```

```
289    (declare-const truck_stock_24 Int)
290    (declare-const truck_travel_time_24 Int)
291    (declare-const truck_loc_24 Int)
292    (declare-const s_stockb_24 Int)
293    (declare-const s_stocka_24 Int)
294    (declare-const a_stockb_24 Int)
295    (declare-const a_stocka_24 Int)
296    (declare-const b_stockb_24 Int)
297    (declare-const b_stocka_24 Int)
298    (declare-const c_stockb_24 Int)
299    (declare-const c_stocka_24 Int)
300    (declare-const loopto_24 Bool)
301    (declare-const truck_stock_25 Int)
302    (declare-const truck_travel_time_25 Int)
303    (declare-const truck_loc_25 Int)
304    (declare-const s_stockb_25 Int)
305    (declare-const s_stocka_25 Int)
306    (declare-const a_stockb_25 Int)
307    (declare-const a_stocka_25 Int)
308    (declare-const b_stockb_25 Int)
309    (declare-const b_stocka_25 Int)
310    (declare-const c_stockb_25 Int)
311    (declare-const c_stocka_25 Int)
312    (declare-const loopto_25 Bool)
313    (declare-const truck_stock_26 Int)
314    (declare-const truck_travel_time_26 Int)
315    (declare-const truck_loc_26 Int)
316    (declare-const s_stockb_26 Int)
317    (declare-const s_stocka_26 Int)
318    (declare-const a_stockb_26 Int)
319    (declare-const a_stocka_26 Int)
320    (declare-const b_stockb_26 Int)
321    (declare-const b_stocka_26 Int)
322    (declare-const c_stockb_26 Int)
323    (declare-const c_stocka_26 Int)
324    (declare-const loopto_26 Bool)
325    (declare-const truck_stock_27 Int)
326    (declare-const truck_travel_time_27 Int)
327    (declare-const truck_loc_27 Int)
328    (declare-const s_stockb_27 Int)
329    (declare-const s_stocka_27 Int)
330    (declare-const a_stockb_27 Int)
331    (declare-const a_stocka_27 Int)
332    (declare-const b_stockb_27 Int)
333    (declare-const b_stocka_27 Int)
334    (declare-const c_stockb_27 Int)
335    (declare-const c_stocka_27 Int)
336    (declare-const loopto_27 Bool)
337    (declare-const truck_stock_28 Int)
338    (declare-const truck_travel_time_28 Int)
339    (declare-const truck_loc_28 Int)
340    (declare-const s_stockb_28 Int)
341    (declare-const s_stocka_28 Int)
342    (declare-const a_stockb_28 Int)
343    (declare-const a_stocka_28 Int)
344    (declare-const b_stockb_28 Int)
345    (declare-const b_stocka_28 Int)
346    (declare-const c_stockb_28 Int)
347    (declare-const c_stocka_28 Int)
348    (declare-const loopto_28 Bool)
349    (declare-const truck_stock_29 Int)
350    (declare-const truck_travel_time_29 Int)
```

```
351  (declare-const truck_loc_29 Int)
352  (declare-const s_stockb_29 Int)
353  (declare-const s_stocka_29 Int)
354  (declare-const a_stockb_29 Int)
355  (declare-const a_stocka_29 Int)
356  (declare-const b_stockb_29 Int)
357  (declare-const b_stocka_29 Int)
358  (declare-const c_stockb_29 Int)
359  (declare-const c_stocka_29 Int)
360  (declare-const loopto_29 Bool)
361  (declare-const truck_stock_30 Int)
362  (declare-const truck_travel_time_30 Int)
363  (declare-const truck_loc_30 Int)
364  (declare-const s_stockb_30 Int)
365  (declare-const s_stocka_30 Int)
366  (declare-const a_stockb_30 Int)
367  (declare-const a_stocka_30 Int)
368  (declare-const b_stockb_30 Int)
369  (declare-const b_stocka_30 Int)
370  (declare-const c_stockb_30 Int)
371  (declare-const c_stocka_30 Int)
372  (declare-const loopto_30 Bool)
373  (declare-const truck_stock_31 Int)
374  (declare-const truck_travel_time_31 Int)
375  (declare-const truck_loc_31 Int)
376  (declare-const s_stockb_31 Int)
377  (declare-const s_stocka_31 Int)
378  (declare-const a_stockb_31 Int)
379  (declare-const a_stocka_31 Int)
380  (declare-const b_stockb_31 Int)
381  (declare-const b_stocka_31 Int)
382  (declare-const c_stockb_31 Int)
383  (declare-const c_stocka_31 Int)
384  (declare-const loopto_31 Bool)
385  (declare-const truck_stock_32 Int)
386  (declare-const truck_travel_time_32 Int)
387  (declare-const truck_loc_32 Int)
388  (declare-const s_stockb_32 Int)
389  (declare-const s_stocka_32 Int)
390  (declare-const a_stockb_32 Int)
391  (declare-const a_stocka_32 Int)
392  (declare-const b_stockb_32 Int)
393  (declare-const b_stocka_32 Int)
394  (declare-const c_stockb_32 Int)
395  (declare-const c_stocka_32 Int)
396  (declare-const loopto_32 Bool)
397  (declare-const truck_stock_33 Int)
398  (declare-const truck_travel_time_33 Int)
399  (declare-const truck_loc_33 Int)
400  (declare-const s_stockb_33 Int)
401  (declare-const s_stocka_33 Int)
402  (declare-const a_stockb_33 Int)
403  (declare-const a_stocka_33 Int)
404  (declare-const b_stockb_33 Int)
405  (declare-const b_stocka_33 Int)
406  (declare-const c_stockb_33 Int)
407  (declare-const c_stocka_33 Int)
408  (declare-const loopto_33 Bool)
409  (declare-const truck_stock_34 Int)
410  (declare-const truck_travel_time_34 Int)
411  (declare-const truck_loc_34 Int)
412  (declare-const s_stockb_34 Int)
```

```
413  (declare-const s_stocka_34 Int)
414  (declare-const a_stockb_34 Int)
415  (declare-const a_stocka_34 Int)
416  (declare-const b_stockb_34 Int)
417  (declare-const b_stocka_34 Int)
418  (declare-const c_stockb_34 Int)
419  (declare-const c_stocka_34 Int)
420  (declare-const loopto_34 Bool)
421  (declare-const truck_stock_35 Int)
422  (declare-const truck_travel_time_35 Int)
423  (declare-const truck_loc_35 Int)
424  (declare-const s_stockb_35 Int)
425  (declare-const s_stocka_35 Int)
426  (declare-const a_stockb_35 Int)
427  (declare-const a_stocka_35 Int)
428  (declare-const b_stockb_35 Int)
429  (declare-const b_stocka_35 Int)
430  (declare-const c_stockb_35 Int)
431  (declare-const c_stocka_35 Int)
432  (declare-const loopto_35 Bool)
433  (declare-const truck_stock_36 Int)
434  (declare-const truck_travel_time_36 Int)
435  (declare-const truck_loc_36 Int)
436  (declare-const s_stockb_36 Int)
437  (declare-const s_stocka_36 Int)
438  (declare-const a_stockb_36 Int)
439  (declare-const a_stocka_36 Int)
440  (declare-const b_stockb_36 Int)
441  (declare-const b_stocka_36 Int)
442  (declare-const c_stockb_36 Int)
443  (declare-const c_stocka_36 Int)
444  (declare-const loopto_36 Bool)
445  (declare-const truck_stock_37 Int)
446  (declare-const truck_travel_time_37 Int)
447  (declare-const truck_loc_37 Int)
448  (declare-const s_stockb_37 Int)
449  (declare-const s_stocka_37 Int)
450  (declare-const a_stockb_37 Int)
451  (declare-const a_stocka_37 Int)
452  (declare-const b_stockb_37 Int)
453  (declare-const b_stocka_37 Int)
454  (declare-const c_stockb_37 Int)
455  (declare-const c_stocka_37 Int)
456  (declare-const loopto_37 Bool)
457  (declare-const truck_stock_38 Int)
458  (declare-const truck_travel_time_38 Int)
459  (declare-const truck_loc_38 Int)
460  (declare-const s_stockb_38 Int)
461  (declare-const s_stocka_38 Int)
462  (declare-const a_stockb_38 Int)
463  (declare-const a_stocka_38 Int)
464  (declare-const b_stockb_38 Int)
465  (declare-const b_stocka_38 Int)
466  (declare-const c_stockb_38 Int)
467  (declare-const c_stocka_38 Int)
468  (declare-const loopto_38 Bool)
469  (declare-const truck_stock_39 Int)
470  (declare-const truck_travel_time_39 Int)
471  (declare-const truck_loc_39 Int)
472  (declare-const s_stockb_39 Int)
473  (declare-const s_stocka_39 Int)
474  (declare-const a_stockb_39 Int)
```

```
475  (declare-const a_stocka_39 Int)
476  (declare-const b_stockb_39 Int)
477  (declare-const b_stocka_39 Int)
478  (declare-const c_stockb_39 Int)
479  (declare-const c_stocka_39 Int)
480  (declare-const loopto_39 Bool)
481  (declare-const truck_stock_40 Int)
482  (declare-const truck_travel_time_40 Int)
483  (declare-const truck_loc_40 Int)
484  (declare-const s_stockb_40 Int)
485  (declare-const s_stocka_40 Int)
486  (declare-const a_stockb_40 Int)
487  (declare-const a_stocka_40 Int)
488  (declare-const b_stockb_40 Int)
489  (declare-const b_stocka_40 Int)
490  (declare-const c_stockb_40 Int)
491  (declare-const c_stocka_40 Int)
492  (declare-const loopto_40 Bool)
493  (declare-const truck_stock_41 Int)
494  (declare-const truck_travel_time_41 Int)
495  (declare-const truck_loc_41 Int)
496  (declare-const s_stockb_41 Int)
497  (declare-const s_stocka_41 Int)
498  (declare-const a_stockb_41 Int)
499  (declare-const a_stocka_41 Int)
500  (declare-const b_stockb_41 Int)
501  (declare-const b_stocka_41 Int)
502  (declare-const c_stockb_41 Int)
503  (declare-const c_stocka_41 Int)
504  (declare-const loopto_41 Bool)
505  (declare-const truck_stock_42 Int)
506  (declare-const truck_travel_time_42 Int)
507  (declare-const truck_loc_42 Int)
508  (declare-const s_stockb_42 Int)
509  (declare-const s_stocka_42 Int)
510  (declare-const a_stockb_42 Int)
511  (declare-const a_stocka_42 Int)
512  (declare-const b_stockb_42 Int)
513  (declare-const b_stocka_42 Int)
514  (declare-const c_stockb_42 Int)
515  (declare-const c_stocka_42 Int)
516  (declare-const loopto_42 Bool)
517  (declare-const truck_stock_43 Int)
518  (declare-const truck_travel_time_43 Int)
519  (declare-const truck_loc_43 Int)
520  (declare-const s_stockb_43 Int)
521  (declare-const s_stocka_43 Int)
522  (declare-const a_stockb_43 Int)
523  (declare-const a_stocka_43 Int)
524  (declare-const b_stockb_43 Int)
525  (declare-const b_stocka_43 Int)
526  (declare-const c_stockb_43 Int)
527  (declare-const c_stocka_43 Int)
528  (declare-const loopto_43 Bool)
529  (declare-const truck_stock_44 Int)
530  (declare-const truck_travel_time_44 Int)
531  (declare-const truck_loc_44 Int)
532  (declare-const s_stockb_44 Int)
533  (declare-const s_stocka_44 Int)
534  (declare-const a_stockb_44 Int)
535  (declare-const a_stocka_44 Int)
536  (declare-const b_stockb_44 Int)
```

```
537  (declare-const b_stocka_44 Int)
538  (declare-const c_stockb_44 Int)
539  (declare-const c_stocka_44 Int)
540  (declare-const loopto_44 Bool)
541  (declare-const truck_stock_45 Int)
542  (declare-const truck_travel_time_45 Int)
543  (declare-const truck_loc_45 Int)
544  (declare-const s_stockb_45 Int)
545  (declare-const s_stocka_45 Int)
546  (declare-const a_stockb_45 Int)
547  (declare-const a_stocka_45 Int)
548  (declare-const b_stockb_45 Int)
549  (declare-const b_stocka_45 Int)
550  (declare-const c_stockb_45 Int)
551  (declare-const c_stocka_45 Int)
552  (declare-const loopto_45 Bool)
553  (declare-const truck_stock_46 Int)
554  (declare-const truck_travel_time_46 Int)
555  (declare-const truck_loc_46 Int)
556  (declare-const s_stockb_46 Int)
557  (declare-const s_stocka_46 Int)
558  (declare-const a_stockb_46 Int)
559  (declare-const a_stocka_46 Int)
560  (declare-const b_stockb_46 Int)
561  (declare-const b_stocka_46 Int)
562  (declare-const c_stockb_46 Int)
563  (declare-const c_stocka_46 Int)
564  (declare-const loopto_46 Bool)
565  (declare-const truck_stock_47 Int)
566  (declare-const truck_travel_time_47 Int)
567  (declare-const truck_loc_47 Int)
568  (declare-const s_stockb_47 Int)
569  (declare-const s_stocka_47 Int)
570  (declare-const a_stockb_47 Int)
571  (declare-const a_stocka_47 Int)
572  (declare-const b_stockb_47 Int)
573  (declare-const b_stocka_47 Int)
574  (declare-const c_stockb_47 Int)
575  (declare-const c_stocka_47 Int)
576  (declare-const loopto_47 Bool)
577  (declare-const truck_stock_48 Int)
578  (declare-const truck_travel_time_48 Int)
579  (declare-const truck_loc_48 Int)
580  (declare-const s_stockb_48 Int)
581  (declare-const s_stocka_48 Int)
582  (declare-const a_stockb_48 Int)
583  (declare-const a_stocka_48 Int)
584  (declare-const b_stockb_48 Int)
585  (declare-const b_stocka_48 Int)
586  (declare-const c_stockb_48 Int)
587  (declare-const c_stocka_48 Int)
588  (declare-const loopto_48 Bool)
589  (declare-const truck_stock_49 Int)
590  (declare-const truck_travel_time_49 Int)
591  (declare-const truck_loc_49 Int)
592  (declare-const s_stockb_49 Int)
593  (declare-const s_stocka_49 Int)
594  (declare-const a_stockb_49 Int)
595  (declare-const a_stocka_49 Int)
596  (declare-const b_stockb_49 Int)
597  (declare-const b_stocka_49 Int)
598  (declare-const c_stockb_49 Int)
```

```
599   (declare-const c_stocka_49 Int)
600   (declare-const loopto_49 Bool)
601   (declare-const truck_stock_50 Int)
602   (declare-const truck_travel_time_50 Int)
603   (declare-const truck_loc_50 Int)
604   (declare-const s_stockb_50 Int)
605   (declare-const s_stocka_50 Int)
606   (declare-const a_stockb_50 Int)
607   (declare-const a_stocka_50 Int)
608   (declare-const b_stockb_50 Int)
609   (declare-const b_stocka_50 Int)
610   (declare-const c_stockb_50 Int)
611   (declare-const c_stocka_50 Int)
612   (declare-const loopto_50 Bool)
613   (declare-const truck_stock_51 Int)
614   (declare-const truck_travel_time_51 Int)
615   (declare-const truck_loc_51 Int)
616   (declare-const s_stockb_51 Int)
617   (declare-const s_stocka_51 Int)
618   (declare-const a_stockb_51 Int)
619   (declare-const a_stocka_51 Int)
620   (declare-const b_stockb_51 Int)
621   (declare-const b_stocka_51 Int)
622   (declare-const c_stockb_51 Int)
623   (declare-const c_stocka_51 Int)
624   (declare-const loopto_51 Bool)
625   (declare-const truck_stock_52 Int)
626   (declare-const truck_travel_time_52 Int)
627   (declare-const truck_loc_52 Int)
628   (declare-const s_stockb_52 Int)
629   (declare-const s_stocka_52 Int)
630   (declare-const a_stockb_52 Int)
631   (declare-const a_stocka_52 Int)
632   (declare-const b_stockb_52 Int)
633   (declare-const b_stocka_52 Int)
634   (declare-const c_stockb_52 Int)
635   (declare-const c_stocka_52 Int)
636   (declare-const loopto_52 Bool)
637   (declare-const truck_stock_53 Int)
638   (declare-const truck_travel_time_53 Int)
639   (declare-const truck_loc_53 Int)
640   (declare-const s_stockb_53 Int)
641   (declare-const s_stocka_53 Int)
642   (declare-const a_stockb_53 Int)
643   (declare-const a_stocka_53 Int)
644   (declare-const b_stockb_53 Int)
645   (declare-const b_stocka_53 Int)
646   (declare-const c_stockb_53 Int)
647   (declare-const c_stocka_53 Int)
648   (declare-const loopto_53 Bool)
649   (declare-const truck_stock_54 Int)
650   (declare-const truck_travel_time_54 Int)
651   (declare-const truck_loc_54 Int)
652   (declare-const s_stockb_54 Int)
653   (declare-const s_stocka_54 Int)
654   (declare-const a_stockb_54 Int)
655   (declare-const a_stocka_54 Int)
656   (declare-const b_stockb_54 Int)
657   (declare-const b_stocka_54 Int)
658   (declare-const c_stockb_54 Int)
659   (declare-const c_stocka_54 Int)
660   (declare-const loopto_54 Bool)
```

```
661  (declare-const truck_stock_55 Int)
662  (declare-const truck_travel_time_55 Int)
663  (declare-const truck_loc_55 Int)
664  (declare-const s_stockb_55 Int)
665  (declare-const s_stocka_55 Int)
666  (declare-const a_stockb_55 Int)
667  (declare-const a_stocka_55 Int)
668  (declare-const b_stockb_55 Int)
669  (declare-const b_stocka_55 Int)
670  (declare-const c_stockb_55 Int)
671  (declare-const c_stocka_55 Int)
672  (declare-const loopto_55 Bool)
673  (declare-const truck_stock_56 Int)
674  (declare-const truck_travel_time_56 Int)
675  (declare-const truck_loc_56 Int)
676  (declare-const s_stockb_56 Int)
677  (declare-const s_stocka_56 Int)
678  (declare-const a_stockb_56 Int)
679  (declare-const a_stocka_56 Int)
680  (declare-const b_stockb_56 Int)
681  (declare-const b_stocka_56 Int)
682  (declare-const c_stockb_56 Int)
683  (declare-const c_stocka_56 Int)
684  (declare-const loopto_56 Bool)
685  (declare-const truck_stock_57 Int)
686  (declare-const truck_travel_time_57 Int)
687  (declare-const truck_loc_57 Int)
688  (declare-const s_stockb_57 Int)
689  (declare-const s_stocka_57 Int)
690  (declare-const a_stockb_57 Int)
691  (declare-const a_stocka_57 Int)
692  (declare-const b_stockb_57 Int)
693  (declare-const b_stocka_57 Int)
694  (declare-const c_stockb_57 Int)
695  (declare-const c_stocka_57 Int)
696  (declare-const loopto_57 Bool)
697  (declare-const truck_stock_58 Int)
698  (declare-const truck_travel_time_58 Int)
699  (declare-const truck_loc_58 Int)
700  (declare-const s_stockb_58 Int)
701  (declare-const s_stocka_58 Int)
702  (declare-const a_stockb_58 Int)
703  (declare-const a_stocka_58 Int)
704  (declare-const b_stockb_58 Int)
705  (declare-const b_stocka_58 Int)
706  (declare-const c_stockb_58 Int)
707  (declare-const c_stocka_58 Int)
708  (declare-const loopto_58 Bool)
709  (declare-const truck_stock_59 Int)
710  (declare-const truck_travel_time_59 Int)
711  (declare-const truck_loc_59 Int)
712  (declare-const s_stockb_59 Int)
713  (declare-const s_stocka_59 Int)
714  (declare-const a_stockb_59 Int)
715  (declare-const a_stocka_59 Int)
716  (declare-const b_stockb_59 Int)
717  (declare-const b_stocka_59 Int)
718  (declare-const c_stockb_59 Int)
719  (declare-const c_stocka_59 Int)
720  (declare-const loopto_59 Bool)
721  (declare-const truck_stock_60 Int)
722  (declare-const truck_travel_time_60 Int)
```

```
723  (declare-const truck_loc_60 Int)
724  (declare-const s_stockb_60 Int)
725  (declare-const s_stocka_60 Int)
726  (declare-const a_stockb_60 Int)
727  (declare-const a_stocka_60 Int)
728  (declare-const b_stockb_60 Int)
729  (declare-const b_stocka_60 Int)
730  (declare-const c_stockb_60 Int)
731  (declare-const c_stocka_60 Int)
732  (declare-const loopto_60 Bool)
733  (declare-const truck_stock_61 Int)
734  (declare-const truck_travel_time_61 Int)
735  (declare-const truck_loc_61 Int)
736  (declare-const s_stockb_61 Int)
737  (declare-const s_stocka_61 Int)
738  (declare-const a_stockb_61 Int)
739  (declare-const a_stocka_61 Int)
740  (declare-const b_stockb_61 Int)
741  (declare-const b_stocka_61 Int)
742  (declare-const c_stockb_61 Int)
743  (declare-const c_stocka_61 Int)
744  (declare-const loopto_61 Bool)
745  (declare-const truck_stock_62 Int)
746  (declare-const truck_travel_time_62 Int)
747  (declare-const truck_loc_62 Int)
748  (declare-const s_stockb_62 Int)
749  (declare-const s_stocka_62 Int)
750  (declare-const a_stockb_62 Int)
751  (declare-const a_stocka_62 Int)
752  (declare-const b_stockb_62 Int)
753  (declare-const b_stocka_62 Int)
754  (declare-const c_stockb_62 Int)
755  (declare-const c_stocka_62 Int)
756  (declare-const loopto_62 Bool)
757  (declare-const truck_stock_63 Int)
758  (declare-const truck_travel_time_63 Int)
759  (declare-const truck_loc_63 Int)
760  (declare-const s_stockb_63 Int)
761  (declare-const s_stocka_63 Int)
762  (declare-const a_stockb_63 Int)
763  (declare-const a_stocka_63 Int)
764  (declare-const b_stockb_63 Int)
765  (declare-const b_stocka_63 Int)
766  (declare-const c_stockb_63 Int)
767  (declare-const c_stocka_63 Int)
768  (declare-const loopto_63 Bool)
769  (declare-const truck_stock_64 Int)
770  (declare-const truck_travel_time_64 Int)
771  (declare-const truck_loc_64 Int)
772  (declare-const s_stockb_64 Int)
773  (declare-const s_stocka_64 Int)
774  (declare-const a_stockb_64 Int)
775  (declare-const a_stocka_64 Int)
776  (declare-const b_stockb_64 Int)
777  (declare-const b_stocka_64 Int)
778  (declare-const c_stockb_64 Int)
779  (declare-const c_stocka_64 Int)
780  (declare-const loopto_64 Bool)
781  (declare-const truck_stock_65 Int)
782  (declare-const truck_travel_time_65 Int)
783  (declare-const truck_loc_65 Int)
784  (declare-const s_stockb_65 Int)
```

```
785  (declare-const s_stocka_65 Int)
786  (declare-const a_stockb_65 Int)
787  (declare-const a_stocka_65 Int)
788  (declare-const b_stockb_65 Int)
789  (declare-const b_stocka_65 Int)
790  (declare-const c_stockb_65 Int)
791  (declare-const c_stocka_65 Int)
792  (declare-const loopto_65 Bool)
793  (declare-const truck_stock_66 Int)
794  (declare-const truck_travel_time_66 Int)
795  (declare-const truck_loc_66 Int)
796  (declare-const s_stockb_66 Int)
797  (declare-const s_stocka_66 Int)
798  (declare-const a_stockb_66 Int)
799  (declare-const a_stocka_66 Int)
800  (declare-const b_stockb_66 Int)
801  (declare-const b_stocka_66 Int)
802  (declare-const c_stockb_66 Int)
803  (declare-const c_stocka_66 Int)
804  (declare-const loopto_66 Bool)
805  (declare-const truck_stock_67 Int)
806  (declare-const truck_travel_time_67 Int)
807  (declare-const truck_loc_67 Int)
808  (declare-const s_stockb_67 Int)
809  (declare-const s_stocka_67 Int)
810  (declare-const a_stockb_67 Int)
811  (declare-const a_stocka_67 Int)
812  (declare-const b_stockb_67 Int)
813  (declare-const b_stocka_67 Int)
814  (declare-const c_stockb_67 Int)
815  (declare-const c_stocka_67 Int)
816  (declare-const loopto_67 Bool)
817  (declare-const truck_stock_68 Int)
818  (declare-const truck_travel_time_68 Int)
819  (declare-const truck_loc_68 Int)
820  (declare-const s_stockb_68 Int)
821  (declare-const s_stocka_68 Int)
822  (declare-const a_stockb_68 Int)
823  (declare-const a_stocka_68 Int)
824  (declare-const b_stockb_68 Int)
825  (declare-const b_stocka_68 Int)
826  (declare-const c_stockb_68 Int)
827  (declare-const c_stocka_68 Int)
828  (declare-const loopto_68 Bool)
829  (declare-const truck_stock_69 Int)
830  (declare-const truck_travel_time_69 Int)
831  (declare-const truck_loc_69 Int)
832  (declare-const s_stockb_69 Int)
833  (declare-const s_stocka_69 Int)
834  (declare-const a_stockb_69 Int)
835  (declare-const a_stocka_69 Int)
836  (declare-const b_stockb_69 Int)
837  (declare-const b_stocka_69 Int)
838  (declare-const c_stockb_69 Int)
839  (declare-const c_stocka_69 Int)
840  (declare-const loopto_69 Bool)
841  (declare-const truck_stock_70 Int)
842  (declare-const truck_travel_time_70 Int)
843  (declare-const truck_loc_70 Int)
844  (declare-const s_stockb_70 Int)
845  (declare-const s_stocka_70 Int)
846  (declare-const a_stockb_70 Int)
```

```
847  (declare-const a_stocka_70 Int)
848  (declare-const b_stockb_70 Int)
849  (declare-const b_stocka_70 Int)
850  (declare-const c_stockb_70 Int)
851  (declare-const c_stocka_70 Int)
852  (declare-const loopto_70 Bool)
853  (declare-const truck_stock_71 Int)
854  (declare-const truck_travel_time_71 Int)
855  (declare-const truck_loc_71 Int)
856  (declare-const s_stockb_71 Int)
857  (declare-const s_stocka_71 Int)
858  (declare-const a_stockb_71 Int)
859  (declare-const a_stocka_71 Int)
860  (declare-const b_stockb_71 Int)
861  (declare-const b_stocka_71 Int)
862  (declare-const c_stockb_71 Int)
863  (declare-const c_stocka_71 Int)
864  (declare-const loopto_71 Bool)
865  (declare-const truck_stock_72 Int)
866  (declare-const truck_travel_time_72 Int)
867  (declare-const truck_loc_72 Int)
868  (declare-const s_stockb_72 Int)
869  (declare-const s_stocka_72 Int)
870  (declare-const a_stockb_72 Int)
871  (declare-const a_stocka_72 Int)
872  (declare-const b_stockb_72 Int)
873  (declare-const b_stocka_72 Int)
874  (declare-const c_stockb_72 Int)
875  (declare-const c_stocka_72 Int)
876  (declare-const loopto_72 Bool)
877  (declare-const truck_stock_73 Int)
878  (declare-const truck_travel_time_73 Int)
879  (declare-const truck_loc_73 Int)
880  (declare-const s_stockb_73 Int)
881  (declare-const s_stocka_73 Int)
882  (declare-const a_stockb_73 Int)
883  (declare-const a_stocka_73 Int)
884  (declare-const b_stockb_73 Int)
885  (declare-const b_stocka_73 Int)
886  (declare-const c_stockb_73 Int)
887  (declare-const c_stocka_73 Int)
888  (declare-const loopto_73 Bool)
889  (declare-const truck_stock_74 Int)
890  (declare-const truck_travel_time_74 Int)
891  (declare-const truck_loc_74 Int)
892  (declare-const s_stockb_74 Int)
893  (declare-const s_stocka_74 Int)
894  (declare-const a_stockb_74 Int)
895  (declare-const a_stocka_74 Int)
896  (declare-const b_stockb_74 Int)
897  (declare-const b_stocka_74 Int)
898  (declare-const c_stockb_74 Int)
899  (declare-const c_stocka_74 Int)
900  (declare-const loopto_74 Bool)
901  (declare-const truck_stock_75 Int)
902  (declare-const truck_travel_time_75 Int)
903  (declare-const truck_loc_75 Int)
904  (declare-const s_stockb_75 Int)
905  (declare-const s_stocka_75 Int)
906  (declare-const a_stockb_75 Int)
907  (declare-const a_stocka_75 Int)
908  (declare-const b_stockb_75 Int)
```

```
909    (declare-const b_stocka_75 Int)
910    (declare-const c_stockb_75 Int)
911    (declare-const c_stocka_75 Int)
912    (declare-const loopto_75 Bool)
913    (declare-const truck_stock_76 Int)
914    (declare-const truck_travel_time_76 Int)
915    (declare-const truck_loc_76 Int)
916    (declare-const s_stockb_76 Int)
917    (declare-const s_stocka_76 Int)
918    (declare-const a_stockb_76 Int)
919    (declare-const a_stocka_76 Int)
920    (declare-const b_stockb_76 Int)
921    (declare-const b_stocka_76 Int)
922    (declare-const c_stockb_76 Int)
923    (declare-const c_stocka_76 Int)
924    (declare-const loopto_76 Bool)
925    (declare-const truck_stock_77 Int)
926    (declare-const truck_travel_time_77 Int)
927    (declare-const truck_loc_77 Int)
928    (declare-const s_stockb_77 Int)
929    (declare-const s_stocka_77 Int)
930    (declare-const a_stockb_77 Int)
931    (declare-const a_stocka_77 Int)
932    (declare-const b_stockb_77 Int)
933    (declare-const b_stocka_77 Int)
934    (declare-const c_stockb_77 Int)
935    (declare-const c_stocka_77 Int)
936    (declare-const loopto_77 Bool)
937    (declare-const truck_stock_78 Int)
938    (declare-const truck_travel_time_78 Int)
939    (declare-const truck_loc_78 Int)
940    (declare-const s_stockb_78 Int)
941    (declare-const s_stocka_78 Int)
942    (declare-const a_stockb_78 Int)
943    (declare-const a_stocka_78 Int)
944    (declare-const b_stockb_78 Int)
945    (declare-const b_stocka_78 Int)
946    (declare-const c_stockb_78 Int)
947    (declare-const c_stocka_78 Int)
948    (declare-const loopto_78 Bool)
949    (declare-const truck_stock_79 Int)
950    (declare-const truck_travel_time_79 Int)
951    (declare-const truck_loc_79 Int)
952    (declare-const s_stockb_79 Int)
953    (declare-const s_stocka_79 Int)
954    (declare-const a_stockb_79 Int)
955    (declare-const a_stocka_79 Int)
956    (declare-const b_stockb_79 Int)
957    (declare-const b_stocka_79 Int)
958    (declare-const c_stockb_79 Int)
959    (declare-const c_stocka_79 Int)
960    (declare-const loopto_79 Bool)
961    (declare-const truck_stock_80 Int)
962    (declare-const truck_travel_time_80 Int)
963    (declare-const truck_loc_80 Int)
964    (declare-const s_stockb_80 Int)
965    (declare-const s_stocka_80 Int)
966    (declare-const a_stockb_80 Int)
967    (declare-const a_stocka_80 Int)
968    (declare-const b_stockb_80 Int)
969    (declare-const b_stocka_80 Int)
970    (declare-const c_stockb_80 Int)
```

```
971   (declare-const c_stocka_80 Int)
972   (declare-const loopto_80 Bool)
973   (declare-const truck_stock_81 Int)
974   (declare-const truck_travel_time_81 Int)
975   (declare-const truck_loc_81 Int)
976   (declare-const s_stockb_81 Int)
977   (declare-const s_stocka_81 Int)
978   (declare-const a_stockb_81 Int)
979   (declare-const a_stocka_81 Int)
980   (declare-const b_stockb_81 Int)
981   (declare-const b_stocka_81 Int)
982   (declare-const c_stockb_81 Int)
983   (declare-const c_stocka_81 Int)
984   (declare-const loopto_81 Bool)
985   (declare-const truck_stock_82 Int)
986   (declare-const truck_travel_time_82 Int)
987   (declare-const truck_loc_82 Int)
988   (declare-const s_stockb_82 Int)
989   (declare-const s_stocka_82 Int)
990   (declare-const a_stockb_82 Int)
991   (declare-const a_stocka_82 Int)
992   (declare-const b_stockb_82 Int)
993   (declare-const b_stocka_82 Int)
994   (declare-const c_stockb_82 Int)
995   (declare-const c_stocka_82 Int)
996   (declare-const loopto_82 Bool)
997   (declare-const truck_stock_83 Int)
998   (declare-const truck_travel_time_83 Int)
999   (declare-const truck_loc_83 Int)
1000  (declare-const s_stockb_83 Int)
1001  (declare-const s_stocka_83 Int)
1002  (declare-const a_stockb_83 Int)
1003  (declare-const a_stocka_83 Int)
1004  (declare-const b_stockb_83 Int)
1005  (declare-const b_stocka_83 Int)
1006  (declare-const c_stockb_83 Int)
1007  (declare-const c_stocka_83 Int)
1008  (declare-const loopto_83 Bool)
1009  (declare-const truck_stock_84 Int)
1010  (declare-const truck_travel_time_84 Int)
1011  (declare-const truck_loc_84 Int)
1012  (declare-const s_stockb_84 Int)
1013  (declare-const s_stocka_84 Int)
1014  (declare-const a_stockb_84 Int)
1015  (declare-const a_stocka_84 Int)
1016  (declare-const b_stockb_84 Int)
1017  (declare-const b_stocka_84 Int)
1018  (declare-const c_stockb_84 Int)
1019  (declare-const c_stocka_84 Int)
1020  (declare-const loopto_84 Bool)
1021  (declare-const truck_stock_85 Int)
1022  (declare-const truck_travel_time_85 Int)
1023  (declare-const truck_loc_85 Int)
1024  (declare-const s_stockb_85 Int)
1025  (declare-const s_stocka_85 Int)
1026  (declare-const a_stockb_85 Int)
1027  (declare-const a_stocka_85 Int)
1028  (declare-const b_stockb_85 Int)
1029  (declare-const b_stocka_85 Int)
1030  (declare-const c_stockb_85 Int)
1031  (declare-const c_stocka_85 Int)
1032  (declare-const loopto_85 Bool)
```

```
1033  (declare-const truck_stock_86 Int)
1034  (declare-const truck_travel_time_86 Int)
1035  (declare-const truck_loc_86 Int)
1036  (declare-const s_stockb_86 Int)
1037  (declare-const s_stocka_86 Int)
1038  (declare-const a_stockb_86 Int)
1039  (declare-const a_stocka_86 Int)
1040  (declare-const b_stockb_86 Int)
1041  (declare-const b_stocka_86 Int)
1042  (declare-const c_stockb_86 Int)
1043  (declare-const c_stocka_86 Int)
1044  (declare-const loopto_86 Bool)
1045  (declare-const truck_stock_87 Int)
1046  (declare-const truck_travel_time_87 Int)
1047  (declare-const truck_loc_87 Int)
1048  (declare-const s_stockb_87 Int)
1049  (declare-const s_stocka_87 Int)
1050  (declare-const a_stockb_87 Int)
1051  (declare-const a_stocka_87 Int)
1052  (declare-const b_stockb_87 Int)
1053  (declare-const b_stocka_87 Int)
1054  (declare-const c_stockb_87 Int)
1055  (declare-const c_stocka_87 Int)
1056  (declare-const loopto_87 Bool)
1057  (declare-const truck_stock_88 Int)
1058  (declare-const truck_travel_time_88 Int)
1059  (declare-const truck_loc_88 Int)
1060  (declare-const s_stockb_88 Int)
1061  (declare-const s_stocka_88 Int)
1062  (declare-const a_stockb_88 Int)
1063  (declare-const a_stocka_88 Int)
1064  (declare-const b_stockb_88 Int)
1065  (declare-const b_stocka_88 Int)
1066  (declare-const c_stockb_88 Int)
1067  (declare-const c_stocka_88 Int)
1068  (declare-const loopto_88 Bool)
1069  (declare-const truck_stock_89 Int)
1070  (declare-const truck_travel_time_89 Int)
1071  (declare-const truck_loc_89 Int)
1072  (declare-const s_stockb_89 Int)
1073  (declare-const s_stocka_89 Int)
1074  (declare-const a_stockb_89 Int)
1075  (declare-const a_stocka_89 Int)
1076  (declare-const b_stockb_89 Int)
1077  (declare-const b_stocka_89 Int)
1078  (declare-const c_stockb_89 Int)
1079  (declare-const c_stocka_89 Int)
1080  (declare-const loopto_89 Bool)
1081  (declare-const truck_stock_90 Int)
1082  (declare-const truck_travel_time_90 Int)
1083  (declare-const truck_loc_90 Int)
1084  (declare-const s_stockb_90 Int)
1085  (declare-const s_stocka_90 Int)
1086  (declare-const a_stockb_90 Int)
1087  (declare-const a_stocka_90 Int)
1088  (declare-const b_stockb_90 Int)
1089  (declare-const b_stocka_90 Int)
1090  (declare-const c_stockb_90 Int)
1091  (declare-const c_stocka_90 Int)
1092  (declare-const loopto_90 Bool)
1093  (declare-const truck_stock_91 Int)
1094  (declare-const truck_travel_time_91 Int)
```

```
1095  (declare-const truck_loc_91 Int)
1096  (declare-const s_stockb_91 Int)
1097  (declare-const s_stocka_91 Int)
1098  (declare-const a_stockb_91 Int)
1099  (declare-const a_stocka_91 Int)
1100  (declare-const b_stockb_91 Int)
1101  (declare-const b_stocka_91 Int)
1102  (declare-const c_stockb_91 Int)
1103  (declare-const c_stocka_91 Int)
1104  (declare-const loopto_91 Bool)
1105  (declare-const truck_stock_92 Int)
1106  (declare-const truck_travel_time_92 Int)
1107  (declare-const truck_loc_92 Int)
1108  (declare-const s_stockb_92 Int)
1109  (declare-const s_stocka_92 Int)
1110  (declare-const a_stockb_92 Int)
1111  (declare-const a_stocka_92 Int)
1112  (declare-const b_stockb_92 Int)
1113  (declare-const b_stocka_92 Int)
1114  (declare-const c_stockb_92 Int)
1115  (declare-const c_stocka_92 Int)
1116  (declare-const loopto_92 Bool)
1117  (declare-const truck_stock_93 Int)
1118  (declare-const truck_travel_time_93 Int)
1119  (declare-const truck_loc_93 Int)
1120  (declare-const s_stockb_93 Int)
1121  (declare-const s_stocka_93 Int)
1122  (declare-const a_stockb_93 Int)
1123  (declare-const a_stocka_93 Int)
1124  (declare-const b_stockb_93 Int)
1125  (declare-const b_stocka_93 Int)
1126  (declare-const c_stockb_93 Int)
1127  (declare-const c_stocka_93 Int)
1128  (declare-const loopto_93 Bool)
1129  (declare-const truck_stock_94 Int)
1130  (declare-const truck_travel_time_94 Int)
1131  (declare-const truck_loc_94 Int)
1132  (declare-const s_stockb_94 Int)
1133  (declare-const s_stocka_94 Int)
1134  (declare-const a_stockb_94 Int)
1135  (declare-const a_stocka_94 Int)
1136  (declare-const b_stockb_94 Int)
1137  (declare-const b_stocka_94 Int)
1138  (declare-const c_stockb_94 Int)
1139  (declare-const c_stocka_94 Int)
1140  (declare-const loopto_94 Bool)
1141  (declare-const truck_stock_95 Int)
1142  (declare-const truck_travel_time_95 Int)
1143  (declare-const truck_loc_95 Int)
1144  (declare-const s_stockb_95 Int)
1145  (declare-const s_stocka_95 Int)
1146  (declare-const a_stockb_95 Int)
1147  (declare-const a_stocka_95 Int)
1148  (declare-const b_stockb_95 Int)
1149  (declare-const b_stocka_95 Int)
1150  (declare-const c_stockb_95 Int)
1151  (declare-const c_stocka_95 Int)
1152  (declare-const loopto_95 Bool)
1153  (declare-const truck_stock_96 Int)
1154  (declare-const truck_travel_time_96 Int)
1155  (declare-const truck_loc_96 Int)
1156  (declare-const s_stockb_96 Int)
```

```
1157  (declare-const s_stocka_96 Int)
1158  (declare-const a_stockb_96 Int)
1159  (declare-const a_stocka_96 Int)
1160  (declare-const b_stockb_96 Int)
1161  (declare-const b_stocka_96 Int)
1162  (declare-const c_stockb_96 Int)
1163  (declare-const c_stocka_96 Int)
1164  (declare-const loopto_96 Bool)
1165  (declare-const truck_stock_97 Int)
1166  (declare-const truck_travel_time_97 Int)
1167  (declare-const truck_loc_97 Int)
1168  (declare-const s_stockb_97 Int)
1169  (declare-const s_stocka_97 Int)
1170  (declare-const a_stockb_97 Int)
1171  (declare-const a_stocka_97 Int)
1172  (declare-const b_stockb_97 Int)
1173  (declare-const b_stocka_97 Int)
1174  (declare-const c_stockb_97 Int)
1175  (declare-const c_stocka_97 Int)
1176  (declare-const loopto_97 Bool)
1177  (declare-const truck_stock_98 Int)
1178  (declare-const truck_travel_time_98 Int)
1179  (declare-const truck_loc_98 Int)
1180  (declare-const s_stockb_98 Int)
1181  (declare-const s_stocka_98 Int)
1182  (declare-const a_stockb_98 Int)
1183  (declare-const a_stocka_98 Int)
1184  (declare-const b_stockb_98 Int)
1185  (declare-const b_stocka_98 Int)
1186  (declare-const c_stockb_98 Int)
1187  (declare-const c_stocka_98 Int)
1188  (declare-const loopto_98 Bool)
1189  (declare-const truck_stock_99 Int)
1190  (declare-const truck_travel_time_99 Int)
1191  (declare-const truck_loc_99 Int)
1192  (declare-const s_stockb_99 Int)
1193  (declare-const s_stocka_99 Int)
1194  (declare-const a_stockb_99 Int)
1195  (declare-const a_stocka_99 Int)
1196  (declare-const b_stockb_99 Int)
1197  (declare-const b_stocka_99 Int)
1198  (declare-const c_stockb_99 Int)
1199  (declare-const c_stocka_99 Int)
1200  (declare-const loopto_99 Bool)
1201  (declare-const truck_stock_100 Int)
1202  (declare-const truck_travel_time_100 Int)
1203  (declare-const truck_loc_100 Int)
1204  (declare-const s_stockb_100 Int)
1205  (declare-const s_stocka_100 Int)
1206  (declare-const a_stockb_100 Int)
1207  (declare-const a_stocka_100 Int)
1208  (declare-const b_stockb_100 Int)
1209  (declare-const b_stocka_100 Int)
1210  (declare-const c_stockb_100 Int)
1211  (declare-const c_stocka_100 Int)
1212  (declare-const loopto_100 Bool)
1213  (declare-const truck_stock_101 Int)
1214  (declare-const truck_travel_time_101 Int)
1215  (declare-const truck_loc_101 Int)
1216  (declare-const s_stockb_101 Int)
1217  (declare-const s_stocka_101 Int)
1218  (declare-const a_stockb_101 Int)
```

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1219  (declare-const a_stocka_101 Int)
1220  (declare-const b_stockb_101 Int)
1221  (declare-const b_stocka_101 Int)
1222  (declare-const c_stockb_101 Int)
1223  (declare-const c_stocka_101 Int)
1224  (declare-const loopto_101 Bool)
1225  (declare-const truck_stock_102 Int)
1226  (declare-const truck_travel_time_102 Int)
1227  (declare-const truck_loc_102 Int)
1228  (declare-const s_stockb_102 Int)
1229  (declare-const s_stocka_102 Int)
1230  (declare-const a_stockb_102 Int)
1231  (declare-const a_stocka_102 Int)
1232  (declare-const b_stockb_102 Int)
1233  (declare-const b_stocka_102 Int)
1234  (declare-const c_stockb_102 Int)
1235  (declare-const c_stocka_102 Int)
1236  (declare-const loopto_102 Bool)
1237  (declare-const truck_stock_103 Int)
1238  (declare-const truck_travel_time_103 Int)
1239  (declare-const truck_loc_103 Int)
1240  (declare-const s_stockb_103 Int)
1241  (declare-const s_stocka_103 Int)
1242  (declare-const a_stockb_103 Int)
1243  (declare-const a_stocka_103 Int)
1244  (declare-const b_stockb_103 Int)
1245  (declare-const b_stocka_103 Int)
1246  (declare-const c_stockb_103 Int)
1247  (declare-const c_stocka_103 Int)
1248  (declare-const loopto_103 Bool)
1249  (declare-const truck_stock_104 Int)
1250  (declare-const truck_travel_time_104 Int)
1251  (declare-const truck_loc_104 Int)
1252  (declare-const s_stockb_104 Int)
1253  (declare-const s_stocka_104 Int)
1254  (declare-const a_stockb_104 Int)
1255  (declare-const a_stocka_104 Int)
1256  (declare-const b_stockb_104 Int)
1257  (declare-const b_stocka_104 Int)
1258  (declare-const c_stockb_104 Int)
1259  (declare-const c_stocka_104 Int)
1260  (declare-const loopto_104 Bool)
1261  (declare-const truck_stock_105 Int)
1262  (declare-const truck_travel_time_105 Int)
1263  (declare-const truck_loc_105 Int)
1264  (declare-const s_stockb_105 Int)
1265  (declare-const s_stocka_105 Int)
1266  (declare-const a_stockb_105 Int)
1267  (declare-const a_stocka_105 Int)
1268  (declare-const b_stockb_105 Int)
1269  (declare-const b_stocka_105 Int)
1270  (declare-const c_stockb_105 Int)
1271  (declare-const c_stocka_105 Int)
1272  (declare-const loopto_105 Bool)
1273  (declare-const truck_stock_106 Int)
1274  (declare-const truck_travel_time_106 Int)
1275  (declare-const truck_loc_106 Int)
1276  (declare-const s_stockb_106 Int)
1277  (declare-const s_stocka_106 Int)
1278  (declare-const a_stockb_106 Int)
1279  (declare-const a_stocka_106 Int)
1280  (declare-const b_stockb_106 Int)
```

```
1281   (declare-const b_stocka_106 Int)
1282   (declare-const c_stockb_106 Int)
1283   (declare-const c_stocka_106 Int)
1284   (declare-const loopto_106 Bool)
1285   (declare-const truck_stock_107 Int)
1286   (declare-const truck_travel_time_107 Int)
1287   (declare-const truck_loc_107 Int)
1288   (declare-const s_stockb_107 Int)
1289   (declare-const s_stocka_107 Int)
1290   (declare-const a_stockb_107 Int)
1291   (declare-const a_stocka_107 Int)
1292   (declare-const b_stockb_107 Int)
1293   (declare-const b_stocka_107 Int)
1294   (declare-const c_stockb_107 Int)
1295   (declare-const c_stocka_107 Int)
1296   (declare-const loopto_107 Bool)
1297   (declare-const truck_stock_108 Int)
1298   (declare-const truck_travel_time_108 Int)
1299   (declare-const truck_loc_108 Int)
1300   (declare-const s_stockb_108 Int)
1301   (declare-const s_stocka_108 Int)
1302   (declare-const a_stockb_108 Int)
1303   (declare-const a_stocka_108 Int)
1304   (declare-const b_stockb_108 Int)
1305   (declare-const b_stocka_108 Int)
1306   (declare-const c_stockb_108 Int)
1307   (declare-const c_stocka_108 Int)
1308   (declare-const loopto_108 Bool)
1309   (declare-const truck_stock_109 Int)
1310   (declare-const truck_travel_time_109 Int)
1311   (declare-const truck_loc_109 Int)
1312   (declare-const s_stockb_109 Int)
1313   (declare-const s_stocka_109 Int)
1314   (declare-const a_stockb_109 Int)
1315   (declare-const a_stocka_109 Int)
1316   (declare-const b_stockb_109 Int)
1317   (declare-const b_stocka_109 Int)
1318   (declare-const c_stockb_109 Int)
1319   (declare-const c_stocka_109 Int)
1320   (declare-const loopto_109 Bool)
1321   (declare-const truck_stock_110 Int)
1322   (declare-const truck_travel_time_110 Int)
1323   (declare-const truck_loc_110 Int)
1324   (declare-const s_stockb_110 Int)
1325   (declare-const s_stocka_110 Int)
1326   (declare-const a_stockb_110 Int)
1327   (declare-const a_stocka_110 Int)
1328   (declare-const b_stockb_110 Int)
1329   (declare-const b_stocka_110 Int)
1330   (declare-const c_stockb_110 Int)
1331   (declare-const c_stocka_110 Int)
1332   (declare-const loopto_110 Bool)
1333   (declare-const truck_stock_111 Int)
1334   (declare-const truck_travel_time_111 Int)
1335   (declare-const truck_loc_111 Int)
1336   (declare-const s_stockb_111 Int)
1337   (declare-const s_stocka_111 Int)
1338   (declare-const a_stockb_111 Int)
1339   (declare-const a_stocka_111 Int)
1340   (declare-const b_stockb_111 Int)
1341   (declare-const b_stocka_111 Int)
1342   (declare-const c_stockb_111 Int)
```

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1343  (declare-const c_stocka_111 Int)
1344  (declare-const loopto_111 Bool)
1345  (declare-const truck_stock_112 Int)
1346  (declare-const truck_travel_time_112 Int)
1347  (declare-const truck_loc_112 Int)
1348  (declare-const s_stockb_112 Int)
1349  (declare-const s_stocka_112 Int)
1350  (declare-const a_stockb_112 Int)
1351  (declare-const a_stocka_112 Int)
1352  (declare-const b_stockb_112 Int)
1353  (declare-const b_stocka_112 Int)
1354  (declare-const c_stockb_112 Int)
1355  (declare-const c_stocka_112 Int)
1356  (declare-const loopto_112 Bool)
1357  (declare-const truck_stock_113 Int)
1358  (declare-const truck_travel_time_113 Int)
1359  (declare-const truck_loc_113 Int)
1360  (declare-const s_stockb_113 Int)
1361  (declare-const s_stocka_113 Int)
1362  (declare-const a_stockb_113 Int)
1363  (declare-const a_stocka_113 Int)
1364  (declare-const b_stockb_113 Int)
1365  (declare-const b_stocka_113 Int)
1366  (declare-const c_stockb_113 Int)
1367  (declare-const c_stocka_113 Int)
1368  (declare-const loopto_113 Bool)
1369  (declare-const truck_stock_114 Int)
1370  (declare-const truck_travel_time_114 Int)
1371  (declare-const truck_loc_114 Int)
1372  (declare-const s_stockb_114 Int)
1373  (declare-const s_stocka_114 Int)
1374  (declare-const a_stockb_114 Int)
1375  (declare-const a_stocka_114 Int)
1376  (declare-const b_stockb_114 Int)
1377  (declare-const b_stocka_114 Int)
1378  (declare-const c_stockb_114 Int)
1379  (declare-const c_stocka_114 Int)
1380  (declare-const loopto_114 Bool)
1381  (declare-const truck_stock_115 Int)
1382  (declare-const truck_travel_time_115 Int)
1383  (declare-const truck_loc_115 Int)
1384  (declare-const s_stockb_115 Int)
1385  (declare-const s_stocka_115 Int)
1386  (declare-const a_stockb_115 Int)
1387  (declare-const a_stocka_115 Int)
1388  (declare-const b_stockb_115 Int)
1389  (declare-const b_stocka_115 Int)
1390  (declare-const c_stockb_115 Int)
1391  (declare-const c_stocka_115 Int)
1392  (declare-const loopto_115 Bool)
1393  (declare-const truck_stock_116 Int)
1394  (declare-const truck_travel_time_116 Int)
1395  (declare-const truck_loc_116 Int)
1396  (declare-const s_stockb_116 Int)
1397  (declare-const s_stocka_116 Int)
1398  (declare-const a_stockb_116 Int)
1399  (declare-const a_stocka_116 Int)
1400  (declare-const b_stockb_116 Int)
1401  (declare-const b_stocka_116 Int)
1402  (declare-const c_stockb_116 Int)
1403  (declare-const c_stocka_116 Int)
1404  (declare-const loopto_116 Bool)
```

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1405  (declare-const truck_stock_117 Int)
1406  (declare-const truck_travel_time_117 Int)
1407  (declare-const truck_loc_117 Int)
1408  (declare-const s_stockb_117 Int)
1409  (declare-const s_stocka_117 Int)
1410  (declare-const a_stockb_117 Int)
1411  (declare-const a_stocka_117 Int)
1412  (declare-const b_stockb_117 Int)
1413  (declare-const b_stocka_117 Int)
1414  (declare-const c_stockb_117 Int)
1415  (declare-const c_stocka_117 Int)
1416  (declare-const loopto_117 Bool)
1417  (declare-const truck_stock_118 Int)
1418  (declare-const truck_travel_time_118 Int)
1419  (declare-const truck_loc_118 Int)
1420  (declare-const s_stockb_118 Int)
1421  (declare-const s_stocka_118 Int)
1422  (declare-const a_stockb_118 Int)
1423  (declare-const a_stocka_118 Int)
1424  (declare-const b_stockb_118 Int)
1425  (declare-const b_stocka_118 Int)
1426  (declare-const c_stockb_118 Int)
1427  (declare-const c_stocka_118 Int)
1428  (declare-const loopto_118 Bool)
1429  (declare-const truck_stock_119 Int)
1430  (declare-const truck_travel_time_119 Int)
1431  (declare-const truck_loc_119 Int)
1432  (declare-const s_stockb_119 Int)
1433  (declare-const s_stocka_119 Int)
1434  (declare-const a_stockb_119 Int)
1435  (declare-const a_stocka_119 Int)
1436  (declare-const b_stockb_119 Int)
1437  (declare-const b_stocka_119 Int)
1438  (declare-const c_stockb_119 Int)
1439  (declare-const c_stocka_119 Int)
1440  (declare-const loopto_119 Bool)
1441  (declare-const truck_stock_120 Int)
1442  (declare-const truck_travel_time_120 Int)
1443  (declare-const truck_loc_120 Int)
1444  (declare-const s_stockb_120 Int)
1445  (declare-const s_stocka_120 Int)
1446  (declare-const a_stockb_120 Int)
1447  (declare-const a_stocka_120 Int)
1448  (declare-const b_stockb_120 Int)
1449  (declare-const b_stocka_120 Int)
1450  (declare-const c_stockb_120 Int)
1451  (declare-const c_stocka_120 Int)
1452  (declare-const loopto_120 Bool)
1453  (declare-const truck_stock_121 Int)
1454  (declare-const truck_travel_time_121 Int)
1455  (declare-const truck_loc_121 Int)
1456  (declare-const s_stockb_121 Int)
1457  (declare-const s_stocka_121 Int)
1458  (declare-const a_stockb_121 Int)
1459  (declare-const a_stocka_121 Int)
1460  (declare-const b_stockb_121 Int)
1461  (declare-const b_stocka_121 Int)
1462  (declare-const c_stockb_121 Int)
1463  (declare-const c_stocka_121 Int)
1464  (declare-const loopto_121 Bool)
1465  (declare-const truck_stock_122 Int)
1466  (declare-const truck_travel_time_122 Int)
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1467  (declare-const truck_loc_122 Int)
1468  (declare-const s_stockb_122 Int)
1469  (declare-const s_stocka_122 Int)
1470  (declare-const a_stockb_122 Int)
1471  (declare-const a_stocka_122 Int)
1472  (declare-const b_stockb_122 Int)
1473  (declare-const b_stocka_122 Int)
1474  (declare-const c_stockb_122 Int)
1475  (declare-const c_stocka_122 Int)
1476  (declare-const loopto_122 Bool)
1477  (declare-const truck_stock_123 Int)
1478  (declare-const truck_travel_time_123 Int)
1479  (declare-const truck_loc_123 Int)
1480  (declare-const s_stockb_123 Int)
1481  (declare-const s_stocka_123 Int)
1482  (declare-const a_stockb_123 Int)
1483  (declare-const a_stocka_123 Int)
1484  (declare-const b_stockb_123 Int)
1485  (declare-const b_stocka_123 Int)
1486  (declare-const c_stockb_123 Int)
1487  (declare-const c_stocka_123 Int)
1488  (declare-const loopto_123 Bool)
1489  (declare-const truck_stock_124 Int)
1490  (declare-const truck_travel_time_124 Int)
1491  (declare-const truck_loc_124 Int)
1492  (declare-const s_stockb_124 Int)
1493  (declare-const s_stocka_124 Int)
1494  (declare-const a_stockb_124 Int)
1495  (declare-const a_stocka_124 Int)
1496  (declare-const b_stockb_124 Int)
1497  (declare-const b_stocka_124 Int)
1498  (declare-const c_stockb_124 Int)
1499  (declare-const c_stocka_124 Int)
1500  (declare-const loopto_124 Bool)
1501  (declare-const truck_stock_125 Int)
1502  (declare-const truck_travel_time_125 Int)
1503  (declare-const truck_loc_125 Int)
1504  (declare-const s_stockb_125 Int)
1505  (declare-const s_stocka_125 Int)
1506  (declare-const a_stockb_125 Int)
1507  (declare-const a_stocka_125 Int)
1508  (declare-const b_stockb_125 Int)
1509  (declare-const b_stocka_125 Int)
1510  (declare-const c_stockb_125 Int)
1511  (declare-const c_stocka_125 Int)
1512  (declare-const loopto_125 Bool)
1513  (declare-const truck_stock_126 Int)
1514  (declare-const truck_travel_time_126 Int)
1515  (declare-const truck_loc_126 Int)
1516  (declare-const s_stockb_126 Int)
1517  (declare-const s_stocka_126 Int)
1518  (declare-const a_stockb_126 Int)
1519  (declare-const a_stocka_126 Int)
1520  (declare-const b_stockb_126 Int)
1521  (declare-const b_stocka_126 Int)
1522  (declare-const c_stockb_126 Int)
1523  (declare-const c_stocka_126 Int)
1524  (declare-const loopto_126 Bool)
1525  (declare-const truck_stock_127 Int)
1526  (declare-const truck_travel_time_127 Int)
1527  (declare-const truck_loc_127 Int)
1528  (declare-const s_stockb_127 Int)
```

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1529  (declare-const s_stocka_127 Int)
1530  (declare-const a_stockb_127 Int)
1531  (declare-const a_stocka_127 Int)
1532  (declare-const b_stockb_127 Int)
1533  (declare-const b_stocka_127 Int)
1534  (declare-const c_stockb_127 Int)
1535  (declare-const c_stocka_127 Int)
1536  (declare-const loopto_127 Bool)
1537  (declare-const truck_stock_128 Int)
1538  (declare-const truck_travel_time_128 Int)
1539  (declare-const truck_loc_128 Int)
1540  (declare-const s_stockb_128 Int)
1541  (declare-const s_stocka_128 Int)
1542  (declare-const a_stockb_128 Int)
1543  (declare-const a_stocka_128 Int)
1544  (declare-const b_stockb_128 Int)
1545  (declare-const b_stocka_128 Int)
1546  (declare-const c_stockb_128 Int)
1547  (declare-const c_stocka_128 Int)
1548  (declare-const loopto_128 Bool)
1549  (declare-const truck_stock_129 Int)
1550  (declare-const truck_travel_time_129 Int)
1551  (declare-const truck_loc_129 Int)
1552  (declare-const s_stockb_129 Int)
1553  (declare-const s_stocka_129 Int)
1554  (declare-const a_stockb_129 Int)
1555  (declare-const a_stocka_129 Int)
1556  (declare-const b_stockb_129 Int)
1557  (declare-const b_stocka_129 Int)
1558  (declare-const c_stockb_129 Int)
1559  (declare-const c_stocka_129 Int)
1560  (declare-const loopto_129 Bool)
1561  (declare-const truck_stock_130 Int)
1562  (declare-const truck_travel_time_130 Int)
1563  (declare-const truck_loc_130 Int)
1564  (declare-const s_stockb_130 Int)
1565  (declare-const s_stocka_130 Int)
1566  (declare-const a_stockb_130 Int)
1567  (declare-const a_stocka_130 Int)
1568  (declare-const b_stockb_130 Int)
1569  (declare-const b_stocka_130 Int)
1570  (declare-const c_stockb_130 Int)
1571  (declare-const c_stocka_130 Int)
1572  (declare-const loopto_130 Bool)
1573  (declare-const truck_stock_131 Int)
1574  (declare-const truck_travel_time_131 Int)
1575  (declare-const truck_loc_131 Int)
1576  (declare-const s_stockb_131 Int)
1577  (declare-const s_stocka_131 Int)
1578  (declare-const a_stockb_131 Int)
1579  (declare-const a_stocka_131 Int)
1580  (declare-const b_stockb_131 Int)
1581  (declare-const b_stocka_131 Int)
1582  (declare-const c_stockb_131 Int)
1583  (declare-const c_stocka_131 Int)
1584  (declare-const loopto_131 Bool)
1585  (declare-const truck_stock_132 Int)
1586  (declare-const truck_travel_time_132 Int)
1587  (declare-const truck_loc_132 Int)
1588  (declare-const s_stockb_132 Int)
1589  (declare-const s_stocka_132 Int)
1590  (declare-const a_stockb_132 Int)
```

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1591  (declare-const a_stocka_132 Int)
1592  (declare-const b_stockb_132 Int)
1593  (declare-const b_stocka_132 Int)
1594  (declare-const c_stockb_132 Int)
1595  (declare-const c_stocka_132 Int)
1596  (declare-const loopto_132 Bool)
1597  (declare-const truck_stock_133 Int)
1598  (declare-const truck_travel_time_133 Int)
1599  (declare-const truck_loc_133 Int)
1600  (declare-const s_stockb_133 Int)
1601  (declare-const s_stocka_133 Int)
1602  (declare-const a_stockb_133 Int)
1603  (declare-const a_stocka_133 Int)
1604  (declare-const b_stockb_133 Int)
1605  (declare-const b_stocka_133 Int)
1606  (declare-const c_stockb_133 Int)
1607  (declare-const c_stocka_133 Int)
1608  (declare-const loopto_133 Bool)
1609  (declare-const truck_stock_134 Int)
1610  (declare-const truck_travel_time_134 Int)
1611  (declare-const truck_loc_134 Int)
1612  (declare-const s_stockb_134 Int)
1613  (declare-const s_stocka_134 Int)
1614  (declare-const a_stockb_134 Int)
1615  (declare-const a_stocka_134 Int)
1616  (declare-const b_stockb_134 Int)
1617  (declare-const b_stocka_134 Int)
1618  (declare-const c_stockb_134 Int)
1619  (declare-const c_stocka_134 Int)
1620  (declare-const loopto_134 Bool)
1621  (declare-const truck_stock_135 Int)
1622  (declare-const truck_travel_time_135 Int)
1623  (declare-const truck_loc_135 Int)
1624  (declare-const s_stockb_135 Int)
1625  (declare-const s_stocka_135 Int)
1626  (declare-const a_stockb_135 Int)
1627  (declare-const a_stocka_135 Int)
1628  (declare-const b_stockb_135 Int)
1629  (declare-const b_stocka_135 Int)
1630  (declare-const c_stockb_135 Int)
1631  (declare-const c_stocka_135 Int)
1632  (declare-const loopto_135 Bool)
1633  (declare-const truck_stock_136 Int)
1634  (declare-const truck_travel_time_136 Int)
1635  (declare-const truck_loc_136 Int)
1636  (declare-const s_stockb_136 Int)
1637  (declare-const s_stocka_136 Int)
1638  (declare-const a_stockb_136 Int)
1639  (declare-const a_stocka_136 Int)
1640  (declare-const b_stockb_136 Int)
1641  (declare-const b_stocka_136 Int)
1642  (declare-const c_stockb_136 Int)
1643  (declare-const c_stocka_136 Int)
1644  (declare-const loopto_136 Bool)
1645  (declare-const truck_stock_137 Int)
1646  (declare-const truck_travel_time_137 Int)
1647  (declare-const truck_loc_137 Int)
1648  (declare-const s_stockb_137 Int)
1649  (declare-const s_stocka_137 Int)
1650  (declare-const a_stockb_137 Int)
1651  (declare-const a_stocka_137 Int)
1652  (declare-const b_stockb_137 Int)
```

```
1653  (declare-const b_stocka_137 Int)
1654  (declare-const c_stockb_137 Int)
1655  (declare-const c_stocka_137 Int)
1656  (declare-const loopto_137 Bool)
1657  (declare-const truck_stock_138 Int)
1658  (declare-const truck_travel_time_138 Int)
1659  (declare-const truck_loc_138 Int)
1660  (declare-const s_stockb_138 Int)
1661  (declare-const s_stocka_138 Int)
1662  (declare-const a_stockb_138 Int)
1663  (declare-const a_stocka_138 Int)
1664  (declare-const b_stockb_138 Int)
1665  (declare-const b_stocka_138 Int)
1666  (declare-const c_stockb_138 Int)
1667  (declare-const c_stocka_138 Int)
1668  (declare-const loopto_138 Bool)
1669  (declare-const truck_stock_139 Int)
1670  (declare-const truck_travel_time_139 Int)
1671  (declare-const truck_loc_139 Int)
1672  (declare-const s_stockb_139 Int)
1673  (declare-const s_stocka_139 Int)
1674  (declare-const a_stockb_139 Int)
1675  (declare-const a_stocka_139 Int)
1676  (declare-const b_stockb_139 Int)
1677  (declare-const b_stocka_139 Int)
1678  (declare-const c_stockb_139 Int)
1679  (declare-const c_stocka_139 Int)
1680  (declare-const loopto_139 Bool)
1681  (declare-const truck_stock_140 Int)
1682  (declare-const truck_travel_time_140 Int)
1683  (declare-const truck_loc_140 Int)
1684  (declare-const s_stockb_140 Int)
1685  (declare-const s_stocka_140 Int)
1686  (declare-const a_stockb_140 Int)
1687  (declare-const a_stocka_140 Int)
1688  (declare-const b_stockb_140 Int)
1689  (declare-const b_stocka_140 Int)
1690  (declare-const c_stockb_140 Int)
1691  (declare-const c_stocka_140 Int)
1692  (declare-const loopto_140 Bool)
1693  (declare-const truck_stock_141 Int)
1694  (declare-const truck_travel_time_141 Int)
1695  (declare-const truck_loc_141 Int)
1696  (declare-const s_stockb_141 Int)
1697  (declare-const s_stocka_141 Int)
1698  (declare-const a_stockb_141 Int)
1699  (declare-const a_stocka_141 Int)
1700  (declare-const b_stockb_141 Int)
1701  (declare-const b_stocka_141 Int)
1702  (declare-const c_stockb_141 Int)
1703  (declare-const c_stocka_141 Int)
1704  (declare-const loopto_141 Bool)
1705  (declare-const truck_stock_142 Int)
1706  (declare-const truck_travel_time_142 Int)
1707  (declare-const truck_loc_142 Int)
1708  (declare-const s_stockb_142 Int)
1709  (declare-const s_stocka_142 Int)
1710  (declare-const a_stockb_142 Int)
1711  (declare-const a_stocka_142 Int)
1712  (declare-const b_stockb_142 Int)
1713  (declare-const b_stocka_142 Int)
1714  (declare-const c_stockb_142 Int)
```

```
1715    (declare-const c_stocka_142 Int)
1716    (declare-const loopto_142 Bool)
1717    (declare-const truck_stock_143 Int)
1718    (declare-const truck_travel_time_143 Int)
1719    (declare-const truck_loc_143 Int)
1720    (declare-const s_stockb_143 Int)
1721    (declare-const s_stocka_143 Int)
1722    (declare-const a_stockb_143 Int)
1723    (declare-const a_stocka_143 Int)
1724    (declare-const b_stockb_143 Int)
1725    (declare-const b_stocka_143 Int)
1726    (declare-const c_stockb_143 Int)
1727    (declare-const c_stocka_143 Int)
1728    (declare-const loopto_143 Bool)
1729    (declare-const truck_stock_144 Int)
1730    (declare-const truck_travel_time_144 Int)
1731    (declare-const truck_loc_144 Int)
1732    (declare-const s_stockb_144 Int)
1733    (declare-const s_stocka_144 Int)
1734    (declare-const a_stockb_144 Int)
1735    (declare-const a_stocka_144 Int)
1736    (declare-const b_stockb_144 Int)
1737    (declare-const b_stocka_144 Int)
1738    (declare-const c_stockb_144 Int)
1739    (declare-const c_stocka_144 Int)
1740    (declare-const loopto_144 Bool)
1741    (declare-const truck_stock_145 Int)
1742    (declare-const truck_travel_time_145 Int)
1743    (declare-const truck_loc_145 Int)
1744    (declare-const s_stockb_145 Int)
1745    (declare-const s_stocka_145 Int)
1746    (declare-const a_stockb_145 Int)
1747    (declare-const a_stocka_145 Int)
1748    (declare-const b_stockb_145 Int)
1749    (declare-const b_stocka_145 Int)
1750    (declare-const c_stockb_145 Int)
1751    (declare-const c_stocka_145 Int)
1752    (declare-const loopto_145 Bool)
1753    (declare-const truck_stock_146 Int)
1754    (declare-const truck_travel_time_146 Int)
1755    (declare-const truck_loc_146 Int)
1756    (declare-const s_stockb_146 Int)
1757    (declare-const s_stocka_146 Int)
1758    (declare-const a_stockb_146 Int)
1759    (declare-const a_stocka_146 Int)
1760    (declare-const b_stockb_146 Int)
1761    (declare-const b_stocka_146 Int)
1762    (declare-const c_stockb_146 Int)
1763    (declare-const c_stocka_146 Int)
1764    (declare-const loopto_146 Bool)
1765    (declare-const truck_stock_147 Int)
1766    (declare-const truck_travel_time_147 Int)
1767    (declare-const truck_loc_147 Int)
1768    (declare-const s_stockb_147 Int)
1769    (declare-const s_stocka_147 Int)
1770    (declare-const a_stockb_147 Int)
1771    (declare-const a_stocka_147 Int)
1772    (declare-const b_stockb_147 Int)
1773    (declare-const b_stocka_147 Int)
1774    (declare-const c_stockb_147 Int)
1775    (declare-const c_stocka_147 Int)
1776    (declare-const loopto_147 Bool)
```

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1777  (declare-const truck_stock_148 Int)
1778  (declare-const truck_travel_time_148 Int)
1779  (declare-const truck_loc_148 Int)
1780  (declare-const s_stockb_148 Int)
1781  (declare-const s_stocka_148 Int)
1782  (declare-const a_stockb_148 Int)
1783  (declare-const a_stocka_148 Int)
1784  (declare-const b_stockb_148 Int)
1785  (declare-const b_stocka_148 Int)
1786  (declare-const c_stockb_148 Int)
1787  (declare-const c_stocka_148 Int)
1788  (declare-const loopto_148 Bool)
1789  (declare-const truck_stock_149 Int)
1790  (declare-const truck_travel_time_149 Int)
1791  (declare-const truck_loc_149 Int)
1792  (declare-const s_stockb_149 Int)
1793  (declare-const s_stocka_149 Int)
1794  (declare-const a_stockb_149 Int)
1795  (declare-const a_stocka_149 Int)
1796  (declare-const b_stockb_149 Int)
1797  (declare-const b_stocka_149 Int)
1798  (declare-const c_stockb_149 Int)
1799  (declare-const c_stocka_149 Int)
1800  (declare-const loopto_149 Bool)
1801  (declare-const truck_stock_150 Int)
1802  (declare-const truck_travel_time_150 Int)
1803  (declare-const truck_loc_150 Int)
1804  (declare-const s_stockb_150 Int)
1805  (declare-const s_stocka_150 Int)
1806  (declare-const a_stockb_150 Int)
1807  (declare-const a_stocka_150 Int)
1808  (declare-const b_stockb_150 Int)
1809  (declare-const b_stocka_150 Int)
1810  (declare-const c_stockb_150 Int)
1811  (declare-const c_stocka_150 Int)
1812  (declare-const loopto_150 Bool)
1813  (declare-const truck_stock_151 Int)
1814  (declare-const truck_travel_time_151 Int)
1815  (declare-const truck_loc_151 Int)
1816  (declare-const s_stockb_151 Int)
1817  (declare-const s_stocka_151 Int)
1818  (declare-const a_stockb_151 Int)
1819  (declare-const a_stocka_151 Int)
1820  (declare-const b_stockb_151 Int)
1821  (declare-const b_stocka_151 Int)
1822  (declare-const c_stockb_151 Int)
1823  (declare-const c_stocka_151 Int)
1824  (declare-const loopto_151 Bool)
1825  (declare-const truck_stock_152 Int)
1826  (declare-const truck_travel_time_152 Int)
1827  (declare-const truck_loc_152 Int)
1828  (declare-const s_stockb_152 Int)
1829  (declare-const s_stocka_152 Int)
1830  (declare-const a_stockb_152 Int)
1831  (declare-const a_stocka_152 Int)
1832  (declare-const b_stockb_152 Int)
1833  (declare-const b_stocka_152 Int)
1834  (declare-const c_stockb_152 Int)
1835  (declare-const c_stocka_152 Int)
1836  (declare-const loopto_152 Bool)
1837  (declare-const truck_stock_153 Int)
1838  (declare-const truck_travel_time_153 Int)
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1839   (declare-const truck_loc_153 Int)
1840   (declare-const s_stockb_153 Int)
1841   (declare-const s_stocka_153 Int)
1842   (declare-const a_stockb_153 Int)
1843   (declare-const a_stocka_153 Int)
1844   (declare-const b_stockb_153 Int)
1845   (declare-const b_stocka_153 Int)
1846   (declare-const c_stockb_153 Int)
1847   (declare-const c_stocka_153 Int)
1848   (declare-const loopto_153 Bool)
1849   (declare-const truck_stock_154 Int)
1850   (declare-const truck_travel_time_154 Int)
1851   (declare-const truck_loc_154 Int)
1852   (declare-const s_stockb_154 Int)
1853   (declare-const s_stocka_154 Int)
1854   (declare-const a_stockb_154 Int)
1855   (declare-const a_stocka_154 Int)
1856   (declare-const b_stockb_154 Int)
1857   (declare-const b_stocka_154 Int)
1858   (declare-const c_stockb_154 Int)
1859   (declare-const c_stocka_154 Int)
1860   (declare-const loopto_154 Bool)
1861   (declare-const truck_stock_155 Int)
1862   (declare-const truck_travel_time_155 Int)
1863   (declare-const truck_loc_155 Int)
1864   (declare-const s_stockb_155 Int)
1865   (declare-const s_stocka_155 Int)
1866   (declare-const a_stockb_155 Int)
1867   (declare-const a_stocka_155 Int)
1868   (declare-const b_stockb_155 Int)
1869   (declare-const b_stocka_155 Int)
1870   (declare-const c_stockb_155 Int)
1871   (declare-const c_stocka_155 Int)
1872   (declare-const loopto_155 Bool)
1873   (declare-const truck_stock_156 Int)
1874   (declare-const truck_travel_time_156 Int)
1875   (declare-const truck_loc_156 Int)
1876   (declare-const s_stockb_156 Int)
1877   (declare-const s_stocka_156 Int)
1878   (declare-const a_stockb_156 Int)
1879   (declare-const a_stocka_156 Int)
1880   (declare-const b_stockb_156 Int)
1881   (declare-const b_stocka_156 Int)
1882   (declare-const c_stockb_156 Int)
1883   (declare-const c_stocka_156 Int)
1884   (declare-const loopto_156 Bool)
1885   (declare-const truck_stock_157 Int)
1886   (declare-const truck_travel_time_157 Int)
1887   (declare-const truck_loc_157 Int)
1888   (declare-const s_stockb_157 Int)
1889   (declare-const s_stocka_157 Int)
1890   (declare-const a_stockb_157 Int)
1891   (declare-const a_stocka_157 Int)
1892   (declare-const b_stockb_157 Int)
1893   (declare-const b_stocka_157 Int)
1894   (declare-const c_stockb_157 Int)
1895   (declare-const c_stocka_157 Int)
1896   (declare-const loopto_157 Bool)
1897   (declare-const truck_stock_158 Int)
1898   (declare-const truck_travel_time_158 Int)
1899   (declare-const truck_loc_158 Int)
1900   (declare-const s_stockb_158 Int)
```

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1901  (declare-const s_stocka_158 Int)
1902  (declare-const a_stockb_158 Int)
1903  (declare-const a_stocka_158 Int)
1904  (declare-const b_stockb_158 Int)
1905  (declare-const b_stocka_158 Int)
1906  (declare-const c_stockb_158 Int)
1907  (declare-const c_stocka_158 Int)
1908  (declare-const loopto_158 Bool)
1909  (declare-const truck_stock_159 Int)
1910  (declare-const truck_travel_time_159 Int)
1911  (declare-const truck_loc_159 Int)
1912  (declare-const s_stockb_159 Int)
1913  (declare-const s_stocka_159 Int)
1914  (declare-const a_stockb_159 Int)
1915  (declare-const a_stocka_159 Int)
1916  (declare-const b_stockb_159 Int)
1917  (declare-const b_stocka_159 Int)
1918  (declare-const c_stockb_159 Int)
1919  (declare-const c_stocka_159 Int)
1920  (declare-const loopto_159 Bool)
1921  (declare-const truck_stock_160 Int)
1922  (declare-const truck_travel_time_160 Int)
1923  (declare-const truck_loc_160 Int)
1924  (declare-const s_stockb_160 Int)
1925  (declare-const s_stocka_160 Int)
1926  (declare-const a_stockb_160 Int)
1927  (declare-const a_stocka_160 Int)
1928  (declare-const b_stockb_160 Int)
1929  (declare-const b_stocka_160 Int)
1930  (declare-const c_stockb_160 Int)
1931  (declare-const c_stocka_160 Int)
1932  (declare-const loopto_160 Bool)
1933  (declare-const truck_stock_161 Int)
1934  (declare-const truck_travel_time_161 Int)
1935  (declare-const truck_loc_161 Int)
1936  (declare-const s_stockb_161 Int)
1937  (declare-const s_stocka_161 Int)
1938  (declare-const a_stockb_161 Int)
1939  (declare-const a_stocka_161 Int)
1940  (declare-const b_stockb_161 Int)
1941  (declare-const b_stocka_161 Int)
1942  (declare-const c_stockb_161 Int)
1943  (declare-const c_stocka_161 Int)
1944  (declare-const loopto_161 Bool)
1945  (declare-const truck_stock_162 Int)
1946  (declare-const truck_travel_time_162 Int)
1947  (declare-const truck_loc_162 Int)
1948  (declare-const s_stockb_162 Int)
1949  (declare-const s_stocka_162 Int)
1950  (declare-const a_stockb_162 Int)
1951  (declare-const a_stocka_162 Int)
1952  (declare-const b_stockb_162 Int)
1953  (declare-const b_stocka_162 Int)
1954  (declare-const c_stockb_162 Int)
1955  (declare-const c_stocka_162 Int)
1956  (declare-const loopto_162 Bool)
1957  (declare-const truck_stock_163 Int)
1958  (declare-const truck_travel_time_163 Int)
1959  (declare-const truck_loc_163 Int)
1960  (declare-const s_stockb_163 Int)
1961  (declare-const s_stocka_163 Int)
1962  (declare-const a_stockb_163 Int)
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1963  (declare-const a_stocka_163 Int)
1964  (declare-const b_stockb_163 Int)
1965  (declare-const b_stocka_163 Int)
1966  (declare-const c_stockb_163 Int)
1967  (declare-const c_stocka_163 Int)
1968  (declare-const loopto_163 Bool)
1969  (declare-const truck_stock_164 Int)
1970  (declare-const truck_travel_time_164 Int)
1971  (declare-const truck_loc_164 Int)
1972  (declare-const s_stockb_164 Int)
1973  (declare-const s_stocka_164 Int)
1974  (declare-const a_stockb_164 Int)
1975  (declare-const a_stocka_164 Int)
1976  (declare-const b_stockb_164 Int)
1977  (declare-const b_stocka_164 Int)
1978  (declare-const c_stockb_164 Int)
1979  (declare-const c_stocka_164 Int)
1980  (declare-const loopto_164 Bool)
1981  (declare-const truck_stock_165 Int)
1982  (declare-const truck_travel_time_165 Int)
1983  (declare-const truck_loc_165 Int)
1984  (declare-const s_stockb_165 Int)
1985  (declare-const s_stocka_165 Int)
1986  (declare-const a_stockb_165 Int)
1987  (declare-const a_stocka_165 Int)
1988  (declare-const b_stockb_165 Int)
1989  (declare-const b_stocka_165 Int)
1990  (declare-const c_stockb_165 Int)
1991  (declare-const c_stocka_165 Int)
1992  (declare-const loopto_165 Bool)
1993  (declare-const truck_stock_166 Int)
1994  (declare-const truck_travel_time_166 Int)
1995  (declare-const truck_loc_166 Int)
1996  (declare-const s_stockb_166 Int)
1997  (declare-const s_stocka_166 Int)
1998  (declare-const a_stockb_166 Int)
1999  (declare-const a_stocka_166 Int)
2000  (declare-const b_stockb_166 Int)
2001  (declare-const b_stocka_166 Int)
2002  (declare-const c_stockb_166 Int)
2003  (declare-const c_stocka_166 Int)
2004  (declare-const loopto_166 Bool)
2005  (declare-const truck_stock_167 Int)
2006  (declare-const truck_travel_time_167 Int)
2007  (declare-const truck_loc_167 Int)
2008  (declare-const s_stockb_167 Int)
2009  (declare-const s_stocka_167 Int)
2010  (declare-const a_stockb_167 Int)
2011  (declare-const a_stocka_167 Int)
2012  (declare-const b_stockb_167 Int)
2013  (declare-const b_stocka_167 Int)
2014  (declare-const c_stockb_167 Int)
2015  (declare-const c_stocka_167 Int)
2016  (declare-const loopto_167 Bool)
2017  (declare-const truck_stock_168 Int)
2018  (declare-const truck_travel_time_168 Int)
2019  (declare-const truck_loc_168 Int)
2020  (declare-const s_stockb_168 Int)
2021  (declare-const s_stocka_168 Int)
2022  (declare-const a_stockb_168 Int)
2023  (declare-const a_stocka_168 Int)
2024  (declare-const b_stockb_168 Int)
```

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2025   (declare-const b_stocka_168 Int)
2026   (declare-const c_stockb_168 Int)
2027   (declare-const c_stocka_168 Int)
2028   (declare-const loopto_168 Bool)
2029   (declare-const truck_stock_169 Int)
2030   (declare-const truck_travel_time_169 Int)
2031   (declare-const truck_loc_169 Int)
2032   (declare-const s_stockb_169 Int)
2033   (declare-const s_stocka_169 Int)
2034   (declare-const a_stockb_169 Int)
2035   (declare-const a_stocka_169 Int)
2036   (declare-const b_stockb_169 Int)
2037   (declare-const b_stocka_169 Int)
2038   (declare-const c_stockb_169 Int)
2039   (declare-const c_stocka_169 Int)
2040   (declare-const loopto_169 Bool)
2041   (declare-const truck_stock_170 Int)
2042   (declare-const truck_travel_time_170 Int)
2043   (declare-const truck_loc_170 Int)
2044   (declare-const s_stockb_170 Int)
2045   (declare-const s_stocka_170 Int)
2046   (declare-const a_stockb_170 Int)
2047   (declare-const a_stocka_170 Int)
2048   (declare-const b_stockb_170 Int)
2049   (declare-const b_stocka_170 Int)
2050   (declare-const c_stockb_170 Int)
2051   (declare-const c_stocka_170 Int)
2052   (declare-const loopto_170 Bool)
2053   (declare-const truck_stock_171 Int)
2054   (declare-const truck_travel_time_171 Int)
2055   (declare-const truck_loc_171 Int)
2056   (declare-const s_stockb_171 Int)
2057   (declare-const s_stocka_171 Int)
2058   (declare-const a_stockb_171 Int)
2059   (declare-const a_stocka_171 Int)
2060   (declare-const b_stockb_171 Int)
2061   (declare-const b_stocka_171 Int)
2062   (declare-const c_stockb_171 Int)
2063   (declare-const c_stocka_171 Int)
2064   (declare-const loopto_171 Bool)
2065   (declare-const truck_stock_172 Int)
2066   (declare-const truck_travel_time_172 Int)
2067   (declare-const truck_loc_172 Int)
2068   (declare-const s_stockb_172 Int)
2069   (declare-const s_stocka_172 Int)
2070   (declare-const a_stockb_172 Int)
2071   (declare-const a_stocka_172 Int)
2072   (declare-const b_stockb_172 Int)
2073   (declare-const b_stocka_172 Int)
2074   (declare-const c_stockb_172 Int)
2075   (declare-const c_stocka_172 Int)
2076   (declare-const loopto_172 Bool)
2077   (declare-const truck_stock_173 Int)
2078   (declare-const truck_travel_time_173 Int)
2079   (declare-const truck_loc_173 Int)
2080   (declare-const s_stockb_173 Int)
2081   (declare-const s_stocka_173 Int)
2082   (declare-const a_stockb_173 Int)
2083   (declare-const a_stocka_173 Int)
2084   (declare-const b_stockb_173 Int)
2085   (declare-const b_stocka_173 Int)
2086   (declare-const c_stockb_173 Int)
```

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2087  (declare-const c_stocka_173 Int)
2088  (declare-const loopto_173 Bool)
2089  (declare-const truck_stock_174 Int)
2090  (declare-const truck_travel_time_174 Int)
2091  (declare-const truck_loc_174 Int)
2092  (declare-const s_stockb_174 Int)
2093  (declare-const s_stocka_174 Int)
2094  (declare-const a_stockb_174 Int)
2095  (declare-const a_stocka_174 Int)
2096  (declare-const b_stockb_174 Int)
2097  (declare-const b_stocka_174 Int)
2098  (declare-const c_stockb_174 Int)
2099  (declare-const c_stocka_174 Int)
2100  (declare-const loopto_174 Bool)
2101  (declare-const truck_stock_175 Int)
2102  (declare-const truck_travel_time_175 Int)
2103  (declare-const truck_loc_175 Int)
2104  (declare-const s_stockb_175 Int)
2105  (declare-const s_stocka_175 Int)
2106  (declare-const a_stockb_175 Int)
2107  (declare-const a_stocka_175 Int)
2108  (declare-const b_stockb_175 Int)
2109  (declare-const b_stocka_175 Int)
2110  (declare-const c_stockb_175 Int)
2111  (declare-const c_stocka_175 Int)
2112  (declare-const loopto_175 Bool)
2113  (declare-const truck_stock_176 Int)
2114  (declare-const truck_travel_time_176 Int)
2115  (declare-const truck_loc_176 Int)
2116  (declare-const s_stockb_176 Int)
2117  (declare-const s_stocka_176 Int)
2118  (declare-const a_stockb_176 Int)
2119  (declare-const a_stocka_176 Int)
2120  (declare-const b_stockb_176 Int)
2121  (declare-const b_stocka_176 Int)
2122  (declare-const c_stockb_176 Int)
2123  (declare-const c_stocka_176 Int)
2124  (declare-const loopto_176 Bool)
2125  (declare-const truck_stock_177 Int)
2126  (declare-const truck_travel_time_177 Int)
2127  (declare-const truck_loc_177 Int)
2128  (declare-const s_stockb_177 Int)
2129  (declare-const s_stocka_177 Int)
2130  (declare-const a_stockb_177 Int)
2131  (declare-const a_stocka_177 Int)
2132  (declare-const b_stockb_177 Int)
2133  (declare-const b_stocka_177 Int)
2134  (declare-const c_stockb_177 Int)
2135  (declare-const c_stocka_177 Int)
2136  (declare-const loopto_177 Bool)
2137  (declare-const truck_stock_178 Int)
2138  (declare-const truck_travel_time_178 Int)
2139  (declare-const truck_loc_178 Int)
2140  (declare-const s_stockb_178 Int)
2141  (declare-const s_stocka_178 Int)
2142  (declare-const a_stockb_178 Int)
2143  (declare-const a_stocka_178 Int)
2144  (declare-const b_stockb_178 Int)
2145  (declare-const b_stocka_178 Int)
2146  (declare-const c_stockb_178 Int)
2147  (declare-const c_stocka_178 Int)
2148  (declare-const loopto_178 Bool)
```

```
2149  (declare-const truck_stock_179 Int)
2150  (declare-const truck_travel_time_179 Int)
2151  (declare-const truck_loc_179 Int)
2152  (declare-const s_stockb_179 Int)
2153  (declare-const s_stocka_179 Int)
2154  (declare-const a_stockb_179 Int)
2155  (declare-const a_stocka_179 Int)
2156  (declare-const b_stockb_179 Int)
2157  (declare-const b_stocka_179 Int)
2158  (declare-const c_stockb_179 Int)
2159  (declare-const c_stocka_179 Int)
2160  (declare-const loopto_179 Bool)
2161  (declare-const truck_stock_180 Int)
2162  (declare-const truck_travel_time_180 Int)
2163  (declare-const truck_loc_180 Int)
2164  (declare-const s_stockb_180 Int)
2165  (declare-const s_stocka_180 Int)
2166  (declare-const a_stockb_180 Int)
2167  (declare-const a_stocka_180 Int)
2168  (declare-const b_stockb_180 Int)
2169  (declare-const b_stocka_180 Int)
2170  (declare-const c_stockb_180 Int)
2171  (declare-const c_stocka_180 Int)
2172  (declare-const loopto_180 Bool)
2173  (declare-const truck_stock_181 Int)
2174  (declare-const truck_travel_time_181 Int)
2175  (declare-const truck_loc_181 Int)
2176  (declare-const s_stockb_181 Int)
2177  (declare-const s_stocka_181 Int)
2178  (declare-const a_stockb_181 Int)
2179  (declare-const a_stocka_181 Int)
2180  (declare-const b_stockb_181 Int)
2181  (declare-const b_stocka_181 Int)
2182  (declare-const c_stockb_181 Int)
2183  (declare-const c_stocka_181 Int)
2184  (declare-const loopto_181 Bool)
2185  (declare-const truck_stock_182 Int)
2186  (declare-const truck_travel_time_182 Int)
2187  (declare-const truck_loc_182 Int)
2188  (declare-const s_stockb_182 Int)
2189  (declare-const s_stocka_182 Int)
2190  (declare-const a_stockb_182 Int)
2191  (declare-const a_stocka_182 Int)
2192  (declare-const b_stockb_182 Int)
2193  (declare-const b_stocka_182 Int)
2194  (declare-const c_stockb_182 Int)
2195  (declare-const c_stocka_182 Int)
2196  (declare-const loopto_182 Bool)
2197  (declare-const truck_stock_183 Int)
2198  (declare-const truck_travel_time_183 Int)
2199  (declare-const truck_loc_183 Int)
2200  (declare-const s_stockb_183 Int)
2201  (declare-const s_stocka_183 Int)
2202  (declare-const a_stockb_183 Int)
2203  (declare-const a_stocka_183 Int)
2204  (declare-const b_stockb_183 Int)
2205  (declare-const b_stocka_183 Int)
2206  (declare-const c_stockb_183 Int)
2207  (declare-const c_stocka_183 Int)
2208  (declare-const loopto_183 Bool)
2209  (declare-const truck_stock_184 Int)
2210  (declare-const truck_travel_time_184 Int)
```

```
2211  (declare-const truck_loc_184 Int)
2212  (declare-const s_stockb_184 Int)
2213  (declare-const s_stocka_184 Int)
2214  (declare-const a_stockb_184 Int)
2215  (declare-const a_stocka_184 Int)
2216  (declare-const b_stockb_184 Int)
2217  (declare-const b_stocka_184 Int)
2218  (declare-const c_stockb_184 Int)
2219  (declare-const c_stocka_184 Int)
2220  (declare-const loopto_184 Bool)
2221  (declare-const truck_stock_185 Int)
2222  (declare-const truck_travel_time_185 Int)
2223  (declare-const truck_loc_185 Int)
2224  (declare-const s_stockb_185 Int)
2225  (declare-const s_stocka_185 Int)
2226  (declare-const a_stockb_185 Int)
2227  (declare-const a_stocka_185 Int)
2228  (declare-const b_stockb_185 Int)
2229  (declare-const b_stocka_185 Int)
2230  (declare-const c_stockb_185 Int)
2231  (declare-const c_stocka_185 Int)
2232  (declare-const loopto_185 Bool)
2233  (declare-const truck_stock_186 Int)
2234  (declare-const truck_travel_time_186 Int)
2235  (declare-const truck_loc_186 Int)
2236  (declare-const s_stockb_186 Int)
2237  (declare-const s_stocka_186 Int)
2238  (declare-const a_stockb_186 Int)
2239  (declare-const a_stocka_186 Int)
2240  (declare-const b_stockb_186 Int)
2241  (declare-const b_stocka_186 Int)
2242  (declare-const c_stockb_186 Int)
2243  (declare-const c_stocka_186 Int)
2244  (declare-const loopto_186 Bool)
2245  (declare-const truck_stock_187 Int)
2246  (declare-const truck_travel_time_187 Int)
2247  (declare-const truck_loc_187 Int)
2248  (declare-const s_stockb_187 Int)
2249  (declare-const s_stocka_187 Int)
2250  (declare-const a_stockb_187 Int)
2251  (declare-const a_stocka_187 Int)
2252  (declare-const b_stockb_187 Int)
2253  (declare-const b_stocka_187 Int)
2254  (declare-const c_stockb_187 Int)
2255  (declare-const c_stocka_187 Int)
2256  (declare-const loopto_187 Bool)
2257  (declare-const truck_stock_188 Int)
2258  (declare-const truck_travel_time_188 Int)
2259  (declare-const truck_loc_188 Int)
2260  (declare-const s_stockb_188 Int)
2261  (declare-const s_stocka_188 Int)
2262  (declare-const a_stockb_188 Int)
2263  (declare-const a_stocka_188 Int)
2264  (declare-const b_stockb_188 Int)
2265  (declare-const b_stocka_188 Int)
2266  (declare-const c_stockb_188 Int)
2267  (declare-const c_stocka_188 Int)
2268  (declare-const loopto_188 Bool)
2269  (declare-const truck_stock_189 Int)
2270  (declare-const truck_travel_time_189 Int)
2271  (declare-const truck_loc_189 Int)
2272  (declare-const s_stockb_189 Int)
```

```
2273  (declare-const s_stocka_189 Int)
2274  (declare-const a_stockb_189 Int)
2275  (declare-const a_stocka_189 Int)
2276  (declare-const b_stockb_189 Int)
2277  (declare-const b_stocka_189 Int)
2278  (declare-const c_stockb_189 Int)
2279  (declare-const c_stocka_189 Int)
2280  (declare-const loopto_189 Bool)
2281  (declare-const truck_stock_190 Int)
2282  (declare-const truck_travel_time_190 Int)
2283  (declare-const truck_loc_190 Int)
2284  (declare-const s_stockb_190 Int)
2285  (declare-const s_stocka_190 Int)
2286  (declare-const a_stockb_190 Int)
2287  (declare-const a_stocka_190 Int)
2288  (declare-const b_stockb_190 Int)
2289  (declare-const b_stocka_190 Int)
2290  (declare-const c_stockb_190 Int)
2291  (declare-const c_stocka_190 Int)
2292  (declare-const loopto_190 Bool)
2293  (declare-const truck_stock_191 Int)
2294  (declare-const truck_travel_time_191 Int)
2295  (declare-const truck_loc_191 Int)
2296  (declare-const s_stockb_191 Int)
2297  (declare-const s_stocka_191 Int)
2298  (declare-const a_stockb_191 Int)
2299  (declare-const a_stocka_191 Int)
2300  (declare-const b_stockb_191 Int)
2301  (declare-const b_stocka_191 Int)
2302  (declare-const c_stockb_191 Int)
2303  (declare-const c_stocka_191 Int)
2304  (declare-const loopto_191 Bool)
2305  (declare-const truck_stock_192 Int)
2306  (declare-const truck_travel_time_192 Int)
2307  (declare-const truck_loc_192 Int)
2308  (declare-const s_stockb_192 Int)
2309  (declare-const s_stocka_192 Int)
2310  (declare-const a_stockb_192 Int)
2311  (declare-const a_stocka_192 Int)
2312  (declare-const b_stockb_192 Int)
2313  (declare-const b_stocka_192 Int)
2314  (declare-const c_stockb_192 Int)
2315  (declare-const c_stocka_192 Int)
2316  (declare-const loopto_192 Bool)
2317  (declare-const truck_stock_193 Int)
2318  (declare-const truck_travel_time_193 Int)
2319  (declare-const truck_loc_193 Int)
2320  (declare-const s_stockb_193 Int)
2321  (declare-const s_stocka_193 Int)
2322  (declare-const a_stockb_193 Int)
2323  (declare-const a_stocka_193 Int)
2324  (declare-const b_stockb_193 Int)
2325  (declare-const b_stocka_193 Int)
2326  (declare-const c_stockb_193 Int)
2327  (declare-const c_stocka_193 Int)
2328  (declare-const loopto_193 Bool)
2329  (declare-const truck_stock_194 Int)
2330  (declare-const truck_travel_time_194 Int)
2331  (declare-const truck_loc_194 Int)
2332  (declare-const s_stockb_194 Int)
2333  (declare-const s_stocka_194 Int)
2334  (declare-const a_stockb_194 Int)
```

```
2335  (declare-const a_stocka_194 Int)
2336  (declare-const b_stockb_194 Int)
2337  (declare-const b_stocka_194 Int)
2338  (declare-const c_stockb_194 Int)
2339  (declare-const c_stocka_194 Int)
2340  (declare-const loopto_194 Bool)
2341  (declare-const truck_stock_195 Int)
2342  (declare-const truck_travel_time_195 Int)
2343  (declare-const truck_loc_195 Int)
2344  (declare-const s_stockb_195 Int)
2345  (declare-const s_stocka_195 Int)
2346  (declare-const a_stockb_195 Int)
2347  (declare-const a_stocka_195 Int)
2348  (declare-const b_stockb_195 Int)
2349  (declare-const b_stocka_195 Int)
2350  (declare-const c_stockb_195 Int)
2351  (declare-const c_stocka_195 Int)
2352  (declare-const loopto_195 Bool)
2353  (declare-const truck_stock_196 Int)
2354  (declare-const truck_travel_time_196 Int)
2355  (declare-const truck_loc_196 Int)
2356  (declare-const s_stockb_196 Int)
2357  (declare-const s_stocka_196 Int)
2358  (declare-const a_stockb_196 Int)
2359  (declare-const a_stocka_196 Int)
2360  (declare-const b_stockb_196 Int)
2361  (declare-const b_stocka_196 Int)
2362  (declare-const c_stockb_196 Int)
2363  (declare-const c_stocka_196 Int)
2364  (declare-const loopto_196 Bool)
2365  (declare-const truck_stock_197 Int)
2366  (declare-const truck_travel_time_197 Int)
2367  (declare-const truck_loc_197 Int)
2368  (declare-const s_stockb_197 Int)
2369  (declare-const s_stocka_197 Int)
2370  (declare-const a_stockb_197 Int)
2371  (declare-const a_stocka_197 Int)
2372  (declare-const b_stockb_197 Int)
2373  (declare-const b_stocka_197 Int)
2374  (declare-const c_stockb_197 Int)
2375  (declare-const c_stocka_197 Int)
2376  (declare-const loopto_197 Bool)
2377  (declare-const truck_stock_198 Int)
2378  (declare-const truck_travel_time_198 Int)
2379  (declare-const truck_loc_198 Int)
2380  (declare-const s_stockb_198 Int)
2381  (declare-const s_stocka_198 Int)
2382  (declare-const a_stockb_198 Int)
2383  (declare-const a_stocka_198 Int)
2384  (declare-const b_stockb_198 Int)
2385  (declare-const b_stocka_198 Int)
2386  (declare-const c_stockb_198 Int)
2387  (declare-const c_stocka_198 Int)
2388  (declare-const loopto_198 Bool)
2389  (declare-const truck_stock_199 Int)
2390  (declare-const truck_travel_time_199 Int)
2391  (declare-const truck_loc_199 Int)
2392  (declare-const s_stockb_199 Int)
2393  (declare-const s_stocka_199 Int)
2394  (declare-const a_stockb_199 Int)
2395  (declare-const a_stocka_199 Int)
2396  (declare-const b_stockb_199 Int)
```

```
2397   (declare-const b_stocka_199 Int)
2398   (declare-const c_stockb_199 Int)
2399   (declare-const c_stocka_199 Int)
2400   (declare-const loopto_199 Bool)
2401   (assert
2402   (and
2403   (= truck_stock_0 318)
2404   (= truck_travel_time_0 0)
2405   (= truck_loc_0 0)
2406   (= a_stockb_0 40)
2407   (= a_stocka_0 40)
2408   (= b_stockb_0 30)
2409   (= b_stocka_0 30)
2410   (= c_stockb_0 145)
2411   (= c_stocka_0 145)
2412   (= a_stockb_1 (- a_stocka_0 truck_travel_time_0))
2413   (= b_stockb_1 (- b_stocka_0 truck_travel_time_0))
2414   (= c_stockb_1 (- c_stocka_0 truck_travel_time_0))
2415   (and
2416     (=> (= truck_loc_0 0)
2417       (and
2418         (= a_stocka_1 a_stockb_1)
2419         (= b_stocka_1 b_stockb_1)
2420         (= c_stocka_1 c_stockb_1)
2421         (or
2422           (and
2423             (= truck_loc_1 1)
2424             (= truck_travel_time_1 29)
2425           )
2426           (and
2427             (= truck_loc_1 2)
2428             (= truck_travel_time_1 21)
2429           )
2430         )
2431       )
2432     )
2433     (=> (= truck_loc_0 1)
2434       (and
2435         (<= a_stocka_1 120)
2436         (= (+ truck_stock_1 a_stocka_1) (+ truck_stock_0 a_stockb_1))
2437         (= b_stocka_1 b_stockb_1)
2438         (= c_stocka_1 c_stockb_1)
2439         (or
2440           (and
2441             (= truck_loc_1 0)
2442             (= truck_travel_time_1 29)
2443           )
2444           (and
2445             (= truck_loc_1 2)
2446             (= truck_travel_time_1 17)
2447           )
2448           (and
2449             (= truck_loc_1 3)
2450             (= truck_travel_time_1 32)
2451           )
2452         )
2453       )
2454     )
2455     (=> (= truck_loc_0 2)
2456       (and
2457         (<= b_stocka_1 120)
2458         (= (+ truck_stock_1 b_stocka_1) (+ truck_stock_0 b_stockb_1))
```

```
2459        (= a_stocka_1 a_stockb_1)
2460        (= c_stocka_1 c_stockb_1)
2461        (or
2462          (and
2463            (= truck_loc_1 1)
2464            (= truck_travel_time_1 17)
2465          )
2466          (and
2467            (= truck_loc_1 0)
2468            (= truck_travel_time_1 21)
2469          )
2470          (and
2471            (= truck_loc_1 3)
2472            (= truck_travel_time_1 37)
2473          )
2474        )
2475      )
2476    )
2477    (=> (= truck_loc_0 3)
2478      (and
2479        (<= c_stocka_1 200)
2480        (= (+ truck_stock_1 c_stocka_1) (+ truck_stock_0 c_stockb_1))
2481        (= a_stocka_1 a_stockb_1)
2482        (= b_stocka_1 b_stockb_1)
2483        (or
2484          (and
2485            (= truck_loc_1 1)
2486            (= truck_travel_time_1 32)
2487          )
2488          (and
2489            (= truck_loc_1 2)
2490            (= truck_travel_time_1 37)
2491          )
2492        )
2493      )
2494    )
2495  )
2496  (<= truck_stock_1 318)
2497  (>= truck_stock_1 0)
2498  (= a_stockb_2 (- a_stocka_1 truck_travel_time_1))
2499  (= b_stockb_2 (- b_stocka_1 truck_travel_time_1))
2500  (= c_stockb_2 (- c_stocka_1 truck_travel_time_1))
2501  (and
2502    (=> (= truck_loc_1 0)
2503      (and
2504        (= a_stocka_2 a_stockb_2)
2505        (= b_stocka_2 b_stockb_2)
2506        (= c_stocka_2 c_stockb_2)
2507        (or
2508          (and
2509            (= truck_loc_2 1)
2510            (= truck_travel_time_2 29)
2511          )
2512          (and
2513            (= truck_loc_2 2)
2514            (= truck_travel_time_2 21)
2515          )
2516        )
2517      )
2518    )
2519    (=> (= truck_loc_1 1)
2520      (and
```

```
2521        (<= a_stocka_2 120)
2522        (= (+ truck_stock_2 a_stocka_2) (+ truck_stock_1 a_stockb_2))
2523        (= b_stocka_2 b_stockb_2)
2524        (= c_stocka_2 c_stockb_2)
2525        (or
2526          (and
2527            (= truck_loc_2 0)
2528            (= truck_travel_time_2 29)
2529          )
2530          (and
2531            (= truck_loc_2 2)
2532            (= truck_travel_time_2 17)
2533          )
2534          (and
2535            (= truck_loc_2 3)
2536            (= truck_travel_time_2 32)
2537          )
2538        )
2539      )
2540    )
2541    (=> (= truck_loc_1 2)
2542      (and
2543        (<= b_stocka_2 120)
2544        (= (+ truck_stock_2 b_stocka_2) (+ truck_stock_1 b_stockb_2))
2545        (= a_stocka_2 a_stockb_2)
2546        (= c_stocka_2 c_stockb_2)
2547        (or
2548          (and
2549            (= truck_loc_2 1)
2550            (= truck_travel_time_2 17)
2551          )
2552          (and
2553            (= truck_loc_2 0)
2554            (= truck_travel_time_2 21)
2555          )
2556          (and
2557            (= truck_loc_2 3)
2558            (= truck_travel_time_2 37)
2559          )
2560        )
2561      )
2562    )
2563    (=> (= truck_loc_1 3)
2564      (and
2565        (<= c_stocka_2 200)
2566        (= (+ truck_stock_2 c_stocka_2) (+ truck_stock_1 c_stockb_2))
2567        (= a_stocka_2 a_stockb_2)
2568        (= b_stocka_2 b_stockb_2)
2569        (or
2570          (and
2571            (= truck_loc_2 1)
2572            (= truck_travel_time_2 32)
2573          )
2574          (and
2575            (= truck_loc_2 2)
2576            (= truck_travel_time_2 37)
2577          )
2578        )
2579      )
2580    )
2581  )
2582  (<= truck_stock_2 318)
```

```
2583  (>= truck_stock_2 0)
2584  (= a_stockb_3 (- a_stocka_2 truck_travel_time_2))
2585  (= b_stockb_3 (- b_stocka_2 truck_travel_time_2))
2586  (= c_stockb_3 (- c_stocka_2 truck_travel_time_2))
2587  (and
2588    (=> (= truck_loc_2 0)
2589      (and
2590        (= a_stocka_3 a_stockb_3)
2591        (= b_stocka_3 b_stockb_3)
2592        (= c_stocka_3 c_stockb_3)
2593        (or
2594          (and
2595            (= truck_loc_3 1)
2596            (= truck_travel_time_3 29)
2597          )
2598          (and
2599            (= truck_loc_3 2)
2600            (= truck_travel_time_3 21)
2601          )
2602        )
2603      )
2604    )
2605    (=> (= truck_loc_2 1)
2606      (and
2607        (<= a_stocka_3 120)
2608        (= (+ truck_stock_3 a_stocka_3) (+ truck_stock_2 a_stockb_3))
2609        (= b_stocka_3 b_stockb_3)
2610        (= c_stocka_3 c_stockb_3)
2611        (or
2612          (and
2613            (= truck_loc_3 0)
2614            (= truck_travel_time_3 29)
2615          )
2616          (and
2617            (= truck_loc_3 2)
2618            (= truck_travel_time_3 17)
2619          )
2620          (and
2621            (= truck_loc_3 3)
2622            (= truck_travel_time_3 32)
2623          )
2624        )
2625      )
2626    )
2627    (=> (= truck_loc_2 2)
2628      (and
2629        (<= b_stocka_3 120)
2630        (= (+ truck_stock_3 b_stocka_3) (+ truck_stock_2 b_stockb_3))
2631        (= a_stocka_3 a_stockb_3)
2632        (= c_stocka_3 c_stockb_3)
2633        (or
2634          (and
2635            (= truck_loc_3 1)
2636            (= truck_travel_time_3 17)
2637          )
2638          (and
2639            (= truck_loc_3 0)
2640            (= truck_travel_time_3 21)
2641          )
2642          (and
2643            (= truck_loc_3 3)
2644            (= truck_travel_time_3 37)
```

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2645            )
2646          )
2647        )
2648    )
2649    (=> (= truck_loc_2 3)
2650      (and
2651        (<= c_stocka_3 200)
2652        (= (+ truck_stock_3 c_stocka_3) (+ truck_stock_2 c_stockb_3))
2653        (= a_stocka_3 a_stockb_3)
2654        (= b_stocka_3 b_stockb_3)
2655        (or
2656          (and
2657            (= truck_loc_3 1)
2658            (= truck_travel_time_3 32)
2659          )
2660          (and
2661            (= truck_loc_3 2)
2662            (= truck_travel_time_3 37)
2663          )
2664        )
2665      )
2666    )
2667  )
2668  (<= truck_stock_3 318)
2669  (>= truck_stock_3 0)
2670  (= a_stockb_4 (- a_stocka_3 truck_travel_time_3))
2671  (= b_stockb_4 (- b_stocka_3 truck_travel_time_3))
2672  (= c_stockb_4 (- c_stocka_3 truck_travel_time_3))
2673  (and
2674    (=> (= truck_loc_3 0)
2675      (and
2676        (= a_stocka_4 a_stockb_4)
2677        (= b_stocka_4 b_stockb_4)
2678        (= c_stocka_4 c_stockb_4)
2679        (or
2680          (and
2681            (= truck_loc_4 1)
2682            (= truck_travel_time_4 29)
2683          )
2684          (and
2685            (= truck_loc_4 2)
2686            (= truck_travel_time_4 21)
2687          )
2688        )
2689      )
2690    )
2691    (=> (= truck_loc_3 1)
2692      (and
2693        (<= a_stocka_4 120)
2694        (= (+ truck_stock_4 a_stocka_4) (+ truck_stock_3 a_stockb_4))
2695        (= b_stocka_4 b_stockb_4)
2696        (= c_stocka_4 c_stockb_4)
2697        (or
2698          (and
2699            (= truck_loc_4 0)
2700            (= truck_travel_time_4 29)
2701          )
2702          (and
2703            (= truck_loc_4 2)
2704            (= truck_travel_time_4 17)
2705          )
2706          (and
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```
2707              (= truck_loc_4 3)
2708              (= truck_travel_time_4 32)
2709           )
2710         )
2711       )
2712    )
2713    (=> (= truck_loc_3 2)
2714       (and
2715         (<= b_stocka_4 120)
2716         (= (+ truck_stock_4 b_stocka_4) (+ truck_stock_3 b_stockb_4))
2717         (= a_stocka_4 a_stockb_4)
2718         (= c_stocka_4 c_stockb_4)
2719         (or
2720           (and
2721             (= truck_loc_4 1)
2722             (= truck_travel_time_4 17)
2723           )
2724           (and
2725             (= truck_loc_4 0)
2726             (= truck_travel_time_4 21)
2727           )
2728           (and
2729             (= truck_loc_4 3)
2730             (= truck_travel_time_4 37)
2731           )
2732         )
2733       )
2734    )
2735    (=> (= truck_loc_3 3)
2736       (and
2737         (<= c_stocka_4 200)
2738         (= (+ truck_stock_4 c_stocka_4) (+ truck_stock_3 c_stockb_4))
2739         (= a_stocka_4 a_stockb_4)
2740         (= b_stocka_4 b_stockb_4)
2741         (or
2742           (and
2743             (= truck_loc_4 1)
2744             (= truck_travel_time_4 32)
2745           )
2746           (and
2747             (= truck_loc_4 2)
2748             (= truck_travel_time_4 37)
2749           )
2750         )
2751       )
2752    )
2753 )
2754 (<= truck_stock_4 318)
2755 (>= truck_stock_4 0)
2756 (= a_stockb_5 (- a_stocka_4 truck_travel_time_4))
2757 (= b_stockb_5 (- b_stocka_4 truck_travel_time_4))
2758 (= c_stockb_5 (- c_stocka_4 truck_travel_time_4))
2759 (and
2760    (=> (= truck_loc_4 0)
2761       (and
2762         (= a_stocka_5 a_stockb_5)
2763         (= b_stocka_5 b_stockb_5)
2764         (= c_stocka_5 c_stockb_5)
2765         (or
2766           (and
2767             (= truck_loc_5 1)
2768             (= truck_travel_time_5 29)
```

```
2769            )
2770          (and
2771            (= truck_loc_5 2)
2772            (= truck_travel_time_5 21)
2773          )
2774        )
2775      )
2776    )
2777    (=> (= truck_loc_4 1)
2778      (and
2779        (<= a_stocka_5 120)
2780        (= (+ truck_stock_5 a_stocka_5) (+ truck_stock_4 a_stockb_5))
2781        (= b_stocka_5 b_stockb_5)
2782        (= c_stocka_5 c_stockb_5)
2783        (or
2784          (and
2785            (= truck_loc_5 0)
2786            (= truck_travel_time_5 29)
2787          )
2788          (and
2789            (= truck_loc_5 2)
2790            (= truck_travel_time_5 17)
2791          )
2792          (and
2793            (= truck_loc_5 3)
2794            (= truck_travel_time_5 32)
2795          )
2796        )
2797      )
2798    )
2799    (=> (= truck_loc_4 2)
2800      (and
2801        (<= b_stocka_5 120)
2802        (= (+ truck_stock_5 b_stocka_5) (+ truck_stock_4 b_stockb_5))
2803        (= a_stocka_5 a_stockb_5)
2804        (= c_stocka_5 c_stockb_5)
2805        (or
2806          (and
2807            (= truck_loc_5 1)
2808            (= truck_travel_time_5 17)
2809          )
2810          (and
2811            (= truck_loc_5 0)
2812            (= truck_travel_time_5 21)
2813          )
2814          (and
2815            (= truck_loc_5 3)
2816            (= truck_travel_time_5 37)
2817          )
2818        )
2819      )
2820    )
2821    (=> (= truck_loc_4 3)
2822      (and
2823        (<= c_stocka_5 200)
2824        (= (+ truck_stock_5 c_stocka_5) (+ truck_stock_4 c_stockb_5))
2825        (= a_stocka_5 a_stockb_5)
2826        (= b_stocka_5 b_stockb_5)
2827        (or
2828          (and
2829            (= truck_loc_5 1)
2830            (= truck_travel_time_5 32)
```

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2831          )
2832       (and
2833         (= truck_loc_5 2)
2834         (= truck_travel_time_5 37)
2835       )
2836     )
2837   )
2838   )
2839 )
2840 (<= truck_stock_5 318)
2841 (>= truck_stock_5 0)
2842 (= a_stockb_6 (- a_stocka_5 truck_travel_time_5))
2843 (= b_stockb_6 (- b_stocka_5 truck_travel_time_5))
2844 (= c_stockb_6 (- c_stocka_5 truck_travel_time_5))
2845 (and
2846   (=> (= truck_loc_5 0)
2847     (and
2848       (= a_stocka_6 a_stockb_6)
2849       (= b_stocka_6 b_stockb_6)
2850       (= c_stocka_6 c_stockb_6)
2851       (or
2852         (and
2853           (= truck_loc_6 1)
2854           (= truck_travel_time_6 29)
2855         )
2856         (and
2857           (= truck_loc_6 2)
2858           (= truck_travel_time_6 21)
2859         )
2860       )
2861     )
2862   )
2863   (=> (= truck_loc_5 1)
2864     (and
2865       (<= a_stocka_6 120)
2866       (= (+ truck_stock_6 a_stocka_6) (+ truck_stock_5 a_stockb_6))
2867       (= b_stocka_6 b_stockb_6)
2868       (= c_stocka_6 c_stockb_6)
2869       (or
2870         (and
2871           (= truck_loc_6 0)
2872           (= truck_travel_time_6 29)
2873         )
2874         (and
2875           (= truck_loc_6 2)
2876           (= truck_travel_time_6 17)
2877         )
2878         (and
2879           (= truck_loc_6 3)
2880           (= truck_travel_time_6 32)
2881         )
2882       )
2883     )
2884   )
2885   (=> (= truck_loc_5 2)
2886     (and
2887       (<= b_stocka_6 120)
2888       (= (+ truck_stock_6 b_stocka_6) (+ truck_stock_5 b_stockb_6))
2889       (= a_stocka_6 a_stockb_6)
2890       (= c_stocka_6 c_stockb_6)
2891       (or
2892         (and
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2893          (= truck_loc_6 1)
2894          (= truck_travel_time_6 17)
2895        )
2896      (and
2897        (= truck_loc_6 0)
2898        (= truck_travel_time_6 21)
2899      )
2900      (and
2901        (= truck_loc_6 3)
2902        (= truck_travel_time_6 37)
2903      )
2904    )
2905  )
2906 )
2907 (=> (= truck_loc_5 3)
2908   (and
2909     (<= c_stocka_6 200)
2910     (= (+ truck_stock_6 c_stocka_6) (+ truck_stock_5 c_stockb_6))
2911     (= a_stocka_6 a_stockb_6)
2912     (= b_stocka_6 b_stockb_6)
2913     (or
2914       (and
2915         (= truck_loc_6 1)
2916         (= truck_travel_time_6 32)
2917       )
2918       (and
2919         (= truck_loc_6 2)
2920         (= truck_travel_time_6 37)
2921       )
2922     )
2923   )
2924 )
2925 )
2926 (<= truck_stock_6 318)
2927 (>= truck_stock_6 0)
2928 (= a_stockb_7 (- a_stocka_6 truck_travel_time_6))
2929 (= b_stockb_7 (- b_stocka_6 truck_travel_time_6))
2930 (= c_stockb_7 (- c_stocka_6 truck_travel_time_6))
2931 (and
2932   (=> (= truck_loc_6 0)
2933     (and
2934       (= a_stocka_7 a_stockb_7)
2935       (= b_stocka_7 b_stockb_7)
2936       (= c_stocka_7 c_stockb_7)
2937       (or
2938         (and
2939           (= truck_loc_7 1)
2940           (= truck_travel_time_7 29)
2941         )
2942         (and
2943           (= truck_loc_7 2)
2944           (= truck_travel_time_7 21)
2945         )
2946       )
2947     )
2948   )
2949   (=> (= truck_loc_6 1)
2950     (and
2951       (<= a_stocka_7 120)
2952       (= (+ truck_stock_7 a_stocka_7) (+ truck_stock_6 a_stockb_7))
2953       (= b_stocka_7 b_stockb_7)
2954       (= c_stocka_7 c_stockb_7)
```

```
2955        (or
2956          (and
2957            (= truck_loc_7 0)
2958            (= truck_travel_time_7 29)
2959          )
2960          (and
2961            (= truck_loc_7 2)
2962            (= truck_travel_time_7 17)
2963          )
2964          (and
2965            (= truck_loc_7 3)
2966            (= truck_travel_time_7 32)
2967          )
2968        )
2969      )
2970    )
2971    (=> (= truck_loc_6 2)
2972      (and
2973        (<= b_stocka_7 120)
2974        (= (+ truck_stock_7 b_stocka_7) (+ truck_stock_6 b_stockb_7))
2975        (= a_stocka_7 a_stockb_7)
2976        (= c_stocka_7 c_stockb_7)
2977        (or
2978          (and
2979            (= truck_loc_7 1)
2980            (= truck_travel_time_7 17)
2981          )
2982          (and
2983            (= truck_loc_7 0)
2984            (= truck_travel_time_7 21)
2985          )
2986          (and
2987            (= truck_loc_7 3)
2988            (= truck_travel_time_7 37)
2989          )
2990        )
2991      )
2992    )
2993    (=> (= truck_loc_6 3)
2994      (and
2995        (<= c_stocka_7 200)
2996        (= (+ truck_stock_7 c_stocka_7) (+ truck_stock_6 c_stockb_7))
2997        (= a_stocka_7 a_stockb_7)
2998        (= b_stocka_7 b_stockb_7)
2999        (or
3000          (and
3001            (= truck_loc_7 1)
3002            (= truck_travel_time_7 32)
3003          )
3004          (and
3005            (= truck_loc_7 2)
3006            (= truck_travel_time_7 37)
3007          )
3008        )
3009      )
3010    )
3011  )
3012  (<= truck_stock_7 318)
3013  (>= truck_stock_7 0)
3014  (= a_stockb_8 (- a_stocka_7 truck_travel_time_7))
3015  (= b_stockb_8 (- b_stocka_7 truck_travel_time_7))
3016  (= c_stockb_8 (- c_stocka_7 truck_travel_time_7))
```

```
3017   (and
3018     (=> (= truck_loc_7 0)
3019       (and
3020         (= a_stocka_8 a_stockb_8)
3021         (= b_stocka_8 b_stockb_8)
3022         (= c_stocka_8 c_stockb_8)
3023         (or
3024           (and
3025             (= truck_loc_8 1)
3026             (= truck_travel_time_8 29)
3027           )
3028           (and
3029             (= truck_loc_8 2)
3030             (= truck_travel_time_8 21)
3031           )
3032         )
3033       )
3034     )
3035     (=> (= truck_loc_7 1)
3036       (and
3037         (<= a_stocka_8 120)
3038         (= (+ truck_stock_8 a_stocka_8) (+ truck_stock_7 a_stockb_8))
3039         (= b_stocka_8 b_stockb_8)
3040         (= c_stocka_8 c_stockb_8)
3041         (or
3042           (and
3043             (= truck_loc_8 0)
3044             (= truck_travel_time_8 29)
3045           )
3046           (and
3047             (= truck_loc_8 2)
3048             (= truck_travel_time_8 17)
3049           )
3050           (and
3051             (= truck_loc_8 3)
3052             (= truck_travel_time_8 32)
3053           )
3054         )
3055       )
3056     )
3057     (=> (= truck_loc_7 2)
3058       (and
3059         (<= b_stocka_8 120)
3060         (= (+ truck_stock_8 b_stocka_8) (+ truck_stock_7 b_stockb_8))
3061         (= a_stocka_8 a_stockb_8)
3062         (= c_stocka_8 c_stockb_8)
3063         (or
3064           (and
3065             (= truck_loc_8 1)
3066             (= truck_travel_time_8 17)
3067           )
3068           (and
3069             (= truck_loc_8 0)
3070             (= truck_travel_time_8 21)
3071           )
3072           (and
3073             (= truck_loc_8 3)
3074             (= truck_travel_time_8 37)
3075           )
3076         )
3077       )
3078     )
```

```
3079    (=> (= truck_loc_7 3)
3080      (and
3081        (<= c_stocka_8 200)
3082        (= (+ truck_stock_8 c_stocka_8) (+ truck_stock_7 c_stockb_8))
3083        (= a_stocka_8 a_stockb_8)
3084        (= b_stocka_8 b_stockb_8)
3085        (or
3086          (and
3087            (= truck_loc_8 1)
3088            (= truck_travel_time_8 32)
3089          )
3090          (and
3091            (= truck_loc_8 2)
3092            (= truck_travel_time_8 37)
3093          )
3094        )
3095      )
3096    )
3097  )
3098  (<= truck_stock_8 318)
3099  (>= truck_stock_8 0)
3100  (= a_stockb_9 (- a_stocka_8 truck_travel_time_8))
3101  (= b_stockb_9 (- b_stocka_8 truck_travel_time_8))
3102  (= c_stockb_9 (- c_stocka_8 truck_travel_time_8))
3103  (and
3104    (=> (= truck_loc_8 0)
3105      (and
3106        (= a_stocka_9 a_stockb_9)
3107        (= b_stocka_9 b_stockb_9)
3108        (= c_stocka_9 c_stockb_9)
3109        (or
3110          (and
3111            (= truck_loc_9 1)
3112            (= truck_travel_time_9 29)
3113          )
3114          (and
3115            (= truck_loc_9 2)
3116            (= truck_travel_time_9 21)
3117          )
3118        )
3119      )
3120    )
3121    (=> (= truck_loc_8 1)
3122      (and
3123        (<= a_stocka_9 120)
3124        (= (+ truck_stock_9 a_stocka_9) (+ truck_stock_8 a_stockb_9))
3125        (= b_stocka_9 b_stockb_9)
3126        (= c_stocka_9 c_stockb_9)
3127        (or
3128          (and
3129            (= truck_loc_9 0)
3130            (= truck_travel_time_9 29)
3131          )
3132          (and
3133            (= truck_loc_9 2)
3134            (= truck_travel_time_9 17)
3135          )
3136          (and
3137            (= truck_loc_9 3)
3138            (= truck_travel_time_9 32)
3139          )
3140        )
```

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3141          )
3142        )
3143      (=> (= truck_loc_8 2)
3144        (and
3145          (<= b_stocka_9 120)
3146          (= (+ truck_stock_9 b_stocka_9) (+ truck_stock_8 b_stockb_9))
3147          (= a_stocka_9 a_stockb_9)
3148          (= c_stocka_9 c_stockb_9)
3149          (or
3150            (and
3151              (= truck_loc_9 1)
3152              (= truck_travel_time_9 17)
3153            )
3154            (and
3155              (= truck_loc_9 0)
3156              (= truck_travel_time_9 21)
3157            )
3158            (and
3159              (= truck_loc_9 3)
3160              (= truck_travel_time_9 37)
3161            )
3162          )
3163        )
3164      )
3165      (=> (= truck_loc_8 3)
3166        (and
3167          (<= c_stocka_9 200)
3168          (= (+ truck_stock_9 c_stocka_9) (+ truck_stock_8 c_stockb_9))
3169          (= a_stocka_9 a_stockb_9)
3170          (= b_stocka_9 b_stockb_9)
3171          (or
3172            (and
3173              (= truck_loc_9 1)
3174              (= truck_travel_time_9 32)
3175            )
3176            (and
3177              (= truck_loc_9 2)
3178              (= truck_travel_time_9 37)
3179            )
3180          )
3181        )
3182      )
3183    )
3184    (<= truck_stock_9 318)
3185    (>= truck_stock_9 0)
3186    (= a_stockb_10 (- a_stocka_9 truck_travel_time_9))
3187    (= b_stockb_10 (- b_stocka_9 truck_travel_time_9))
3188    (= c_stockb_10 (- c_stocka_9 truck_travel_time_9))
3189    (and
3190      (=> (= truck_loc_9 0)
3191        (and
3192          (= a_stocka_10 a_stockb_10)
3193          (= b_stocka_10 b_stockb_10)
3194          (= c_stocka_10 c_stockb_10)
3195          (or
3196            (and
3197              (= truck_loc_10 1)
3198              (= truck_travel_time_10 29)
3199            )
3200            (and
3201              (= truck_loc_10 2)
3202              (= truck_travel_time_10 21)
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3203              )
3204            )
3205         )
3206    )
3207    (=> (= truck_loc_9 1)
3208      (and
3209        (<= a_stocka_10 120)
3210        (= (+ truck_stock_10 a_stocka_10) (+ truck_stock_9 a_stockb_10))
3211        (= b_stocka_10 b_stockb_10)
3212        (= c_stocka_10 c_stockb_10)
3213        (or
3214          (and
3215            (= truck_loc_10 0)
3216            (= truck_travel_time_10 29)
3217          )
3218          (and
3219            (= truck_loc_10 2)
3220            (= truck_travel_time_10 17)
3221          )
3222          (and
3223            (= truck_loc_10 3)
3224            (= truck_travel_time_10 32)
3225          )
3226        )
3227      )
3228    )
3229    (=> (= truck_loc_9 2)
3230      (and
3231        (<= b_stocka_10 120)
3232        (= (+ truck_stock_10 b_stocka_10) (+ truck_stock_9 b_stockb_10))
3233        (= a_stocka_10 a_stockb_10)
3234        (= c_stocka_10 c_stockb_10)
3235        (or
3236          (and
3237            (= truck_loc_10 1)
3238            (= truck_travel_time_10 17)
3239          )
3240          (and
3241            (= truck_loc_10 0)
3242            (= truck_travel_time_10 21)
3243          )
3244          (and
3245            (= truck_loc_10 3)
3246            (= truck_travel_time_10 37)
3247          )
3248        )
3249      )
3250    )
3251    (=> (= truck_loc_9 3)
3252      (and
3253        (<= c_stocka_10 200)
3254        (= (+ truck_stock_10 c_stocka_10) (+ truck_stock_9 c_stockb_10))
3255        (= a_stocka_10 a_stockb_10)
3256        (= b_stocka_10 b_stockb_10)
3257        (or
3258          (and
3259            (= truck_loc_10 1)
3260            (= truck_travel_time_10 32)
3261          )
3262          (and
3263            (= truck_loc_10 2)
3264            (= truck_travel_time_10 37)
```

```
3265            )
3266          )
3267        )
3268      )
3269  )
3270  (<= truck_stock_10 318)
3271  (>= truck_stock_10 0)
3272  (= a_stockb_11 (- a_stocka_10 truck_travel_time_10))
3273  (= b_stockb_11 (- b_stocka_10 truck_travel_time_10))
3274  (= c_stockb_11 (- c_stocka_10 truck_travel_time_10))
3275  (and
3276    (=> (= truck_loc_10 0)
3277      (and
3278        (= a_stocka_11 a_stockb_11)
3279        (= b_stocka_11 b_stockb_11)
3280        (= c_stocka_11 c_stockb_11)
3281        (or
3282          (and
3283            (= truck_loc_11 1)
3284            (= truck_travel_time_11 29)
3285          )
3286          (and
3287            (= truck_loc_11 2)
3288            (= truck_travel_time_11 21)
3289          )
3290        )
3291      )
3292    )
3293    (=> (= truck_loc_10 1)
3294      (and
3295        (<= a_stocka_11 120)
3296        (= (+ truck_stock_11 a_stocka_11) (+ truck_stock_10 a_stockb_11))
3297        (= b_stocka_11 b_stockb_11)
3298        (= c_stocka_11 c_stockb_11)
3299        (or
3300          (and
3301            (= truck_loc_11 0)
3302            (= truck_travel_time_11 29)
3303          )
3304          (and
3305            (= truck_loc_11 2)
3306            (= truck_travel_time_11 17)
3307          )
3308          (and
3309            (= truck_loc_11 3)
3310            (= truck_travel_time_11 32)
3311          )
3312        )
3313      )
3314    )
3315    (=> (= truck_loc_10 2)
3316      (and
3317        (<= b_stocka_11 120)
3318        (= (+ truck_stock_11 b_stocka_11) (+ truck_stock_10 b_stockb_11))
3319        (= a_stocka_11 a_stockb_11)
3320        (= c_stocka_11 c_stockb_11)
3321        (or
3322          (and
3323            (= truck_loc_11 1)
3324            (= truck_travel_time_11 17)
3325          )
3326          (and
```

```
3327              (= truck_loc_11 0)
3328              (= truck_travel_time_11 21)
3329            )
3330          (and
3331              (= truck_loc_11 3)
3332              (= truck_travel_time_11 37)
3333          )
3334        )
3335      )
3336    )
3337    (=> (= truck_loc_10 3)
3338      (and
3339        (<= c_stocka_11 200)
3340        (= (+ truck_stock_11 c_stocka_11) (+ truck_stock_10 c_stockb_11))
3341        (= a_stocka_11 a_stockb_11)
3342        (= b_stocka_11 b_stockb_11)
3343        (or
3344          (and
3345              (= truck_loc_11 1)
3346              (= truck_travel_time_11 32)
3347          )
3348          (and
3349              (= truck_loc_11 2)
3350              (= truck_travel_time_11 37)
3351          )
3352        )
3353      )
3354    )
3355  )
3356  (<= truck_stock_11 318)
3357  (>= truck_stock_11 0)
3358  (= a_stockb_12 (- a_stocka_11 truck_travel_time_11))
3359  (= b_stockb_12 (- b_stocka_11 truck_travel_time_11))
3360  (= c_stockb_12 (- c_stocka_11 truck_travel_time_11))
3361  (and
3362    (=> (= truck_loc_11 0)
3363      (and
3364        (= a_stocka_12 a_stockb_12)
3365        (= b_stocka_12 b_stockb_12)
3366        (= c_stocka_12 c_stockb_12)
3367        (or
3368          (and
3369              (= truck_loc_12 1)
3370              (= truck_travel_time_12 29)
3371          )
3372          (and
3373              (= truck_loc_12 2)
3374              (= truck_travel_time_12 21)
3375          )
3376        )
3377      )
3378    )
3379    (=> (= truck_loc_11 1)
3380      (and
3381        (<= a_stocka_12 120)
3382        (= (+ truck_stock_12 a_stocka_12) (+ truck_stock_11 a_stockb_12))
3383        (= b_stocka_12 b_stockb_12)
3384        (= c_stocka_12 c_stockb_12)
3385        (or
3386          (and
3387              (= truck_loc_12 0)
3388              (= truck_travel_time_12 29)
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3389            )
3390          (and
3391            (= truck_loc_12 2)
3392            (= truck_travel_time_12 17)
3393          )
3394          (and
3395            (= truck_loc_12 3)
3396            (= truck_travel_time_12 32)
3397          )
3398        )
3399      )
3400    )
3401    (=> (= truck_loc_11 2)
3402      (and
3403        (<= b_stocka_12 120)
3404        (= (+ truck_stock_12 b_stocka_12) (+ truck_stock_11 b_stockb_12))
3405        (= a_stocka_12 a_stockb_12)
3406        (= c_stocka_12 c_stockb_12)
3407        (or
3408          (and
3409            (= truck_loc_12 1)
3410            (= truck_travel_time_12 17)
3411          )
3412          (and
3413            (= truck_loc_12 0)
3414            (= truck_travel_time_12 21)
3415          )
3416          (and
3417            (= truck_loc_12 3)
3418            (= truck_travel_time_12 37)
3419          )
3420        )
3421      )
3422    )
3423    (=> (= truck_loc_11 3)
3424      (and
3425        (<= c_stocka_12 200)
3426        (= (+ truck_stock_12 c_stocka_12) (+ truck_stock_11 c_stockb_12))
3427        (= a_stocka_12 a_stockb_12)
3428        (= b_stocka_12 b_stockb_12)
3429        (or
3430          (and
3431            (= truck_loc_12 1)
3432            (= truck_travel_time_12 32)
3433          )
3434          (and
3435            (= truck_loc_12 2)
3436            (= truck_travel_time_12 37)
3437          )
3438        )
3439      )
3440    )
3441  )
3442  (<= truck_stock_12 318)
3443  (>= truck_stock_12 0)
3444  (= a_stockb_13 (- a_stocka_12 truck_travel_time_12))
3445  (= b_stockb_13 (- b_stocka_12 truck_travel_time_12))
3446  (= c_stockb_13 (- c_stocka_12 truck_travel_time_12))
3447  (and
3448    (=> (= truck_loc_12 0)
3449      (and
3450        (= a_stocka_13 a_stockb_13)
```

```
3451        (= b_stocka_13 b_stockb_13)
3452        (= c_stocka_13 c_stockb_13)
3453        (or
3454          (and
3455            (= truck_loc_13 1)
3456            (= truck_travel_time_13 29)
3457          )
3458          (and
3459            (= truck_loc_13 2)
3460            (= truck_travel_time_13 21)
3461          )
3462        )
3463      )
3464    )
3465    (=> (= truck_loc_12 1)
3466      (and
3467        (<= a_stocka_13 120)
3468        (= (+ truck_stock_13 a_stocka_13) (+ truck_stock_12 a_stockb_13))
3469        (= b_stocka_13 b_stockb_13)
3470        (= c_stocka_13 c_stockb_13)
3471        (or
3472          (and
3473            (= truck_loc_13 0)
3474            (= truck_travel_time_13 29)
3475          )
3476          (and
3477            (= truck_loc_13 2)
3478            (= truck_travel_time_13 17)
3479          )
3480          (and
3481            (= truck_loc_13 3)
3482            (= truck_travel_time_13 32)
3483          )
3484        )
3485      )
3486    )
3487    (=> (= truck_loc_12 2)
3488      (and
3489        (<= b_stocka_13 120)
3490        (= (+ truck_stock_13 b_stocka_13) (+ truck_stock_12 b_stockb_13))
3491        (= a_stocka_13 a_stockb_13)
3492        (= c_stocka_13 c_stockb_13)
3493        (or
3494          (and
3495            (= truck_loc_13 1)
3496            (= truck_travel_time_13 17)
3497          )
3498          (and
3499            (= truck_loc_13 0)
3500            (= truck_travel_time_13 21)
3501          )
3502          (and
3503            (= truck_loc_13 3)
3504            (= truck_travel_time_13 37)
3505          )
3506        )
3507      )
3508    )
3509    (=> (= truck_loc_12 3)
3510      (and
3511        (<= c_stocka_13 200)
3512        (= (+ truck_stock_13 c_stocka_13) (+ truck_stock_12 c_stockb_13))
```

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3513        (= a_stocka_13 a_stockb_13)
3514        (= b_stocka_13 b_stockb_13)
3515        (or
3516          (and
3517            (= truck_loc_13 1)
3518            (= truck_travel_time_13 32)
3519          )
3520          (and
3521            (= truck_loc_13 2)
3522            (= truck_travel_time_13 37)
3523          )
3524        )
3525      )
3526    )
3527  )
3528  (<= truck_stock_13 318)
3529  (>= truck_stock_13 0)
3530  (= a_stockb_14 (- a_stocka_13 truck_travel_time_13))
3531  (= b_stockb_14 (- b_stocka_13 truck_travel_time_13))
3532  (= c_stockb_14 (- c_stocka_13 truck_travel_time_13))
3533  (and
3534    (=> (= truck_loc_13 0)
3535      (and
3536        (= a_stocka_14 a_stockb_14)
3537        (= b_stocka_14 b_stockb_14)
3538        (= c_stocka_14 c_stockb_14)
3539        (or
3540          (and
3541            (= truck_loc_14 1)
3542            (= truck_travel_time_14 29)
3543          )
3544          (and
3545            (= truck_loc_14 2)
3546            (= truck_travel_time_14 21)
3547          )
3548        )
3549      )
3550    )
3551    (=> (= truck_loc_13 1)
3552      (and
3553        (<= a_stocka_14 120)
3554        (= (+ truck_stock_14 a_stocka_14) (+ truck_stock_13 a_stockb_14))
3555        (= b_stocka_14 b_stockb_14)
3556        (= c_stocka_14 c_stockb_14)
3557        (or
3558          (and
3559            (= truck_loc_14 0)
3560            (= truck_travel_time_14 29)
3561          )
3562          (and
3563            (= truck_loc_14 2)
3564            (= truck_travel_time_14 17)
3565          )
3566          (and
3567            (= truck_loc_14 3)
3568            (= truck_travel_time_14 32)
3569          )
3570        )
3571      )
3572    )
3573    (=> (= truck_loc_13 2)
3574      (and
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3575        (<= b_stocka_14 120)
3576        (= (+ truck_stock_14 b_stocka_14) (+ truck_stock_13 b_stockb_14))
3577        (= a_stocka_14 a_stockb_14)
3578        (= c_stocka_14 c_stockb_14)
3579        (or
3580          (and
3581            (= truck_loc_14 1)
3582            (= truck_travel_time_14 17)
3583          )
3584          (and
3585            (= truck_loc_14 0)
3586            (= truck_travel_time_14 21)
3587          )
3588          (and
3589            (= truck_loc_14 3)
3590            (= truck_travel_time_14 37)
3591          )
3592        )
3593      )
3594    )
3595    (=> (= truck_loc_13 3)
3596      (and
3597        (<= c_stocka_14 200)
3598        (= (+ truck_stock_14 c_stocka_14) (+ truck_stock_13 c_stockb_14))
3599        (= a_stocka_14 a_stockb_14)
3600        (= b_stocka_14 b_stockb_14)
3601        (or
3602          (and
3603            (= truck_loc_14 1)
3604            (= truck_travel_time_14 32)
3605          )
3606          (and
3607            (= truck_loc_14 2)
3608            (= truck_travel_time_14 37)
3609          )
3610        )
3611      )
3612    )
3613  )
3614  (<= truck_stock_14 318)
3615  (>= truck_stock_14 0)
3616  (= a_stockb_15 (- a_stocka_14 truck_travel_time_14))
3617  (= b_stockb_15 (- b_stocka_14 truck_travel_time_14))
3618  (= c_stockb_15 (- c_stocka_14 truck_travel_time_14))
3619  (and
3620    (=> (= truck_loc_14 0)
3621      (and
3622        (= a_stocka_15 a_stockb_15)
3623        (= b_stocka_15 b_stockb_15)
3624        (= c_stocka_15 c_stockb_15)
3625        (or
3626          (and
3627            (= truck_loc_15 1)
3628            (= truck_travel_time_15 29)
3629          )
3630          (and
3631            (= truck_loc_15 2)
3632            (= truck_travel_time_15 21)
3633          )
3634        )
3635      )
3636    )
```

```
3637     (=> (= truck_loc_14 1)
3638       (and
3639         (<= a_stocka_15 120)
3640         (= (+ truck_stock_15 a_stocka_15) (+ truck_stock_14 a_stockb_15))
3641         (= b_stocka_15 b_stockb_15)
3642         (= c_stocka_15 c_stockb_15)
3643         (or
3644           (and
3645             (= truck_loc_15 0)
3646             (= truck_travel_time_15 29)
3647           )
3648           (and
3649             (= truck_loc_15 2)
3650             (= truck_travel_time_15 17)
3651           )
3652           (and
3653             (= truck_loc_15 3)
3654             (= truck_travel_time_15 32)
3655           )
3656         )
3657       )
3658     )
3659     (=> (= truck_loc_14 2)
3660       (and
3661         (<= b_stocka_15 120)
3662         (= (+ truck_stock_15 b_stocka_15) (+ truck_stock_14 b_stockb_15))
3663         (= a_stocka_15 a_stockb_15)
3664         (= c_stocka_15 c_stockb_15)
3665         (or
3666           (and
3667             (= truck_loc_15 1)
3668             (= truck_travel_time_15 17)
3669           )
3670           (and
3671             (= truck_loc_15 0)
3672             (= truck_travel_time_15 21)
3673           )
3674           (and
3675             (= truck_loc_15 3)
3676             (= truck_travel_time_15 37)
3677           )
3678         )
3679       )
3680     )
3681     (=> (= truck_loc_14 3)
3682       (and
3683         (<= c_stocka_15 200)
3684         (= (+ truck_stock_15 c_stocka_15) (+ truck_stock_14 c_stockb_15))
3685         (= a_stocka_15 a_stockb_15)
3686         (= b_stocka_15 b_stockb_15)
3687         (or
3688           (and
3689             (= truck_loc_15 1)
3690             (= truck_travel_time_15 32)
3691           )
3692           (and
3693             (= truck_loc_15 2)
3694             (= truck_travel_time_15 37)
3695           )
3696         )
3697       )
3698     )
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3699  )
3700  (<= truck_stock_15 318)
3701  (>= truck_stock_15 0)
3702  (= a_stockb_16 (- a_stocka_15 truck_travel_time_15))
3703  (= b_stockb_16 (- b_stocka_15 truck_travel_time_15))
3704  (= c_stockb_16 (- c_stocka_15 truck_travel_time_15))
3705  (and
3706    (=> (= truck_loc_15 0)
3707      (and
3708        (= a_stocka_16 a_stockb_16)
3709        (= b_stocka_16 b_stockb_16)
3710        (= c_stocka_16 c_stockb_16)
3711        (or
3712          (and
3713            (= truck_loc_16 1)
3714            (= truck_travel_time_16 29)
3715          )
3716          (and
3717            (= truck_loc_16 2)
3718            (= truck_travel_time_16 21)
3719          )
3720        )
3721      )
3722    )
3723    (=> (= truck_loc_15 1)
3724      (and
3725        (<= a_stocka_16 120)
3726        (= (+ truck_stock_16 a_stocka_16) (+ truck_stock_15 a_stockb_16))
3727        (= b_stocka_16 b_stockb_16)
3728        (= c_stocka_16 c_stockb_16)
3729        (or
3730          (and
3731            (= truck_loc_16 0)
3732            (= truck_travel_time_16 29)
3733          )
3734          (and
3735            (= truck_loc_16 2)
3736            (= truck_travel_time_16 17)
3737          )
3738          (and
3739            (= truck_loc_16 3)
3740            (= truck_travel_time_16 32)
3741          )
3742        )
3743      )
3744    )
3745    (=> (= truck_loc_15 2)
3746      (and
3747        (<= b_stocka_16 120)
3748        (= (+ truck_stock_16 b_stocka_16) (+ truck_stock_15 b_stockb_16))
3749        (= a_stocka_16 a_stockb_16)
3750        (= c_stocka_16 c_stockb_16)
3751        (or
3752          (and
3753            (= truck_loc_16 1)
3754            (= truck_travel_time_16 17)
3755          )
3756          (and
3757            (= truck_loc_16 0)
3758            (= truck_travel_time_16 21)
3759          )
3760          (and
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3761            (= truck_loc_16 3)
3762            (= truck_travel_time_16 37)
3763          )
3764        )
3765      )
3766    )
3767    (=> (= truck_loc_15 3)
3768      (and
3769        (<= c_stocka_16 200)
3770        (= (+ truck_stock_16 c_stocka_16) (+ truck_stock_15 c_stockb_16))
3771        (= a_stocka_16 a_stockb_16)
3772        (= b_stocka_16 b_stockb_16)
3773        (or
3774          (and
3775            (= truck_loc_16 1)
3776            (= truck_travel_time_16 32)
3777          )
3778          (and
3779            (= truck_loc_16 2)
3780            (= truck_travel_time_16 37)
3781          )
3782        )
3783      )
3784    )
3785  )
3786  (<= truck_stock_16 318)
3787  (>= truck_stock_16 0)
3788  (= a_stockb_17 (- a_stocka_16 truck_travel_time_16))
3789  (= b_stockb_17 (- b_stocka_16 truck_travel_time_16))
3790  (= c_stockb_17 (- c_stocka_16 truck_travel_time_16))
3791  (and
3792    (=> (= truck_loc_16 0)
3793      (and
3794        (= a_stocka_17 a_stockb_17)
3795        (= b_stocka_17 b_stockb_17)
3796        (= c_stocka_17 c_stockb_17)
3797        (or
3798          (and
3799            (= truck_loc_17 1)
3800            (= truck_travel_time_17 29)
3801          )
3802          (and
3803            (= truck_loc_17 2)
3804            (= truck_travel_time_17 21)
3805          )
3806        )
3807      )
3808    )
3809    (=> (= truck_loc_16 1)
3810      (and
3811        (<= a_stocka_17 120)
3812        (= (+ truck_stock_17 a_stocka_17) (+ truck_stock_16 a_stockb_17))
3813        (= b_stocka_17 b_stockb_17)
3814        (= c_stocka_17 c_stockb_17)
3815        (or
3816          (and
3817            (= truck_loc_17 0)
3818            (= truck_travel_time_17 29)
3819          )
3820          (and
3821            (= truck_loc_17 2)
3822            (= truck_travel_time_17 17)
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3823            )
3824          (and
3825            (= truck_loc_17 3)
3826            (= truck_travel_time_17 32)
3827          )
3828        )
3829      )
3830    )
3831    (=> (= truck_loc_16 2)
3832      (and
3833        (<= b_stocka_17 120)
3834        (= (+ truck_stock_17 b_stocka_17) (+ truck_stock_16 b_stockb_17))
3835        (= a_stocka_17 a_stockb_17)
3836        (= c_stocka_17 c_stockb_17)
3837        (or
3838          (and
3839            (= truck_loc_17 1)
3840            (= truck_travel_time_17 17)
3841          )
3842          (and
3843            (= truck_loc_17 0)
3844            (= truck_travel_time_17 21)
3845          )
3846          (and
3847            (= truck_loc_17 3)
3848            (= truck_travel_time_17 37)
3849          )
3850        )
3851      )
3852    )
3853    (=> (= truck_loc_16 3)
3854      (and
3855        (<= c_stocka_17 200)
3856        (= (+ truck_stock_17 c_stocka_17) (+ truck_stock_16 c_stockb_17))
3857        (= a_stocka_17 a_stockb_17)
3858        (= b_stocka_17 b_stockb_17)
3859        (or
3860          (and
3861            (= truck_loc_17 1)
3862            (= truck_travel_time_17 32)
3863          )
3864          (and
3865            (= truck_loc_17 2)
3866            (= truck_travel_time_17 37)
3867          )
3868        )
3869      )
3870    )
3871  )
3872  (<= truck_stock_17 318)
3873  (>= truck_stock_17 0)
3874  (= a_stockb_18 (- a_stocka_17 truck_travel_time_17))
3875  (= b_stockb_18 (- b_stocka_17 truck_travel_time_17))
3876  (= c_stockb_18 (- c_stocka_17 truck_travel_time_17))
3877  (and
3878    (=> (= truck_loc_17 0)
3879      (and
3880        (= a_stocka_18 a_stockb_18)
3881        (= b_stocka_18 b_stockb_18)
3882        (= c_stocka_18 c_stockb_18)
3883        (or
3884          (and
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3885            (= truck_loc_18 1)
3886            (= truck_travel_time_18 29)
3887          )
3888        (and
3889            (= truck_loc_18 2)
3890            (= truck_travel_time_18 21)
3891        )
3892      )
3893    )
3894  )
3895  (=> (= truck_loc_17 1)
3896    (and
3897      (<= a_stocka_18 120)
3898      (= (+ truck_stock_18 a_stocka_18) (+ truck_stock_17 a_stockb_18))
3899      (= b_stocka_18 b_stockb_18)
3900      (= c_stocka_18 c_stockb_18)
3901      (or
3902        (and
3903            (= truck_loc_18 0)
3904            (= truck_travel_time_18 29)
3905        )
3906        (and
3907            (= truck_loc_18 2)
3908            (= truck_travel_time_18 17)
3909        )
3910        (and
3911            (= truck_loc_18 3)
3912            (= truck_travel_time_18 32)
3913        )
3914      )
3915    )
3916  )
3917  (=> (= truck_loc_17 2)
3918    (and
3919      (<= b_stocka_18 120)
3920      (= (+ truck_stock_18 b_stocka_18) (+ truck_stock_17 b_stockb_18))
3921      (= a_stocka_18 a_stockb_18)
3922      (= c_stocka_18 c_stockb_18)
3923      (or
3924        (and
3925            (= truck_loc_18 1)
3926            (= truck_travel_time_18 17)
3927        )
3928        (and
3929            (= truck_loc_18 0)
3930            (= truck_travel_time_18 21)
3931        )
3932        (and
3933            (= truck_loc_18 3)
3934            (= truck_travel_time_18 37)
3935        )
3936      )
3937    )
3938  )
3939  (=> (= truck_loc_17 3)
3940    (and
3941      (<= c_stocka_18 200)
3942      (= (+ truck_stock_18 c_stocka_18) (+ truck_stock_17 c_stockb_18))
3943      (= a_stocka_18 a_stockb_18)
3944      (= b_stocka_18 b_stockb_18)
3945      (or
3946        (and
```

```
3947              (= truck_loc_18 1)
3948              (= truck_travel_time_18 32)
3949          )
3950        (and
3951            (= truck_loc_18 2)
3952            (= truck_travel_time_18 37)
3953        )
3954      )
3955    )
3956   )
3957 )
3958 (<= truck_stock_18 318)
3959 (>= truck_stock_18 0)
3960 (= a_stockb_19 (- a_stocka_18 truck_travel_time_18))
3961 (= b_stockb_19 (- b_stocka_18 truck_travel_time_18))
3962 (= c_stockb_19 (- c_stocka_18 truck_travel_time_18))
3963 (and
3964   (=> (= truck_loc_18 0)
3965     (and
3966       (= a_stocka_19 a_stockb_19)
3967       (= b_stocka_19 b_stockb_19)
3968       (= c_stocka_19 c_stockb_19)
3969       (or
3970         (and
3971           (= truck_loc_19 1)
3972           (= truck_travel_time_19 29)
3973         )
3974         (and
3975           (= truck_loc_19 2)
3976           (= truck_travel_time_19 21)
3977         )
3978       )
3979     )
3980   )
3981   (=> (= truck_loc_18 1)
3982     (and
3983       (<= a_stocka_19 120)
3984       (= (+ truck_stock_19 a_stocka_19) (+ truck_stock_18 a_stockb_19))
3985       (= b_stocka_19 b_stockb_19)
3986       (= c_stocka_19 c_stockb_19)
3987       (or
3988         (and
3989           (= truck_loc_19 0)
3990           (= truck_travel_time_19 29)
3991         )
3992         (and
3993           (= truck_loc_19 2)
3994           (= truck_travel_time_19 17)
3995         )
3996         (and
3997           (= truck_loc_19 3)
3998           (= truck_travel_time_19 32)
3999         )
4000       )
4001     )
4002   )
4003   (=> (= truck_loc_18 2)
4004     (and
4005       (<= b_stocka_19 120)
4006       (= (+ truck_stock_19 b_stocka_19) (+ truck_stock_18 b_stockb_19))
4007       (= a_stocka_19 a_stockb_19)
4008       (= c_stocka_19 c_stockb_19)
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4009        (or
4010          (and
4011            (= truck_loc_19 1)
4012            (= truck_travel_time_19 17)
4013          )
4014          (and
4015            (= truck_loc_19 0)
4016            (= truck_travel_time_19 21)
4017          )
4018          (and
4019            (= truck_loc_19 3)
4020            (= truck_travel_time_19 37)
4021          )
4022        )
4023      )
4024    )
4025    (=> (= truck_loc_18 3)
4026      (and
4027        (<= c_stocka_19 200)
4028        (= (+ truck_stock_19 c_stocka_19) (+ truck_stock_18 c_stockb_19))
4029        (= a_stocka_19 a_stockb_19)
4030        (= b_stocka_19 b_stockb_19)
4031        (or
4032          (and
4033            (= truck_loc_19 1)
4034            (= truck_travel_time_19 32)
4035          )
4036          (and
4037            (= truck_loc_19 2)
4038            (= truck_travel_time_19 37)
4039          )
4040        )
4041      )
4042    )
4043  )
4044  (<= truck_stock_19 318)
4045  (>= truck_stock_19 0)
4046  (= a_stockb_20 (- a_stocka_19 truck_travel_time_19))
4047  (= b_stockb_20 (- b_stocka_19 truck_travel_time_19))
4048  (= c_stockb_20 (- c_stocka_19 truck_travel_time_19))
4049  (and
4050    (=> (= truck_loc_19 0)
4051      (and
4052        (= a_stocka_20 a_stockb_20)
4053        (= b_stocka_20 b_stockb_20)
4054        (= c_stocka_20 c_stockb_20)
4055        (or
4056          (and
4057            (= truck_loc_20 1)
4058            (= truck_travel_time_20 29)
4059          )
4060          (and
4061            (= truck_loc_20 2)
4062            (= truck_travel_time_20 21)
4063          )
4064        )
4065      )
4066    )
4067    (=> (= truck_loc_19 1)
4068      (and
4069        (<= a_stocka_20 120)
4070        (= (+ truck_stock_20 a_stocka_20) (+ truck_stock_19 a_stockb_20))
```

```
4071        (= b_stocka_20 b_stockb_20)
4072        (= c_stocka_20 c_stockb_20)
4073        (or
4074          (and
4075            (= truck_loc_20 0)
4076            (= truck_travel_time_20 29)
4077          )
4078          (and
4079            (= truck_loc_20 2)
4080            (= truck_travel_time_20 17)
4081          )
4082          (and
4083            (= truck_loc_20 3)
4084            (= truck_travel_time_20 32)
4085          )
4086        )
4087      )
4088    )
4089    (=> (= truck_loc_19 2)
4090      (and
4091        (<= b_stocka_20 120)
4092        (= (+ truck_stock_20 b_stocka_20) (+ truck_stock_19 b_stockb_20))
4093        (= a_stocka_20 a_stockb_20)
4094        (= c_stocka_20 c_stockb_20)
4095        (or
4096          (and
4097            (= truck_loc_20 1)
4098            (= truck_travel_time_20 17)
4099          )
4100          (and
4101            (= truck_loc_20 0)
4102            (= truck_travel_time_20 21)
4103          )
4104          (and
4105            (= truck_loc_20 3)
4106            (= truck_travel_time_20 37)
4107          )
4108        )
4109      )
4110    )
4111    (=> (= truck_loc_19 3)
4112      (and
4113        (<= c_stocka_20 200)
4114        (= (+ truck_stock_20 c_stocka_20) (+ truck_stock_19 c_stockb_20))
4115        (= a_stocka_20 a_stockb_20)
4116        (= b_stocka_20 b_stockb_20)
4117        (or
4118          (and
4119            (= truck_loc_20 1)
4120            (= truck_travel_time_20 32)
4121          )
4122          (and
4123            (= truck_loc_20 2)
4124            (= truck_travel_time_20 37)
4125          )
4126        )
4127      )
4128    )
4129  )
4130  (<= truck_stock_20 318)
4131  (>= truck_stock_20 0)
4132  (= a_stockb_21 (- a_stocka_20 truck_travel_time_20))
```

```
4133  (= b_stockb_21 (- b_stocka_20 truck_travel_time_20))
4134  (= c_stockb_21 (- c_stocka_20 truck_travel_time_20))
4135  (and
4136    (=> (= truck_loc_20 0)
4137      (and
4138        (= a_stocka_21 a_stockb_21)
4139        (= b_stocka_21 b_stockb_21)
4140        (= c_stocka_21 c_stockb_21)
4141        (or
4142          (and
4143            (= truck_loc_21 1)
4144            (= truck_travel_time_21 29)
4145          )
4146          (and
4147            (= truck_loc_21 2)
4148            (= truck_travel_time_21 21)
4149          )
4150        )
4151      )
4152    )
4153    (=> (= truck_loc_20 1)
4154      (and
4155        (<= a_stocka_21 120)
4156        (= (+ truck_stock_21 a_stocka_21) (+ truck_stock_20 a_stockb_21))
4157        (= b_stocka_21 b_stockb_21)
4158        (= c_stocka_21 c_stockb_21)
4159        (or
4160          (and
4161            (= truck_loc_21 0)
4162            (= truck_travel_time_21 29)
4163          )
4164          (and
4165            (= truck_loc_21 2)
4166            (= truck_travel_time_21 17)
4167          )
4168          (and
4169            (= truck_loc_21 3)
4170            (= truck_travel_time_21 32)
4171          )
4172        )
4173      )
4174    )
4175    (=> (= truck_loc_20 2)
4176      (and
4177        (<= b_stocka_21 120)
4178        (= (+ truck_stock_21 b_stocka_21) (+ truck_stock_20 b_stockb_21))
4179        (= a_stocka_21 a_stockb_21)
4180        (= c_stocka_21 c_stockb_21)
4181        (or
4182          (and
4183            (= truck_loc_21 1)
4184            (= truck_travel_time_21 17)
4185          )
4186          (and
4187            (= truck_loc_21 0)
4188            (= truck_travel_time_21 21)
4189          )
4190          (and
4191            (= truck_loc_21 3)
4192            (= truck_travel_time_21 37)
4193          )
4194        )
```

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4195        )
4196      )
4197    (=> (= truck_loc_20 3)
4198      (and
4199        (<= c_stocka_21 200)
4200        (= (+ truck_stock_21 c_stocka_21) (+ truck_stock_20 c_stockb_21))
4201        (= a_stocka_21 a_stockb_21)
4202        (= b_stocka_21 b_stockb_21)
4203        (or
4204          (and
4205            (= truck_loc_21 1)
4206            (= truck_travel_time_21 32)
4207          )
4208          (and
4209            (= truck_loc_21 2)
4210            (= truck_travel_time_21 37)
4211          )
4212        )
4213      )
4214    )
4215  )
4216  (<= truck_stock_21 318)
4217  (>= truck_stock_21 0)
4218  (= a_stockb_22 (- a_stocka_21 truck_travel_time_21))
4219  (= b_stockb_22 (- b_stocka_21 truck_travel_time_21))
4220  (= c_stockb_22 (- c_stocka_21 truck_travel_time_21))
4221  (and
4222    (=> (= truck_loc_21 0)
4223      (and
4224        (= a_stocka_22 a_stockb_22)
4225        (= b_stocka_22 b_stockb_22)
4226        (= c_stocka_22 c_stockb_22)
4227        (or
4228          (and
4229            (= truck_loc_22 1)
4230            (= truck_travel_time_22 29)
4231          )
4232          (and
4233            (= truck_loc_22 2)
4234            (= truck_travel_time_22 21)
4235          )
4236        )
4237      )
4238    )
4239    (=> (= truck_loc_21 1)
4240      (and
4241        (<= a_stocka_22 120)
4242        (= (+ truck_stock_22 a_stocka_22) (+ truck_stock_21 a_stockb_22))
4243        (= b_stocka_22 b_stockb_22)
4244        (= c_stocka_22 c_stockb_22)
4245        (or
4246          (and
4247            (= truck_loc_22 0)
4248            (= truck_travel_time_22 29)
4249          )
4250          (and
4251            (= truck_loc_22 2)
4252            (= truck_travel_time_22 17)
4253          )
4254          (and
4255            (= truck_loc_22 3)
4256            (= truck_travel_time_22 32)
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4257            )
4258          )
4259        )
4260      )
4261    (=> (= truck_loc_21 2)
4262      (and
4263        (<= b_stocka_22 120)
4264        (= (+ truck_stock_22 b_stocka_22) (+ truck_stock_21 b_stockb_22))
4265        (= a_stocka_22 a_stockb_22)
4266        (= c_stocka_22 c_stockb_22)
4267        (or
4268          (and
4269            (= truck_loc_22 1)
4270            (= truck_travel_time_22 17)
4271          )
4272          (and
4273            (= truck_loc_22 0)
4274            (= truck_travel_time_22 21)
4275          )
4276          (and
4277            (= truck_loc_22 3)
4278            (= truck_travel_time_22 37)
4279          )
4280        )
4281      )
4282    )
4283    (=> (= truck_loc_21 3)
4284      (and
4285        (<= c_stocka_22 200)
4286        (= (+ truck_stock_22 c_stocka_22) (+ truck_stock_21 c_stockb_22))
4287        (= a_stocka_22 a_stockb_22)
4288        (= b_stocka_22 b_stockb_22)
4289        (or
4290          (and
4291            (= truck_loc_22 1)
4292            (= truck_travel_time_22 32)
4293          )
4294          (and
4295            (= truck_loc_22 2)
4296            (= truck_travel_time_22 37)
4297          )
4298        )
4299      )
4300    )
4301  )
4302  (<= truck_stock_22 318)
4303  (>= truck_stock_22 0)
4304  (= a_stockb_23 (- a_stocka_22 truck_travel_time_22))
4305  (= b_stockb_23 (- b_stocka_22 truck_travel_time_22))
4306  (= c_stockb_23 (- c_stocka_22 truck_travel_time_22))
4307  (and
4308    (=> (= truck_loc_22 0)
4309      (and
4310        (= a_stocka_23 a_stockb_23)
4311        (= b_stocka_23 b_stockb_23)
4312        (= c_stocka_23 c_stockb_23)
4313        (or
4314          (and
4315            (= truck_loc_23 1)
4316            (= truck_travel_time_23 29)
4317          )
4318          (and
```

```
4319            (= truck_loc_23 2)
4320            (= truck_travel_time_23 21)
4321          )
4322        )
4323      )
4324    )
4325    (=> (= truck_loc_22 1)
4326      (and
4327        (<= a_stocka_23 120)
4328        (= (+ truck_stock_23 a_stocka_23) (+ truck_stock_22 a_stockb_23))
4329        (= b_stocka_23 b_stockb_23)
4330        (= c_stocka_23 c_stockb_23)
4331        (or
4332          (and
4333            (= truck_loc_23 0)
4334            (= truck_travel_time_23 29)
4335          )
4336          (and
4337            (= truck_loc_23 2)
4338            (= truck_travel_time_23 17)
4339          )
4340          (and
4341            (= truck_loc_23 3)
4342            (= truck_travel_time_23 32)
4343          )
4344        )
4345      )
4346    )
4347    (=> (= truck_loc_22 2)
4348      (and
4349        (<= b_stocka_23 120)
4350        (= (+ truck_stock_23 b_stocka_23) (+ truck_stock_22 b_stockb_23))
4351        (= a_stocka_23 a_stockb_23)
4352        (= c_stocka_23 c_stockb_23)
4353        (or
4354          (and
4355            (= truck_loc_23 1)
4356            (= truck_travel_time_23 17)
4357          )
4358          (and
4359            (= truck_loc_23 0)
4360            (= truck_travel_time_23 21)
4361          )
4362          (and
4363            (= truck_loc_23 3)
4364            (= truck_travel_time_23 37)
4365          )
4366        )
4367      )
4368    )
4369    (=> (= truck_loc_22 3)
4370      (and
4371        (<= c_stocka_23 200)
4372        (= (+ truck_stock_23 c_stocka_23) (+ truck_stock_22 c_stockb_23))
4373        (= a_stocka_23 a_stockb_23)
4374        (= b_stocka_23 b_stockb_23)
4375        (or
4376          (and
4377            (= truck_loc_23 1)
4378            (= truck_travel_time_23 32)
4379          )
4380          (and
```

```
4381            (= truck_loc_23 2)
4382            (= truck_travel_time_23 37)
4383          )
4384        )
4385      )
4386    )
4387  )
4388  (<= truck_stock_23 318)
4389  (>= truck_stock_23 0)
4390  (= a_stockb_24 (- a_stocka_23 truck_travel_time_23))
4391  (= b_stockb_24 (- b_stocka_23 truck_travel_time_23))
4392  (= c_stockb_24 (- c_stocka_23 truck_travel_time_23))
4393  (and
4394    (=> (= truck_loc_23 0)
4395      (and
4396        (= a_stocka_24 a_stockb_24)
4397        (= b_stocka_24 b_stockb_24)
4398        (= c_stocka_24 c_stockb_24)
4399        (or
4400          (and
4401            (= truck_loc_24 1)
4402            (= truck_travel_time_24 29)
4403          )
4404          (and
4405            (= truck_loc_24 2)
4406            (= truck_travel_time_24 21)
4407          )
4408        )
4409      )
4410    )
4411    (=> (= truck_loc_23 1)
4412      (and
4413        (<= a_stocka_24 120)
4414        (= (+ truck_stock_24 a_stocka_24) (+ truck_stock_23 a_stockb_24))
4415        (= b_stocka_24 b_stockb_24)
4416        (= c_stocka_24 c_stockb_24)
4417        (or
4418          (and
4419            (= truck_loc_24 0)
4420            (= truck_travel_time_24 29)
4421          )
4422          (and
4423            (= truck_loc_24 2)
4424            (= truck_travel_time_24 17)
4425          )
4426          (and
4427            (= truck_loc_24 3)
4428            (= truck_travel_time_24 32)
4429          )
4430        )
4431      )
4432    )
4433    (=> (= truck_loc_23 2)
4434      (and
4435        (<= b_stocka_24 120)
4436        (= (+ truck_stock_24 b_stocka_24) (+ truck_stock_23 b_stockb_24))
4437        (= a_stocka_24 a_stockb_24)
4438        (= c_stocka_24 c_stockb_24)
4439        (or
4440          (and
4441            (= truck_loc_24 1)
4442            (= truck_travel_time_24 17)
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4443            )
4444          (and
4445            (= truck_loc_24 0)
4446            (= truck_travel_time_24 21)
4447          )
4448          (and
4449            (= truck_loc_24 3)
4450            (= truck_travel_time_24 37)
4451          )
4452        )
4453      )
4454    )
4455    (=> (= truck_loc_23 3)
4456      (and
4457        (<= c_stocka_24 200)
4458        (= (+ truck_stock_24 c_stocka_24) (+ truck_stock_23 c_stockb_24))
4459        (= a_stocka_24 a_stockb_24)
4460        (= b_stocka_24 b_stockb_24)
4461        (or
4462          (and
4463            (= truck_loc_24 1)
4464            (= truck_travel_time_24 32)
4465          )
4466          (and
4467            (= truck_loc_24 2)
4468            (= truck_travel_time_24 37)
4469          )
4470        )
4471      )
4472    )
4473  )
4474  (<= truck_stock_24 318)
4475  (>= truck_stock_24 0)
4476  (= a_stockb_25 (- a_stocka_24 truck_travel_time_24))
4477  (= b_stockb_25 (- b_stocka_24 truck_travel_time_24))
4478  (= c_stockb_25 (- c_stocka_24 truck_travel_time_24))
4479  (and
4480    (=> (= truck_loc_24 0)
4481      (and
4482        (= a_stocka_25 a_stockb_25)
4483        (= b_stocka_25 b_stockb_25)
4484        (= c_stocka_25 c_stockb_25)
4485        (or
4486          (and
4487            (= truck_loc_25 1)
4488            (= truck_travel_time_25 29)
4489          )
4490          (and
4491            (= truck_loc_25 2)
4492            (= truck_travel_time_25 21)
4493          )
4494        )
4495      )
4496    )
4497    (=> (= truck_loc_24 1)
4498      (and
4499        (<= a_stocka_25 120)
4500        (= (+ truck_stock_25 a_stocka_25) (+ truck_stock_24 a_stockb_25))
4501        (= b_stocka_25 b_stockb_25)
4502        (= c_stocka_25 c_stockb_25)
4503        (or
4504          (and
```

```
4505            (= truck_loc_25 0)
4506            (= truck_travel_time_25 29)
4507          )
4508          (and
4509            (= truck_loc_25 2)
4510            (= truck_travel_time_25 17)
4511          )
4512          (and
4513            (= truck_loc_25 3)
4514            (= truck_travel_time_25 32)
4515          )
4516        )
4517      )
4518    )
4519    (=> (= truck_loc_24 2)
4520      (and
4521        (<= b_stocka_25 120)
4522        (= (+ truck_stock_25 b_stocka_25) (+ truck_stock_24 b_stockb_25))
4523        (= a_stocka_25 a_stockb_25)
4524        (= c_stocka_25 c_stockb_25)
4525        (or
4526          (and
4527            (= truck_loc_25 1)
4528            (= truck_travel_time_25 17)
4529          )
4530          (and
4531            (= truck_loc_25 0)
4532            (= truck_travel_time_25 21)
4533          )
4534          (and
4535            (= truck_loc_25 3)
4536            (= truck_travel_time_25 37)
4537          )
4538        )
4539      )
4540    )
4541    (=> (= truck_loc_24 3)
4542      (and
4543        (<= c_stocka_25 200)
4544        (= (+ truck_stock_25 c_stocka_25) (+ truck_stock_24 c_stockb_25))
4545        (= a_stocka_25 a_stockb_25)
4546        (= b_stocka_25 b_stockb_25)
4547        (or
4548          (and
4549            (= truck_loc_25 1)
4550            (= truck_travel_time_25 32)
4551          )
4552          (and
4553            (= truck_loc_25 2)
4554            (= truck_travel_time_25 37)
4555          )
4556        )
4557      )
4558    )
4559  )
4560  (<= truck_stock_25 318)
4561  (>= truck_stock_25 0)
4562  (= a_stockb_26 (- a_stocka_25 truck_travel_time_25))
4563  (= b_stockb_26 (- b_stocka_25 truck_travel_time_25))
4564  (= c_stockb_26 (- c_stocka_25 truck_travel_time_25))
4565  (and
4566    (=> (= truck_loc_25 0)
```

```
4567        (and
4568          (= a_stocka_26 a_stockb_26)
4569          (= b_stocka_26 b_stockb_26)
4570          (= c_stocka_26 c_stockb_26)
4571          (or
4572            (and
4573              (= truck_loc_26 1)
4574              (= truck_travel_time_26 29)
4575            )
4576            (and
4577              (= truck_loc_26 2)
4578              (= truck_travel_time_26 21)
4579            )
4580          )
4581        )
4582      )
4583      (=> (= truck_loc_25 1)
4584        (and
4585          (<= a_stocka_26 120)
4586          (= (+ truck_stock_26 a_stocka_26) (+ truck_stock_25 a_stockb_26))
4587          (= b_stocka_26 b_stockb_26)
4588          (= c_stocka_26 c_stockb_26)
4589          (or
4590            (and
4591              (= truck_loc_26 0)
4592              (= truck_travel_time_26 29)
4593            )
4594            (and
4595              (= truck_loc_26 2)
4596              (= truck_travel_time_26 17)
4597            )
4598            (and
4599              (= truck_loc_26 3)
4600              (= truck_travel_time_26 32)
4601            )
4602          )
4603        )
4604      )
4605      (=> (= truck_loc_25 2)
4606        (and
4607          (<= b_stocka_26 120)
4608          (= (+ truck_stock_26 b_stocka_26) (+ truck_stock_25 b_stockb_26))
4609          (= a_stocka_26 a_stockb_26)
4610          (= c_stocka_26 c_stockb_26)
4611          (or
4612            (and
4613              (= truck_loc_26 1)
4614              (= truck_travel_time_26 17)
4615            )
4616            (and
4617              (= truck_loc_26 0)
4618              (= truck_travel_time_26 21)
4619            )
4620            (and
4621              (= truck_loc_26 3)
4622              (= truck_travel_time_26 37)
4623            )
4624          )
4625        )
4626      )
4627      (=> (= truck_loc_25 3)
4628        (and
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4629          (<= c_stocka_26 200)
4630          (= (+ truck_stock_26 c_stocka_26) (+ truck_stock_25 c_stockb_26))
4631          (= a_stocka_26 a_stockb_26)
4632          (= b_stocka_26 b_stockb_26)
4633          (or
4634            (and
4635              (= truck_loc_26 1)
4636              (= truck_travel_time_26 32)
4637            )
4638            (and
4639              (= truck_loc_26 2)
4640              (= truck_travel_time_26 37)
4641            )
4642          )
4643        )
4644      )
4645  )
4646  (<= truck_stock_26 318)
4647  (>= truck_stock_26 0)
4648  (= a_stockb_27 (- a_stocka_26 truck_travel_time_26))
4649  (= b_stockb_27 (- b_stocka_26 truck_travel_time_26))
4650  (= c_stockb_27 (- c_stocka_26 truck_travel_time_26))
4651  (and
4652    (=> (= truck_loc_26 0)
4653      (and
4654        (= a_stocka_27 a_stockb_27)
4655        (= b_stocka_27 b_stockb_27)
4656        (= c_stocka_27 c_stockb_27)
4657        (or
4658          (and
4659            (= truck_loc_27 1)
4660            (= truck_travel_time_27 29)
4661          )
4662          (and
4663            (= truck_loc_27 2)
4664            (= truck_travel_time_27 21)
4665          )
4666        )
4667      )
4668    )
4669    (=> (= truck_loc_26 1)
4670      (and
4671        (<= a_stocka_27 120)
4672        (= (+ truck_stock_27 a_stocka_27) (+ truck_stock_26 a_stockb_27))
4673        (= b_stocka_27 b_stockb_27)
4674        (= c_stocka_27 c_stockb_27)
4675        (or
4676          (and
4677            (= truck_loc_27 0)
4678            (= truck_travel_time_27 29)
4679          )
4680          (and
4681            (= truck_loc_27 2)
4682            (= truck_travel_time_27 17)
4683          )
4684          (and
4685            (= truck_loc_27 3)
4686            (= truck_travel_time_27 32)
4687          )
4688        )
4689      )
4690    )
```

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4691    (=> (= truck_loc_26 2)
4692      (and
4693        (<= b_stocka_27 120)
4694        (= (+ truck_stock_27 b_stocka_27) (+ truck_stock_26 b_stockb_27))
4695        (= a_stocka_27 a_stockb_27)
4696        (= c_stocka_27 c_stockb_27)
4697        (or
4698          (and
4699            (= truck_loc_27 1)
4700            (= truck_travel_time_27 17)
4701          )
4702          (and
4703            (= truck_loc_27 0)
4704            (= truck_travel_time_27 21)
4705          )
4706          (and
4707            (= truck_loc_27 3)
4708            (= truck_travel_time_27 37)
4709          )
4710        )
4711      )
4712    )
4713    (=> (= truck_loc_26 3)
4714      (and
4715        (<= c_stocka_27 200)
4716        (= (+ truck_stock_27 c_stocka_27) (+ truck_stock_26 c_stockb_27))
4717        (= a_stocka_27 a_stockb_27)
4718        (= b_stocka_27 b_stockb_27)
4719        (or
4720          (and
4721            (= truck_loc_27 1)
4722            (= truck_travel_time_27 32)
4723          )
4724          (and
4725            (= truck_loc_27 2)
4726            (= truck_travel_time_27 37)
4727          )
4728        )
4729      )
4730    )
4731  )
4732  (<= truck_stock_27 318)
4733  (>= truck_stock_27 0)
4734  (= a_stockb_28 (- a_stocka_27 truck_travel_time_27))
4735  (= b_stockb_28 (- b_stocka_27 truck_travel_time_27))
4736  (= c_stockb_28 (- c_stocka_27 truck_travel_time_27))
4737  (and
4738    (=> (= truck_loc_27 0)
4739      (and
4740        (= a_stocka_28 a_stockb_28)
4741        (= b_stocka_28 b_stockb_28)
4742        (= c_stocka_28 c_stockb_28)
4743        (or
4744          (and
4745            (= truck_loc_28 1)
4746            (= truck_travel_time_28 29)
4747          )
4748          (and
4749            (= truck_loc_28 2)
4750            (= truck_travel_time_28 21)
4751          )
4752        )
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4753        )
4754      )
4755      (=> (= truck_loc_27 1)
4756        (and
4757          (<= a_stocka_28 120)
4758          (= (+ truck_stock_28 a_stocka_28) (+ truck_stock_27 a_stockb_28))
4759          (= b_stocka_28 b_stockb_28)
4760          (= c_stocka_28 c_stockb_28)
4761          (or
4762            (and
4763              (= truck_loc_28 0)
4764              (= truck_travel_time_28 29)
4765            )
4766            (and
4767              (= truck_loc_28 2)
4768              (= truck_travel_time_28 17)
4769            )
4770            (and
4771              (= truck_loc_28 3)
4772              (= truck_travel_time_28 32)
4773            )
4774          )
4775        )
4776      )
4777      (=> (= truck_loc_27 2)
4778        (and
4779          (<= b_stocka_28 120)
4780          (= (+ truck_stock_28 b_stocka_28) (+ truck_stock_27 b_stockb_28))
4781          (= a_stocka_28 a_stockb_28)
4782          (= c_stocka_28 c_stockb_28)
4783          (or
4784            (and
4785              (= truck_loc_28 1)
4786              (= truck_travel_time_28 17)
4787            )
4788            (and
4789              (= truck_loc_28 0)
4790              (= truck_travel_time_28 21)
4791            )
4792            (and
4793              (= truck_loc_28 3)
4794              (= truck_travel_time_28 37)
4795            )
4796          )
4797        )
4798      )
4799      (=> (= truck_loc_27 3)
4800        (and
4801          (<= c_stocka_28 200)
4802          (= (+ truck_stock_28 c_stocka_28) (+ truck_stock_27 c_stockb_28))
4803          (= a_stocka_28 a_stockb_28)
4804          (= b_stocka_28 b_stockb_28)
4805          (or
4806            (and
4807              (= truck_loc_28 1)
4808              (= truck_travel_time_28 32)
4809            )
4810            (and
4811              (= truck_loc_28 2)
4812              (= truck_travel_time_28 37)
4813            )
4814          )
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4815        )
4816      )
4817  )
4818  (<= truck_stock_28 318)
4819  (>= truck_stock_28 0)
4820  (= a_stockb_29 (- a_stocka_28 truck_travel_time_28))
4821  (= b_stockb_29 (- b_stocka_28 truck_travel_time_28))
4822  (= c_stockb_29 (- c_stocka_28 truck_travel_time_28))
4823  (and
4824    (=> (= truck_loc_28 0)
4825      (and
4826        (= a_stocka_29 a_stockb_29)
4827        (= b_stocka_29 b_stockb_29)
4828        (= c_stocka_29 c_stockb_29)
4829        (or
4830          (and
4831            (= truck_loc_29 1)
4832            (= truck_travel_time_29 29)
4833          )
4834          (and
4835            (= truck_loc_29 2)
4836            (= truck_travel_time_29 21)
4837          )
4838        )
4839      )
4840    )
4841    (=> (= truck_loc_28 1)
4842      (and
4843        (<= a_stocka_29 120)
4844        (= (+ truck_stock_29 a_stocka_29) (+ truck_stock_28 a_stockb_29))
4845        (= b_stocka_29 b_stockb_29)
4846        (= c_stocka_29 c_stockb_29)
4847        (or
4848          (and
4849            (= truck_loc_29 0)
4850            (= truck_travel_time_29 29)
4851          )
4852          (and
4853            (= truck_loc_29 2)
4854            (= truck_travel_time_29 17)
4855          )
4856          (and
4857            (= truck_loc_29 3)
4858            (= truck_travel_time_29 32)
4859          )
4860        )
4861      )
4862    )
4863    (=> (= truck_loc_28 2)
4864      (and
4865        (<= b_stocka_29 120)
4866        (= (+ truck_stock_29 b_stocka_29) (+ truck_stock_28 b_stockb_29))
4867        (= a_stocka_29 a_stockb_29)
4868        (= c_stocka_29 c_stockb_29)
4869        (or
4870          (and
4871            (= truck_loc_29 1)
4872            (= truck_travel_time_29 17)
4873          )
4874          (and
4875            (= truck_loc_29 0)
4876            (= truck_travel_time_29 21)
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4877              )
4878            (and
4879              (= truck_loc_29 3)
4880              (= truck_travel_time_29 37)
4881            )
4882          )
4883        )
4884     )
4885     (=> (= truck_loc_28 3)
4886        (and
4887          (<= c_stocka_29 200)
4888          (= (+ truck_stock_29 c_stocka_29) (+ truck_stock_28 c_stockb_29))
4889          (= a_stocka_29 a_stockb_29)
4890          (= b_stocka_29 b_stockb_29)
4891          (or
4892            (and
4893              (= truck_loc_29 1)
4894              (= truck_travel_time_29 32)
4895            )
4896            (and
4897              (= truck_loc_29 2)
4898              (= truck_travel_time_29 37)
4899            )
4900          )
4901        )
4902     )
4903   )
4904   (<= truck_stock_29 318)
4905   (>= truck_stock_29 0)
4906   (= a_stockb_30 (- a_stocka_29 truck_travel_time_29))
4907   (= b_stockb_30 (- b_stocka_29 truck_travel_time_29))
4908   (= c_stockb_30 (- c_stocka_29 truck_travel_time_29))
4909   (and
4910     (=> (= truck_loc_29 0)
4911        (and
4912          (= a_stocka_30 a_stockb_30)
4913          (= b_stocka_30 b_stockb_30)
4914          (= c_stocka_30 c_stockb_30)
4915          (or
4916            (and
4917              (= truck_loc_30 1)
4918              (= truck_travel_time_30 29)
4919            )
4920            (and
4921              (= truck_loc_30 2)
4922              (= truck_travel_time_30 21)
4923            )
4924          )
4925        )
4926     )
4927     (=> (= truck_loc_29 1)
4928        (and
4929          (<= a_stocka_30 120)
4930          (= (+ truck_stock_30 a_stocka_30) (+ truck_stock_29 a_stockb_30))
4931          (= b_stocka_30 b_stockb_30)
4932          (= c_stocka_30 c_stockb_30)
4933          (or
4934            (and
4935              (= truck_loc_30 0)
4936              (= truck_travel_time_30 29)
4937            )
4938            (and
```

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4939            (= truck_loc_30 2)
4940            (= truck_travel_time_30 17)
4941          )
4942        (and
4943          (= truck_loc_30 3)
4944          (= truck_travel_time_30 32)
4945        )
4946      )
4947    )
4948  )
4949  (=> (= truck_loc_29 2)
4950    (and
4951      (<= b_stocka_30 120)
4952      (= (+ truck_stock_30 b_stocka_30) (+ truck_stock_29 b_stockb_30))
4953      (= a_stocka_30 a_stockb_30)
4954      (= c_stocka_30 c_stockb_30)
4955      (or
4956        (and
4957          (= truck_loc_30 1)
4958          (= truck_travel_time_30 17)
4959        )
4960        (and
4961          (= truck_loc_30 0)
4962          (= truck_travel_time_30 21)
4963        )
4964        (and
4965          (= truck_loc_30 3)
4966          (= truck_travel_time_30 37)
4967        )
4968      )
4969    )
4970  )
4971  (=> (= truck_loc_29 3)
4972    (and
4973      (<= c_stocka_30 200)
4974      (= (+ truck_stock_30 c_stocka_30) (+ truck_stock_29 c_stockb_30))
4975      (= a_stocka_30 a_stockb_30)
4976      (= b_stocka_30 b_stockb_30)
4977      (or
4978        (and
4979          (= truck_loc_30 1)
4980          (= truck_travel_time_30 32)
4981        )
4982        (and
4983          (= truck_loc_30 2)
4984          (= truck_travel_time_30 37)
4985        )
4986      )
4987    )
4988  )
4989 )
4990 (<= truck_stock_30 318)
4991 (>= truck_stock_30 0)
4992 (= a_stockb_31 (- a_stocka_30 truck_travel_time_30))
4993 (= b_stockb_31 (- b_stocka_30 truck_travel_time_30))
4994 (= c_stockb_31 (- c_stocka_30 truck_travel_time_30))
4995 (and
4996   (=> (= truck_loc_30 0)
4997     (and
4998       (= a_stocka_31 a_stockb_31)
4999       (= b_stocka_31 b_stockb_31)
5000       (= c_stocka_31 c_stockb_31)
```

```
5001          (or
5002            (and
5003              (= truck_loc_31 1)
5004              (= truck_travel_time_31 29)
5005            )
5006            (and
5007              (= truck_loc_31 2)
5008              (= truck_travel_time_31 21)
5009            )
5010          )
5011        )
5012      )
5013      (=> (= truck_loc_30 1)
5014        (and
5015          (<= a_stocka_31 120)
5016          (= (+ truck_stock_31 a_stocka_31) (+ truck_stock_30 a_stockb_31))
5017          (= b_stocka_31 b_stockb_31)
5018          (= c_stocka_31 c_stockb_31)
5019          (or
5020            (and
5021              (= truck_loc_31 0)
5022              (= truck_travel_time_31 29)
5023            )
5024            (and
5025              (= truck_loc_31 2)
5026              (= truck_travel_time_31 17)
5027            )
5028            (and
5029              (= truck_loc_31 3)
5030              (= truck_travel_time_31 32)
5031            )
5032          )
5033        )
5034      )
5035      (=> (= truck_loc_30 2)
5036        (and
5037          (<= b_stocka_31 120)
5038          (= (+ truck_stock_31 b_stocka_31) (+ truck_stock_30 b_stockb_31))
5039          (= a_stocka_31 a_stockb_31)
5040          (= c_stocka_31 c_stockb_31)
5041          (or
5042            (and
5043              (= truck_loc_31 1)
5044              (= truck_travel_time_31 17)
5045            )
5046            (and
5047              (= truck_loc_31 0)
5048              (= truck_travel_time_31 21)
5049            )
5050            (and
5051              (= truck_loc_31 3)
5052              (= truck_travel_time_31 37)
5053            )
5054          )
5055        )
5056      )
5057      (=> (= truck_loc_30 3)
5058        (and
5059          (<= c_stocka_31 200)
5060          (= (+ truck_stock_31 c_stocka_31) (+ truck_stock_30 c_stockb_31))
5061          (= a_stocka_31 a_stockb_31)
5062          (= b_stocka_31 b_stockb_31)
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```
5063        (or
5064          (and
5065            (= truck_loc_31 1)
5066            (= truck_travel_time_31 32)
5067          )
5068          (and
5069            (= truck_loc_31 2)
5070            (= truck_travel_time_31 37)
5071          )
5072        )
5073      )
5074    )
5075  )
5076  (<= truck_stock_31 318)
5077  (>= truck_stock_31 0)
5078  (= a_stockb_32 (- a_stocka_31 truck_travel_time_31))
5079  (= b_stockb_32 (- b_stocka_31 truck_travel_time_31))
5080  (= c_stockb_32 (- c_stocka_31 truck_travel_time_31))
5081  (and
5082    (=> (= truck_loc_31 0)
5083      (and
5084        (= a_stocka_32 a_stockb_32)
5085        (= b_stocka_32 b_stockb_32)
5086        (= c_stocka_32 c_stockb_32)
5087        (or
5088          (and
5089            (= truck_loc_32 1)
5090            (= truck_travel_time_32 29)
5091          )
5092          (and
5093            (= truck_loc_32 2)
5094            (= truck_travel_time_32 21)
5095          )
5096        )
5097      )
5098    )
5099    (=> (= truck_loc_31 1)
5100      (and
5101        (<= a_stocka_32 120)
5102        (= (+ truck_stock_32 a_stocka_32) (+ truck_stock_31 a_stockb_32))
5103        (= b_stocka_32 b_stockb_32)
5104        (= c_stocka_32 c_stockb_32)
5105        (or
5106          (and
5107            (= truck_loc_32 0)
5108            (= truck_travel_time_32 29)
5109          )
5110          (and
5111            (= truck_loc_32 2)
5112            (= truck_travel_time_32 17)
5113          )
5114          (and
5115            (= truck_loc_32 3)
5116            (= truck_travel_time_32 32)
5117          )
5118        )
5119      )
5120    )
5121    (=> (= truck_loc_31 2)
5122      (and
5123        (<= b_stocka_32 120)
5124        (= (+ truck_stock_32 b_stocka_32) (+ truck_stock_31 b_stockb_32))
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5125        (= a_stocka_32 a_stockb_32)
5126        (= c_stocka_32 c_stockb_32)
5127        (or
5128          (and
5129            (= truck_loc_32 1)
5130            (= truck_travel_time_32 17)
5131          )
5132          (and
5133            (= truck_loc_32 0)
5134            (= truck_travel_time_32 21)
5135          )
5136          (and
5137            (= truck_loc_32 3)
5138            (= truck_travel_time_32 37)
5139          )
5140        )
5141      )
5142    )
5143    (=> (= truck_loc_31 3)
5144      (and
5145        (<= c_stocka_32 200)
5146        (= (+ truck_stock_32 c_stocka_32) (+ truck_stock_31 c_stockb_32))
5147        (= a_stocka_32 a_stockb_32)
5148        (= b_stocka_32 b_stockb_32)
5149        (or
5150          (and
5151            (= truck_loc_32 1)
5152            (= truck_travel_time_32 32)
5153          )
5154          (and
5155            (= truck_loc_32 2)
5156            (= truck_travel_time_32 37)
5157          )
5158        )
5159      )
5160    )
5161  )
5162  (<= truck_stock_32 318)
5163  (>= truck_stock_32 0)
5164  (= a_stockb_33 (- a_stocka_32 truck_travel_time_32))
5165  (= b_stockb_33 (- b_stocka_32 truck_travel_time_32))
5166  (= c_stockb_33 (- c_stocka_32 truck_travel_time_32))
5167  (and
5168    (=> (= truck_loc_32 0)
5169      (and
5170        (= a_stocka_33 a_stockb_33)
5171        (= b_stocka_33 b_stockb_33)
5172        (= c_stocka_33 c_stockb_33)
5173        (or
5174          (and
5175            (= truck_loc_33 1)
5176            (= truck_travel_time_33 29)
5177          )
5178          (and
5179            (= truck_loc_33 2)
5180            (= truck_travel_time_33 21)
5181          )
5182        )
5183      )
5184    )
5185    (=> (= truck_loc_32 1)
5186      (and
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5187        (<= a_stocka_33 120)
5188        (= (+ truck_stock_33 a_stocka_33) (+ truck_stock_32 a_stockb_33))
5189        (= b_stocka_33 b_stockb_33)
5190        (= c_stocka_33 c_stockb_33)
5191        (or
5192          (and
5193            (= truck_loc_33 0)
5194            (= truck_travel_time_33 29)
5195          )
5196          (and
5197            (= truck_loc_33 2)
5198            (= truck_travel_time_33 17)
5199          )
5200          (and
5201            (= truck_loc_33 3)
5202            (= truck_travel_time_33 32)
5203          )
5204        )
5205      )
5206    )
5207    (=> (= truck_loc_32 2)
5208      (and
5209        (<= b_stocka_33 120)
5210        (= (+ truck_stock_33 b_stocka_33) (+ truck_stock_32 b_stockb_33))
5211        (= a_stocka_33 a_stockb_33)
5212        (= c_stocka_33 c_stockb_33)
5213        (or
5214          (and
5215            (= truck_loc_33 1)
5216            (= truck_travel_time_33 17)
5217          )
5218          (and
5219            (= truck_loc_33 0)
5220            (= truck_travel_time_33 21)
5221          )
5222          (and
5223            (= truck_loc_33 3)
5224            (= truck_travel_time_33 37)
5225          )
5226        )
5227      )
5228    )
5229    (=> (= truck_loc_32 3)
5230      (and
5231        (<= c_stocka_33 200)
5232        (= (+ truck_stock_33 c_stocka_33) (+ truck_stock_32 c_stockb_33))
5233        (= a_stocka_33 a_stockb_33)
5234        (= b_stocka_33 b_stockb_33)
5235        (or
5236          (and
5237            (= truck_loc_33 1)
5238            (= truck_travel_time_33 32)
5239          )
5240          (and
5241            (= truck_loc_33 2)
5242            (= truck_travel_time_33 37)
5243          )
5244        )
5245      )
5246    )
5247  )
5248  (<= truck_stock_33 318)
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```
5249  (>= truck_stock_33 0)
5250  (= a_stockb_34 (- a_stocka_33 truck_travel_time_33))
5251  (= b_stockb_34 (- b_stocka_33 truck_travel_time_33))
5252  (= c_stockb_34 (- c_stocka_33 truck_travel_time_33))
5253  (and
5254    (=> (= truck_loc_33 0)
5255      (and
5256        (= a_stocka_34 a_stockb_34)
5257        (= b_stocka_34 b_stockb_34)
5258        (= c_stocka_34 c_stockb_34)
5259        (or
5260          (and
5261            (= truck_loc_34 1)
5262            (= truck_travel_time_34 29)
5263          )
5264          (and
5265            (= truck_loc_34 2)
5266            (= truck_travel_time_34 21)
5267          )
5268        )
5269      )
5270    )
5271    (=> (= truck_loc_33 1)
5272      (and
5273        (<= a_stocka_34 120)
5274        (= (+ truck_stock_34 a_stocka_34) (+ truck_stock_33 a_stockb_34))
5275        (= b_stocka_34 b_stockb_34)
5276        (= c_stocka_34 c_stockb_34)
5277        (or
5278          (and
5279            (= truck_loc_34 0)
5280            (= truck_travel_time_34 29)
5281          )
5282          (and
5283            (= truck_loc_34 2)
5284            (= truck_travel_time_34 17)
5285          )
5286          (and
5287            (= truck_loc_34 3)
5288            (= truck_travel_time_34 32)
5289          )
5290        )
5291      )
5292    )
5293    (=> (= truck_loc_33 2)
5294      (and
5295        (<= b_stocka_34 120)
5296        (= (+ truck_stock_34 b_stocka_34) (+ truck_stock_33 b_stockb_34))
5297        (= a_stocka_34 a_stockb_34)
5298        (= c_stocka_34 c_stockb_34)
5299        (or
5300          (and
5301            (= truck_loc_34 1)
5302            (= truck_travel_time_34 17)
5303          )
5304          (and
5305            (= truck_loc_34 0)
5306            (= truck_travel_time_34 21)
5307          )
5308          (and
5309            (= truck_loc_34 3)
5310            (= truck_travel_time_34 37)
```

```
5311              )
5312            )
5313          )
5314        )
5315     (=> (= truck_loc_33 3)
5316        (and
5317          (<= c_stocka_34 200)
5318          (= (+ truck_stock_34 c_stocka_34) (+ truck_stock_33 c_stockb_34))
5319          (= a_stocka_34 a_stockb_34)
5320          (= b_stocka_34 b_stockb_34)
5321          (or
5322            (and
5323              (= truck_loc_34 1)
5324              (= truck_travel_time_34 32)
5325            )
5326            (and
5327              (= truck_loc_34 2)
5328              (= truck_travel_time_34 37)
5329            )
5330          )
5331        )
5332     )
5333  )
5334  (<= truck_stock_34 318)
5335  (>= truck_stock_34 0)
5336  (= a_stockb_35 (- a_stocka_34 truck_travel_time_34))
5337  (= b_stockb_35 (- b_stocka_34 truck_travel_time_34))
5338  (= c_stockb_35 (- c_stocka_34 truck_travel_time_34))
5339  (and
5340     (=> (= truck_loc_34 0)
5341        (and
5342          (= a_stocka_35 a_stockb_35)
5343          (= b_stocka_35 b_stockb_35)
5344          (= c_stocka_35 c_stockb_35)
5345          (or
5346            (and
5347              (= truck_loc_35 1)
5348              (= truck_travel_time_35 29)
5349            )
5350            (and
5351              (= truck_loc_35 2)
5352              (= truck_travel_time_35 21)
5353            )
5354          )
5355        )
5356     )
5357     (=> (= truck_loc_34 1)
5358        (and
5359          (<= a_stocka_35 120)
5360          (= (+ truck_stock_35 a_stocka_35) (+ truck_stock_34 a_stockb_35))
5361          (= b_stocka_35 b_stockb_35)
5362          (= c_stocka_35 c_stockb_35)
5363          (or
5364            (and
5365              (= truck_loc_35 0)
5366              (= truck_travel_time_35 29)
5367            )
5368            (and
5369              (= truck_loc_35 2)
5370              (= truck_travel_time_35 17)
5371            )
5372            (and
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```
5373            (= truck_loc_35 3)
5374            (= truck_travel_time_35 32)
5375          )
5376        )
5377      )
5378    )
5379    (=> (= truck_loc_34 2)
5380      (and
5381        (<= b_stocka_35 120)
5382        (= (+ truck_stock_35 b_stocka_35) (+ truck_stock_34 b_stockb_35))
5383        (= a_stocka_35 a_stockb_35)
5384        (= c_stocka_35 c_stockb_35)
5385        (or
5386          (and
5387            (= truck_loc_35 1)
5388            (= truck_travel_time_35 17)
5389          )
5390          (and
5391            (= truck_loc_35 0)
5392            (= truck_travel_time_35 21)
5393          )
5394          (and
5395            (= truck_loc_35 3)
5396            (= truck_travel_time_35 37)
5397          )
5398        )
5399      )
5400    )
5401    (=> (= truck_loc_34 3)
5402      (and
5403        (<= c_stocka_35 200)
5404        (= (+ truck_stock_35 c_stocka_35) (+ truck_stock_34 c_stockb_35))
5405        (= a_stocka_35 a_stockb_35)
5406        (= b_stocka_35 b_stockb_35)
5407        (or
5408          (and
5409            (= truck_loc_35 1)
5410            (= truck_travel_time_35 32)
5411          )
5412          (and
5413            (= truck_loc_35 2)
5414            (= truck_travel_time_35 37)
5415          )
5416        )
5417      )
5418    )
5419  )
5420  (<= truck_stock_35 318)
5421  (>= truck_stock_35 0)
5422  (= a_stockb_36 (- a_stocka_35 truck_travel_time_35))
5423  (= b_stockb_36 (- b_stocka_35 truck_travel_time_35))
5424  (= c_stockb_36 (- c_stocka_35 truck_travel_time_35))
5425  (and
5426    (=> (= truck_loc_35 0)
5427      (and
5428        (= a_stocka_36 a_stockb_36)
5429        (= b_stocka_36 b_stockb_36)
5430        (= c_stocka_36 c_stockb_36)
5431        (or
5432          (and
5433            (= truck_loc_36 1)
5434            (= truck_travel_time_36 29)
```

```
5435            )
5436          (and
5437            (= truck_loc_36 2)
5438            (= truck_travel_time_36 21)
5439          )
5440        )
5441      )
5442    )
5443    (=> (= truck_loc_35 1)
5444      (and
5445        (<= a_stocka_36 120)
5446        (= (+ truck_stock_36 a_stocka_36) (+ truck_stock_35 a_stockb_36))
5447        (= b_stocka_36 b_stockb_36)
5448        (= c_stocka_36 c_stockb_36)
5449        (or
5450          (and
5451            (= truck_loc_36 0)
5452            (= truck_travel_time_36 29)
5453          )
5454          (and
5455            (= truck_loc_36 2)
5456            (= truck_travel_time_36 17)
5457          )
5458          (and
5459            (= truck_loc_36 3)
5460            (= truck_travel_time_36 32)
5461          )
5462        )
5463      )
5464    )
5465    (=> (= truck_loc_35 2)
5466      (and
5467        (<= b_stocka_36 120)
5468        (= (+ truck_stock_36 b_stocka_36) (+ truck_stock_35 b_stockb_36))
5469        (= a_stocka_36 a_stockb_36)
5470        (= c_stocka_36 c_stockb_36)
5471        (or
5472          (and
5473            (= truck_loc_36 1)
5474            (= truck_travel_time_36 17)
5475          )
5476          (and
5477            (= truck_loc_36 0)
5478            (= truck_travel_time_36 21)
5479          )
5480          (and
5481            (= truck_loc_36 3)
5482            (= truck_travel_time_36 37)
5483          )
5484        )
5485      )
5486    )
5487    (=> (= truck_loc_35 3)
5488      (and
5489        (<= c_stocka_36 200)
5490        (= (+ truck_stock_36 c_stocka_36) (+ truck_stock_35 c_stockb_36))
5491        (= a_stocka_36 a_stockb_36)
5492        (= b_stocka_36 b_stockb_36)
5493        (or
5494          (and
5495            (= truck_loc_36 1)
5496            (= truck_travel_time_36 32)
```

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5497            )
5498          (and
5499            (= truck_loc_36 2)
5500            (= truck_travel_time_36 37)
5501          )
5502        )
5503      )
5504    )
5505  )
5506  (<= truck_stock_36 318)
5507  (>= truck_stock_36 0)
5508  (= a_stockb_37 (- a_stocka_36 truck_travel_time_36))
5509  (= b_stockb_37 (- b_stocka_36 truck_travel_time_36))
5510  (= c_stockb_37 (- c_stocka_36 truck_travel_time_36))
5511  (and
5512    (=> (= truck_loc_36 0)
5513      (and
5514        (= a_stocka_37 a_stockb_37)
5515        (= b_stocka_37 b_stockb_37)
5516        (= c_stocka_37 c_stockb_37)
5517        (or
5518          (and
5519            (= truck_loc_37 1)
5520            (= truck_travel_time_37 29)
5521          )
5522          (and
5523            (= truck_loc_37 2)
5524            (= truck_travel_time_37 21)
5525          )
5526        )
5527      )
5528    )
5529    (=> (= truck_loc_36 1)
5530      (and
5531        (<= a_stocka_37 120)
5532        (= (+ truck_stock_37 a_stocka_37) (+ truck_stock_36 a_stockb_37))
5533        (= b_stocka_37 b_stockb_37)
5534        (= c_stocka_37 c_stockb_37)
5535        (or
5536          (and
5537            (= truck_loc_37 0)
5538            (= truck_travel_time_37 29)
5539          )
5540          (and
5541            (= truck_loc_37 2)
5542            (= truck_travel_time_37 17)
5543          )
5544          (and
5545            (= truck_loc_37 3)
5546            (= truck_travel_time_37 32)
5547          )
5548        )
5549      )
5550    )
5551    (=> (= truck_loc_36 2)
5552      (and
5553        (<= b_stocka_37 120)
5554        (= (+ truck_stock_37 b_stocka_37) (+ truck_stock_36 b_stockb_37))
5555        (= a_stocka_37 a_stockb_37)
5556        (= c_stocka_37 c_stockb_37)
5557        (or
5558          (and
```

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```
5559              (= truck_loc_37 1)
5560              (= truck_travel_time_37 17)
5561            )
5562          (and
5563              (= truck_loc_37 0)
5564              (= truck_travel_time_37 21)
5565          )
5566          (and
5567              (= truck_loc_37 3)
5568              (= truck_travel_time_37 37)
5569          )
5570        )
5571      )
5572    )
5573    (=> (= truck_loc_36 3)
5574      (and
5575        (<= c_stocka_37 200)
5576        (= (+ truck_stock_37 c_stocka_37) (+ truck_stock_36 c_stockb_37))
5577        (= a_stocka_37 a_stockb_37)
5578        (= b_stocka_37 b_stockb_37)
5579        (or
5580          (and
5581            (= truck_loc_37 1)
5582            (= truck_travel_time_37 32)
5583          )
5584          (and
5585            (= truck_loc_37 2)
5586            (= truck_travel_time_37 37)
5587          )
5588        )
5589      )
5590    )
5591  )
5592  (<= truck_stock_37 318)
5593  (>= truck_stock_37 0)
5594  (= a_stockb_38 (- a_stocka_37 truck_travel_time_37))
5595  (= b_stockb_38 (- b_stocka_37 truck_travel_time_37))
5596  (= c_stockb_38 (- c_stocka_37 truck_travel_time_37))
5597  (and
5598    (=> (= truck_loc_37 0)
5599      (and
5600        (= a_stocka_38 a_stockb_38)
5601        (= b_stocka_38 b_stockb_38)
5602        (= c_stocka_38 c_stockb_38)
5603        (or
5604          (and
5605            (= truck_loc_38 1)
5606            (= truck_travel_time_38 29)
5607          )
5608          (and
5609            (= truck_loc_38 2)
5610            (= truck_travel_time_38 21)
5611          )
5612        )
5613      )
5614    )
5615    (=> (= truck_loc_37 1)
5616      (and
5617        (<= a_stocka_38 120)
5618        (= (+ truck_stock_38 a_stocka_38) (+ truck_stock_37 a_stockb_38))
5619        (= b_stocka_38 b_stockb_38)
5620        (= c_stocka_38 c_stockb_38)
```

```
5621        (or
5622          (and
5623            (= truck_loc_38 0)
5624            (= truck_travel_time_38 29)
5625          )
5626          (and
5627            (= truck_loc_38 2)
5628            (= truck_travel_time_38 17)
5629          )
5630          (and
5631            (= truck_loc_38 3)
5632            (= truck_travel_time_38 32)
5633          )
5634        )
5635      )
5636    )
5637    (=> (= truck_loc_37 2)
5638      (and
5639        (<= b_stocka_38 120)
5640        (= (+ truck_stock_38 b_stocka_38) (+ truck_stock_37 b_stockb_38))
5641        (= a_stocka_38 a_stockb_38)
5642        (= c_stocka_38 c_stockb_38)
5643        (or
5644          (and
5645            (= truck_loc_38 1)
5646            (= truck_travel_time_38 17)
5647          )
5648          (and
5649            (= truck_loc_38 0)
5650            (= truck_travel_time_38 21)
5651          )
5652          (and
5653            (= truck_loc_38 3)
5654            (= truck_travel_time_38 37)
5655          )
5656        )
5657      )
5658    )
5659    (=> (= truck_loc_37 3)
5660      (and
5661        (<= c_stocka_38 200)
5662        (= (+ truck_stock_38 c_stocka_38) (+ truck_stock_37 c_stockb_38))
5663        (= a_stocka_38 a_stockb_38)
5664        (= b_stocka_38 b_stockb_38)
5665        (or
5666          (and
5667            (= truck_loc_38 1)
5668            (= truck_travel_time_38 32)
5669          )
5670          (and
5671            (= truck_loc_38 2)
5672            (= truck_travel_time_38 37)
5673          )
5674        )
5675      )
5676    )
5677  )
5678  (<= truck_stock_38 318)
5679  (>= truck_stock_38 0)
5680  (= a_stockb_39 (- a_stocka_38 truck_travel_time_38))
5681  (= b_stockb_39 (- b_stocka_38 truck_travel_time_38))
5682  (= c_stockb_39 (- c_stocka_38 truck_travel_time_38))
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```
5683   (and
5684     (=> (= truck_loc_38 0)
5685       (and
5686         (= a_stocka_39 a_stockb_39)
5687         (= b_stocka_39 b_stockb_39)
5688         (= c_stocka_39 c_stockb_39)
5689         (or
5690           (and
5691             (= truck_loc_39 1)
5692             (= truck_travel_time_39 29)
5693           )
5694           (and
5695             (= truck_loc_39 2)
5696             (= truck_travel_time_39 21)
5697           )
5698         )
5699       )
5700     )
5701     (=> (= truck_loc_38 1)
5702       (and
5703         (<= a_stocka_39 120)
5704         (= (+ truck_stock_39 a_stocka_39) (+ truck_stock_38 a_stockb_39))
5705         (= b_stocka_39 b_stockb_39)
5706         (= c_stocka_39 c_stockb_39)
5707         (or
5708           (and
5709             (= truck_loc_39 0)
5710             (= truck_travel_time_39 29)
5711           )
5712           (and
5713             (= truck_loc_39 2)
5714             (= truck_travel_time_39 17)
5715           )
5716           (and
5717             (= truck_loc_39 3)
5718             (= truck_travel_time_39 32)
5719           )
5720         )
5721       )
5722     )
5723     (=> (= truck_loc_38 2)
5724       (and
5725         (<= b_stocka_39 120)
5726         (= (+ truck_stock_39 b_stocka_39) (+ truck_stock_38 b_stockb_39))
5727         (= a_stocka_39 a_stockb_39)
5728         (= c_stocka_39 c_stockb_39)
5729         (or
5730           (and
5731             (= truck_loc_39 1)
5732             (= truck_travel_time_39 17)
5733           )
5734           (and
5735             (= truck_loc_39 0)
5736             (= truck_travel_time_39 21)
5737           )
5738           (and
5739             (= truck_loc_39 3)
5740             (= truck_travel_time_39 37)
5741           )
5742         )
5743       )
5744     )
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```
5745    (=> (= truck_loc_38 3)
5746      (and
5747        (<= c_stocka_39 200)
5748        (= (+ truck_stock_39 c_stocka_39) (+ truck_stock_38 c_stockb_39))
5749        (= a_stocka_39 a_stockb_39)
5750        (= b_stocka_39 b_stockb_39)
5751        (or
5752          (and
5753            (= truck_loc_39 1)
5754            (= truck_travel_time_39 32)
5755          )
5756          (and
5757            (= truck_loc_39 2)
5758            (= truck_travel_time_39 37)
5759          )
5760        )
5761      )
5762    )
5763  )
5764  (<= truck_stock_39 318)
5765  (>= truck_stock_39 0)
5766  (= a_stockb_40 (- a_stocka_39 truck_travel_time_39))
5767  (= b_stockb_40 (- b_stocka_39 truck_travel_time_39))
5768  (= c_stockb_40 (- c_stocka_39 truck_travel_time_39))
5769  (and
5770    (=> (= truck_loc_39 0)
5771      (and
5772        (= a_stocka_40 a_stockb_40)
5773        (= b_stocka_40 b_stockb_40)
5774        (= c_stocka_40 c_stockb_40)
5775        (or
5776          (and
5777            (= truck_loc_40 1)
5778            (= truck_travel_time_40 29)
5779          )
5780          (and
5781            (= truck_loc_40 2)
5782            (= truck_travel_time_40 21)
5783          )
5784        )
5785      )
5786    )
5787    (=> (= truck_loc_39 1)
5788      (and
5789        (<= a_stocka_40 120)
5790        (= (+ truck_stock_40 a_stocka_40) (+ truck_stock_39 a_stockb_40))
5791        (= b_stocka_40 b_stockb_40)
5792        (= c_stocka_40 c_stockb_40)
5793        (or
5794          (and
5795            (= truck_loc_40 0)
5796            (= truck_travel_time_40 29)
5797          )
5798          (and
5799            (= truck_loc_40 2)
5800            (= truck_travel_time_40 17)
5801          )
5802          (and
5803            (= truck_loc_40 3)
5804            (= truck_travel_time_40 32)
5805          )
5806        )
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5807        )
5808      )
5809      (=> (= truck_loc_39 2)
5810        (and
5811          (<= b_stocka_40 120)
5812          (= (+ truck_stock_40 b_stocka_40) (+ truck_stock_39 b_stockb_40))
5813          (= a_stocka_40 a_stockb_40)
5814          (= c_stocka_40 c_stockb_40)
5815          (or
5816            (and
5817              (= truck_loc_40 1)
5818              (= truck_travel_time_40 17)
5819            )
5820            (and
5821              (= truck_loc_40 0)
5822              (= truck_travel_time_40 21)
5823            )
5824            (and
5825              (= truck_loc_40 3)
5826              (= truck_travel_time_40 37)
5827            )
5828          )
5829        )
5830      )
5831      (=> (= truck_loc_39 3)
5832        (and
5833          (<= c_stocka_40 200)
5834          (= (+ truck_stock_40 c_stocka_40) (+ truck_stock_39 c_stockb_40))
5835          (= a_stocka_40 a_stockb_40)
5836          (= b_stocka_40 b_stockb_40)
5837          (or
5838            (and
5839              (= truck_loc_40 1)
5840              (= truck_travel_time_40 32)
5841            )
5842            (and
5843              (= truck_loc_40 2)
5844              (= truck_travel_time_40 37)
5845            )
5846          )
5847        )
5848      )
5849  )
5850  (<= truck_stock_40 318)
5851  (>= truck_stock_40 0)
5852  (= a_stockb_41 (- a_stocka_40 truck_travel_time_40))
5853  (= b_stockb_41 (- b_stocka_40 truck_travel_time_40))
5854  (= c_stockb_41 (- c_stocka_40 truck_travel_time_40))
5855  (and
5856    (=> (= truck_loc_40 0)
5857      (and
5858        (= a_stocka_41 a_stockb_41)
5859        (= b_stocka_41 b_stockb_41)
5860        (= c_stocka_41 c_stockb_41)
5861        (or
5862          (and
5863            (= truck_loc_41 1)
5864            (= truck_travel_time_41 29)
5865          )
5866          (and
5867            (= truck_loc_41 2)
5868            (= truck_travel_time_41 21)
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5869            )
5870          )
5871        )
5872      )
5873      (=> (= truck_loc_40 1)
5874        (and
5875          (<= a_stocka_41 120)
5876          (= (+ truck_stock_41 a_stocka_41) (+ truck_stock_40 a_stockb_41))
5877          (= b_stocka_41 b_stockb_41)
5878          (= c_stocka_41 c_stockb_41)
5879          (or
5880            (and
5881              (= truck_loc_41 0)
5882              (= truck_travel_time_41 29)
5883            )
5884            (and
5885              (= truck_loc_41 2)
5886              (= truck_travel_time_41 17)
5887            )
5888            (and
5889              (= truck_loc_41 3)
5890              (= truck_travel_time_41 32)
5891            )
5892          )
5893        )
5894      )
5895      (=> (= truck_loc_40 2)
5896        (and
5897          (<= b_stocka_41 120)
5898          (= (+ truck_stock_41 b_stocka_41) (+ truck_stock_40 b_stockb_41))
5899          (= a_stocka_41 a_stockb_41)
5900          (= c_stocka_41 c_stockb_41)
5901          (or
5902            (and
5903              (= truck_loc_41 1)
5904              (= truck_travel_time_41 17)
5905            )
5906            (and
5907              (= truck_loc_41 0)
5908              (= truck_travel_time_41 21)
5909            )
5910            (and
5911              (= truck_loc_41 3)
5912              (= truck_travel_time_41 37)
5913            )
5914          )
5915        )
5916      )
5917      (=> (= truck_loc_40 3)
5918        (and
5919          (<= c_stocka_41 200)
5920          (= (+ truck_stock_41 c_stocka_41) (+ truck_stock_40 c_stockb_41))
5921          (= a_stocka_41 a_stockb_41)
5922          (= b_stocka_41 b_stockb_41)
5923          (or
5924            (and
5925              (= truck_loc_41 1)
5926              (= truck_travel_time_41 32)
5927            )
5928            (and
5929              (= truck_loc_41 2)
5930              (= truck_travel_time_41 37)
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5931              )
5932            )
5933          )
5934      )
5935  )
5936  (<= truck_stock_41 318)
5937  (>= truck_stock_41 0)
5938  (= a_stockb_42 (- a_stocka_41 truck_travel_time_41))
5939  (= b_stockb_42 (- b_stocka_41 truck_travel_time_41))
5940  (= c_stockb_42 (- c_stocka_41 truck_travel_time_41))
5941  (and
5942    (=> (= truck_loc_41 0)
5943      (and
5944        (= a_stocka_42 a_stockb_42)
5945        (= b_stocka_42 b_stockb_42)
5946        (= c_stocka_42 c_stockb_42)
5947        (or
5948          (and
5949            (= truck_loc_42 1)
5950            (= truck_travel_time_42 29)
5951          )
5952          (and
5953            (= truck_loc_42 2)
5954            (= truck_travel_time_42 21)
5955          )
5956        )
5957      )
5958    )
5959    (=> (= truck_loc_41 1)
5960      (and
5961        (<= a_stocka_42 120)
5962        (= (+ truck_stock_42 a_stocka_42) (+ truck_stock_41 a_stockb_42))
5963        (= b_stocka_42 b_stockb_42)
5964        (= c_stocka_42 c_stockb_42)
5965        (or
5966          (and
5967            (= truck_loc_42 0)
5968            (= truck_travel_time_42 29)
5969          )
5970          (and
5971            (= truck_loc_42 2)
5972            (= truck_travel_time_42 17)
5973          )
5974          (and
5975            (= truck_loc_42 3)
5976            (= truck_travel_time_42 32)
5977          )
5978        )
5979      )
5980    )
5981    (=> (= truck_loc_41 2)
5982      (and
5983        (<= b_stocka_42 120)
5984        (= (+ truck_stock_42 b_stocka_42) (+ truck_stock_41 b_stockb_42))
5985        (= a_stocka_42 a_stockb_42)
5986        (= c_stocka_42 c_stockb_42)
5987        (or
5988          (and
5989            (= truck_loc_42 1)
5990            (= truck_travel_time_42 17)
5991          )
5992          (and
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5993              (= truck_loc_42 0)
5994              (= truck_travel_time_42 21)
5995            )
5996          (and
5997              (= truck_loc_42 3)
5998              (= truck_travel_time_42 37)
5999          )
6000        )
6001      )
6002    )
6003    (=> (= truck_loc_41 3)
6004      (and
6005        (<= c_stocka_42 200)
6006        (= (+ truck_stock_42 c_stocka_42) (+ truck_stock_41 c_stockb_42))
6007        (= a_stocka_42 a_stockb_42)
6008        (= b_stocka_42 b_stockb_42)
6009        (or
6010          (and
6011              (= truck_loc_42 1)
6012              (= truck_travel_time_42 32)
6013          )
6014          (and
6015              (= truck_loc_42 2)
6016              (= truck_travel_time_42 37)
6017          )
6018        )
6019      )
6020    )
6021  )
6022  (<= truck_stock_42 318)
6023  (>= truck_stock_42 0)
6024  (= a_stockb_43 (- a_stocka_42 truck_travel_time_42))
6025  (= b_stockb_43 (- b_stocka_42 truck_travel_time_42))
6026  (= c_stockb_43 (- c_stocka_42 truck_travel_time_42))
6027  (and
6028    (=> (= truck_loc_42 0)
6029      (and
6030        (= a_stocka_43 a_stockb_43)
6031        (= b_stocka_43 b_stockb_43)
6032        (= c_stocka_43 c_stockb_43)
6033        (or
6034          (and
6035              (= truck_loc_43 1)
6036              (= truck_travel_time_43 29)
6037          )
6038          (and
6039              (= truck_loc_43 2)
6040              (= truck_travel_time_43 21)
6041          )
6042        )
6043      )
6044    )
6045    (=> (= truck_loc_42 1)
6046      (and
6047        (<= a_stocka_43 120)
6048        (= (+ truck_stock_43 a_stocka_43) (+ truck_stock_42 a_stockb_43))
6049        (= b_stocka_43 b_stockb_43)
6050        (= c_stocka_43 c_stockb_43)
6051        (or
6052          (and
6053              (= truck_loc_43 0)
6054              (= truck_travel_time_43 29)
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6055            )
6056          (and
6057            (= truck_loc_43 2)
6058            (= truck_travel_time_43 17)
6059          )
6060          (and
6061            (= truck_loc_43 3)
6062            (= truck_travel_time_43 32)
6063          )
6064        )
6065      )
6066    )
6067    (=> (= truck_loc_42 2)
6068      (and
6069        (<= b_stocka_43 120)
6070        (= (+ truck_stock_43 b_stocka_43) (+ truck_stock_42 b_stockb_43))
6071        (= a_stocka_43 a_stockb_43)
6072        (= c_stocka_43 c_stockb_43)
6073        (or
6074          (and
6075            (= truck_loc_43 1)
6076            (= truck_travel_time_43 17)
6077          )
6078          (and
6079            (= truck_loc_43 0)
6080            (= truck_travel_time_43 21)
6081          )
6082          (and
6083            (= truck_loc_43 3)
6084            (= truck_travel_time_43 37)
6085          )
6086        )
6087      )
6088    )
6089    (=> (= truck_loc_42 3)
6090      (and
6091        (<= c_stocka_43 200)
6092        (= (+ truck_stock_43 c_stocka_43) (+ truck_stock_42 c_stockb_43))
6093        (= a_stocka_43 a_stockb_43)
6094        (= b_stocka_43 b_stockb_43)
6095        (or
6096          (and
6097            (= truck_loc_43 1)
6098            (= truck_travel_time_43 32)
6099          )
6100          (and
6101            (= truck_loc_43 2)
6102            (= truck_travel_time_43 37)
6103          )
6104        )
6105      )
6106    )
6107  )
6108  (<= truck_stock_43 318)
6109  (>= truck_stock_43 0)
6110  (= a_stockb_44 (- a_stocka_43 truck_travel_time_43))
6111  (= b_stockb_44 (- b_stocka_43 truck_travel_time_43))
6112  (= c_stockb_44 (- c_stocka_43 truck_travel_time_43))
6113  (and
6114    (=> (= truck_loc_43 0)
6115      (and
6116        (= a_stocka_44 a_stockb_44)
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6117        (= b_stocka_44 b_stockb_44)
6118        (= c_stocka_44 c_stockb_44)
6119        (or
6120          (and
6121            (= truck_loc_44 1)
6122            (= truck_travel_time_44 29)
6123          )
6124          (and
6125            (= truck_loc_44 2)
6126            (= truck_travel_time_44 21)
6127          )
6128        )
6129      )
6130    )
6131    (=> (= truck_loc_43 1)
6132      (and
6133        (<= a_stocka_44 120)
6134        (= (+ truck_stock_44 a_stocka_44) (+ truck_stock_43 a_stockb_44))
6135        (= b_stocka_44 b_stockb_44)
6136        (= c_stocka_44 c_stockb_44)
6137        (or
6138          (and
6139            (= truck_loc_44 0)
6140            (= truck_travel_time_44 29)
6141          )
6142          (and
6143            (= truck_loc_44 2)
6144            (= truck_travel_time_44 17)
6145          )
6146          (and
6147            (= truck_loc_44 3)
6148            (= truck_travel_time_44 32)
6149          )
6150        )
6151      )
6152    )
6153    (=> (= truck_loc_43 2)
6154      (and
6155        (<= b_stocka_44 120)
6156        (= (+ truck_stock_44 b_stocka_44) (+ truck_stock_43 b_stockb_44))
6157        (= a_stocka_44 a_stockb_44)
6158        (= c_stocka_44 c_stockb_44)
6159        (or
6160          (and
6161            (= truck_loc_44 1)
6162            (= truck_travel_time_44 17)
6163          )
6164          (and
6165            (= truck_loc_44 0)
6166            (= truck_travel_time_44 21)
6167          )
6168          (and
6169            (= truck_loc_44 3)
6170            (= truck_travel_time_44 37)
6171          )
6172        )
6173      )
6174    )
6175    (=> (= truck_loc_43 3)
6176      (and
6177        (<= c_stocka_44 200)
6178        (= (+ truck_stock_44 c_stocka_44) (+ truck_stock_43 c_stockb_44))
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6179          (= a_stocka_44 a_stockb_44)
6180          (= b_stocka_44 b_stockb_44)
6181          (or
6182            (and
6183              (= truck_loc_44 1)
6184              (= truck_travel_time_44 32)
6185            )
6186            (and
6187              (= truck_loc_44 2)
6188              (= truck_travel_time_44 37)
6189            )
6190          )
6191        )
6192    )
6193  )
6194  (<= truck_stock_44 318)
6195  (>= truck_stock_44 0)
6196  (= a_stockb_45 (- a_stocka_44 truck_travel_time_44))
6197  (= b_stockb_45 (- b_stocka_44 truck_travel_time_44))
6198  (= c_stockb_45 (- c_stocka_44 truck_travel_time_44))
6199  (and
6200    (=> (= truck_loc_44 0)
6201      (and
6202        (= a_stocka_45 a_stockb_45)
6203        (= b_stocka_45 b_stockb_45)
6204        (= c_stocka_45 c_stockb_45)
6205        (or
6206          (and
6207            (= truck_loc_45 1)
6208            (= truck_travel_time_45 29)
6209          )
6210          (and
6211            (= truck_loc_45 2)
6212            (= truck_travel_time_45 21)
6213          )
6214        )
6215      )
6216    )
6217    (=> (= truck_loc_44 1)
6218      (and
6219        (<= a_stocka_45 120)
6220        (= (+ truck_stock_45 a_stocka_45) (+ truck_stock_44 a_stockb_45))
6221        (= b_stocka_45 b_stockb_45)
6222        (= c_stocka_45 c_stockb_45)
6223        (or
6224          (and
6225            (= truck_loc_45 0)
6226            (= truck_travel_time_45 29)
6227          )
6228          (and
6229            (= truck_loc_45 2)
6230            (= truck_travel_time_45 17)
6231          )
6232          (and
6233            (= truck_loc_45 3)
6234            (= truck_travel_time_45 32)
6235          )
6236        )
6237      )
6238    )
6239    (=> (= truck_loc_44 2)
6240      (and
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6241        (<= b_stocka_45 120)
6242        (= (+ truck_stock_45 b_stocka_45) (+ truck_stock_44 b_stockb_45))
6243        (= a_stocka_45 a_stockb_45)
6244        (= c_stocka_45 c_stockb_45)
6245        (or
6246          (and
6247            (= truck_loc_45 1)
6248            (= truck_travel_time_45 17)
6249          )
6250          (and
6251            (= truck_loc_45 0)
6252            (= truck_travel_time_45 21)
6253          )
6254          (and
6255            (= truck_loc_45 3)
6256            (= truck_travel_time_45 37)
6257          )
6258        )
6259      )
6260    )
6261    (=> (= truck_loc_44 3)
6262      (and
6263        (<= c_stocka_45 200)
6264        (= (+ truck_stock_45 c_stocka_45) (+ truck_stock_44 c_stockb_45))
6265        (= a_stocka_45 a_stockb_45)
6266        (= b_stocka_45 b_stockb_45)
6267        (or
6268          (and
6269            (= truck_loc_45 1)
6270            (= truck_travel_time_45 32)
6271          )
6272          (and
6273            (= truck_loc_45 2)
6274            (= truck_travel_time_45 37)
6275          )
6276        )
6277      )
6278    )
6279  )
6280  (<= truck_stock_45 318)
6281  (>= truck_stock_45 0)
6282  (= a_stockb_46 (- a_stocka_45 truck_travel_time_45))
6283  (= b_stockb_46 (- b_stocka_45 truck_travel_time_45))
6284  (= c_stockb_46 (- c_stocka_45 truck_travel_time_45))
6285  (and
6286    (=> (= truck_loc_45 0)
6287      (and
6288        (= a_stocka_46 a_stockb_46)
6289        (= b_stocka_46 b_stockb_46)
6290        (= c_stocka_46 c_stockb_46)
6291        (or
6292          (and
6293            (= truck_loc_46 1)
6294            (= truck_travel_time_46 29)
6295          )
6296          (and
6297            (= truck_loc_46 2)
6298            (= truck_travel_time_46 21)
6299          )
6300        )
6301      )
6302    )
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6303      (=> (= truck_loc_45 1)
6304        (and
6305          (<= a_stocka_46 120)
6306          (= (+ truck_stock_46 a_stocka_46) (+ truck_stock_45 a_stockb_46))
6307          (= b_stocka_46 b_stockb_46)
6308          (= c_stocka_46 c_stockb_46)
6309          (or
6310            (and
6311              (= truck_loc_46 0)
6312              (= truck_travel_time_46 29)
6313            )
6314            (and
6315              (= truck_loc_46 2)
6316              (= truck_travel_time_46 17)
6317            )
6318            (and
6319              (= truck_loc_46 3)
6320              (= truck_travel_time_46 32)
6321            )
6322          )
6323        )
6324      )
6325      (=> (= truck_loc_45 2)
6326        (and
6327          (<= b_stocka_46 120)
6328          (= (+ truck_stock_46 b_stocka_46) (+ truck_stock_45 b_stockb_46))
6329          (= a_stocka_46 a_stockb_46)
6330          (= c_stocka_46 c_stockb_46)
6331          (or
6332            (and
6333              (= truck_loc_46 1)
6334              (= truck_travel_time_46 17)
6335            )
6336            (and
6337              (= truck_loc_46 0)
6338              (= truck_travel_time_46 21)
6339            )
6340            (and
6341              (= truck_loc_46 3)
6342              (= truck_travel_time_46 37)
6343            )
6344          )
6345        )
6346      )
6347      (=> (= truck_loc_45 3)
6348        (and
6349          (<= c_stocka_46 200)
6350          (= (+ truck_stock_46 c_stocka_46) (+ truck_stock_45 c_stockb_46))
6351          (= a_stocka_46 a_stockb_46)
6352          (= b_stocka_46 b_stockb_46)
6353          (or
6354            (and
6355              (= truck_loc_46 1)
6356              (= truck_travel_time_46 32)
6357            )
6358            (and
6359              (= truck_loc_46 2)
6360              (= truck_travel_time_46 37)
6361            )
6362          )
6363        )
6364      )
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6365  )
6366  (<= truck_stock_46 318)
6367  (>= truck_stock_46 0)
6368  (= a_stockb_47 (- a_stocka_46 truck_travel_time_46))
6369  (= b_stockb_47 (- b_stocka_46 truck_travel_time_46))
6370  (= c_stockb_47 (- c_stocka_46 truck_travel_time_46))
6371  (and
6372    (=> (= truck_loc_46 0)
6373      (and
6374        (= a_stocka_47 a_stockb_47)
6375        (= b_stocka_47 b_stockb_47)
6376        (= c_stocka_47 c_stockb_47)
6377        (or
6378          (and
6379            (= truck_loc_47 1)
6380            (= truck_travel_time_47 29)
6381          )
6382          (and
6383            (= truck_loc_47 2)
6384            (= truck_travel_time_47 21)
6385          )
6386        )
6387      )
6388    )
6389    (=> (= truck_loc_46 1)
6390      (and
6391        (<= a_stocka_47 120)
6392        (= (+ truck_stock_47 a_stocka_47) (+ truck_stock_46 a_stockb_47))
6393        (= b_stocka_47 b_stockb_47)
6394        (= c_stocka_47 c_stockb_47)
6395        (or
6396          (and
6397            (= truck_loc_47 0)
6398            (= truck_travel_time_47 29)
6399          )
6400          (and
6401            (= truck_loc_47 2)
6402            (= truck_travel_time_47 17)
6403          )
6404          (and
6405            (= truck_loc_47 3)
6406            (= truck_travel_time_47 32)
6407          )
6408        )
6409      )
6410    )
6411    (=> (= truck_loc_46 2)
6412      (and
6413        (<= b_stocka_47 120)
6414        (= (+ truck_stock_47 b_stocka_47) (+ truck_stock_46 b_stockb_47))
6415        (= a_stocka_47 a_stockb_47)
6416        (= c_stocka_47 c_stockb_47)
6417        (or
6418          (and
6419            (= truck_loc_47 1)
6420            (= truck_travel_time_47 17)
6421          )
6422          (and
6423            (= truck_loc_47 0)
6424            (= truck_travel_time_47 21)
6425          )
6426          (and
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6427              (= truck_loc_47 3)
6428              (= truck_travel_time_47 37)
6429            )
6430          )
6431        )
6432    )
6433    (=> (= truck_loc_46 3)
6434      (and
6435        (<= c_stocka_47 200)
6436        (= (+ truck_stock_47 c_stocka_47) (+ truck_stock_46 c_stockb_47))
6437        (= a_stocka_47 a_stockb_47)
6438        (= b_stocka_47 b_stockb_47)
6439        (or
6440          (and
6441            (= truck_loc_47 1)
6442            (= truck_travel_time_47 32)
6443          )
6444          (and
6445            (= truck_loc_47 2)
6446            (= truck_travel_time_47 37)
6447          )
6448        )
6449      )
6450    )
6451  )
6452  (<= truck_stock_47 318)
6453  (>= truck_stock_47 0)
6454  (= a_stockb_48 (- a_stocka_47 truck_travel_time_47))
6455  (= b_stockb_48 (- b_stocka_47 truck_travel_time_47))
6456  (= c_stockb_48 (- c_stocka_47 truck_travel_time_47))
6457  (and
6458    (=> (= truck_loc_47 0)
6459      (and
6460        (= a_stocka_48 a_stockb_48)
6461        (= b_stocka_48 b_stockb_48)
6462        (= c_stocka_48 c_stockb_48)
6463        (or
6464          (and
6465            (= truck_loc_48 1)
6466            (= truck_travel_time_48 29)
6467          )
6468          (and
6469            (= truck_loc_48 2)
6470            (= truck_travel_time_48 21)
6471          )
6472        )
6473      )
6474    )
6475    (=> (= truck_loc_47 1)
6476      (and
6477        (<= a_stocka_48 120)
6478        (= (+ truck_stock_48 a_stocka_48) (+ truck_stock_47 a_stockb_48))
6479        (= b_stocka_48 b_stockb_48)
6480        (= c_stocka_48 c_stockb_48)
6481        (or
6482          (and
6483            (= truck_loc_48 0)
6484            (= truck_travel_time_48 29)
6485          )
6486          (and
6487            (= truck_loc_48 2)
6488            (= truck_travel_time_48 17)
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6489            )
6490          (and
6491            (= truck_loc_48 3)
6492            (= truck_travel_time_48 32)
6493          )
6494        )
6495      )
6496    )
6497    (=> (= truck_loc_47 2)
6498      (and
6499        (<= b_stocka_48 120)
6500        (= (+ truck_stock_48 b_stocka_48) (+ truck_stock_47 b_stockb_48))
6501        (= a_stocka_48 a_stockb_48)
6502        (= c_stocka_48 c_stockb_48)
6503        (or
6504          (and
6505            (= truck_loc_48 1)
6506            (= truck_travel_time_48 17)
6507          )
6508          (and
6509            (= truck_loc_48 0)
6510            (= truck_travel_time_48 21)
6511          )
6512          (and
6513            (= truck_loc_48 3)
6514            (= truck_travel_time_48 37)
6515          )
6516        )
6517      )
6518    )
6519    (=> (= truck_loc_47 3)
6520      (and
6521        (<= c_stocka_48 200)
6522        (= (+ truck_stock_48 c_stocka_48) (+ truck_stock_47 c_stockb_48))
6523        (= a_stocka_48 a_stockb_48)
6524        (= b_stocka_48 b_stockb_48)
6525        (or
6526          (and
6527            (= truck_loc_48 1)
6528            (= truck_travel_time_48 32)
6529          )
6530          (and
6531            (= truck_loc_48 2)
6532            (= truck_travel_time_48 37)
6533          )
6534        )
6535      )
6536    )
6537  )
6538  (<= truck_stock_48 318)
6539  (>= truck_stock_48 0)
6540  (= a_stockb_49 (- a_stocka_48 truck_travel_time_48))
6541  (= b_stockb_49 (- b_stocka_48 truck_travel_time_48))
6542  (= c_stockb_49 (- c_stocka_48 truck_travel_time_48))
6543  (and
6544    (=> (= truck_loc_48 0)
6545      (and
6546        (= a_stocka_49 a_stockb_49)
6547        (= b_stocka_49 b_stockb_49)
6548        (= c_stocka_49 c_stockb_49)
6549        (or
6550          (and
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```
6551            (= truck_loc_49 1)
6552            (= truck_travel_time_49 29)
6553          )
6554        (and
6555            (= truck_loc_49 2)
6556            (= truck_travel_time_49 21)
6557        )
6558        )
6559      )
6560    )
6561    (=> (= truck_loc_48 1)
6562      (and
6563        (<= a_stocka_49 120)
6564        (= (+ truck_stock_49 a_stocka_49) (+ truck_stock_48 a_stockb_49))
6565        (= b_stocka_49 b_stockb_49)
6566        (= c_stocka_49 c_stockb_49)
6567        (or
6568          (and
6569            (= truck_loc_49 0)
6570            (= truck_travel_time_49 29)
6571          )
6572          (and
6573            (= truck_loc_49 2)
6574            (= truck_travel_time_49 17)
6575          )
6576          (and
6577            (= truck_loc_49 3)
6578            (= truck_travel_time_49 32)
6579          )
6580        )
6581      )
6582    )
6583    (=> (= truck_loc_48 2)
6584      (and
6585        (<= b_stocka_49 120)
6586        (= (+ truck_stock_49 b_stocka_49) (+ truck_stock_48 b_stockb_49))
6587        (= a_stocka_49 a_stockb_49)
6588        (= c_stocka_49 c_stockb_49)
6589        (or
6590          (and
6591            (= truck_loc_49 1)
6592            (= truck_travel_time_49 17)
6593          )
6594          (and
6595            (= truck_loc_49 0)
6596            (= truck_travel_time_49 21)
6597          )
6598          (and
6599            (= truck_loc_49 3)
6600            (= truck_travel_time_49 37)
6601          )
6602        )
6603      )
6604    )
6605    (=> (= truck_loc_48 3)
6606      (and
6607        (<= c_stocka_49 200)
6608        (= (+ truck_stock_49 c_stocka_49) (+ truck_stock_48 c_stockb_49))
6609        (= a_stocka_49 a_stockb_49)
6610        (= b_stocka_49 b_stockb_49)
6611        (or
6612          (and
```

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```
6613            (= truck_loc_49 1)
6614            (= truck_travel_time_49 32)
6615          )
6616        (and
6617          (= truck_loc_49 2)
6618          (= truck_travel_time_49 37)
6619        )
6620      )
6621    )
6622  )
6623  )
6624  (<= truck_stock_49 318)
6625  (>= truck_stock_49 0)
6626  (= a_stockb_50 (- a_stocka_49 truck_travel_time_49))
6627  (= b_stockb_50 (- b_stocka_49 truck_travel_time_49))
6628  (= c_stockb_50 (- c_stocka_49 truck_travel_time_49))
6629  (and
6630    (=> (= truck_loc_49 0)
6631      (and
6632        (= a_stocka_50 a_stockb_50)
6633        (= b_stocka_50 b_stockb_50)
6634        (= c_stocka_50 c_stockb_50)
6635        (or
6636          (and
6637            (= truck_loc_50 1)
6638            (= truck_travel_time_50 29)
6639          )
6640          (and
6641            (= truck_loc_50 2)
6642            (= truck_travel_time_50 21)
6643          )
6644        )
6645      )
6646    )
6647    (=> (= truck_loc_49 1)
6648      (and
6649        (<= a_stocka_50 120)
6650        (= (+ truck_stock_50 a_stocka_50) (+ truck_stock_49 a_stockb_50))
6651        (= b_stocka_50 b_stockb_50)
6652        (= c_stocka_50 c_stockb_50)
6653        (or
6654          (and
6655            (= truck_loc_50 0)
6656            (= truck_travel_time_50 29)
6657          )
6658          (and
6659            (= truck_loc_50 2)
6660            (= truck_travel_time_50 17)
6661          )
6662          (and
6663            (= truck_loc_50 3)
6664            (= truck_travel_time_50 32)
6665          )
6666        )
6667      )
6668    )
6669    (=> (= truck_loc_49 2)
6670      (and
6671        (<= b_stocka_50 120)
6672        (= (+ truck_stock_50 b_stocka_50) (+ truck_stock_49 b_stockb_50))
6673        (= a_stocka_50 a_stockb_50)
6674        (= c_stocka_50 c_stockb_50)
```

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```
6675        (or
6676          (and
6677            (= truck_loc_50 1)
6678            (= truck_travel_time_50 17)
6679          )
6680          (and
6681            (= truck_loc_50 0)
6682            (= truck_travel_time_50 21)
6683          )
6684          (and
6685            (= truck_loc_50 3)
6686            (= truck_travel_time_50 37)
6687          )
6688        )
6689      )
6690    )
6691    (=> (= truck_loc_49 3)
6692      (and
6693        (<= c_stocka_50 200)
6694        (= (+ truck_stock_50 c_stocka_50) (+ truck_stock_49 c_stockb_50))
6695        (= a_stocka_50 a_stockb_50)
6696        (= b_stocka_50 b_stockb_50)
6697        (or
6698          (and
6699            (= truck_loc_50 1)
6700            (= truck_travel_time_50 32)
6701          )
6702          (and
6703            (= truck_loc_50 2)
6704            (= truck_travel_time_50 37)
6705          )
6706        )
6707      )
6708    )
6709  )
6710  (<= truck_stock_50 318)
6711  (>= truck_stock_50 0)
6712  (= a_stockb_51 (- a_stocka_50 truck_travel_time_50))
6713  (= b_stockb_51 (- b_stocka_50 truck_travel_time_50))
6714  (= c_stockb_51 (- c_stocka_50 truck_travel_time_50))
6715  (and
6716    (=> (= truck_loc_50 0)
6717      (and
6718        (= a_stocka_51 a_stockb_51)
6719        (= b_stocka_51 b_stockb_51)
6720        (= c_stocka_51 c_stockb_51)
6721        (or
6722          (and
6723            (= truck_loc_51 1)
6724            (= truck_travel_time_51 29)
6725          )
6726          (and
6727            (= truck_loc_51 2)
6728            (= truck_travel_time_51 21)
6729          )
6730        )
6731      )
6732    )
6733    (=> (= truck_loc_50 1)
6734      (and
6735        (<= a_stocka_51 120)
6736        (= (+ truck_stock_51 a_stocka_51) (+ truck_stock_50 a_stockb_51))
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```
6737        (= b_stocka_51 b_stockb_51)
6738        (= c_stocka_51 c_stockb_51)
6739        (or
6740          (and
6741            (= truck_loc_51 0)
6742            (= truck_travel_time_51 29)
6743          )
6744          (and
6745            (= truck_loc_51 2)
6746            (= truck_travel_time_51 17)
6747          )
6748          (and
6749            (= truck_loc_51 3)
6750            (= truck_travel_time_51 32)
6751          )
6752        )
6753      )
6754    )
6755    (=> (= truck_loc_50 2)
6756      (and
6757        (<= b_stocka_51 120)
6758        (= (+ truck_stock_51 b_stocka_51) (+ truck_stock_50 b_stockb_51))
6759        (= a_stocka_51 a_stockb_51)
6760        (= c_stocka_51 c_stockb_51)
6761        (or
6762          (and
6763            (= truck_loc_51 1)
6764            (= truck_travel_time_51 17)
6765          )
6766          (and
6767            (= truck_loc_51 0)
6768            (= truck_travel_time_51 21)
6769          )
6770          (and
6771            (= truck_loc_51 3)
6772            (= truck_travel_time_51 37)
6773          )
6774        )
6775      )
6776    )
6777    (=> (= truck_loc_50 3)
6778      (and
6779        (<= c_stocka_51 200)
6780        (= (+ truck_stock_51 c_stocka_51) (+ truck_stock_50 c_stockb_51))
6781        (= a_stocka_51 a_stockb_51)
6782        (= b_stocka_51 b_stockb_51)
6783        (or
6784          (and
6785            (= truck_loc_51 1)
6786            (= truck_travel_time_51 32)
6787          )
6788          (and
6789            (= truck_loc_51 2)
6790            (= truck_travel_time_51 37)
6791          )
6792        )
6793      )
6794    )
6795  )
6796  (<= truck_stock_51 318)
6797  (>= truck_stock_51 0)
6798  (= a_stockb_52 (- a_stocka_51 truck_travel_time_51))
```

```
6799  (= b_stockb_52 (- b_stocka_51 truck_travel_time_51))
6800  (= c_stockb_52 (- c_stocka_51 truck_travel_time_51))
6801  (and
6802    (=> (= truck_loc_51 0)
6803      (and
6804        (= a_stocka_52 a_stockb_52)
6805        (= b_stocka_52 b_stockb_52)
6806        (= c_stocka_52 c_stockb_52)
6807        (or
6808          (and
6809            (= truck_loc_52 1)
6810            (= truck_travel_time_52 29)
6811          )
6812          (and
6813            (= truck_loc_52 2)
6814            (= truck_travel_time_52 21)
6815          )
6816        )
6817      )
6818    )
6819    (=> (= truck_loc_51 1)
6820      (and
6821        (<= a_stocka_52 120)
6822        (= (+ truck_stock_52 a_stocka_52) (+ truck_stock_51 a_stockb_52))
6823        (= b_stocka_52 b_stockb_52)
6824        (= c_stocka_52 c_stockb_52)
6825        (or
6826          (and
6827            (= truck_loc_52 0)
6828            (= truck_travel_time_52 29)
6829          )
6830          (and
6831            (= truck_loc_52 2)
6832            (= truck_travel_time_52 17)
6833          )
6834          (and
6835            (= truck_loc_52 3)
6836            (= truck_travel_time_52 32)
6837          )
6838        )
6839      )
6840    )
6841    (=> (= truck_loc_51 2)
6842      (and
6843        (<= b_stocka_52 120)
6844        (= (+ truck_stock_52 b_stocka_52) (+ truck_stock_51 b_stockb_52))
6845        (= a_stocka_52 a_stockb_52)
6846        (= c_stocka_52 c_stockb_52)
6847        (or
6848          (and
6849            (= truck_loc_52 1)
6850            (= truck_travel_time_52 17)
6851          )
6852          (and
6853            (= truck_loc_52 0)
6854            (= truck_travel_time_52 21)
6855          )
6856          (and
6857            (= truck_loc_52 3)
6858            (= truck_travel_time_52 37)
6859          )
6860        )
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```
6861        )
6862      )
6863      (=> (= truck_loc_51 3)
6864        (and
6865          (<= c_stocka_52 200)
6866          (= (+ truck_stock_52 c_stocka_52) (+ truck_stock_51 c_stockb_52))
6867          (= a_stocka_52 a_stockb_52)
6868          (= b_stocka_52 b_stockb_52)
6869          (or
6870            (and
6871              (= truck_loc_52 1)
6872              (= truck_travel_time_52 32)
6873            )
6874            (and
6875              (= truck_loc_52 2)
6876              (= truck_travel_time_52 37)
6877            )
6878          )
6879        )
6880      )
6881    )
6882    (<= truck_stock_52 318)
6883    (>= truck_stock_52 0)
6884    (= a_stockb_53 (- a_stocka_52 truck_travel_time_52))
6885    (= b_stockb_53 (- b_stocka_52 truck_travel_time_52))
6886    (= c_stockb_53 (- c_stocka_52 truck_travel_time_52))
6887    (and
6888      (=> (= truck_loc_52 0)
6889        (and
6890          (= a_stocka_53 a_stockb_53)
6891          (= b_stocka_53 b_stockb_53)
6892          (= c_stocka_53 c_stockb_53)
6893          (or
6894            (and
6895              (= truck_loc_53 1)
6896              (= truck_travel_time_53 29)
6897            )
6898            (and
6899              (= truck_loc_53 2)
6900              (= truck_travel_time_53 21)
6901            )
6902          )
6903        )
6904      )
6905      (=> (= truck_loc_52 1)
6906        (and
6907          (<= a_stocka_53 120)
6908          (= (+ truck_stock_53 a_stocka_53) (+ truck_stock_52 a_stockb_53))
6909          (= b_stocka_53 b_stockb_53)
6910          (= c_stocka_53 c_stockb_53)
6911          (or
6912            (and
6913              (= truck_loc_53 0)
6914              (= truck_travel_time_53 29)
6915            )
6916            (and
6917              (= truck_loc_53 2)
6918              (= truck_travel_time_53 17)
6919            )
6920            (and
6921              (= truck_loc_53 3)
6922              (= truck_travel_time_53 32)
```

```
6923              )
6924            )
6925          )
6926        )
6927      (=> (= truck_loc_52 2)
6928        (and
6929          (<= b_stocka_53 120)
6930          (= (+ truck_stock_53 b_stocka_53) (+ truck_stock_52 b_stockb_53))
6931          (= a_stocka_53 a_stockb_53)
6932          (= c_stocka_53 c_stockb_53)
6933          (or
6934            (and
6935              (= truck_loc_53 1)
6936              (= truck_travel_time_53 17)
6937            )
6938            (and
6939              (= truck_loc_53 0)
6940              (= truck_travel_time_53 21)
6941            )
6942            (and
6943              (= truck_loc_53 3)
6944              (= truck_travel_time_53 37)
6945            )
6946          )
6947        )
6948      )
6949      (=> (= truck_loc_52 3)
6950        (and
6951          (<= c_stocka_53 200)
6952          (= (+ truck_stock_53 c_stocka_53) (+ truck_stock_52 c_stockb_53))
6953          (= a_stocka_53 a_stockb_53)
6954          (= b_stocka_53 b_stockb_53)
6955          (or
6956            (and
6957              (= truck_loc_53 1)
6958              (= truck_travel_time_53 32)
6959            )
6960            (and
6961              (= truck_loc_53 2)
6962              (= truck_travel_time_53 37)
6963            )
6964          )
6965        )
6966      )
6967    )
6968    (<= truck_stock_53 318)
6969    (>= truck_stock_53 0)
6970    (= a_stockb_54 (- a_stocka_53 truck_travel_time_53))
6971    (= b_stockb_54 (- b_stocka_53 truck_travel_time_53))
6972    (= c_stockb_54 (- c_stocka_53 truck_travel_time_53))
6973    (and
6974      (=> (= truck_loc_53 0)
6975        (and
6976          (= a_stocka_54 a_stockb_54)
6977          (= b_stocka_54 b_stockb_54)
6978          (= c_stocka_54 c_stockb_54)
6979          (or
6980            (and
6981              (= truck_loc_54 1)
6982              (= truck_travel_time_54 29)
6983            )
6984            (and
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```
6985            (= truck_loc_54 2)
6986            (= truck_travel_time_54 21)
6987          )
6988        )
6989      )
6990    )
6991    (=> (= truck_loc_53 1)
6992      (and
6993        (<= a_stocka_54 120)
6994        (= (+ truck_stock_54 a_stocka_54) (+ truck_stock_53 a_stockb_54))
6995        (= b_stocka_54 b_stockb_54)
6996        (= c_stocka_54 c_stockb_54)
6997        (or
6998          (and
6999            (= truck_loc_54 0)
7000            (= truck_travel_time_54 29)
7001          )
7002          (and
7003            (= truck_loc_54 2)
7004            (= truck_travel_time_54 17)
7005          )
7006          (and
7007            (= truck_loc_54 3)
7008            (= truck_travel_time_54 32)
7009          )
7010        )
7011      )
7012    )
7013    (=> (= truck_loc_53 2)
7014      (and
7015        (<= b_stocka_54 120)
7016        (= (+ truck_stock_54 b_stocka_54) (+ truck_stock_53 b_stockb_54))
7017        (= a_stocka_54 a_stockb_54)
7018        (= c_stocka_54 c_stockb_54)
7019        (or
7020          (and
7021            (= truck_loc_54 1)
7022            (= truck_travel_time_54 17)
7023          )
7024          (and
7025            (= truck_loc_54 0)
7026            (= truck_travel_time_54 21)
7027          )
7028          (and
7029            (= truck_loc_54 3)
7030            (= truck_travel_time_54 37)
7031          )
7032        )
7033      )
7034    )
7035    (=> (= truck_loc_53 3)
7036      (and
7037        (<= c_stocka_54 200)
7038        (= (+ truck_stock_54 c_stocka_54) (+ truck_stock_53 c_stockb_54))
7039        (= a_stocka_54 a_stockb_54)
7040        (= b_stocka_54 b_stockb_54)
7041        (or
7042          (and
7043            (= truck_loc_54 1)
7044            (= truck_travel_time_54 32)
7045          )
7046          (and
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```
7047              (= truck_loc_54 2)
7048              (= truck_travel_time_54 37)
7049            )
7050          )
7051        )
7052      )
7053    )
7054    (<= truck_stock_54 318)
7055    (>= truck_stock_54 0)
7056    (= a_stockb_55 (- a_stocka_54 truck_travel_time_54))
7057    (= b_stockb_55 (- b_stocka_54 truck_travel_time_54))
7058    (= c_stockb_55 (- c_stocka_54 truck_travel_time_54))
7059    (and
7060      (=> (= truck_loc_54 0)
7061        (and
7062          (= a_stocka_55 a_stockb_55)
7063          (= b_stocka_55 b_stockb_55)
7064          (= c_stocka_55 c_stockb_55)
7065          (or
7066            (and
7067              (= truck_loc_55 1)
7068              (= truck_travel_time_55 29)
7069            )
7070            (and
7071              (= truck_loc_55 2)
7072              (= truck_travel_time_55 21)
7073            )
7074          )
7075        )
7076      )
7077      (=> (= truck_loc_54 1)
7078        (and
7079          (<= a_stocka_55 120)
7080          (= (+ truck_stock_55 a_stocka_55) (+ truck_stock_54 a_stockb_55))
7081          (= b_stocka_55 b_stockb_55)
7082          (= c_stocka_55 c_stockb_55)
7083          (or
7084            (and
7085              (= truck_loc_55 0)
7086              (= truck_travel_time_55 29)
7087            )
7088            (and
7089              (= truck_loc_55 2)
7090              (= truck_travel_time_55 17)
7091            )
7092            (and
7093              (= truck_loc_55 3)
7094              (= truck_travel_time_55 32)
7095            )
7096          )
7097        )
7098      )
7099      (=> (= truck_loc_54 2)
7100        (and
7101          (<= b_stocka_55 120)
7102          (= (+ truck_stock_55 b_stocka_55) (+ truck_stock_54 b_stockb_55))
7103          (= a_stocka_55 a_stockb_55)
7104          (= c_stocka_55 c_stockb_55)
7105          (or
7106            (and
7107              (= truck_loc_55 1)
7108              (= truck_travel_time_55 17)
```

```
7109            )
7110          (and
7111            (= truck_loc_55 0)
7112            (= truck_travel_time_55 21)
7113          )
7114          (and
7115            (= truck_loc_55 3)
7116            (= truck_travel_time_55 37)
7117          )
7118        )
7119      )
7120    )
7121    (=> (= truck_loc_54 3)
7122      (and
7123        (<= c_stocka_55 200)
7124        (= (+ truck_stock_55 c_stocka_55) (+ truck_stock_54 c_stockb_55))
7125        (= a_stocka_55 a_stockb_55)
7126        (= b_stocka_55 b_stockb_55)
7127        (or
7128          (and
7129            (= truck_loc_55 1)
7130            (= truck_travel_time_55 32)
7131          )
7132          (and
7133            (= truck_loc_55 2)
7134            (= truck_travel_time_55 37)
7135          )
7136        )
7137      )
7138    )
7139  )
7140  (<= truck_stock_55 318)
7141  (>= truck_stock_55 0)
7142  (= a_stockb_56 (- a_stocka_55 truck_travel_time_55))
7143  (= b_stockb_56 (- b_stocka_55 truck_travel_time_55))
7144  (= c_stockb_56 (- c_stocka_55 truck_travel_time_55))
7145  (and
7146    (=> (= truck_loc_55 0)
7147      (and
7148        (= a_stocka_56 a_stockb_56)
7149        (= b_stocka_56 b_stockb_56)
7150        (= c_stocka_56 c_stockb_56)
7151        (or
7152          (and
7153            (= truck_loc_56 1)
7154            (= truck_travel_time_56 29)
7155          )
7156          (and
7157            (= truck_loc_56 2)
7158            (= truck_travel_time_56 21)
7159          )
7160        )
7161      )
7162    )
7163    (=> (= truck_loc_55 1)
7164      (and
7165        (<= a_stocka_56 120)
7166        (= (+ truck_stock_56 a_stocka_56) (+ truck_stock_55 a_stockb_56))
7167        (= b_stocka_56 b_stockb_56)
7168        (= c_stocka_56 c_stockb_56)
7169        (or
7170          (and
```

```
7171              (= truck_loc_56 0)
7172              (= truck_travel_time_56 29)
7173            )
7174          (and
7175              (= truck_loc_56 2)
7176              (= truck_travel_time_56 17)
7177            )
7178          (and
7179              (= truck_loc_56 3)
7180              (= truck_travel_time_56 32)
7181            )
7182          )
7183        )
7184    )
7185    (=> (= truck_loc_55 2)
7186      (and
7187        (<= b_stocka_56 120)
7188        (= (+ truck_stock_56 b_stocka_56) (+ truck_stock_55 b_stockb_56))
7189        (= a_stocka_56 a_stockb_56)
7190        (= c_stocka_56 c_stockb_56)
7191        (or
7192          (and
7193              (= truck_loc_56 1)
7194              (= truck_travel_time_56 17)
7195            )
7196          (and
7197              (= truck_loc_56 0)
7198              (= truck_travel_time_56 21)
7199            )
7200          (and
7201              (= truck_loc_56 3)
7202              (= truck_travel_time_56 37)
7203            )
7204          )
7205        )
7206    )
7207    (=> (= truck_loc_55 3)
7208      (and
7209        (<= c_stocka_56 200)
7210        (= (+ truck_stock_56 c_stocka_56) (+ truck_stock_55 c_stockb_56))
7211        (= a_stocka_56 a_stockb_56)
7212        (= b_stocka_56 b_stockb_56)
7213        (or
7214          (and
7215              (= truck_loc_56 1)
7216              (= truck_travel_time_56 32)
7217            )
7218          (and
7219              (= truck_loc_56 2)
7220              (= truck_travel_time_56 37)
7221            )
7222          )
7223        )
7224    )
7225 )
7226 (<= truck_stock_56 318)
7227 (>= truck_stock_56 0)
7228 (= a_stockb_57 (- a_stocka_56 truck_travel_time_56))
7229 (= b_stockb_57 (- b_stocka_56 truck_travel_time_56))
7230 (= c_stockb_57 (- c_stocka_56 truck_travel_time_56))
7231 (and
7232    (=> (= truck_loc_56 0)
```

```
7233        (and
7234          (= a_stocka_57 a_stockb_57)
7235          (= b_stocka_57 b_stockb_57)
7236          (= c_stocka_57 c_stockb_57)
7237          (or
7238            (and
7239              (= truck_loc_57 1)
7240              (= truck_travel_time_57 29)
7241            )
7242            (and
7243              (= truck_loc_57 2)
7244              (= truck_travel_time_57 21)
7245            )
7246          )
7247        )
7248      )
7249      (=> (= truck_loc_56 1)
7250        (and
7251          (<= a_stocka_57 120)
7252          (= (+ truck_stock_57 a_stocka_57) (+ truck_stock_56 a_stockb_57))
7253          (= b_stocka_57 b_stockb_57)
7254          (= c_stocka_57 c_stockb_57)
7255          (or
7256            (and
7257              (= truck_loc_57 0)
7258              (= truck_travel_time_57 29)
7259            )
7260            (and
7261              (= truck_loc_57 2)
7262              (= truck_travel_time_57 17)
7263            )
7264            (and
7265              (= truck_loc_57 3)
7266              (= truck_travel_time_57 32)
7267            )
7268          )
7269        )
7270      )
7271      (=> (= truck_loc_56 2)
7272        (and
7273          (<= b_stocka_57 120)
7274          (= (+ truck_stock_57 b_stocka_57) (+ truck_stock_56 b_stockb_57))
7275          (= a_stocka_57 a_stockb_57)
7276          (= c_stocka_57 c_stockb_57)
7277          (or
7278            (and
7279              (= truck_loc_57 1)
7280              (= truck_travel_time_57 17)
7281            )
7282            (and
7283              (= truck_loc_57 0)
7284              (= truck_travel_time_57 21)
7285            )
7286            (and
7287              (= truck_loc_57 3)
7288              (= truck_travel_time_57 37)
7289            )
7290          )
7291        )
7292      )
7293      (=> (= truck_loc_56 3)
7294        (and
```

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```
7295        (<= c_stocka_57 200)
7296        (= (+ truck_stock_57 c_stocka_57) (+ truck_stock_56 c_stockb_57))
7297        (= a_stocka_57 a_stockb_57)
7298        (= b_stocka_57 b_stockb_57)
7299        (or
7300          (and
7301            (= truck_loc_57 1)
7302            (= truck_travel_time_57 32)
7303          )
7304          (and
7305            (= truck_loc_57 2)
7306            (= truck_travel_time_57 37)
7307          )
7308        )
7309      )
7310    )
7311  )
7312  (<= truck_stock_57 318)
7313  (>= truck_stock_57 0)
7314  (= a_stockb_58 (- a_stocka_57 truck_travel_time_57))
7315  (= b_stockb_58 (- b_stocka_57 truck_travel_time_57))
7316  (= c_stockb_58 (- c_stocka_57 truck_travel_time_57))
7317  (and
7318    (=> (= truck_loc_57 0)
7319      (and
7320        (= a_stocka_58 a_stockb_58)
7321        (= b_stocka_58 b_stockb_58)
7322        (= c_stocka_58 c_stockb_58)
7323        (or
7324          (and
7325            (= truck_loc_58 1)
7326            (= truck_travel_time_58 29)
7327          )
7328          (and
7329            (= truck_loc_58 2)
7330            (= truck_travel_time_58 21)
7331          )
7332        )
7333      )
7334    )
7335    (=> (= truck_loc_57 1)
7336      (and
7337        (<= a_stocka_58 120)
7338        (= (+ truck_stock_58 a_stocka_58) (+ truck_stock_57 a_stockb_58))
7339        (= b_stocka_58 b_stockb_58)
7340        (= c_stocka_58 c_stockb_58)
7341        (or
7342          (and
7343            (= truck_loc_58 0)
7344            (= truck_travel_time_58 29)
7345          )
7346          (and
7347            (= truck_loc_58 2)
7348            (= truck_travel_time_58 17)
7349          )
7350          (and
7351            (= truck_loc_58 3)
7352            (= truck_travel_time_58 32)
7353          )
7354        )
7355      )
7356    )
```

```
7357    (=> (= truck_loc_57 2)
7358      (and
7359        (<= b_stocka_58 120)
7360        (= (+ truck_stock_58 b_stocka_58) (+ truck_stock_57 b_stockb_58))
7361        (= a_stocka_58 a_stockb_58)
7362        (= c_stocka_58 c_stockb_58)
7363        (or
7364          (and
7365            (= truck_loc_58 1)
7366            (= truck_travel_time_58 17)
7367          )
7368          (and
7369            (= truck_loc_58 0)
7370            (= truck_travel_time_58 21)
7371          )
7372          (and
7373            (= truck_loc_58 3)
7374            (= truck_travel_time_58 37)
7375          )
7376        )
7377      )
7378    )
7379    (=> (= truck_loc_57 3)
7380      (and
7381        (<= c_stocka_58 200)
7382        (= (+ truck_stock_58 c_stocka_58) (+ truck_stock_57 c_stockb_58))
7383        (= a_stocka_58 a_stockb_58)
7384        (= b_stocka_58 b_stockb_58)
7385        (or
7386          (and
7387            (= truck_loc_58 1)
7388            (= truck_travel_time_58 32)
7389          )
7390          (and
7391            (= truck_loc_58 2)
7392            (= truck_travel_time_58 37)
7393          )
7394        )
7395      )
7396    )
7397  )
7398  (<= truck_stock_58 318)
7399  (>= truck_stock_58 0)
7400  (= a_stockb_59 (- a_stocka_58 truck_travel_time_58))
7401  (= b_stockb_59 (- b_stocka_58 truck_travel_time_58))
7402  (= c_stockb_59 (- c_stocka_58 truck_travel_time_58))
7403  (and
7404    (=> (= truck_loc_58 0)
7405      (and
7406        (= a_stocka_59 a_stockb_59)
7407        (= b_stocka_59 b_stockb_59)
7408        (= c_stocka_59 c_stockb_59)
7409        (or
7410          (and
7411            (= truck_loc_59 1)
7412            (= truck_travel_time_59 29)
7413          )
7414          (and
7415            (= truck_loc_59 2)
7416            (= truck_travel_time_59 21)
7417          )
7418        )
```

```
7419        )
7420      )
7421      (=> (= truck_loc_58 1)
7422        (and
7423          (<= a_stocka_59 120)
7424          (= (+ truck_stock_59 a_stocka_59) (+ truck_stock_58 a_stockb_59))
7425          (= b_stocka_59 b_stockb_59)
7426          (= c_stocka_59 c_stockb_59)
7427          (or
7428            (and
7429              (= truck_loc_59 0)
7430              (= truck_travel_time_59 29)
7431            )
7432            (and
7433              (= truck_loc_59 2)
7434              (= truck_travel_time_59 17)
7435            )
7436            (and
7437              (= truck_loc_59 3)
7438              (= truck_travel_time_59 32)
7439            )
7440          )
7441        )
7442      )
7443      (=> (= truck_loc_58 2)
7444        (and
7445          (<= b_stocka_59 120)
7446          (= (+ truck_stock_59 b_stocka_59) (+ truck_stock_58 b_stockb_59))
7447          (= a_stocka_59 a_stockb_59)
7448          (= c_stocka_59 c_stockb_59)
7449          (or
7450            (and
7451              (= truck_loc_59 1)
7452              (= truck_travel_time_59 17)
7453            )
7454            (and
7455              (= truck_loc_59 0)
7456              (= truck_travel_time_59 21)
7457            )
7458            (and
7459              (= truck_loc_59 3)
7460              (= truck_travel_time_59 37)
7461            )
7462          )
7463        )
7464      )
7465      (=> (= truck_loc_58 3)
7466        (and
7467          (<= c_stocka_59 200)
7468          (= (+ truck_stock_59 c_stocka_59) (+ truck_stock_58 c_stockb_59))
7469          (= a_stocka_59 a_stockb_59)
7470          (= b_stocka_59 b_stockb_59)
7471          (or
7472            (and
7473              (= truck_loc_59 1)
7474              (= truck_travel_time_59 32)
7475            )
7476            (and
7477              (= truck_loc_59 2)
7478              (= truck_travel_time_59 37)
7479            )
7480          )
```

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7481        )
7482      )
7483  )
7484  (<= truck_stock_59 318)
7485  (>= truck_stock_59 0)
7486  (= a_stockb_60 (- a_stocka_59 truck_travel_time_59))
7487  (= b_stockb_60 (- b_stocka_59 truck_travel_time_59))
7488  (= c_stockb_60 (- c_stocka_59 truck_travel_time_59))
7489  (and
7490    (=> (= truck_loc_59 0)
7491      (and
7492        (= a_stocka_60 a_stockb_60)
7493        (= b_stocka_60 b_stockb_60)
7494        (= c_stocka_60 c_stockb_60)
7495        (or
7496          (and
7497            (= truck_loc_60 1)
7498            (= truck_travel_time_60 29)
7499          )
7500          (and
7501            (= truck_loc_60 2)
7502            (= truck_travel_time_60 21)
7503          )
7504        )
7505      )
7506    )
7507    (=> (= truck_loc_59 1)
7508      (and
7509        (<= a_stocka_60 120)
7510        (= (+ truck_stock_60 a_stocka_60) (+ truck_stock_59 a_stockb_60))
7511        (= b_stocka_60 b_stockb_60)
7512        (= c_stocka_60 c_stockb_60)
7513        (or
7514          (and
7515            (= truck_loc_60 0)
7516            (= truck_travel_time_60 29)
7517          )
7518          (and
7519            (= truck_loc_60 2)
7520            (= truck_travel_time_60 17)
7521          )
7522          (and
7523            (= truck_loc_60 3)
7524            (= truck_travel_time_60 32)
7525          )
7526        )
7527      )
7528    )
7529    (=> (= truck_loc_59 2)
7530      (and
7531        (<= b_stocka_60 120)
7532        (= (+ truck_stock_60 b_stocka_60) (+ truck_stock_59 b_stockb_60))
7533        (= a_stocka_60 a_stockb_60)
7534        (= c_stocka_60 c_stockb_60)
7535        (or
7536          (and
7537            (= truck_loc_60 1)
7538            (= truck_travel_time_60 17)
7539          )
7540          (and
7541            (= truck_loc_60 0)
7542            (= truck_travel_time_60 21)
```

```
7543              )
7544            (and
7545              (= truck_loc_60 3)
7546              (= truck_travel_time_60 37)
7547            )
7548          )
7549        )
7550     )
7551     (=> (= truck_loc_59 3)
7552       (and
7553         (<= c_stocka_60 200)
7554         (= (+ truck_stock_60 c_stocka_60) (+ truck_stock_59 c_stockb_60))
7555         (= a_stocka_60 a_stockb_60)
7556         (= b_stocka_60 b_stockb_60)
7557         (or
7558           (and
7559             (= truck_loc_60 1)
7560             (= truck_travel_time_60 32)
7561           )
7562           (and
7563             (= truck_loc_60 2)
7564             (= truck_travel_time_60 37)
7565           )
7566         )
7567       )
7568     )
7569   )
7570   (<= truck_stock_60 318)
7571   (>= truck_stock_60 0)
7572   (= a_stockb_61 (- a_stocka_60 truck_travel_time_60))
7573   (= b_stockb_61 (- b_stocka_60 truck_travel_time_60))
7574   (= c_stockb_61 (- c_stocka_60 truck_travel_time_60))
7575   (and
7576     (=> (= truck_loc_60 0)
7577       (and
7578         (= a_stocka_61 a_stockb_61)
7579         (= b_stocka_61 b_stockb_61)
7580         (= c_stocka_61 c_stockb_61)
7581         (or
7582           (and
7583             (= truck_loc_61 1)
7584             (= truck_travel_time_61 29)
7585           )
7586           (and
7587             (= truck_loc_61 2)
7588             (= truck_travel_time_61 21)
7589           )
7590         )
7591       )
7592     )
7593     (=> (= truck_loc_60 1)
7594       (and
7595         (<= a_stocka_61 120)
7596         (= (+ truck_stock_61 a_stocka_61) (+ truck_stock_60 a_stockb_61))
7597         (= b_stocka_61 b_stockb_61)
7598         (= c_stocka_61 c_stockb_61)
7599         (or
7600           (and
7601             (= truck_loc_61 0)
7602             (= truck_travel_time_61 29)
7603           )
7604           (and
```

```
7605            (= truck_loc_61 2)
7606            (= truck_travel_time_61 17)
7607          )
7608          (and
7609            (= truck_loc_61 3)
7610            (= truck_travel_time_61 32)
7611          )
7612        )
7613      )
7614    )
7615    (=> (= truck_loc_60 2)
7616      (and
7617        (<= b_stocka_61 120)
7618        (= (+ truck_stock_61 b_stocka_61) (+ truck_stock_60 b_stockb_61))
7619        (= a_stocka_61 a_stockb_61)
7620        (= c_stocka_61 c_stockb_61)
7621        (or
7622          (and
7623            (= truck_loc_61 1)
7624            (= truck_travel_time_61 17)
7625          )
7626          (and
7627            (= truck_loc_61 0)
7628            (= truck_travel_time_61 21)
7629          )
7630          (and
7631            (= truck_loc_61 3)
7632            (= truck_travel_time_61 37)
7633          )
7634        )
7635      )
7636    )
7637    (=> (= truck_loc_60 3)
7638      (and
7639        (<= c_stocka_61 200)
7640        (= (+ truck_stock_61 c_stocka_61) (+ truck_stock_60 c_stockb_61))
7641        (= a_stocka_61 a_stockb_61)
7642        (= b_stocka_61 b_stockb_61)
7643        (or
7644          (and
7645            (= truck_loc_61 1)
7646            (= truck_travel_time_61 32)
7647          )
7648          (and
7649            (= truck_loc_61 2)
7650            (= truck_travel_time_61 37)
7651          )
7652        )
7653      )
7654    )
7655  )
7656  (<= truck_stock_61 318)
7657  (>= truck_stock_61 0)
7658  (= a_stockb_62 (- a_stocka_61 truck_travel_time_61))
7659  (= b_stockb_62 (- b_stocka_61 truck_travel_time_61))
7660  (= c_stockb_62 (- c_stocka_61 truck_travel_time_61))
7661  (and
7662    (=> (= truck_loc_61 0)
7663      (and
7664        (= a_stocka_62 a_stockb_62)
7665        (= b_stocka_62 b_stockb_62)
7666        (= c_stocka_62 c_stockb_62)
```

```
7667        (or
7668          (and
7669            (= truck_loc_62 1)
7670            (= truck_travel_time_62 29)
7671          )
7672          (and
7673            (= truck_loc_62 2)
7674            (= truck_travel_time_62 21)
7675          )
7676        )
7677      )
7678    )
7679    (=> (= truck_loc_61 1)
7680      (and
7681        (<= a_stocka_62 120)
7682        (= (+ truck_stock_62 a_stocka_62) (+ truck_stock_61 a_stockb_62))
7683        (= b_stocka_62 b_stockb_62)
7684        (= c_stocka_62 c_stockb_62)
7685        (or
7686          (and
7687            (= truck_loc_62 0)
7688            (= truck_travel_time_62 29)
7689          )
7690          (and
7691            (= truck_loc_62 2)
7692            (= truck_travel_time_62 17)
7693          )
7694          (and
7695            (= truck_loc_62 3)
7696            (= truck_travel_time_62 32)
7697          )
7698        )
7699      )
7700    )
7701    (=> (= truck_loc_61 2)
7702      (and
7703        (<= b_stocka_62 120)
7704        (= (+ truck_stock_62 b_stocka_62) (+ truck_stock_61 b_stockb_62))
7705        (= a_stocka_62 a_stockb_62)
7706        (= c_stocka_62 c_stockb_62)
7707        (or
7708          (and
7709            (= truck_loc_62 1)
7710            (= truck_travel_time_62 17)
7711          )
7712          (and
7713            (= truck_loc_62 0)
7714            (= truck_travel_time_62 21)
7715          )
7716          (and
7717            (= truck_loc_62 3)
7718            (= truck_travel_time_62 37)
7719          )
7720        )
7721      )
7722    )
7723    (=> (= truck_loc_61 3)
7724      (and
7725        (<= c_stocka_62 200)
7726        (= (+ truck_stock_62 c_stocka_62) (+ truck_stock_61 c_stockb_62))
7727        (= a_stocka_62 a_stockb_62)
7728        (= b_stocka_62 b_stockb_62)
```

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```
7729          (or
7730            (and
7731              (= truck_loc_62 1)
7732              (= truck_travel_time_62 32)
7733            )
7734            (and
7735              (= truck_loc_62 2)
7736              (= truck_travel_time_62 37)
7737            )
7738          )
7739        )
7740     )
7741  )
7742  (<= truck_stock_62 318)
7743  (>= truck_stock_62 0)
7744  (= a_stockb_63 (- a_stocka_62 truck_travel_time_62))
7745  (= b_stockb_63 (- b_stocka_62 truck_travel_time_62))
7746  (= c_stockb_63 (- c_stocka_62 truck_travel_time_62))
7747  (and
7748    (=> (= truck_loc_62 0)
7749      (and
7750        (= a_stocka_63 a_stockb_63)
7751        (= b_stocka_63 b_stockb_63)
7752        (= c_stocka_63 c_stockb_63)
7753        (or
7754          (and
7755            (= truck_loc_63 1)
7756            (= truck_travel_time_63 29)
7757          )
7758          (and
7759            (= truck_loc_63 2)
7760            (= truck_travel_time_63 21)
7761          )
7762        )
7763      )
7764    )
7765    (=> (= truck_loc_62 1)
7766      (and
7767        (<= a_stocka_63 120)
7768        (= (+ truck_stock_63 a_stocka_63) (+ truck_stock_62 a_stockb_63))
7769        (= b_stocka_63 b_stockb_63)
7770        (= c_stocka_63 c_stockb_63)
7771        (or
7772          (and
7773            (= truck_loc_63 0)
7774            (= truck_travel_time_63 29)
7775          )
7776          (and
7777            (= truck_loc_63 2)
7778            (= truck_travel_time_63 17)
7779          )
7780          (and
7781            (= truck_loc_63 3)
7782            (= truck_travel_time_63 32)
7783          )
7784        )
7785      )
7786    )
7787    (=> (= truck_loc_62 2)
7788      (and
7789        (<= b_stocka_63 120)
7790        (= (+ truck_stock_63 b_stocka_63) (+ truck_stock_62 b_stockb_63))
```

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```
7791          (= a_stocka_63 a_stockb_63)
7792          (= c_stocka_63 c_stockb_63)
7793          (or
7794            (and
7795              (= truck_loc_63 1)
7796              (= truck_travel_time_63 17)
7797            )
7798            (and
7799              (= truck_loc_63 0)
7800              (= truck_travel_time_63 21)
7801            )
7802            (and
7803              (= truck_loc_63 3)
7804              (= truck_travel_time_63 37)
7805            )
7806          )
7807        )
7808      )
7809      (=> (= truck_loc_62 3)
7810        (and
7811          (<= c_stocka_63 200)
7812          (= (+ truck_stock_63 c_stocka_63) (+ truck_stock_62 c_stockb_63))
7813          (= a_stocka_63 a_stockb_63)
7814          (= b_stocka_63 b_stockb_63)
7815          (or
7816            (and
7817              (= truck_loc_63 1)
7818              (= truck_travel_time_63 32)
7819            )
7820            (and
7821              (= truck_loc_63 2)
7822              (= truck_travel_time_63 37)
7823            )
7824          )
7825        )
7826      )
7827  )
7828  (<= truck_stock_63 318)
7829  (>= truck_stock_63 0)
7830  (= a_stockb_64 (- a_stocka_63 truck_travel_time_63))
7831  (= b_stockb_64 (- b_stocka_63 truck_travel_time_63))
7832  (= c_stockb_64 (- c_stocka_63 truck_travel_time_63))
7833  (and
7834    (=> (= truck_loc_63 0)
7835      (and
7836        (= a_stocka_64 a_stockb_64)
7837        (= b_stocka_64 b_stockb_64)
7838        (= c_stocka_64 c_stockb_64)
7839        (or
7840          (and
7841            (= truck_loc_64 1)
7842            (= truck_travel_time_64 29)
7843          )
7844          (and
7845            (= truck_loc_64 2)
7846            (= truck_travel_time_64 21)
7847          )
7848        )
7849      )
7850    )
7851    (=> (= truck_loc_63 1)
7852      (and
```

```
7853        (<= a_stocka_64 120)
7854        (= (+ truck_stock_64 a_stocka_64) (+ truck_stock_63 a_stockb_64))
7855        (= b_stocka_64 b_stockb_64)
7856        (= c_stocka_64 c_stockb_64)
7857        (or
7858          (and
7859            (= truck_loc_64 0)
7860            (= truck_travel_time_64 29)
7861          )
7862          (and
7863            (= truck_loc_64 2)
7864            (= truck_travel_time_64 17)
7865          )
7866          (and
7867            (= truck_loc_64 3)
7868            (= truck_travel_time_64 32)
7869          )
7870        )
7871      )
7872    )
7873    (=> (= truck_loc_63 2)
7874      (and
7875        (<= b_stocka_64 120)
7876        (= (+ truck_stock_64 b_stocka_64) (+ truck_stock_63 b_stockb_64))
7877        (= a_stocka_64 a_stockb_64)
7878        (= c_stocka_64 c_stockb_64)
7879        (or
7880          (and
7881            (= truck_loc_64 1)
7882            (= truck_travel_time_64 17)
7883          )
7884          (and
7885            (= truck_loc_64 0)
7886            (= truck_travel_time_64 21)
7887          )
7888          (and
7889            (= truck_loc_64 3)
7890            (= truck_travel_time_64 37)
7891          )
7892        )
7893      )
7894    )
7895    (=> (= truck_loc_63 3)
7896      (and
7897        (<= c_stocka_64 200)
7898        (= (+ truck_stock_64 c_stocka_64) (+ truck_stock_63 c_stockb_64))
7899        (= a_stocka_64 a_stockb_64)
7900        (= b_stocka_64 b_stockb_64)
7901        (or
7902          (and
7903            (= truck_loc_64 1)
7904            (= truck_travel_time_64 32)
7905          )
7906          (and
7907            (= truck_loc_64 2)
7908            (= truck_travel_time_64 37)
7909          )
7910        )
7911      )
7912    )
7913  )
7914  (<= truck_stock_64 318)
```

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```
7915  (>= truck_stock_64 0)
7916  (= a_stockb_65 (- a_stocka_64 truck_travel_time_64))
7917  (= b_stockb_65 (- b_stocka_64 truck_travel_time_64))
7918  (= c_stockb_65 (- c_stocka_64 truck_travel_time_64))
7919  (and
7920    (=> (= truck_loc_64 0)
7921      (and
7922        (= a_stocka_65 a_stockb_65)
7923        (= b_stocka_65 b_stockb_65)
7924        (= c_stocka_65 c_stockb_65)
7925        (or
7926          (and
7927            (= truck_loc_65 1)
7928            (= truck_travel_time_65 29)
7929          )
7930          (and
7931            (= truck_loc_65 2)
7932            (= truck_travel_time_65 21)
7933          )
7934        )
7935      )
7936    )
7937    (=> (= truck_loc_64 1)
7938      (and
7939        (<= a_stocka_65 120)
7940        (= (+ truck_stock_65 a_stocka_65) (+ truck_stock_64 a_stockb_65))
7941        (= b_stocka_65 b_stockb_65)
7942        (= c_stocka_65 c_stockb_65)
7943        (or
7944          (and
7945            (= truck_loc_65 0)
7946            (= truck_travel_time_65 29)
7947          )
7948          (and
7949            (= truck_loc_65 2)
7950            (= truck_travel_time_65 17)
7951          )
7952          (and
7953            (= truck_loc_65 3)
7954            (= truck_travel_time_65 32)
7955          )
7956        )
7957      )
7958    )
7959    (=> (= truck_loc_64 2)
7960      (and
7961        (<= b_stocka_65 120)
7962        (= (+ truck_stock_65 b_stocka_65) (+ truck_stock_64 b_stockb_65))
7963        (= a_stocka_65 a_stockb_65)
7964        (= c_stocka_65 c_stockb_65)
7965        (or
7966          (and
7967            (= truck_loc_65 1)
7968            (= truck_travel_time_65 17)
7969          )
7970          (and
7971            (= truck_loc_65 0)
7972            (= truck_travel_time_65 21)
7973          )
7974          (and
7975            (= truck_loc_65 3)
7976            (= truck_travel_time_65 37)
```

```
7977            )
7978          )
7979        )
7980    )
7981    (=> (= truck_loc_64 3)
7982      (and
7983        (<= c_stocka_65 200)
7984        (= (+ truck_stock_65 c_stocka_65) (+ truck_stock_64 c_stockb_65))
7985        (= a_stocka_65 a_stockb_65)
7986        (= b_stocka_65 b_stockb_65)
7987        (or
7988          (and
7989            (= truck_loc_65 1)
7990            (= truck_travel_time_65 32)
7991          )
7992          (and
7993            (= truck_loc_65 2)
7994            (= truck_travel_time_65 37)
7995          )
7996        )
7997      )
7998    )
7999  )
8000  (<= truck_stock_65 318)
8001  (>= truck_stock_65 0)
8002  (= a_stockb_66 (- a_stocka_65 truck_travel_time_65))
8003  (= b_stockb_66 (- b_stocka_65 truck_travel_time_65))
8004  (= c_stockb_66 (- c_stocka_65 truck_travel_time_65))
8005  (and
8006    (=> (= truck_loc_65 0)
8007      (and
8008        (= a_stocka_66 a_stockb_66)
8009        (= b_stocka_66 b_stockb_66)
8010        (= c_stocka_66 c_stockb_66)
8011        (or
8012          (and
8013            (= truck_loc_66 1)
8014            (= truck_travel_time_66 29)
8015          )
8016          (and
8017            (= truck_loc_66 2)
8018            (= truck_travel_time_66 21)
8019          )
8020        )
8021      )
8022    )
8023    (=> (= truck_loc_65 1)
8024      (and
8025        (<= a_stocka_66 120)
8026        (= (+ truck_stock_66 a_stocka_66) (+ truck_stock_65 a_stockb_66))
8027        (= b_stocka_66 b_stockb_66)
8028        (= c_stocka_66 c_stockb_66)
8029        (or
8030          (and
8031            (= truck_loc_66 0)
8032            (= truck_travel_time_66 29)
8033          )
8034          (and
8035            (= truck_loc_66 2)
8036            (= truck_travel_time_66 17)
8037          )
8038          (and
```

```
8039            (= truck_loc_66 3)
8040            (= truck_travel_time_66 32)
8041          )
8042        )
8043      )
8044   )
8045   (=> (= truck_loc_65 2)
8046      (and
8047        (<= b_stocka_66 120)
8048        (= (+ truck_stock_66 b_stocka_66) (+ truck_stock_65 b_stockb_66))
8049        (= a_stocka_66 a_stockb_66)
8050        (= c_stocka_66 c_stockb_66)
8051        (or
8052          (and
8053            (= truck_loc_66 1)
8054            (= truck_travel_time_66 17)
8055          )
8056          (and
8057            (= truck_loc_66 0)
8058            (= truck_travel_time_66 21)
8059          )
8060          (and
8061            (= truck_loc_66 3)
8062            (= truck_travel_time_66 37)
8063          )
8064        )
8065      )
8066   )
8067   (=> (= truck_loc_65 3)
8068      (and
8069        (<= c_stocka_66 200)
8070        (= (+ truck_stock_66 c_stocka_66) (+ truck_stock_65 c_stockb_66))
8071        (= a_stocka_66 a_stockb_66)
8072        (= b_stocka_66 b_stockb_66)
8073        (or
8074          (and
8075            (= truck_loc_66 1)
8076            (= truck_travel_time_66 32)
8077          )
8078          (and
8079            (= truck_loc_66 2)
8080            (= truck_travel_time_66 37)
8081          )
8082        )
8083      )
8084   )
8085 )
8086 (<= truck_stock_66 318)
8087 (>= truck_stock_66 0)
8088 (= a_stockb_67 (- a_stocka_66 truck_travel_time_66))
8089 (= b_stockb_67 (- b_stocka_66 truck_travel_time_66))
8090 (= c_stockb_67 (- c_stocka_66 truck_travel_time_66))
8091 (and
8092   (=> (= truck_loc_66 0)
8093      (and
8094        (= a_stocka_67 a_stockb_67)
8095        (= b_stocka_67 b_stockb_67)
8096        (= c_stocka_67 c_stockb_67)
8097        (or
8098          (and
8099            (= truck_loc_67 1)
8100            (= truck_travel_time_67 29)
```

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```
8101              )
8102           (and
8103             (= truck_loc_67 2)
8104             (= truck_travel_time_67 21)
8105           )
8106         )
8107       )
8108   )
8109   (=> (= truck_loc_66 1)
8110     (and
8111       (<= a_stocka_67 120)
8112       (= (+ truck_stock_67 a_stocka_67) (+ truck_stock_66 a_stockb_67))
8113       (= b_stocka_67 b_stockb_67)
8114       (= c_stocka_67 c_stockb_67)
8115       (or
8116         (and
8117           (= truck_loc_67 0)
8118           (= truck_travel_time_67 29)
8119         )
8120         (and
8121           (= truck_loc_67 2)
8122           (= truck_travel_time_67 17)
8123         )
8124         (and
8125           (= truck_loc_67 3)
8126           (= truck_travel_time_67 32)
8127         )
8128       )
8129     )
8130   )
8131   (=> (= truck_loc_66 2)
8132     (and
8133       (<= b_stocka_67 120)
8134       (= (+ truck_stock_67 b_stocka_67) (+ truck_stock_66 b_stockb_67))
8135       (= a_stocka_67 a_stockb_67)
8136       (= c_stocka_67 c_stockb_67)
8137       (or
8138         (and
8139           (= truck_loc_67 1)
8140           (= truck_travel_time_67 17)
8141         )
8142         (and
8143           (= truck_loc_67 0)
8144           (= truck_travel_time_67 21)
8145         )
8146         (and
8147           (= truck_loc_67 3)
8148           (= truck_travel_time_67 37)
8149         )
8150       )
8151     )
8152   )
8153   (=> (= truck_loc_66 3)
8154     (and
8155       (<= c_stocka_67 200)
8156       (= (+ truck_stock_67 c_stocka_67) (+ truck_stock_66 c_stockb_67))
8157       (= a_stocka_67 a_stockb_67)
8158       (= b_stocka_67 b_stockb_67)
8159       (or
8160         (and
8161           (= truck_loc_67 1)
8162           (= truck_travel_time_67 32)
```

```
8163            )
8164          (and
8165            (= truck_loc_67 2)
8166            (= truck_travel_time_67 37)
8167          )
8168        )
8169      )
8170    )
8171  )
8172  (<= truck_stock_67 318)
8173  (>= truck_stock_67 0)
8174  (= a_stockb_68 (- a_stocka_67 truck_travel_time_67))
8175  (= b_stockb_68 (- b_stocka_67 truck_travel_time_67))
8176  (= c_stockb_68 (- c_stocka_67 truck_travel_time_67))
8177  (and
8178    (=> (= truck_loc_67 0)
8179      (and
8180        (= a_stocka_68 a_stockb_68)
8181        (= b_stocka_68 b_stockb_68)
8182        (= c_stocka_68 c_stockb_68)
8183        (or
8184          (and
8185            (= truck_loc_68 1)
8186            (= truck_travel_time_68 29)
8187          )
8188          (and
8189            (= truck_loc_68 2)
8190            (= truck_travel_time_68 21)
8191          )
8192        )
8193      )
8194    )
8195    (=> (= truck_loc_67 1)
8196      (and
8197        (<= a_stocka_68 120)
8198        (= (+ truck_stock_68 a_stocka_68) (+ truck_stock_67 a_stockb_68))
8199        (= b_stocka_68 b_stockb_68)
8200        (= c_stocka_68 c_stockb_68)
8201        (or
8202          (and
8203            (= truck_loc_68 0)
8204            (= truck_travel_time_68 29)
8205          )
8206          (and
8207            (= truck_loc_68 2)
8208            (= truck_travel_time_68 17)
8209          )
8210          (and
8211            (= truck_loc_68 3)
8212            (= truck_travel_time_68 32)
8213          )
8214        )
8215      )
8216    )
8217    (=> (= truck_loc_67 2)
8218      (and
8219        (<= b_stocka_68 120)
8220        (= (+ truck_stock_68 b_stocka_68) (+ truck_stock_67 b_stockb_68))
8221        (= a_stocka_68 a_stockb_68)
8222        (= c_stocka_68 c_stockb_68)
8223        (or
8224          (and
```

```
8225              (= truck_loc_68 1)
8226              (= truck_travel_time_68 17)
8227            )
8228          (and
8229              (= truck_loc_68 0)
8230              (= truck_travel_time_68 21)
8231          )
8232          (and
8233              (= truck_loc_68 3)
8234              (= truck_travel_time_68 37)
8235          )
8236        )
8237      )
8238    )
8239    (=> (= truck_loc_67 3)
8240      (and
8241        (<= c_stocka_68 200)
8242        (= (+ truck_stock_68 c_stocka_68) (+ truck_stock_67 c_stockb_68))
8243        (= a_stocka_68 a_stockb_68)
8244        (= b_stocka_68 b_stockb_68)
8245        (or
8246          (and
8247              (= truck_loc_68 1)
8248              (= truck_travel_time_68 32)
8249          )
8250          (and
8251              (= truck_loc_68 2)
8252              (= truck_travel_time_68 37)
8253          )
8254        )
8255      )
8256    )
8257  )
8258  (<= truck_stock_68 318)
8259  (>= truck_stock_68 0)
8260  (= a_stockb_69 (- a_stocka_68 truck_travel_time_68))
8261  (= b_stockb_69 (- b_stocka_68 truck_travel_time_68))
8262  (= c_stockb_69 (- c_stocka_68 truck_travel_time_68))
8263  (and
8264    (=> (= truck_loc_68 0)
8265      (and
8266        (= a_stocka_69 a_stockb_69)
8267        (= b_stocka_69 b_stockb_69)
8268        (= c_stocka_69 c_stockb_69)
8269        (or
8270          (and
8271              (= truck_loc_69 1)
8272              (= truck_travel_time_69 29)
8273          )
8274          (and
8275              (= truck_loc_69 2)
8276              (= truck_travel_time_69 21)
8277          )
8278        )
8279      )
8280    )
8281    (=> (= truck_loc_68 1)
8282      (and
8283        (<= a_stocka_69 120)
8284        (= (+ truck_stock_69 a_stocka_69) (+ truck_stock_68 a_stockb_69))
8285        (= b_stocka_69 b_stockb_69)
8286        (= c_stocka_69 c_stockb_69)
```

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```
8287        (or
8288          (and
8289            (= truck_loc_69 0)
8290            (= truck_travel_time_69 29)
8291          )
8292          (and
8293            (= truck_loc_69 2)
8294            (= truck_travel_time_69 17)
8295          )
8296          (and
8297            (= truck_loc_69 3)
8298            (= truck_travel_time_69 32)
8299          )
8300        )
8301      )
8302    )
8303    (=> (= truck_loc_68 2)
8304      (and
8305        (<= b_stocka_69 120)
8306        (= (+ truck_stock_69 b_stocka_69) (+ truck_stock_68 b_stockb_69))
8307        (= a_stocka_69 a_stockb_69)
8308        (= c_stocka_69 c_stockb_69)
8309        (or
8310          (and
8311            (= truck_loc_69 1)
8312            (= truck_travel_time_69 17)
8313          )
8314          (and
8315            (= truck_loc_69 0)
8316            (= truck_travel_time_69 21)
8317          )
8318          (and
8319            (= truck_loc_69 3)
8320            (= truck_travel_time_69 37)
8321          )
8322        )
8323      )
8324    )
8325    (=> (= truck_loc_68 3)
8326      (and
8327        (<= c_stocka_69 200)
8328        (= (+ truck_stock_69 c_stocka_69) (+ truck_stock_68 c_stockb_69))
8329        (= a_stocka_69 a_stockb_69)
8330        (= b_stocka_69 b_stockb_69)
8331        (or
8332          (and
8333            (= truck_loc_69 1)
8334            (= truck_travel_time_69 32)
8335          )
8336          (and
8337            (= truck_loc_69 2)
8338            (= truck_travel_time_69 37)
8339          )
8340        )
8341      )
8342    )
8343  )
8344  (<= truck_stock_69 318)
8345  (>= truck_stock_69 0)
8346  (= a_stockb_70 (- a_stocka_69 truck_travel_time_69))
8347  (= b_stockb_70 (- b_stocka_69 truck_travel_time_69))
8348  (= c_stockb_70 (- c_stocka_69 truck_travel_time_69))
```

```
8349  (and
8350    (=> (= truck_loc_69 0)
8351      (and
8352        (= a_stocka_70 a_stockb_70)
8353        (= b_stocka_70 b_stockb_70)
8354        (= c_stocka_70 c_stockb_70)
8355        (or
8356          (and
8357            (= truck_loc_70 1)
8358            (= truck_travel_time_70 29)
8359          )
8360          (and
8361            (= truck_loc_70 2)
8362            (= truck_travel_time_70 21)
8363          )
8364        )
8365      )
8366    )
8367    (=> (= truck_loc_69 1)
8368      (and
8369        (<= a_stocka_70 120)
8370        (= (+ truck_stock_70 a_stocka_70) (+ truck_stock_69 a_stockb_70))
8371        (= b_stocka_70 b_stockb_70)
8372        (= c_stocka_70 c_stockb_70)
8373        (or
8374          (and
8375            (= truck_loc_70 0)
8376            (= truck_travel_time_70 29)
8377          )
8378          (and
8379            (= truck_loc_70 2)
8380            (= truck_travel_time_70 17)
8381          )
8382          (and
8383            (= truck_loc_70 3)
8384            (= truck_travel_time_70 32)
8385          )
8386        )
8387      )
8388    )
8389    (=> (= truck_loc_69 2)
8390      (and
8391        (<= b_stocka_70 120)
8392        (= (+ truck_stock_70 b_stocka_70) (+ truck_stock_69 b_stockb_70))
8393        (= a_stocka_70 a_stockb_70)
8394        (= c_stocka_70 c_stockb_70)
8395        (or
8396          (and
8397            (= truck_loc_70 1)
8398            (= truck_travel_time_70 17)
8399          )
8400          (and
8401            (= truck_loc_70 0)
8402            (= truck_travel_time_70 21)
8403          )
8404          (and
8405            (= truck_loc_70 3)
8406            (= truck_travel_time_70 37)
8407          )
8408        )
8409      )
8410    )
```

```
8411    (=> (= truck_loc_69 3)
8412      (and
8413        (<= c_stocka_70 200)
8414        (= (+ truck_stock_70 c_stocka_70) (+ truck_stock_69 c_stockb_70))
8415        (= a_stocka_70 a_stockb_70)
8416        (= b_stocka_70 b_stockb_70)
8417        (or
8418          (and
8419            (= truck_loc_70 1)
8420            (= truck_travel_time_70 32)
8421          )
8422          (and
8423            (= truck_loc_70 2)
8424            (= truck_travel_time_70 37)
8425          )
8426        )
8427      )
8428    )
8429  )
8430  (<= truck_stock_70 318)
8431  (>= truck_stock_70 0)
8432  (= a_stockb_71 (- a_stocka_70 truck_travel_time_70))
8433  (= b_stockb_71 (- b_stocka_70 truck_travel_time_70))
8434  (= c_stockb_71 (- c_stocka_70 truck_travel_time_70))
8435  (and
8436    (=> (= truck_loc_70 0)
8437      (and
8438        (= a_stocka_71 a_stockb_71)
8439        (= b_stocka_71 b_stockb_71)
8440        (= c_stocka_71 c_stockb_71)
8441        (or
8442          (and
8443            (= truck_loc_71 1)
8444            (= truck_travel_time_71 29)
8445          )
8446          (and
8447            (= truck_loc_71 2)
8448            (= truck_travel_time_71 21)
8449          )
8450        )
8451      )
8452    )
8453    (=> (= truck_loc_70 1)
8454      (and
8455        (<= a_stocka_71 120)
8456        (= (+ truck_stock_71 a_stocka_71) (+ truck_stock_70 a_stockb_71))
8457        (= b_stocka_71 b_stockb_71)
8458        (= c_stocka_71 c_stockb_71)
8459        (or
8460          (and
8461            (= truck_loc_71 0)
8462            (= truck_travel_time_71 29)
8463          )
8464          (and
8465            (= truck_loc_71 2)
8466            (= truck_travel_time_71 17)
8467          )
8468          (and
8469            (= truck_loc_71 3)
8470            (= truck_travel_time_71 32)
8471          )
8472        )
```

```
8473        )
8474      )
8475      (=> (= truck_loc_70 2)
8476        (and
8477          (<= b_stocka_71 120)
8478          (= (+ truck_stock_71 b_stocka_71) (+ truck_stock_70 b_stockb_71))
8479          (= a_stocka_71 a_stockb_71)
8480          (= c_stocka_71 c_stockb_71)
8481          (or
8482            (and
8483              (= truck_loc_71 1)
8484              (= truck_travel_time_71 17)
8485            )
8486            (and
8487              (= truck_loc_71 0)
8488              (= truck_travel_time_71 21)
8489            )
8490            (and
8491              (= truck_loc_71 3)
8492              (= truck_travel_time_71 37)
8493            )
8494          )
8495        )
8496      )
8497      (=> (= truck_loc_70 3)
8498        (and
8499          (<= c_stocka_71 200)
8500          (= (+ truck_stock_71 c_stocka_71) (+ truck_stock_70 c_stockb_71))
8501          (= a_stocka_71 a_stockb_71)
8502          (= b_stocka_71 b_stockb_71)
8503          (or
8504            (and
8505              (= truck_loc_71 1)
8506              (= truck_travel_time_71 32)
8507            )
8508            (and
8509              (= truck_loc_71 2)
8510              (= truck_travel_time_71 37)
8511            )
8512          )
8513        )
8514      )
8515    )
8516    (<= truck_stock_71 318)
8517    (>= truck_stock_71 0)
8518    (= a_stockb_72 (- a_stocka_71 truck_travel_time_71))
8519    (= b_stockb_72 (- b_stocka_71 truck_travel_time_71))
8520    (= c_stockb_72 (- c_stocka_71 truck_travel_time_71))
8521    (and
8522      (=> (= truck_loc_71 0)
8523        (and
8524          (= a_stocka_72 a_stockb_72)
8525          (= b_stocka_72 b_stockb_72)
8526          (= c_stocka_72 c_stockb_72)
8527          (or
8528            (and
8529              (= truck_loc_72 1)
8530              (= truck_travel_time_72 29)
8531            )
8532            (and
8533              (= truck_loc_72 2)
8534              (= truck_travel_time_72 21)
```

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8535            )
8536          )
8537        )
8538    )
8539    (=> (= truck_loc_71 1)
8540      (and
8541        (<= a_stocka_72 120)
8542        (= (+ truck_stock_72 a_stocka_72) (+ truck_stock_71 a_stockb_72))
8543        (= b_stocka_72 b_stockb_72)
8544        (= c_stocka_72 c_stockb_72)
8545        (or
8546          (and
8547            (= truck_loc_72 0)
8548            (= truck_travel_time_72 29)
8549          )
8550          (and
8551            (= truck_loc_72 2)
8552            (= truck_travel_time_72 17)
8553          )
8554          (and
8555            (= truck_loc_72 3)
8556            (= truck_travel_time_72 32)
8557          )
8558        )
8559      )
8560    )
8561    (=> (= truck_loc_71 2)
8562      (and
8563        (<= b_stocka_72 120)
8564        (= (+ truck_stock_72 b_stocka_72) (+ truck_stock_71 b_stockb_72))
8565        (= a_stocka_72 a_stockb_72)
8566        (= c_stocka_72 c_stockb_72)
8567        (or
8568          (and
8569            (= truck_loc_72 1)
8570            (= truck_travel_time_72 17)
8571          )
8572          (and
8573            (= truck_loc_72 0)
8574            (= truck_travel_time_72 21)
8575          )
8576          (and
8577            (= truck_loc_72 3)
8578            (= truck_travel_time_72 37)
8579          )
8580        )
8581      )
8582    )
8583    (=> (= truck_loc_71 3)
8584      (and
8585        (<= c_stocka_72 200)
8586        (= (+ truck_stock_72 c_stocka_72) (+ truck_stock_71 c_stockb_72))
8587        (= a_stocka_72 a_stockb_72)
8588        (= b_stocka_72 b_stockb_72)
8589        (or
8590          (and
8591            (= truck_loc_72 1)
8592            (= truck_travel_time_72 32)
8593          )
8594          (and
8595            (= truck_loc_72 2)
8596            (= truck_travel_time_72 37)
```

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8597            )
8598          )
8599        )
8600    )
8601  )
8602  (<= truck_stock_72 318)
8603  (>= truck_stock_72 0)
8604  (= a_stockb_73 (- a_stocka_72 truck_travel_time_72))
8605  (= b_stockb_73 (- b_stocka_72 truck_travel_time_72))
8606  (= c_stockb_73 (- c_stocka_72 truck_travel_time_72))
8607  (and
8608    (=> (= truck_loc_72 0)
8609      (and
8610        (= a_stocka_73 a_stockb_73)
8611        (= b_stocka_73 b_stockb_73)
8612        (= c_stocka_73 c_stockb_73)
8613        (or
8614          (and
8615            (= truck_loc_73 1)
8616            (= truck_travel_time_73 29)
8617          )
8618          (and
8619            (= truck_loc_73 2)
8620            (= truck_travel_time_73 21)
8621          )
8622        )
8623      )
8624    )
8625    (=> (= truck_loc_72 1)
8626      (and
8627        (<= a_stocka_73 120)
8628        (= (+ truck_stock_73 a_stocka_73) (+ truck_stock_72 a_stockb_73))
8629        (= b_stocka_73 b_stockb_73)
8630        (= c_stocka_73 c_stockb_73)
8631        (or
8632          (and
8633            (= truck_loc_73 0)
8634            (= truck_travel_time_73 29)
8635          )
8636          (and
8637            (= truck_loc_73 2)
8638            (= truck_travel_time_73 17)
8639          )
8640          (and
8641            (= truck_loc_73 3)
8642            (= truck_travel_time_73 32)
8643          )
8644        )
8645      )
8646    )
8647    (=> (= truck_loc_72 2)
8648      (and
8649        (<= b_stocka_73 120)
8650        (= (+ truck_stock_73 b_stocka_73) (+ truck_stock_72 b_stockb_73))
8651        (= a_stocka_73 a_stockb_73)
8652        (= c_stocka_73 c_stockb_73)
8653        (or
8654          (and
8655            (= truck_loc_73 1)
8656            (= truck_travel_time_73 17)
8657          )
8658          (and
```

```
8659            (= truck_loc_73 0)
8660            (= truck_travel_time_73 21)
8661          )
8662        (and
8663          (= truck_loc_73 3)
8664          (= truck_travel_time_73 37)
8665        )
8666      )
8667    )
8668  )
8669  (=> (= truck_loc_72 3)
8670    (and
8671      (<= c_stocka_73 200)
8672      (= (+ truck_stock_73 c_stocka_73) (+ truck_stock_72 c_stockb_73))
8673      (= a_stocka_73 a_stockb_73)
8674      (= b_stocka_73 b_stockb_73)
8675      (or
8676        (and
8677          (= truck_loc_73 1)
8678          (= truck_travel_time_73 32)
8679        )
8680        (and
8681          (= truck_loc_73 2)
8682          (= truck_travel_time_73 37)
8683        )
8684      )
8685    )
8686  )
8687 )
8688 (<= truck_stock_73 318)
8689 (>= truck_stock_73 0)
8690 (= a_stockb_74 (- a_stocka_73 truck_travel_time_73))
8691 (= b_stockb_74 (- b_stocka_73 truck_travel_time_73))
8692 (= c_stockb_74 (- c_stocka_73 truck_travel_time_73))
8693 (and
8694   (=> (= truck_loc_73 0)
8695     (and
8696       (= a_stocka_74 a_stockb_74)
8697       (= b_stocka_74 b_stockb_74)
8698       (= c_stocka_74 c_stockb_74)
8699       (or
8700         (and
8701           (= truck_loc_74 1)
8702           (= truck_travel_time_74 29)
8703         )
8704         (and
8705           (= truck_loc_74 2)
8706           (= truck_travel_time_74 21)
8707         )
8708       )
8709     )
8710   )
8711   (=> (= truck_loc_73 1)
8712     (and
8713       (<= a_stocka_74 120)
8714       (= (+ truck_stock_74 a_stocka_74) (+ truck_stock_73 a_stockb_74))
8715       (= b_stocka_74 b_stockb_74)
8716       (= c_stocka_74 c_stockb_74)
8717       (or
8718         (and
8719           (= truck_loc_74 0)
8720           (= truck_travel_time_74 29)
```

```
8721            )
8722          (and
8723            (= truck_loc_74 2)
8724            (= truck_travel_time_74 17)
8725          )
8726          (and
8727            (= truck_loc_74 3)
8728            (= truck_travel_time_74 32)
8729          )
8730        )
8731      )
8732    )
8733    (=> (= truck_loc_73 2)
8734      (and
8735        (<= b_stocka_74 120)
8736        (= (+ truck_stock_74 b_stocka_74) (+ truck_stock_73 b_stockb_74))
8737        (= a_stocka_74 a_stockb_74)
8738        (= c_stocka_74 c_stockb_74)
8739        (or
8740          (and
8741            (= truck_loc_74 1)
8742            (= truck_travel_time_74 17)
8743          )
8744          (and
8745            (= truck_loc_74 0)
8746            (= truck_travel_time_74 21)
8747          )
8748          (and
8749            (= truck_loc_74 3)
8750            (= truck_travel_time_74 37)
8751          )
8752        )
8753      )
8754    )
8755    (=> (= truck_loc_73 3)
8756      (and
8757        (<= c_stocka_74 200)
8758        (= (+ truck_stock_74 c_stocka_74) (+ truck_stock_73 c_stockb_74))
8759        (= a_stocka_74 a_stockb_74)
8760        (= b_stocka_74 b_stockb_74)
8761        (or
8762          (and
8763            (= truck_loc_74 1)
8764            (= truck_travel_time_74 32)
8765          )
8766          (and
8767            (= truck_loc_74 2)
8768            (= truck_travel_time_74 37)
8769          )
8770        )
8771      )
8772    )
8773  )
8774  (<= truck_stock_74 318)
8775  (>= truck_stock_74 0)
8776  (= a_stockb_75 (- a_stocka_74 truck_travel_time_74))
8777  (= b_stockb_75 (- b_stocka_74 truck_travel_time_74))
8778  (= c_stockb_75 (- c_stocka_74 truck_travel_time_74))
8779  (and
8780    (=> (= truck_loc_74 0)
8781      (and
8782        (= a_stocka_75 a_stockb_75)
```

```
8783          (= b_stocka_75 b_stockb_75)
8784          (= c_stocka_75 c_stockb_75)
8785          (or
8786            (and
8787              (= truck_loc_75 1)
8788              (= truck_travel_time_75 29)
8789            )
8790            (and
8791              (= truck_loc_75 2)
8792              (= truck_travel_time_75 21)
8793            )
8794          )
8795        )
8796      )
8797      (=> (= truck_loc_74 1)
8798        (and
8799          (<= a_stocka_75 120)
8800          (= (+ truck_stock_75 a_stocka_75) (+ truck_stock_74 a_stockb_75))
8801          (= b_stocka_75 b_stockb_75)
8802          (= c_stocka_75 c_stockb_75)
8803          (or
8804            (and
8805              (= truck_loc_75 0)
8806              (= truck_travel_time_75 29)
8807            )
8808            (and
8809              (= truck_loc_75 2)
8810              (= truck_travel_time_75 17)
8811            )
8812            (and
8813              (= truck_loc_75 3)
8814              (= truck_travel_time_75 32)
8815            )
8816          )
8817        )
8818      )
8819      (=> (= truck_loc_74 2)
8820        (and
8821          (<= b_stocka_75 120)
8822          (= (+ truck_stock_75 b_stocka_75) (+ truck_stock_74 b_stockb_75))
8823          (= a_stocka_75 a_stockb_75)
8824          (= c_stocka_75 c_stockb_75)
8825          (or
8826            (and
8827              (= truck_loc_75 1)
8828              (= truck_travel_time_75 17)
8829            )
8830            (and
8831              (= truck_loc_75 0)
8832              (= truck_travel_time_75 21)
8833            )
8834            (and
8835              (= truck_loc_75 3)
8836              (= truck_travel_time_75 37)
8837            )
8838          )
8839        )
8840      )
8841      (=> (= truck_loc_74 3)
8842        (and
8843          (<= c_stocka_75 200)
8844          (= (+ truck_stock_75 c_stocka_75) (+ truck_stock_74 c_stockb_75))
```

```
8845        (= a_stocka_75 a_stockb_75)
8846        (= b_stocka_75 b_stockb_75)
8847        (or
8848          (and
8849            (= truck_loc_75 1)
8850            (= truck_travel_time_75 32)
8851          )
8852          (and
8853            (= truck_loc_75 2)
8854            (= truck_travel_time_75 37)
8855          )
8856        )
8857      )
8858    )
8859  )
8860  (<= truck_stock_75 318)
8861  (>= truck_stock_75 0)
8862  (= a_stockb_76 (- a_stocka_75 truck_travel_time_75))
8863  (= b_stockb_76 (- b_stocka_75 truck_travel_time_75))
8864  (= c_stockb_76 (- c_stocka_75 truck_travel_time_75))
8865  (and
8866    (=> (= truck_loc_75 0)
8867      (and
8868        (= a_stocka_76 a_stockb_76)
8869        (= b_stocka_76 b_stockb_76)
8870        (= c_stocka_76 c_stockb_76)
8871        (or
8872          (and
8873            (= truck_loc_76 1)
8874            (= truck_travel_time_76 29)
8875          )
8876          (and
8877            (= truck_loc_76 2)
8878            (= truck_travel_time_76 21)
8879          )
8880        )
8881      )
8882    )
8883    (=> (= truck_loc_75 1)
8884      (and
8885        (<= a_stocka_76 120)
8886        (= (+ truck_stock_76 a_stocka_76) (+ truck_stock_75 a_stockb_76))
8887        (= b_stocka_76 b_stockb_76)
8888        (= c_stocka_76 c_stockb_76)
8889        (or
8890          (and
8891            (= truck_loc_76 0)
8892            (= truck_travel_time_76 29)
8893          )
8894          (and
8895            (= truck_loc_76 2)
8896            (= truck_travel_time_76 17)
8897          )
8898          (and
8899            (= truck_loc_76 3)
8900            (= truck_travel_time_76 32)
8901          )
8902        )
8903      )
8904    )
8905    (=> (= truck_loc_75 2)
8906      (and
```

```
8907          (<= b_stocka_76 120)
8908          (= (+ truck_stock_76 b_stocka_76) (+ truck_stock_75 b_stockb_76))
8909          (= a_stocka_76 a_stockb_76)
8910          (= c_stocka_76 c_stockb_76)
8911          (or
8912            (and
8913              (= truck_loc_76 1)
8914              (= truck_travel_time_76 17)
8915            )
8916            (and
8917              (= truck_loc_76 0)
8918              (= truck_travel_time_76 21)
8919            )
8920            (and
8921              (= truck_loc_76 3)
8922              (= truck_travel_time_76 37)
8923            )
8924          )
8925        )
8926      )
8927      (=> (= truck_loc_75 3)
8928        (and
8929          (<= c_stocka_76 200)
8930          (= (+ truck_stock_76 c_stocka_76) (+ truck_stock_75 c_stockb_76))
8931          (= a_stocka_76 a_stockb_76)
8932          (= b_stocka_76 b_stockb_76)
8933          (or
8934            (and
8935              (= truck_loc_76 1)
8936              (= truck_travel_time_76 32)
8937            )
8938            (and
8939              (= truck_loc_76 2)
8940              (= truck_travel_time_76 37)
8941            )
8942          )
8943        )
8944      )
8945    )
8946    (<= truck_stock_76 318)
8947    (>= truck_stock_76 0)
8948    (= a_stockb_77 (- a_stocka_76 truck_travel_time_76))
8949    (= b_stockb_77 (- b_stocka_76 truck_travel_time_76))
8950    (= c_stockb_77 (- c_stocka_76 truck_travel_time_76))
8951    (and
8952      (=> (= truck_loc_76 0)
8953        (and
8954          (= a_stocka_77 a_stockb_77)
8955          (= b_stocka_77 b_stockb_77)
8956          (= c_stocka_77 c_stockb_77)
8957          (or
8958            (and
8959              (= truck_loc_77 1)
8960              (= truck_travel_time_77 29)
8961            )
8962            (and
8963              (= truck_loc_77 2)
8964              (= truck_travel_time_77 21)
8965            )
8966          )
8967        )
8968      )
```

```
8969    (=> (= truck_loc_76 1)
8970      (and
8971        (<= a_stocka_77 120)
8972        (= (+ truck_stock_77 a_stocka_77) (+ truck_stock_76 a_stockb_77))
8973        (= b_stocka_77 b_stockb_77)
8974        (= c_stocka_77 c_stockb_77)
8975        (or
8976          (and
8977            (= truck_loc_77 0)
8978            (= truck_travel_time_77 29)
8979          )
8980          (and
8981            (= truck_loc_77 2)
8982            (= truck_travel_time_77 17)
8983          )
8984          (and
8985            (= truck_loc_77 3)
8986            (= truck_travel_time_77 32)
8987          )
8988        )
8989      )
8990    )
8991    (=> (= truck_loc_76 2)
8992      (and
8993        (<= b_stocka_77 120)
8994        (= (+ truck_stock_77 b_stocka_77) (+ truck_stock_76 b_stockb_77))
8995        (= a_stocka_77 a_stockb_77)
8996        (= c_stocka_77 c_stockb_77)
8997        (or
8998          (and
8999            (= truck_loc_77 1)
9000            (= truck_travel_time_77 17)
9001          )
9002          (and
9003            (= truck_loc_77 0)
9004            (= truck_travel_time_77 21)
9005          )
9006          (and
9007            (= truck_loc_77 3)
9008            (= truck_travel_time_77 37)
9009          )
9010        )
9011      )
9012    )
9013    (=> (= truck_loc_76 3)
9014      (and
9015        (<= c_stocka_77 200)
9016        (= (+ truck_stock_77 c_stocka_77) (+ truck_stock_76 c_stockb_77))
9017        (= a_stocka_77 a_stockb_77)
9018        (= b_stocka_77 b_stockb_77)
9019        (or
9020          (and
9021            (= truck_loc_77 1)
9022            (= truck_travel_time_77 32)
9023          )
9024          (and
9025            (= truck_loc_77 2)
9026            (= truck_travel_time_77 37)
9027          )
9028        )
9029      )
9030    )
```

```
9031  )
9032  (<= truck_stock_77 318)
9033  (>= truck_stock_77 0)
9034  (= a_stockb_78 (- a_stocka_77 truck_travel_time_77))
9035  (= b_stockb_78 (- b_stocka_77 truck_travel_time_77))
9036  (= c_stockb_78 (- c_stocka_77 truck_travel_time_77))
9037  (and
9038    (=> (= truck_loc_77 0)
9039      (and
9040        (= a_stocka_78 a_stockb_78)
9041        (= b_stocka_78 b_stockb_78)
9042        (= c_stocka_78 c_stockb_78)
9043        (or
9044          (and
9045            (= truck_loc_78 1)
9046            (= truck_travel_time_78 29)
9047          )
9048          (and
9049            (= truck_loc_78 2)
9050            (= truck_travel_time_78 21)
9051          )
9052        )
9053      )
9054    )
9055    (=> (= truck_loc_77 1)
9056      (and
9057        (<= a_stocka_78 120)
9058        (= (+ truck_stock_78 a_stocka_78) (+ truck_stock_77 a_stockb_78))
9059        (= b_stocka_78 b_stockb_78)
9060        (= c_stocka_78 c_stockb_78)
9061        (or
9062          (and
9063            (= truck_loc_78 0)
9064            (= truck_travel_time_78 29)
9065          )
9066          (and
9067            (= truck_loc_78 2)
9068            (= truck_travel_time_78 17)
9069          )
9070          (and
9071            (= truck_loc_78 3)
9072            (= truck_travel_time_78 32)
9073          )
9074        )
9075      )
9076    )
9077    (=> (= truck_loc_77 2)
9078      (and
9079        (<= b_stocka_78 120)
9080        (= (+ truck_stock_78 b_stocka_78) (+ truck_stock_77 b_stockb_78))
9081        (= a_stocka_78 a_stockb_78)
9082        (= c_stocka_78 c_stockb_78)
9083        (or
9084          (and
9085            (= truck_loc_78 1)
9086            (= truck_travel_time_78 17)
9087          )
9088          (and
9089            (= truck_loc_78 0)
9090            (= truck_travel_time_78 21)
9091          )
9092          (and
```

```
9093              (= truck_loc_78 3)
9094              (= truck_travel_time_78 37)
9095            )
9096          )
9097        )
9098      )
9099      (=> (= truck_loc_77 3)
9100        (and
9101          (<= c_stocka_78 200)
9102          (= (+ truck_stock_78 c_stocka_78) (+ truck_stock_77 c_stockb_78))
9103          (= a_stocka_78 a_stockb_78)
9104          (= b_stocka_78 b_stockb_78)
9105          (or
9106            (and
9107              (= truck_loc_78 1)
9108              (= truck_travel_time_78 32)
9109            )
9110            (and
9111              (= truck_loc_78 2)
9112              (= truck_travel_time_78 37)
9113            )
9114          )
9115        )
9116      )
9117    )
9118    (<= truck_stock_78 318)
9119    (>= truck_stock_78 0)
9120    (= a_stockb_79 (- a_stocka_78 truck_travel_time_78))
9121    (= b_stockb_79 (- b_stocka_78 truck_travel_time_78))
9122    (= c_stockb_79 (- c_stocka_78 truck_travel_time_78))
9123    (and
9124      (=> (= truck_loc_78 0)
9125        (and
9126          (= a_stocka_79 a_stockb_79)
9127          (= b_stocka_79 b_stockb_79)
9128          (= c_stocka_79 c_stockb_79)
9129          (or
9130            (and
9131              (= truck_loc_79 1)
9132              (= truck_travel_time_79 29)
9133            )
9134            (and
9135              (= truck_loc_79 2)
9136              (= truck_travel_time_79 21)
9137            )
9138          )
9139        )
9140      )
9141      (=> (= truck_loc_78 1)
9142        (and
9143          (<= a_stocka_79 120)
9144          (= (+ truck_stock_79 a_stocka_79) (+ truck_stock_78 a_stockb_79))
9145          (= b_stocka_79 b_stockb_79)
9146          (= c_stocka_79 c_stockb_79)
9147          (or
9148            (and
9149              (= truck_loc_79 0)
9150              (= truck_travel_time_79 29)
9151            )
9152            (and
9153              (= truck_loc_79 2)
9154              (= truck_travel_time_79 17)
```

```
9155          )
9156        (and
9157          (= truck_loc_79 3)
9158          (= truck_travel_time_79 32)
9159        )
9160      )
9161    )
9162  )
9163  (=> (= truck_loc_78 2)
9164    (and
9165      (<= b_stocka_79 120)
9166      (= (+ truck_stock_79 b_stocka_79) (+ truck_stock_78 b_stockb_79))
9167      (= a_stocka_79 a_stockb_79)
9168      (= c_stocka_79 c_stockb_79)
9169      (or
9170        (and
9171          (= truck_loc_79 1)
9172          (= truck_travel_time_79 17)
9173        )
9174        (and
9175          (= truck_loc_79 0)
9176          (= truck_travel_time_79 21)
9177        )
9178        (and
9179          (= truck_loc_79 3)
9180          (= truck_travel_time_79 37)
9181        )
9182      )
9183    )
9184  )
9185  (=> (= truck_loc_78 3)
9186    (and
9187      (<= c_stocka_79 200)
9188      (= (+ truck_stock_79 c_stocka_79) (+ truck_stock_78 c_stockb_79))
9189      (= a_stocka_79 a_stockb_79)
9190      (= b_stocka_79 b_stockb_79)
9191      (or
9192        (and
9193          (= truck_loc_79 1)
9194          (= truck_travel_time_79 32)
9195        )
9196        (and
9197          (= truck_loc_79 2)
9198          (= truck_travel_time_79 37)
9199        )
9200      )
9201    )
9202  )
9203  )
9204  (<= truck_stock_79 318)
9205  (>= truck_stock_79 0)
9206  (= a_stockb_80 (- a_stocka_79 truck_travel_time_79))
9207  (= b_stockb_80 (- b_stocka_79 truck_travel_time_79))
9208  (= c_stockb_80 (- c_stocka_79 truck_travel_time_79))
9209  (and
9210    (=> (= truck_loc_79 0)
9211      (and
9212        (= a_stocka_80 a_stockb_80)
9213        (= b_stocka_80 b_stockb_80)
9214        (= c_stocka_80 c_stockb_80)
9215        (or
9216          (and
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```
9217          (= truck_loc_80 1)
9218          (= truck_travel_time_80 29)
9219        )
9220      (and
9221        (= truck_loc_80 2)
9222        (= truck_travel_time_80 21)
9223      )
9224    )
9225   )
9226  )
9227  (=> (= truck_loc_79 1)
9228    (and
9229      (<= a_stocka_80 120)
9230      (= (+ truck_stock_80 a_stocka_80) (+ truck_stock_79 a_stockb_80))
9231      (= b_stocka_80 b_stockb_80)
9232      (= c_stocka_80 c_stockb_80)
9233      (or
9234        (and
9235          (= truck_loc_80 0)
9236          (= truck_travel_time_80 29)
9237        )
9238        (and
9239          (= truck_loc_80 2)
9240          (= truck_travel_time_80 17)
9241        )
9242        (and
9243          (= truck_loc_80 3)
9244          (= truck_travel_time_80 32)
9245        )
9246      )
9247    )
9248  )
9249  (=> (= truck_loc_79 2)
9250    (and
9251      (<= b_stocka_80 120)
9252      (= (+ truck_stock_80 b_stocka_80) (+ truck_stock_79 b_stockb_80))
9253      (= a_stocka_80 a_stockb_80)
9254      (= c_stocka_80 c_stockb_80)
9255      (or
9256        (and
9257          (= truck_loc_80 1)
9258          (= truck_travel_time_80 17)
9259        )
9260        (and
9261          (= truck_loc_80 0)
9262          (= truck_travel_time_80 21)
9263        )
9264        (and
9265          (= truck_loc_80 3)
9266          (= truck_travel_time_80 37)
9267        )
9268      )
9269    )
9270  )
9271  (=> (= truck_loc_79 3)
9272    (and
9273      (<= c_stocka_80 200)
9274      (= (+ truck_stock_80 c_stocka_80) (+ truck_stock_79 c_stockb_80))
9275      (= a_stocka_80 a_stockb_80)
9276      (= b_stocka_80 b_stockb_80)
9277      (or
9278        (and
```

```
9279            (= truck_loc_80 1)
9280            (= truck_travel_time_80 32)
9281          )
9282        (and
9283          (= truck_loc_80 2)
9284          (= truck_travel_time_80 37)
9285        )
9286      )
9287    )
9288  )
9289 )
9290 (<= truck_stock_80 318)
9291 (>= truck_stock_80 0)
9292 (= a_stockb_81 (- a_stocka_80 truck_travel_time_80))
9293 (= b_stockb_81 (- b_stocka_80 truck_travel_time_80))
9294 (= c_stockb_81 (- c_stocka_80 truck_travel_time_80))
9295 (and
9296   (=> (= truck_loc_80 0)
9297     (and
9298       (= a_stocka_81 a_stockb_81)
9299       (= b_stocka_81 b_stockb_81)
9300       (= c_stocka_81 c_stockb_81)
9301       (or
9302         (and
9303           (= truck_loc_81 1)
9304           (= truck_travel_time_81 29)
9305         )
9306         (and
9307           (= truck_loc_81 2)
9308           (= truck_travel_time_81 21)
9309         )
9310       )
9311     )
9312   )
9313   (=> (= truck_loc_80 1)
9314     (and
9315       (<= a_stocka_81 120)
9316       (= (+ truck_stock_81 a_stocka_81) (+ truck_stock_80 a_stockb_81))
9317       (= b_stocka_81 b_stockb_81)
9318       (= c_stocka_81 c_stockb_81)
9319       (or
9320         (and
9321           (= truck_loc_81 0)
9322           (= truck_travel_time_81 29)
9323         )
9324         (and
9325           (= truck_loc_81 2)
9326           (= truck_travel_time_81 17)
9327         )
9328         (and
9329           (= truck_loc_81 3)
9330           (= truck_travel_time_81 32)
9331         )
9332       )
9333     )
9334   )
9335   (=> (= truck_loc_80 2)
9336     (and
9337       (<= b_stocka_81 120)
9338       (= (+ truck_stock_81 b_stocka_81) (+ truck_stock_80 b_stockb_81))
9339       (= a_stocka_81 a_stockb_81)
9340       (= c_stocka_81 c_stockb_81)
```

```
9341        (or
9342          (and
9343            (= truck_loc_81 1)
9344            (= truck_travel_time_81 17)
9345          )
9346          (and
9347            (= truck_loc_81 0)
9348            (= truck_travel_time_81 21)
9349          )
9350          (and
9351            (= truck_loc_81 3)
9352            (= truck_travel_time_81 37)
9353          )
9354        )
9355      )
9356    )
9357    (=> (= truck_loc_80 3)
9358      (and
9359        (<= c_stocka_81 200)
9360        (= (+ truck_stock_81 c_stocka_81) (+ truck_stock_80 c_stockb_81))
9361        (= a_stocka_81 a_stockb_81)
9362        (= b_stocka_81 b_stockb_81)
9363        (or
9364          (and
9365            (= truck_loc_81 1)
9366            (= truck_travel_time_81 32)
9367          )
9368          (and
9369            (= truck_loc_81 2)
9370            (= truck_travel_time_81 37)
9371          )
9372        )
9373      )
9374    )
9375  )
9376  (<= truck_stock_81 318)
9377  (>= truck_stock_81 0)
9378  (= a_stockb_82 (- a_stocka_81 truck_travel_time_81))
9379  (= b_stockb_82 (- b_stocka_81 truck_travel_time_81))
9380  (= c_stockb_82 (- c_stocka_81 truck_travel_time_81))
9381  (and
9382    (=> (= truck_loc_81 0)
9383      (and
9384        (= a_stocka_82 a_stockb_82)
9385        (= b_stocka_82 b_stockb_82)
9386        (= c_stocka_82 c_stockb_82)
9387        (or
9388          (and
9389            (= truck_loc_82 1)
9390            (= truck_travel_time_82 29)
9391          )
9392          (and
9393            (= truck_loc_82 2)
9394            (= truck_travel_time_82 21)
9395          )
9396        )
9397      )
9398    )
9399    (=> (= truck_loc_81 1)
9400      (and
9401        (<= a_stocka_82 120)
9402        (= (+ truck_stock_82 a_stocka_82) (+ truck_stock_81 a_stockb_82))
```

```
9403        (= b_stocka_82 b_stockb_82)
9404        (= c_stocka_82 c_stockb_82)
9405        (or
9406          (and
9407            (= truck_loc_82 0)
9408            (= truck_travel_time_82 29)
9409          )
9410          (and
9411            (= truck_loc_82 2)
9412            (= truck_travel_time_82 17)
9413          )
9414          (and
9415            (= truck_loc_82 3)
9416            (= truck_travel_time_82 32)
9417          )
9418        )
9419      )
9420    )
9421    (=> (= truck_loc_81 2)
9422      (and
9423        (<= b_stocka_82 120)
9424        (= (+ truck_stock_82 b_stocka_82) (+ truck_stock_81 b_stockb_82))
9425        (= a_stocka_82 a_stockb_82)
9426        (= c_stocka_82 c_stockb_82)
9427        (or
9428          (and
9429            (= truck_loc_82 1)
9430            (= truck_travel_time_82 17)
9431          )
9432          (and
9433            (= truck_loc_82 0)
9434            (= truck_travel_time_82 21)
9435          )
9436          (and
9437            (= truck_loc_82 3)
9438            (= truck_travel_time_82 37)
9439          )
9440        )
9441      )
9442    )
9443    (=> (= truck_loc_81 3)
9444      (and
9445        (<= c_stocka_82 200)
9446        (= (+ truck_stock_82 c_stocka_82) (+ truck_stock_81 c_stockb_82))
9447        (= a_stocka_82 a_stockb_82)
9448        (= b_stocka_82 b_stockb_82)
9449        (or
9450          (and
9451            (= truck_loc_82 1)
9452            (= truck_travel_time_82 32)
9453          )
9454          (and
9455            (= truck_loc_82 2)
9456            (= truck_travel_time_82 37)
9457          )
9458        )
9459      )
9460    )
9461  )
9462  (<= truck_stock_82 318)
9463  (>= truck_stock_82 0)
9464  (= a_stockb_83 (- a_stocka_82 truck_travel_time_82))
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```
9465    (= b_stockb_83 (- b_stocka_82 truck_travel_time_82))
9466    (= c_stockb_83 (- c_stocka_82 truck_travel_time_82))
9467    (and
9468      (=> (= truck_loc_82 0)
9469        (and
9470          (= a_stocka_83 a_stockb_83)
9471          (= b_stocka_83 b_stockb_83)
9472          (= c_stocka_83 c_stockb_83)
9473          (or
9474            (and
9475              (= truck_loc_83 1)
9476              (= truck_travel_time_83 29)
9477            )
9478            (and
9479              (= truck_loc_83 2)
9480              (= truck_travel_time_83 21)
9481            )
9482          )
9483        )
9484      )
9485      (=> (= truck_loc_82 1)
9486        (and
9487          (<= a_stocka_83 120)
9488          (= (+ truck_stock_83 a_stocka_83) (+ truck_stock_82 a_stockb_83))
9489          (= b_stocka_83 b_stockb_83)
9490          (= c_stocka_83 c_stockb_83)
9491          (or
9492            (and
9493              (= truck_loc_83 0)
9494              (= truck_travel_time_83 29)
9495            )
9496            (and
9497              (= truck_loc_83 2)
9498              (= truck_travel_time_83 17)
9499            )
9500            (and
9501              (= truck_loc_83 3)
9502              (= truck_travel_time_83 32)
9503            )
9504          )
9505        )
9506      )
9507      (=> (= truck_loc_82 2)
9508        (and
9509          (<= b_stocka_83 120)
9510          (= (+ truck_stock_83 b_stocka_83) (+ truck_stock_82 b_stockb_83))
9511          (= a_stocka_83 a_stockb_83)
9512          (= c_stocka_83 c_stockb_83)
9513          (or
9514            (and
9515              (= truck_loc_83 1)
9516              (= truck_travel_time_83 17)
9517            )
9518            (and
9519              (= truck_loc_83 0)
9520              (= truck_travel_time_83 21)
9521            )
9522            (and
9523              (= truck_loc_83 3)
9524              (= truck_travel_time_83 37)
9525            )
9526          )
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```
9527        )
9528      )
9529      (=> (= truck_loc_82 3)
9530        (and
9531          (<= c_stocka_83 200)
9532          (= (+ truck_stock_83 c_stocka_83) (+ truck_stock_82 c_stockb_83))
9533          (= a_stocka_83 a_stockb_83)
9534          (= b_stocka_83 b_stockb_83)
9535          (or
9536            (and
9537              (= truck_loc_83 1)
9538              (= truck_travel_time_83 32)
9539            )
9540            (and
9541              (= truck_loc_83 2)
9542              (= truck_travel_time_83 37)
9543            )
9544          )
9545        )
9546      )
9547    )
9548    (<= truck_stock_83 318)
9549    (>= truck_stock_83 0)
9550    (= a_stockb_84 (- a_stocka_83 truck_travel_time_83))
9551    (= b_stockb_84 (- b_stocka_83 truck_travel_time_83))
9552    (= c_stockb_84 (- c_stocka_83 truck_travel_time_83))
9553    (and
9554      (=> (= truck_loc_83 0)
9555        (and
9556          (= a_stocka_84 a_stockb_84)
9557          (= b_stocka_84 b_stockb_84)
9558          (= c_stocka_84 c_stockb_84)
9559          (or
9560            (and
9561              (= truck_loc_84 1)
9562              (= truck_travel_time_84 29)
9563            )
9564            (and
9565              (= truck_loc_84 2)
9566              (= truck_travel_time_84 21)
9567            )
9568          )
9569        )
9570      )
9571      (=> (= truck_loc_83 1)
9572        (and
9573          (<= a_stocka_84 120)
9574          (= (+ truck_stock_84 a_stocka_84) (+ truck_stock_83 a_stockb_84))
9575          (= b_stocka_84 b_stockb_84)
9576          (= c_stocka_84 c_stockb_84)
9577          (or
9578            (and
9579              (= truck_loc_84 0)
9580              (= truck_travel_time_84 29)
9581            )
9582            (and
9583              (= truck_loc_84 2)
9584              (= truck_travel_time_84 17)
9585            )
9586            (and
9587              (= truck_loc_84 3)
9588              (= truck_travel_time_84 32)
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```
9589              )
9590            )
9591          )
9592        )
9593      (=> (= truck_loc_83 2)
9594        (and
9595          (<= b_stocka_84 120)
9596          (= (+ truck_stock_84 b_stocka_84) (+ truck_stock_83 b_stockb_84))
9597          (= a_stocka_84 a_stockb_84)
9598          (= c_stocka_84 c_stockb_84)
9599          (or
9600            (and
9601              (= truck_loc_84 1)
9602              (= truck_travel_time_84 17)
9603            )
9604            (and
9605              (= truck_loc_84 0)
9606              (= truck_travel_time_84 21)
9607            )
9608            (and
9609              (= truck_loc_84 3)
9610              (= truck_travel_time_84 37)
9611            )
9612          )
9613        )
9614      )
9615      (=> (= truck_loc_83 3)
9616        (and
9617          (<= c_stocka_84 200)
9618          (= (+ truck_stock_84 c_stocka_84) (+ truck_stock_83 c_stockb_84))
9619          (= a_stocka_84 a_stockb_84)
9620          (= b_stocka_84 b_stockb_84)
9621          (or
9622            (and
9623              (= truck_loc_84 1)
9624              (= truck_travel_time_84 32)
9625            )
9626            (and
9627              (= truck_loc_84 2)
9628              (= truck_travel_time_84 37)
9629            )
9630          )
9631        )
9632      )
9633    )
9634    (<= truck_stock_84 318)
9635    (>= truck_stock_84 0)
9636    (= a_stockb_85 (- a_stocka_84 truck_travel_time_84))
9637    (= b_stockb_85 (- b_stocka_84 truck_travel_time_84))
9638    (= c_stockb_85 (- c_stocka_84 truck_travel_time_84))
9639    (and
9640      (=> (= truck_loc_84 0)
9641        (and
9642          (= a_stocka_85 a_stockb_85)
9643          (= b_stocka_85 b_stockb_85)
9644          (= c_stocka_85 c_stockb_85)
9645          (or
9646            (and
9647              (= truck_loc_85 1)
9648              (= truck_travel_time_85 29)
9649            )
9650            (and
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```
9651              (= truck_loc_85 2)
9652              (= truck_travel_time_85 21)
9653            )
9654          )
9655        )
9656    )
9657    (=> (= truck_loc_84 1)
9658       (and
9659         (<= a_stocka_85 120)
9660         (= (+ truck_stock_85 a_stocka_85) (+ truck_stock_84 a_stockb_85))
9661         (= b_stocka_85 b_stockb_85)
9662         (= c_stocka_85 c_stockb_85)
9663         (or
9664           (and
9665             (= truck_loc_85 0)
9666             (= truck_travel_time_85 29)
9667           )
9668           (and
9669             (= truck_loc_85 2)
9670             (= truck_travel_time_85 17)
9671           )
9672           (and
9673             (= truck_loc_85 3)
9674             (= truck_travel_time_85 32)
9675           )
9676         )
9677       )
9678    )
9679    (=> (= truck_loc_84 2)
9680       (and
9681         (<= b_stocka_85 120)
9682         (= (+ truck_stock_85 b_stocka_85) (+ truck_stock_84 b_stockb_85))
9683         (= a_stocka_85 a_stockb_85)
9684         (= c_stocka_85 c_stockb_85)
9685         (or
9686           (and
9687             (= truck_loc_85 1)
9688             (= truck_travel_time_85 17)
9689           )
9690           (and
9691             (= truck_loc_85 0)
9692             (= truck_travel_time_85 21)
9693           )
9694           (and
9695             (= truck_loc_85 3)
9696             (= truck_travel_time_85 37)
9697           )
9698         )
9699       )
9700    )
9701    (=> (= truck_loc_84 3)
9702       (and
9703         (<= c_stocka_85 200)
9704         (= (+ truck_stock_85 c_stocka_85) (+ truck_stock_84 c_stockb_85))
9705         (= a_stocka_85 a_stockb_85)
9706         (= b_stocka_85 b_stockb_85)
9707         (or
9708           (and
9709             (= truck_loc_85 1)
9710             (= truck_travel_time_85 32)
9711           )
9712           (and
```

```
9713              (= truck_loc_85 2)
9714              (= truck_travel_time_85 37)
9715            )
9716          )
9717        )
9718      )
9719  )
9720  (<= truck_stock_85 318)
9721  (>= truck_stock_85 0)
9722  (= a_stockb_86 (- a_stocka_85 truck_travel_time_85))
9723  (= b_stockb_86 (- b_stocka_85 truck_travel_time_85))
9724  (= c_stockb_86 (- c_stocka_85 truck_travel_time_85))
9725  (and
9726    (=> (= truck_loc_85 0)
9727      (and
9728        (= a_stocka_86 a_stockb_86)
9729        (= b_stocka_86 b_stockb_86)
9730        (= c_stocka_86 c_stockb_86)
9731        (or
9732          (and
9733            (= truck_loc_86 1)
9734            (= truck_travel_time_86 29)
9735          )
9736          (and
9737            (= truck_loc_86 2)
9738            (= truck_travel_time_86 21)
9739          )
9740        )
9741      )
9742    )
9743    (=> (= truck_loc_85 1)
9744      (and
9745        (<= a_stocka_86 120)
9746        (= (+ truck_stock_86 a_stocka_86) (+ truck_stock_85 a_stockb_86))
9747        (= b_stocka_86 b_stockb_86)
9748        (= c_stocka_86 c_stockb_86)
9749        (or
9750          (and
9751            (= truck_loc_86 0)
9752            (= truck_travel_time_86 29)
9753          )
9754          (and
9755            (= truck_loc_86 2)
9756            (= truck_travel_time_86 17)
9757          )
9758          (and
9759            (= truck_loc_86 3)
9760            (= truck_travel_time_86 32)
9761          )
9762        )
9763      )
9764    )
9765    (=> (= truck_loc_85 2)
9766      (and
9767        (<= b_stocka_86 120)
9768        (= (+ truck_stock_86 b_stocka_86) (+ truck_stock_85 b_stockb_86))
9769        (= a_stocka_86 a_stockb_86)
9770        (= c_stocka_86 c_stockb_86)
9771        (or
9772          (and
9773            (= truck_loc_86 1)
9774            (= truck_travel_time_86 17)
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```
9775              )
9776            (and
9777              (= truck_loc_86 0)
9778              (= truck_travel_time_86 21)
9779            )
9780            (and
9781              (= truck_loc_86 3)
9782              (= truck_travel_time_86 37)
9783            )
9784          )
9785        )
9786      )
9787      (=> (= truck_loc_85 3)
9788        (and
9789          (<= c_stocka_86 200)
9790          (= (+ truck_stock_86 c_stocka_86) (+ truck_stock_85 c_stockb_86))
9791          (= a_stocka_86 a_stockb_86)
9792          (= b_stocka_86 b_stockb_86)
9793          (or
9794            (and
9795              (= truck_loc_86 1)
9796              (= truck_travel_time_86 32)
9797            )
9798            (and
9799              (= truck_loc_86 2)
9800              (= truck_travel_time_86 37)
9801            )
9802          )
9803        )
9804      )
9805    )
9806    (<= truck_stock_86 318)
9807    (>= truck_stock_86 0)
9808    (= a_stockb_87 (- a_stocka_86 truck_travel_time_86))
9809    (= b_stockb_87 (- b_stocka_86 truck_travel_time_86))
9810    (= c_stockb_87 (- c_stocka_86 truck_travel_time_86))
9811    (and
9812      (=> (= truck_loc_86 0)
9813        (and
9814          (= a_stocka_87 a_stockb_87)
9815          (= b_stocka_87 b_stockb_87)
9816          (= c_stocka_87 c_stockb_87)
9817          (or
9818            (and
9819              (= truck_loc_87 1)
9820              (= truck_travel_time_87 29)
9821            )
9822            (and
9823              (= truck_loc_87 2)
9824              (= truck_travel_time_87 21)
9825            )
9826          )
9827        )
9828      )
9829      (=> (= truck_loc_86 1)
9830        (and
9831          (<= a_stocka_87 120)
9832          (= (+ truck_stock_87 a_stocka_87) (+ truck_stock_86 a_stockb_87))
9833          (= b_stocka_87 b_stockb_87)
9834          (= c_stocka_87 c_stockb_87)
9835          (or
9836            (and
```

```
9837            (= truck_loc_87 0)
9838            (= truck_travel_time_87 29)
9839          )
9840         (and
9841            (= truck_loc_87 2)
9842            (= truck_travel_time_87 17)
9843          )
9844         (and
9845            (= truck_loc_87 3)
9846            (= truck_travel_time_87 32)
9847          )
9848       )
9849     )
9850   )
9851   (=> (= truck_loc_86 2)
9852     (and
9853       (<= b_stocka_87 120)
9854       (= (+ truck_stock_87 b_stocka_87) (+ truck_stock_86 b_stockb_87))
9855       (= a_stocka_87 a_stockb_87)
9856       (= c_stocka_87 c_stockb_87)
9857       (or
9858         (and
9859            (= truck_loc_87 1)
9860            (= truck_travel_time_87 17)
9861          )
9862         (and
9863            (= truck_loc_87 0)
9864            (= truck_travel_time_87 21)
9865          )
9866         (and
9867            (= truck_loc_87 3)
9868            (= truck_travel_time_87 37)
9869          )
9870       )
9871     )
9872   )
9873   (=> (= truck_loc_86 3)
9874     (and
9875       (<= c_stocka_87 200)
9876       (= (+ truck_stock_87 c_stocka_87) (+ truck_stock_86 c_stockb_87))
9877       (= a_stocka_87 a_stockb_87)
9878       (= b_stocka_87 b_stockb_87)
9879       (or
9880         (and
9881            (= truck_loc_87 1)
9882            (= truck_travel_time_87 32)
9883          )
9884         (and
9885            (= truck_loc_87 2)
9886            (= truck_travel_time_87 37)
9887          )
9888       )
9889     )
9890   )
9891 )
9892 (<= truck_stock_87 318)
9893 (>= truck_stock_87 0)
9894 (= a_stockb_88 (- a_stocka_87 truck_travel_time_87))
9895 (= b_stockb_88 (- b_stocka_87 truck_travel_time_87))
9896 (= c_stockb_88 (- c_stocka_87 truck_travel_time_87))
9897 (and
9898   (=> (= truck_loc_87 0)
```

```
9899      (and
9900        (= a_stocka_88 a_stockb_88)
9901        (= b_stocka_88 b_stockb_88)
9902        (= c_stocka_88 c_stockb_88)
9903        (or
9904          (and
9905            (= truck_loc_88 1)
9906            (= truck_travel_time_88 29)
9907          )
9908          (and
9909            (= truck_loc_88 2)
9910            (= truck_travel_time_88 21)
9911          )
9912        )
9913      )
9914    )
9915    (=> (= truck_loc_87 1)
9916      (and
9917        (<= a_stocka_88 120)
9918        (= (+ truck_stock_88 a_stocka_88) (+ truck_stock_87 a_stockb_88))
9919        (= b_stocka_88 b_stockb_88)
9920        (= c_stocka_88 c_stockb_88)
9921        (or
9922          (and
9923            (= truck_loc_88 0)
9924            (= truck_travel_time_88 29)
9925          )
9926          (and
9927            (= truck_loc_88 2)
9928            (= truck_travel_time_88 17)
9929          )
9930          (and
9931            (= truck_loc_88 3)
9932            (= truck_travel_time_88 32)
9933          )
9934        )
9935      )
9936    )
9937    (=> (= truck_loc_87 2)
9938      (and
9939        (<= b_stocka_88 120)
9940        (= (+ truck_stock_88 b_stocka_88) (+ truck_stock_87 b_stockb_88))
9941        (= a_stocka_88 a_stockb_88)
9942        (= c_stocka_88 c_stockb_88)
9943        (or
9944          (and
9945            (= truck_loc_88 1)
9946            (= truck_travel_time_88 17)
9947          )
9948          (and
9949            (= truck_loc_88 0)
9950            (= truck_travel_time_88 21)
9951          )
9952          (and
9953            (= truck_loc_88 3)
9954            (= truck_travel_time_88 37)
9955          )
9956        )
9957      )
9958    )
9959    (=> (= truck_loc_87 3)
9960      (and
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```
9961        (<= c_stocka_88 200)
9962        (= (+ truck_stock_88 c_stocka_88) (+ truck_stock_87 c_stockb_88))
9963        (= a_stocka_88 a_stockb_88)
9964        (= b_stocka_88 b_stockb_88)
9965        (or
9966          (and
9967            (= truck_loc_88 1)
9968            (= truck_travel_time_88 32)
9969          )
9970          (and
9971            (= truck_loc_88 2)
9972            (= truck_travel_time_88 37)
9973          )
9974        )
9975      )
9976    )
9977  )
9978  (<= truck_stock_88 318)
9979  (>= truck_stock_88 0)
9980  (= a_stockb_89 (- a_stocka_88 truck_travel_time_88))
9981  (= b_stockb_89 (- b_stocka_88 truck_travel_time_88))
9982  (= c_stockb_89 (- c_stocka_88 truck_travel_time_88))
9983  (and
9984    (=> (= truck_loc_88 0)
9985      (and
9986        (= a_stocka_89 a_stockb_89)
9987        (= b_stocka_89 b_stockb_89)
9988        (= c_stocka_89 c_stockb_89)
9989        (or
9990          (and
9991            (= truck_loc_89 1)
9992            (= truck_travel_time_89 29)
9993          )
9994          (and
9995            (= truck_loc_89 2)
9996            (= truck_travel_time_89 21)
9997          )
9998        )
9999      )
10000    )
10001    (=> (= truck_loc_88 1)
10002      (and
10003        (<= a_stocka_89 120)
10004        (= (+ truck_stock_89 a_stocka_89) (+ truck_stock_88 a_stockb_89))
10005        (= b_stocka_89 b_stockb_89)
10006        (= c_stocka_89 c_stockb_89)
10007        (or
10008          (and
10009            (= truck_loc_89 0)
10010            (= truck_travel_time_89 29)
10011          )
10012          (and
10013            (= truck_loc_89 2)
10014            (= truck_travel_time_89 17)
10015          )
10016          (and
10017            (= truck_loc_89 3)
10018            (= truck_travel_time_89 32)
10019          )
10020        )
10021      )
10022    )
```

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```
10023    (=> (= truck_loc_88 2)
10024      (and
10025        (<= b_stocka_89 120)
10026        (= (+ truck_stock_89 b_stocka_89) (+ truck_stock_88 b_stockb_89))
10027        (= a_stocka_89 a_stockb_89)
10028        (= c_stocka_89 c_stockb_89)
10029        (or
10030          (and
10031            (= truck_loc_89 1)
10032            (= truck_travel_time_89 17)
10033          )
10034          (and
10035            (= truck_loc_89 0)
10036            (= truck_travel_time_89 21)
10037          )
10038          (and
10039            (= truck_loc_89 3)
10040            (= truck_travel_time_89 37)
10041          )
10042        )
10043      )
10044    )
10045    (=> (= truck_loc_88 3)
10046      (and
10047        (<= c_stocka_89 200)
10048        (= (+ truck_stock_89 c_stocka_89) (+ truck_stock_88 c_stockb_89))
10049        (= a_stocka_89 a_stockb_89)
10050        (= b_stocka_89 b_stockb_89)
10051        (or
10052          (and
10053            (= truck_loc_89 1)
10054            (= truck_travel_time_89 32)
10055          )
10056          (and
10057            (= truck_loc_89 2)
10058            (= truck_travel_time_89 37)
10059          )
10060        )
10061      )
10062    )
10063  )
10064  (<= truck_stock_89 318)
10065  (>= truck_stock_89 0)
10066  (= a_stockb_90 (- a_stocka_89 truck_travel_time_89))
10067  (= b_stockb_90 (- b_stocka_89 truck_travel_time_89))
10068  (= c_stockb_90 (- c_stocka_89 truck_travel_time_89))
10069  (and
10070    (=> (= truck_loc_89 0)
10071      (and
10072        (= a_stocka_90 a_stockb_90)
10073        (= b_stocka_90 b_stockb_90)
10074        (= c_stocka_90 c_stockb_90)
10075        (or
10076          (and
10077            (= truck_loc_90 1)
10078            (= truck_travel_time_90 29)
10079          )
10080          (and
10081            (= truck_loc_90 2)
10082            (= truck_travel_time_90 21)
10083          )
10084        )
```

```
10085          )
10086      )
10087      (=> (= truck_loc_89 1)
10088        (and
10089          (<= a_stocka_90 120)
10090          (= (+ truck_stock_90 a_stocka_90) (+ truck_stock_89 a_stockb_90))
10091          (= b_stocka_90 b_stockb_90)
10092          (= c_stocka_90 c_stockb_90)
10093          (or
10094            (and
10095              (= truck_loc_90 0)
10096              (= truck_travel_time_90 29)
10097            )
10098            (and
10099              (= truck_loc_90 2)
10100              (= truck_travel_time_90 17)
10101            )
10102            (and
10103              (= truck_loc_90 3)
10104              (= truck_travel_time_90 32)
10105            )
10106          )
10107        )
10108      )
10109      (=> (= truck_loc_89 2)
10110        (and
10111          (<= b_stocka_90 120)
10112          (= (+ truck_stock_90 b_stocka_90) (+ truck_stock_89 b_stockb_90))
10113          (= a_stocka_90 a_stockb_90)
10114          (= c_stocka_90 c_stockb_90)
10115          (or
10116            (and
10117              (= truck_loc_90 1)
10118              (= truck_travel_time_90 17)
10119            )
10120            (and
10121              (= truck_loc_90 0)
10122              (= truck_travel_time_90 21)
10123            )
10124            (and
10125              (= truck_loc_90 3)
10126              (= truck_travel_time_90 37)
10127            )
10128          )
10129        )
10130      )
10131      (=> (= truck_loc_89 3)
10132        (and
10133          (<= c_stocka_90 200)
10134          (= (+ truck_stock_90 c_stocka_90) (+ truck_stock_89 c_stockb_90))
10135          (= a_stocka_90 a_stockb_90)
10136          (= b_stocka_90 b_stockb_90)
10137          (or
10138            (and
10139              (= truck_loc_90 1)
10140              (= truck_travel_time_90 32)
10141            )
10142            (and
10143              (= truck_loc_90 2)
10144              (= truck_travel_time_90 37)
10145            )
10146          )
```

```
10147          )
10148       )
10149    )
10150    (<= truck_stock_90 318)
10151    (>= truck_stock_90 0)
10152    (= a_stockb_91 (- a_stocka_90 truck_travel_time_90))
10153    (= b_stockb_91 (- b_stocka_90 truck_travel_time_90))
10154    (= c_stockb_91 (- c_stocka_90 truck_travel_time_90))
10155    (and
10156      (=> (= truck_loc_90 0)
10157        (and
10158          (= a_stocka_91 a_stockb_91)
10159          (= b_stocka_91 b_stockb_91)
10160          (= c_stocka_91 c_stockb_91)
10161          (or
10162            (and
10163              (= truck_loc_91 1)
10164              (= truck_travel_time_91 29)
10165            )
10166            (and
10167              (= truck_loc_91 2)
10168              (= truck_travel_time_91 21)
10169            )
10170          )
10171        )
10172      )
10173      (=> (= truck_loc_90 1)
10174        (and
10175          (<= a_stocka_91 120)
10176          (= (+ truck_stock_91 a_stocka_91) (+ truck_stock_90 a_stockb_91))
10177          (= b_stocka_91 b_stockb_91)
10178          (= c_stocka_91 c_stockb_91)
10179          (or
10180            (and
10181              (= truck_loc_91 0)
10182              (= truck_travel_time_91 29)
10183            )
10184            (and
10185              (= truck_loc_91 2)
10186              (= truck_travel_time_91 17)
10187            )
10188            (and
10189              (= truck_loc_91 3)
10190              (= truck_travel_time_91 32)
10191            )
10192          )
10193        )
10194      )
10195      (=> (= truck_loc_90 2)
10196        (and
10197          (<= b_stocka_91 120)
10198          (= (+ truck_stock_91 b_stocka_91) (+ truck_stock_90 b_stockb_91))
10199          (= a_stocka_91 a_stockb_91)
10200          (= c_stocka_91 c_stockb_91)
10201          (or
10202            (and
10203              (= truck_loc_91 1)
10204              (= truck_travel_time_91 17)
10205            )
10206            (and
10207              (= truck_loc_91 0)
10208              (= truck_travel_time_91 21)
```

```
10209              )
10210           (and
10211             (= truck_loc_91 3)
10212             (= truck_travel_time_91 37)
10213           )
10214         )
10215       )
10216   )
10217   (=> (= truck_loc_90 3)
10218     (and
10219       (<= c_stocka_91 200)
10220       (= (+ truck_stock_91 c_stocka_91) (+ truck_stock_90 c_stockb_91))
10221       (= a_stocka_91 a_stockb_91)
10222       (= b_stocka_91 b_stockb_91)
10223       (or
10224         (and
10225           (= truck_loc_91 1)
10226           (= truck_travel_time_91 32)
10227         )
10228         (and
10229           (= truck_loc_91 2)
10230           (= truck_travel_time_91 37)
10231         )
10232       )
10233     )
10234   )
10235 )
10236 (<= truck_stock_91 318)
10237 (>= truck_stock_91 0)
10238 (= a_stockb_92 (- a_stocka_91 truck_travel_time_91))
10239 (= b_stockb_92 (- b_stocka_91 truck_travel_time_91))
10240 (= c_stockb_92 (- c_stocka_91 truck_travel_time_91))
10241 (and
10242   (=> (= truck_loc_91 0)
10243     (and
10244       (= a_stocka_92 a_stockb_92)
10245       (= b_stocka_92 b_stockb_92)
10246       (= c_stocka_92 c_stockb_92)
10247       (or
10248         (and
10249           (= truck_loc_92 1)
10250           (= truck_travel_time_92 29)
10251         )
10252         (and
10253           (= truck_loc_92 2)
10254           (= truck_travel_time_92 21)
10255         )
10256       )
10257     )
10258   )
10259   (=> (= truck_loc_91 1)
10260     (and
10261       (<= a_stocka_92 120)
10262       (= (+ truck_stock_92 a_stocka_92) (+ truck_stock_91 a_stockb_92))
10263       (= b_stocka_92 b_stockb_92)
10264       (= c_stocka_92 c_stockb_92)
10265       (or
10266         (and
10267           (= truck_loc_92 0)
10268           (= truck_travel_time_92 29)
10269         )
10270         (and
```

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```
10271            (= truck_loc_92 2)
10272            (= truck_travel_time_92 17)
10273          )
10274        (and
10275          (= truck_loc_92 3)
10276          (= truck_travel_time_92 32)
10277        )
10278      )
10279    )
10280  )
10281  (=> (= truck_loc_91 2)
10282    (and
10283      (<= b_stocka_92 120)
10284      (= (+ truck_stock_92 b_stocka_92) (+ truck_stock_91 b_stockb_92))
10285      (= a_stocka_92 a_stockb_92)
10286      (= c_stocka_92 c_stockb_92)
10287      (or
10288        (and
10289          (= truck_loc_92 1)
10290          (= truck_travel_time_92 17)
10291        )
10292        (and
10293          (= truck_loc_92 0)
10294          (= truck_travel_time_92 21)
10295        )
10296        (and
10297          (= truck_loc_92 3)
10298          (= truck_travel_time_92 37)
10299        )
10300      )
10301    )
10302  )
10303  (=> (= truck_loc_91 3)
10304    (and
10305      (<= c_stocka_92 200)
10306      (= (+ truck_stock_92 c_stocka_92) (+ truck_stock_91 c_stockb_92))
10307      (= a_stocka_92 a_stockb_92)
10308      (= b_stocka_92 b_stockb_92)
10309      (or
10310        (and
10311          (= truck_loc_92 1)
10312          (= truck_travel_time_92 32)
10313        )
10314        (and
10315          (= truck_loc_92 2)
10316          (= truck_travel_time_92 37)
10317        )
10318      )
10319    )
10320  )
10321  )
10322  (<= truck_stock_92 318)
10323  (>= truck_stock_92 0)
10324  (= a_stockb_93 (- a_stocka_92 truck_travel_time_92))
10325  (= b_stockb_93 (- b_stocka_92 truck_travel_time_92))
10326  (= c_stockb_93 (- c_stocka_92 truck_travel_time_92))
10327  (and
10328    (=> (= truck_loc_92 0)
10329      (and
10330        (= a_stocka_93 a_stockb_93)
10331        (= b_stocka_93 b_stockb_93)
10332        (= c_stocka_93 c_stockb_93)
```

```
10333          (or
10334            (and
10335              (= truck_loc_93 1)
10336              (= truck_travel_time_93 29)
10337            )
10338            (and
10339              (= truck_loc_93 2)
10340              (= truck_travel_time_93 21)
10341            )
10342          )
10343        )
10344      )
10345      (=> (= truck_loc_92 1)
10346        (and
10347          (<= a_stocka_93 120)
10348          (= (+ truck_stock_93 a_stocka_93) (+ truck_stock_92 a_stockb_93))
10349          (= b_stocka_93 b_stockb_93)
10350          (= c_stocka_93 c_stockb_93)
10351          (or
10352            (and
10353              (= truck_loc_93 0)
10354              (= truck_travel_time_93 29)
10355            )
10356            (and
10357              (= truck_loc_93 2)
10358              (= truck_travel_time_93 17)
10359            )
10360            (and
10361              (= truck_loc_93 3)
10362              (= truck_travel_time_93 32)
10363            )
10364          )
10365        )
10366      )
10367      (=> (= truck_loc_92 2)
10368        (and
10369          (<= b_stocka_93 120)
10370          (= (+ truck_stock_93 b_stocka_93) (+ truck_stock_92 b_stockb_93))
10371          (= a_stocka_93 a_stockb_93)
10372          (= c_stocka_93 c_stockb_93)
10373          (or
10374            (and
10375              (= truck_loc_93 1)
10376              (= truck_travel_time_93 17)
10377            )
10378            (and
10379              (= truck_loc_93 0)
10380              (= truck_travel_time_93 21)
10381            )
10382            (and
10383              (= truck_loc_93 3)
10384              (= truck_travel_time_93 37)
10385            )
10386          )
10387        )
10388      )
10389      (=> (= truck_loc_92 3)
10390        (and
10391          (<= c_stocka_93 200)
10392          (= (+ truck_stock_93 c_stocka_93) (+ truck_stock_92 c_stockb_93))
10393          (= a_stocka_93 a_stockb_93)
10394          (= b_stocka_93 b_stockb_93)
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```
10395         (or
10396           (and
10397             (= truck_loc_93 1)
10398             (= truck_travel_time_93 32)
10399           )
10400           (and
10401             (= truck_loc_93 2)
10402             (= truck_travel_time_93 37)
10403           )
10404         )
10405       )
10406     )
10407 )
10408 (<= truck_stock_93 318)
10409 (>= truck_stock_93 0)
10410 (= a_stockb_94 (- a_stocka_93 truck_travel_time_93))
10411 (= b_stockb_94 (- b_stocka_93 truck_travel_time_93))
10412 (= c_stockb_94 (- c_stocka_93 truck_travel_time_93))
10413 (and
10414   (=> (= truck_loc_93 0)
10415     (and
10416       (= a_stocka_94 a_stockb_94)
10417       (= b_stocka_94 b_stockb_94)
10418       (= c_stocka_94 c_stockb_94)
10419       (or
10420         (and
10421           (= truck_loc_94 1)
10422           (= truck_travel_time_94 29)
10423         )
10424         (and
10425           (= truck_loc_94 2)
10426           (= truck_travel_time_94 21)
10427         )
10428       )
10429     )
10430   )
10431   (=> (= truck_loc_93 1)
10432     (and
10433       (<= a_stocka_94 120)
10434       (= (+ truck_stock_94 a_stocka_94) (+ truck_stock_93 a_stockb_94))
10435       (= b_stocka_94 b_stockb_94)
10436       (= c_stocka_94 c_stockb_94)
10437       (or
10438         (and
10439           (= truck_loc_94 0)
10440           (= truck_travel_time_94 29)
10441         )
10442         (and
10443           (= truck_loc_94 2)
10444           (= truck_travel_time_94 17)
10445         )
10446         (and
10447           (= truck_loc_94 3)
10448           (= truck_travel_time_94 32)
10449         )
10450       )
10451     )
10452   )
10453   (=> (= truck_loc_93 2)
10454     (and
10455       (<= b_stocka_94 120)
10456       (= (+ truck_stock_94 b_stocka_94) (+ truck_stock_93 b_stockb_94))
```

```
10457        (= a_stocka_94 a_stockb_94)
10458        (= c_stocka_94 c_stockb_94)
10459        (or
10460          (and
10461            (= truck_loc_94 1)
10462            (= truck_travel_time_94 17)
10463          )
10464          (and
10465            (= truck_loc_94 0)
10466            (= truck_travel_time_94 21)
10467          )
10468          (and
10469            (= truck_loc_94 3)
10470            (= truck_travel_time_94 37)
10471          )
10472        )
10473      )
10474    )
10475    (=> (= truck_loc_93 3)
10476      (and
10477        (<= c_stocka_94 200)
10478        (= (+ truck_stock_94 c_stocka_94) (+ truck_stock_93 c_stockb_94))
10479        (= a_stocka_94 a_stockb_94)
10480        (= b_stocka_94 b_stockb_94)
10481        (or
10482          (and
10483            (= truck_loc_94 1)
10484            (= truck_travel_time_94 32)
10485          )
10486          (and
10487            (= truck_loc_94 2)
10488            (= truck_travel_time_94 37)
10489          )
10490        )
10491      )
10492    )
10493  )
10494  (<= truck_stock_94 318)
10495  (>= truck_stock_94 0)
10496  (= a_stockb_95 (- a_stocka_94 truck_travel_time_94))
10497  (= b_stockb_95 (- b_stocka_94 truck_travel_time_94))
10498  (= c_stockb_95 (- c_stocka_94 truck_travel_time_94))
10499  (and
10500    (=> (= truck_loc_94 0)
10501      (and
10502        (= a_stocka_95 a_stockb_95)
10503        (= b_stocka_95 b_stockb_95)
10504        (= c_stocka_95 c_stockb_95)
10505        (or
10506          (and
10507            (= truck_loc_95 1)
10508            (= truck_travel_time_95 29)
10509          )
10510          (and
10511            (= truck_loc_95 2)
10512            (= truck_travel_time_95 21)
10513          )
10514        )
10515      )
10516    )
10517    (=> (= truck_loc_94 1)
10518      (and
```

```
10519        (<= a_stocka_95 120)
10520        (= (+ truck_stock_95 a_stocka_95) (+ truck_stock_94 a_stockb_95))
10521        (= b_stocka_95 b_stockb_95)
10522        (= c_stocka_95 c_stockb_95)
10523        (or
10524          (and
10525            (= truck_loc_95 0)
10526            (= truck_travel_time_95 29)
10527          )
10528          (and
10529            (= truck_loc_95 2)
10530            (= truck_travel_time_95 17)
10531          )
10532          (and
10533            (= truck_loc_95 3)
10534            (= truck_travel_time_95 32)
10535          )
10536        )
10537      )
10538    )
10539    (=> (= truck_loc_94 2)
10540      (and
10541        (<= b_stocka_95 120)
10542        (= (+ truck_stock_95 b_stocka_95) (+ truck_stock_94 b_stockb_95))
10543        (= a_stocka_95 a_stockb_95)
10544        (= c_stocka_95 c_stockb_95)
10545        (or
10546          (and
10547            (= truck_loc_95 1)
10548            (= truck_travel_time_95 17)
10549          )
10550          (and
10551            (= truck_loc_95 0)
10552            (= truck_travel_time_95 21)
10553          )
10554          (and
10555            (= truck_loc_95 3)
10556            (= truck_travel_time_95 37)
10557          )
10558        )
10559      )
10560    )
10561    (=> (= truck_loc_94 3)
10562      (and
10563        (<= c_stocka_95 200)
10564        (= (+ truck_stock_95 c_stocka_95) (+ truck_stock_94 c_stockb_95))
10565        (= a_stocka_95 a_stockb_95)
10566        (= b_stocka_95 b_stockb_95)
10567        (or
10568          (and
10569            (= truck_loc_95 1)
10570            (= truck_travel_time_95 32)
10571          )
10572          (and
10573            (= truck_loc_95 2)
10574            (= truck_travel_time_95 37)
10575          )
10576        )
10577      )
10578    )
10579  )
10580  (<= truck_stock_95 318)
```

```
10581  (>= truck_stock_95 0)
10582  (= a_stockb_96 (- a_stocka_95 truck_travel_time_95))
10583  (= b_stockb_96 (- b_stocka_95 truck_travel_time_95))
10584  (= c_stockb_96 (- c_stocka_95 truck_travel_time_95))
10585  (and
10586    (=> (= truck_loc_95 0)
10587      (and
10588        (= a_stocka_96 a_stockb_96)
10589        (= b_stocka_96 b_stockb_96)
10590        (= c_stocka_96 c_stockb_96)
10591        (or
10592          (and
10593            (= truck_loc_96 1)
10594            (= truck_travel_time_96 29)
10595          )
10596          (and
10597            (= truck_loc_96 2)
10598            (= truck_travel_time_96 21)
10599          )
10600        )
10601      )
10602    )
10603    (=> (= truck_loc_95 1)
10604      (and
10605        (<= a_stocka_96 120)
10606        (= (+ truck_stock_96 a_stocka_96) (+ truck_stock_95 a_stockb_96))
10607        (= b_stocka_96 b_stockb_96)
10608        (= c_stocka_96 c_stockb_96)
10609        (or
10610          (and
10611            (= truck_loc_96 0)
10612            (= truck_travel_time_96 29)
10613          )
10614          (and
10615            (= truck_loc_96 2)
10616            (= truck_travel_time_96 17)
10617          )
10618          (and
10619            (= truck_loc_96 3)
10620            (= truck_travel_time_96 32)
10621          )
10622        )
10623      )
10624    )
10625    (=> (= truck_loc_95 2)
10626      (and
10627        (<= b_stocka_96 120)
10628        (= (+ truck_stock_96 b_stocka_96) (+ truck_stock_95 b_stockb_96))
10629        (= a_stocka_96 a_stockb_96)
10630        (= c_stocka_96 c_stockb_96)
10631        (or
10632          (and
10633            (= truck_loc_96 1)
10634            (= truck_travel_time_96 17)
10635          )
10636          (and
10637            (= truck_loc_96 0)
10638            (= truck_travel_time_96 21)
10639          )
10640          (and
10641            (= truck_loc_96 3)
10642            (= truck_travel_time_96 37)
```

```
10643            )
10644          )
10645        )
10646    )
10647    (=> (= truck_loc_95 3)
10648      (and
10649        (<= c_stocka_96 200)
10650        (= (+ truck_stock_96 c_stocka_96) (+ truck_stock_95 c_stockb_96))
10651        (= a_stocka_96 a_stockb_96)
10652        (= b_stocka_96 b_stockb_96)
10653        (or
10654          (and
10655            (= truck_loc_96 1)
10656            (= truck_travel_time_96 32)
10657          )
10658          (and
10659            (= truck_loc_96 2)
10660            (= truck_travel_time_96 37)
10661          )
10662        )
10663      )
10664    )
10665  )
10666  (<= truck_stock_96 318)
10667  (>= truck_stock_96 0)
10668  (= a_stockb_97 (- a_stocka_96 truck_travel_time_96))
10669  (= b_stockb_97 (- b_stocka_96 truck_travel_time_96))
10670  (= c_stockb_97 (- c_stocka_96 truck_travel_time_96))
10671  (and
10672    (=> (= truck_loc_96 0)
10673      (and
10674        (= a_stocka_97 a_stockb_97)
10675        (= b_stocka_97 b_stockb_97)
10676        (= c_stocka_97 c_stockb_97)
10677        (or
10678          (and
10679            (= truck_loc_97 1)
10680            (= truck_travel_time_97 29)
10681          )
10682          (and
10683            (= truck_loc_97 2)
10684            (= truck_travel_time_97 21)
10685          )
10686        )
10687      )
10688    )
10689    (=> (= truck_loc_96 1)
10690      (and
10691        (<= a_stocka_97 120)
10692        (= (+ truck_stock_97 a_stocka_97) (+ truck_stock_96 a_stockb_97))
10693        (= b_stocka_97 b_stockb_97)
10694        (= c_stocka_97 c_stockb_97)
10695        (or
10696          (and
10697            (= truck_loc_97 0)
10698            (= truck_travel_time_97 29)
10699          )
10700          (and
10701            (= truck_loc_97 2)
10702            (= truck_travel_time_97 17)
10703          )
10704          (and
```

```
10705              (= truck_loc_97 3)
10706              (= truck_travel_time_97 32)
10707           )
10708         )
10709       )
10710    )
10711    (=> (= truck_loc_96 2)
10712      (and
10713        (<= b_stocka_97 120)
10714        (= (+ truck_stock_97 b_stocka_97) (+ truck_stock_96 b_stockb_97))
10715        (= a_stocka_97 a_stockb_97)
10716        (= c_stocka_97 c_stockb_97)
10717        (or
10718          (and
10719            (= truck_loc_97 1)
10720            (= truck_travel_time_97 17)
10721          )
10722          (and
10723            (= truck_loc_97 0)
10724            (= truck_travel_time_97 21)
10725          )
10726          (and
10727            (= truck_loc_97 3)
10728            (= truck_travel_time_97 37)
10729          )
10730        )
10731      )
10732    )
10733    (=> (= truck_loc_96 3)
10734      (and
10735        (<= c_stocka_97 200)
10736        (= (+ truck_stock_97 c_stocka_97) (+ truck_stock_96 c_stockb_97))
10737        (= a_stocka_97 a_stockb_97)
10738        (= b_stocka_97 b_stockb_97)
10739        (or
10740          (and
10741            (= truck_loc_97 1)
10742            (= truck_travel_time_97 32)
10743          )
10744          (and
10745            (= truck_loc_97 2)
10746            (= truck_travel_time_97 37)
10747          )
10748        )
10749      )
10750    )
10751  )
10752  (<= truck_stock_97 318)
10753  (>= truck_stock_97 0)
10754  (= a_stockb_98 (- a_stocka_97 truck_travel_time_97))
10755  (= b_stockb_98 (- b_stocka_97 truck_travel_time_97))
10756  (= c_stockb_98 (- c_stocka_97 truck_travel_time_97))
10757  (and
10758    (=> (= truck_loc_97 0)
10759      (and
10760        (= a_stocka_98 a_stockb_98)
10761        (= b_stocka_98 b_stockb_98)
10762        (= c_stocka_98 c_stockb_98)
10763        (or
10764          (and
10765            (= truck_loc_98 1)
10766            (= truck_travel_time_98 29)
```

```
10767          )
10768        (and
10769          (= truck_loc_98 2)
10770          (= truck_travel_time_98 21)
10771        )
10772      )
10773    )
10774  )
10775  (=> (= truck_loc_97 1)
10776    (and
10777      (<= a_stocka_98 120)
10778      (= (+ truck_stock_98 a_stocka_98) (+ truck_stock_97 a_stockb_98))
10779      (= b_stocka_98 b_stockb_98)
10780      (= c_stocka_98 c_stockb_98)
10781      (or
10782        (and
10783          (= truck_loc_98 0)
10784          (= truck_travel_time_98 29)
10785        )
10786        (and
10787          (= truck_loc_98 2)
10788          (= truck_travel_time_98 17)
10789        )
10790        (and
10791          (= truck_loc_98 3)
10792          (= truck_travel_time_98 32)
10793        )
10794      )
10795    )
10796  )
10797  (=> (= truck_loc_97 2)
10798    (and
10799      (<= b_stocka_98 120)
10800      (= (+ truck_stock_98 b_stocka_98) (+ truck_stock_97 b_stockb_98))
10801      (= a_stocka_98 a_stockb_98)
10802      (= c_stocka_98 c_stockb_98)
10803      (or
10804        (and
10805          (= truck_loc_98 1)
10806          (= truck_travel_time_98 17)
10807        )
10808        (and
10809          (= truck_loc_98 0)
10810          (= truck_travel_time_98 21)
10811        )
10812        (and
10813          (= truck_loc_98 3)
10814          (= truck_travel_time_98 37)
10815        )
10816      )
10817    )
10818  )
10819  (=> (= truck_loc_97 3)
10820    (and
10821      (<= c_stocka_98 200)
10822      (= (+ truck_stock_98 c_stocka_98) (+ truck_stock_97 c_stockb_98))
10823      (= a_stocka_98 a_stockb_98)
10824      (= b_stocka_98 b_stockb_98)
10825      (or
10826        (and
10827          (= truck_loc_98 1)
10828          (= truck_travel_time_98 32)
```

```
10829            )
10830          (and
10831            (= truck_loc_98 2)
10832            (= truck_travel_time_98 37)
10833          )
10834        )
10835      )
10836    )
10837  )
10838  (<= truck_stock_98 318)
10839  (>= truck_stock_98 0)
10840  (= a_stockb_99 (- a_stocka_98 truck_travel_time_98))
10841  (= b_stockb_99 (- b_stocka_98 truck_travel_time_98))
10842  (= c_stockb_99 (- c_stocka_98 truck_travel_time_98))
10843  (and
10844    (=> (= truck_loc_98 0)
10845      (and
10846        (= a_stocka_99 a_stockb_99)
10847        (= b_stocka_99 b_stockb_99)
10848        (= c_stocka_99 c_stockb_99)
10849        (or
10850          (and
10851            (= truck_loc_99 1)
10852            (= truck_travel_time_99 29)
10853          )
10854          (and
10855            (= truck_loc_99 2)
10856            (= truck_travel_time_99 21)
10857          )
10858        )
10859      )
10860    )
10861    (=> (= truck_loc_98 1)
10862      (and
10863        (<= a_stocka_99 120)
10864        (= (+ truck_stock_99 a_stocka_99) (+ truck_stock_98 a_stockb_99))
10865        (= b_stocka_99 b_stockb_99)
10866        (= c_stocka_99 c_stockb_99)
10867        (or
10868          (and
10869            (= truck_loc_99 0)
10870            (= truck_travel_time_99 29)
10871          )
10872          (and
10873            (= truck_loc_99 2)
10874            (= truck_travel_time_99 17)
10875          )
10876          (and
10877            (= truck_loc_99 3)
10878            (= truck_travel_time_99 32)
10879          )
10880        )
10881      )
10882    )
10883    (=> (= truck_loc_98 2)
10884      (and
10885        (<= b_stocka_99 120)
10886        (= (+ truck_stock_99 b_stocka_99) (+ truck_stock_98 b_stockb_99))
10887        (= a_stocka_99 a_stockb_99)
10888        (= c_stocka_99 c_stockb_99)
10889        (or
10890          (and
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```
10891            (= truck_loc_99 1)
10892            (= truck_travel_time_99 17)
10893          )
10894        (and
10895          (= truck_loc_99 0)
10896          (= truck_travel_time_99 21)
10897        )
10898        (and
10899          (= truck_loc_99 3)
10900          (= truck_travel_time_99 37)
10901        )
10902      )
10903    )
10904  )
10905  (=> (= truck_loc_98 3)
10906    (and
10907      (<= c_stocka_99 200)
10908      (= (+ truck_stock_99 c_stocka_99) (+ truck_stock_98 c_stockb_99))
10909      (= a_stocka_99 a_stockb_99)
10910      (= b_stocka_99 b_stockb_99)
10911      (or
10912        (and
10913          (= truck_loc_99 1)
10914          (= truck_travel_time_99 32)
10915        )
10916        (and
10917          (= truck_loc_99 2)
10918          (= truck_travel_time_99 37)
10919        )
10920      )
10921    )
10922  )
10923 )
10924 (<= truck_stock_99 318)
10925 (>= truck_stock_99 0)
10926 (= a_stockb_100 (- a_stocka_99 truck_travel_time_99))
10927 (= b_stockb_100 (- b_stocka_99 truck_travel_time_99))
10928 (= c_stockb_100 (- c_stocka_99 truck_travel_time_99))
10929 (and
10930   (=> (= truck_loc_99 0)
10931     (and
10932       (= a_stocka_100 a_stockb_100)
10933       (= b_stocka_100 b_stockb_100)
10934       (= c_stocka_100 c_stockb_100)
10935       (or
10936         (and
10937           (= truck_loc_100 1)
10938           (= truck_travel_time_100 29)
10939         )
10940         (and
10941           (= truck_loc_100 2)
10942           (= truck_travel_time_100 21)
10943         )
10944       )
10945     )
10946   )
10947   (=> (= truck_loc_99 1)
10948     (and
10949       (<= a_stocka_100 120)
10950       (= (+ truck_stock_100 a_stocka_100) (+ truck_stock_99 a_stockb_100))
10951       (= b_stocka_100 b_stockb_100)
10952       (= c_stocka_100 c_stockb_100)
```

```
10953        (or
10954          (and
10955            (= truck_loc_100 0)
10956            (= truck_travel_time_100 29)
10957          )
10958          (and
10959            (= truck_loc_100 2)
10960            (= truck_travel_time_100 17)
10961          )
10962          (and
10963            (= truck_loc_100 3)
10964            (= truck_travel_time_100 32)
10965          )
10966        )
10967      )
10968    )
10969    (=> (= truck_loc_99 2)
10970      (and
10971        (<= b_stocka_100 120)
10972        (= (+ truck_stock_100 b_stocka_100) (+ truck_stock_99 b_stockb_100))
10973        (= a_stocka_100 a_stockb_100)
10974        (= c_stocka_100 c_stockb_100)
10975        (or
10976          (and
10977            (= truck_loc_100 1)
10978            (= truck_travel_time_100 17)
10979          )
10980          (and
10981            (= truck_loc_100 0)
10982            (= truck_travel_time_100 21)
10983          )
10984          (and
10985            (= truck_loc_100 3)
10986            (= truck_travel_time_100 37)
10987          )
10988        )
10989      )
10990    )
10991    (=> (= truck_loc_99 3)
10992      (and
10993        (<= c_stocka_100 200)
10994        (= (+ truck_stock_100 c_stocka_100) (+ truck_stock_99 c_stockb_100))
10995        (= a_stocka_100 a_stockb_100)
10996        (= b_stocka_100 b_stockb_100)
10997        (or
10998          (and
10999            (= truck_loc_100 1)
11000            (= truck_travel_time_100 32)
11001          )
11002          (and
11003            (= truck_loc_100 2)
11004            (= truck_travel_time_100 37)
11005          )
11006        )
11007      )
11008    )
11009 )
11010 (<= truck_stock_100 318)
11011 (>= truck_stock_100 0)
11012 (= a_stockb_101 (- a_stocka_100 truck_travel_time_100))
11013 (= b_stockb_101 (- b_stocka_100 truck_travel_time_100))
11014 (= c_stockb_101 (- c_stocka_100 truck_travel_time_100))
```

```
11015  (and
11016    (=> (= truck_loc_100 0)
11017      (and
11018        (= a_stocka_101 a_stockb_101)
11019        (= b_stocka_101 b_stockb_101)
11020        (= c_stocka_101 c_stockb_101)
11021        (or
11022          (and
11023            (= truck_loc_101 1)
11024            (= truck_travel_time_101 29)
11025          )
11026          (and
11027            (= truck_loc_101 2)
11028            (= truck_travel_time_101 21)
11029          )
11030        )
11031      )
11032    )
11033    (=> (= truck_loc_100 1)
11034      (and
11035        (<= a_stocka_101 120)
11036        (= (+ truck_stock_101 a_stocka_101) (+ truck_stock_100 a_stockb_101))
11037        (= b_stocka_101 b_stockb_101)
11038        (= c_stocka_101 c_stockb_101)
11039        (or
11040          (and
11041            (= truck_loc_101 0)
11042            (= truck_travel_time_101 29)
11043          )
11044          (and
11045            (= truck_loc_101 2)
11046            (= truck_travel_time_101 17)
11047          )
11048          (and
11049            (= truck_loc_101 3)
11050            (= truck_travel_time_101 32)
11051          )
11052        )
11053      )
11054    )
11055    (=> (= truck_loc_100 2)
11056      (and
11057        (<= b_stocka_101 120)
11058        (= (+ truck_stock_101 b_stocka_101) (+ truck_stock_100 b_stockb_101))
11059        (= a_stocka_101 a_stockb_101)
11060        (= c_stocka_101 c_stockb_101)
11061        (or
11062          (and
11063            (= truck_loc_101 1)
11064            (= truck_travel_time_101 17)
11065          )
11066          (and
11067            (= truck_loc_101 0)
11068            (= truck_travel_time_101 21)
11069          )
11070          (and
11071            (= truck_loc_101 3)
11072            (= truck_travel_time_101 37)
11073          )
11074        )
11075      )
11076    )
```

```
11077    (=> (= truck_loc_100 3)
11078      (and
11079        (<= c_stocka_101 200)
11080        (= (+ truck_stock_101 c_stocka_101) (+ truck_stock_100 c_stockb_101))
11081        (= a_stocka_101 a_stockb_101)
11082        (= b_stocka_101 b_stockb_101)
11083        (or
11084          (and
11085            (= truck_loc_101 1)
11086            (= truck_travel_time_101 32)
11087          )
11088          (and
11089            (= truck_loc_101 2)
11090            (= truck_travel_time_101 37)
11091          )
11092        )
11093      )
11094    )
11095  )
11096  (<= truck_stock_101 318)
11097  (>= truck_stock_101 0)
11098  (= a_stockb_102 (- a_stocka_101 truck_travel_time_101))
11099  (= b_stockb_102 (- b_stocka_101 truck_travel_time_101))
11100  (= c_stockb_102 (- c_stocka_101 truck_travel_time_101))
11101  (and
11102    (=> (= truck_loc_101 0)
11103      (and
11104        (= a_stocka_102 a_stockb_102)
11105        (= b_stocka_102 b_stockb_102)
11106        (= c_stocka_102 c_stockb_102)
11107        (or
11108          (and
11109            (= truck_loc_102 1)
11110            (= truck_travel_time_102 29)
11111          )
11112          (and
11113            (= truck_loc_102 2)
11114            (= truck_travel_time_102 21)
11115          )
11116        )
11117      )
11118    )
11119    (=> (= truck_loc_101 1)
11120      (and
11121        (<= a_stocka_102 120)
11122        (= (+ truck_stock_102 a_stocka_102) (+ truck_stock_101 a_stockb_102))
11123        (= b_stocka_102 b_stockb_102)
11124        (= c_stocka_102 c_stockb_102)
11125        (or
11126          (and
11127            (= truck_loc_102 0)
11128            (= truck_travel_time_102 29)
11129          )
11130          (and
11131            (= truck_loc_102 2)
11132            (= truck_travel_time_102 17)
11133          )
11134          (and
11135            (= truck_loc_102 3)
11136            (= truck_travel_time_102 32)
11137          )
11138        )
```

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11139          )
11140        )
11141      (=> (= truck_loc_101 2)
11142        (and
11143          (<= b_stocka_102 120)
11144          (= (+ truck_stock_102 b_stocka_102) (+ truck_stock_101 b_stockb_102))
11145          (= a_stocka_102 a_stockb_102)
11146          (= c_stocka_102 c_stockb_102)
11147          (or
11148            (and
11149              (= truck_loc_102 1)
11150              (= truck_travel_time_102 17)
11151            )
11152            (and
11153              (= truck_loc_102 0)
11154              (= truck_travel_time_102 21)
11155            )
11156            (and
11157              (= truck_loc_102 3)
11158              (= truck_travel_time_102 37)
11159            )
11160          )
11161        )
11162      )
11163      (=> (= truck_loc_101 3)
11164        (and
11165          (<= c_stocka_102 200)
11166          (= (+ truck_stock_102 c_stocka_102) (+ truck_stock_101 c_stockb_102))
11167          (= a_stocka_102 a_stockb_102)
11168          (= b_stocka_102 b_stockb_102)
11169          (or
11170            (and
11171              (= truck_loc_102 1)
11172              (= truck_travel_time_102 32)
11173            )
11174            (and
11175              (= truck_loc_102 2)
11176              (= truck_travel_time_102 37)
11177            )
11178          )
11179        )
11180      )
11181    )
11182    (<= truck_stock_102 318)
11183    (>= truck_stock_102 0)
11184    (= a_stockb_103 (- a_stocka_102 truck_travel_time_102))
11185    (= b_stockb_103 (- b_stocka_102 truck_travel_time_102))
11186    (= c_stockb_103 (- c_stocka_102 truck_travel_time_102))
11187    (and
11188      (=> (= truck_loc_102 0)
11189        (and
11190          (= a_stocka_103 a_stockb_103)
11191          (= b_stocka_103 b_stockb_103)
11192          (= c_stocka_103 c_stockb_103)
11193          (or
11194            (and
11195              (= truck_loc_103 1)
11196              (= truck_travel_time_103 29)
11197            )
11198            (and
11199              (= truck_loc_103 2)
11200              (= truck_travel_time_103 21)
```

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11201              )
11202            )
11203          )
11204      )
11205      (=> (= truck_loc_102 1)
11206        (and
11207          (<= a_stocka_103 120)
11208          (= (+ truck_stock_103 a_stocka_103) (+ truck_stock_102 a_stockb_103))
11209          (= b_stocka_103 b_stockb_103)
11210          (= c_stocka_103 c_stockb_103)
11211          (or
11212            (and
11213              (= truck_loc_103 0)
11214              (= truck_travel_time_103 29)
11215            )
11216            (and
11217              (= truck_loc_103 2)
11218              (= truck_travel_time_103 17)
11219            )
11220            (and
11221              (= truck_loc_103 3)
11222              (= truck_travel_time_103 32)
11223            )
11224          )
11225        )
11226      )
11227      (=> (= truck_loc_102 2)
11228        (and
11229          (<= b_stocka_103 120)
11230          (= (+ truck_stock_103 b_stocka_103) (+ truck_stock_102 b_stockb_103))
11231          (= a_stocka_103 a_stockb_103)
11232          (= c_stocka_103 c_stockb_103)
11233          (or
11234            (and
11235              (= truck_loc_103 1)
11236              (= truck_travel_time_103 17)
11237            )
11238            (and
11239              (= truck_loc_103 0)
11240              (= truck_travel_time_103 21)
11241            )
11242            (and
11243              (= truck_loc_103 3)
11244              (= truck_travel_time_103 37)
11245            )
11246          )
11247        )
11248      )
11249      (=> (= truck_loc_102 3)
11250        (and
11251          (<= c_stocka_103 200)
11252          (= (+ truck_stock_103 c_stocka_103) (+ truck_stock_102 c_stockb_103))
11253          (= a_stocka_103 a_stockb_103)
11254          (= b_stocka_103 b_stockb_103)
11255          (or
11256            (and
11257              (= truck_loc_103 1)
11258              (= truck_travel_time_103 32)
11259            )
11260            (and
11261              (= truck_loc_103 2)
11262              (= truck_travel_time_103 37)
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11263              )
11264            )
11265          )
11266        )
11267      )
11268      (<= truck_stock_103 318)
11269      (>= truck_stock_103 0)
11270      (= a_stockb_104 (- a_stocka_103 truck_travel_time_103))
11271      (= b_stockb_104 (- b_stocka_103 truck_travel_time_103))
11272      (= c_stockb_104 (- c_stocka_103 truck_travel_time_103))
11273      (and
11274        (=> (= truck_loc_103 0)
11275          (and
11276            (= a_stocka_104 a_stockb_104)
11277            (= b_stocka_104 b_stockb_104)
11278            (= c_stocka_104 c_stockb_104)
11279            (or
11280              (and
11281                (= truck_loc_104 1)
11282                (= truck_travel_time_104 29)
11283              )
11284              (and
11285                (= truck_loc_104 2)
11286                (= truck_travel_time_104 21)
11287              )
11288            )
11289          )
11290        )
11291        (=> (= truck_loc_103 1)
11292          (and
11293            (<= a_stocka_104 120)
11294            (= (+ truck_stock_104 a_stocka_104) (+ truck_stock_103 a_stockb_104))
11295            (= b_stocka_104 b_stockb_104)
11296            (= c_stocka_104 c_stockb_104)
11297            (or
11298              (and
11299                (= truck_loc_104 0)
11300                (= truck_travel_time_104 29)
11301              )
11302              (and
11303                (= truck_loc_104 2)
11304                (= truck_travel_time_104 17)
11305              )
11306              (and
11307                (= truck_loc_104 3)
11308                (= truck_travel_time_104 32)
11309              )
11310            )
11311          )
11312        )
11313        (=> (= truck_loc_103 2)
11314          (and
11315            (<= b_stocka_104 120)
11316            (= (+ truck_stock_104 b_stocka_104) (+ truck_stock_103 b_stockb_104))
11317            (= a_stocka_104 a_stockb_104)
11318            (= c_stocka_104 c_stockb_104)
11319            (or
11320              (and
11321                (= truck_loc_104 1)
11322                (= truck_travel_time_104 17)
11323              )
11324              (and
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```
11325            (= truck_loc_104 0)
11326            (= truck_travel_time_104 21)
11327          )
11328        (and
11329            (= truck_loc_104 3)
11330            (= truck_travel_time_104 37)
11331        )
11332      )
11333    )
11334  )
11335  (=> (= truck_loc_103 3)
11336    (and
11337      (<= c_stocka_104 200)
11338      (= (+ truck_stock_104 c_stocka_104) (+ truck_stock_103 c_stockb_104))
11339      (= a_stocka_104 a_stockb_104)
11340      (= b_stocka_104 b_stockb_104)
11341      (or
11342        (and
11343            (= truck_loc_104 1)
11344            (= truck_travel_time_104 32)
11345        )
11346        (and
11347            (= truck_loc_104 2)
11348            (= truck_travel_time_104 37)
11349        )
11350      )
11351    )
11352  )
11353 )
11354 (<= truck_stock_104 318)
11355 (>= truck_stock_104 0)
11356 (= a_stockb_105 (- a_stocka_104 truck_travel_time_104))
11357 (= b_stockb_105 (- b_stocka_104 truck_travel_time_104))
11358 (= c_stockb_105 (- c_stocka_104 truck_travel_time_104))
11359 (and
11360   (=> (= truck_loc_104 0)
11361     (and
11362       (= a_stocka_105 a_stockb_105)
11363       (= b_stocka_105 b_stockb_105)
11364       (= c_stocka_105 c_stockb_105)
11365       (or
11366         (and
11367            (= truck_loc_105 1)
11368            (= truck_travel_time_105 29)
11369         )
11370         (and
11371            (= truck_loc_105 2)
11372            (= truck_travel_time_105 21)
11373         )
11374       )
11375     )
11376   )
11377   (=> (= truck_loc_104 1)
11378     (and
11379       (<= a_stocka_105 120)
11380       (= (+ truck_stock_105 a_stocka_105) (+ truck_stock_104 a_stockb_105))
11381       (= b_stocka_105 b_stockb_105)
11382       (= c_stocka_105 c_stockb_105)
11383       (or
11384         (and
11385            (= truck_loc_105 0)
11386            (= truck_travel_time_105 29)
```

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11387             )
11388           (and
11389             (= truck_loc_105 2)
11390             (= truck_travel_time_105 17)
11391           )
11392           (and
11393             (= truck_loc_105 3)
11394             (= truck_travel_time_105 32)
11395           )
11396         )
11397       )
11398     )
11399     (=> (= truck_loc_104 2)
11400       (and
11401         (<= b_stocka_105 120)
11402         (= (+ truck_stock_105 b_stocka_105) (+ truck_stock_104 b_stockb_105))
11403         (= a_stocka_105 a_stockb_105)
11404         (= c_stocka_105 c_stockb_105)
11405         (or
11406           (and
11407             (= truck_loc_105 1)
11408             (= truck_travel_time_105 17)
11409           )
11410           (and
11411             (= truck_loc_105 0)
11412             (= truck_travel_time_105 21)
11413           )
11414           (and
11415             (= truck_loc_105 3)
11416             (= truck_travel_time_105 37)
11417           )
11418         )
11419       )
11420     )
11421     (=> (= truck_loc_104 3)
11422       (and
11423         (<= c_stocka_105 200)
11424         (= (+ truck_stock_105 c_stocka_105) (+ truck_stock_104 c_stockb_105))
11425         (= a_stocka_105 a_stockb_105)
11426         (= b_stocka_105 b_stockb_105)
11427         (or
11428           (and
11429             (= truck_loc_105 1)
11430             (= truck_travel_time_105 32)
11431           )
11432           (and
11433             (= truck_loc_105 2)
11434             (= truck_travel_time_105 37)
11435           )
11436         )
11437       )
11438     )
11439   )
11440   (<= truck_stock_105 318)
11441   (>= truck_stock_105 0)
11442   (= a_stockb_106 (- a_stocka_105 truck_travel_time_105))
11443   (= b_stockb_106 (- b_stocka_105 truck_travel_time_105))
11444   (= c_stockb_106 (- c_stocka_105 truck_travel_time_105))
11445   (and
11446     (=> (= truck_loc_105 0)
11447       (and
11448         (= a_stocka_106 a_stockb_106)
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```
11449        (= b_stocka_106 b_stockb_106)
11450        (= c_stocka_106 c_stockb_106)
11451        (or
11452          (and
11453            (= truck_loc_106 1)
11454            (= truck_travel_time_106 29)
11455          )
11456          (and
11457            (= truck_loc_106 2)
11458            (= truck_travel_time_106 21)
11459          )
11460        )
11461      )
11462    )
11463    (=> (= truck_loc_105 1)
11464      (and
11465        (<= a_stocka_106 120)
11466        (= (+ truck_stock_106 a_stocka_106) (+ truck_stock_105 a_stockb_106))
11467        (= b_stocka_106 b_stockb_106)
11468        (= c_stocka_106 c_stockb_106)
11469        (or
11470          (and
11471            (= truck_loc_106 0)
11472            (= truck_travel_time_106 29)
11473          )
11474          (and
11475            (= truck_loc_106 2)
11476            (= truck_travel_time_106 17)
11477          )
11478          (and
11479            (= truck_loc_106 3)
11480            (= truck_travel_time_106 32)
11481          )
11482        )
11483      )
11484    )
11485    (=> (= truck_loc_105 2)
11486      (and
11487        (<= b_stocka_106 120)
11488        (= (+ truck_stock_106 b_stocka_106) (+ truck_stock_105 b_stockb_106))
11489        (= a_stocka_106 a_stockb_106)
11490        (= c_stocka_106 c_stockb_106)
11491        (or
11492          (and
11493            (= truck_loc_106 1)
11494            (= truck_travel_time_106 17)
11495          )
11496          (and
11497            (= truck_loc_106 0)
11498            (= truck_travel_time_106 21)
11499          )
11500          (and
11501            (= truck_loc_106 3)
11502            (= truck_travel_time_106 37)
11503          )
11504        )
11505      )
11506    )
11507    (=> (= truck_loc_105 3)
11508      (and
11509        (<= c_stocka_106 200)
11510        (= (+ truck_stock_106 c_stocka_106) (+ truck_stock_105 c_stockb_106))
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11511          (= a_stocka_106 a_stockb_106)
11512          (= b_stocka_106 b_stockb_106)
11513          (or
11514            (and
11515              (= truck_loc_106 1)
11516              (= truck_travel_time_106 32)
11517            )
11518            (and
11519              (= truck_loc_106 2)
11520              (= truck_travel_time_106 37)
11521            )
11522          )
11523        )
11524      )
11525  )
11526  (<= truck_stock_106 318)
11527  (>= truck_stock_106 0)
11528  (= a_stockb_107 (- a_stocka_106 truck_travel_time_106))
11529  (= b_stockb_107 (- b_stocka_106 truck_travel_time_106))
11530  (= c_stockb_107 (- c_stocka_106 truck_travel_time_106))
11531  (and
11532    (=> (= truck_loc_106 0)
11533      (and
11534        (= a_stocka_107 a_stockb_107)
11535        (= b_stocka_107 b_stockb_107)
11536        (= c_stocka_107 c_stockb_107)
11537        (or
11538          (and
11539            (= truck_loc_107 1)
11540            (= truck_travel_time_107 29)
11541          )
11542          (and
11543            (= truck_loc_107 2)
11544            (= truck_travel_time_107 21)
11545          )
11546        )
11547      )
11548    )
11549    (=> (= truck_loc_106 1)
11550      (and
11551        (<= a_stocka_107 120)
11552        (= (+ truck_stock_107 a_stocka_107) (+ truck_stock_106 a_stockb_107))
11553        (= b_stocka_107 b_stockb_107)
11554        (= c_stocka_107 c_stockb_107)
11555        (or
11556          (and
11557            (= truck_loc_107 0)
11558            (= truck_travel_time_107 29)
11559          )
11560          (and
11561            (= truck_loc_107 2)
11562            (= truck_travel_time_107 17)
11563          )
11564          (and
11565            (= truck_loc_107 3)
11566            (= truck_travel_time_107 32)
11567          )
11568        )
11569      )
11570    )
11571    (=> (= truck_loc_106 2)
11572      (and
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```
11573            (<= b_stocka_107 120)
11574            (= (+ truck_stock_107 b_stocka_107) (+ truck_stock_106 b_stockb_107))
11575            (= a_stocka_107 a_stockb_107)
11576            (= c_stocka_107 c_stockb_107)
11577            (or
11578              (and
11579                (= truck_loc_107 1)
11580                (= truck_travel_time_107 17)
11581              )
11582              (and
11583                (= truck_loc_107 0)
11584                (= truck_travel_time_107 21)
11585              )
11586              (and
11587                (= truck_loc_107 3)
11588                (= truck_travel_time_107 37)
11589              )
11590            )
11591          )
11592        )
11593        (=> (= truck_loc_106 3)
11594          (and
11595            (<= c_stocka_107 200)
11596            (= (+ truck_stock_107 c_stocka_107) (+ truck_stock_106 c_stockb_107))
11597            (= a_stocka_107 a_stockb_107)
11598            (= b_stocka_107 b_stockb_107)
11599            (or
11600              (and
11601                (= truck_loc_107 1)
11602                (= truck_travel_time_107 32)
11603              )
11604              (and
11605                (= truck_loc_107 2)
11606                (= truck_travel_time_107 37)
11607              )
11608            )
11609          )
11610        )
11611      )
11612      (<= truck_stock_107 318)
11613      (>= truck_stock_107 0)
11614      (= a_stockb_108 (- a_stocka_107 truck_travel_time_107))
11615      (= b_stockb_108 (- b_stocka_107 truck_travel_time_107))
11616      (= c_stockb_108 (- c_stocka_107 truck_travel_time_107))
11617      (and
11618        (=> (= truck_loc_107 0)
11619          (and
11620            (= a_stocka_108 a_stockb_108)
11621            (= b_stocka_108 b_stockb_108)
11622            (= c_stocka_108 c_stockb_108)
11623            (or
11624              (and
11625                (= truck_loc_108 1)
11626                (= truck_travel_time_108 29)
11627              )
11628              (and
11629                (= truck_loc_108 2)
11630                (= truck_travel_time_108 21)
11631              )
11632            )
11633          )
11634        )
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```
11635    (=> (= truck_loc_107 1)
11636      (and
11637        (<= a_stocka_108 120)
11638        (= (+ truck_stock_108 a_stocka_108) (+ truck_stock_107 a_stockb_108))
11639        (= b_stocka_108 b_stockb_108)
11640        (= c_stocka_108 c_stockb_108)
11641        (or
11642          (and
11643            (= truck_loc_108 0)
11644            (= truck_travel_time_108 29)
11645          )
11646          (and
11647            (= truck_loc_108 2)
11648            (= truck_travel_time_108 17)
11649          )
11650          (and
11651            (= truck_loc_108 3)
11652            (= truck_travel_time_108 32)
11653          )
11654        )
11655      )
11656    )
11657    (=> (= truck_loc_107 2)
11658      (and
11659        (<= b_stocka_108 120)
11660        (= (+ truck_stock_108 b_stocka_108) (+ truck_stock_107 b_stockb_108))
11661        (= a_stocka_108 a_stockb_108)
11662        (= c_stocka_108 c_stockb_108)
11663        (or
11664          (and
11665            (= truck_loc_108 1)
11666            (= truck_travel_time_108 17)
11667          )
11668          (and
11669            (= truck_loc_108 0)
11670            (= truck_travel_time_108 21)
11671          )
11672          (and
11673            (= truck_loc_108 3)
11674            (= truck_travel_time_108 37)
11675          )
11676        )
11677      )
11678    )
11679    (=> (= truck_loc_107 3)
11680      (and
11681        (<= c_stocka_108 200)
11682        (= (+ truck_stock_108 c_stocka_108) (+ truck_stock_107 c_stockb_108))
11683        (= a_stocka_108 a_stockb_108)
11684        (= b_stocka_108 b_stockb_108)
11685        (or
11686          (and
11687            (= truck_loc_108 1)
11688            (= truck_travel_time_108 32)
11689          )
11690          (and
11691            (= truck_loc_108 2)
11692            (= truck_travel_time_108 37)
11693          )
11694        )
11695      )
11696    )
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11697  )
11698  (<= truck_stock_108 318)
11699  (>= truck_stock_108 0)
11700  (= a_stockb_109 (- a_stocka_108 truck_travel_time_108))
11701  (= b_stockb_109 (- b_stocka_108 truck_travel_time_108))
11702  (= c_stockb_109 (- c_stocka_108 truck_travel_time_108))
11703  (and
11704    (=> (= truck_loc_108 0)
11705      (and
11706        (= a_stocka_109 a_stockb_109)
11707        (= b_stocka_109 b_stockb_109)
11708        (= c_stocka_109 c_stockb_109)
11709        (or
11710          (and
11711            (= truck_loc_109 1)
11712            (= truck_travel_time_109 29)
11713          )
11714          (and
11715            (= truck_loc_109 2)
11716            (= truck_travel_time_109 21)
11717          )
11718        )
11719      )
11720    )
11721    (=> (= truck_loc_108 1)
11722      (and
11723        (<= a_stocka_109 120)
11724        (= (+ truck_stock_109 a_stocka_109) (+ truck_stock_108 a_stockb_109))
11725        (= b_stocka_109 b_stockb_109)
11726        (= c_stocka_109 c_stockb_109)
11727        (or
11728          (and
11729            (= truck_loc_109 0)
11730            (= truck_travel_time_109 29)
11731          )
11732          (and
11733            (= truck_loc_109 2)
11734            (= truck_travel_time_109 17)
11735          )
11736          (and
11737            (= truck_loc_109 3)
11738            (= truck_travel_time_109 32)
11739          )
11740        )
11741      )
11742    )
11743    (=> (= truck_loc_108 2)
11744      (and
11745        (<= b_stocka_109 120)
11746        (= (+ truck_stock_109 b_stocka_109) (+ truck_stock_108 b_stockb_109))
11747        (= a_stocka_109 a_stockb_109)
11748        (= c_stocka_109 c_stockb_109)
11749        (or
11750          (and
11751            (= truck_loc_109 1)
11752            (= truck_travel_time_109 17)
11753          )
11754          (and
11755            (= truck_loc_109 0)
11756            (= truck_travel_time_109 21)
11757          )
11758          (and
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```
11759              (= truck_loc_109 3)
11760              (= truck_travel_time_109 37)
11761            )
11762          )
11763        )
11764    )
11765    (=> (= truck_loc_108 3)
11766      (and
11767        (<= c_stocka_109 200)
11768        (= (+ truck_stock_109 c_stocka_109) (+ truck_stock_108 c_stockb_109))
11769        (= a_stocka_109 a_stockb_109)
11770        (= b_stocka_109 b_stockb_109)
11771        (or
11772          (and
11773            (= truck_loc_109 1)
11774            (= truck_travel_time_109 32)
11775          )
11776          (and
11777            (= truck_loc_109 2)
11778            (= truck_travel_time_109 37)
11779          )
11780        )
11781      )
11782    )
11783  )
11784  (<= truck_stock_109 318)
11785  (>= truck_stock_109 0)
11786  (= a_stockb_110 (- a_stocka_109 truck_travel_time_109))
11787  (= b_stockb_110 (- b_stocka_109 truck_travel_time_109))
11788  (= c_stockb_110 (- c_stocka_109 truck_travel_time_109))
11789  (and
11790    (=> (= truck_loc_109 0)
11791      (and
11792        (= a_stocka_110 a_stockb_110)
11793        (= b_stocka_110 b_stockb_110)
11794        (= c_stocka_110 c_stockb_110)
11795        (or
11796          (and
11797            (= truck_loc_110 1)
11798            (= truck_travel_time_110 29)
11799          )
11800          (and
11801            (= truck_loc_110 2)
11802            (= truck_travel_time_110 21)
11803          )
11804        )
11805      )
11806    )
11807    (=> (= truck_loc_109 1)
11808      (and
11809        (<= a_stocka_110 120)
11810        (= (+ truck_stock_110 a_stocka_110) (+ truck_stock_109 a_stockb_110))
11811        (= b_stocka_110 b_stockb_110)
11812        (= c_stocka_110 c_stockb_110)
11813        (or
11814          (and
11815            (= truck_loc_110 0)
11816            (= truck_travel_time_110 29)
11817          )
11818          (and
11819            (= truck_loc_110 2)
11820            (= truck_travel_time_110 17)
```

```
11821              )
11822            (and
11823              (= truck_loc_110 3)
11824              (= truck_travel_time_110 32)
11825            )
11826          )
11827        )
11828      )
11829    (=> (= truck_loc_109 2)
11830      (and
11831        (<= b_stocka_110 120)
11832        (= (+ truck_stock_110 b_stocka_110) (+ truck_stock_109 b_stockb_110))
11833        (= a_stocka_110 a_stockb_110)
11834        (= c_stocka_110 c_stockb_110)
11835        (or
11836          (and
11837            (= truck_loc_110 1)
11838            (= truck_travel_time_110 17)
11839          )
11840          (and
11841            (= truck_loc_110 0)
11842            (= truck_travel_time_110 21)
11843          )
11844          (and
11845            (= truck_loc_110 3)
11846            (= truck_travel_time_110 37)
11847          )
11848        )
11849      )
11850    )
11851    (=> (= truck_loc_109 3)
11852      (and
11853        (<= c_stocka_110 200)
11854        (= (+ truck_stock_110 c_stocka_110) (+ truck_stock_109 c_stockb_110))
11855        (= a_stocka_110 a_stockb_110)
11856        (= b_stocka_110 b_stockb_110)
11857        (or
11858          (and
11859            (= truck_loc_110 1)
11860            (= truck_travel_time_110 32)
11861          )
11862          (and
11863            (= truck_loc_110 2)
11864            (= truck_travel_time_110 37)
11865          )
11866        )
11867      )
11868    )
11869  )
11870  (<= truck_stock_110 318)
11871  (>= truck_stock_110 0)
11872  (= a_stockb_111 (- a_stocka_110 truck_travel_time_110))
11873  (= b_stockb_111 (- b_stocka_110 truck_travel_time_110))
11874  (= c_stockb_111 (- c_stocka_110 truck_travel_time_110))
11875  (and
11876    (=> (= truck_loc_110 0)
11877      (and
11878        (= a_stocka_111 a_stockb_111)
11879        (= b_stocka_111 b_stockb_111)
11880        (= c_stocka_111 c_stockb_111)
11881        (or
11882          (and
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```
11883              (= truck_loc_111 1)
11884              (= truck_travel_time_111 29)
11885            )
11886          (and
11887              (= truck_loc_111 2)
11888              (= truck_travel_time_111 21)
11889          )
11890        )
11891      )
11892    )
11893    (=> (= truck_loc_110 1)
11894      (and
11895        (<= a_stocka_111 120)
11896        (= (+ truck_stock_111 a_stocka_111) (+ truck_stock_110 a_stockb_111))
11897        (= b_stocka_111 b_stockb_111)
11898        (= c_stocka_111 c_stockb_111)
11899        (or
11900          (and
11901              (= truck_loc_111 0)
11902              (= truck_travel_time_111 29)
11903          )
11904          (and
11905              (= truck_loc_111 2)
11906              (= truck_travel_time_111 17)
11907          )
11908          (and
11909              (= truck_loc_111 3)
11910              (= truck_travel_time_111 32)
11911          )
11912        )
11913      )
11914    )
11915    (=> (= truck_loc_110 2)
11916      (and
11917        (<= b_stocka_111 120)
11918        (= (+ truck_stock_111 b_stocka_111) (+ truck_stock_110 b_stockb_111))
11919        (= a_stocka_111 a_stockb_111)
11920        (= c_stocka_111 c_stockb_111)
11921        (or
11922          (and
11923              (= truck_loc_111 1)
11924              (= truck_travel_time_111 17)
11925          )
11926          (and
11927              (= truck_loc_111 0)
11928              (= truck_travel_time_111 21)
11929          )
11930          (and
11931              (= truck_loc_111 3)
11932              (= truck_travel_time_111 37)
11933          )
11934        )
11935      )
11936    )
11937    (=> (= truck_loc_110 3)
11938      (and
11939        (<= c_stocka_111 200)
11940        (= (+ truck_stock_111 c_stocka_111) (+ truck_stock_110 c_stockb_111))
11941        (= a_stocka_111 a_stockb_111)
11942        (= b_stocka_111 b_stockb_111)
11943        (or
11944          (and
```

```
11945              (= truck_loc_111 1)
11946              (= truck_travel_time_111 32)
11947            )
11948          (and
11949            (= truck_loc_111 2)
11950            (= truck_travel_time_111 37)
11951          )
11952        )
11953      )
11954    )
11955  )
11956  (<= truck_stock_111 318)
11957  (>= truck_stock_111 0)
11958  (= a_stockb_112 (- a_stocka_111 truck_travel_time_111))
11959  (= b_stockb_112 (- b_stocka_111 truck_travel_time_111))
11960  (= c_stockb_112 (- c_stocka_111 truck_travel_time_111))
11961  (and
11962    (=> (= truck_loc_111 0)
11963      (and
11964        (= a_stocka_112 a_stockb_112)
11965        (= b_stocka_112 b_stockb_112)
11966        (= c_stocka_112 c_stockb_112)
11967        (or
11968          (and
11969            (= truck_loc_112 1)
11970            (= truck_travel_time_112 29)
11971          )
11972          (and
11973            (= truck_loc_112 2)
11974            (= truck_travel_time_112 21)
11975          )
11976        )
11977      )
11978    )
11979    (=> (= truck_loc_111 1)
11980      (and
11981        (<= a_stocka_112 120)
11982        (= (+ truck_stock_112 a_stocka_112) (+ truck_stock_111 a_stockb_112))
11983        (= b_stocka_112 b_stockb_112)
11984        (= c_stocka_112 c_stockb_112)
11985        (or
11986          (and
11987            (= truck_loc_112 0)
11988            (= truck_travel_time_112 29)
11989          )
11990          (and
11991            (= truck_loc_112 2)
11992            (= truck_travel_time_112 17)
11993          )
11994          (and
11995            (= truck_loc_112 3)
11996            (= truck_travel_time_112 32)
11997          )
11998        )
11999      )
12000    )
12001    (=> (= truck_loc_111 2)
12002      (and
12003        (<= b_stocka_112 120)
12004        (= (+ truck_stock_112 b_stocka_112) (+ truck_stock_111 b_stockb_112))
12005        (= a_stocka_112 a_stockb_112)
12006        (= c_stocka_112 c_stockb_112)
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```
12007        (or
12008          (and
12009            (= truck_loc_112 1)
12010            (= truck_travel_time_112 17)
12011          )
12012          (and
12013            (= truck_loc_112 0)
12014            (= truck_travel_time_112 21)
12015          )
12016          (and
12017            (= truck_loc_112 3)
12018            (= truck_travel_time_112 37)
12019          )
12020        )
12021      )
12022    )
12023    (=> (= truck_loc_111 3)
12024      (and
12025        (<= c_stocka_112 200)
12026        (= (+ truck_stock_112 c_stocka_112) (+ truck_stock_111 c_stockb_112))
12027        (= a_stocka_112 a_stockb_112)
12028        (= b_stocka_112 b_stockb_112)
12029        (or
12030          (and
12031            (= truck_loc_112 1)
12032            (= truck_travel_time_112 32)
12033          )
12034          (and
12035            (= truck_loc_112 2)
12036            (= truck_travel_time_112 37)
12037          )
12038        )
12039      )
12040    )
12041  )
12042  (<= truck_stock_112 318)
12043  (>= truck_stock_112 0)
12044  (= a_stockb_113 (- a_stocka_112 truck_travel_time_112))
12045  (= b_stockb_113 (- b_stocka_112 truck_travel_time_112))
12046  (= c_stockb_113 (- c_stocka_112 truck_travel_time_112))
12047  (and
12048    (=> (= truck_loc_112 0)
12049      (and
12050        (= a_stocka_113 a_stockb_113)
12051        (= b_stocka_113 b_stockb_113)
12052        (= c_stocka_113 c_stockb_113)
12053        (or
12054          (and
12055            (= truck_loc_113 1)
12056            (= truck_travel_time_113 29)
12057          )
12058          (and
12059            (= truck_loc_113 2)
12060            (= truck_travel_time_113 21)
12061          )
12062        )
12063      )
12064    )
12065    (=> (= truck_loc_112 1)
12066      (and
12067        (<= a_stocka_113 120)
12068        (= (+ truck_stock_113 a_stocka_113) (+ truck_stock_112 a_stockb_113))
```

```
12069        (= b_stocka_113 b_stockb_113)
12070        (= c_stocka_113 c_stockb_113)
12071        (or
12072          (and
12073            (= truck_loc_113 0)
12074            (= truck_travel_time_113 29)
12075          )
12076          (and
12077            (= truck_loc_113 2)
12078            (= truck_travel_time_113 17)
12079          )
12080          (and
12081            (= truck_loc_113 3)
12082            (= truck_travel_time_113 32)
12083          )
12084        )
12085      )
12086    )
12087    (=> (= truck_loc_112 2)
12088      (and
12089        (<= b_stocka_113 120)
12090        (= (+ truck_stock_113 b_stocka_113) (+ truck_stock_112 b_stockb_113))
12091        (= a_stocka_113 a_stockb_113)
12092        (= c_stocka_113 c_stockb_113)
12093        (or
12094          (and
12095            (= truck_loc_113 1)
12096            (= truck_travel_time_113 17)
12097          )
12098          (and
12099            (= truck_loc_113 0)
12100            (= truck_travel_time_113 21)
12101          )
12102          (and
12103            (= truck_loc_113 3)
12104            (= truck_travel_time_113 37)
12105          )
12106        )
12107      )
12108    )
12109    (=> (= truck_loc_112 3)
12110      (and
12111        (<= c_stocka_113 200)
12112        (= (+ truck_stock_113 c_stocka_113) (+ truck_stock_112 c_stockb_113))
12113        (= a_stocka_113 a_stockb_113)
12114        (= b_stocka_113 b_stockb_113)
12115        (or
12116          (and
12117            (= truck_loc_113 1)
12118            (= truck_travel_time_113 32)
12119          )
12120          (and
12121            (= truck_loc_113 2)
12122            (= truck_travel_time_113 37)
12123          )
12124        )
12125      )
12126    )
12127  )
12128  (<= truck_stock_113 318)
12129  (>= truck_stock_113 0)
12130  (= a_stockb_114 (- a_stocka_113 truck_travel_time_113))
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```
12131   (= b_stockb_114 (- b_stocka_113 truck_travel_time_113))
12132   (= c_stockb_114 (- c_stocka_113 truck_travel_time_113))
12133   (and
12134     (=> (= truck_loc_113 0)
12135       (and
12136         (= a_stocka_114 a_stockb_114)
12137         (= b_stocka_114 b_stockb_114)
12138         (= c_stocka_114 c_stockb_114)
12139         (or
12140           (and
12141             (= truck_loc_114 1)
12142             (= truck_travel_time_114 29)
12143           )
12144           (and
12145             (= truck_loc_114 2)
12146             (= truck_travel_time_114 21)
12147           )
12148         )
12149       )
12150     )
12151     (=> (= truck_loc_113 1)
12152       (and
12153         (<= a_stocka_114 120)
12154         (= (+ truck_stock_114 a_stocka_114) (+ truck_stock_113 a_stockb_114))
12155         (= b_stocka_114 b_stockb_114)
12156         (= c_stocka_114 c_stockb_114)
12157         (or
12158           (and
12159             (= truck_loc_114 0)
12160             (= truck_travel_time_114 29)
12161           )
12162           (and
12163             (= truck_loc_114 2)
12164             (= truck_travel_time_114 17)
12165           )
12166           (and
12167             (= truck_loc_114 3)
12168             (= truck_travel_time_114 32)
12169           )
12170         )
12171       )
12172     )
12173     (=> (= truck_loc_113 2)
12174       (and
12175         (<= b_stocka_114 120)
12176         (= (+ truck_stock_114 b_stocka_114) (+ truck_stock_113 b_stockb_114))
12177         (= a_stocka_114 a_stockb_114)
12178         (= c_stocka_114 c_stockb_114)
12179         (or
12180           (and
12181             (= truck_loc_114 1)
12182             (= truck_travel_time_114 17)
12183           )
12184           (and
12185             (= truck_loc_114 0)
12186             (= truck_travel_time_114 21)
12187           )
12188           (and
12189             (= truck_loc_114 3)
12190             (= truck_travel_time_114 37)
12191           )
12192         )
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12193        )
12194      )
12195      (=> (= truck_loc_113 3)
12196        (and
12197          (<= c_stocka_114 200)
12198          (= (+ truck_stock_114 c_stocka_114) (+ truck_stock_113 c_stockb_114))
12199          (= a_stocka_114 a_stockb_114)
12200          (= b_stocka_114 b_stockb_114)
12201          (or
12202            (and
12203              (= truck_loc_114 1)
12204              (= truck_travel_time_114 32)
12205            )
12206            (and
12207              (= truck_loc_114 2)
12208              (= truck_travel_time_114 37)
12209            )
12210          )
12211        )
12212      )
12213    )
12214    (<= truck_stock_114 318)
12215    (>= truck_stock_114 0)
12216    (= a_stockb_115 (- a_stocka_114 truck_travel_time_114))
12217    (= b_stockb_115 (- b_stocka_114 truck_travel_time_114))
12218    (= c_stockb_115 (- c_stocka_114 truck_travel_time_114))
12219    (and
12220      (=> (= truck_loc_114 0)
12221        (and
12222          (= a_stocka_115 a_stockb_115)
12223          (= b_stocka_115 b_stockb_115)
12224          (= c_stocka_115 c_stockb_115)
12225          (or
12226            (and
12227              (= truck_loc_115 1)
12228              (= truck_travel_time_115 29)
12229            )
12230            (and
12231              (= truck_loc_115 2)
12232              (= truck_travel_time_115 21)
12233            )
12234          )
12235        )
12236      )
12237      (=> (= truck_loc_114 1)
12238        (and
12239          (<= a_stocka_115 120)
12240          (= (+ truck_stock_115 a_stocka_115) (+ truck_stock_114 a_stockb_115))
12241          (= b_stocka_115 b_stockb_115)
12242          (= c_stocka_115 c_stockb_115)
12243          (or
12244            (and
12245              (= truck_loc_115 0)
12246              (= truck_travel_time_115 29)
12247            )
12248            (and
12249              (= truck_loc_115 2)
12250              (= truck_travel_time_115 17)
12251            )
12252            (and
12253              (= truck_loc_115 3)
12254              (= truck_travel_time_115 32)
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12255          )
12256        )
12257      )
12258    )
12259    (=> (= truck_loc_114 2)
12260      (and
12261        (<= b_stocka_115 120)
12262        (= (+ truck_stock_115 b_stocka_115) (+ truck_stock_114 b_stockb_115))
12263        (= a_stocka_115 a_stockb_115)
12264        (= c_stocka_115 c_stockb_115)
12265        (or
12266          (and
12267            (= truck_loc_115 1)
12268            (= truck_travel_time_115 17)
12269          )
12270          (and
12271            (= truck_loc_115 0)
12272            (= truck_travel_time_115 21)
12273          )
12274          (and
12275            (= truck_loc_115 3)
12276            (= truck_travel_time_115 37)
12277          )
12278        )
12279      )
12280    )
12281    (=> (= truck_loc_114 3)
12282      (and
12283        (<= c_stocka_115 200)
12284        (= (+ truck_stock_115 c_stocka_115) (+ truck_stock_114 c_stockb_115))
12285        (= a_stocka_115 a_stockb_115)
12286        (= b_stocka_115 b_stockb_115)
12287        (or
12288          (and
12289            (= truck_loc_115 1)
12290            (= truck_travel_time_115 32)
12291          )
12292          (and
12293            (= truck_loc_115 2)
12294            (= truck_travel_time_115 37)
12295          )
12296        )
12297      )
12298    )
12299  )
12300  (<= truck_stock_115 318)
12301  (>= truck_stock_115 0)
12302  (= a_stockb_116 (- a_stocka_115 truck_travel_time_115))
12303  (= b_stockb_116 (- b_stocka_115 truck_travel_time_115))
12304  (= c_stockb_116 (- c_stocka_115 truck_travel_time_115))
12305  (and
12306    (=> (= truck_loc_115 0)
12307      (and
12308        (= a_stocka_116 a_stockb_116)
12309        (= b_stocka_116 b_stockb_116)
12310        (= c_stocka_116 c_stockb_116)
12311        (or
12312          (and
12313            (= truck_loc_116 1)
12314            (= truck_travel_time_116 29)
12315          )
12316          (and
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```
12317              (= truck_loc_116 2)
12318              (= truck_travel_time_116 21)
12319            )
12320          )
12321        )
12322      )
12323      (=> (= truck_loc_115 1)
12324        (and
12325          (<= a_stocka_116 120)
12326          (= (+ truck_stock_116 a_stocka_116) (+ truck_stock_115 a_stockb_116))
12327          (= b_stocka_116 b_stockb_116)
12328          (= c_stocka_116 c_stockb_116)
12329          (or
12330            (and
12331              (= truck_loc_116 0)
12332              (= truck_travel_time_116 29)
12333            )
12334            (and
12335              (= truck_loc_116 2)
12336              (= truck_travel_time_116 17)
12337            )
12338            (and
12339              (= truck_loc_116 3)
12340              (= truck_travel_time_116 32)
12341            )
12342          )
12343        )
12344      )
12345      (=> (= truck_loc_115 2)
12346        (and
12347          (<= b_stocka_116 120)
12348          (= (+ truck_stock_116 b_stocka_116) (+ truck_stock_115 b_stockb_116))
12349          (= a_stocka_116 a_stockb_116)
12350          (= c_stocka_116 c_stockb_116)
12351          (or
12352            (and
12353              (= truck_loc_116 1)
12354              (= truck_travel_time_116 17)
12355            )
12356            (and
12357              (= truck_loc_116 0)
12358              (= truck_travel_time_116 21)
12359            )
12360            (and
12361              (= truck_loc_116 3)
12362              (= truck_travel_time_116 37)
12363            )
12364          )
12365        )
12366      )
12367      (=> (= truck_loc_115 3)
12368        (and
12369          (<= c_stocka_116 200)
12370          (= (+ truck_stock_116 c_stocka_116) (+ truck_stock_115 c_stockb_116))
12371          (= a_stocka_116 a_stockb_116)
12372          (= b_stocka_116 b_stockb_116)
12373          (or
12374            (and
12375              (= truck_loc_116 1)
12376              (= truck_travel_time_116 32)
12377            )
12378            (and
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12379              (= truck_loc_116 2)
12380              (= truck_travel_time_116 37)
12381            )
12382          )
12383        )
12384      )
12385   )
12386   (<= truck_stock_116 318)
12387   (>= truck_stock_116 0)
12388   (= a_stockb_117 (- a_stocka_116 truck_travel_time_116))
12389   (= b_stockb_117 (- b_stocka_116 truck_travel_time_116))
12390   (= c_stockb_117 (- c_stocka_116 truck_travel_time_116))
12391   (and
12392     (=> (= truck_loc_116 0)
12393       (and
12394         (= a_stocka_117 a_stockb_117)
12395         (= b_stocka_117 b_stockb_117)
12396         (= c_stocka_117 c_stockb_117)
12397         (or
12398           (and
12399             (= truck_loc_117 1)
12400             (= truck_travel_time_117 29)
12401           )
12402           (and
12403             (= truck_loc_117 2)
12404             (= truck_travel_time_117 21)
12405           )
12406         )
12407       )
12408     )
12409     (=> (= truck_loc_116 1)
12410       (and
12411         (<= a_stocka_117 120)
12412         (= (+ truck_stock_117 a_stocka_117) (+ truck_stock_116 a_stockb_117))
12413         (= b_stocka_117 b_stockb_117)
12414         (= c_stocka_117 c_stockb_117)
12415         (or
12416           (and
12417             (= truck_loc_117 0)
12418             (= truck_travel_time_117 29)
12419           )
12420           (and
12421             (= truck_loc_117 2)
12422             (= truck_travel_time_117 17)
12423           )
12424           (and
12425             (= truck_loc_117 3)
12426             (= truck_travel_time_117 32)
12427           )
12428         )
12429       )
12430     )
12431     (=> (= truck_loc_116 2)
12432       (and
12433         (<= b_stocka_117 120)
12434         (= (+ truck_stock_117 b_stocka_117) (+ truck_stock_116 b_stockb_117))
12435         (= a_stocka_117 a_stockb_117)
12436         (= c_stocka_117 c_stockb_117)
12437         (or
12438           (and
12439             (= truck_loc_117 1)
12440             (= truck_travel_time_117 17)
```

```
12441            )
12442          (and
12443            (= truck_loc_117 0)
12444            (= truck_travel_time_117 21)
12445          )
12446          (and
12447            (= truck_loc_117 3)
12448            (= truck_travel_time_117 37)
12449          )
12450        )
12451      )
12452    )
12453    (=> (= truck_loc_116 3)
12454      (and
12455        (<= c_stocka_117 200)
12456        (= (+ truck_stock_117 c_stocka_117) (+ truck_stock_116 c_stockb_117))
12457        (= a_stocka_117 a_stockb_117)
12458        (= b_stocka_117 b_stockb_117)
12459        (or
12460          (and
12461            (= truck_loc_117 1)
12462            (= truck_travel_time_117 32)
12463          )
12464          (and
12465            (= truck_loc_117 2)
12466            (= truck_travel_time_117 37)
12467          )
12468        )
12469      )
12470    )
12471  )
12472  (<= truck_stock_117 318)
12473  (>= truck_stock_117 0)
12474  (= a_stockb_118 (- a_stocka_117 truck_travel_time_117))
12475  (= b_stockb_118 (- b_stocka_117 truck_travel_time_117))
12476  (= c_stockb_118 (- c_stocka_117 truck_travel_time_117))
12477  (and
12478    (=> (= truck_loc_117 0)
12479      (and
12480        (= a_stocka_118 a_stockb_118)
12481        (= b_stocka_118 b_stockb_118)
12482        (= c_stocka_118 c_stockb_118)
12483        (or
12484          (and
12485            (= truck_loc_118 1)
12486            (= truck_travel_time_118 29)
12487          )
12488          (and
12489            (= truck_loc_118 2)
12490            (= truck_travel_time_118 21)
12491          )
12492        )
12493      )
12494    )
12495    (=> (= truck_loc_117 1)
12496      (and
12497        (<= a_stocka_118 120)
12498        (= (+ truck_stock_118 a_stocka_118) (+ truck_stock_117 a_stockb_118))
12499        (= b_stocka_118 b_stockb_118)
12500        (= c_stocka_118 c_stockb_118)
12501        (or
12502          (and
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```
12503            (= truck_loc_118 0)
12504            (= truck_travel_time_118 29)
12505          )
12506        (and
12507          (= truck_loc_118 2)
12508          (= truck_travel_time_118 17)
12509        )
12510        (and
12511          (= truck_loc_118 3)
12512          (= truck_travel_time_118 32)
12513        )
12514      )
12515    )
12516  )
12517  (=> (= truck_loc_117 2)
12518    (and
12519      (<= b_stocka_118 120)
12520      (= (+ truck_stock_118 b_stocka_118) (+ truck_stock_117 b_stockb_118))
12521      (= a_stocka_118 a_stockb_118)
12522      (= c_stocka_118 c_stockb_118)
12523      (or
12524        (and
12525          (= truck_loc_118 1)
12526          (= truck_travel_time_118 17)
12527        )
12528        (and
12529          (= truck_loc_118 0)
12530          (= truck_travel_time_118 21)
12531        )
12532        (and
12533          (= truck_loc_118 3)
12534          (= truck_travel_time_118 37)
12535        )
12536      )
12537    )
12538  )
12539  (=> (= truck_loc_117 3)
12540    (and
12541      (<= c_stocka_118 200)
12542      (= (+ truck_stock_118 c_stocka_118) (+ truck_stock_117 c_stockb_118))
12543      (= a_stocka_118 a_stockb_118)
12544      (= b_stocka_118 b_stockb_118)
12545      (or
12546        (and
12547          (= truck_loc_118 1)
12548          (= truck_travel_time_118 32)
12549        )
12550        (and
12551          (= truck_loc_118 2)
12552          (= truck_travel_time_118 37)
12553        )
12554      )
12555    )
12556  )
12557 )
12558 (<= truck_stock_118 318)
12559 (>= truck_stock_118 0)
12560 (= a_stockb_119 (- a_stocka_118 truck_travel_time_118))
12561 (= b_stockb_119 (- b_stocka_118 truck_travel_time_118))
12562 (= c_stockb_119 (- c_stocka_118 truck_travel_time_118))
12563 (and
12564    (=> (= truck_loc_118 0)
```

```
12565        (and
12566          (= a_stocka_119 a_stockb_119)
12567          (= b_stocka_119 b_stockb_119)
12568          (= c_stocka_119 c_stockb_119)
12569          (or
12570            (and
12571              (= truck_loc_119 1)
12572              (= truck_travel_time_119 29)
12573            )
12574            (and
12575              (= truck_loc_119 2)
12576              (= truck_travel_time_119 21)
12577            )
12578          )
12579        )
12580      )
12581      (=> (= truck_loc_118 1)
12582        (and
12583          (<= a_stocka_119 120)
12584          (= (+ truck_stock_119 a_stocka_119) (+ truck_stock_118 a_stockb_119))
12585          (= b_stocka_119 b_stockb_119)
12586          (= c_stocka_119 c_stockb_119)
12587          (or
12588            (and
12589              (= truck_loc_119 0)
12590              (= truck_travel_time_119 29)
12591            )
12592            (and
12593              (= truck_loc_119 2)
12594              (= truck_travel_time_119 17)
12595            )
12596            (and
12597              (= truck_loc_119 3)
12598              (= truck_travel_time_119 32)
12599            )
12600          )
12601        )
12602      )
12603      (=> (= truck_loc_118 2)
12604        (and
12605          (<= b_stocka_119 120)
12606          (= (+ truck_stock_119 b_stocka_119) (+ truck_stock_118 b_stockb_119))
12607          (= a_stocka_119 a_stockb_119)
12608          (= c_stocka_119 c_stockb_119)
12609          (or
12610            (and
12611              (= truck_loc_119 1)
12612              (= truck_travel_time_119 17)
12613            )
12614            (and
12615              (= truck_loc_119 0)
12616              (= truck_travel_time_119 21)
12617            )
12618            (and
12619              (= truck_loc_119 3)
12620              (= truck_travel_time_119 37)
12621            )
12622          )
12623        )
12624      )
12625      (=> (= truck_loc_118 3)
12626        (and
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12627        (<= c_stocka_119 200)
12628        (= (+ truck_stock_119 c_stocka_119) (+ truck_stock_118 c_stockb_119))
12629        (= a_stocka_119 a_stockb_119)
12630        (= b_stocka_119 b_stockb_119)
12631        (or
12632          (and
12633            (= truck_loc_119 1)
12634            (= truck_travel_time_119 32)
12635          )
12636          (and
12637            (= truck_loc_119 2)
12638            (= truck_travel_time_119 37)
12639          )
12640        )
12641      )
12642    )
12643  )
12644  (<= truck_stock_119 318)
12645  (>= truck_stock_119 0)
12646  (= a_stockb_120 (- a_stocka_119 truck_travel_time_119))
12647  (= b_stockb_120 (- b_stocka_119 truck_travel_time_119))
12648  (= c_stockb_120 (- c_stocka_119 truck_travel_time_119))
12649  (and
12650    (=> (= truck_loc_119 0)
12651      (and
12652        (= a_stocka_120 a_stockb_120)
12653        (= b_stocka_120 b_stockb_120)
12654        (= c_stocka_120 c_stockb_120)
12655        (or
12656          (and
12657            (= truck_loc_120 1)
12658            (= truck_travel_time_120 29)
12659          )
12660          (and
12661            (= truck_loc_120 2)
12662            (= truck_travel_time_120 21)
12663          )
12664        )
12665      )
12666    )
12667    (=> (= truck_loc_119 1)
12668      (and
12669        (<= a_stocka_120 120)
12670        (= (+ truck_stock_120 a_stocka_120) (+ truck_stock_119 a_stockb_120))
12671        (= b_stocka_120 b_stockb_120)
12672        (= c_stocka_120 c_stockb_120)
12673        (or
12674          (and
12675            (= truck_loc_120 0)
12676            (= truck_travel_time_120 29)
12677          )
12678          (and
12679            (= truck_loc_120 2)
12680            (= truck_travel_time_120 17)
12681          )
12682          (and
12683            (= truck_loc_120 3)
12684            (= truck_travel_time_120 32)
12685          )
12686        )
12687      )
12688    )
```

```
12689    (=> (= truck_loc_119 2)
12690      (and
12691        (<= b_stocka_120 120)
12692        (= (+ truck_stock_120 b_stocka_120) (+ truck_stock_119 b_stockb_120))
12693        (= a_stocka_120 a_stockb_120)
12694        (= c_stocka_120 c_stockb_120)
12695        (or
12696          (and
12697            (= truck_loc_120 1)
12698            (= truck_travel_time_120 17)
12699          )
12700          (and
12701            (= truck_loc_120 0)
12702            (= truck_travel_time_120 21)
12703          )
12704          (and
12705            (= truck_loc_120 3)
12706            (= truck_travel_time_120 37)
12707          )
12708        )
12709      )
12710    )
12711    (=> (= truck_loc_119 3)
12712      (and
12713        (<= c_stocka_120 200)
12714        (= (+ truck_stock_120 c_stocka_120) (+ truck_stock_119 c_stockb_120))
12715        (= a_stocka_120 a_stockb_120)
12716        (= b_stocka_120 b_stockb_120)
12717        (or
12718          (and
12719            (= truck_loc_120 1)
12720            (= truck_travel_time_120 32)
12721          )
12722          (and
12723            (= truck_loc_120 2)
12724            (= truck_travel_time_120 37)
12725          )
12726        )
12727      )
12728    )
12729  )
12730  (<= truck_stock_120 318)
12731  (>= truck_stock_120 0)
12732  (= a_stockb_121 (- a_stocka_120 truck_travel_time_120))
12733  (= b_stockb_121 (- b_stocka_120 truck_travel_time_120))
12734  (= c_stockb_121 (- c_stocka_120 truck_travel_time_120))
12735  (and
12736    (=> (= truck_loc_120 0)
12737      (and
12738        (= a_stocka_121 a_stockb_121)
12739        (= b_stocka_121 b_stockb_121)
12740        (= c_stocka_121 c_stockb_121)
12741        (or
12742          (and
12743            (= truck_loc_121 1)
12744            (= truck_travel_time_121 29)
12745          )
12746          (and
12747            (= truck_loc_121 2)
12748            (= truck_travel_time_121 21)
12749          )
12750        )
```

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12751        )
12752      )
12753      (=> (= truck_loc_120 1)
12754        (and
12755          (<= a_stocka_121 120)
12756          (= (+ truck_stock_121 a_stocka_121) (+ truck_stock_120 a_stockb_121))
12757          (= b_stocka_121 b_stockb_121)
12758          (= c_stocka_121 c_stockb_121)
12759          (or
12760            (and
12761              (= truck_loc_121 0)
12762              (= truck_travel_time_121 29)
12763            )
12764            (and
12765              (= truck_loc_121 2)
12766              (= truck_travel_time_121 17)
12767            )
12768            (and
12769              (= truck_loc_121 3)
12770              (= truck_travel_time_121 32)
12771            )
12772          )
12773        )
12774      )
12775      (=> (= truck_loc_120 2)
12776        (and
12777          (<= b_stocka_121 120)
12778          (= (+ truck_stock_121 b_stocka_121) (+ truck_stock_120 b_stockb_121))
12779          (= a_stocka_121 a_stockb_121)
12780          (= c_stocka_121 c_stockb_121)
12781          (or
12782            (and
12783              (= truck_loc_121 1)
12784              (= truck_travel_time_121 17)
12785            )
12786            (and
12787              (= truck_loc_121 0)
12788              (= truck_travel_time_121 21)
12789            )
12790            (and
12791              (= truck_loc_121 3)
12792              (= truck_travel_time_121 37)
12793            )
12794          )
12795        )
12796      )
12797      (=> (= truck_loc_120 3)
12798        (and
12799          (<= c_stocka_121 200)
12800          (= (+ truck_stock_121 c_stocka_121) (+ truck_stock_120 c_stockb_121))
12801          (= a_stocka_121 a_stockb_121)
12802          (= b_stocka_121 b_stockb_121)
12803          (or
12804            (and
12805              (= truck_loc_121 1)
12806              (= truck_travel_time_121 32)
12807            )
12808            (and
12809              (= truck_loc_121 2)
12810              (= truck_travel_time_121 37)
12811            )
12812          )
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12813        )
12814      )
12815  )
12816  (<= truck_stock_121 318)
12817  (>= truck_stock_121 0)
12818  (= a_stockb_122 (- a_stocka_121 truck_travel_time_121))
12819  (= b_stockb_122 (- b_stocka_121 truck_travel_time_121))
12820  (= c_stockb_122 (- c_stocka_121 truck_travel_time_121))
12821  (and
12822    (=> (= truck_loc_121 0)
12823      (and
12824        (= a_stocka_122 a_stockb_122)
12825        (= b_stocka_122 b_stockb_122)
12826        (= c_stocka_122 c_stockb_122)
12827        (or
12828          (and
12829            (= truck_loc_122 1)
12830            (= truck_travel_time_122 29)
12831          )
12832          (and
12833            (= truck_loc_122 2)
12834            (= truck_travel_time_122 21)
12835          )
12836        )
12837      )
12838    )
12839    (=> (= truck_loc_121 1)
12840      (and
12841        (<= a_stocka_122 120)
12842        (= (+ truck_stock_122 a_stocka_122) (+ truck_stock_121 a_stockb_122))
12843        (= b_stocka_122 b_stockb_122)
12844        (= c_stocka_122 c_stockb_122)
12845        (or
12846          (and
12847            (= truck_loc_122 0)
12848            (= truck_travel_time_122 29)
12849          )
12850          (and
12851            (= truck_loc_122 2)
12852            (= truck_travel_time_122 17)
12853          )
12854          (and
12855            (= truck_loc_122 3)
12856            (= truck_travel_time_122 32)
12857          )
12858        )
12859      )
12860    )
12861    (=> (= truck_loc_121 2)
12862      (and
12863        (<= b_stocka_122 120)
12864        (= (+ truck_stock_122 b_stocka_122) (+ truck_stock_121 b_stockb_122))
12865        (= a_stocka_122 a_stockb_122)
12866        (= c_stocka_122 c_stockb_122)
12867        (or
12868          (and
12869            (= truck_loc_122 1)
12870            (= truck_travel_time_122 17)
12871          )
12872          (and
12873            (= truck_loc_122 0)
12874            (= truck_travel_time_122 21)
```

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12875            )
12876          (and
12877            (= truck_loc_122 3)
12878            (= truck_travel_time_122 37)
12879          )
12880        )
12881      )
12882    )
12883    (=> (= truck_loc_121 3)
12884      (and
12885        (<= c_stocka_122 200)
12886        (= (+ truck_stock_122 c_stocka_122) (+ truck_stock_121 c_stockb_122))
12887        (= a_stocka_122 a_stockb_122)
12888        (= b_stocka_122 b_stockb_122)
12889        (or
12890          (and
12891            (= truck_loc_122 1)
12892            (= truck_travel_time_122 32)
12893          )
12894          (and
12895            (= truck_loc_122 2)
12896            (= truck_travel_time_122 37)
12897          )
12898        )
12899      )
12900    )
12901  )
12902  (<= truck_stock_122 318)
12903  (>= truck_stock_122 0)
12904  (= a_stockb_123 (- a_stocka_122 truck_travel_time_122))
12905  (= b_stockb_123 (- b_stocka_122 truck_travel_time_122))
12906  (= c_stockb_123 (- c_stocka_122 truck_travel_time_122))
12907  (and
12908    (=> (= truck_loc_122 0)
12909      (and
12910        (= a_stocka_123 a_stockb_123)
12911        (= b_stocka_123 b_stockb_123)
12912        (= c_stocka_123 c_stockb_123)
12913        (or
12914          (and
12915            (= truck_loc_123 1)
12916            (= truck_travel_time_123 29)
12917          )
12918          (and
12919            (= truck_loc_123 2)
12920            (= truck_travel_time_123 21)
12921          )
12922        )
12923      )
12924    )
12925    (=> (= truck_loc_122 1)
12926      (and
12927        (<= a_stocka_123 120)
12928        (= (+ truck_stock_123 a_stocka_123) (+ truck_stock_122 a_stockb_123))
12929        (= b_stocka_123 b_stockb_123)
12930        (= c_stocka_123 c_stockb_123)
12931        (or
12932          (and
12933            (= truck_loc_123 0)
12934            (= truck_travel_time_123 29)
12935          )
12936          (and
```

```
12937              (= truck_loc_123 2)
12938              (= truck_travel_time_123 17)
12939            )
12940          (and
12941              (= truck_loc_123 3)
12942              (= truck_travel_time_123 32)
12943          )
12944        )
12945      )
12946    )
12947    (=> (= truck_loc_122 2)
12948      (and
12949        (<= b_stocka_123 120)
12950        (= (+ truck_stock_123 b_stocka_123) (+ truck_stock_122 b_stockb_123))
12951        (= a_stocka_123 a_stockb_123)
12952        (= c_stocka_123 c_stockb_123)
12953        (or
12954          (and
12955              (= truck_loc_123 1)
12956              (= truck_travel_time_123 17)
12957          )
12958          (and
12959              (= truck_loc_123 0)
12960              (= truck_travel_time_123 21)
12961          )
12962          (and
12963              (= truck_loc_123 3)
12964              (= truck_travel_time_123 37)
12965          )
12966        )
12967      )
12968    )
12969    (=> (= truck_loc_122 3)
12970      (and
12971        (<= c_stocka_123 200)
12972        (= (+ truck_stock_123 c_stocka_123) (+ truck_stock_122 c_stockb_123))
12973        (= a_stocka_123 a_stockb_123)
12974        (= b_stocka_123 b_stockb_123)
12975        (or
12976          (and
12977              (= truck_loc_123 1)
12978              (= truck_travel_time_123 32)
12979          )
12980          (and
12981              (= truck_loc_123 2)
12982              (= truck_travel_time_123 37)
12983          )
12984        )
12985      )
12986    )
12987  )
12988  (<= truck_stock_123 318)
12989  (>= truck_stock_123 0)
12990  (= a_stockb_124 (- a_stocka_123 truck_travel_time_123))
12991  (= b_stockb_124 (- b_stocka_123 truck_travel_time_123))
12992  (= c_stockb_124 (- c_stocka_123 truck_travel_time_123))
12993  (and
12994    (=> (= truck_loc_123 0)
12995      (and
12996        (= a_stocka_124 a_stockb_124)
12997        (= b_stocka_124 b_stockb_124)
12998        (= c_stocka_124 c_stockb_124)
```

```
12999        (or
13000          (and
13001            (= truck_loc_124 1)
13002            (= truck_travel_time_124 29)
13003          )
13004          (and
13005            (= truck_loc_124 2)
13006            (= truck_travel_time_124 21)
13007          )
13008        )
13009      )
13010    )
13011    (=> (= truck_loc_123 1)
13012      (and
13013        (<= a_stocka_124 120)
13014        (= (+ truck_stock_124 a_stocka_124) (+ truck_stock_123 a_stockb_124))
13015        (= b_stocka_124 b_stockb_124)
13016        (= c_stocka_124 c_stockb_124)
13017        (or
13018          (and
13019            (= truck_loc_124 0)
13020            (= truck_travel_time_124 29)
13021          )
13022          (and
13023            (= truck_loc_124 2)
13024            (= truck_travel_time_124 17)
13025          )
13026          (and
13027            (= truck_loc_124 3)
13028            (= truck_travel_time_124 32)
13029          )
13030        )
13031      )
13032    )
13033    (=> (= truck_loc_123 2)
13034      (and
13035        (<= b_stocka_124 120)
13036        (= (+ truck_stock_124 b_stocka_124) (+ truck_stock_123 b_stockb_124))
13037        (= a_stocka_124 a_stockb_124)
13038        (= c_stocka_124 c_stockb_124)
13039        (or
13040          (and
13041            (= truck_loc_124 1)
13042            (= truck_travel_time_124 17)
13043          )
13044          (and
13045            (= truck_loc_124 0)
13046            (= truck_travel_time_124 21)
13047          )
13048          (and
13049            (= truck_loc_124 3)
13050            (= truck_travel_time_124 37)
13051          )
13052        )
13053      )
13054    )
13055    (=> (= truck_loc_123 3)
13056      (and
13057        (<= c_stocka_124 200)
13058        (= (+ truck_stock_124 c_stocka_124) (+ truck_stock_123 c_stockb_124))
13059        (= a_stocka_124 a_stockb_124)
13060        (= b_stocka_124 b_stockb_124)
```

```
13061        (or
13062          (and
13063            (= truck_loc_124 1)
13064            (= truck_travel_time_124 32)
13065          )
13066          (and
13067            (= truck_loc_124 2)
13068            (= truck_travel_time_124 37)
13069          )
13070        )
13071      )
13072    )
13073  )
13074  (<= truck_stock_124 318)
13075  (>= truck_stock_124 0)
13076  (= a_stockb_125 (- a_stocka_124 truck_travel_time_124))
13077  (= b_stockb_125 (- b_stocka_124 truck_travel_time_124))
13078  (= c_stockb_125 (- c_stocka_124 truck_travel_time_124))
13079  (and
13080    (=> (= truck_loc_124 0)
13081      (and
13082        (= a_stocka_125 a_stockb_125)
13083        (= b_stocka_125 b_stockb_125)
13084        (= c_stocka_125 c_stockb_125)
13085        (or
13086          (and
13087            (= truck_loc_125 1)
13088            (= truck_travel_time_125 29)
13089          )
13090          (and
13091            (= truck_loc_125 2)
13092            (= truck_travel_time_125 21)
13093          )
13094        )
13095      )
13096    )
13097    (=> (= truck_loc_124 1)
13098      (and
13099        (<= a_stocka_125 120)
13100        (= (+ truck_stock_125 a_stocka_125) (+ truck_stock_124 a_stockb_125))
13101        (= b_stocka_125 b_stockb_125)
13102        (= c_stocka_125 c_stockb_125)
13103        (or
13104          (and
13105            (= truck_loc_125 0)
13106            (= truck_travel_time_125 29)
13107          )
13108          (and
13109            (= truck_loc_125 2)
13110            (= truck_travel_time_125 17)
13111          )
13112          (and
13113            (= truck_loc_125 3)
13114            (= truck_travel_time_125 32)
13115          )
13116        )
13117      )
13118    )
13119    (=> (= truck_loc_124 2)
13120      (and
13121        (<= b_stocka_125 120)
13122        (= (+ truck_stock_125 b_stocka_125) (+ truck_stock_124 b_stockb_125))
```

```
13123          (= a_stocka_125 a_stockb_125)
13124          (= c_stocka_125 c_stockb_125)
13125          (or
13126            (and
13127              (= truck_loc_125 1)
13128              (= truck_travel_time_125 17)
13129            )
13130            (and
13131              (= truck_loc_125 0)
13132              (= truck_travel_time_125 21)
13133            )
13134            (and
13135              (= truck_loc_125 3)
13136              (= truck_travel_time_125 37)
13137            )
13138          )
13139        )
13140      )
13141      (=> (= truck_loc_124 3)
13142        (and
13143          (<= c_stocka_125 200)
13144          (= (+ truck_stock_125 c_stocka_125) (+ truck_stock_124 c_stockb_125))
13145          (= a_stocka_125 a_stockb_125)
13146          (= b_stocka_125 b_stockb_125)
13147          (or
13148            (and
13149              (= truck_loc_125 1)
13150              (= truck_travel_time_125 32)
13151            )
13152            (and
13153              (= truck_loc_125 2)
13154              (= truck_travel_time_125 37)
13155            )
13156          )
13157        )
13158      )
13159    )
13160    (<= truck_stock_125 318)
13161    (>= truck_stock_125 0)
13162    (= a_stockb_126 (- a_stocka_125 truck_travel_time_125))
13163    (= b_stockb_126 (- b_stocka_125 truck_travel_time_125))
13164    (= c_stockb_126 (- c_stocka_125 truck_travel_time_125))
13165    (and
13166      (=> (= truck_loc_125 0)
13167        (and
13168          (= a_stocka_126 a_stockb_126)
13169          (= b_stocka_126 b_stockb_126)
13170          (= c_stocka_126 c_stockb_126)
13171          (or
13172            (and
13173              (= truck_loc_126 1)
13174              (= truck_travel_time_126 29)
13175            )
13176            (and
13177              (= truck_loc_126 2)
13178              (= truck_travel_time_126 21)
13179            )
13180          )
13181        )
13182      )
13183      (=> (= truck_loc_125 1)
13184        (and
```

```
13185        (<= a_stocka_126 120)
13186        (= (+ truck_stock_126 a_stocka_126) (+ truck_stock_125 a_stockb_126))
13187        (= b_stocka_126 b_stockb_126)
13188        (= c_stocka_126 c_stockb_126)
13189        (or
13190          (and
13191            (= truck_loc_126 0)
13192            (= truck_travel_time_126 29)
13193          )
13194          (and
13195            (= truck_loc_126 2)
13196            (= truck_travel_time_126 17)
13197          )
13198          (and
13199            (= truck_loc_126 3)
13200            (= truck_travel_time_126 32)
13201          )
13202        )
13203      )
13204    )
13205    (=> (= truck_loc_125 2)
13206      (and
13207        (<= b_stocka_126 120)
13208        (= (+ truck_stock_126 b_stocka_126) (+ truck_stock_125 b_stockb_126))
13209        (= a_stocka_126 a_stockb_126)
13210        (= c_stocka_126 c_stockb_126)
13211        (or
13212          (and
13213            (= truck_loc_126 1)
13214            (= truck_travel_time_126 17)
13215          )
13216          (and
13217            (= truck_loc_126 0)
13218            (= truck_travel_time_126 21)
13219          )
13220          (and
13221            (= truck_loc_126 3)
13222            (= truck_travel_time_126 37)
13223          )
13224        )
13225      )
13226    )
13227    (=> (= truck_loc_125 3)
13228      (and
13229        (<= c_stocka_126 200)
13230        (= (+ truck_stock_126 c_stocka_126) (+ truck_stock_125 c_stockb_126))
13231        (= a_stocka_126 a_stockb_126)
13232        (= b_stocka_126 b_stockb_126)
13233        (or
13234          (and
13235            (= truck_loc_126 1)
13236            (= truck_travel_time_126 32)
13237          )
13238          (and
13239            (= truck_loc_126 2)
13240            (= truck_travel_time_126 37)
13241          )
13242        )
13243      )
13244    )
13245  )
13246  (<= truck_stock_126 318)
```

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13247  (>= truck_stock_126 0)
13248  (= a_stockb_127 (- a_stocka_126 truck_travel_time_126))
13249  (= b_stockb_127 (- b_stocka_126 truck_travel_time_126))
13250  (= c_stockb_127 (- c_stocka_126 truck_travel_time_126))
13251  (and
13252    (=> (= truck_loc_126 0)
13253      (and
13254        (= a_stocka_127 a_stockb_127)
13255        (= b_stocka_127 b_stockb_127)
13256        (= c_stocka_127 c_stockb_127)
13257        (or
13258          (and
13259            (= truck_loc_127 1)
13260            (= truck_travel_time_127 29)
13261          )
13262          (and
13263            (= truck_loc_127 2)
13264            (= truck_travel_time_127 21)
13265          )
13266        )
13267      )
13268    )
13269    (=> (= truck_loc_126 1)
13270      (and
13271        (<= a_stocka_127 120)
13272        (= (+ truck_stock_127 a_stocka_127) (+ truck_stock_126 a_stockb_127))
13273        (= b_stocka_127 b_stockb_127)
13274        (= c_stocka_127 c_stockb_127)
13275        (or
13276          (and
13277            (= truck_loc_127 0)
13278            (= truck_travel_time_127 29)
13279          )
13280          (and
13281            (= truck_loc_127 2)
13282            (= truck_travel_time_127 17)
13283          )
13284          (and
13285            (= truck_loc_127 3)
13286            (= truck_travel_time_127 32)
13287          )
13288        )
13289      )
13290    )
13291    (=> (= truck_loc_126 2)
13292      (and
13293        (<= b_stocka_127 120)
13294        (= (+ truck_stock_127 b_stocka_127) (+ truck_stock_126 b_stockb_127))
13295        (= a_stocka_127 a_stockb_127)
13296        (= c_stocka_127 c_stockb_127)
13297        (or
13298          (and
13299            (= truck_loc_127 1)
13300            (= truck_travel_time_127 17)
13301          )
13302          (and
13303            (= truck_loc_127 0)
13304            (= truck_travel_time_127 21)
13305          )
13306          (and
13307            (= truck_loc_127 3)
13308            (= truck_travel_time_127 37)
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13309              )
13310            )
13311          )
13312        )
13313      (=> (= truck_loc_126 3)
13314        (and
13315          (<= c_stocka_127 200)
13316          (= (+ truck_stock_127 c_stocka_127) (+ truck_stock_126 c_stockb_127))
13317          (= a_stocka_127 a_stockb_127)
13318          (= b_stocka_127 b_stockb_127)
13319          (or
13320            (and
13321              (= truck_loc_127 1)
13322              (= truck_travel_time_127 32)
13323            )
13324            (and
13325              (= truck_loc_127 2)
13326              (= truck_travel_time_127 37)
13327            )
13328          )
13329        )
13330      )
13331    )
13332    (<= truck_stock_127 318)
13333    (>= truck_stock_127 0)
13334    (= a_stockb_128 (- a_stocka_127 truck_travel_time_127))
13335    (= b_stockb_128 (- b_stocka_127 truck_travel_time_127))
13336    (= c_stockb_128 (- c_stocka_127 truck_travel_time_127))
13337    (and
13338      (=> (= truck_loc_127 0)
13339        (and
13340          (= a_stocka_128 a_stockb_128)
13341          (= b_stocka_128 b_stockb_128)
13342          (= c_stocka_128 c_stockb_128)
13343          (or
13344            (and
13345              (= truck_loc_128 1)
13346              (= truck_travel_time_128 29)
13347            )
13348            (and
13349              (= truck_loc_128 2)
13350              (= truck_travel_time_128 21)
13351            )
13352          )
13353        )
13354      )
13355      (=> (= truck_loc_127 1)
13356        (and
13357          (<= a_stocka_128 120)
13358          (= (+ truck_stock_128 a_stocka_128) (+ truck_stock_127 a_stockb_128))
13359          (= b_stocka_128 b_stockb_128)
13360          (= c_stocka_128 c_stockb_128)
13361          (or
13362            (and
13363              (= truck_loc_128 0)
13364              (= truck_travel_time_128 29)
13365            )
13366            (and
13367              (= truck_loc_128 2)
13368              (= truck_travel_time_128 17)
13369            )
13370            (and
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```
13371            (= truck_loc_128 3)
13372            (= truck_travel_time_128 32)
13373          )
13374        )
13375      )
13376    )
13377    (=> (= truck_loc_127 2)
13378      (and
13379        (<= b_stocka_128 120)
13380        (= (+ truck_stock_128 b_stocka_128) (+ truck_stock_127 b_stockb_128))
13381        (= a_stocka_128 a_stockb_128)
13382        (= c_stocka_128 c_stockb_128)
13383        (or
13384          (and
13385            (= truck_loc_128 1)
13386            (= truck_travel_time_128 17)
13387          )
13388          (and
13389            (= truck_loc_128 0)
13390            (= truck_travel_time_128 21)
13391          )
13392          (and
13393            (= truck_loc_128 3)
13394            (= truck_travel_time_128 37)
13395          )
13396        )
13397      )
13398    )
13399    (=> (= truck_loc_127 3)
13400      (and
13401        (<= c_stocka_128 200)
13402        (= (+ truck_stock_128 c_stocka_128) (+ truck_stock_127 c_stockb_128))
13403        (= a_stocka_128 a_stockb_128)
13404        (= b_stocka_128 b_stockb_128)
13405        (or
13406          (and
13407            (= truck_loc_128 1)
13408            (= truck_travel_time_128 32)
13409          )
13410          (and
13411            (= truck_loc_128 2)
13412            (= truck_travel_time_128 37)
13413          )
13414        )
13415      )
13416    )
13417  )
13418  (<= truck_stock_128 318)
13419  (>= truck_stock_128 0)
13420  (= a_stockb_129 (- a_stocka_128 truck_travel_time_128))
13421  (= b_stockb_129 (- b_stocka_128 truck_travel_time_128))
13422  (= c_stockb_129 (- c_stocka_128 truck_travel_time_128))
13423  (and
13424    (=> (= truck_loc_128 0)
13425      (and
13426        (= a_stocka_129 a_stockb_129)
13427        (= b_stocka_129 b_stockb_129)
13428        (= c_stocka_129 c_stockb_129)
13429        (or
13430          (and
13431            (= truck_loc_129 1)
13432            (= truck_travel_time_129 29)
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13433            )
13434          (and
13435            (= truck_loc_129 2)
13436            (= truck_travel_time_129 21)
13437          )
13438        )
13439      )
13440    )
13441    (=> (= truck_loc_128 1)
13442      (and
13443        (<= a_stocka_129 120)
13444        (= (+ truck_stock_129 a_stocka_129) (+ truck_stock_128 a_stockb_129))
13445        (= b_stocka_129 b_stockb_129)
13446        (= c_stocka_129 c_stockb_129)
13447        (or
13448          (and
13449            (= truck_loc_129 0)
13450            (= truck_travel_time_129 29)
13451          )
13452          (and
13453            (= truck_loc_129 2)
13454            (= truck_travel_time_129 17)
13455          )
13456          (and
13457            (= truck_loc_129 3)
13458            (= truck_travel_time_129 32)
13459          )
13460        )
13461      )
13462    )
13463    (=> (= truck_loc_128 2)
13464      (and
13465        (<= b_stocka_129 120)
13466        (= (+ truck_stock_129 b_stocka_129) (+ truck_stock_128 b_stockb_129))
13467        (= a_stocka_129 a_stockb_129)
13468        (= c_stocka_129 c_stockb_129)
13469        (or
13470          (and
13471            (= truck_loc_129 1)
13472            (= truck_travel_time_129 17)
13473          )
13474          (and
13475            (= truck_loc_129 0)
13476            (= truck_travel_time_129 21)
13477          )
13478          (and
13479            (= truck_loc_129 3)
13480            (= truck_travel_time_129 37)
13481          )
13482        )
13483      )
13484    )
13485    (=> (= truck_loc_128 3)
13486      (and
13487        (<= c_stocka_129 200)
13488        (= (+ truck_stock_129 c_stocka_129) (+ truck_stock_128 c_stockb_129))
13489        (= a_stocka_129 a_stockb_129)
13490        (= b_stocka_129 b_stockb_129)
13491        (or
13492          (and
13493            (= truck_loc_129 1)
13494            (= truck_travel_time_129 32)
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13495            )
13496          (and
13497            (= truck_loc_129 2)
13498            (= truck_travel_time_129 37)
13499          )
13500        )
13501      )
13502    )
13503  )
13504  (<= truck_stock_129 318)
13505  (>= truck_stock_129 0)
13506  (= a_stockb_130 (- a_stocka_129 truck_travel_time_129))
13507  (= b_stockb_130 (- b_stocka_129 truck_travel_time_129))
13508  (= c_stockb_130 (- c_stocka_129 truck_travel_time_129))
13509  (and
13510    (=> (= truck_loc_129 0)
13511      (and
13512        (= a_stocka_130 a_stockb_130)
13513        (= b_stocka_130 b_stockb_130)
13514        (= c_stocka_130 c_stockb_130)
13515        (or
13516          (and
13517            (= truck_loc_130 1)
13518            (= truck_travel_time_130 29)
13519          )
13520          (and
13521            (= truck_loc_130 2)
13522            (= truck_travel_time_130 21)
13523          )
13524        )
13525      )
13526    )
13527    (=> (= truck_loc_129 1)
13528      (and
13529        (<= a_stocka_130 120)
13530        (= (+ truck_stock_130 a_stocka_130) (+ truck_stock_129 a_stockb_130))
13531        (= b_stocka_130 b_stockb_130)
13532        (= c_stocka_130 c_stockb_130)
13533        (or
13534          (and
13535            (= truck_loc_130 0)
13536            (= truck_travel_time_130 29)
13537          )
13538          (and
13539            (= truck_loc_130 2)
13540            (= truck_travel_time_130 17)
13541          )
13542          (and
13543            (= truck_loc_130 3)
13544            (= truck_travel_time_130 32)
13545          )
13546        )
13547      )
13548    )
13549    (=> (= truck_loc_129 2)
13550      (and
13551        (<= b_stocka_130 120)
13552        (= (+ truck_stock_130 b_stocka_130) (+ truck_stock_129 b_stockb_130))
13553        (= a_stocka_130 a_stockb_130)
13554        (= c_stocka_130 c_stockb_130)
13555        (or
13556          (and
```

```
13557              (= truck_loc_130 1)
13558              (= truck_travel_time_130 17)
13559            )
13560          (and
13561            (= truck_loc_130 0)
13562            (= truck_travel_time_130 21)
13563          )
13564          (and
13565            (= truck_loc_130 3)
13566            (= truck_travel_time_130 37)
13567          )
13568        )
13569      )
13570    )
13571    (=> (= truck_loc_129 3)
13572      (and
13573        (<= c_stocka_130 200)
13574        (= (+ truck_stock_130 c_stocka_130) (+ truck_stock_129 c_stockb_130))
13575        (= a_stocka_130 a_stockb_130)
13576        (= b_stocka_130 b_stockb_130)
13577        (or
13578          (and
13579            (= truck_loc_130 1)
13580            (= truck_travel_time_130 32)
13581          )
13582          (and
13583            (= truck_loc_130 2)
13584            (= truck_travel_time_130 37)
13585          )
13586        )
13587      )
13588    )
13589  )
13590  (<= truck_stock_130 318)
13591  (>= truck_stock_130 0)
13592  (= a_stockb_131 (- a_stocka_130 truck_travel_time_130))
13593  (= b_stockb_131 (- b_stocka_130 truck_travel_time_130))
13594  (= c_stockb_131 (- c_stocka_130 truck_travel_time_130))
13595  (and
13596    (=> (= truck_loc_130 0)
13597      (and
13598        (= a_stocka_131 a_stockb_131)
13599        (= b_stocka_131 b_stockb_131)
13600        (= c_stocka_131 c_stockb_131)
13601        (or
13602          (and
13603            (= truck_loc_131 1)
13604            (= truck_travel_time_131 29)
13605          )
13606          (and
13607            (= truck_loc_131 2)
13608            (= truck_travel_time_131 21)
13609          )
13610        )
13611      )
13612    )
13613    (=> (= truck_loc_130 1)
13614      (and
13615        (<= a_stocka_131 120)
13616        (= (+ truck_stock_131 a_stocka_131) (+ truck_stock_130 a_stockb_131))
13617        (= b_stocka_131 b_stockb_131)
13618        (= c_stocka_131 c_stockb_131)
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```
13619        (or
13620          (and
13621            (= truck_loc_131 0)
13622            (= truck_travel_time_131 29)
13623          )
13624          (and
13625            (= truck_loc_131 2)
13626            (= truck_travel_time_131 17)
13627          )
13628          (and
13629            (= truck_loc_131 3)
13630            (= truck_travel_time_131 32)
13631          )
13632        )
13633      )
13634    )
13635    (=> (= truck_loc_130 2)
13636      (and
13637        (<= b_stocka_131 120)
13638        (= (+ truck_stock_131 b_stocka_131) (+ truck_stock_130 b_stockb_131))
13639        (= a_stocka_131 a_stockb_131)
13640        (= c_stocka_131 c_stockb_131)
13641        (or
13642          (and
13643            (= truck_loc_131 1)
13644            (= truck_travel_time_131 17)
13645          )
13646          (and
13647            (= truck_loc_131 0)
13648            (= truck_travel_time_131 21)
13649          )
13650          (and
13651            (= truck_loc_131 3)
13652            (= truck_travel_time_131 37)
13653          )
13654        )
13655      )
13656    )
13657    (=> (= truck_loc_130 3)
13658      (and
13659        (<= c_stocka_131 200)
13660        (= (+ truck_stock_131 c_stocka_131) (+ truck_stock_130 c_stockb_131))
13661        (= a_stocka_131 a_stockb_131)
13662        (= b_stocka_131 b_stockb_131)
13663        (or
13664          (and
13665            (= truck_loc_131 1)
13666            (= truck_travel_time_131 32)
13667          )
13668          (and
13669            (= truck_loc_131 2)
13670            (= truck_travel_time_131 37)
13671          )
13672        )
13673      )
13674    )
13675  )
13676  (<= truck_stock_131 318)
13677  (>= truck_stock_131 0)
13678  (= a_stockb_132 (- a_stocka_131 truck_travel_time_131))
13679  (= b_stockb_132 (- b_stocka_131 truck_travel_time_131))
13680  (= c_stockb_132 (- c_stocka_131 truck_travel_time_131))
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```
13681   (and
13682     (=> (= truck_loc_131 0)
13683       (and
13684         (= a_stocka_132 a_stockb_132)
13685         (= b_stocka_132 b_stockb_132)
13686         (= c_stocka_132 c_stockb_132)
13687         (or
13688           (and
13689             (= truck_loc_132 1)
13690             (= truck_travel_time_132 29)
13691           )
13692           (and
13693             (= truck_loc_132 2)
13694             (= truck_travel_time_132 21)
13695           )
13696         )
13697       )
13698     )
13699     (=> (= truck_loc_131 1)
13700       (and
13701         (<= a_stocka_132 120)
13702         (= (+ truck_stock_132 a_stocka_132) (+ truck_stock_131 a_stockb_132))
13703         (= b_stocka_132 b_stockb_132)
13704         (= c_stocka_132 c_stockb_132)
13705         (or
13706           (and
13707             (= truck_loc_132 0)
13708             (= truck_travel_time_132 29)
13709           )
13710           (and
13711             (= truck_loc_132 2)
13712             (= truck_travel_time_132 17)
13713           )
13714           (and
13715             (= truck_loc_132 3)
13716             (= truck_travel_time_132 32)
13717           )
13718         )
13719       )
13720     )
13721     (=> (= truck_loc_131 2)
13722       (and
13723         (<= b_stocka_132 120)
13724         (= (+ truck_stock_132 b_stocka_132) (+ truck_stock_131 b_stockb_132))
13725         (= a_stocka_132 a_stockb_132)
13726         (= c_stocka_132 c_stockb_132)
13727         (or
13728           (and
13729             (= truck_loc_132 1)
13730             (= truck_travel_time_132 17)
13731           )
13732           (and
13733             (= truck_loc_132 0)
13734             (= truck_travel_time_132 21)
13735           )
13736           (and
13737             (= truck_loc_132 3)
13738             (= truck_travel_time_132 37)
13739           )
13740         )
13741       )
13742     )
```

```
13743    (=> (= truck_loc_131 3)
13744      (and
13745        (<= c_stocka_132 200)
13746        (= (+ truck_stock_132 c_stocka_132) (+ truck_stock_131 c_stockb_132))
13747        (= a_stocka_132 a_stockb_132)
13748        (= b_stocka_132 b_stockb_132)
13749        (or
13750          (and
13751            (= truck_loc_132 1)
13752            (= truck_travel_time_132 32)
13753          )
13754          (and
13755            (= truck_loc_132 2)
13756            (= truck_travel_time_132 37)
13757          )
13758        )
13759      )
13760    )
13761  )
13762  (<= truck_stock_132 318)
13763  (>= truck_stock_132 0)
13764  (= a_stockb_133 (- a_stocka_132 truck_travel_time_132))
13765  (= b_stockb_133 (- b_stocka_132 truck_travel_time_132))
13766  (= c_stockb_133 (- c_stocka_132 truck_travel_time_132))
13767  (and
13768    (=> (= truck_loc_132 0)
13769      (and
13770        (= a_stocka_133 a_stockb_133)
13771        (= b_stocka_133 b_stockb_133)
13772        (= c_stocka_133 c_stockb_133)
13773        (or
13774          (and
13775            (= truck_loc_133 1)
13776            (= truck_travel_time_133 29)
13777          )
13778          (and
13779            (= truck_loc_133 2)
13780            (= truck_travel_time_133 21)
13781          )
13782        )
13783      )
13784    )
13785    (=> (= truck_loc_132 1)
13786      (and
13787        (<= a_stocka_133 120)
13788        (= (+ truck_stock_133 a_stocka_133) (+ truck_stock_132 a_stockb_133))
13789        (= b_stocka_133 b_stockb_133)
13790        (= c_stocka_133 c_stockb_133)
13791        (or
13792          (and
13793            (= truck_loc_133 0)
13794            (= truck_travel_time_133 29)
13795          )
13796          (and
13797            (= truck_loc_133 2)
13798            (= truck_travel_time_133 17)
13799          )
13800          (and
13801            (= truck_loc_133 3)
13802            (= truck_travel_time_133 32)
13803          )
13804        )
```

```
13805          )
13806      )
13807      (=> (= truck_loc_132 2)
13808          (and
13809              (<= b_stocka_133 120)
13810              (= (+ truck_stock_133 b_stocka_133) (+ truck_stock_132 b_stockb_133))
13811              (= a_stocka_133 a_stockb_133)
13812              (= c_stocka_133 c_stockb_133)
13813              (or
13814                  (and
13815                      (= truck_loc_133 1)
13816                      (= truck_travel_time_133 17)
13817                  )
13818                  (and
13819                      (= truck_loc_133 0)
13820                      (= truck_travel_time_133 21)
13821                  )
13822                  (and
13823                      (= truck_loc_133 3)
13824                      (= truck_travel_time_133 37)
13825                  )
13826              )
13827          )
13828      )
13829      (=> (= truck_loc_132 3)
13830          (and
13831              (<= c_stocka_133 200)
13832              (= (+ truck_stock_133 c_stocka_133) (+ truck_stock_132 c_stockb_133))
13833              (= a_stocka_133 a_stockb_133)
13834              (= b_stocka_133 b_stockb_133)
13835              (or
13836                  (and
13837                      (= truck_loc_133 1)
13838                      (= truck_travel_time_133 32)
13839                  )
13840                  (and
13841                      (= truck_loc_133 2)
13842                      (= truck_travel_time_133 37)
13843                  )
13844              )
13845          )
13846      )
13847  )
13848  (<= truck_stock_133 318)
13849  (>= truck_stock_133 0)
13850  (= a_stockb_134 (- a_stocka_133 truck_travel_time_133))
13851  (= b_stockb_134 (- b_stocka_133 truck_travel_time_133))
13852  (= c_stockb_134 (- c_stocka_133 truck_travel_time_133))
13853  (and
13854      (=> (= truck_loc_133 0)
13855          (and
13856              (= a_stocka_134 a_stockb_134)
13857              (= b_stocka_134 b_stockb_134)
13858              (= c_stocka_134 c_stockb_134)
13859              (or
13860                  (and
13861                      (= truck_loc_134 1)
13862                      (= truck_travel_time_134 29)
13863                  )
13864                  (and
13865                      (= truck_loc_134 2)
13866                      (= truck_travel_time_134 21)
```

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```
13867              )
13868            )
13869          )
13870        )
13871        (=> (= truck_loc_133 1)
13872          (and
13873            (<= a_stocka_134 120)
13874            (= (+ truck_stock_134 a_stocka_134) (+ truck_stock_133 a_stockb_134))
13875            (= b_stocka_134 b_stockb_134)
13876            (= c_stocka_134 c_stockb_134)
13877            (or
13878              (and
13879                (= truck_loc_134 0)
13880                (= truck_travel_time_134 29)
13881              )
13882              (and
13883                (= truck_loc_134 2)
13884                (= truck_travel_time_134 17)
13885              )
13886              (and
13887                (= truck_loc_134 3)
13888                (= truck_travel_time_134 32)
13889              )
13890            )
13891          )
13892        )
13893        (=> (= truck_loc_133 2)
13894          (and
13895            (<= b_stocka_134 120)
13896            (= (+ truck_stock_134 b_stocka_134) (+ truck_stock_133 b_stockb_134))
13897            (= a_stocka_134 a_stockb_134)
13898            (= c_stocka_134 c_stockb_134)
13899            (or
13900              (and
13901                (= truck_loc_134 1)
13902                (= truck_travel_time_134 17)
13903              )
13904              (and
13905                (= truck_loc_134 0)
13906                (= truck_travel_time_134 21)
13907              )
13908              (and
13909                (= truck_loc_134 3)
13910                (= truck_travel_time_134 37)
13911              )
13912            )
13913          )
13914        )
13915        (=> (= truck_loc_133 3)
13916          (and
13917            (<= c_stocka_134 200)
13918            (= (+ truck_stock_134 c_stocka_134) (+ truck_stock_133 c_stockb_134))
13919            (= a_stocka_134 a_stockb_134)
13920            (= b_stocka_134 b_stockb_134)
13921            (or
13922              (and
13923                (= truck_loc_134 1)
13924                (= truck_travel_time_134 32)
13925              )
13926              (and
13927                (= truck_loc_134 2)
13928                (= truck_travel_time_134 37)
```

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```
13929             )
13930           )
13931         )
13932     )
13933  )
13934  (<= truck_stock_134 318)
13935  (>= truck_stock_134 0)
13936  (= a_stockb_135 (- a_stocka_134 truck_travel_time_134))
13937  (= b_stockb_135 (- b_stocka_134 truck_travel_time_134))
13938  (= c_stockb_135 (- c_stocka_134 truck_travel_time_134))
13939  (and
13940    (=> (= truck_loc_134 0)
13941      (and
13942        (= a_stocka_135 a_stockb_135)
13943        (= b_stocka_135 b_stockb_135)
13944        (= c_stocka_135 c_stockb_135)
13945        (or
13946          (and
13947            (= truck_loc_135 1)
13948            (= truck_travel_time_135 29)
13949          )
13950          (and
13951            (= truck_loc_135 2)
13952            (= truck_travel_time_135 21)
13953          )
13954        )
13955      )
13956    )
13957    (=> (= truck_loc_134 1)
13958      (and
13959        (<= a_stocka_135 120)
13960        (= (+ truck_stock_135 a_stocka_135) (+ truck_stock_134 a_stockb_135))
13961        (= b_stocka_135 b_stockb_135)
13962        (= c_stocka_135 c_stockb_135)
13963        (or
13964          (and
13965            (= truck_loc_135 0)
13966            (= truck_travel_time_135 29)
13967          )
13968          (and
13969            (= truck_loc_135 2)
13970            (= truck_travel_time_135 17)
13971          )
13972          (and
13973            (= truck_loc_135 3)
13974            (= truck_travel_time_135 32)
13975          )
13976        )
13977      )
13978    )
13979    (=> (= truck_loc_134 2)
13980      (and
13981        (<= b_stocka_135 120)
13982        (= (+ truck_stock_135 b_stocka_135) (+ truck_stock_134 b_stockb_135))
13983        (= a_stocka_135 a_stockb_135)
13984        (= c_stocka_135 c_stockb_135)
13985        (or
13986          (and
13987            (= truck_loc_135 1)
13988            (= truck_travel_time_135 17)
13989          )
13990          (and
```

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```
13991              (= truck_loc_135 0)
13992              (= truck_travel_time_135 21)
13993            )
13994          (and
13995              (= truck_loc_135 3)
13996              (= truck_travel_time_135 37)
13997          )
13998        )
13999      )
14000    )
14001    (=> (= truck_loc_134 3)
14002      (and
14003        (<= c_stocka_135 200)
14004        (= (+ truck_stock_135 c_stocka_135) (+ truck_stock_134 c_stockb_135))
14005        (= a_stocka_135 a_stockb_135)
14006        (= b_stocka_135 b_stockb_135)
14007        (or
14008          (and
14009              (= truck_loc_135 1)
14010              (= truck_travel_time_135 32)
14011          )
14012          (and
14013              (= truck_loc_135 2)
14014              (= truck_travel_time_135 37)
14015          )
14016        )
14017      )
14018    )
14019  )
14020  (<= truck_stock_135 318)
14021  (>= truck_stock_135 0)
14022  (= a_stockb_136 (- a_stocka_135 truck_travel_time_135))
14023  (= b_stockb_136 (- b_stocka_135 truck_travel_time_135))
14024  (= c_stockb_136 (- c_stocka_135 truck_travel_time_135))
14025  (and
14026    (=> (= truck_loc_135 0)
14027      (and
14028        (= a_stocka_136 a_stockb_136)
14029        (= b_stocka_136 b_stockb_136)
14030        (= c_stocka_136 c_stockb_136)
14031        (or
14032          (and
14033              (= truck_loc_136 1)
14034              (= truck_travel_time_136 29)
14035          )
14036          (and
14037              (= truck_loc_136 2)
14038              (= truck_travel_time_136 21)
14039          )
14040        )
14041      )
14042    )
14043    (=> (= truck_loc_135 1)
14044      (and
14045        (<= a_stocka_136 120)
14046        (= (+ truck_stock_136 a_stocka_136) (+ truck_stock_135 a_stockb_136))
14047        (= b_stocka_136 b_stockb_136)
14048        (= c_stocka_136 c_stockb_136)
14049        (or
14050          (and
14051              (= truck_loc_136 0)
14052              (= truck_travel_time_136 29)
```

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```
14053            )
14054          (and
14055            (= truck_loc_136 2)
14056            (= truck_travel_time_136 17)
14057          )
14058          (and
14059            (= truck_loc_136 3)
14060            (= truck_travel_time_136 32)
14061          )
14062        )
14063      )
14064    )
14065    (=> (= truck_loc_135 2)
14066      (and
14067        (<= b_stocka_136 120)
14068        (= (+ truck_stock_136 b_stocka_136) (+ truck_stock_135 b_stockb_136))
14069        (= a_stocka_136 a_stockb_136)
14070        (= c_stocka_136 c_stockb_136)
14071        (or
14072          (and
14073            (= truck_loc_136 1)
14074            (= truck_travel_time_136 17)
14075          )
14076          (and
14077            (= truck_loc_136 0)
14078            (= truck_travel_time_136 21)
14079          )
14080          (and
14081            (= truck_loc_136 3)
14082            (= truck_travel_time_136 37)
14083          )
14084        )
14085      )
14086    )
14087    (=> (= truck_loc_135 3)
14088      (and
14089        (<= c_stocka_136 200)
14090        (= (+ truck_stock_136 c_stocka_136) (+ truck_stock_135 c_stockb_136))
14091        (= a_stocka_136 a_stockb_136)
14092        (= b_stocka_136 b_stockb_136)
14093        (or
14094          (and
14095            (= truck_loc_136 1)
14096            (= truck_travel_time_136 32)
14097          )
14098          (and
14099            (= truck_loc_136 2)
14100            (= truck_travel_time_136 37)
14101          )
14102        )
14103      )
14104    )
14105  )
14106  (<= truck_stock_136 318)
14107  (>= truck_stock_136 0)
14108  (= a_stockb_137 (- a_stocka_136 truck_travel_time_136))
14109  (= b_stockb_137 (- b_stocka_136 truck_travel_time_136))
14110  (= c_stockb_137 (- c_stocka_136 truck_travel_time_136))
14111  (and
14112    (=> (= truck_loc_136 0)
14113      (and
14114        (= a_stocka_137 a_stockb_137)
```

```
14115        (= b_stocka_137 b_stockb_137)
14116        (= c_stocka_137 c_stockb_137)
14117        (or
14118          (and
14119            (= truck_loc_137 1)
14120            (= truck_travel_time_137 29)
14121          )
14122          (and
14123            (= truck_loc_137 2)
14124            (= truck_travel_time_137 21)
14125          )
14126        )
14127      )
14128    )
14129    (=> (= truck_loc_136 1)
14130      (and
14131        (<= a_stocka_137 120)
14132        (= (+ truck_stock_137 a_stocka_137) (+ truck_stock_136 a_stockb_137))
14133        (= b_stocka_137 b_stockb_137)
14134        (= c_stocka_137 c_stockb_137)
14135        (or
14136          (and
14137            (= truck_loc_137 0)
14138            (= truck_travel_time_137 29)
14139          )
14140          (and
14141            (= truck_loc_137 2)
14142            (= truck_travel_time_137 17)
14143          )
14144          (and
14145            (= truck_loc_137 3)
14146            (= truck_travel_time_137 32)
14147          )
14148        )
14149      )
14150    )
14151    (=> (= truck_loc_136 2)
14152      (and
14153        (<= b_stocka_137 120)
14154        (= (+ truck_stock_137 b_stocka_137) (+ truck_stock_136 b_stockb_137))
14155        (= a_stocka_137 a_stockb_137)
14156        (= c_stocka_137 c_stockb_137)
14157        (or
14158          (and
14159            (= truck_loc_137 1)
14160            (= truck_travel_time_137 17)
14161          )
14162          (and
14163            (= truck_loc_137 0)
14164            (= truck_travel_time_137 21)
14165          )
14166          (and
14167            (= truck_loc_137 3)
14168            (= truck_travel_time_137 37)
14169          )
14170        )
14171      )
14172    )
14173    (=> (= truck_loc_136 3)
14174      (and
14175        (<= c_stocka_137 200)
14176        (= (+ truck_stock_137 c_stocka_137) (+ truck_stock_136 c_stockb_137))
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```
14177        (= a_stocka_137 a_stockb_137)
14178        (= b_stocka_137 b_stockb_137)
14179        (or
14180          (and
14181            (= truck_loc_137 1)
14182            (= truck_travel_time_137 32)
14183          )
14184          (and
14185            (= truck_loc_137 2)
14186            (= truck_travel_time_137 37)
14187          )
14188        )
14189      )
14190    )
14191  )
14192  (<= truck_stock_137 318)
14193  (>= truck_stock_137 0)
14194  (= a_stockb_138 (- a_stocka_137 truck_travel_time_137))
14195  (= b_stockb_138 (- b_stocka_137 truck_travel_time_137))
14196  (= c_stockb_138 (- c_stocka_137 truck_travel_time_137))
14197  (and
14198    (=> (= truck_loc_137 0)
14199      (and
14200        (= a_stocka_138 a_stockb_138)
14201        (= b_stocka_138 b_stockb_138)
14202        (= c_stocka_138 c_stockb_138)
14203        (or
14204          (and
14205            (= truck_loc_138 1)
14206            (= truck_travel_time_138 29)
14207          )
14208          (and
14209            (= truck_loc_138 2)
14210            (= truck_travel_time_138 21)
14211          )
14212        )
14213      )
14214    )
14215    (=> (= truck_loc_137 1)
14216      (and
14217        (<= a_stocka_138 120)
14218        (= (+ truck_stock_138 a_stocka_138) (+ truck_stock_137 a_stockb_138))
14219        (= b_stocka_138 b_stockb_138)
14220        (= c_stocka_138 c_stockb_138)
14221        (or
14222          (and
14223            (= truck_loc_138 0)
14224            (= truck_travel_time_138 29)
14225          )
14226          (and
14227            (= truck_loc_138 2)
14228            (= truck_travel_time_138 17)
14229          )
14230          (and
14231            (= truck_loc_138 3)
14232            (= truck_travel_time_138 32)
14233          )
14234        )
14235      )
14236    )
14237    (=> (= truck_loc_137 2)
14238      (and
```

```
14239          (<= b_stocka_138 120)
14240          (= (+ truck_stock_138 b_stocka_138) (+ truck_stock_137 b_stockb_138))
14241          (= a_stocka_138 a_stockb_138)
14242          (= c_stocka_138 c_stockb_138)
14243          (or
14244            (and
14245              (= truck_loc_138 1)
14246              (= truck_travel_time_138 17)
14247            )
14248            (and
14249              (= truck_loc_138 0)
14250              (= truck_travel_time_138 21)
14251            )
14252            (and
14253              (= truck_loc_138 3)
14254              (= truck_travel_time_138 37)
14255            )
14256          )
14257        )
14258    )
14259    (=> (= truck_loc_137 3)
14260        (and
14261          (<= c_stocka_138 200)
14262          (= (+ truck_stock_138 c_stocka_138) (+ truck_stock_137 c_stockb_138))
14263          (= a_stocka_138 a_stockb_138)
14264          (= b_stocka_138 b_stockb_138)
14265          (or
14266            (and
14267              (= truck_loc_138 1)
14268              (= truck_travel_time_138 32)
14269            )
14270            (and
14271              (= truck_loc_138 2)
14272              (= truck_travel_time_138 37)
14273            )
14274          )
14275        )
14276    )
14277  )
14278  (<= truck_stock_138 318)
14279  (>= truck_stock_138 0)
14280  (= a_stockb_139 (- a_stocka_138 truck_travel_time_138))
14281  (= b_stockb_139 (- b_stocka_138 truck_travel_time_138))
14282  (= c_stockb_139 (- c_stocka_138 truck_travel_time_138))
14283  (and
14284    (=> (= truck_loc_138 0)
14285        (and
14286          (= a_stocka_139 a_stockb_139)
14287          (= b_stocka_139 b_stockb_139)
14288          (= c_stocka_139 c_stockb_139)
14289          (or
14290            (and
14291              (= truck_loc_139 1)
14292              (= truck_travel_time_139 29)
14293            )
14294            (and
14295              (= truck_loc_139 2)
14296              (= truck_travel_time_139 21)
14297            )
14298          )
14299        )
14300    )
```

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```
14301    (=> (= truck_loc_138 1)
14302      (and
14303        (<= a_stocka_139 120)
14304        (= (+ truck_stock_139 a_stocka_139) (+ truck_stock_138 a_stockb_139))
14305        (= b_stocka_139 b_stockb_139)
14306        (= c_stocka_139 c_stockb_139)
14307        (or
14308          (and
14309            (= truck_loc_139 0)
14310            (= truck_travel_time_139 29)
14311          )
14312          (and
14313            (= truck_loc_139 2)
14314            (= truck_travel_time_139 17)
14315          )
14316          (and
14317            (= truck_loc_139 3)
14318            (= truck_travel_time_139 32)
14319          )
14320        )
14321      )
14322    )
14323    (=> (= truck_loc_138 2)
14324      (and
14325        (<= b_stocka_139 120)
14326        (= (+ truck_stock_139 b_stocka_139) (+ truck_stock_138 b_stockb_139))
14327        (= a_stocka_139 a_stockb_139)
14328        (= c_stocka_139 c_stockb_139)
14329        (or
14330          (and
14331            (= truck_loc_139 1)
14332            (= truck_travel_time_139 17)
14333          )
14334          (and
14335            (= truck_loc_139 0)
14336            (= truck_travel_time_139 21)
14337          )
14338          (and
14339            (= truck_loc_139 3)
14340            (= truck_travel_time_139 37)
14341          )
14342        )
14343      )
14344    )
14345    (=> (= truck_loc_138 3)
14346      (and
14347        (<= c_stocka_139 200)
14348        (= (+ truck_stock_139 c_stocka_139) (+ truck_stock_138 c_stockb_139))
14349        (= a_stocka_139 a_stockb_139)
14350        (= b_stocka_139 b_stockb_139)
14351        (or
14352          (and
14353            (= truck_loc_139 1)
14354            (= truck_travel_time_139 32)
14355          )
14356          (and
14357            (= truck_loc_139 2)
14358            (= truck_travel_time_139 37)
14359          )
14360        )
14361      )
14362    )
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```
14363  )
14364  (<= truck_stock_139 318)
14365  (>= truck_stock_139 0)
14366  (= a_stockb_140 (- a_stocka_139 truck_travel_time_139))
14367  (= b_stockb_140 (- b_stocka_139 truck_travel_time_139))
14368  (= c_stockb_140 (- c_stocka_139 truck_travel_time_139))
14369  (and
14370    (=> (= truck_loc_139 0)
14371      (and
14372        (= a_stocka_140 a_stockb_140)
14373        (= b_stocka_140 b_stockb_140)
14374        (= c_stocka_140 c_stockb_140)
14375        (or
14376          (and
14377            (= truck_loc_140 1)
14378            (= truck_travel_time_140 29)
14379          )
14380          (and
14381            (= truck_loc_140 2)
14382            (= truck_travel_time_140 21)
14383          )
14384        )
14385      )
14386    )
14387    (=> (= truck_loc_139 1)
14388      (and
14389        (<= a_stocka_140 120)
14390        (= (+ truck_stock_140 a_stocka_140) (+ truck_stock_139 a_stockb_140))
14391        (= b_stocka_140 b_stockb_140)
14392        (= c_stocka_140 c_stockb_140)
14393        (or
14394          (and
14395            (= truck_loc_140 0)
14396            (= truck_travel_time_140 29)
14397          )
14398          (and
14399            (= truck_loc_140 2)
14400            (= truck_travel_time_140 17)
14401          )
14402          (and
14403            (= truck_loc_140 3)
14404            (= truck_travel_time_140 32)
14405          )
14406        )
14407      )
14408    )
14409    (=> (= truck_loc_139 2)
14410      (and
14411        (<= b_stocka_140 120)
14412        (= (+ truck_stock_140 b_stocka_140) (+ truck_stock_139 b_stockb_140))
14413        (= a_stocka_140 a_stockb_140)
14414        (= c_stocka_140 c_stockb_140)
14415        (or
14416          (and
14417            (= truck_loc_140 1)
14418            (= truck_travel_time_140 17)
14419          )
14420          (and
14421            (= truck_loc_140 0)
14422            (= truck_travel_time_140 21)
14423          )
14424          (and
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14425              (= truck_loc_140 3)
14426              (= truck_travel_time_140 37)
14427            )
14428          )
14429        )
14430      )
14431      (=> (= truck_loc_139 3)
14432        (and
14433          (<= c_stocka_140 200)
14434          (= (+ truck_stock_140 c_stocka_140) (+ truck_stock_139 c_stockb_140))
14435          (= a_stocka_140 a_stockb_140)
14436          (= b_stocka_140 b_stockb_140)
14437          (or
14438            (and
14439              (= truck_loc_140 1)
14440              (= truck_travel_time_140 32)
14441            )
14442            (and
14443              (= truck_loc_140 2)
14444              (= truck_travel_time_140 37)
14445            )
14446          )
14447        )
14448      )
14449    )
14450    (<= truck_stock_140 318)
14451    (>= truck_stock_140 0)
14452    (= a_stockb_141 (- a_stocka_140 truck_travel_time_140))
14453    (= b_stockb_141 (- b_stocka_140 truck_travel_time_140))
14454    (= c_stockb_141 (- c_stocka_140 truck_travel_time_140))
14455    (and
14456      (=> (= truck_loc_140 0)
14457        (and
14458          (= a_stocka_141 a_stockb_141)
14459          (= b_stocka_141 b_stockb_141)
14460          (= c_stocka_141 c_stockb_141)
14461          (or
14462            (and
14463              (= truck_loc_141 1)
14464              (= truck_travel_time_141 29)
14465            )
14466            (and
14467              (= truck_loc_141 2)
14468              (= truck_travel_time_141 21)
14469            )
14470          )
14471        )
14472      )
14473      (=> (= truck_loc_140 1)
14474        (and
14475          (<= a_stocka_141 120)
14476          (= (+ truck_stock_141 a_stocka_141) (+ truck_stock_140 a_stockb_141))
14477          (= b_stocka_141 b_stockb_141)
14478          (= c_stocka_141 c_stockb_141)
14479          (or
14480            (and
14481              (= truck_loc_141 0)
14482              (= truck_travel_time_141 29)
14483            )
14484            (and
14485              (= truck_loc_141 2)
14486              (= truck_travel_time_141 17)
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14487            )
14488          (and
14489            (= truck_loc_141 3)
14490            (= truck_travel_time_141 32)
14491          )
14492        )
14493      )
14494    )
14495    (=> (= truck_loc_140 2)
14496      (and
14497        (<= b_stocka_141 120)
14498        (= (+ truck_stock_141 b_stocka_141) (+ truck_stock_140 b_stockb_141))
14499        (= a_stocka_141 a_stockb_141)
14500        (= c_stocka_141 c_stockb_141)
14501        (or
14502          (and
14503            (= truck_loc_141 1)
14504            (= truck_travel_time_141 17)
14505          )
14506          (and
14507            (= truck_loc_141 0)
14508            (= truck_travel_time_141 21)
14509          )
14510          (and
14511            (= truck_loc_141 3)
14512            (= truck_travel_time_141 37)
14513          )
14514        )
14515      )
14516    )
14517    (=> (= truck_loc_140 3)
14518      (and
14519        (<= c_stocka_141 200)
14520        (= (+ truck_stock_141 c_stocka_141) (+ truck_stock_140 c_stockb_141))
14521        (= a_stocka_141 a_stockb_141)
14522        (= b_stocka_141 b_stockb_141)
14523        (or
14524          (and
14525            (= truck_loc_141 1)
14526            (= truck_travel_time_141 32)
14527          )
14528          (and
14529            (= truck_loc_141 2)
14530            (= truck_travel_time_141 37)
14531          )
14532        )
14533      )
14534    )
14535  )
14536  (<= truck_stock_141 318)
14537  (>= truck_stock_141 0)
14538  (= a_stockb_142 (- a_stocka_141 truck_travel_time_141))
14539  (= b_stockb_142 (- b_stocka_141 truck_travel_time_141))
14540  (= c_stockb_142 (- c_stocka_141 truck_travel_time_141))
14541  (and
14542    (=> (= truck_loc_141 0)
14543      (and
14544        (= a_stocka_142 a_stockb_142)
14545        (= b_stocka_142 b_stockb_142)
14546        (= c_stocka_142 c_stockb_142)
14547        (or
14548          (and
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14549          (= truck_loc_142 1)
14550          (= truck_travel_time_142 29)
14551        )
14552      (and
14553        (= truck_loc_142 2)
14554        (= truck_travel_time_142 21)
14555      )
14556    )
14557  )
14558  )
14559  (=> (= truck_loc_141 1)
14560    (and
14561      (<= a_stocka_142 120)
14562      (= (+ truck_stock_142 a_stocka_142) (+ truck_stock_141 a_stockb_142))
14563      (= b_stocka_142 b_stockb_142)
14564      (= c_stocka_142 c_stockb_142)
14565      (or
14566        (and
14567          (= truck_loc_142 0)
14568          (= truck_travel_time_142 29)
14569        )
14570        (and
14571          (= truck_loc_142 2)
14572          (= truck_travel_time_142 17)
14573        )
14574        (and
14575          (= truck_loc_142 3)
14576          (= truck_travel_time_142 32)
14577        )
14578      )
14579    )
14580  )
14581  (=> (= truck_loc_141 2)
14582    (and
14583      (<= b_stocka_142 120)
14584      (= (+ truck_stock_142 b_stocka_142) (+ truck_stock_141 b_stockb_142))
14585      (= a_stocka_142 a_stockb_142)
14586      (= c_stocka_142 c_stockb_142)
14587      (or
14588        (and
14589          (= truck_loc_142 1)
14590          (= truck_travel_time_142 17)
14591        )
14592        (and
14593          (= truck_loc_142 0)
14594          (= truck_travel_time_142 21)
14595        )
14596        (and
14597          (= truck_loc_142 3)
14598          (= truck_travel_time_142 37)
14599        )
14600      )
14601    )
14602  )
14603  (=> (= truck_loc_141 3)
14604    (and
14605      (<= c_stocka_142 200)
14606      (= (+ truck_stock_142 c_stocka_142) (+ truck_stock_141 c_stockb_142))
14607      (= a_stocka_142 a_stockb_142)
14608      (= b_stocka_142 b_stockb_142)
14609      (or
14610        (and
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14611            (= truck_loc_142 1)
14612            (= truck_travel_time_142 32)
14613          )
14614        (and
14615          (= truck_loc_142 2)
14616          (= truck_travel_time_142 37)
14617        )
14618      )
14619    )
14620  )
14621 )
14622 (<= truck_stock_142 318)
14623 (>= truck_stock_142 0)
14624 (= a_stockb_143 (- a_stocka_142 truck_travel_time_142))
14625 (= b_stockb_143 (- b_stocka_142 truck_travel_time_142))
14626 (= c_stockb_143 (- c_stocka_142 truck_travel_time_142))
14627 (and
14628   (=> (= truck_loc_142 0)
14629     (and
14630       (= a_stocka_143 a_stockb_143)
14631       (= b_stocka_143 b_stockb_143)
14632       (= c_stocka_143 c_stockb_143)
14633       (or
14634         (and
14635           (= truck_loc_143 1)
14636           (= truck_travel_time_143 29)
14637         )
14638         (and
14639           (= truck_loc_143 2)
14640           (= truck_travel_time_143 21)
14641         )
14642       )
14643     )
14644   )
14645   (=> (= truck_loc_142 1)
14646     (and
14647       (<= a_stocka_143 120)
14648       (= (+ truck_stock_143 a_stocka_143) (+ truck_stock_142 a_stockb_143))
14649       (= b_stocka_143 b_stockb_143)
14650       (= c_stocka_143 c_stockb_143)
14651       (or
14652         (and
14653           (= truck_loc_143 0)
14654           (= truck_travel_time_143 29)
14655         )
14656         (and
14657           (= truck_loc_143 2)
14658           (= truck_travel_time_143 17)
14659         )
14660         (and
14661           (= truck_loc_143 3)
14662           (= truck_travel_time_143 32)
14663         )
14664       )
14665     )
14666   )
14667   (=> (= truck_loc_142 2)
14668     (and
14669       (<= b_stocka_143 120)
14670       (= (+ truck_stock_143 b_stocka_143) (+ truck_stock_142 b_stockb_143))
14671       (= a_stocka_143 a_stockb_143)
14672       (= c_stocka_143 c_stockb_143)
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14673          (or
14674            (and
14675              (= truck_loc_143 1)
14676              (= truck_travel_time_143 17)
14677            )
14678            (and
14679              (= truck_loc_143 0)
14680              (= truck_travel_time_143 21)
14681            )
14682            (and
14683              (= truck_loc_143 3)
14684              (= truck_travel_time_143 37)
14685            )
14686          )
14687        )
14688      )
14689      (=> (= truck_loc_142 3)
14690        (and
14691          (<= c_stocka_143 200)
14692          (= (+ truck_stock_143 c_stocka_143) (+ truck_stock_142 c_stockb_143))
14693          (= a_stocka_143 a_stockb_143)
14694          (= b_stocka_143 b_stockb_143)
14695          (or
14696            (and
14697              (= truck_loc_143 1)
14698              (= truck_travel_time_143 32)
14699            )
14700            (and
14701              (= truck_loc_143 2)
14702              (= truck_travel_time_143 37)
14703            )
14704          )
14705        )
14706      )
14707    )
14708    (<= truck_stock_143 318)
14709    (>= truck_stock_143 0)
14710    (= a_stockb_144 (- a_stocka_143 truck_travel_time_143))
14711    (= b_stockb_144 (- b_stocka_143 truck_travel_time_143))
14712    (= c_stockb_144 (- c_stocka_143 truck_travel_time_143))
14713    (and
14714      (=> (= truck_loc_143 0)
14715        (and
14716          (= a_stocka_144 a_stockb_144)
14717          (= b_stocka_144 b_stockb_144)
14718          (= c_stocka_144 c_stockb_144)
14719          (or
14720            (and
14721              (= truck_loc_144 1)
14722              (= truck_travel_time_144 29)
14723            )
14724            (and
14725              (= truck_loc_144 2)
14726              (= truck_travel_time_144 21)
14727            )
14728          )
14729        )
14730      )
14731      (=> (= truck_loc_143 1)
14732        (and
14733          (<= a_stocka_144 120)
14734          (= (+ truck_stock_144 a_stocka_144) (+ truck_stock_143 a_stockb_144))
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14735        (= b_stocka_144 b_stockb_144)
14736        (= c_stocka_144 c_stockb_144)
14737        (or
14738          (and
14739            (= truck_loc_144 0)
14740            (= truck_travel_time_144 29)
14741          )
14742          (and
14743            (= truck_loc_144 2)
14744            (= truck_travel_time_144 17)
14745          )
14746          (and
14747            (= truck_loc_144 3)
14748            (= truck_travel_time_144 32)
14749          )
14750        )
14751      )
14752    )
14753    (=> (= truck_loc_143 2)
14754      (and
14755        (<= b_stocka_144 120)
14756        (= (+ truck_stock_144 b_stocka_144) (+ truck_stock_143 b_stockb_144))
14757        (= a_stocka_144 a_stockb_144)
14758        (= c_stocka_144 c_stockb_144)
14759        (or
14760          (and
14761            (= truck_loc_144 1)
14762            (= truck_travel_time_144 17)
14763          )
14764          (and
14765            (= truck_loc_144 0)
14766            (= truck_travel_time_144 21)
14767          )
14768          (and
14769            (= truck_loc_144 3)
14770            (= truck_travel_time_144 37)
14771          )
14772        )
14773      )
14774    )
14775    (=> (= truck_loc_143 3)
14776      (and
14777        (<= c_stocka_144 200)
14778        (= (+ truck_stock_144 c_stocka_144) (+ truck_stock_143 c_stockb_144))
14779        (= a_stocka_144 a_stockb_144)
14780        (= b_stocka_144 b_stockb_144)
14781        (or
14782          (and
14783            (= truck_loc_144 1)
14784            (= truck_travel_time_144 32)
14785          )
14786          (and
14787            (= truck_loc_144 2)
14788            (= truck_travel_time_144 37)
14789          )
14790        )
14791      )
14792    )
14793  )
14794  (<= truck_stock_144 318)
14795  (>= truck_stock_144 0)
14796  (= a_stockb_145 (- a_stocka_144 truck_travel_time_144))
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14797   (= b_stockb_145 (- b_stocka_144 truck_travel_time_144))
14798   (= c_stockb_145 (- c_stocka_144 truck_travel_time_144))
14799   (and
14800     (=> (= truck_loc_144 0)
14801       (and
14802         (= a_stocka_145 a_stockb_145)
14803         (= b_stocka_145 b_stockb_145)
14804         (= c_stocka_145 c_stockb_145)
14805         (or
14806           (and
14807             (= truck_loc_145 1)
14808             (= truck_travel_time_145 29)
14809           )
14810           (and
14811             (= truck_loc_145 2)
14812             (= truck_travel_time_145 21)
14813           )
14814         )
14815       )
14816     )
14817     (=> (= truck_loc_144 1)
14818       (and
14819         (<= a_stocka_145 120)
14820         (= (+ truck_stock_145 a_stocka_145) (+ truck_stock_144 a_stockb_145))
14821         (= b_stocka_145 b_stockb_145)
14822         (= c_stocka_145 c_stockb_145)
14823         (or
14824           (and
14825             (= truck_loc_145 0)
14826             (= truck_travel_time_145 29)
14827           )
14828           (and
14829             (= truck_loc_145 2)
14830             (= truck_travel_time_145 17)
14831           )
14832           (and
14833             (= truck_loc_145 3)
14834             (= truck_travel_time_145 32)
14835           )
14836         )
14837       )
14838     )
14839     (=> (= truck_loc_144 2)
14840       (and
14841         (<= b_stocka_145 120)
14842         (= (+ truck_stock_145 b_stocka_145) (+ truck_stock_144 b_stockb_145))
14843         (= a_stocka_145 a_stockb_145)
14844         (= c_stocka_145 c_stockb_145)
14845         (or
14846           (and
14847             (= truck_loc_145 1)
14848             (= truck_travel_time_145 17)
14849           )
14850           (and
14851             (= truck_loc_145 0)
14852             (= truck_travel_time_145 21)
14853           )
14854           (and
14855             (= truck_loc_145 3)
14856             (= truck_travel_time_145 37)
14857           )
14858         )
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14859         )
14860      )
14861     (=> (= truck_loc_144 3)
14862       (and
14863         (<= c_stocka_145 200)
14864         (= (+ truck_stock_145 c_stocka_145) (+ truck_stock_144 c_stockb_145))
14865         (= a_stocka_145 a_stockb_145)
14866         (= b_stocka_145 b_stockb_145)
14867         (or
14868           (and
14869             (= truck_loc_145 1)
14870             (= truck_travel_time_145 32)
14871           )
14872           (and
14873             (= truck_loc_145 2)
14874             (= truck_travel_time_145 37)
14875           )
14876         )
14877       )
14878     )
14879   )
14880   (<= truck_stock_145 318)
14881   (>= truck_stock_145 0)
14882   (= a_stockb_146 (- a_stocka_145 truck_travel_time_145))
14883   (= b_stockb_146 (- b_stocka_145 truck_travel_time_145))
14884   (= c_stockb_146 (- c_stocka_145 truck_travel_time_145))
14885   (and
14886     (=> (= truck_loc_145 0)
14887       (and
14888         (= a_stocka_146 a_stockb_146)
14889         (= b_stocka_146 b_stockb_146)
14890         (= c_stocka_146 c_stockb_146)
14891         (or
14892           (and
14893             (= truck_loc_146 1)
14894             (= truck_travel_time_146 29)
14895           )
14896           (and
14897             (= truck_loc_146 2)
14898             (= truck_travel_time_146 21)
14899           )
14900         )
14901       )
14902     )
14903     (=> (= truck_loc_145 1)
14904       (and
14905         (<= a_stocka_146 120)
14906         (= (+ truck_stock_146 a_stocka_146) (+ truck_stock_145 a_stockb_146))
14907         (= b_stocka_146 b_stockb_146)
14908         (= c_stocka_146 c_stockb_146)
14909         (or
14910           (and
14911             (= truck_loc_146 0)
14912             (= truck_travel_time_146 29)
14913           )
14914           (and
14915             (= truck_loc_146 2)
14916             (= truck_travel_time_146 17)
14917           )
14918           (and
14919             (= truck_loc_146 3)
14920             (= truck_travel_time_146 32)
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14921             )
14922           )
14923         )
14924     )
14925     (=> (= truck_loc_145 2)
14926       (and
14927         (<= b_stocka_146 120)
14928         (= (+ truck_stock_146 b_stocka_146) (+ truck_stock_145 b_stockb_146))
14929         (= a_stocka_146 a_stockb_146)
14930         (= c_stocka_146 c_stockb_146)
14931         (or
14932           (and
14933             (= truck_loc_146 1)
14934             (= truck_travel_time_146 17)
14935           )
14936           (and
14937             (= truck_loc_146 0)
14938             (= truck_travel_time_146 21)
14939           )
14940           (and
14941             (= truck_loc_146 3)
14942             (= truck_travel_time_146 37)
14943           )
14944         )
14945       )
14946     )
14947     (=> (= truck_loc_145 3)
14948       (and
14949         (<= c_stocka_146 200)
14950         (= (+ truck_stock_146 c_stocka_146) (+ truck_stock_145 c_stockb_146))
14951         (= a_stocka_146 a_stockb_146)
14952         (= b_stocka_146 b_stockb_146)
14953         (or
14954           (and
14955             (= truck_loc_146 1)
14956             (= truck_travel_time_146 32)
14957           )
14958           (and
14959             (= truck_loc_146 2)
14960             (= truck_travel_time_146 37)
14961           )
14962         )
14963       )
14964     )
14965 )
14966 (<= truck_stock_146 318)
14967 (>= truck_stock_146 0)
14968 (= a_stockb_147 (- a_stocka_146 truck_travel_time_146))
14969 (= b_stockb_147 (- b_stocka_146 truck_travel_time_146))
14970 (= c_stockb_147 (- c_stocka_146 truck_travel_time_146))
14971 (and
14972     (=> (= truck_loc_146 0)
14973       (and
14974         (= a_stocka_147 a_stockb_147)
14975         (= b_stocka_147 b_stockb_147)
14976         (= c_stocka_147 c_stockb_147)
14977         (or
14978           (and
14979             (= truck_loc_147 1)
14980             (= truck_travel_time_147 29)
14981           )
14982           (and
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14983          (= truck_loc_147 2)
14984          (= truck_travel_time_147 21)
14985        )
14986      )
14987    )
14988  )
14989  (=> (= truck_loc_146 1)
14990    (and
14991      (<= a_stocka_147 120)
14992      (= (+ truck_stock_147 a_stocka_147) (+ truck_stock_146 a_stockb_147))
14993      (= b_stocka_147 b_stockb_147)
14994      (= c_stocka_147 c_stockb_147)
14995      (or
14996        (and
14997          (= truck_loc_147 0)
14998          (= truck_travel_time_147 29)
14999        )
15000        (and
15001          (= truck_loc_147 2)
15002          (= truck_travel_time_147 17)
15003        )
15004        (and
15005          (= truck_loc_147 3)
15006          (= truck_travel_time_147 32)
15007        )
15008      )
15009    )
15010  )
15011  (=> (= truck_loc_146 2)
15012    (and
15013      (<= b_stocka_147 120)
15014      (= (+ truck_stock_147 b_stocka_147) (+ truck_stock_146 b_stockb_147))
15015      (= a_stocka_147 a_stockb_147)
15016      (= c_stocka_147 c_stockb_147)
15017      (or
15018        (and
15019          (= truck_loc_147 1)
15020          (= truck_travel_time_147 17)
15021        )
15022        (and
15023          (= truck_loc_147 0)
15024          (= truck_travel_time_147 21)
15025        )
15026        (and
15027          (= truck_loc_147 3)
15028          (= truck_travel_time_147 37)
15029        )
15030      )
15031    )
15032  )
15033  (=> (= truck_loc_146 3)
15034    (and
15035      (<= c_stocka_147 200)
15036      (= (+ truck_stock_147 c_stocka_147) (+ truck_stock_146 c_stockb_147))
15037      (= a_stocka_147 a_stockb_147)
15038      (= b_stocka_147 b_stockb_147)
15039      (or
15040        (and
15041          (= truck_loc_147 1)
15042          (= truck_travel_time_147 32)
15043        )
15044        (and
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```
15045              (= truck_loc_147 2)
15046              (= truck_travel_time_147 37)
15047            )
15048          )
15049        )
15050      )
15051    )
15052    (<= truck_stock_147 318)
15053    (>= truck_stock_147 0)
15054    (= a_stockb_148 (- a_stocka_147 truck_travel_time_147))
15055    (= b_stockb_148 (- b_stocka_147 truck_travel_time_147))
15056    (= c_stockb_148 (- c_stocka_147 truck_travel_time_147))
15057    (and
15058      (=> (= truck_loc_147 0)
15059        (and
15060          (= a_stocka_148 a_stockb_148)
15061          (= b_stocka_148 b_stockb_148)
15062          (= c_stocka_148 c_stockb_148)
15063          (or
15064            (and
15065              (= truck_loc_148 1)
15066              (= truck_travel_time_148 29)
15067            )
15068            (and
15069              (= truck_loc_148 2)
15070              (= truck_travel_time_148 21)
15071            )
15072          )
15073        )
15074      )
15075      (=> (= truck_loc_147 1)
15076        (and
15077          (<= a_stocka_148 120)
15078          (= (+ truck_stock_148 a_stocka_148) (+ truck_stock_147 a_stockb_148))
15079          (= b_stocka_148 b_stockb_148)
15080          (= c_stocka_148 c_stockb_148)
15081          (or
15082            (and
15083              (= truck_loc_148 0)
15084              (= truck_travel_time_148 29)
15085            )
15086            (and
15087              (= truck_loc_148 2)
15088              (= truck_travel_time_148 17)
15089            )
15090            (and
15091              (= truck_loc_148 3)
15092              (= truck_travel_time_148 32)
15093            )
15094          )
15095        )
15096      )
15097      (=> (= truck_loc_147 2)
15098        (and
15099          (<= b_stocka_148 120)
15100          (= (+ truck_stock_148 b_stocka_148) (+ truck_stock_147 b_stockb_148))
15101          (= a_stocka_148 a_stockb_148)
15102          (= c_stocka_148 c_stockb_148)
15103          (or
15104            (and
15105              (= truck_loc_148 1)
15106              (= truck_travel_time_148 17)
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15107            )
15108          (and
15109            (= truck_loc_148 0)
15110            (= truck_travel_time_148 21)
15111          )
15112          (and
15113            (= truck_loc_148 3)
15114            (= truck_travel_time_148 37)
15115          )
15116        )
15117      )
15118    )
15119    (=> (= truck_loc_147 3)
15120      (and
15121        (<= c_stocka_148 200)
15122        (= (+ truck_stock_148 c_stocka_148) (+ truck_stock_147 c_stockb_148))
15123        (= a_stocka_148 a_stockb_148)
15124        (= b_stocka_148 b_stockb_148)
15125        (or
15126          (and
15127            (= truck_loc_148 1)
15128            (= truck_travel_time_148 32)
15129          )
15130          (and
15131            (= truck_loc_148 2)
15132            (= truck_travel_time_148 37)
15133          )
15134        )
15135      )
15136    )
15137  )
15138  (<= truck_stock_148 318)
15139  (>= truck_stock_148 0)
15140  (= a_stockb_149 (- a_stocka_148 truck_travel_time_148))
15141  (= b_stockb_149 (- b_stocka_148 truck_travel_time_148))
15142  (= c_stockb_149 (- c_stocka_148 truck_travel_time_148))
15143  (and
15144    (=> (= truck_loc_148 0)
15145      (and
15146        (= a_stocka_149 a_stockb_149)
15147        (= b_stocka_149 b_stockb_149)
15148        (= c_stocka_149 c_stockb_149)
15149        (or
15150          (and
15151            (= truck_loc_149 1)
15152            (= truck_travel_time_149 29)
15153          )
15154          (and
15155            (= truck_loc_149 2)
15156            (= truck_travel_time_149 21)
15157          )
15158        )
15159      )
15160    )
15161    (=> (= truck_loc_148 1)
15162      (and
15163        (<= a_stocka_149 120)
15164        (= (+ truck_stock_149 a_stocka_149) (+ truck_stock_148 a_stockb_149))
15165        (= b_stocka_149 b_stockb_149)
15166        (= c_stocka_149 c_stockb_149)
15167        (or
15168          (and
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15169              (= truck_loc_149 0)
15170              (= truck_travel_time_149 29)
15171            )
15172          (and
15173            (= truck_loc_149 2)
15174            (= truck_travel_time_149 17)
15175          )
15176          (and
15177            (= truck_loc_149 3)
15178            (= truck_travel_time_149 32)
15179          )
15180        )
15181      )
15182    )
15183    (=> (= truck_loc_148 2)
15184      (and
15185        (<= b_stocka_149 120)
15186        (= (+ truck_stock_149 b_stocka_149) (+ truck_stock_148 b_stockb_149))
15187        (= a_stocka_149 a_stockb_149)
15188        (= c_stocka_149 c_stockb_149)
15189        (or
15190          (and
15191            (= truck_loc_149 1)
15192            (= truck_travel_time_149 17)
15193          )
15194          (and
15195            (= truck_loc_149 0)
15196            (= truck_travel_time_149 21)
15197          )
15198          (and
15199            (= truck_loc_149 3)
15200            (= truck_travel_time_149 37)
15201          )
15202        )
15203      )
15204    )
15205    (=> (= truck_loc_148 3)
15206      (and
15207        (<= c_stocka_149 200)
15208        (= (+ truck_stock_149 c_stocka_149) (+ truck_stock_148 c_stockb_149))
15209        (= a_stocka_149 a_stockb_149)
15210        (= b_stocka_149 b_stockb_149)
15211        (or
15212          (and
15213            (= truck_loc_149 1)
15214            (= truck_travel_time_149 32)
15215          )
15216          (and
15217            (= truck_loc_149 2)
15218            (= truck_travel_time_149 37)
15219          )
15220        )
15221      )
15222    )
15223  )
15224  (<= truck_stock_149 318)
15225  (>= truck_stock_149 0)
15226  (= a_stockb_150 (- a_stocka_149 truck_travel_time_149))
15227  (= b_stockb_150 (- b_stocka_149 truck_travel_time_149))
15228  (= c_stockb_150 (- c_stocka_149 truck_travel_time_149))
15229  (and
15230    (=> (= truck_loc_149 0)
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15231       (and
15232         (= a_stocka_150 a_stockb_150)
15233         (= b_stocka_150 b_stockb_150)
15234         (= c_stocka_150 c_stockb_150)
15235         (or
15236           (and
15237             (= truck_loc_150 1)
15238             (= truck_travel_time_150 29)
15239           )
15240           (and
15241             (= truck_loc_150 2)
15242             (= truck_travel_time_150 21)
15243           )
15244         )
15245       )
15246     )
15247     (=> (= truck_loc_149 1)
15248       (and
15249         (<= a_stocka_150 120)
15250         (= (+ truck_stock_150 a_stocka_150) (+ truck_stock_149 a_stockb_150))
15251         (= b_stocka_150 b_stockb_150)
15252         (= c_stocka_150 c_stockb_150)
15253         (or
15254           (and
15255             (= truck_loc_150 0)
15256             (= truck_travel_time_150 29)
15257           )
15258           (and
15259             (= truck_loc_150 2)
15260             (= truck_travel_time_150 17)
15261           )
15262           (and
15263             (= truck_loc_150 3)
15264             (= truck_travel_time_150 32)
15265           )
15266         )
15267       )
15268     )
15269     (=> (= truck_loc_149 2)
15270       (and
15271         (<= b_stocka_150 120)
15272         (= (+ truck_stock_150 b_stocka_150) (+ truck_stock_149 b_stockb_150))
15273         (= a_stocka_150 a_stockb_150)
15274         (= c_stocka_150 c_stockb_150)
15275         (or
15276           (and
15277             (= truck_loc_150 1)
15278             (= truck_travel_time_150 17)
15279           )
15280           (and
15281             (= truck_loc_150 0)
15282             (= truck_travel_time_150 21)
15283           )
15284           (and
15285             (= truck_loc_150 3)
15286             (= truck_travel_time_150 37)
15287           )
15288         )
15289       )
15290     )
15291     (=> (= truck_loc_149 3)
15292       (and
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15293          (<= c_stocka_150 200)
15294          (= (+ truck_stock_150 c_stocka_150) (+ truck_stock_149 c_stockb_150))
15295          (= a_stocka_150 a_stockb_150)
15296          (= b_stocka_150 b_stockb_150)
15297          (or
15298            (and
15299              (= truck_loc_150 1)
15300              (= truck_travel_time_150 32)
15301            )
15302            (and
15303              (= truck_loc_150 2)
15304              (= truck_travel_time_150 37)
15305            )
15306          )
15307        )
15308      )
15309  )
15310  (<= truck_stock_150 318)
15311  (>= truck_stock_150 0)
15312  (= a_stockb_151 (- a_stocka_150 truck_travel_time_150))
15313  (= b_stockb_151 (- b_stocka_150 truck_travel_time_150))
15314  (= c_stockb_151 (- c_stocka_150 truck_travel_time_150))
15315  (and
15316    (=> (= truck_loc_150 0)
15317      (and
15318        (= a_stocka_151 a_stockb_151)
15319        (= b_stocka_151 b_stockb_151)
15320        (= c_stocka_151 c_stockb_151)
15321        (or
15322          (and
15323            (= truck_loc_151 1)
15324            (= truck_travel_time_151 29)
15325          )
15326          (and
15327            (= truck_loc_151 2)
15328            (= truck_travel_time_151 21)
15329          )
15330        )
15331      )
15332    )
15333    (=> (= truck_loc_150 1)
15334      (and
15335        (<= a_stocka_151 120)
15336        (= (+ truck_stock_151 a_stocka_151) (+ truck_stock_150 a_stockb_151))
15337        (= b_stocka_151 b_stockb_151)
15338        (= c_stocka_151 c_stockb_151)
15339        (or
15340          (and
15341            (= truck_loc_151 0)
15342            (= truck_travel_time_151 29)
15343          )
15344          (and
15345            (= truck_loc_151 2)
15346            (= truck_travel_time_151 17)
15347          )
15348          (and
15349            (= truck_loc_151 3)
15350            (= truck_travel_time_151 32)
15351          )
15352        )
15353      )
15354    )
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15355    (=> (= truck_loc_150 2)
15356      (and
15357        (<= b_stocka_151 120)
15358        (= (+ truck_stock_151 b_stocka_151) (+ truck_stock_150 b_stockb_151))
15359        (= a_stocka_151 a_stockb_151)
15360        (= c_stocka_151 c_stockb_151)
15361        (or
15362          (and
15363            (= truck_loc_151 1)
15364            (= truck_travel_time_151 17)
15365          )
15366          (and
15367            (= truck_loc_151 0)
15368            (= truck_travel_time_151 21)
15369          )
15370          (and
15371            (= truck_loc_151 3)
15372            (= truck_travel_time_151 37)
15373          )
15374        )
15375      )
15376    )
15377    (=> (= truck_loc_150 3)
15378      (and
15379        (<= c_stocka_151 200)
15380        (= (+ truck_stock_151 c_stocka_151) (+ truck_stock_150 c_stockb_151))
15381        (= a_stocka_151 a_stockb_151)
15382        (= b_stocka_151 b_stockb_151)
15383        (or
15384          (and
15385            (= truck_loc_151 1)
15386            (= truck_travel_time_151 32)
15387          )
15388          (and
15389            (= truck_loc_151 2)
15390            (= truck_travel_time_151 37)
15391          )
15392        )
15393      )
15394    )
15395  )
15396  (<= truck_stock_151 318)
15397  (>= truck_stock_151 0)
15398  (= a_stockb_152 (- a_stocka_151 truck_travel_time_151))
15399  (= b_stockb_152 (- b_stocka_151 truck_travel_time_151))
15400  (= c_stockb_152 (- c_stocka_151 truck_travel_time_151))
15401  (and
15402    (=> (= truck_loc_151 0)
15403      (and
15404        (= a_stocka_152 a_stockb_152)
15405        (= b_stocka_152 b_stockb_152)
15406        (= c_stocka_152 c_stockb_152)
15407        (or
15408          (and
15409            (= truck_loc_152 1)
15410            (= truck_travel_time_152 29)
15411          )
15412          (and
15413            (= truck_loc_152 2)
15414            (= truck_travel_time_152 21)
15415          )
15416        )
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15417        )
15418      )
15419      (=> (= truck_loc_151 1)
15420        (and
15421          (<= a_stocka_152 120)
15422          (= (+ truck_stock_152 a_stocka_152) (+ truck_stock_151 a_stockb_152))
15423          (= b_stocka_152 b_stockb_152)
15424          (= c_stocka_152 c_stockb_152)
15425          (or
15426            (and
15427              (= truck_loc_152 0)
15428              (= truck_travel_time_152 29)
15429            )
15430            (and
15431              (= truck_loc_152 2)
15432              (= truck_travel_time_152 17)
15433            )
15434            (and
15435              (= truck_loc_152 3)
15436              (= truck_travel_time_152 32)
15437            )
15438          )
15439        )
15440      )
15441      (=> (= truck_loc_151 2)
15442        (and
15443          (<= b_stocka_152 120)
15444          (= (+ truck_stock_152 b_stocka_152) (+ truck_stock_151 b_stockb_152))
15445          (= a_stocka_152 a_stockb_152)
15446          (= c_stocka_152 c_stockb_152)
15447          (or
15448            (and
15449              (= truck_loc_152 1)
15450              (= truck_travel_time_152 17)
15451            )
15452            (and
15453              (= truck_loc_152 0)
15454              (= truck_travel_time_152 21)
15455            )
15456            (and
15457              (= truck_loc_152 3)
15458              (= truck_travel_time_152 37)
15459            )
15460          )
15461        )
15462      )
15463      (=> (= truck_loc_151 3)
15464        (and
15465          (<= c_stocka_152 200)
15466          (= (+ truck_stock_152 c_stocka_152) (+ truck_stock_151 c_stockb_152))
15467          (= a_stocka_152 a_stockb_152)
15468          (= b_stocka_152 b_stockb_152)
15469          (or
15470            (and
15471              (= truck_loc_152 1)
15472              (= truck_travel_time_152 32)
15473            )
15474            (and
15475              (= truck_loc_152 2)
15476              (= truck_travel_time_152 37)
15477            )
15478          )
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15479        )
15480      )
15481    )
15482    (<= truck_stock_152 318)
15483    (>= truck_stock_152 0)
15484    (= a_stockb_153 (- a_stocka_152 truck_travel_time_152))
15485    (= b_stockb_153 (- b_stocka_152 truck_travel_time_152))
15486    (= c_stockb_153 (- c_stocka_152 truck_travel_time_152))
15487    (and
15488      (=> (= truck_loc_152 0)
15489        (and
15490          (= a_stocka_153 a_stockb_153)
15491          (= b_stocka_153 b_stockb_153)
15492          (= c_stocka_153 c_stockb_153)
15493          (or
15494            (and
15495              (= truck_loc_153 1)
15496              (= truck_travel_time_153 29)
15497            )
15498            (and
15499              (= truck_loc_153 2)
15500              (= truck_travel_time_153 21)
15501            )
15502          )
15503        )
15504      )
15505      (=> (= truck_loc_152 1)
15506        (and
15507          (<= a_stocka_153 120)
15508          (= (+ truck_stock_153 a_stocka_153) (+ truck_stock_152 a_stockb_153))
15509          (= b_stocka_153 b_stockb_153)
15510          (= c_stocka_153 c_stockb_153)
15511          (or
15512            (and
15513              (= truck_loc_153 0)
15514              (= truck_travel_time_153 29)
15515            )
15516            (and
15517              (= truck_loc_153 2)
15518              (= truck_travel_time_153 17)
15519            )
15520            (and
15521              (= truck_loc_153 3)
15522              (= truck_travel_time_153 32)
15523            )
15524          )
15525        )
15526      )
15527      (=> (= truck_loc_152 2)
15528        (and
15529          (<= b_stocka_153 120)
15530          (= (+ truck_stock_153 b_stocka_153) (+ truck_stock_152 b_stockb_153))
15531          (= a_stocka_153 a_stockb_153)
15532          (= c_stocka_153 c_stockb_153)
15533          (or
15534            (and
15535              (= truck_loc_153 1)
15536              (= truck_travel_time_153 17)
15537            )
15538            (and
15539              (= truck_loc_153 0)
15540              (= truck_travel_time_153 21)
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15541              )
15542           (and
15543              (= truck_loc_153 3)
15544              (= truck_travel_time_153 37)
15545           )
15546        )
15547      )
15548    )
15549    (=> (= truck_loc_152 3)
15550      (and
15551        (<= c_stocka_153 200)
15552        (= (+ truck_stock_153 c_stocka_153) (+ truck_stock_152 c_stockb_153))
15553        (= a_stocka_153 a_stockb_153)
15554        (= b_stocka_153 b_stockb_153)
15555        (or
15556           (and
15557              (= truck_loc_153 1)
15558              (= truck_travel_time_153 32)
15559           )
15560           (and
15561              (= truck_loc_153 2)
15562              (= truck_travel_time_153 37)
15563           )
15564        )
15565      )
15566    )
15567  )
15568  (<= truck_stock_153 318)
15569  (>= truck_stock_153 0)
15570  (= a_stockb_154 (- a_stocka_153 truck_travel_time_153))
15571  (= b_stockb_154 (- b_stocka_153 truck_travel_time_153))
15572  (= c_stockb_154 (- c_stocka_153 truck_travel_time_153))
15573  (and
15574    (=> (= truck_loc_153 0)
15575      (and
15576        (= a_stocka_154 a_stockb_154)
15577        (= b_stocka_154 b_stockb_154)
15578        (= c_stocka_154 c_stockb_154)
15579        (or
15580           (and
15581              (= truck_loc_154 1)
15582              (= truck_travel_time_154 29)
15583           )
15584           (and
15585              (= truck_loc_154 2)
15586              (= truck_travel_time_154 21)
15587           )
15588        )
15589      )
15590    )
15591    (=> (= truck_loc_153 1)
15592      (and
15593        (<= a_stocka_154 120)
15594        (= (+ truck_stock_154 a_stocka_154) (+ truck_stock_153 a_stockb_154))
15595        (= b_stocka_154 b_stockb_154)
15596        (= c_stocka_154 c_stockb_154)
15597        (or
15598           (and
15599              (= truck_loc_154 0)
15600              (= truck_travel_time_154 29)
15601           )
15602           (and
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15603              (= truck_loc_154 2)
15604              (= truck_travel_time_154 17)
15605            )
15606          (and
15607              (= truck_loc_154 3)
15608              (= truck_travel_time_154 32)
15609          )
15610        )
15611      )
15612    )
15613    (=> (= truck_loc_153 2)
15614      (and
15615        (<= b_stocka_154 120)
15616        (= (+ truck_stock_154 b_stocka_154) (+ truck_stock_153 b_stockb_154))
15617        (= a_stocka_154 a_stockb_154)
15618        (= c_stocka_154 c_stockb_154)
15619        (or
15620          (and
15621              (= truck_loc_154 1)
15622              (= truck_travel_time_154 17)
15623          )
15624          (and
15625              (= truck_loc_154 0)
15626              (= truck_travel_time_154 21)
15627          )
15628          (and
15629              (= truck_loc_154 3)
15630              (= truck_travel_time_154 37)
15631          )
15632        )
15633      )
15634    )
15635    (=> (= truck_loc_153 3)
15636      (and
15637        (<= c_stocka_154 200)
15638        (= (+ truck_stock_154 c_stocka_154) (+ truck_stock_153 c_stockb_154))
15639        (= a_stocka_154 a_stockb_154)
15640        (= b_stocka_154 b_stockb_154)
15641        (or
15642          (and
15643              (= truck_loc_154 1)
15644              (= truck_travel_time_154 32)
15645          )
15646          (and
15647              (= truck_loc_154 2)
15648              (= truck_travel_time_154 37)
15649          )
15650        )
15651      )
15652    )
15653  )
15654  (<= truck_stock_154 318)
15655  (>= truck_stock_154 0)
15656  (= a_stockb_155 (- a_stocka_154 truck_travel_time_154))
15657  (= b_stockb_155 (- b_stocka_154 truck_travel_time_154))
15658  (= c_stockb_155 (- c_stocka_154 truck_travel_time_154))
15659  (and
15660    (=> (= truck_loc_154 0)
15661      (and
15662        (= a_stocka_155 a_stockb_155)
15663        (= b_stocka_155 b_stockb_155)
15664        (= c_stocka_155 c_stockb_155)
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15665        (or
15666          (and
15667            (= truck_loc_155 1)
15668            (= truck_travel_time_155 29)
15669          )
15670          (and
15671            (= truck_loc_155 2)
15672            (= truck_travel_time_155 21)
15673          )
15674        )
15675      )
15676    )
15677    (=> (= truck_loc_154 1)
15678      (and
15679        (<= a_stocka_155 120)
15680        (= (+ truck_stock_155 a_stocka_155) (+ truck_stock_154 a_stockb_155))
15681        (= b_stocka_155 b_stockb_155)
15682        (= c_stocka_155 c_stockb_155)
15683        (or
15684          (and
15685            (= truck_loc_155 0)
15686            (= truck_travel_time_155 29)
15687          )
15688          (and
15689            (= truck_loc_155 2)
15690            (= truck_travel_time_155 17)
15691          )
15692          (and
15693            (= truck_loc_155 3)
15694            (= truck_travel_time_155 32)
15695          )
15696        )
15697      )
15698    )
15699    (=> (= truck_loc_154 2)
15700      (and
15701        (<= b_stocka_155 120)
15702        (= (+ truck_stock_155 b_stocka_155) (+ truck_stock_154 b_stockb_155))
15703        (= a_stocka_155 a_stockb_155)
15704        (= c_stocka_155 c_stockb_155)
15705        (or
15706          (and
15707            (= truck_loc_155 1)
15708            (= truck_travel_time_155 17)
15709          )
15710          (and
15711            (= truck_loc_155 0)
15712            (= truck_travel_time_155 21)
15713          )
15714          (and
15715            (= truck_loc_155 3)
15716            (= truck_travel_time_155 37)
15717          )
15718        )
15719      )
15720    )
15721    (=> (= truck_loc_154 3)
15722      (and
15723        (<= c_stocka_155 200)
15724        (= (+ truck_stock_155 c_stocka_155) (+ truck_stock_154 c_stockb_155))
15725        (= a_stocka_155 a_stockb_155)
15726        (= b_stocka_155 b_stockb_155)
```

```
15727        (or
15728          (and
15729            (= truck_loc_155 1)
15730            (= truck_travel_time_155 32)
15731          )
15732          (and
15733            (= truck_loc_155 2)
15734            (= truck_travel_time_155 37)
15735          )
15736        )
15737      )
15738    )
15739  )
15740  (<= truck_stock_155 318)
15741  (>= truck_stock_155 0)
15742  (= a_stockb_156 (- a_stocka_155 truck_travel_time_155))
15743  (= b_stockb_156 (- b_stocka_155 truck_travel_time_155))
15744  (= c_stockb_156 (- c_stocka_155 truck_travel_time_155))
15745  (and
15746    (=> (= truck_loc_155 0)
15747      (and
15748        (= a_stocka_156 a_stockb_156)
15749        (= b_stocka_156 b_stockb_156)
15750        (= c_stocka_156 c_stockb_156)
15751        (or
15752          (and
15753            (= truck_loc_156 1)
15754            (= truck_travel_time_156 29)
15755          )
15756          (and
15757            (= truck_loc_156 2)
15758            (= truck_travel_time_156 21)
15759          )
15760        )
15761      )
15762    )
15763    (=> (= truck_loc_155 1)
15764      (and
15765        (<= a_stocka_156 120)
15766        (= (+ truck_stock_156 a_stocka_156) (+ truck_stock_155 a_stockb_156))
15767        (= b_stocka_156 b_stockb_156)
15768        (= c_stocka_156 c_stockb_156)
15769        (or
15770          (and
15771            (= truck_loc_156 0)
15772            (= truck_travel_time_156 29)
15773          )
15774          (and
15775            (= truck_loc_156 2)
15776            (= truck_travel_time_156 17)
15777          )
15778          (and
15779            (= truck_loc_156 3)
15780            (= truck_travel_time_156 32)
15781          )
15782        )
15783      )
15784    )
15785    (=> (= truck_loc_155 2)
15786      (and
15787        (<= b_stocka_156 120)
15788        (= (+ truck_stock_156 b_stocka_156) (+ truck_stock_155 b_stockb_156))
```

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```
15789          (= a_stocka_156 a_stockb_156)
15790          (= c_stocka_156 c_stockb_156)
15791          (or
15792            (and
15793              (= truck_loc_156 1)
15794              (= truck_travel_time_156 17)
15795            )
15796            (and
15797              (= truck_loc_156 0)
15798              (= truck_travel_time_156 21)
15799            )
15800            (and
15801              (= truck_loc_156 3)
15802              (= truck_travel_time_156 37)
15803            )
15804          )
15805        )
15806    )
15807    (=> (= truck_loc_155 3)
15808      (and
15809        (<= c_stocka_156 200)
15810        (= (+ truck_stock_156 c_stocka_156) (+ truck_stock_155 c_stockb_156))
15811        (= a_stocka_156 a_stockb_156)
15812        (= b_stocka_156 b_stockb_156)
15813        (or
15814          (and
15815            (= truck_loc_156 1)
15816            (= truck_travel_time_156 32)
15817          )
15818          (and
15819            (= truck_loc_156 2)
15820            (= truck_travel_time_156 37)
15821          )
15822        )
15823      )
15824    )
15825  )
15826  (<= truck_stock_156 318)
15827  (>= truck_stock_156 0)
15828  (= a_stockb_157 (- a_stocka_156 truck_travel_time_156))
15829  (= b_stockb_157 (- b_stocka_156 truck_travel_time_156))
15830  (= c_stockb_157 (- c_stocka_156 truck_travel_time_156))
15831  (and
15832    (=> (= truck_loc_156 0)
15833      (and
15834        (= a_stocka_157 a_stockb_157)
15835        (= b_stocka_157 b_stockb_157)
15836        (= c_stocka_157 c_stockb_157)
15837        (or
15838          (and
15839            (= truck_loc_157 1)
15840            (= truck_travel_time_157 29)
15841          )
15842          (and
15843            (= truck_loc_157 2)
15844            (= truck_travel_time_157 21)
15845          )
15846        )
15847      )
15848    )
15849    (=> (= truck_loc_156 1)
15850      (and
```

```
15851          (<= a_stocka_157 120)
15852          (= (+ truck_stock_157 a_stocka_157) (+ truck_stock_156 a_stockb_157))
15853          (= b_stocka_157 b_stockb_157)
15854          (= c_stocka_157 c_stockb_157)
15855          (or
15856            (and
15857              (= truck_loc_157 0)
15858              (= truck_travel_time_157 29)
15859            )
15860            (and
15861              (= truck_loc_157 2)
15862              (= truck_travel_time_157 17)
15863            )
15864            (and
15865              (= truck_loc_157 3)
15866              (= truck_travel_time_157 32)
15867            )
15868          )
15869        )
15870      )
15871      (=> (= truck_loc_156 2)
15872        (and
15873          (<= b_stocka_157 120)
15874          (= (+ truck_stock_157 b_stocka_157) (+ truck_stock_156 b_stockb_157))
15875          (= a_stocka_157 a_stockb_157)
15876          (= c_stocka_157 c_stockb_157)
15877          (or
15878            (and
15879              (= truck_loc_157 1)
15880              (= truck_travel_time_157 17)
15881            )
15882            (and
15883              (= truck_loc_157 0)
15884              (= truck_travel_time_157 21)
15885            )
15886            (and
15887              (= truck_loc_157 3)
15888              (= truck_travel_time_157 37)
15889            )
15890          )
15891        )
15892      )
15893      (=> (= truck_loc_156 3)
15894        (and
15895          (<= c_stocka_157 200)
15896          (= (+ truck_stock_157 c_stocka_157) (+ truck_stock_156 c_stockb_157))
15897          (= a_stocka_157 a_stockb_157)
15898          (= b_stocka_157 b_stockb_157)
15899          (or
15900            (and
15901              (= truck_loc_157 1)
15902              (= truck_travel_time_157 32)
15903            )
15904            (and
15905              (= truck_loc_157 2)
15906              (= truck_travel_time_157 37)
15907            )
15908          )
15909        )
15910      )
15911  )
15912  (<= truck_stock_157 318)
```

```
15913  (>= truck_stock_157 0)
15914  (= a_stockb_158 (- a_stocka_157 truck_travel_time_157))
15915  (= b_stockb_158 (- b_stocka_157 truck_travel_time_157))
15916  (= c_stockb_158 (- c_stocka_157 truck_travel_time_157))
15917  (and
15918    (=> (= truck_loc_157 0)
15919      (and
15920        (= a_stocka_158 a_stockb_158)
15921        (= b_stocka_158 b_stockb_158)
15922        (= c_stocka_158 c_stockb_158)
15923        (or
15924          (and
15925            (= truck_loc_158 1)
15926            (= truck_travel_time_158 29)
15927          )
15928          (and
15929            (= truck_loc_158 2)
15930            (= truck_travel_time_158 21)
15931          )
15932        )
15933      )
15934    )
15935    (=> (= truck_loc_157 1)
15936      (and
15937        (<= a_stocka_158 120)
15938        (= (+ truck_stock_158 a_stocka_158) (+ truck_stock_157 a_stockb_158))
15939        (= b_stocka_158 b_stockb_158)
15940        (= c_stocka_158 c_stockb_158)
15941        (or
15942          (and
15943            (= truck_loc_158 0)
15944            (= truck_travel_time_158 29)
15945          )
15946          (and
15947            (= truck_loc_158 2)
15948            (= truck_travel_time_158 17)
15949          )
15950          (and
15951            (= truck_loc_158 3)
15952            (= truck_travel_time_158 32)
15953          )
15954        )
15955      )
15956    )
15957    (=> (= truck_loc_157 2)
15958      (and
15959        (<= b_stocka_158 120)
15960        (= (+ truck_stock_158 b_stocka_158) (+ truck_stock_157 b_stockb_158))
15961        (= a_stocka_158 a_stockb_158)
15962        (= c_stocka_158 c_stockb_158)
15963        (or
15964          (and
15965            (= truck_loc_158 1)
15966            (= truck_travel_time_158 17)
15967          )
15968          (and
15969            (= truck_loc_158 0)
15970            (= truck_travel_time_158 21)
15971          )
15972          (and
15973            (= truck_loc_158 3)
15974            (= truck_travel_time_158 37)
```

```
15975            )
15976          )
15977        )
15978      )
15979    (=> (= truck_loc_157 3)
15980      (and
15981        (<= c_stocka_158 200)
15982        (= (+ truck_stock_158 c_stocka_158) (+ truck_stock_157 c_stockb_158))
15983        (= a_stocka_158 a_stockb_158)
15984        (= b_stocka_158 b_stockb_158)
15985        (or
15986          (and
15987            (= truck_loc_158 1)
15988            (= truck_travel_time_158 32)
15989          )
15990          (and
15991            (= truck_loc_158 2)
15992            (= truck_travel_time_158 37)
15993          )
15994        )
15995      )
15996    )
15997  )
15998  (<= truck_stock_158 318)
15999  (>= truck_stock_158 0)
16000  (= a_stockb_159 (- a_stocka_158 truck_travel_time_158))
16001  (= b_stockb_159 (- b_stocka_158 truck_travel_time_158))
16002  (= c_stockb_159 (- c_stocka_158 truck_travel_time_158))
16003  (and
16004    (=> (= truck_loc_158 0)
16005      (and
16006        (= a_stocka_159 a_stockb_159)
16007        (= b_stocka_159 b_stockb_159)
16008        (= c_stocka_159 c_stockb_159)
16009        (or
16010          (and
16011            (= truck_loc_159 1)
16012            (= truck_travel_time_159 29)
16013          )
16014          (and
16015            (= truck_loc_159 2)
16016            (= truck_travel_time_159 21)
16017          )
16018        )
16019      )
16020    )
16021    (=> (= truck_loc_158 1)
16022      (and
16023        (<= a_stocka_159 120)
16024        (= (+ truck_stock_159 a_stocka_159) (+ truck_stock_158 a_stockb_159))
16025        (= b_stocka_159 b_stockb_159)
16026        (= c_stocka_159 c_stockb_159)
16027        (or
16028          (and
16029            (= truck_loc_159 0)
16030            (= truck_travel_time_159 29)
16031          )
16032          (and
16033            (= truck_loc_159 2)
16034            (= truck_travel_time_159 17)
16035          )
16036          (and
```

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```
16037              (= truck_loc_159 3)
16038              (= truck_travel_time_159 32)
16039            )
16040          )
16041        )
16042      )
16043      (=> (= truck_loc_158 2)
16044        (and
16045          (<= b_stocka_159 120)
16046          (= (+ truck_stock_159 b_stocka_159) (+ truck_stock_158 b_stockb_159))
16047          (= a_stocka_159 a_stockb_159)
16048          (= c_stocka_159 c_stockb_159)
16049          (or
16050            (and
16051              (= truck_loc_159 1)
16052              (= truck_travel_time_159 17)
16053            )
16054            (and
16055              (= truck_loc_159 0)
16056              (= truck_travel_time_159 21)
16057            )
16058            (and
16059              (= truck_loc_159 3)
16060              (= truck_travel_time_159 37)
16061            )
16062          )
16063        )
16064      )
16065      (=> (= truck_loc_158 3)
16066        (and
16067          (<= c_stocka_159 200)
16068          (= (+ truck_stock_159 c_stocka_159) (+ truck_stock_158 c_stockb_159))
16069          (= a_stocka_159 a_stockb_159)
16070          (= b_stocka_159 b_stockb_159)
16071          (or
16072            (and
16073              (= truck_loc_159 1)
16074              (= truck_travel_time_159 32)
16075            )
16076            (and
16077              (= truck_loc_159 2)
16078              (= truck_travel_time_159 37)
16079            )
16080          )
16081        )
16082      )
16083    )
16084    (<= truck_stock_159 318)
16085    (>= truck_stock_159 0)
16086    (= a_stockb_160 (- a_stocka_159 truck_travel_time_159))
16087    (= b_stockb_160 (- b_stocka_159 truck_travel_time_159))
16088    (= c_stockb_160 (- c_stocka_159 truck_travel_time_159))
16089    (and
16090      (=> (= truck_loc_159 0)
16091        (and
16092          (= a_stocka_160 a_stockb_160)
16093          (= b_stocka_160 b_stockb_160)
16094          (= c_stocka_160 c_stockb_160)
16095          (or
16096            (and
16097              (= truck_loc_160 1)
16098              (= truck_travel_time_160 29)
```

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```
16099              )
16100           (and
16101             (= truck_loc_160 2)
16102             (= truck_travel_time_160 21)
16103           )
16104         )
16105       )
16106   )
16107   (=> (= truck_loc_159 1)
16108     (and
16109       (<= a_stocka_160 120)
16110       (= (+ truck_stock_160 a_stocka_160) (+ truck_stock_159 a_stockb_160))
16111       (= b_stocka_160 b_stockb_160)
16112       (= c_stocka_160 c_stockb_160)
16113       (or
16114         (and
16115           (= truck_loc_160 0)
16116           (= truck_travel_time_160 29)
16117         )
16118         (and
16119           (= truck_loc_160 2)
16120           (= truck_travel_time_160 17)
16121         )
16122         (and
16123           (= truck_loc_160 3)
16124           (= truck_travel_time_160 32)
16125         )
16126       )
16127     )
16128   )
16129   (=> (= truck_loc_159 2)
16130     (and
16131       (<= b_stocka_160 120)
16132       (= (+ truck_stock_160 b_stocka_160) (+ truck_stock_159 b_stockb_160))
16133       (= a_stocka_160 a_stockb_160)
16134       (= c_stocka_160 c_stockb_160)
16135       (or
16136         (and
16137           (= truck_loc_160 1)
16138           (= truck_travel_time_160 17)
16139         )
16140         (and
16141           (= truck_loc_160 0)
16142           (= truck_travel_time_160 21)
16143         )
16144         (and
16145           (= truck_loc_160 3)
16146           (= truck_travel_time_160 37)
16147         )
16148       )
16149     )
16150   )
16151   (=> (= truck_loc_159 3)
16152     (and
16153       (<= c_stocka_160 200)
16154       (= (+ truck_stock_160 c_stocka_160) (+ truck_stock_159 c_stockb_160))
16155       (= a_stocka_160 a_stockb_160)
16156       (= b_stocka_160 b_stockb_160)
16157       (or
16158         (and
16159           (= truck_loc_160 1)
16160           (= truck_travel_time_160 32)
```

```
16161            )
16162          (and
16163            (= truck_loc_160 2)
16164            (= truck_travel_time_160 37)
16165          )
16166        )
16167      )
16168    )
16169  )
16170  (<= truck_stock_160 318)
16171  (>= truck_stock_160 0)
16172  (= a_stockb_161 (- a_stocka_160 truck_travel_time_160))
16173  (= b_stockb_161 (- b_stocka_160 truck_travel_time_160))
16174  (= c_stockb_161 (- c_stocka_160 truck_travel_time_160))
16175  (and
16176    (=> (= truck_loc_160 0)
16177      (and
16178        (= a_stocka_161 a_stockb_161)
16179        (= b_stocka_161 b_stockb_161)
16180        (= c_stocka_161 c_stockb_161)
16181        (or
16182          (and
16183            (= truck_loc_161 1)
16184            (= truck_travel_time_161 29)
16185          )
16186          (and
16187            (= truck_loc_161 2)
16188            (= truck_travel_time_161 21)
16189          )
16190        )
16191      )
16192    )
16193    (=> (= truck_loc_160 1)
16194      (and
16195        (<= a_stocka_161 120)
16196        (= (+ truck_stock_161 a_stocka_161) (+ truck_stock_160 a_stockb_161))
16197        (= b_stocka_161 b_stockb_161)
16198        (= c_stocka_161 c_stockb_161)
16199        (or
16200          (and
16201            (= truck_loc_161 0)
16202            (= truck_travel_time_161 29)
16203          )
16204          (and
16205            (= truck_loc_161 2)
16206            (= truck_travel_time_161 17)
16207          )
16208          (and
16209            (= truck_loc_161 3)
16210            (= truck_travel_time_161 32)
16211          )
16212        )
16213      )
16214    )
16215    (=> (= truck_loc_160 2)
16216      (and
16217        (<= b_stocka_161 120)
16218        (= (+ truck_stock_161 b_stocka_161) (+ truck_stock_160 b_stockb_161))
16219        (= a_stocka_161 a_stockb_161)
16220        (= c_stocka_161 c_stockb_161)
16221        (or
16222          (and
```

```
16223              (= truck_loc_161 1)
16224              (= truck_travel_time_161 17)
16225            )
16226          (and
16227            (= truck_loc_161 0)
16228            (= truck_travel_time_161 21)
16229          )
16230          (and
16231            (= truck_loc_161 3)
16232            (= truck_travel_time_161 37)
16233          )
16234        )
16235      )
16236    )
16237    (=> (= truck_loc_160 3)
16238      (and
16239        (<= c_stocka_161 200)
16240        (= (+ truck_stock_161 c_stocka_161) (+ truck_stock_160 c_stockb_161))
16241        (= a_stocka_161 a_stockb_161)
16242        (= b_stocka_161 b_stockb_161)
16243        (or
16244          (and
16245            (= truck_loc_161 1)
16246            (= truck_travel_time_161 32)
16247          )
16248          (and
16249            (= truck_loc_161 2)
16250            (= truck_travel_time_161 37)
16251          )
16252        )
16253      )
16254    )
16255  )
16256  (<= truck_stock_161 318)
16257  (>= truck_stock_161 0)
16258  (= a_stockb_162 (- a_stocka_161 truck_travel_time_161))
16259  (= b_stockb_162 (- b_stocka_161 truck_travel_time_161))
16260  (= c_stockb_162 (- c_stocka_161 truck_travel_time_161))
16261  (and
16262    (=> (= truck_loc_161 0)
16263      (and
16264        (= a_stocka_162 a_stockb_162)
16265        (= b_stocka_162 b_stockb_162)
16266        (= c_stocka_162 c_stockb_162)
16267        (or
16268          (and
16269            (= truck_loc_162 1)
16270            (= truck_travel_time_162 29)
16271          )
16272          (and
16273            (= truck_loc_162 2)
16274            (= truck_travel_time_162 21)
16275          )
16276        )
16277      )
16278    )
16279    (=> (= truck_loc_161 1)
16280      (and
16281        (<= a_stocka_162 120)
16282        (= (+ truck_stock_162 a_stocka_162) (+ truck_stock_161 a_stockb_162))
16283        (= b_stocka_162 b_stockb_162)
16284        (= c_stocka_162 c_stockb_162)
```

```
16285        (or
16286          (and
16287            (= truck_loc_162 0)
16288            (= truck_travel_time_162 29)
16289          )
16290          (and
16291            (= truck_loc_162 2)
16292            (= truck_travel_time_162 17)
16293          )
16294          (and
16295            (= truck_loc_162 3)
16296            (= truck_travel_time_162 32)
16297          )
16298        )
16299      )
16300    )
16301    (=> (= truck_loc_161 2)
16302      (and
16303        (<= b_stocka_162 120)
16304        (= (+ truck_stock_162 b_stocka_162) (+ truck_stock_161 b_stockb_162))
16305        (= a_stocka_162 a_stockb_162)
16306        (= c_stocka_162 c_stockb_162)
16307        (or
16308          (and
16309            (= truck_loc_162 1)
16310            (= truck_travel_time_162 17)
16311          )
16312          (and
16313            (= truck_loc_162 0)
16314            (= truck_travel_time_162 21)
16315          )
16316          (and
16317            (= truck_loc_162 3)
16318            (= truck_travel_time_162 37)
16319          )
16320        )
16321      )
16322    )
16323    (=> (= truck_loc_161 3)
16324      (and
16325        (<= c_stocka_162 200)
16326        (= (+ truck_stock_162 c_stocka_162) (+ truck_stock_161 c_stockb_162))
16327        (= a_stocka_162 a_stockb_162)
16328        (= b_stocka_162 b_stockb_162)
16329        (or
16330          (and
16331            (= truck_loc_162 1)
16332            (= truck_travel_time_162 32)
16333          )
16334          (and
16335            (= truck_loc_162 2)
16336            (= truck_travel_time_162 37)
16337          )
16338        )
16339      )
16340    )
16341  )
16342  (<= truck_stock_162 318)
16343  (>= truck_stock_162 0)
16344  (= a_stockb_163 (- a_stocka_162 truck_travel_time_162))
16345  (= b_stockb_163 (- b_stocka_162 truck_travel_time_162))
16346  (= c_stockb_163 (- c_stocka_162 truck_travel_time_162))
```

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```
16347   (and
16348     (=> (= truck_loc_162 0)
16349       (and
16350         (= a_stocka_163 a_stockb_163)
16351         (= b_stocka_163 b_stockb_163)
16352         (= c_stocka_163 c_stockb_163)
16353         (or
16354           (and
16355             (= truck_loc_163 1)
16356             (= truck_travel_time_163 29)
16357           )
16358           (and
16359             (= truck_loc_163 2)
16360             (= truck_travel_time_163 21)
16361           )
16362         )
16363       )
16364     )
16365     (=> (= truck_loc_162 1)
16366       (and
16367         (<= a_stocka_163 120)
16368         (= (+ truck_stock_163 a_stocka_163) (+ truck_stock_162 a_stockb_163))
16369         (= b_stocka_163 b_stockb_163)
16370         (= c_stocka_163 c_stockb_163)
16371         (or
16372           (and
16373             (= truck_loc_163 0)
16374             (= truck_travel_time_163 29)
16375           )
16376           (and
16377             (= truck_loc_163 2)
16378             (= truck_travel_time_163 17)
16379           )
16380           (and
16381             (= truck_loc_163 3)
16382             (= truck_travel_time_163 32)
16383           )
16384         )
16385       )
16386     )
16387     (=> (= truck_loc_162 2)
16388       (and
16389         (<= b_stocka_163 120)
16390         (= (+ truck_stock_163 b_stocka_163) (+ truck_stock_162 b_stockb_163))
16391         (= a_stocka_163 a_stockb_163)
16392         (= c_stocka_163 c_stockb_163)
16393         (or
16394           (and
16395             (= truck_loc_163 1)
16396             (= truck_travel_time_163 17)
16397           )
16398           (and
16399             (= truck_loc_163 0)
16400             (= truck_travel_time_163 21)
16401           )
16402           (and
16403             (= truck_loc_163 3)
16404             (= truck_travel_time_163 37)
16405           )
16406         )
16407       )
16408     )
```

```
16409    (=> (= truck_loc_162 3)
16410      (and
16411        (<= c_stocka_163 200)
16412        (= (+ truck_stock_163 c_stocka_163) (+ truck_stock_162 c_stockb_163))
16413        (= a_stocka_163 a_stockb_163)
16414        (= b_stocka_163 b_stockb_163)
16415        (or
16416          (and
16417            (= truck_loc_163 1)
16418            (= truck_travel_time_163 32)
16419          )
16420          (and
16421            (= truck_loc_163 2)
16422            (= truck_travel_time_163 37)
16423          )
16424        )
16425      )
16426    )
16427  )
16428  (<= truck_stock_163 318)
16429  (>= truck_stock_163 0)
16430  (= a_stockb_164 (- a_stocka_163 truck_travel_time_163))
16431  (= b_stockb_164 (- b_stocka_163 truck_travel_time_163))
16432  (= c_stockb_164 (- c_stocka_163 truck_travel_time_163))
16433  (and
16434    (=> (= truck_loc_163 0)
16435      (and
16436        (= a_stocka_164 a_stockb_164)
16437        (= b_stocka_164 b_stockb_164)
16438        (= c_stocka_164 c_stockb_164)
16439        (or
16440          (and
16441            (= truck_loc_164 1)
16442            (= truck_travel_time_164 29)
16443          )
16444          (and
16445            (= truck_loc_164 2)
16446            (= truck_travel_time_164 21)
16447          )
16448        )
16449      )
16450    )
16451    (=> (= truck_loc_163 1)
16452      (and
16453        (<= a_stocka_164 120)
16454        (= (+ truck_stock_164 a_stocka_164) (+ truck_stock_163 a_stockb_164))
16455        (= b_stocka_164 b_stockb_164)
16456        (= c_stocka_164 c_stockb_164)
16457        (or
16458          (and
16459            (= truck_loc_164 0)
16460            (= truck_travel_time_164 29)
16461          )
16462          (and
16463            (= truck_loc_164 2)
16464            (= truck_travel_time_164 17)
16465          )
16466          (and
16467            (= truck_loc_164 3)
16468            (= truck_travel_time_164 32)
16469          )
16470        )
```

```
16471        )
16472      )
16473      (=> (= truck_loc_163 2)
16474        (and
16475          (<= b_stocka_164 120)
16476          (= (+ truck_stock_164 b_stocka_164) (+ truck_stock_163 b_stockb_164))
16477          (= a_stocka_164 a_stockb_164)
16478          (= c_stocka_164 c_stockb_164)
16479          (or
16480            (and
16481              (= truck_loc_164 1)
16482              (= truck_travel_time_164 17)
16483            )
16484            (and
16485              (= truck_loc_164 0)
16486              (= truck_travel_time_164 21)
16487            )
16488            (and
16489              (= truck_loc_164 3)
16490              (= truck_travel_time_164 37)
16491            )
16492          )
16493        )
16494      )
16495      (=> (= truck_loc_163 3)
16496        (and
16497          (<= c_stocka_164 200)
16498          (= (+ truck_stock_164 c_stocka_164) (+ truck_stock_163 c_stockb_164))
16499          (= a_stocka_164 a_stockb_164)
16500          (= b_stocka_164 b_stockb_164)
16501          (or
16502            (and
16503              (= truck_loc_164 1)
16504              (= truck_travel_time_164 32)
16505            )
16506            (and
16507              (= truck_loc_164 2)
16508              (= truck_travel_time_164 37)
16509            )
16510          )
16511        )
16512      )
16513    )
16514    (<= truck_stock_164 318)
16515    (>= truck_stock_164 0)
16516    (= a_stockb_165 (- a_stocka_164 truck_travel_time_164))
16517    (= b_stockb_165 (- b_stocka_164 truck_travel_time_164))
16518    (= c_stockb_165 (- c_stocka_164 truck_travel_time_164))
16519    (and
16520      (=> (= truck_loc_164 0)
16521        (and
16522          (= a_stocka_165 a_stockb_165)
16523          (= b_stocka_165 b_stockb_165)
16524          (= c_stocka_165 c_stockb_165)
16525          (or
16526            (and
16527              (= truck_loc_165 1)
16528              (= truck_travel_time_165 29)
16529            )
16530            (and
16531              (= truck_loc_165 2)
16532              (= truck_travel_time_165 21)
```

```
16533              )
16534            )
16535          )
16536      )
16537      (=> (= truck_loc_164 1)
16538        (and
16539          (<= a_stocka_165 120)
16540          (= (+ truck_stock_165 a_stocka_165) (+ truck_stock_164 a_stockb_165))
16541          (= b_stocka_165 b_stockb_165)
16542          (= c_stocka_165 c_stockb_165)
16543          (or
16544            (and
16545              (= truck_loc_165 0)
16546              (= truck_travel_time_165 29)
16547            )
16548            (and
16549              (= truck_loc_165 2)
16550              (= truck_travel_time_165 17)
16551            )
16552            (and
16553              (= truck_loc_165 3)
16554              (= truck_travel_time_165 32)
16555            )
16556          )
16557        )
16558      )
16559      (=> (= truck_loc_164 2)
16560        (and
16561          (<= b_stocka_165 120)
16562          (= (+ truck_stock_165 b_stocka_165) (+ truck_stock_164 b_stockb_165))
16563          (= a_stocka_165 a_stockb_165)
16564          (= c_stocka_165 c_stockb_165)
16565          (or
16566            (and
16567              (= truck_loc_165 1)
16568              (= truck_travel_time_165 17)
16569            )
16570            (and
16571              (= truck_loc_165 0)
16572              (= truck_travel_time_165 21)
16573            )
16574            (and
16575              (= truck_loc_165 3)
16576              (= truck_travel_time_165 37)
16577            )
16578          )
16579        )
16580      )
16581      (=> (= truck_loc_164 3)
16582        (and
16583          (<= c_stocka_165 200)
16584          (= (+ truck_stock_165 c_stocka_165) (+ truck_stock_164 c_stockb_165))
16585          (= a_stocka_165 a_stockb_165)
16586          (= b_stocka_165 b_stockb_165)
16587          (or
16588            (and
16589              (= truck_loc_165 1)
16590              (= truck_travel_time_165 32)
16591            )
16592            (and
16593              (= truck_loc_165 2)
16594              (= truck_travel_time_165 37)
```

```
16595          )
16596        )
16597      )
16598    )
16599  )
16600  (<= truck_stock_165 318)
16601  (>= truck_stock_165 0)
16602  (= a_stockb_166 (- a_stocka_165 truck_travel_time_165))
16603  (= b_stockb_166 (- b_stocka_165 truck_travel_time_165))
16604  (= c_stockb_166 (- c_stocka_165 truck_travel_time_165))
16605  (and
16606    (=> (= truck_loc_165 0)
16607      (and
16608        (= a_stocka_166 a_stockb_166)
16609        (= b_stocka_166 b_stockb_166)
16610        (= c_stocka_166 c_stockb_166)
16611        (or
16612          (and
16613            (= truck_loc_166 1)
16614            (= truck_travel_time_166 29)
16615          )
16616          (and
16617            (= truck_loc_166 2)
16618            (= truck_travel_time_166 21)
16619          )
16620        )
16621      )
16622    )
16623    (=> (= truck_loc_165 1)
16624      (and
16625        (<= a_stocka_166 120)
16626        (= (+ truck_stock_166 a_stocka_166) (+ truck_stock_165 a_stockb_166))
16627        (= b_stocka_166 b_stockb_166)
16628        (= c_stocka_166 c_stockb_166)
16629        (or
16630          (and
16631            (= truck_loc_166 0)
16632            (= truck_travel_time_166 29)
16633          )
16634          (and
16635            (= truck_loc_166 2)
16636            (= truck_travel_time_166 17)
16637          )
16638          (and
16639            (= truck_loc_166 3)
16640            (= truck_travel_time_166 32)
16641          )
16642        )
16643      )
16644    )
16645    (=> (= truck_loc_165 2)
16646      (and
16647        (<= b_stocka_166 120)
16648        (= (+ truck_stock_166 b_stocka_166) (+ truck_stock_165 b_stockb_166))
16649        (= a_stocka_166 a_stockb_166)
16650        (= c_stocka_166 c_stockb_166)
16651        (or
16652          (and
16653            (= truck_loc_166 1)
16654            (= truck_travel_time_166 17)
16655          )
16656          (and
```

```
16657            (= truck_loc_166 0)
16658            (= truck_travel_time_166 21)
16659              )
16660            (and
16661              (= truck_loc_166 3)
16662              (= truck_travel_time_166 37)
16663            )
16664          )
16665        )
16666      )
16667    (=> (= truck_loc_165 3)
16668       (and
16669         (<= c_stocka_166 200)
16670         (= (+ truck_stock_166 c_stocka_166) (+ truck_stock_165 c_stockb_166))
16671         (= a_stocka_166 a_stockb_166)
16672         (= b_stocka_166 b_stockb_166)
16673         (or
16674           (and
16675             (= truck_loc_166 1)
16676             (= truck_travel_time_166 32)
16677           )
16678           (and
16679             (= truck_loc_166 2)
16680             (= truck_travel_time_166 37)
16681           )
16682         )
16683       )
16684    )
16685  )
16686  (<= truck_stock_166 318)
16687  (>= truck_stock_166 0)
16688  (= a_stockb_167 (- a_stocka_166 truck_travel_time_166))
16689  (= b_stockb_167 (- b_stocka_166 truck_travel_time_166))
16690  (= c_stockb_167 (- c_stocka_166 truck_travel_time_166))
16691  (and
16692    (=> (= truck_loc_166 0)
16693       (and
16694         (= a_stocka_167 a_stockb_167)
16695         (= b_stocka_167 b_stockb_167)
16696         (= c_stocka_167 c_stockb_167)
16697         (or
16698           (and
16699             (= truck_loc_167 1)
16700             (= truck_travel_time_167 29)
16701           )
16702           (and
16703             (= truck_loc_167 2)
16704             (= truck_travel_time_167 21)
16705           )
16706         )
16707       )
16708    )
16709    (=> (= truck_loc_166 1)
16710       (and
16711         (<= a_stocka_167 120)
16712         (= (+ truck_stock_167 a_stocka_167) (+ truck_stock_166 a_stockb_167))
16713         (= b_stocka_167 b_stockb_167)
16714         (= c_stocka_167 c_stockb_167)
16715         (or
16716           (and
16717             (= truck_loc_167 0)
16718             (= truck_travel_time_167 29)
```

```
16719            )
16720          (and
16721            (= truck_loc_167 2)
16722            (= truck_travel_time_167 17)
16723          )
16724          (and
16725            (= truck_loc_167 3)
16726            (= truck_travel_time_167 32)
16727          )
16728        )
16729      )
16730    )
16731    (=> (= truck_loc_166 2)
16732      (and
16733        (<= b_stocka_167 120)
16734        (= (+ truck_stock_167 b_stocka_167) (+ truck_stock_166 b_stockb_167))
16735        (= a_stocka_167 a_stockb_167)
16736        (= c_stocka_167 c_stockb_167)
16737        (or
16738          (and
16739            (= truck_loc_167 1)
16740            (= truck_travel_time_167 17)
16741          )
16742          (and
16743            (= truck_loc_167 0)
16744            (= truck_travel_time_167 21)
16745          )
16746          (and
16747            (= truck_loc_167 3)
16748            (= truck_travel_time_167 37)
16749          )
16750        )
16751      )
16752    )
16753    (=> (= truck_loc_166 3)
16754      (and
16755        (<= c_stocka_167 200)
16756        (= (+ truck_stock_167 c_stocka_167) (+ truck_stock_166 c_stockb_167))
16757        (= a_stocka_167 a_stockb_167)
16758        (= b_stocka_167 b_stockb_167)
16759        (or
16760          (and
16761            (= truck_loc_167 1)
16762            (= truck_travel_time_167 32)
16763          )
16764          (and
16765            (= truck_loc_167 2)
16766            (= truck_travel_time_167 37)
16767          )
16768        )
16769      )
16770    )
16771  )
16772  (<= truck_stock_167 318)
16773  (>= truck_stock_167 0)
16774  (= a_stockb_168 (- a_stocka_167 truck_travel_time_167))
16775  (= b_stockb_168 (- b_stocka_167 truck_travel_time_167))
16776  (= c_stockb_168 (- c_stocka_167 truck_travel_time_167))
16777  (and
16778    (=> (= truck_loc_167 0)
16779      (and
16780        (= a_stocka_168 a_stockb_168)
```

```
16781        (= b_stocka_168 b_stockb_168)
16782        (= c_stocka_168 c_stockb_168)
16783        (or
16784          (and
16785            (= truck_loc_168 1)
16786            (= truck_travel_time_168 29)
16787          )
16788          (and
16789            (= truck_loc_168 2)
16790            (= truck_travel_time_168 21)
16791          )
16792        )
16793      )
16794    )
16795    (=> (= truck_loc_167 1)
16796      (and
16797        (<= a_stocka_168 120)
16798        (= (+ truck_stock_168 a_stocka_168) (+ truck_stock_167 a_stockb_168))
16799        (= b_stocka_168 b_stockb_168)
16800        (= c_stocka_168 c_stockb_168)
16801        (or
16802          (and
16803            (= truck_loc_168 0)
16804            (= truck_travel_time_168 29)
16805          )
16806          (and
16807            (= truck_loc_168 2)
16808            (= truck_travel_time_168 17)
16809          )
16810          (and
16811            (= truck_loc_168 3)
16812            (= truck_travel_time_168 32)
16813          )
16814        )
16815      )
16816    )
16817    (=> (= truck_loc_167 2)
16818      (and
16819        (<= b_stocka_168 120)
16820        (= (+ truck_stock_168 b_stocka_168) (+ truck_stock_167 b_stockb_168))
16821        (= a_stocka_168 a_stockb_168)
16822        (= c_stocka_168 c_stockb_168)
16823        (or
16824          (and
16825            (= truck_loc_168 1)
16826            (= truck_travel_time_168 17)
16827          )
16828          (and
16829            (= truck_loc_168 0)
16830            (= truck_travel_time_168 21)
16831          )
16832          (and
16833            (= truck_loc_168 3)
16834            (= truck_travel_time_168 37)
16835          )
16836        )
16837      )
16838    )
16839    (=> (= truck_loc_167 3)
16840      (and
16841        (<= c_stocka_168 200)
16842        (= (+ truck_stock_168 c_stocka_168) (+ truck_stock_167 c_stockb_168))
```

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```
16843        (= a_stocka_168 a_stockb_168)
16844        (= b_stocka_168 b_stockb_168)
16845        (or
16846          (and
16847            (= truck_loc_168 1)
16848            (= truck_travel_time_168 32)
16849          )
16850          (and
16851            (= truck_loc_168 2)
16852            (= truck_travel_time_168 37)
16853          )
16854        )
16855      )
16856    )
16857  )
16858  (<= truck_stock_168 318)
16859  (>= truck_stock_168 0)
16860  (= a_stockb_169 (- a_stocka_168 truck_travel_time_168))
16861  (= b_stockb_169 (- b_stocka_168 truck_travel_time_168))
16862  (= c_stockb_169 (- c_stocka_168 truck_travel_time_168))
16863  (and
16864    (=> (= truck_loc_168 0)
16865      (and
16866        (= a_stocka_169 a_stockb_169)
16867        (= b_stocka_169 b_stockb_169)
16868        (= c_stocka_169 c_stockb_169)
16869        (or
16870          (and
16871            (= truck_loc_169 1)
16872            (= truck_travel_time_169 29)
16873          )
16874          (and
16875            (= truck_loc_169 2)
16876            (= truck_travel_time_169 21)
16877          )
16878        )
16879      )
16880    )
16881    (=> (= truck_loc_168 1)
16882      (and
16883        (<= a_stocka_169 120)
16884        (= (+ truck_stock_169 a_stocka_169) (+ truck_stock_168 a_stockb_169))
16885        (= b_stocka_169 b_stockb_169)
16886        (= c_stocka_169 c_stockb_169)
16887        (or
16888          (and
16889            (= truck_loc_169 0)
16890            (= truck_travel_time_169 29)
16891          )
16892          (and
16893            (= truck_loc_169 2)
16894            (= truck_travel_time_169 17)
16895          )
16896          (and
16897            (= truck_loc_169 3)
16898            (= truck_travel_time_169 32)
16899          )
16900        )
16901      )
16902    )
16903    (=> (= truck_loc_168 2)
16904      (and
```

```
16905        (<= b_stocka_169 120)
16906        (= (+ truck_stock_169 b_stocka_169) (+ truck_stock_168 b_stockb_169))
16907        (= a_stocka_169 a_stockb_169)
16908        (= c_stocka_169 c_stockb_169)
16909        (or
16910          (and
16911            (= truck_loc_169 1)
16912            (= truck_travel_time_169 17)
16913          )
16914          (and
16915            (= truck_loc_169 0)
16916            (= truck_travel_time_169 21)
16917          )
16918          (and
16919            (= truck_loc_169 3)
16920            (= truck_travel_time_169 37)
16921          )
16922        )
16923      )
16924    )
16925    (=> (= truck_loc_168 3)
16926      (and
16927        (<= c_stocka_169 200)
16928        (= (+ truck_stock_169 c_stocka_169) (+ truck_stock_168 c_stockb_169))
16929        (= a_stocka_169 a_stockb_169)
16930        (= b_stocka_169 b_stockb_169)
16931        (or
16932          (and
16933            (= truck_loc_169 1)
16934            (= truck_travel_time_169 32)
16935          )
16936          (and
16937            (= truck_loc_169 2)
16938            (= truck_travel_time_169 37)
16939          )
16940        )
16941      )
16942    )
16943  )
16944  (<= truck_stock_169 318)
16945  (>= truck_stock_169 0)
16946  (= a_stockb_170 (- a_stocka_169 truck_travel_time_169))
16947  (= b_stockb_170 (- b_stocka_169 truck_travel_time_169))
16948  (= c_stockb_170 (- c_stocka_169 truck_travel_time_169))
16949  (and
16950    (=> (= truck_loc_169 0)
16951      (and
16952        (= a_stocka_170 a_stockb_170)
16953        (= b_stocka_170 b_stockb_170)
16954        (= c_stocka_170 c_stockb_170)
16955        (or
16956          (and
16957            (= truck_loc_170 1)
16958            (= truck_travel_time_170 29)
16959          )
16960          (and
16961            (= truck_loc_170 2)
16962            (= truck_travel_time_170 21)
16963          )
16964        )
16965      )
16966    )
```

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```
16967      (=> (= truck_loc_169 1)
16968        (and
16969          (<= a_stocka_170 120)
16970          (= (+ truck_stock_170 a_stocka_170) (+ truck_stock_169 a_stockb_170))
16971          (= b_stocka_170 b_stockb_170)
16972          (= c_stocka_170 c_stockb_170)
16973          (or
16974            (and
16975              (= truck_loc_170 0)
16976              (= truck_travel_time_170 29)
16977            )
16978            (and
16979              (= truck_loc_170 2)
16980              (= truck_travel_time_170 17)
16981            )
16982            (and
16983              (= truck_loc_170 3)
16984              (= truck_travel_time_170 32)
16985            )
16986          )
16987        )
16988      )
16989      (=> (= truck_loc_169 2)
16990        (and
16991          (<= b_stocka_170 120)
16992          (= (+ truck_stock_170 b_stocka_170) (+ truck_stock_169 b_stockb_170))
16993          (= a_stocka_170 a_stockb_170)
16994          (= c_stocka_170 c_stockb_170)
16995          (or
16996            (and
16997              (= truck_loc_170 1)
16998              (= truck_travel_time_170 17)
16999            )
17000            (and
17001              (= truck_loc_170 0)
17002              (= truck_travel_time_170 21)
17003            )
17004            (and
17005              (= truck_loc_170 3)
17006              (= truck_travel_time_170 37)
17007            )
17008          )
17009        )
17010      )
17011      (=> (= truck_loc_169 3)
17012        (and
17013          (<= c_stocka_170 200)
17014          (= (+ truck_stock_170 c_stocka_170) (+ truck_stock_169 c_stockb_170))
17015          (= a_stocka_170 a_stockb_170)
17016          (= b_stocka_170 b_stockb_170)
17017          (or
17018            (and
17019              (= truck_loc_170 1)
17020              (= truck_travel_time_170 32)
17021            )
17022            (and
17023              (= truck_loc_170 2)
17024              (= truck_travel_time_170 37)
17025            )
17026          )
17027        )
17028      )
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17029  )
17030  (<= truck_stock_170 318)
17031  (>= truck_stock_170 0)
17032  (= a_stockb_171 (- a_stocka_170 truck_travel_time_170))
17033  (= b_stockb_171 (- b_stocka_170 truck_travel_time_170))
17034  (= c_stockb_171 (- c_stocka_170 truck_travel_time_170))
17035  (and
17036    (=> (= truck_loc_170 0)
17037      (and
17038        (= a_stocka_171 a_stockb_171)
17039        (= b_stocka_171 b_stockb_171)
17040        (= c_stocka_171 c_stockb_171)
17041        (or
17042          (and
17043            (= truck_loc_171 1)
17044            (= truck_travel_time_171 29)
17045          )
17046          (and
17047            (= truck_loc_171 2)
17048            (= truck_travel_time_171 21)
17049          )
17050        )
17051      )
17052    )
17053    (=> (= truck_loc_170 1)
17054      (and
17055        (<= a_stocka_171 120)
17056        (= (+ truck_stock_171 a_stocka_171) (+ truck_stock_170 a_stockb_171))
17057        (= b_stocka_171 b_stockb_171)
17058        (= c_stocka_171 c_stockb_171)
17059        (or
17060          (and
17061            (= truck_loc_171 0)
17062            (= truck_travel_time_171 29)
17063          )
17064          (and
17065            (= truck_loc_171 2)
17066            (= truck_travel_time_171 17)
17067          )
17068          (and
17069            (= truck_loc_171 3)
17070            (= truck_travel_time_171 32)
17071          )
17072        )
17073      )
17074    )
17075    (=> (= truck_loc_170 2)
17076      (and
17077        (<= b_stocka_171 120)
17078        (= (+ truck_stock_171 b_stocka_171) (+ truck_stock_170 b_stockb_171))
17079        (= a_stocka_171 a_stockb_171)
17080        (= c_stocka_171 c_stockb_171)
17081        (or
17082          (and
17083            (= truck_loc_171 1)
17084            (= truck_travel_time_171 17)
17085          )
17086          (and
17087            (= truck_loc_171 0)
17088            (= truck_travel_time_171 21)
17089          )
17090          (and
```

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17091            (= truck_loc_171 3)
17092            (= truck_travel_time_171 37)
17093          )
17094        )
17095      )
17096    )
17097    (=> (= truck_loc_170 3)
17098      (and
17099        (<= c_stocka_171 200)
17100        (= (+ truck_stock_171 c_stocka_171) (+ truck_stock_170 c_stockb_171))
17101        (= a_stocka_171 a_stockb_171)
17102        (= b_stocka_171 b_stockb_171)
17103        (or
17104          (and
17105            (= truck_loc_171 1)
17106            (= truck_travel_time_171 32)
17107          )
17108          (and
17109            (= truck_loc_171 2)
17110            (= truck_travel_time_171 37)
17111          )
17112        )
17113      )
17114    )
17115  )
17116  (<= truck_stock_171 318)
17117  (>= truck_stock_171 0)
17118  (= a_stockb_172 (- a_stocka_171 truck_travel_time_171))
17119  (= b_stockb_172 (- b_stocka_171 truck_travel_time_171))
17120  (= c_stockb_172 (- c_stocka_171 truck_travel_time_171))
17121  (and
17122    (=> (= truck_loc_171 0)
17123      (and
17124        (= a_stocka_172 a_stockb_172)
17125        (= b_stocka_172 b_stockb_172)
17126        (= c_stocka_172 c_stockb_172)
17127        (or
17128          (and
17129            (= truck_loc_172 1)
17130            (= truck_travel_time_172 29)
17131          )
17132          (and
17133            (= truck_loc_172 2)
17134            (= truck_travel_time_172 21)
17135          )
17136        )
17137      )
17138    )
17139    (=> (= truck_loc_171 1)
17140      (and
17141        (<= a_stocka_172 120)
17142        (= (+ truck_stock_172 a_stocka_172) (+ truck_stock_171 a_stockb_172))
17143        (= b_stocka_172 b_stockb_172)
17144        (= c_stocka_172 c_stockb_172)
17145        (or
17146          (and
17147            (= truck_loc_172 0)
17148            (= truck_travel_time_172 29)
17149          )
17150          (and
17151            (= truck_loc_172 2)
17152            (= truck_travel_time_172 17)
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17153              )
17154            (and
17155              (= truck_loc_172 3)
17156              (= truck_travel_time_172 32)
17157            )
17158          )
17159        )
17160      )
17161      (=> (= truck_loc_171 2)
17162        (and
17163          (<= b_stocka_172 120)
17164          (= (+ truck_stock_172 b_stocka_172) (+ truck_stock_171 b_stockb_172))
17165          (= a_stocka_172 a_stockb_172)
17166          (= c_stocka_172 c_stockb_172)
17167          (or
17168            (and
17169              (= truck_loc_172 1)
17170              (= truck_travel_time_172 17)
17171            )
17172            (and
17173              (= truck_loc_172 0)
17174              (= truck_travel_time_172 21)
17175            )
17176            (and
17177              (= truck_loc_172 3)
17178              (= truck_travel_time_172 37)
17179            )
17180          )
17181        )
17182      )
17183      (=> (= truck_loc_171 3)
17184        (and
17185          (<= c_stocka_172 200)
17186          (= (+ truck_stock_172 c_stocka_172) (+ truck_stock_171 c_stockb_172))
17187          (= a_stocka_172 a_stockb_172)
17188          (= b_stocka_172 b_stockb_172)
17189          (or
17190            (and
17191              (= truck_loc_172 1)
17192              (= truck_travel_time_172 32)
17193            )
17194            (and
17195              (= truck_loc_172 2)
17196              (= truck_travel_time_172 37)
17197            )
17198          )
17199        )
17200      )
17201    )
17202    (<= truck_stock_172 318)
17203    (>= truck_stock_172 0)
17204    (= a_stockb_173 (- a_stocka_172 truck_travel_time_172))
17205    (= b_stockb_173 (- b_stocka_172 truck_travel_time_172))
17206    (= c_stockb_173 (- c_stocka_172 truck_travel_time_172))
17207    (and
17208      (=> (= truck_loc_172 0)
17209        (and
17210          (= a_stocka_173 a_stockb_173)
17211          (= b_stocka_173 b_stockb_173)
17212          (= c_stocka_173 c_stockb_173)
17213          (or
17214            (and
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17215          (= truck_loc_173 1)
17216          (= truck_travel_time_173 29)
17217        )
17218      (and
17219        (= truck_loc_173 2)
17220        (= truck_travel_time_173 21)
17221      )
17222    )
17223   )
17224  )
17225  (=> (= truck_loc_172 1)
17226    (and
17227      (<= a_stocka_173 120)
17228      (= (+ truck_stock_173 a_stocka_173) (+ truck_stock_172 a_stockb_173))
17229      (= b_stocka_173 b_stockb_173)
17230      (= c_stocka_173 c_stockb_173)
17231      (or
17232        (and
17233          (= truck_loc_173 0)
17234          (= truck_travel_time_173 29)
17235        )
17236        (and
17237          (= truck_loc_173 2)
17238          (= truck_travel_time_173 17)
17239        )
17240        (and
17241          (= truck_loc_173 3)
17242          (= truck_travel_time_173 32)
17243        )
17244      )
17245    )
17246  )
17247  (=> (= truck_loc_172 2)
17248    (and
17249      (<= b_stocka_173 120)
17250      (= (+ truck_stock_173 b_stocka_173) (+ truck_stock_172 b_stockb_173))
17251      (= a_stocka_173 a_stockb_173)
17252      (= c_stocka_173 c_stockb_173)
17253      (or
17254        (and
17255          (= truck_loc_173 1)
17256          (= truck_travel_time_173 17)
17257        )
17258        (and
17259          (= truck_loc_173 0)
17260          (= truck_travel_time_173 21)
17261        )
17262        (and
17263          (= truck_loc_173 3)
17264          (= truck_travel_time_173 37)
17265        )
17266      )
17267    )
17268  )
17269  (=> (= truck_loc_172 3)
17270    (and
17271      (<= c_stocka_173 200)
17272      (= (+ truck_stock_173 c_stocka_173) (+ truck_stock_172 c_stockb_173))
17273      (= a_stocka_173 a_stockb_173)
17274      (= b_stocka_173 b_stockb_173)
17275      (or
17276        (and
```

```
17277              (= truck_loc_173 1)
17278              (= truck_travel_time_173 32)
17279            )
17280          (and
17281            (= truck_loc_173 2)
17282            (= truck_travel_time_173 37)
17283          )
17284        )
17285      )
17286    )
17287  )
17288  (<= truck_stock_173 318)
17289  (>= truck_stock_173 0)
17290  (= a_stockb_174 (- a_stocka_173 truck_travel_time_173))
17291  (= b_stockb_174 (- b_stocka_173 truck_travel_time_173))
17292  (= c_stockb_174 (- c_stocka_173 truck_travel_time_173))
17293  (and
17294    (=> (= truck_loc_173 0)
17295      (and
17296        (= a_stocka_174 a_stockb_174)
17297        (= b_stocka_174 b_stockb_174)
17298        (= c_stocka_174 c_stockb_174)
17299        (or
17300          (and
17301            (= truck_loc_174 1)
17302            (= truck_travel_time_174 29)
17303          )
17304          (and
17305            (= truck_loc_174 2)
17306            (= truck_travel_time_174 21)
17307          )
17308        )
17309      )
17310    )
17311    (=> (= truck_loc_173 1)
17312      (and
17313        (<= a_stocka_174 120)
17314        (= (+ truck_stock_174 a_stocka_174) (+ truck_stock_173 a_stockb_174))
17315        (= b_stocka_174 b_stockb_174)
17316        (= c_stocka_174 c_stockb_174)
17317        (or
17318          (and
17319            (= truck_loc_174 0)
17320            (= truck_travel_time_174 29)
17321          )
17322          (and
17323            (= truck_loc_174 2)
17324            (= truck_travel_time_174 17)
17325          )
17326          (and
17327            (= truck_loc_174 3)
17328            (= truck_travel_time_174 32)
17329          )
17330        )
17331      )
17332    )
17333    (=> (= truck_loc_173 2)
17334      (and
17335        (<= b_stocka_174 120)
17336        (= (+ truck_stock_174 b_stocka_174) (+ truck_stock_173 b_stockb_174))
17337        (= a_stocka_174 a_stockb_174)
17338        (= c_stocka_174 c_stockb_174)
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```
17339        (or
17340          (and
17341            (= truck_loc_174 1)
17342            (= truck_travel_time_174 17)
17343          )
17344          (and
17345            (= truck_loc_174 0)
17346            (= truck_travel_time_174 21)
17347          )
17348          (and
17349            (= truck_loc_174 3)
17350            (= truck_travel_time_174 37)
17351          )
17352        )
17353      )
17354    )
17355    (=> (= truck_loc_173 3)
17356      (and
17357        (<= c_stocka_174 200)
17358        (= (+ truck_stock_174 c_stocka_174) (+ truck_stock_173 c_stockb_174))
17359        (= a_stocka_174 a_stockb_174)
17360        (= b_stocka_174 b_stockb_174)
17361        (or
17362          (and
17363            (= truck_loc_174 1)
17364            (= truck_travel_time_174 32)
17365          )
17366          (and
17367            (= truck_loc_174 2)
17368            (= truck_travel_time_174 37)
17369          )
17370        )
17371      )
17372    )
17373  )
17374  (<= truck_stock_174 318)
17375  (>= truck_stock_174 0)
17376  (= a_stockb_175 (- a_stocka_174 truck_travel_time_174))
17377  (= b_stockb_175 (- b_stocka_174 truck_travel_time_174))
17378  (= c_stockb_175 (- c_stocka_174 truck_travel_time_174))
17379  (and
17380    (=> (= truck_loc_174 0)
17381      (and
17382        (= a_stocka_175 a_stockb_175)
17383        (= b_stocka_175 b_stockb_175)
17384        (= c_stocka_175 c_stockb_175)
17385        (or
17386          (and
17387            (= truck_loc_175 1)
17388            (= truck_travel_time_175 29)
17389          )
17390          (and
17391            (= truck_loc_175 2)
17392            (= truck_travel_time_175 21)
17393          )
17394        )
17395      )
17396    )
17397    (=> (= truck_loc_174 1)
17398      (and
17399        (<= a_stocka_175 120)
17400        (= (+ truck_stock_175 a_stocka_175) (+ truck_stock_174 a_stockb_175))
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17401        (= b_stocka_175 b_stockb_175)
17402        (= c_stocka_175 c_stockb_175)
17403        (or
17404          (and
17405            (= truck_loc_175 0)
17406            (= truck_travel_time_175 29)
17407          )
17408          (and
17409            (= truck_loc_175 2)
17410            (= truck_travel_time_175 17)
17411          )
17412          (and
17413            (= truck_loc_175 3)
17414            (= truck_travel_time_175 32)
17415          )
17416        )
17417      )
17418    )
17419    (=> (= truck_loc_174 2)
17420      (and
17421        (<= b_stocka_175 120)
17422        (= (+ truck_stock_175 b_stocka_175) (+ truck_stock_174 b_stockb_175))
17423        (= a_stocka_175 a_stockb_175)
17424        (= c_stocka_175 c_stockb_175)
17425        (or
17426          (and
17427            (= truck_loc_175 1)
17428            (= truck_travel_time_175 17)
17429          )
17430          (and
17431            (= truck_loc_175 0)
17432            (= truck_travel_time_175 21)
17433          )
17434          (and
17435            (= truck_loc_175 3)
17436            (= truck_travel_time_175 37)
17437          )
17438        )
17439      )
17440    )
17441    (=> (= truck_loc_174 3)
17442      (and
17443        (<= c_stocka_175 200)
17444        (= (+ truck_stock_175 c_stocka_175) (+ truck_stock_174 c_stockb_175))
17445        (= a_stocka_175 a_stockb_175)
17446        (= b_stocka_175 b_stockb_175)
17447        (or
17448          (and
17449            (= truck_loc_175 1)
17450            (= truck_travel_time_175 32)
17451          )
17452          (and
17453            (= truck_loc_175 2)
17454            (= truck_travel_time_175 37)
17455          )
17456        )
17457      )
17458    )
17459  )
17460  (<= truck_stock_175 318)
17461  (>= truck_stock_175 0)
17462  (= a_stockb_176 (- a_stocka_175 truck_travel_time_175))
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```
17463  (= b_stockb_176 (- b_stocka_175 truck_travel_time_175))
17464  (= c_stockb_176 (- c_stocka_175 truck_travel_time_175))
17465  (and
17466    (=> (= truck_loc_175 0)
17467      (and
17468        (= a_stocka_176 a_stockb_176)
17469        (= b_stocka_176 b_stockb_176)
17470        (= c_stocka_176 c_stockb_176)
17471        (or
17472          (and
17473            (= truck_loc_176 1)
17474            (= truck_travel_time_176 29)
17475          )
17476          (and
17477            (= truck_loc_176 2)
17478            (= truck_travel_time_176 21)
17479          )
17480        )
17481      )
17482    )
17483    (=> (= truck_loc_175 1)
17484      (and
17485        (<= a_stocka_176 120)
17486        (= (+ truck_stock_176 a_stocka_176) (+ truck_stock_175 a_stockb_176))
17487        (= b_stocka_176 b_stockb_176)
17488        (= c_stocka_176 c_stockb_176)
17489        (or
17490          (and
17491            (= truck_loc_176 0)
17492            (= truck_travel_time_176 29)
17493          )
17494          (and
17495            (= truck_loc_176 2)
17496            (= truck_travel_time_176 17)
17497          )
17498          (and
17499            (= truck_loc_176 3)
17500            (= truck_travel_time_176 32)
17501          )
17502        )
17503      )
17504    )
17505    (=> (= truck_loc_175 2)
17506      (and
17507        (<= b_stocka_176 120)
17508        (= (+ truck_stock_176 b_stocka_176) (+ truck_stock_175 b_stockb_176))
17509        (= a_stocka_176 a_stockb_176)
17510        (= c_stocka_176 c_stockb_176)
17511        (or
17512          (and
17513            (= truck_loc_176 1)
17514            (= truck_travel_time_176 17)
17515          )
17516          (and
17517            (= truck_loc_176 0)
17518            (= truck_travel_time_176 21)
17519          )
17520          (and
17521            (= truck_loc_176 3)
17522            (= truck_travel_time_176 37)
17523          )
17524        )
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17525        )
17526      )
17527      (=> (= truck_loc_175 3)
17528        (and
17529          (<= c_stocka_176 200)
17530          (= (+ truck_stock_176 c_stocka_176) (+ truck_stock_175 c_stockb_176))
17531          (= a_stocka_176 a_stockb_176)
17532          (= b_stocka_176 b_stockb_176)
17533          (or
17534            (and
17535              (= truck_loc_176 1)
17536              (= truck_travel_time_176 32)
17537            )
17538            (and
17539              (= truck_loc_176 2)
17540              (= truck_travel_time_176 37)
17541            )
17542          )
17543        )
17544      )
17545  )
17546  (<= truck_stock_176 318)
17547  (>= truck_stock_176 0)
17548  (= a_stockb_177 (- a_stocka_176 truck_travel_time_176))
17549  (= b_stockb_177 (- b_stocka_176 truck_travel_time_176))
17550  (= c_stockb_177 (- c_stocka_176 truck_travel_time_176))
17551  (and
17552    (=> (= truck_loc_176 0)
17553      (and
17554        (= a_stocka_177 a_stockb_177)
17555        (= b_stocka_177 b_stockb_177)
17556        (= c_stocka_177 c_stockb_177)
17557        (or
17558          (and
17559            (= truck_loc_177 1)
17560            (= truck_travel_time_177 29)
17561          )
17562          (and
17563            (= truck_loc_177 2)
17564            (= truck_travel_time_177 21)
17565          )
17566        )
17567      )
17568    )
17569    (=> (= truck_loc_176 1)
17570      (and
17571        (<= a_stocka_177 120)
17572        (= (+ truck_stock_177 a_stocka_177) (+ truck_stock_176 a_stockb_177))
17573        (= b_stocka_177 b_stockb_177)
17574        (= c_stocka_177 c_stockb_177)
17575        (or
17576          (and
17577            (= truck_loc_177 0)
17578            (= truck_travel_time_177 29)
17579          )
17580          (and
17581            (= truck_loc_177 2)
17582            (= truck_travel_time_177 17)
17583          )
17584          (and
17585            (= truck_loc_177 3)
17586            (= truck_travel_time_177 32)
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17587                )
17588              )
17589            )
17590          )
17591        (=> (= truck_loc_176 2)
17592          (and
17593            (<= b_stocka_177 120)
17594            (= (+ truck_stock_177 b_stocka_177) (+ truck_stock_176 b_stockb_177))
17595            (= a_stocka_177 a_stockb_177)
17596            (= c_stocka_177 c_stockb_177)
17597            (or
17598              (and
17599                (= truck_loc_177 1)
17600                (= truck_travel_time_177 17)
17601              )
17602              (and
17603                (= truck_loc_177 0)
17604                (= truck_travel_time_177 21)
17605              )
17606              (and
17607                (= truck_loc_177 3)
17608                (= truck_travel_time_177 37)
17609              )
17610            )
17611          )
17612        )
17613        (=> (= truck_loc_176 3)
17614          (and
17615            (<= c_stocka_177 200)
17616            (= (+ truck_stock_177 c_stocka_177) (+ truck_stock_176 c_stockb_177))
17617            (= a_stocka_177 a_stockb_177)
17618            (= b_stocka_177 b_stockb_177)
17619            (or
17620              (and
17621                (= truck_loc_177 1)
17622                (= truck_travel_time_177 32)
17623              )
17624              (and
17625                (= truck_loc_177 2)
17626                (= truck_travel_time_177 37)
17627              )
17628            )
17629          )
17630        )
17631      )
17632      (<= truck_stock_177 318)
17633      (>= truck_stock_177 0)
17634      (= a_stockb_178 (- a_stocka_177 truck_travel_time_177))
17635      (= b_stockb_178 (- b_stocka_177 truck_travel_time_177))
17636      (= c_stockb_178 (- c_stocka_177 truck_travel_time_177))
17637      (and
17638        (=> (= truck_loc_177 0)
17639          (and
17640            (= a_stocka_178 a_stockb_178)
17641            (= b_stocka_178 b_stockb_178)
17642            (= c_stocka_178 c_stockb_178)
17643            (or
17644              (and
17645                (= truck_loc_178 1)
17646                (= truck_travel_time_178 29)
17647              )
17648              (and
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```
17649            (= truck_loc_178 2)
17650            (= truck_travel_time_178 21)
17651          )
17652        )
17653      )
17654    )
17655    (=> (= truck_loc_177 1)
17656      (and
17657        (<= a_stocka_178 120)
17658        (= (+ truck_stock_178 a_stocka_178) (+ truck_stock_177 a_stockb_178))
17659        (= b_stocka_178 b_stockb_178)
17660        (= c_stocka_178 c_stockb_178)
17661        (or
17662          (and
17663            (= truck_loc_178 0)
17664            (= truck_travel_time_178 29)
17665          )
17666          (and
17667            (= truck_loc_178 2)
17668            (= truck_travel_time_178 17)
17669          )
17670          (and
17671            (= truck_loc_178 3)
17672            (= truck_travel_time_178 32)
17673          )
17674        )
17675      )
17676    )
17677    (=> (= truck_loc_177 2)
17678      (and
17679        (<= b_stocka_178 120)
17680        (= (+ truck_stock_178 b_stocka_178) (+ truck_stock_177 b_stockb_178))
17681        (= a_stocka_178 a_stockb_178)
17682        (= c_stocka_178 c_stockb_178)
17683        (or
17684          (and
17685            (= truck_loc_178 1)
17686            (= truck_travel_time_178 17)
17687          )
17688          (and
17689            (= truck_loc_178 0)
17690            (= truck_travel_time_178 21)
17691          )
17692          (and
17693            (= truck_loc_178 3)
17694            (= truck_travel_time_178 37)
17695          )
17696        )
17697      )
17698    )
17699    (=> (= truck_loc_177 3)
17700      (and
17701        (<= c_stocka_178 200)
17702        (= (+ truck_stock_178 c_stocka_178) (+ truck_stock_177 c_stockb_178))
17703        (= a_stocka_178 a_stockb_178)
17704        (= b_stocka_178 b_stockb_178)
17705        (or
17706          (and
17707            (= truck_loc_178 1)
17708            (= truck_travel_time_178 32)
17709          )
17710          (and
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```
17711              (= truck_loc_178 2)
17712              (= truck_travel_time_178 37)
17713            )
17714          )
17715        )
17716    )
17717  )
17718  (<= truck_stock_178 318)
17719  (>= truck_stock_178 0)
17720  (= a_stockb_179 (- a_stocka_178 truck_travel_time_178))
17721  (= b_stockb_179 (- b_stocka_178 truck_travel_time_178))
17722  (= c_stockb_179 (- c_stocka_178 truck_travel_time_178))
17723  (and
17724    (=> (= truck_loc_178 0)
17725      (and
17726        (= a_stocka_179 a_stockb_179)
17727        (= b_stocka_179 b_stockb_179)
17728        (= c_stocka_179 c_stockb_179)
17729        (or
17730          (and
17731            (= truck_loc_179 1)
17732            (= truck_travel_time_179 29)
17733          )
17734          (and
17735            (= truck_loc_179 2)
17736            (= truck_travel_time_179 21)
17737          )
17738        )
17739      )
17740    )
17741    (=> (= truck_loc_178 1)
17742      (and
17743        (<= a_stocka_179 120)
17744        (= (+ truck_stock_179 a_stocka_179) (+ truck_stock_178 a_stockb_179))
17745        (= b_stocka_179 b_stockb_179)
17746        (= c_stocka_179 c_stockb_179)
17747        (or
17748          (and
17749            (= truck_loc_179 0)
17750            (= truck_travel_time_179 29)
17751          )
17752          (and
17753            (= truck_loc_179 2)
17754            (= truck_travel_time_179 17)
17755          )
17756          (and
17757            (= truck_loc_179 3)
17758            (= truck_travel_time_179 32)
17759          )
17760        )
17761      )
17762    )
17763    (=> (= truck_loc_178 2)
17764      (and
17765        (<= b_stocka_179 120)
17766        (= (+ truck_stock_179 b_stocka_179) (+ truck_stock_178 b_stockb_179))
17767        (= a_stocka_179 a_stockb_179)
17768        (= c_stocka_179 c_stockb_179)
17769        (or
17770          (and
17771            (= truck_loc_179 1)
17772            (= truck_travel_time_179 17)
```

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17773              )
17774            (and
17775              (= truck_loc_179 0)
17776              (= truck_travel_time_179 21)
17777            )
17778            (and
17779              (= truck_loc_179 3)
17780              (= truck_travel_time_179 37)
17781            )
17782          )
17783        )
17784      )
17785      (=> (= truck_loc_178 3)
17786        (and
17787          (<= c_stocka_179 200)
17788          (= (+ truck_stock_179 c_stocka_179) (+ truck_stock_178 c_stockb_179))
17789          (= a_stocka_179 a_stockb_179)
17790          (= b_stocka_179 b_stockb_179)
17791          (or
17792            (and
17793              (= truck_loc_179 1)
17794              (= truck_travel_time_179 32)
17795            )
17796            (and
17797              (= truck_loc_179 2)
17798              (= truck_travel_time_179 37)
17799            )
17800          )
17801        )
17802      )
17803    )
17804    (<= truck_stock_179 318)
17805    (>= truck_stock_179 0)
17806    (= a_stockb_180 (- a_stocka_179 truck_travel_time_179))
17807    (= b_stockb_180 (- b_stocka_179 truck_travel_time_179))
17808    (= c_stockb_180 (- c_stocka_179 truck_travel_time_179))
17809    (and
17810      (=> (= truck_loc_179 0)
17811        (and
17812          (= a_stocka_180 a_stockb_180)
17813          (= b_stocka_180 b_stockb_180)
17814          (= c_stocka_180 c_stockb_180)
17815          (or
17816            (and
17817              (= truck_loc_180 1)
17818              (= truck_travel_time_180 29)
17819            )
17820            (and
17821              (= truck_loc_180 2)
17822              (= truck_travel_time_180 21)
17823            )
17824          )
17825        )
17826      )
17827      (=> (= truck_loc_179 1)
17828        (and
17829          (<= a_stocka_180 120)
17830          (= (+ truck_stock_180 a_stocka_180) (+ truck_stock_179 a_stockb_180))
17831          (= b_stocka_180 b_stockb_180)
17832          (= c_stocka_180 c_stockb_180)
17833          (or
17834            (and
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17835              (= truck_loc_180 0)
17836              (= truck_travel_time_180 29)
17837            )
17838          (and
17839            (= truck_loc_180 2)
17840            (= truck_travel_time_180 17)
17841          )
17842          (and
17843            (= truck_loc_180 3)
17844            (= truck_travel_time_180 32)
17845          )
17846        )
17847      )
17848    )
17849    (=> (= truck_loc_179 2)
17850      (and
17851        (<= b_stocka_180 120)
17852        (= (+ truck_stock_180 b_stocka_180) (+ truck_stock_179 b_stockb_180))
17853        (= a_stocka_180 a_stockb_180)
17854        (= c_stocka_180 c_stockb_180)
17855        (or
17856          (and
17857            (= truck_loc_180 1)
17858            (= truck_travel_time_180 17)
17859          )
17860          (and
17861            (= truck_loc_180 0)
17862            (= truck_travel_time_180 21)
17863          )
17864          (and
17865            (= truck_loc_180 3)
17866            (= truck_travel_time_180 37)
17867          )
17868        )
17869      )
17870    )
17871    (=> (= truck_loc_179 3)
17872      (and
17873        (<= c_stocka_180 200)
17874        (= (+ truck_stock_180 c_stocka_180) (+ truck_stock_179 c_stockb_180))
17875        (= a_stocka_180 a_stockb_180)
17876        (= b_stocka_180 b_stockb_180)
17877        (or
17878          (and
17879            (= truck_loc_180 1)
17880            (= truck_travel_time_180 32)
17881          )
17882          (and
17883            (= truck_loc_180 2)
17884            (= truck_travel_time_180 37)
17885          )
17886        )
17887      )
17888    )
17889  )
17890  (<= truck_stock_180 318)
17891  (>= truck_stock_180 0)
17892  (= a_stockb_181 (- a_stocka_180 truck_travel_time_180))
17893  (= b_stockb_181 (- b_stocka_180 truck_travel_time_180))
17894  (= c_stockb_181 (- c_stocka_180 truck_travel_time_180))
17895  (and
17896    (=> (= truck_loc_180 0)
```

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17897      (and
17898        (= a_stocka_181 a_stockb_181)
17899        (= b_stocka_181 b_stockb_181)
17900        (= c_stocka_181 c_stockb_181)
17901        (or
17902          (and
17903            (= truck_loc_181 1)
17904            (= truck_travel_time_181 29)
17905          )
17906          (and
17907            (= truck_loc_181 2)
17908            (= truck_travel_time_181 21)
17909          )
17910        )
17911      )
17912    )
17913    (=> (= truck_loc_180 1)
17914      (and
17915        (<= a_stocka_181 120)
17916        (= (+ truck_stock_181 a_stocka_181) (+ truck_stock_180 a_stockb_181))
17917        (= b_stocka_181 b_stockb_181)
17918        (= c_stocka_181 c_stockb_181)
17919        (or
17920          (and
17921            (= truck_loc_181 0)
17922            (= truck_travel_time_181 29)
17923          )
17924          (and
17925            (= truck_loc_181 2)
17926            (= truck_travel_time_181 17)
17927          )
17928          (and
17929            (= truck_loc_181 3)
17930            (= truck_travel_time_181 32)
17931          )
17932        )
17933      )
17934    )
17935    (=> (= truck_loc_180 2)
17936      (and
17937        (<= b_stocka_181 120)
17938        (= (+ truck_stock_181 b_stocka_181) (+ truck_stock_180 b_stockb_181))
17939        (= a_stocka_181 a_stockb_181)
17940        (= c_stocka_181 c_stockb_181)
17941        (or
17942          (and
17943            (= truck_loc_181 1)
17944            (= truck_travel_time_181 17)
17945          )
17946          (and
17947            (= truck_loc_181 0)
17948            (= truck_travel_time_181 21)
17949          )
17950          (and
17951            (= truck_loc_181 3)
17952            (= truck_travel_time_181 37)
17953          )
17954        )
17955      )
17956    )
17957    (=> (= truck_loc_180 3)
17958      (and
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```
17959        (<= c_stocka_181 200)
17960        (= (+ truck_stock_181 c_stocka_181) (+ truck_stock_180 c_stockb_181))
17961        (= a_stocka_181 a_stockb_181)
17962        (= b_stocka_181 b_stockb_181)
17963        (or
17964          (and
17965            (= truck_loc_181 1)
17966            (= truck_travel_time_181 32)
17967          )
17968          (and
17969            (= truck_loc_181 2)
17970            (= truck_travel_time_181 37)
17971          )
17972        )
17973      )
17974    )
17975 )
17976 (<= truck_stock_181 318)
17977 (>= truck_stock_181 0)
17978 (= a_stockb_182 (- a_stocka_181 truck_travel_time_181))
17979 (= b_stockb_182 (- b_stocka_181 truck_travel_time_181))
17980 (= c_stockb_182 (- c_stocka_181 truck_travel_time_181))
17981 (and
17982    (=> (= truck_loc_181 0)
17983      (and
17984        (= a_stocka_182 a_stockb_182)
17985        (= b_stocka_182 b_stockb_182)
17986        (= c_stocka_182 c_stockb_182)
17987        (or
17988          (and
17989            (= truck_loc_182 1)
17990            (= truck_travel_time_182 29)
17991          )
17992          (and
17993            (= truck_loc_182 2)
17994            (= truck_travel_time_182 21)
17995          )
17996        )
17997      )
17998    )
17999    (=> (= truck_loc_181 1)
18000      (and
18001        (<= a_stocka_182 120)
18002        (= (+ truck_stock_182 a_stocka_182) (+ truck_stock_181 a_stockb_182))
18003        (= b_stocka_182 b_stockb_182)
18004        (= c_stocka_182 c_stockb_182)
18005        (or
18006          (and
18007            (= truck_loc_182 0)
18008            (= truck_travel_time_182 29)
18009          )
18010          (and
18011            (= truck_loc_182 2)
18012            (= truck_travel_time_182 17)
18013          )
18014          (and
18015            (= truck_loc_182 3)
18016            (= truck_travel_time_182 32)
18017          )
18018        )
18019      )
18020    )
```

```
18021    (=> (= truck_loc_181 2)
18022      (and
18023        (<= b_stocka_182 120)
18024        (= (+ truck_stock_182 b_stocka_182) (+ truck_stock_181 b_stockb_182))
18025        (= a_stocka_182 a_stockb_182)
18026        (= c_stocka_182 c_stockb_182)
18027        (or
18028          (and
18029            (= truck_loc_182 1)
18030            (= truck_travel_time_182 17)
18031          )
18032          (and
18033            (= truck_loc_182 0)
18034            (= truck_travel_time_182 21)
18035          )
18036          (and
18037            (= truck_loc_182 3)
18038            (= truck_travel_time_182 37)
18039          )
18040        )
18041      )
18042    )
18043    (=> (= truck_loc_181 3)
18044      (and
18045        (<= c_stocka_182 200)
18046        (= (+ truck_stock_182 c_stocka_182) (+ truck_stock_181 c_stockb_182))
18047        (= a_stocka_182 a_stockb_182)
18048        (= b_stocka_182 b_stockb_182)
18049        (or
18050          (and
18051            (= truck_loc_182 1)
18052            (= truck_travel_time_182 32)
18053          )
18054          (and
18055            (= truck_loc_182 2)
18056            (= truck_travel_time_182 37)
18057          )
18058        )
18059      )
18060    )
18061  )
18062  (<= truck_stock_182 318)
18063  (>= truck_stock_182 0)
18064  (= a_stockb_183 (- a_stocka_182 truck_travel_time_182))
18065  (= b_stockb_183 (- b_stocka_182 truck_travel_time_182))
18066  (= c_stockb_183 (- c_stocka_182 truck_travel_time_182))
18067  (and
18068    (=> (= truck_loc_182 0)
18069      (and
18070        (= a_stocka_183 a_stockb_183)
18071        (= b_stocka_183 b_stockb_183)
18072        (= c_stocka_183 c_stockb_183)
18073        (or
18074          (and
18075            (= truck_loc_183 1)
18076            (= truck_travel_time_183 29)
18077          )
18078          (and
18079            (= truck_loc_183 2)
18080            (= truck_travel_time_183 21)
18081          )
18082        )
```

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18083          )
18084       )
18085       (=> (= truck_loc_182 1)
18086          (and
18087            (<= a_stocka_183 120)
18088            (= (+ truck_stock_183 a_stocka_183) (+ truck_stock_182 a_stockb_183))
18089            (= b_stocka_183 b_stockb_183)
18090            (= c_stocka_183 c_stockb_183)
18091            (or
18092              (and
18093                (= truck_loc_183 0)
18094                (= truck_travel_time_183 29)
18095              )
18096              (and
18097                (= truck_loc_183 2)
18098                (= truck_travel_time_183 17)
18099              )
18100              (and
18101                (= truck_loc_183 3)
18102                (= truck_travel_time_183 32)
18103              )
18104            )
18105          )
18106       )
18107       (=> (= truck_loc_182 2)
18108          (and
18109            (<= b_stocka_183 120)
18110            (= (+ truck_stock_183 b_stocka_183) (+ truck_stock_182 b_stockb_183))
18111            (= a_stocka_183 a_stockb_183)
18112            (= c_stocka_183 c_stockb_183)
18113            (or
18114              (and
18115                (= truck_loc_183 1)
18116                (= truck_travel_time_183 17)
18117              )
18118              (and
18119                (= truck_loc_183 0)
18120                (= truck_travel_time_183 21)
18121              )
18122              (and
18123                (= truck_loc_183 3)
18124                (= truck_travel_time_183 37)
18125              )
18126            )
18127          )
18128       )
18129       (=> (= truck_loc_182 3)
18130          (and
18131            (<= c_stocka_183 200)
18132            (= (+ truck_stock_183 c_stocka_183) (+ truck_stock_182 c_stockb_183))
18133            (= a_stocka_183 a_stockb_183)
18134            (= b_stocka_183 b_stockb_183)
18135            (or
18136              (and
18137                (= truck_loc_183 1)
18138                (= truck_travel_time_183 32)
18139              )
18140              (and
18141                (= truck_loc_183 2)
18142                (= truck_travel_time_183 37)
18143              )
18144            )
```

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18145        )
18146      )
18147  )
18148  (<= truck_stock_183 318)
18149  (>= truck_stock_183 0)
18150  (= a_stockb_184 (- a_stocka_183 truck_travel_time_183))
18151  (= b_stockb_184 (- b_stocka_183 truck_travel_time_183))
18152  (= c_stockb_184 (- c_stocka_183 truck_travel_time_183))
18153  (and
18154    (=> (= truck_loc_183 0)
18155      (and
18156        (= a_stocka_184 a_stockb_184)
18157        (= b_stocka_184 b_stockb_184)
18158        (= c_stocka_184 c_stockb_184)
18159        (or
18160          (and
18161            (= truck_loc_184 1)
18162            (= truck_travel_time_184 29)
18163          )
18164          (and
18165            (= truck_loc_184 2)
18166            (= truck_travel_time_184 21)
18167          )
18168        )
18169      )
18170    )
18171    (=> (= truck_loc_183 1)
18172      (and
18173        (<= a_stocka_184 120)
18174        (= (+ truck_stock_184 a_stocka_184) (+ truck_stock_183 a_stockb_184))
18175        (= b_stocka_184 b_stockb_184)
18176        (= c_stocka_184 c_stockb_184)
18177        (or
18178          (and
18179            (= truck_loc_184 0)
18180            (= truck_travel_time_184 29)
18181          )
18182          (and
18183            (= truck_loc_184 2)
18184            (= truck_travel_time_184 17)
18185          )
18186          (and
18187            (= truck_loc_184 3)
18188            (= truck_travel_time_184 32)
18189          )
18190        )
18191      )
18192    )
18193    (=> (= truck_loc_183 2)
18194      (and
18195        (<= b_stocka_184 120)
18196        (= (+ truck_stock_184 b_stocka_184) (+ truck_stock_183 b_stockb_184))
18197        (= a_stocka_184 a_stockb_184)
18198        (= c_stocka_184 c_stockb_184)
18199        (or
18200          (and
18201            (= truck_loc_184 1)
18202            (= truck_travel_time_184 17)
18203          )
18204          (and
18205            (= truck_loc_184 0)
18206            (= truck_travel_time_184 21)
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18207              )
18208          (and
18209            (= truck_loc_184 3)
18210            (= truck_travel_time_184 37)
18211          )
18212        )
18213      )
18214    )
18215    (=> (= truck_loc_183 3)
18216      (and
18217        (<= c_stocka_184 200)
18218        (= (+ truck_stock_184 c_stocka_184) (+ truck_stock_183 c_stockb_184))
18219        (= a_stocka_184 a_stockb_184)
18220        (= b_stocka_184 b_stockb_184)
18221        (or
18222          (and
18223            (= truck_loc_184 1)
18224            (= truck_travel_time_184 32)
18225          )
18226          (and
18227            (= truck_loc_184 2)
18228            (= truck_travel_time_184 37)
18229          )
18230        )
18231      )
18232    )
18233  )
18234  (<= truck_stock_184 318)
18235  (>= truck_stock_184 0)
18236  (= a_stockb_185 (- a_stocka_184 truck_travel_time_184))
18237  (= b_stockb_185 (- b_stocka_184 truck_travel_time_184))
18238  (= c_stockb_185 (- c_stocka_184 truck_travel_time_184))
18239  (and
18240    (=> (= truck_loc_184 0)
18241      (and
18242        (= a_stocka_185 a_stockb_185)
18243        (= b_stocka_185 b_stockb_185)
18244        (= c_stocka_185 c_stockb_185)
18245        (or
18246          (and
18247            (= truck_loc_185 1)
18248            (= truck_travel_time_185 29)
18249          )
18250          (and
18251            (= truck_loc_185 2)
18252            (= truck_travel_time_185 21)
18253          )
18254        )
18255      )
18256    )
18257    (=> (= truck_loc_184 1)
18258      (and
18259        (<= a_stocka_185 120)
18260        (= (+ truck_stock_185 a_stocka_185) (+ truck_stock_184 a_stockb_185))
18261        (= b_stocka_185 b_stockb_185)
18262        (= c_stocka_185 c_stockb_185)
18263        (or
18264          (and
18265            (= truck_loc_185 0)
18266            (= truck_travel_time_185 29)
18267          )
18268          (and
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```
18269          (= truck_loc_185 2)
18270          (= truck_travel_time_185 17)
18271        )
18272      (and
18273        (= truck_loc_185 3)
18274        (= truck_travel_time_185 32)
18275      )
18276    )
18277   )
18278  )
18279  (=> (= truck_loc_184 2)
18280    (and
18281      (<= b_stocka_185 120)
18282      (= (+ truck_stock_185 b_stocka_185) (+ truck_stock_184 b_stockb_185))
18283      (= a_stocka_185 a_stockb_185)
18284      (= c_stocka_185 c_stockb_185)
18285      (or
18286        (and
18287          (= truck_loc_185 1)
18288          (= truck_travel_time_185 17)
18289        )
18290        (and
18291          (= truck_loc_185 0)
18292          (= truck_travel_time_185 21)
18293        )
18294        (and
18295          (= truck_loc_185 3)
18296          (= truck_travel_time_185 37)
18297        )
18298      )
18299    )
18300  )
18301  (=> (= truck_loc_184 3)
18302    (and
18303      (<= c_stocka_185 200)
18304      (= (+ truck_stock_185 c_stocka_185) (+ truck_stock_184 c_stockb_185))
18305      (= a_stocka_185 a_stockb_185)
18306      (= b_stocka_185 b_stockb_185)
18307      (or
18308        (and
18309          (= truck_loc_185 1)
18310          (= truck_travel_time_185 32)
18311        )
18312        (and
18313          (= truck_loc_185 2)
18314          (= truck_travel_time_185 37)
18315        )
18316      )
18317    )
18318  )
18319 )
18320 (<= truck_stock_185 318)
18321 (>= truck_stock_185 0)
18322 (= a_stockb_186 (- a_stocka_185 truck_travel_time_185))
18323 (= b_stockb_186 (- b_stocka_185 truck_travel_time_185))
18324 (= c_stockb_186 (- c_stocka_185 truck_travel_time_185))
18325 (and
18326  (=> (= truck_loc_185 0)
18327    (and
18328      (= a_stocka_186 a_stockb_186)
18329      (= b_stocka_186 b_stockb_186)
18330      (= c_stocka_186 c_stockb_186)
```

```
18331          (or
18332            (and
18333              (= truck_loc_186 1)
18334              (= truck_travel_time_186 29)
18335            )
18336            (and
18337              (= truck_loc_186 2)
18338              (= truck_travel_time_186 21)
18339            )
18340          )
18341        )
18342      )
18343      (=> (= truck_loc_185 1)
18344        (and
18345          (<= a_stocka_186 120)
18346          (= (+ truck_stock_186 a_stocka_186) (+ truck_stock_185 a_stockb_186))
18347          (= b_stocka_186 b_stockb_186)
18348          (= c_stocka_186 c_stockb_186)
18349          (or
18350            (and
18351              (= truck_loc_186 0)
18352              (= truck_travel_time_186 29)
18353            )
18354            (and
18355              (= truck_loc_186 2)
18356              (= truck_travel_time_186 17)
18357            )
18358            (and
18359              (= truck_loc_186 3)
18360              (= truck_travel_time_186 32)
18361            )
18362          )
18363        )
18364      )
18365      (=> (= truck_loc_185 2)
18366        (and
18367          (<= b_stocka_186 120)
18368          (= (+ truck_stock_186 b_stocka_186) (+ truck_stock_185 b_stockb_186))
18369          (= a_stocka_186 a_stockb_186)
18370          (= c_stocka_186 c_stockb_186)
18371          (or
18372            (and
18373              (= truck_loc_186 1)
18374              (= truck_travel_time_186 17)
18375            )
18376            (and
18377              (= truck_loc_186 0)
18378              (= truck_travel_time_186 21)
18379            )
18380            (and
18381              (= truck_loc_186 3)
18382              (= truck_travel_time_186 37)
18383            )
18384          )
18385        )
18386      )
18387      (=> (= truck_loc_185 3)
18388        (and
18389          (<= c_stocka_186 200)
18390          (= (+ truck_stock_186 c_stocka_186) (+ truck_stock_185 c_stockb_186))
18391          (= a_stocka_186 a_stockb_186)
18392          (= b_stocka_186 b_stockb_186)
```

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```
18393          (or
18394            (and
18395              (= truck_loc_186 1)
18396              (= truck_travel_time_186 32)
18397            )
18398            (and
18399              (= truck_loc_186 2)
18400              (= truck_travel_time_186 37)
18401            )
18402          )
18403        )
18404    )
18405  )
18406  (<= truck_stock_186 318)
18407  (>= truck_stock_186 0)
18408  (= a_stockb_187 (- a_stocka_186 truck_travel_time_186))
18409  (= b_stockb_187 (- b_stocka_186 truck_travel_time_186))
18410  (= c_stockb_187 (- c_stocka_186 truck_travel_time_186))
18411  (and
18412    (=> (= truck_loc_186 0)
18413      (and
18414        (= a_stocka_187 a_stockb_187)
18415        (= b_stocka_187 b_stockb_187)
18416        (= c_stocka_187 c_stockb_187)
18417        (or
18418          (and
18419            (= truck_loc_187 1)
18420            (= truck_travel_time_187 29)
18421          )
18422          (and
18423            (= truck_loc_187 2)
18424            (= truck_travel_time_187 21)
18425          )
18426        )
18427      )
18428    )
18429    (=> (= truck_loc_186 1)
18430      (and
18431        (<= a_stocka_187 120)
18432        (= (+ truck_stock_187 a_stocka_187) (+ truck_stock_186 a_stockb_187))
18433        (= b_stocka_187 b_stockb_187)
18434        (= c_stocka_187 c_stockb_187)
18435        (or
18436          (and
18437            (= truck_loc_187 0)
18438            (= truck_travel_time_187 29)
18439          )
18440          (and
18441            (= truck_loc_187 2)
18442            (= truck_travel_time_187 17)
18443          )
18444          (and
18445            (= truck_loc_187 3)
18446            (= truck_travel_time_187 32)
18447          )
18448        )
18449      )
18450    )
18451    (=> (= truck_loc_186 2)
18452      (and
18453        (<= b_stocka_187 120)
18454        (= (+ truck_stock_187 b_stocka_187) (+ truck_stock_186 b_stockb_187))
```

```
18455        (= a_stocka_187 a_stockb_187)
18456        (= c_stocka_187 c_stockb_187)
18457        (or
18458          (and
18459            (= truck_loc_187 1)
18460            (= truck_travel_time_187 17)
18461          )
18462          (and
18463            (= truck_loc_187 0)
18464            (= truck_travel_time_187 21)
18465          )
18466          (and
18467            (= truck_loc_187 3)
18468            (= truck_travel_time_187 37)
18469          )
18470        )
18471      )
18472    )
18473    (=> (= truck_loc_186 3)
18474      (and
18475        (<= c_stocka_187 200)
18476        (= (+ truck_stock_187 c_stocka_187) (+ truck_stock_186 c_stockb_187))
18477        (= a_stocka_187 a_stockb_187)
18478        (= b_stocka_187 b_stockb_187)
18479        (or
18480          (and
18481            (= truck_loc_187 1)
18482            (= truck_travel_time_187 32)
18483          )
18484          (and
18485            (= truck_loc_187 2)
18486            (= truck_travel_time_187 37)
18487          )
18488        )
18489      )
18490    )
18491  )
18492  (<= truck_stock_187 318)
18493  (>= truck_stock_187 0)
18494  (= a_stockb_188 (- a_stocka_187 truck_travel_time_187))
18495  (= b_stockb_188 (- b_stocka_187 truck_travel_time_187))
18496  (= c_stockb_188 (- c_stocka_187 truck_travel_time_187))
18497  (and
18498    (=> (= truck_loc_187 0)
18499      (and
18500        (= a_stocka_188 a_stockb_188)
18501        (= b_stocka_188 b_stockb_188)
18502        (= c_stocka_188 c_stockb_188)
18503        (or
18504          (and
18505            (= truck_loc_188 1)
18506            (= truck_travel_time_188 29)
18507          )
18508          (and
18509            (= truck_loc_188 2)
18510            (= truck_travel_time_188 21)
18511          )
18512        )
18513      )
18514    )
18515    (=> (= truck_loc_187 1)
18516      (and
```

```
18517        (<= a_stocka_188 120)
18518        (= (+ truck_stock_188 a_stocka_188) (+ truck_stock_187 a_stockb_188))
18519        (= b_stocka_188 b_stockb_188)
18520        (= c_stocka_188 c_stockb_188)
18521        (or
18522          (and
18523            (= truck_loc_188 0)
18524            (= truck_travel_time_188 29)
18525          )
18526          (and
18527            (= truck_loc_188 2)
18528            (= truck_travel_time_188 17)
18529          )
18530          (and
18531            (= truck_loc_188 3)
18532            (= truck_travel_time_188 32)
18533          )
18534        )
18535      )
18536    )
18537    (=> (= truck_loc_187 2)
18538      (and
18539        (<= b_stocka_188 120)
18540        (= (+ truck_stock_188 b_stocka_188) (+ truck_stock_187 b_stockb_188))
18541        (= a_stocka_188 a_stockb_188)
18542        (= c_stocka_188 c_stockb_188)
18543        (or
18544          (and
18545            (= truck_loc_188 1)
18546            (= truck_travel_time_188 17)
18547          )
18548          (and
18549            (= truck_loc_188 0)
18550            (= truck_travel_time_188 21)
18551          )
18552          (and
18553            (= truck_loc_188 3)
18554            (= truck_travel_time_188 37)
18555          )
18556        )
18557      )
18558    )
18559    (=> (= truck_loc_187 3)
18560      (and
18561        (<= c_stocka_188 200)
18562        (= (+ truck_stock_188 c_stocka_188) (+ truck_stock_187 c_stockb_188))
18563        (= a_stocka_188 a_stockb_188)
18564        (= b_stocka_188 b_stockb_188)
18565        (or
18566          (and
18567            (= truck_loc_188 1)
18568            (= truck_travel_time_188 32)
18569          )
18570          (and
18571            (= truck_loc_188 2)
18572            (= truck_travel_time_188 37)
18573          )
18574        )
18575      )
18576    )
18577  )
18578  (<= truck_stock_188 318)
```

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```
18579    (>= truck_stock_188 0)
18580    (= a_stockb_189 (- a_stocka_188 truck_travel_time_188))
18581    (= b_stockb_189 (- b_stocka_188 truck_travel_time_188))
18582    (= c_stockb_189 (- c_stocka_188 truck_travel_time_188))
18583    (and
18584      (=> (= truck_loc_188 0)
18585        (and
18586          (= a_stocka_189 a_stockb_189)
18587          (= b_stocka_189 b_stockb_189)
18588          (= c_stocka_189 c_stockb_189)
18589          (or
18590            (and
18591              (= truck_loc_189 1)
18592              (= truck_travel_time_189 29)
18593            )
18594            (and
18595              (= truck_loc_189 2)
18596              (= truck_travel_time_189 21)
18597            )
18598          )
18599        )
18600      )
18601      (=> (= truck_loc_188 1)
18602        (and
18603          (<= a_stocka_189 120)
18604          (= (+ truck_stock_189 a_stocka_189) (+ truck_stock_188 a_stockb_189))
18605          (= b_stocka_189 b_stockb_189)
18606          (= c_stocka_189 c_stockb_189)
18607          (or
18608            (and
18609              (= truck_loc_189 0)
18610              (= truck_travel_time_189 29)
18611            )
18612            (and
18613              (= truck_loc_189 2)
18614              (= truck_travel_time_189 17)
18615            )
18616            (and
18617              (= truck_loc_189 3)
18618              (= truck_travel_time_189 32)
18619            )
18620          )
18621        )
18622      )
18623      (=> (= truck_loc_188 2)
18624        (and
18625          (<= b_stocka_189 120)
18626          (= (+ truck_stock_189 b_stocka_189) (+ truck_stock_188 b_stockb_189))
18627          (= a_stocka_189 a_stockb_189)
18628          (= c_stocka_189 c_stockb_189)
18629          (or
18630            (and
18631              (= truck_loc_189 1)
18632              (= truck_travel_time_189 17)
18633            )
18634            (and
18635              (= truck_loc_189 0)
18636              (= truck_travel_time_189 21)
18637            )
18638            (and
18639              (= truck_loc_189 3)
18640              (= truck_travel_time_189 37)
```

```
18641              )
18642            )
18643          )
18644       )
18645     (=> (= truck_loc_188 3)
18646       (and
18647         (<= c_stocka_189 200)
18648         (= (+ truck_stock_189 c_stocka_189) (+ truck_stock_188 c_stockb_189))
18649         (= a_stocka_189 a_stockb_189)
18650         (= b_stocka_189 b_stockb_189)
18651         (or
18652           (and
18653             (= truck_loc_189 1)
18654             (= truck_travel_time_189 32)
18655           )
18656           (and
18657             (= truck_loc_189 2)
18658             (= truck_travel_time_189 37)
18659           )
18660         )
18661       )
18662     )
18663   )
18664   (<= truck_stock_189 318)
18665   (>= truck_stock_189 0)
18666   (= a_stockb_190 (- a_stocka_189 truck_travel_time_189))
18667   (= b_stockb_190 (- b_stocka_189 truck_travel_time_189))
18668   (= c_stockb_190 (- c_stocka_189 truck_travel_time_189))
18669   (and
18670     (=> (= truck_loc_189 0)
18671       (and
18672         (= a_stocka_190 a_stockb_190)
18673         (= b_stocka_190 b_stockb_190)
18674         (= c_stocka_190 c_stockb_190)
18675         (or
18676           (and
18677             (= truck_loc_190 1)
18678             (= truck_travel_time_190 29)
18679           )
18680           (and
18681             (= truck_loc_190 2)
18682             (= truck_travel_time_190 21)
18683           )
18684         )
18685       )
18686     )
18687     (=> (= truck_loc_189 1)
18688       (and
18689         (<= a_stocka_190 120)
18690         (= (+ truck_stock_190 a_stocka_190) (+ truck_stock_189 a_stockb_190))
18691         (= b_stocka_190 b_stockb_190)
18692         (= c_stocka_190 c_stockb_190)
18693         (or
18694           (and
18695             (= truck_loc_190 0)
18696             (= truck_travel_time_190 29)
18697           )
18698           (and
18699             (= truck_loc_190 2)
18700             (= truck_travel_time_190 17)
18701           )
18702           (and
```

```
18703              (= truck_loc_190 3)
18704              (= truck_travel_time_190 32)
18705            )
18706          )
18707        )
18708      )
18709      (=> (= truck_loc_189 2)
18710        (and
18711          (<= b_stocka_190 120)
18712          (= (+ truck_stock_190 b_stocka_190) (+ truck_stock_189 b_stockb_190))
18713          (= a_stocka_190 a_stockb_190)
18714          (= c_stocka_190 c_stockb_190)
18715          (or
18716            (and
18717              (= truck_loc_190 1)
18718              (= truck_travel_time_190 17)
18719            )
18720            (and
18721              (= truck_loc_190 0)
18722              (= truck_travel_time_190 21)
18723            )
18724            (and
18725              (= truck_loc_190 3)
18726              (= truck_travel_time_190 37)
18727            )
18728          )
18729        )
18730      )
18731      (=> (= truck_loc_189 3)
18732        (and
18733          (<= c_stocka_190 200)
18734          (= (+ truck_stock_190 c_stocka_190) (+ truck_stock_189 c_stockb_190))
18735          (= a_stocka_190 a_stockb_190)
18736          (= b_stocka_190 b_stockb_190)
18737          (or
18738            (and
18739              (= truck_loc_190 1)
18740              (= truck_travel_time_190 32)
18741            )
18742            (and
18743              (= truck_loc_190 2)
18744              (= truck_travel_time_190 37)
18745            )
18746          )
18747        )
18748      )
18749  )
18750  (<= truck_stock_190 318)
18751  (>= truck_stock_190 0)
18752  (= a_stockb_191 (- a_stocka_190 truck_travel_time_190))
18753  (= b_stockb_191 (- b_stocka_190 truck_travel_time_190))
18754  (= c_stockb_191 (- c_stocka_190 truck_travel_time_190))
18755  (and
18756    (=> (= truck_loc_190 0)
18757      (and
18758        (= a_stocka_191 a_stockb_191)
18759        (= b_stocka_191 b_stockb_191)
18760        (= c_stocka_191 c_stockb_191)
18761        (or
18762          (and
18763            (= truck_loc_191 1)
18764            (= truck_travel_time_191 29)
```

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```
18765            )
18766          (and
18767            (= truck_loc_191 2)
18768            (= truck_travel_time_191 21)
18769          )
18770        )
18771      )
18772    )
18773    (=> (= truck_loc_190 1)
18774      (and
18775        (<= a_stocka_191 120)
18776        (= (+ truck_stock_191 a_stocka_191) (+ truck_stock_190 a_stockb_191))
18777        (= b_stocka_191 b_stockb_191)
18778        (= c_stocka_191 c_stockb_191)
18779        (or
18780          (and
18781            (= truck_loc_191 0)
18782            (= truck_travel_time_191 29)
18783          )
18784          (and
18785            (= truck_loc_191 2)
18786            (= truck_travel_time_191 17)
18787          )
18788          (and
18789            (= truck_loc_191 3)
18790            (= truck_travel_time_191 32)
18791          )
18792        )
18793      )
18794    )
18795    (=> (= truck_loc_190 2)
18796      (and
18797        (<= b_stocka_191 120)
18798        (= (+ truck_stock_191 b_stocka_191) (+ truck_stock_190 b_stockb_191))
18799        (= a_stocka_191 a_stockb_191)
18800        (= c_stocka_191 c_stockb_191)
18801        (or
18802          (and
18803            (= truck_loc_191 1)
18804            (= truck_travel_time_191 17)
18805          )
18806          (and
18807            (= truck_loc_191 0)
18808            (= truck_travel_time_191 21)
18809          )
18810          (and
18811            (= truck_loc_191 3)
18812            (= truck_travel_time_191 37)
18813          )
18814        )
18815      )
18816    )
18817    (=> (= truck_loc_190 3)
18818      (and
18819        (<= c_stocka_191 200)
18820        (= (+ truck_stock_191 c_stocka_191) (+ truck_stock_190 c_stockb_191))
18821        (= a_stocka_191 a_stockb_191)
18822        (= b_stocka_191 b_stockb_191)
18823        (or
18824          (and
18825            (= truck_loc_191 1)
18826            (= truck_travel_time_191 32)
```

```
18827              )
18828           (and
18829             (= truck_loc_191 2)
18830             (= truck_travel_time_191 37)
18831           )
18832       )
18833     )
18834   )
18835  )
18836  (<= truck_stock_191 318)
18837  (>= truck_stock_191 0)
18838  (= a_stockb_192 (- a_stocka_191 truck_travel_time_191))
18839  (= b_stockb_192 (- b_stocka_191 truck_travel_time_191))
18840  (= c_stockb_192 (- c_stocka_191 truck_travel_time_191))
18841  (and
18842    (=> (= truck_loc_191 0)
18843      (and
18844        (= a_stocka_192 a_stockb_192)
18845        (= b_stocka_192 b_stockb_192)
18846        (= c_stocka_192 c_stockb_192)
18847        (or
18848          (and
18849            (= truck_loc_192 1)
18850            (= truck_travel_time_192 29)
18851          )
18852          (and
18853            (= truck_loc_192 2)
18854            (= truck_travel_time_192 21)
18855          )
18856        )
18857      )
18858    )
18859    (=> (= truck_loc_191 1)
18860      (and
18861        (<= a_stocka_192 120)
18862        (= (+ truck_stock_192 a_stocka_192) (+ truck_stock_191 a_stockb_192))
18863        (= b_stocka_192 b_stockb_192)
18864        (= c_stocka_192 c_stockb_192)
18865        (or
18866          (and
18867            (= truck_loc_192 0)
18868            (= truck_travel_time_192 29)
18869          )
18870          (and
18871            (= truck_loc_192 2)
18872            (= truck_travel_time_192 17)
18873          )
18874          (and
18875            (= truck_loc_192 3)
18876            (= truck_travel_time_192 32)
18877          )
18878        )
18879      )
18880    )
18881    (=> (= truck_loc_191 2)
18882      (and
18883        (<= b_stocka_192 120)
18884        (= (+ truck_stock_192 b_stocka_192) (+ truck_stock_191 b_stockb_192))
18885        (= a_stocka_192 a_stockb_192)
18886        (= c_stocka_192 c_stockb_192)
18887        (or
18888          (and
```

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```
18889              (= truck_loc_192 1)
18890              (= truck_travel_time_192 17)
18891            )
18892          (and
18893            (= truck_loc_192 0)
18894            (= truck_travel_time_192 21)
18895          )
18896          (and
18897            (= truck_loc_192 3)
18898            (= truck_travel_time_192 37)
18899          )
18900        )
18901      )
18902    )
18903    (=> (= truck_loc_191 3)
18904      (and
18905        (<= c_stocka_192 200)
18906        (= (+ truck_stock_192 c_stocka_192) (+ truck_stock_191 c_stockb_192))
18907        (= a_stocka_192 a_stockb_192)
18908        (= b_stocka_192 b_stockb_192)
18909        (or
18910          (and
18911            (= truck_loc_192 1)
18912            (= truck_travel_time_192 32)
18913          )
18914          (and
18915            (= truck_loc_192 2)
18916            (= truck_travel_time_192 37)
18917          )
18918        )
18919      )
18920    )
18921  )
18922  (<= truck_stock_192 318)
18923  (>= truck_stock_192 0)
18924  (= a_stockb_193 (- a_stocka_192 truck_travel_time_192))
18925  (= b_stockb_193 (- b_stocka_192 truck_travel_time_192))
18926  (= c_stockb_193 (- c_stocka_192 truck_travel_time_192))
18927  (and
18928    (=> (= truck_loc_192 0)
18929      (and
18930        (= a_stocka_193 a_stockb_193)
18931        (= b_stocka_193 b_stockb_193)
18932        (= c_stocka_193 c_stockb_193)
18933        (or
18934          (and
18935            (= truck_loc_193 1)
18936            (= truck_travel_time_193 29)
18937          )
18938          (and
18939            (= truck_loc_193 2)
18940            (= truck_travel_time_193 21)
18941          )
18942        )
18943      )
18944    )
18945    (=> (= truck_loc_192 1)
18946      (and
18947        (<= a_stocka_193 120)
18948        (= (+ truck_stock_193 a_stocka_193) (+ truck_stock_192 a_stockb_193))
18949        (= b_stocka_193 b_stockb_193)
18950        (= c_stocka_193 c_stockb_193)
```

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```
18951        (or
18952          (and
18953            (= truck_loc_193 0)
18954            (= truck_travel_time_193 29)
18955          )
18956          (and
18957            (= truck_loc_193 2)
18958            (= truck_travel_time_193 17)
18959          )
18960          (and
18961            (= truck_loc_193 3)
18962            (= truck_travel_time_193 32)
18963          )
18964        )
18965      )
18966    )
18967    (=> (= truck_loc_192 2)
18968      (and
18969        (<= b_stocka_193 120)
18970        (= (+ truck_stock_193 b_stocka_193) (+ truck_stock_192 b_stockb_193))
18971        (= a_stocka_193 a_stockb_193)
18972        (= c_stocka_193 c_stockb_193)
18973        (or
18974          (and
18975            (= truck_loc_193 1)
18976            (= truck_travel_time_193 17)
18977          )
18978          (and
18979            (= truck_loc_193 0)
18980            (= truck_travel_time_193 21)
18981          )
18982          (and
18983            (= truck_loc_193 3)
18984            (= truck_travel_time_193 37)
18985          )
18986        )
18987      )
18988    )
18989    (=> (= truck_loc_192 3)
18990      (and
18991        (<= c_stocka_193 200)
18992        (= (+ truck_stock_193 c_stocka_193) (+ truck_stock_192 c_stockb_193))
18993        (= a_stocka_193 a_stockb_193)
18994        (= b_stocka_193 b_stockb_193)
18995        (or
18996          (and
18997            (= truck_loc_193 1)
18998            (= truck_travel_time_193 32)
18999          )
19000          (and
19001            (= truck_loc_193 2)
19002            (= truck_travel_time_193 37)
19003          )
19004        )
19005      )
19006    )
19007  )
19008  (<= truck_stock_193 318)
19009  (>= truck_stock_193 0)
19010  (= a_stockb_194 (- a_stocka_193 truck_travel_time_193))
19011  (= b_stockb_194 (- b_stocka_193 truck_travel_time_193))
19012  (= c_stockb_194 (- c_stocka_193 truck_travel_time_193))
```

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```
19013  (and
19014    (=> (= truck_loc_193 0)
19015      (and
19016        (= a_stocka_194 a_stockb_194)
19017        (= b_stocka_194 b_stockb_194)
19018        (= c_stocka_194 c_stockb_194)
19019        (or
19020          (and
19021            (= truck_loc_194 1)
19022            (= truck_travel_time_194 29)
19023          )
19024          (and
19025            (= truck_loc_194 2)
19026            (= truck_travel_time_194 21)
19027          )
19028        )
19029      )
19030    )
19031    (=> (= truck_loc_193 1)
19032      (and
19033        (<= a_stocka_194 120)
19034        (= (+ truck_stock_194 a_stocka_194) (+ truck_stock_193 a_stockb_194))
19035        (= b_stocka_194 b_stockb_194)
19036        (= c_stocka_194 c_stockb_194)
19037        (or
19038          (and
19039            (= truck_loc_194 0)
19040            (= truck_travel_time_194 29)
19041          )
19042          (and
19043            (= truck_loc_194 2)
19044            (= truck_travel_time_194 17)
19045          )
19046          (and
19047            (= truck_loc_194 3)
19048            (= truck_travel_time_194 32)
19049          )
19050        )
19051      )
19052    )
19053    (=> (= truck_loc_193 2)
19054      (and
19055        (<= b_stocka_194 120)
19056        (= (+ truck_stock_194 b_stocka_194) (+ truck_stock_193 b_stockb_194))
19057        (= a_stocka_194 a_stockb_194)
19058        (= c_stocka_194 c_stockb_194)
19059        (or
19060          (and
19061            (= truck_loc_194 1)
19062            (= truck_travel_time_194 17)
19063          )
19064          (and
19065            (= truck_loc_194 0)
19066            (= truck_travel_time_194 21)
19067          )
19068          (and
19069            (= truck_loc_194 3)
19070            (= truck_travel_time_194 37)
19071          )
19072        )
19073      )
19074    )
```

```
19075    (=> (= truck_loc_193 3)
19076      (and
19077        (<= c_stocka_194 200)
19078        (= (+ truck_stock_194 c_stocka_194) (+ truck_stock_193 c_stockb_194))
19079        (= a_stocka_194 a_stockb_194)
19080        (= b_stocka_194 b_stockb_194)
19081        (or
19082          (and
19083            (= truck_loc_194 1)
19084            (= truck_travel_time_194 32)
19085          )
19086          (and
19087            (= truck_loc_194 2)
19088            (= truck_travel_time_194 37)
19089          )
19090        )
19091      )
19092    )
19093  )
19094  (<= truck_stock_194 318)
19095  (>= truck_stock_194 0)
19096  (= a_stockb_195 (- a_stocka_194 truck_travel_time_194))
19097  (= b_stockb_195 (- b_stocka_194 truck_travel_time_194))
19098  (= c_stockb_195 (- c_stocka_194 truck_travel_time_194))
19099  (and
19100    (=> (= truck_loc_194 0)
19101      (and
19102        (= a_stocka_195 a_stockb_195)
19103        (= b_stocka_195 b_stockb_195)
19104        (= c_stocka_195 c_stockb_195)
19105        (or
19106          (and
19107            (= truck_loc_195 1)
19108            (= truck_travel_time_195 29)
19109          )
19110          (and
19111            (= truck_loc_195 2)
19112            (= truck_travel_time_195 21)
19113          )
19114        )
19115      )
19116    )
19117    (=> (= truck_loc_194 1)
19118      (and
19119        (<= a_stocka_195 120)
19120        (= (+ truck_stock_195 a_stocka_195) (+ truck_stock_194 a_stockb_195))
19121        (= b_stocka_195 b_stockb_195)
19122        (= c_stocka_195 c_stockb_195)
19123        (or
19124          (and
19125            (= truck_loc_195 0)
19126            (= truck_travel_time_195 29)
19127          )
19128          (and
19129            (= truck_loc_195 2)
19130            (= truck_travel_time_195 17)
19131          )
19132          (and
19133            (= truck_loc_195 3)
19134            (= truck_travel_time_195 32)
19135          )
19136        )
```

```
19137          )
19138       )
19139     (=> (= truck_loc_194 2)
19140        (and
19141           (<= b_stocka_195 120)
19142           (= (+ truck_stock_195 b_stocka_195) (+ truck_stock_194 b_stockb_195))
19143           (= a_stocka_195 a_stockb_195)
19144           (= c_stocka_195 c_stockb_195)
19145           (or
19146             (and
19147                (= truck_loc_195 1)
19148                (= truck_travel_time_195 17)
19149             )
19150             (and
19151                (= truck_loc_195 0)
19152                (= truck_travel_time_195 21)
19153             )
19154             (and
19155                (= truck_loc_195 3)
19156                (= truck_travel_time_195 37)
19157             )
19158           )
19159        )
19160     )
19161     (=> (= truck_loc_194 3)
19162        (and
19163           (<= c_stocka_195 200)
19164           (= (+ truck_stock_195 c_stocka_195) (+ truck_stock_194 c_stockb_195))
19165           (= a_stocka_195 a_stockb_195)
19166           (= b_stocka_195 b_stockb_195)
19167           (or
19168             (and
19169                (= truck_loc_195 1)
19170                (= truck_travel_time_195 32)
19171             )
19172             (and
19173                (= truck_loc_195 2)
19174                (= truck_travel_time_195 37)
19175             )
19176           )
19177        )
19178     )
19179  )
19180  (<= truck_stock_195 318)
19181  (>= truck_stock_195 0)
19182  (= a_stockb_196 (- a_stocka_195 truck_travel_time_195))
19183  (= b_stockb_196 (- b_stocka_195 truck_travel_time_195))
19184  (= c_stockb_196 (- c_stocka_195 truck_travel_time_195))
19185  (and
19186     (=> (= truck_loc_195 0)
19187        (and
19188           (= a_stocka_196 a_stockb_196)
19189           (= b_stocka_196 b_stockb_196)
19190           (= c_stocka_196 c_stockb_196)
19191           (or
19192             (and
19193                (= truck_loc_196 1)
19194                (= truck_travel_time_196 29)
19195             )
19196             (and
19197                (= truck_loc_196 2)
19198                (= truck_travel_time_196 21)
```

```
19199            )
19200          )
19201        )
19202    )
19203    (=> (= truck_loc_195 1)
19204      (and
19205        (<= a_stocka_196 120)
19206        (= (+ truck_stock_196 a_stocka_196) (+ truck_stock_195 a_stockb_196))
19207        (= b_stocka_196 b_stockb_196)
19208        (= c_stocka_196 c_stockb_196)
19209        (or
19210          (and
19211            (= truck_loc_196 0)
19212            (= truck_travel_time_196 29)
19213          )
19214          (and
19215            (= truck_loc_196 2)
19216            (= truck_travel_time_196 17)
19217          )
19218          (and
19219            (= truck_loc_196 3)
19220            (= truck_travel_time_196 32)
19221          )
19222        )
19223      )
19224    )
19225    (=> (= truck_loc_195 2)
19226      (and
19227        (<= b_stocka_196 120)
19228        (= (+ truck_stock_196 b_stocka_196) (+ truck_stock_195 b_stockb_196))
19229        (= a_stocka_196 a_stockb_196)
19230        (= c_stocka_196 c_stockb_196)
19231        (or
19232          (and
19233            (= truck_loc_196 1)
19234            (= truck_travel_time_196 17)
19235          )
19236          (and
19237            (= truck_loc_196 0)
19238            (= truck_travel_time_196 21)
19239          )
19240          (and
19241            (= truck_loc_196 3)
19242            (= truck_travel_time_196 37)
19243          )
19244        )
19245      )
19246    )
19247    (=> (= truck_loc_195 3)
19248      (and
19249        (<= c_stocka_196 200)
19250        (= (+ truck_stock_196 c_stocka_196) (+ truck_stock_195 c_stockb_196))
19251        (= a_stocka_196 a_stockb_196)
19252        (= b_stocka_196 b_stockb_196)
19253        (or
19254          (and
19255            (= truck_loc_196 1)
19256            (= truck_travel_time_196 32)
19257          )
19258          (and
19259            (= truck_loc_196 2)
19260            (= truck_travel_time_196 37)
```

```
19261              )
19262            )
19263          )
19264      )
19265    )
19266    (<= truck_stock_196 318)
19267    (>= truck_stock_196 0)
19268    (= a_stockb_197 (- a_stocka_196 truck_travel_time_196))
19269    (= b_stockb_197 (- b_stocka_196 truck_travel_time_196))
19270    (= c_stockb_197 (- c_stocka_196 truck_travel_time_196))
19271    (and
19272      (=> (= truck_loc_196 0)
19273        (and
19274          (= a_stocka_197 a_stockb_197)
19275          (= b_stocka_197 b_stockb_197)
19276          (= c_stocka_197 c_stockb_197)
19277          (or
19278            (and
19279              (= truck_loc_197 1)
19280              (= truck_travel_time_197 29)
19281            )
19282            (and
19283              (= truck_loc_197 2)
19284              (= truck_travel_time_197 21)
19285            )
19286          )
19287        )
19288      )
19289      (=> (= truck_loc_196 1)
19290        (and
19291          (<= a_stocka_197 120)
19292          (= (+ truck_stock_197 a_stocka_197) (+ truck_stock_196 a_stockb_197))
19293          (= b_stocka_197 b_stockb_197)
19294          (= c_stocka_197 c_stockb_197)
19295          (or
19296            (and
19297              (= truck_loc_197 0)
19298              (= truck_travel_time_197 29)
19299            )
19300            (and
19301              (= truck_loc_197 2)
19302              (= truck_travel_time_197 17)
19303            )
19304            (and
19305              (= truck_loc_197 3)
19306              (= truck_travel_time_197 32)
19307            )
19308          )
19309        )
19310      )
19311      (=> (= truck_loc_196 2)
19312        (and
19313          (<= b_stocka_197 120)
19314          (= (+ truck_stock_197 b_stocka_197) (+ truck_stock_196 b_stockb_197))
19315          (= a_stocka_197 a_stockb_197)
19316          (= c_stocka_197 c_stockb_197)
19317          (or
19318            (and
19319              (= truck_loc_197 1)
19320              (= truck_travel_time_197 17)
19321            )
19322            (and
```

```
19323                (= truck_loc_197 0)
19324                (= truck_travel_time_197 21)
19325            )
19326          (and
19327             (= truck_loc_197 3)
19328             (= truck_travel_time_197 37)
19329          )
19330        )
19331      )
19332    )
19333    (=> (= truck_loc_196 3)
19334      (and
19335        (<= c_stocka_197 200)
19336        (= (+ truck_stock_197 c_stocka_197) (+ truck_stock_196 c_stockb_197))
19337        (= a_stocka_197 a_stockb_197)
19338        (= b_stocka_197 b_stockb_197)
19339        (or
19340          (and
19341             (= truck_loc_197 1)
19342             (= truck_travel_time_197 32)
19343          )
19344          (and
19345             (= truck_loc_197 2)
19346             (= truck_travel_time_197 37)
19347          )
19348        )
19349      )
19350    )
19351  )
19352  (<= truck_stock_197 318)
19353  (>= truck_stock_197 0)
19354  (= a_stockb_198 (- a_stocka_197 truck_travel_time_197))
19355  (= b_stockb_198 (- b_stocka_197 truck_travel_time_197))
19356  (= c_stockb_198 (- c_stocka_197 truck_travel_time_197))
19357  (and
19358    (=> (= truck_loc_197 0)
19359      (and
19360        (= a_stocka_198 a_stockb_198)
19361        (= b_stocka_198 b_stockb_198)
19362        (= c_stocka_198 c_stockb_198)
19363        (or
19364          (and
19365             (= truck_loc_198 1)
19366             (= truck_travel_time_198 29)
19367          )
19368          (and
19369             (= truck_loc_198 2)
19370             (= truck_travel_time_198 21)
19371          )
19372        )
19373      )
19374    )
19375    (=> (= truck_loc_197 1)
19376      (and
19377        (<= a_stocka_198 120)
19378        (= (+ truck_stock_198 a_stocka_198) (+ truck_stock_197 a_stockb_198))
19379        (= b_stocka_198 b_stockb_198)
19380        (= c_stocka_198 c_stockb_198)
19381        (or
19382          (and
19383             (= truck_loc_198 0)
19384             (= truck_travel_time_198 29)
```

```
19385            )
19386          (and
19387            (= truck_loc_198 2)
19388            (= truck_travel_time_198 17)
19389          )
19390          (and
19391            (= truck_loc_198 3)
19392            (= truck_travel_time_198 32)
19393          )
19394        )
19395      )
19396    )
19397    (=> (= truck_loc_197 2)
19398      (and
19399        (<= b_stocka_198 120)
19400        (= (+ truck_stock_198 b_stocka_198) (+ truck_stock_197 b_stockb_198))
19401        (= a_stocka_198 a_stockb_198)
19402        (= c_stocka_198 c_stockb_198)
19403        (or
19404          (and
19405            (= truck_loc_198 1)
19406            (= truck_travel_time_198 17)
19407          )
19408          (and
19409            (= truck_loc_198 0)
19410            (= truck_travel_time_198 21)
19411          )
19412          (and
19413            (= truck_loc_198 3)
19414            (= truck_travel_time_198 37)
19415          )
19416        )
19417      )
19418    )
19419    (=> (= truck_loc_197 3)
19420      (and
19421        (<= c_stocka_198 200)
19422        (= (+ truck_stock_198 c_stocka_198) (+ truck_stock_197 c_stockb_198))
19423        (= a_stocka_198 a_stockb_198)
19424        (= b_stocka_198 b_stockb_198)
19425        (or
19426          (and
19427            (= truck_loc_198 1)
19428            (= truck_travel_time_198 32)
19429          )
19430          (and
19431            (= truck_loc_198 2)
19432            (= truck_travel_time_198 37)
19433          )
19434        )
19435      )
19436    )
19437  )
19438  (<= truck_stock_198 318)
19439  (>= truck_stock_198 0)
19440  (= a_stockb_199 (- a_stocka_198 truck_travel_time_198))
19441  (= b_stockb_199 (- b_stocka_198 truck_travel_time_198))
19442  (= c_stockb_199 (- c_stocka_198 truck_travel_time_198))
19443  (and
19444    (=> (= truck_loc_198 0)
19445      (and
19446        (= a_stocka_199 a_stockb_199)
```

```
19447        (= b_stocka_199 b_stockb_199)
19448        (= c_stocka_199 c_stockb_199)
19449        (or
19450          (and
19451            (= truck_loc_199 1)
19452            (= truck_travel_time_199 29)
19453          )
19454          (and
19455            (= truck_loc_199 2)
19456            (= truck_travel_time_199 21)
19457          )
19458        )
19459      )
19460    )
19461    (=> (= truck_loc_198 1)
19462      (and
19463        (<= a_stocka_199 120)
19464        (= (+ truck_stock_199 a_stocka_199) (+ truck_stock_198 a_stockb_199))
19465        (= b_stocka_199 b_stockb_199)
19466        (= c_stocka_199 c_stockb_199)
19467        (or
19468          (and
19469            (= truck_loc_199 0)
19470            (= truck_travel_time_199 29)
19471          )
19472          (and
19473            (= truck_loc_199 2)
19474            (= truck_travel_time_199 17)
19475          )
19476          (and
19477            (= truck_loc_199 3)
19478            (= truck_travel_time_199 32)
19479          )
19480        )
19481      )
19482    )
19483    (=> (= truck_loc_198 2)
19484      (and
19485        (<= b_stocka_199 120)
19486        (= (+ truck_stock_199 b_stocka_199) (+ truck_stock_198 b_stockb_199))
19487        (= a_stocka_199 a_stockb_199)
19488        (= c_stocka_199 c_stockb_199)
19489        (or
19490          (and
19491            (= truck_loc_199 1)
19492            (= truck_travel_time_199 17)
19493          )
19494          (and
19495            (= truck_loc_199 0)
19496            (= truck_travel_time_199 21)
19497          )
19498          (and
19499            (= truck_loc_199 3)
19500            (= truck_travel_time_199 37)
19501          )
19502        )
19503      )
19504    )
19505    (=> (= truck_loc_198 3)
19506      (and
19507        (<= c_stocka_199 200)
19508        (= (+ truck_stock_199 c_stocka_199) (+ truck_stock_198 c_stockb_199))
```

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```
19509          (= a_stocka_199 a_stockb_199)
19510          (= b_stocka_199 b_stockb_199)
19511          (or
19512            (and
19513              (= truck_loc_199 1)
19514              (= truck_travel_time_199 32)
19515            )
19516            (and
19517              (= truck_loc_199 2)
19518              (= truck_travel_time_199 37)
19519            )
19520          )
19521        )
19522      )
19523  )
19524  (<= truck_stock_199 318)
19525  (>= truck_stock_199 0)
19526  (> s_stockb_0 0)
19527  (> s_stocka_0 0)
19528  (> a_stockb_0 0)
19529  (> a_stocka_0 0)
19530  (> b_stockb_0 0)
19531  (> b_stocka_0 0)
19532  (> c_stockb_0 0)
19533  (> c_stocka_0 0)
19534  (> s_stockb_1 0)
19535  (> s_stocka_1 0)
19536  (> a_stockb_1 0)
19537  (> a_stocka_1 0)
19538  (> b_stockb_1 0)
19539  (> b_stocka_1 0)
19540  (> c_stockb_1 0)
19541  (> c_stocka_1 0)
19542  (> s_stockb_2 0)
19543  (> s_stocka_2 0)
19544  (> a_stockb_2 0)
19545  (> a_stocka_2 0)
19546  (> b_stockb_2 0)
19547  (> b_stocka_2 0)
19548  (> c_stockb_2 0)
19549  (> c_stocka_2 0)
19550  (> s_stockb_3 0)
19551  (> s_stocka_3 0)
19552  (> a_stockb_3 0)
19553  (> a_stocka_3 0)
19554  (> b_stockb_3 0)
19555  (> b_stocka_3 0)
19556  (> c_stockb_3 0)
19557  (> c_stocka_3 0)
19558  (> s_stockb_4 0)
19559  (> s_stocka_4 0)
19560  (> a_stockb_4 0)
19561  (> a_stocka_4 0)
19562  (> b_stockb_4 0)
19563  (> b_stocka_4 0)
19564  (> c_stockb_4 0)
19565  (> c_stocka_4 0)
19566  (> s_stockb_5 0)
19567  (> s_stocka_5 0)
19568  (> a_stockb_5 0)
19569  (> a_stocka_5 0)
19570  (> b_stockb_5 0)
```

```
19571    (> b_stocka_5 0)
19572    (> c_stockb_5 0)
19573    (> c_stocka_5 0)
19574    (> s_stockb_6 0)
19575    (> s_stocka_6 0)
19576    (> a_stockb_6 0)
19577    (> a_stocka_6 0)
19578    (> b_stockb_6 0)
19579    (> b_stocka_6 0)
19580    (> c_stockb_6 0)
19581    (> c_stocka_6 0)
19582    (> s_stockb_7 0)
19583    (> s_stocka_7 0)
19584    (> a_stockb_7 0)
19585    (> a_stocka_7 0)
19586    (> b_stockb_7 0)
19587    (> b_stocka_7 0)
19588    (> c_stockb_7 0)
19589    (> c_stocka_7 0)
19590    (> s_stockb_8 0)
19591    (> s_stocka_8 0)
19592    (> a_stockb_8 0)
19593    (> a_stocka_8 0)
19594    (> b_stockb_8 0)
19595    (> b_stocka_8 0)
19596    (> c_stockb_8 0)
19597    (> c_stocka_8 0)
19598    (> s_stockb_9 0)
19599    (> s_stocka_9 0)
19600    (> a_stockb_9 0)
19601    (> a_stocka_9 0)
19602    (> b_stockb_9 0)
19603    (> b_stocka_9 0)
19604    (> c_stockb_9 0)
19605    (> c_stocka_9 0)
19606    (> s_stockb_10 0)
19607    (> s_stocka_10 0)
19608    (> a_stockb_10 0)
19609    (> a_stocka_10 0)
19610    (> b_stockb_10 0)
19611    (> b_stocka_10 0)
19612    (> c_stockb_10 0)
19613    (> c_stocka_10 0)
19614    (> s_stockb_11 0)
19615    (> s_stocka_11 0)
19616    (> a_stockb_11 0)
19617    (> a_stocka_11 0)
19618    (> b_stockb_11 0)
19619    (> b_stocka_11 0)
19620    (> c_stockb_11 0)
19621    (> c_stocka_11 0)
19622    (> s_stockb_12 0)
19623    (> s_stocka_12 0)
19624    (> a_stockb_12 0)
19625    (> a_stocka_12 0)
19626    (> b_stockb_12 0)
19627    (> b_stocka_12 0)
19628    (> c_stockb_12 0)
19629    (> c_stocka_12 0)
19630    (> s_stockb_13 0)
19631    (> s_stocka_13 0)
19632    (> a_stockb_13 0)
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19633    (> a_stocka_13 0)
19634    (> b_stockb_13 0)
19635    (> b_stocka_13 0)
19636    (> c_stockb_13 0)
19637    (> c_stocka_13 0)
19638    (> s_stockb_14 0)
19639    (> s_stocka_14 0)
19640    (> a_stockb_14 0)
19641    (> a_stocka_14 0)
19642    (> b_stockb_14 0)
19643    (> b_stocka_14 0)
19644    (> c_stockb_14 0)
19645    (> c_stocka_14 0)
19646    (> s_stockb_15 0)
19647    (> s_stocka_15 0)
19648    (> a_stockb_15 0)
19649    (> a_stocka_15 0)
19650    (> b_stockb_15 0)
19651    (> b_stocka_15 0)
19652    (> c_stockb_15 0)
19653    (> c_stocka_15 0)
19654    (> s_stockb_16 0)
19655    (> s_stocka_16 0)
19656    (> a_stockb_16 0)
19657    (> a_stocka_16 0)
19658    (> b_stockb_16 0)
19659    (> b_stocka_16 0)
19660    (> c_stockb_16 0)
19661    (> c_stocka_16 0)
19662    (> s_stockb_17 0)
19663    (> s_stocka_17 0)
19664    (> a_stockb_17 0)
19665    (> a_stocka_17 0)
19666    (> b_stockb_17 0)
19667    (> b_stocka_17 0)
19668    (> c_stockb_17 0)
19669    (> c_stocka_17 0)
19670    (> s_stockb_18 0)
19671    (> s_stocka_18 0)
19672    (> a_stockb_18 0)
19673    (> a_stocka_18 0)
19674    (> b_stockb_18 0)
19675    (> b_stocka_18 0)
19676    (> c_stockb_18 0)
19677    (> c_stocka_18 0)
19678    (> s_stockb_19 0)
19679    (> s_stocka_19 0)
19680    (> a_stockb_19 0)
19681    (> a_stocka_19 0)
19682    (> b_stockb_19 0)
19683    (> b_stocka_19 0)
19684    (> c_stockb_19 0)
19685    (> c_stocka_19 0)
19686    (> s_stockb_20 0)
19687    (> s_stocka_20 0)
19688    (> a_stockb_20 0)
19689    (> a_stocka_20 0)
19690    (> b_stockb_20 0)
19691    (> b_stocka_20 0)
19692    (> c_stockb_20 0)
19693    (> c_stocka_20 0)
19694    (> s_stockb_21 0)
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697

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19695   (> s_stocka_21 0)
19696   (> a_stockb_21 0)
19697   (> a_stocka_21 0)
19698   (> b_stockb_21 0)
19699   (> b_stocka_21 0)
19700   (> c_stockb_21 0)
19701   (> c_stocka_21 0)
19702   (> s_stockb_22 0)
19703   (> s_stocka_22 0)
19704   (> a_stockb_22 0)
19705   (> a_stocka_22 0)
19706   (> b_stockb_22 0)
19707   (> b_stocka_22 0)
19708   (> c_stockb_22 0)
19709   (> c_stocka_22 0)
19710   (> s_stockb_23 0)
19711   (> s_stocka_23 0)
19712   (> a_stockb_23 0)
19713   (> a_stocka_23 0)
19714   (> b_stockb_23 0)
19715   (> b_stocka_23 0)
19716   (> c_stockb_23 0)
19717   (> c_stocka_23 0)
19718   (> s_stockb_24 0)
19719   (> s_stocka_24 0)
19720   (> a_stockb_24 0)
19721   (> a_stocka_24 0)
19722   (> b_stockb_24 0)
19723   (> b_stocka_24 0)
19724   (> c_stockb_24 0)
19725   (> c_stocka_24 0)
19726   (> s_stockb_25 0)
19727   (> s_stocka_25 0)
19728   (> a_stockb_25 0)
19729   (> a_stocka_25 0)
19730   (> b_stockb_25 0)
19731   (> b_stocka_25 0)
19732   (> c_stockb_25 0)
19733   (> c_stocka_25 0)
19734   (> s_stockb_26 0)
19735   (> s_stocka_26 0)
19736   (> a_stockb_26 0)
19737   (> a_stocka_26 0)
19738   (> b_stockb_26 0)
19739   (> b_stocka_26 0)
19740   (> c_stockb_26 0)
19741   (> c_stocka_26 0)
19742   (> s_stockb_27 0)
19743   (> s_stocka_27 0)
19744   (> a_stockb_27 0)
19745   (> a_stocka_27 0)
19746   (> b_stockb_27 0)
19747   (> b_stocka_27 0)
19748   (> c_stockb_27 0)
19749   (> c_stocka_27 0)
19750   (> s_stockb_28 0)
19751   (> s_stocka_28 0)
19752   (> a_stockb_28 0)
19753   (> a_stocka_28 0)
19754   (> b_stockb_28 0)
19755   (> b_stocka_28 0)
19756   (> c_stockb_28 0)
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19757    (> c_stocka_28 0)
19758    (> s_stockb_29 0)
19759    (> s_stocka_29 0)
19760    (> a_stockb_29 0)
19761    (> a_stocka_29 0)
19762    (> b_stockb_29 0)
19763    (> b_stocka_29 0)
19764    (> c_stockb_29 0)
19765    (> c_stocka_29 0)
19766    (> s_stockb_30 0)
19767    (> s_stocka_30 0)
19768    (> a_stockb_30 0)
19769    (> a_stocka_30 0)
19770    (> b_stockb_30 0)
19771    (> b_stocka_30 0)
19772    (> c_stockb_30 0)
19773    (> c_stocka_30 0)
19774    (> s_stockb_31 0)
19775    (> s_stocka_31 0)
19776    (> a_stockb_31 0)
19777    (> a_stocka_31 0)
19778    (> b_stockb_31 0)
19779    (> b_stocka_31 0)
19780    (> c_stockb_31 0)
19781    (> c_stocka_31 0)
19782    (> s_stockb_32 0)
19783    (> s_stocka_32 0)
19784    (> a_stockb_32 0)
19785    (> a_stocka_32 0)
19786    (> b_stockb_32 0)
19787    (> b_stocka_32 0)
19788    (> c_stockb_32 0)
19789    (> c_stocka_32 0)
19790    (> s_stockb_33 0)
19791    (> s_stocka_33 0)
19792    (> a_stockb_33 0)
19793    (> a_stocka_33 0)
19794    (> b_stockb_33 0)
19795    (> b_stocka_33 0)
19796    (> c_stockb_33 0)
19797    (> c_stocka_33 0)
19798    (> s_stockb_34 0)
19799    (> s_stocka_34 0)
19800    (> a_stockb_34 0)
19801    (> a_stocka_34 0)
19802    (> b_stockb_34 0)
19803    (> b_stocka_34 0)
19804    (> c_stockb_34 0)
19805    (> c_stocka_34 0)
19806    (> s_stockb_35 0)
19807    (> s_stocka_35 0)
19808    (> a_stockb_35 0)
19809    (> a_stocka_35 0)
19810    (> b_stockb_35 0)
19811    (> b_stocka_35 0)
19812    (> c_stockb_35 0)
19813    (> c_stocka_35 0)
19814    (> s_stockb_36 0)
19815    (> s_stocka_36 0)
19816    (> a_stockb_36 0)
19817    (> a_stocka_36 0)
19818    (> b_stockb_36 0)
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19819    (> b_stocka_36 0)
19820    (> c_stockb_36 0)
19821    (> c_stocka_36 0)
19822    (> s_stockb_37 0)
19823    (> s_stocka_37 0)
19824    (> a_stockb_37 0)
19825    (> a_stocka_37 0)
19826    (> b_stockb_37 0)
19827    (> b_stocka_37 0)
19828    (> c_stockb_37 0)
19829    (> c_stocka_37 0)
19830    (> s_stockb_38 0)
19831    (> s_stocka_38 0)
19832    (> a_stockb_38 0)
19833    (> a_stocka_38 0)
19834    (> b_stockb_38 0)
19835    (> b_stocka_38 0)
19836    (> c_stockb_38 0)
19837    (> c_stocka_38 0)
19838    (> s_stockb_39 0)
19839    (> s_stocka_39 0)
19840    (> a_stockb_39 0)
19841    (> a_stocka_39 0)
19842    (> b_stockb_39 0)
19843    (> b_stocka_39 0)
19844    (> c_stockb_39 0)
19845    (> c_stocka_39 0)
19846    (> s_stockb_40 0)
19847    (> s_stocka_40 0)
19848    (> a_stockb_40 0)
19849    (> a_stocka_40 0)
19850    (> b_stockb_40 0)
19851    (> b_stocka_40 0)
19852    (> c_stockb_40 0)
19853    (> c_stocka_40 0)
19854    (> s_stockb_41 0)
19855    (> s_stocka_41 0)
19856    (> a_stockb_41 0)
19857    (> a_stocka_41 0)
19858    (> b_stockb_41 0)
19859    (> b_stocka_41 0)
19860    (> c_stockb_41 0)
19861    (> c_stocka_41 0)
19862    (> s_stockb_42 0)
19863    (> s_stocka_42 0)
19864    (> a_stockb_42 0)
19865    (> a_stocka_42 0)
19866    (> b_stockb_42 0)
19867    (> b_stocka_42 0)
19868    (> c_stockb_42 0)
19869    (> c_stocka_42 0)
19870    (> s_stockb_43 0)
19871    (> s_stocka_43 0)
19872    (> a_stockb_43 0)
19873    (> a_stocka_43 0)
19874    (> b_stockb_43 0)
19875    (> b_stocka_43 0)
19876    (> c_stockb_43 0)
19877    (> c_stocka_43 0)
19878    (> s_stockb_44 0)
19879    (> s_stocka_44 0)
19880    (> a_stockb_44 0)
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19881    (> a_stocka_44 0)
19882    (> b_stockb_44 0)
19883    (> b_stocka_44 0)
19884    (> c_stockb_44 0)
19885    (> c_stocka_44 0)
19886    (> s_stockb_45 0)
19887    (> s_stocka_45 0)
19888    (> a_stockb_45 0)
19889    (> a_stocka_45 0)
19890    (> b_stockb_45 0)
19891    (> b_stocka_45 0)
19892    (> c_stockb_45 0)
19893    (> c_stocka_45 0)
19894    (> s_stockb_46 0)
19895    (> s_stocka_46 0)
19896    (> a_stockb_46 0)
19897    (> a_stocka_46 0)
19898    (> b_stockb_46 0)
19899    (> b_stocka_46 0)
19900    (> c_stockb_46 0)
19901    (> c_stocka_46 0)
19902    (> s_stockb_47 0)
19903    (> s_stocka_47 0)
19904    (> a_stockb_47 0)
19905    (> a_stocka_47 0)
19906    (> b_stockb_47 0)
19907    (> b_stocka_47 0)
19908    (> c_stockb_47 0)
19909    (> c_stocka_47 0)
19910    (> s_stockb_48 0)
19911    (> s_stocka_48 0)
19912    (> a_stockb_48 0)
19913    (> a_stocka_48 0)
19914    (> b_stockb_48 0)
19915    (> b_stocka_48 0)
19916    (> c_stockb_48 0)
19917    (> c_stocka_48 0)
19918    (> s_stockb_49 0)
19919    (> s_stocka_49 0)
19920    (> a_stockb_49 0)
19921    (> a_stocka_49 0)
19922    (> b_stockb_49 0)
19923    (> b_stocka_49 0)
19924    (> c_stockb_49 0)
19925    (> c_stocka_49 0)
19926    (> s_stockb_50 0)
19927    (> s_stocka_50 0)
19928    (> a_stockb_50 0)
19929    (> a_stocka_50 0)
19930    (> b_stockb_50 0)
19931    (> b_stocka_50 0)
19932    (> c_stockb_50 0)
19933    (> c_stocka_50 0)
19934    (> s_stockb_51 0)
19935    (> s_stocka_51 0)
19936    (> a_stockb_51 0)
19937    (> a_stocka_51 0)
19938    (> b_stockb_51 0)
19939    (> b_stocka_51 0)
19940    (> c_stockb_51 0)
19941    (> c_stocka_51 0)
19942    (> s_stockb_52 0)
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19943    (> s_stocka_52 0)
19944    (> a_stockb_52 0)
19945    (> a_stocka_52 0)
19946    (> b_stockb_52 0)
19947    (> b_stocka_52 0)
19948    (> c_stockb_52 0)
19949    (> c_stocka_52 0)
19950    (> s_stockb_53 0)
19951    (> s_stocka_53 0)
19952    (> a_stockb_53 0)
19953    (> a_stocka_53 0)
19954    (> b_stockb_53 0)
19955    (> b_stocka_53 0)
19956    (> c_stockb_53 0)
19957    (> c_stocka_53 0)
19958    (> s_stockb_54 0)
19959    (> s_stocka_54 0)
19960    (> a_stockb_54 0)
19961    (> a_stocka_54 0)
19962    (> b_stockb_54 0)
19963    (> b_stocka_54 0)
19964    (> c_stockb_54 0)
19965    (> c_stocka_54 0)
19966    (> s_stockb_55 0)
19967    (> s_stocka_55 0)
19968    (> a_stockb_55 0)
19969    (> a_stocka_55 0)
19970    (> b_stockb_55 0)
19971    (> b_stocka_55 0)
19972    (> c_stockb_55 0)
19973    (> c_stocka_55 0)
19974    (> s_stockb_56 0)
19975    (> s_stocka_56 0)
19976    (> a_stockb_56 0)
19977    (> a_stocka_56 0)
19978    (> b_stockb_56 0)
19979    (> b_stocka_56 0)
19980    (> c_stockb_56 0)
19981    (> c_stocka_56 0)
19982    (> s_stockb_57 0)
19983    (> s_stocka_57 0)
19984    (> a_stockb_57 0)
19985    (> a_stocka_57 0)
19986    (> b_stockb_57 0)
19987    (> b_stocka_57 0)
19988    (> c_stockb_57 0)
19989    (> c_stocka_57 0)
19990    (> s_stockb_58 0)
19991    (> s_stocka_58 0)
19992    (> a_stockb_58 0)
19993    (> a_stocka_58 0)
19994    (> b_stockb_58 0)
19995    (> b_stocka_58 0)
19996    (> c_stockb_58 0)
19997    (> c_stocka_58 0)
19998    (> s_stockb_59 0)
19999    (> s_stocka_59 0)
20000    (> a_stockb_59 0)
20001    (> a_stocka_59 0)
20002    (> b_stockb_59 0)
20003    (> b_stocka_59 0)
20004    (> c_stockb_59 0)
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20005    (> c_stocka_59 0)
20006    (> s_stockb_60 0)
20007    (> s_stocka_60 0)
20008    (> a_stockb_60 0)
20009    (> a_stocka_60 0)
20010    (> b_stockb_60 0)
20011    (> b_stocka_60 0)
20012    (> c_stockb_60 0)
20013    (> c_stocka_60 0)
20014    (> s_stockb_61 0)
20015    (> s_stocka_61 0)
20016    (> a_stockb_61 0)
20017    (> a_stocka_61 0)
20018    (> b_stockb_61 0)
20019    (> b_stocka_61 0)
20020    (> c_stockb_61 0)
20021    (> c_stocka_61 0)
20022    (> s_stockb_62 0)
20023    (> s_stocka_62 0)
20024    (> a_stockb_62 0)
20025    (> a_stocka_62 0)
20026    (> b_stockb_62 0)
20027    (> b_stocka_62 0)
20028    (> c_stockb_62 0)
20029    (> c_stocka_62 0)
20030    (> s_stockb_63 0)
20031    (> s_stocka_63 0)
20032    (> a_stockb_63 0)
20033    (> a_stocka_63 0)
20034    (> b_stockb_63 0)
20035    (> b_stocka_63 0)
20036    (> c_stockb_63 0)
20037    (> c_stocka_63 0)
20038    (> s_stockb_64 0)
20039    (> s_stocka_64 0)
20040    (> a_stockb_64 0)
20041    (> a_stocka_64 0)
20042    (> b_stockb_64 0)
20043    (> b_stocka_64 0)
20044    (> c_stockb_64 0)
20045    (> c_stocka_64 0)
20046    (> s_stockb_65 0)
20047    (> s_stocka_65 0)
20048    (> a_stockb_65 0)
20049    (> a_stocka_65 0)
20050    (> b_stockb_65 0)
20051    (> b_stocka_65 0)
20052    (> c_stockb_65 0)
20053    (> c_stocka_65 0)
20054    (> s_stockb_66 0)
20055    (> s_stocka_66 0)
20056    (> a_stockb_66 0)
20057    (> a_stocka_66 0)
20058    (> b_stockb_66 0)
20059    (> b_stocka_66 0)
20060    (> c_stockb_66 0)
20061    (> c_stocka_66 0)
20062    (> s_stockb_67 0)
20063    (> s_stocka_67 0)
20064    (> a_stockb_67 0)
20065    (> a_stocka_67 0)
20066    (> b_stockb_67 0)
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20067    (> b_stocka_67 0)
20068    (> c_stockb_67 0)
20069    (> c_stocka_67 0)
20070    (> s_stockb_68 0)
20071    (> s_stocka_68 0)
20072    (> a_stockb_68 0)
20073    (> a_stocka_68 0)
20074    (> b_stockb_68 0)
20075    (> b_stocka_68 0)
20076    (> c_stockb_68 0)
20077    (> c_stocka_68 0)
20078    (> s_stockb_69 0)
20079    (> s_stocka_69 0)
20080    (> a_stockb_69 0)
20081    (> a_stocka_69 0)
20082    (> b_stockb_69 0)
20083    (> b_stocka_69 0)
20084    (> c_stockb_69 0)
20085    (> c_stocka_69 0)
20086    (> s_stockb_70 0)
20087    (> s_stocka_70 0)
20088    (> a_stockb_70 0)
20089    (> a_stocka_70 0)
20090    (> b_stockb_70 0)
20091    (> b_stocka_70 0)
20092    (> c_stockb_70 0)
20093    (> c_stocka_70 0)
20094    (> s_stockb_71 0)
20095    (> s_stocka_71 0)
20096    (> a_stockb_71 0)
20097    (> a_stocka_71 0)
20098    (> b_stockb_71 0)
20099    (> b_stocka_71 0)
20100    (> c_stockb_71 0)
20101    (> c_stocka_71 0)
20102    (> s_stockb_72 0)
20103    (> s_stocka_72 0)
20104    (> a_stockb_72 0)
20105    (> a_stocka_72 0)
20106    (> b_stockb_72 0)
20107    (> b_stocka_72 0)
20108    (> c_stockb_72 0)
20109    (> c_stocka_72 0)
20110    (> s_stockb_73 0)
20111    (> s_stocka_73 0)
20112    (> a_stockb_73 0)
20113    (> a_stocka_73 0)
20114    (> b_stockb_73 0)
20115    (> b_stocka_73 0)
20116    (> c_stockb_73 0)
20117    (> c_stocka_73 0)
20118    (> s_stockb_74 0)
20119    (> s_stocka_74 0)
20120    (> a_stockb_74 0)
20121    (> a_stocka_74 0)
20122    (> b_stockb_74 0)
20123    (> b_stocka_74 0)
20124    (> c_stockb_74 0)
20125    (> c_stocka_74 0)
20126    (> s_stockb_75 0)
20127    (> s_stocka_75 0)
20128    (> a_stockb_75 0)
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20129   (> a_stocka_75 0)
20130   (> b_stockb_75 0)
20131   (> b_stocka_75 0)
20132   (> c_stockb_75 0)
20133   (> c_stocka_75 0)
20134   (> s_stockb_76 0)
20135   (> s_stocka_76 0)
20136   (> a_stockb_76 0)
20137   (> a_stocka_76 0)
20138   (> b_stockb_76 0)
20139   (> b_stocka_76 0)
20140   (> c_stockb_76 0)
20141   (> c_stocka_76 0)
20142   (> s_stockb_77 0)
20143   (> s_stocka_77 0)
20144   (> a_stockb_77 0)
20145   (> a_stocka_77 0)
20146   (> b_stockb_77 0)
20147   (> b_stocka_77 0)
20148   (> c_stockb_77 0)
20149   (> c_stocka_77 0)
20150   (> s_stockb_78 0)
20151   (> s_stocka_78 0)
20152   (> a_stockb_78 0)
20153   (> a_stocka_78 0)
20154   (> b_stockb_78 0)
20155   (> b_stocka_78 0)
20156   (> c_stockb_78 0)
20157   (> c_stocka_78 0)
20158   (> s_stockb_79 0)
20159   (> s_stocka_79 0)
20160   (> a_stockb_79 0)
20161   (> a_stocka_79 0)
20162   (> b_stockb_79 0)
20163   (> b_stocka_79 0)
20164   (> c_stockb_79 0)
20165   (> c_stocka_79 0)
20166   (> s_stockb_80 0)
20167   (> s_stocka_80 0)
20168   (> a_stockb_80 0)
20169   (> a_stocka_80 0)
20170   (> b_stockb_80 0)
20171   (> b_stocka_80 0)
20172   (> c_stockb_80 0)
20173   (> c_stocka_80 0)
20174   (> s_stockb_81 0)
20175   (> s_stocka_81 0)
20176   (> a_stockb_81 0)
20177   (> a_stocka_81 0)
20178   (> b_stockb_81 0)
20179   (> b_stocka_81 0)
20180   (> c_stockb_81 0)
20181   (> c_stocka_81 0)
20182   (> s_stockb_82 0)
20183   (> s_stocka_82 0)
20184   (> a_stockb_82 0)
20185   (> a_stocka_82 0)
20186   (> b_stockb_82 0)
20187   (> b_stocka_82 0)
20188   (> c_stockb_82 0)
20189   (> c_stocka_82 0)
20190   (> s_stockb_83 0)
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20191    (> s_stocka_83 0)
20192    (> a_stockb_83 0)
20193    (> a_stocka_83 0)
20194    (> b_stockb_83 0)
20195    (> b_stocka_83 0)
20196    (> c_stockb_83 0)
20197    (> c_stocka_83 0)
20198    (> s_stockb_84 0)
20199    (> s_stocka_84 0)
20200    (> a_stockb_84 0)
20201    (> a_stocka_84 0)
20202    (> b_stockb_84 0)
20203    (> b_stocka_84 0)
20204    (> c_stockb_84 0)
20205    (> c_stocka_84 0)
20206    (> s_stockb_85 0)
20207    (> s_stocka_85 0)
20208    (> a_stockb_85 0)
20209    (> a_stocka_85 0)
20210    (> b_stockb_85 0)
20211    (> b_stocka_85 0)
20212    (> c_stockb_85 0)
20213    (> c_stocka_85 0)
20214    (> s_stockb_86 0)
20215    (> s_stocka_86 0)
20216    (> a_stockb_86 0)
20217    (> a_stocka_86 0)
20218    (> b_stockb_86 0)
20219    (> b_stocka_86 0)
20220    (> c_stockb_86 0)
20221    (> c_stocka_86 0)
20222    (> s_stockb_87 0)
20223    (> s_stocka_87 0)
20224    (> a_stockb_87 0)
20225    (> a_stocka_87 0)
20226    (> b_stockb_87 0)
20227    (> b_stocka_87 0)
20228    (> c_stockb_87 0)
20229    (> c_stocka_87 0)
20230    (> s_stockb_88 0)
20231    (> s_stocka_88 0)
20232    (> a_stockb_88 0)
20233    (> a_stocka_88 0)
20234    (> b_stockb_88 0)
20235    (> b_stocka_88 0)
20236    (> c_stockb_88 0)
20237    (> c_stocka_88 0)
20238    (> s_stockb_89 0)
20239    (> s_stocka_89 0)
20240    (> a_stockb_89 0)
20241    (> a_stocka_89 0)
20242    (> b_stockb_89 0)
20243    (> b_stocka_89 0)
20244    (> c_stockb_89 0)
20245    (> c_stocka_89 0)
20246    (> s_stockb_90 0)
20247    (> s_stocka_90 0)
20248    (> a_stockb_90 0)
20249    (> a_stocka_90 0)
20250    (> b_stockb_90 0)
20251    (> b_stocka_90 0)
20252    (> c_stockb_90 0)
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20253    (> c_stocka_90 0)
20254    (> s_stockb_91 0)
20255    (> s_stocka_91 0)
20256    (> a_stockb_91 0)
20257    (> a_stocka_91 0)
20258    (> b_stockb_91 0)
20259    (> b_stocka_91 0)
20260    (> c_stockb_91 0)
20261    (> c_stocka_91 0)
20262    (> s_stockb_92 0)
20263    (> s_stocka_92 0)
20264    (> a_stockb_92 0)
20265    (> a_stocka_92 0)
20266    (> b_stockb_92 0)
20267    (> b_stocka_92 0)
20268    (> c_stockb_92 0)
20269    (> c_stocka_92 0)
20270    (> s_stockb_93 0)
20271    (> s_stocka_93 0)
20272    (> a_stockb_93 0)
20273    (> a_stocka_93 0)
20274    (> b_stockb_93 0)
20275    (> b_stocka_93 0)
20276    (> c_stockb_93 0)
20277    (> c_stocka_93 0)
20278    (> s_stockb_94 0)
20279    (> s_stocka_94 0)
20280    (> a_stockb_94 0)
20281    (> a_stocka_94 0)
20282    (> b_stockb_94 0)
20283    (> b_stocka_94 0)
20284    (> c_stockb_94 0)
20285    (> c_stocka_94 0)
20286    (> s_stockb_95 0)
20287    (> s_stocka_95 0)
20288    (> a_stockb_95 0)
20289    (> a_stocka_95 0)
20290    (> b_stockb_95 0)
20291    (> b_stocka_95 0)
20292    (> c_stockb_95 0)
20293    (> c_stocka_95 0)
20294    (> s_stockb_96 0)
20295    (> s_stocka_96 0)
20296    (> a_stockb_96 0)
20297    (> a_stocka_96 0)
20298    (> b_stockb_96 0)
20299    (> b_stocka_96 0)
20300    (> c_stockb_96 0)
20301    (> c_stocka_96 0)
20302    (> s_stockb_97 0)
20303    (> s_stocka_97 0)
20304    (> a_stockb_97 0)
20305    (> a_stocka_97 0)
20306    (> b_stockb_97 0)
20307    (> b_stocka_97 0)
20308    (> c_stockb_97 0)
20309    (> c_stocka_97 0)
20310    (> s_stockb_98 0)
20311    (> s_stocka_98 0)
20312    (> a_stockb_98 0)
20313    (> a_stocka_98 0)
20314    (> b_stockb_98 0)
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20315    (> b_stocka_98 0)
20316    (> c_stockb_98 0)
20317    (> c_stocka_98 0)
20318    (> s_stockb_99 0)
20319    (> s_stocka_99 0)
20320    (> a_stockb_99 0)
20321    (> a_stocka_99 0)
20322    (> b_stockb_99 0)
20323    (> b_stocka_99 0)
20324    (> c_stockb_99 0)
20325    (> c_stocka_99 0)
20326    (> s_stockb_100 0)
20327    (> s_stocka_100 0)
20328    (> a_stockb_100 0)
20329    (> a_stocka_100 0)
20330    (> b_stockb_100 0)
20331    (> b_stocka_100 0)
20332    (> c_stockb_100 0)
20333    (> c_stocka_100 0)
20334    (> s_stockb_101 0)
20335    (> s_stocka_101 0)
20336    (> a_stockb_101 0)
20337    (> a_stocka_101 0)
20338    (> b_stockb_101 0)
20339    (> b_stocka_101 0)
20340    (> c_stockb_101 0)
20341    (> c_stocka_101 0)
20342    (> s_stockb_102 0)
20343    (> s_stocka_102 0)
20344    (> a_stockb_102 0)
20345    (> a_stocka_102 0)
20346    (> b_stockb_102 0)
20347    (> b_stocka_102 0)
20348    (> c_stockb_102 0)
20349    (> c_stocka_102 0)
20350    (> s_stockb_103 0)
20351    (> s_stocka_103 0)
20352    (> a_stockb_103 0)
20353    (> a_stocka_103 0)
20354    (> b_stockb_103 0)
20355    (> b_stocka_103 0)
20356    (> c_stockb_103 0)
20357    (> c_stocka_103 0)
20358    (> s_stockb_104 0)
20359    (> s_stocka_104 0)
20360    (> a_stockb_104 0)
20361    (> a_stocka_104 0)
20362    (> b_stockb_104 0)
20363    (> b_stocka_104 0)
20364    (> c_stockb_104 0)
20365    (> c_stocka_104 0)
20366    (> s_stockb_105 0)
20367    (> s_stocka_105 0)
20368    (> a_stockb_105 0)
20369    (> a_stocka_105 0)
20370    (> b_stockb_105 0)
20371    (> b_stocka_105 0)
20372    (> c_stockb_105 0)
20373    (> c_stocka_105 0)
20374    (> s_stockb_106 0)
20375    (> s_stocka_106 0)
20376    (> a_stockb_106 0)
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20377    (> a_stocka_106 0)
20378    (> b_stockb_106 0)
20379    (> b_stocka_106 0)
20380    (> c_stockb_106 0)
20381    (> c_stocka_106 0)
20382    (> s_stockb_107 0)
20383    (> s_stocka_107 0)
20384    (> a_stockb_107 0)
20385    (> a_stocka_107 0)
20386    (> b_stockb_107 0)
20387    (> b_stocka_107 0)
20388    (> c_stockb_107 0)
20389    (> c_stocka_107 0)
20390    (> s_stockb_108 0)
20391    (> s_stocka_108 0)
20392    (> a_stockb_108 0)
20393    (> a_stocka_108 0)
20394    (> b_stockb_108 0)
20395    (> b_stocka_108 0)
20396    (> c_stockb_108 0)
20397    (> c_stocka_108 0)
20398    (> s_stockb_109 0)
20399    (> s_stocka_109 0)
20400    (> a_stockb_109 0)
20401    (> a_stocka_109 0)
20402    (> b_stockb_109 0)
20403    (> b_stocka_109 0)
20404    (> c_stockb_109 0)
20405    (> c_stocka_109 0)
20406    (> s_stockb_110 0)
20407    (> s_stocka_110 0)
20408    (> a_stockb_110 0)
20409    (> a_stocka_110 0)
20410    (> b_stockb_110 0)
20411    (> b_stocka_110 0)
20412    (> c_stockb_110 0)
20413    (> c_stocka_110 0)
20414    (> s_stockb_111 0)
20415    (> s_stocka_111 0)
20416    (> a_stockb_111 0)
20417    (> a_stocka_111 0)
20418    (> b_stockb_111 0)
20419    (> b_stocka_111 0)
20420    (> c_stockb_111 0)
20421    (> c_stocka_111 0)
20422    (> s_stockb_112 0)
20423    (> s_stocka_112 0)
20424    (> a_stockb_112 0)
20425    (> a_stocka_112 0)
20426    (> b_stockb_112 0)
20427    (> b_stocka_112 0)
20428    (> c_stockb_112 0)
20429    (> c_stocka_112 0)
20430    (> s_stockb_113 0)
20431    (> s_stocka_113 0)
20432    (> a_stockb_113 0)
20433    (> a_stocka_113 0)
20434    (> b_stockb_113 0)
20435    (> b_stocka_113 0)
20436    (> c_stockb_113 0)
20437    (> c_stocka_113 0)
20438    (> s_stockb_114 0)
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20439   (> s_stocka_114 0)
20440   (> a_stockb_114 0)
20441   (> a_stocka_114 0)
20442   (> b_stockb_114 0)
20443   (> b_stocka_114 0)
20444   (> c_stockb_114 0)
20445   (> c_stocka_114 0)
20446   (> s_stockb_115 0)
20447   (> s_stocka_115 0)
20448   (> a_stockb_115 0)
20449   (> a_stocka_115 0)
20450   (> b_stockb_115 0)
20451   (> b_stocka_115 0)
20452   (> c_stockb_115 0)
20453   (> c_stocka_115 0)
20454   (> s_stockb_116 0)
20455   (> s_stocka_116 0)
20456   (> a_stockb_116 0)
20457   (> a_stocka_116 0)
20458   (> b_stockb_116 0)
20459   (> b_stocka_116 0)
20460   (> c_stockb_116 0)
20461   (> c_stocka_116 0)
20462   (> s_stockb_117 0)
20463   (> s_stocka_117 0)
20464   (> a_stockb_117 0)
20465   (> a_stocka_117 0)
20466   (> b_stockb_117 0)
20467   (> b_stocka_117 0)
20468   (> c_stockb_117 0)
20469   (> c_stocka_117 0)
20470   (> s_stockb_118 0)
20471   (> s_stocka_118 0)
20472   (> a_stockb_118 0)
20473   (> a_stocka_118 0)
20474   (> b_stockb_118 0)
20475   (> b_stocka_118 0)
20476   (> c_stockb_118 0)
20477   (> c_stocka_118 0)
20478   (> s_stockb_119 0)
20479   (> s_stocka_119 0)
20480   (> a_stockb_119 0)
20481   (> a_stocka_119 0)
20482   (> b_stockb_119 0)
20483   (> b_stocka_119 0)
20484   (> c_stockb_119 0)
20485   (> c_stocka_119 0)
20486   (> s_stockb_120 0)
20487   (> s_stocka_120 0)
20488   (> a_stockb_120 0)
20489   (> a_stocka_120 0)
20490   (> b_stockb_120 0)
20491   (> b_stocka_120 0)
20492   (> c_stockb_120 0)
20493   (> c_stocka_120 0)
20494   (> s_stockb_121 0)
20495   (> s_stocka_121 0)
20496   (> a_stockb_121 0)
20497   (> a_stocka_121 0)
20498   (> b_stockb_121 0)
20499   (> b_stocka_121 0)
20500   (> c_stockb_121 0)
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20501    (> c_stocka_121 0)
20502    (> s_stockb_122 0)
20503    (> s_stocka_122 0)
20504    (> a_stockb_122 0)
20505    (> a_stocka_122 0)
20506    (> b_stockb_122 0)
20507    (> b_stocka_122 0)
20508    (> c_stockb_122 0)
20509    (> c_stocka_122 0)
20510    (> s_stockb_123 0)
20511    (> s_stocka_123 0)
20512    (> a_stockb_123 0)
20513    (> a_stocka_123 0)
20514    (> b_stockb_123 0)
20515    (> b_stocka_123 0)
20516    (> c_stockb_123 0)
20517    (> c_stocka_123 0)
20518    (> s_stockb_124 0)
20519    (> s_stocka_124 0)
20520    (> a_stockb_124 0)
20521    (> a_stocka_124 0)
20522    (> b_stockb_124 0)
20523    (> b_stocka_124 0)
20524    (> c_stockb_124 0)
20525    (> c_stocka_124 0)
20526    (> s_stockb_125 0)
20527    (> s_stocka_125 0)
20528    (> a_stockb_125 0)
20529    (> a_stocka_125 0)
20530    (> b_stockb_125 0)
20531    (> b_stocka_125 0)
20532    (> c_stockb_125 0)
20533    (> c_stocka_125 0)
20534    (> s_stockb_126 0)
20535    (> s_stocka_126 0)
20536    (> a_stockb_126 0)
20537    (> a_stocka_126 0)
20538    (> b_stockb_126 0)
20539    (> b_stocka_126 0)
20540    (> c_stockb_126 0)
20541    (> c_stocka_126 0)
20542    (> s_stockb_127 0)
20543    (> s_stocka_127 0)
20544    (> a_stockb_127 0)
20545    (> a_stocka_127 0)
20546    (> b_stockb_127 0)
20547    (> b_stocka_127 0)
20548    (> c_stockb_127 0)
20549    (> c_stocka_127 0)
20550    (> s_stockb_128 0)
20551    (> s_stocka_128 0)
20552    (> a_stockb_128 0)
20553    (> a_stocka_128 0)
20554    (> b_stockb_128 0)
20555    (> b_stocka_128 0)
20556    (> c_stockb_128 0)
20557    (> c_stocka_128 0)
20558    (> s_stockb_129 0)
20559    (> s_stocka_129 0)
20560    (> a_stockb_129 0)
20561    (> a_stocka_129 0)
20562    (> b_stockb_129 0)
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20563    (> b_stocka_129 0)
20564    (> c_stockb_129 0)
20565    (> c_stocka_129 0)
20566    (> s_stockb_130 0)
20567    (> s_stocka_130 0)
20568    (> a_stockb_130 0)
20569    (> a_stocka_130 0)
20570    (> b_stockb_130 0)
20571    (> b_stocka_130 0)
20572    (> c_stockb_130 0)
20573    (> c_stocka_130 0)
20574    (> s_stockb_131 0)
20575    (> s_stocka_131 0)
20576    (> a_stockb_131 0)
20577    (> a_stocka_131 0)
20578    (> b_stockb_131 0)
20579    (> b_stocka_131 0)
20580    (> c_stockb_131 0)
20581    (> c_stocka_131 0)
20582    (> s_stockb_132 0)
20583    (> s_stocka_132 0)
20584    (> a_stockb_132 0)
20585    (> a_stocka_132 0)
20586    (> b_stockb_132 0)
20587    (> b_stocka_132 0)
20588    (> c_stockb_132 0)
20589    (> c_stocka_132 0)
20590    (> s_stockb_133 0)
20591    (> s_stocka_133 0)
20592    (> a_stockb_133 0)
20593    (> a_stocka_133 0)
20594    (> b_stockb_133 0)
20595    (> b_stocka_133 0)
20596    (> c_stockb_133 0)
20597    (> c_stocka_133 0)
20598    (> s_stockb_134 0)
20599    (> s_stocka_134 0)
20600    (> a_stockb_134 0)
20601    (> a_stocka_134 0)
20602    (> b_stockb_134 0)
20603    (> b_stocka_134 0)
20604    (> c_stockb_134 0)
20605    (> c_stocka_134 0)
20606    (> s_stockb_135 0)
20607    (> s_stocka_135 0)
20608    (> a_stockb_135 0)
20609    (> a_stocka_135 0)
20610    (> b_stockb_135 0)
20611    (> b_stocka_135 0)
20612    (> c_stockb_135 0)
20613    (> c_stocka_135 0)
20614    (> s_stockb_136 0)
20615    (> s_stocka_136 0)
20616    (> a_stockb_136 0)
20617    (> a_stocka_136 0)
20618    (> b_stockb_136 0)
20619    (> b_stocka_136 0)
20620    (> c_stockb_136 0)
20621    (> c_stocka_136 0)
20622    (> s_stockb_137 0)
20623    (> s_stocka_137 0)
20624    (> a_stockb_137 0)
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20625   (> a_stocka_137 0)
20626   (> b_stockb_137 0)
20627   (> b_stocka_137 0)
20628   (> c_stockb_137 0)
20629   (> c_stocka_137 0)
20630   (> s_stockb_138 0)
20631   (> s_stocka_138 0)
20632   (> a_stockb_138 0)
20633   (> a_stocka_138 0)
20634   (> b_stockb_138 0)
20635   (> b_stocka_138 0)
20636   (> c_stockb_138 0)
20637   (> c_stocka_138 0)
20638   (> s_stockb_139 0)
20639   (> s_stocka_139 0)
20640   (> a_stockb_139 0)
20641   (> a_stocka_139 0)
20642   (> b_stockb_139 0)
20643   (> b_stocka_139 0)
20644   (> c_stockb_139 0)
20645   (> c_stocka_139 0)
20646   (> s_stockb_140 0)
20647   (> s_stocka_140 0)
20648   (> a_stockb_140 0)
20649   (> a_stocka_140 0)
20650   (> b_stockb_140 0)
20651   (> b_stocka_140 0)
20652   (> c_stockb_140 0)
20653   (> c_stocka_140 0)
20654   (> s_stockb_141 0)
20655   (> s_stocka_141 0)
20656   (> a_stockb_141 0)
20657   (> a_stocka_141 0)
20658   (> b_stockb_141 0)
20659   (> b_stocka_141 0)
20660   (> c_stockb_141 0)
20661   (> c_stocka_141 0)
20662   (> s_stockb_142 0)
20663   (> s_stocka_142 0)
20664   (> a_stockb_142 0)
20665   (> a_stocka_142 0)
20666   (> b_stockb_142 0)
20667   (> b_stocka_142 0)
20668   (> c_stockb_142 0)
20669   (> c_stocka_142 0)
20670   (> s_stockb_143 0)
20671   (> s_stocka_143 0)
20672   (> a_stockb_143 0)
20673   (> a_stocka_143 0)
20674   (> b_stockb_143 0)
20675   (> b_stocka_143 0)
20676   (> c_stockb_143 0)
20677   (> c_stocka_143 0)
20678   (> s_stockb_144 0)
20679   (> s_stocka_144 0)
20680   (> a_stockb_144 0)
20681   (> a_stocka_144 0)
20682   (> b_stockb_144 0)
20683   (> b_stocka_144 0)
20684   (> c_stockb_144 0)
20685   (> c_stocka_144 0)
20686   (> s_stockb_145 0)
```

```
20687    (> s_stocka_145 0)
20688    (> a_stockb_145 0)
20689    (> a_stocka_145 0)
20690    (> b_stockb_145 0)
20691    (> b_stocka_145 0)
20692    (> c_stockb_145 0)
20693    (> c_stocka_145 0)
20694    (> s_stockb_146 0)
20695    (> s_stocka_146 0)
20696    (> a_stockb_146 0)
20697    (> a_stocka_146 0)
20698    (> b_stockb_146 0)
20699    (> b_stocka_146 0)
20700    (> c_stockb_146 0)
20701    (> c_stocka_146 0)
20702    (> s_stockb_147 0)
20703    (> s_stocka_147 0)
20704    (> a_stockb_147 0)
20705    (> a_stocka_147 0)
20706    (> b_stockb_147 0)
20707    (> b_stocka_147 0)
20708    (> c_stockb_147 0)
20709    (> c_stocka_147 0)
20710    (> s_stockb_148 0)
20711    (> s_stocka_148 0)
20712    (> a_stockb_148 0)
20713    (> a_stocka_148 0)
20714    (> b_stockb_148 0)
20715    (> b_stocka_148 0)
20716    (> c_stockb_148 0)
20717    (> c_stocka_148 0)
20718    (> s_stockb_149 0)
20719    (> s_stocka_149 0)
20720    (> a_stockb_149 0)
20721    (> a_stocka_149 0)
20722    (> b_stockb_149 0)
20723    (> b_stocka_149 0)
20724    (> c_stockb_149 0)
20725    (> c_stocka_149 0)
20726    (> s_stockb_150 0)
20727    (> s_stocka_150 0)
20728    (> a_stockb_150 0)
20729    (> a_stocka_150 0)
20730    (> b_stockb_150 0)
20731    (> b_stocka_150 0)
20732    (> c_stockb_150 0)
20733    (> c_stocka_150 0)
20734    (> s_stockb_151 0)
20735    (> s_stocka_151 0)
20736    (> a_stockb_151 0)
20737    (> a_stocka_151 0)
20738    (> b_stockb_151 0)
20739    (> b_stocka_151 0)
20740    (> c_stockb_151 0)
20741    (> c_stocka_151 0)
20742    (> s_stockb_152 0)
20743    (> s_stocka_152 0)
20744    (> a_stockb_152 0)
20745    (> a_stocka_152 0)
20746    (> b_stockb_152 0)
20747    (> b_stocka_152 0)
20748    (> c_stockb_152 0)
```

```
20749   (> c_stocka_152 0)
20750   (> s_stockb_153 0)
20751   (> s_stocka_153 0)
20752   (> a_stockb_153 0)
20753   (> a_stocka_153 0)
20754   (> b_stockb_153 0)
20755   (> b_stocka_153 0)
20756   (> c_stockb_153 0)
20757   (> c_stocka_153 0)
20758   (> s_stockb_154 0)
20759   (> s_stocka_154 0)
20760   (> a_stockb_154 0)
20761   (> a_stocka_154 0)
20762   (> b_stockb_154 0)
20763   (> b_stocka_154 0)
20764   (> c_stockb_154 0)
20765   (> c_stocka_154 0)
20766   (> s_stockb_155 0)
20767   (> s_stocka_155 0)
20768   (> a_stockb_155 0)
20769   (> a_stocka_155 0)
20770   (> b_stockb_155 0)
20771   (> b_stocka_155 0)
20772   (> c_stockb_155 0)
20773   (> c_stocka_155 0)
20774   (> s_stockb_156 0)
20775   (> s_stocka_156 0)
20776   (> a_stockb_156 0)
20777   (> a_stocka_156 0)
20778   (> b_stockb_156 0)
20779   (> b_stocka_156 0)
20780   (> c_stockb_156 0)
20781   (> c_stocka_156 0)
20782   (> s_stockb_157 0)
20783   (> s_stocka_157 0)
20784   (> a_stockb_157 0)
20785   (> a_stocka_157 0)
20786   (> b_stockb_157 0)
20787   (> b_stocka_157 0)
20788   (> c_stockb_157 0)
20789   (> c_stocka_157 0)
20790   (> s_stockb_158 0)
20791   (> s_stocka_158 0)
20792   (> a_stockb_158 0)
20793   (> a_stocka_158 0)
20794   (> b_stockb_158 0)
20795   (> b_stocka_158 0)
20796   (> c_stockb_158 0)
20797   (> c_stocka_158 0)
20798   (> s_stockb_159 0)
20799   (> s_stocka_159 0)
20800   (> a_stockb_159 0)
20801   (> a_stocka_159 0)
20802   (> b_stockb_159 0)
20803   (> b_stocka_159 0)
20804   (> c_stockb_159 0)
20805   (> c_stocka_159 0)
20806   (> s_stockb_160 0)
20807   (> s_stocka_160 0)
20808   (> a_stockb_160 0)
20809   (> a_stocka_160 0)
20810   (> b_stockb_160 0)
```

```
20811    (> b_stocka_160 0)
20812    (> c_stockb_160 0)
20813    (> c_stocka_160 0)
20814    (> s_stockb_161 0)
20815    (> s_stocka_161 0)
20816    (> a_stockb_161 0)
20817    (> a_stocka_161 0)
20818    (> b_stockb_161 0)
20819    (> b_stocka_161 0)
20820    (> c_stockb_161 0)
20821    (> c_stocka_161 0)
20822    (> s_stockb_162 0)
20823    (> s_stocka_162 0)
20824    (> a_stockb_162 0)
20825    (> a_stocka_162 0)
20826    (> b_stockb_162 0)
20827    (> b_stocka_162 0)
20828    (> c_stockb_162 0)
20829    (> c_stocka_162 0)
20830    (> s_stockb_163 0)
20831    (> s_stocka_163 0)
20832    (> a_stockb_163 0)
20833    (> a_stocka_163 0)
20834    (> b_stockb_163 0)
20835    (> b_stocka_163 0)
20836    (> c_stockb_163 0)
20837    (> c_stocka_163 0)
20838    (> s_stockb_164 0)
20839    (> s_stocka_164 0)
20840    (> a_stockb_164 0)
20841    (> a_stocka_164 0)
20842    (> b_stockb_164 0)
20843    (> b_stocka_164 0)
20844    (> c_stockb_164 0)
20845    (> c_stocka_164 0)
20846    (> s_stockb_165 0)
20847    (> s_stocka_165 0)
20848    (> a_stockb_165 0)
20849    (> a_stocka_165 0)
20850    (> b_stockb_165 0)
20851    (> b_stocka_165 0)
20852    (> c_stockb_165 0)
20853    (> c_stocka_165 0)
20854    (> s_stockb_166 0)
20855    (> s_stocka_166 0)
20856    (> a_stockb_166 0)
20857    (> a_stocka_166 0)
20858    (> b_stockb_166 0)
20859    (> b_stocka_166 0)
20860    (> c_stockb_166 0)
20861    (> c_stocka_166 0)
20862    (> s_stockb_167 0)
20863    (> s_stocka_167 0)
20864    (> a_stockb_167 0)
20865    (> a_stocka_167 0)
20866    (> b_stockb_167 0)
20867    (> b_stocka_167 0)
20868    (> c_stockb_167 0)
20869    (> c_stocka_167 0)
20870    (> s_stockb_168 0)
20871    (> s_stocka_168 0)
20872    (> a_stockb_168 0)
```

```
20873    (> a_stocka_168 0)
20874    (> b_stockb_168 0)
20875    (> b_stocka_168 0)
20876    (> c_stockb_168 0)
20877    (> c_stocka_168 0)
20878    (> s_stockb_169 0)
20879    (> s_stocka_169 0)
20880    (> a_stockb_169 0)
20881    (> a_stocka_169 0)
20882    (> b_stockb_169 0)
20883    (> b_stocka_169 0)
20884    (> c_stockb_169 0)
20885    (> c_stocka_169 0)
20886    (> s_stockb_170 0)
20887    (> s_stocka_170 0)
20888    (> a_stockb_170 0)
20889    (> a_stocka_170 0)
20890    (> b_stockb_170 0)
20891    (> b_stocka_170 0)
20892    (> c_stockb_170 0)
20893    (> c_stocka_170 0)
20894    (> s_stockb_171 0)
20895    (> s_stocka_171 0)
20896    (> a_stockb_171 0)
20897    (> a_stocka_171 0)
20898    (> b_stockb_171 0)
20899    (> b_stocka_171 0)
20900    (> c_stockb_171 0)
20901    (> c_stocka_171 0)
20902    (> s_stockb_172 0)
20903    (> s_stocka_172 0)
20904    (> a_stockb_172 0)
20905    (> a_stocka_172 0)
20906    (> b_stockb_172 0)
20907    (> b_stocka_172 0)
20908    (> c_stockb_172 0)
20909    (> c_stocka_172 0)
20910    (> s_stockb_173 0)
20911    (> s_stocka_173 0)
20912    (> a_stockb_173 0)
20913    (> a_stocka_173 0)
20914    (> b_stockb_173 0)
20915    (> b_stocka_173 0)
20916    (> c_stockb_173 0)
20917    (> c_stocka_173 0)
20918    (> s_stockb_174 0)
20919    (> s_stocka_174 0)
20920    (> a_stockb_174 0)
20921    (> a_stocka_174 0)
20922    (> b_stockb_174 0)
20923    (> b_stocka_174 0)
20924    (> c_stockb_174 0)
20925    (> c_stocka_174 0)
20926    (> s_stockb_175 0)
20927    (> s_stocka_175 0)
20928    (> a_stockb_175 0)
20929    (> a_stocka_175 0)
20930    (> b_stockb_175 0)
20931    (> b_stocka_175 0)
20932    (> c_stockb_175 0)
20933    (> c_stocka_175 0)
20934    (> s_stockb_176 0)
```

```
20935    (> s_stocka_176 0)
20936    (> a_stockb_176 0)
20937    (> a_stocka_176 0)
20938    (> b_stockb_176 0)
20939    (> b_stocka_176 0)
20940    (> c_stockb_176 0)
20941    (> c_stocka_176 0)
20942    (> s_stockb_177 0)
20943    (> s_stocka_177 0)
20944    (> a_stockb_177 0)
20945    (> a_stocka_177 0)
20946    (> b_stockb_177 0)
20947    (> b_stocka_177 0)
20948    (> c_stockb_177 0)
20949    (> c_stocka_177 0)
20950    (> s_stockb_178 0)
20951    (> s_stocka_178 0)
20952    (> a_stockb_178 0)
20953    (> a_stocka_178 0)
20954    (> b_stockb_178 0)
20955    (> b_stocka_178 0)
20956    (> c_stockb_178 0)
20957    (> c_stocka_178 0)
20958    (> s_stockb_179 0)
20959    (> s_stocka_179 0)
20960    (> a_stockb_179 0)
20961    (> a_stocka_179 0)
20962    (> b_stockb_179 0)
20963    (> b_stocka_179 0)
20964    (> c_stockb_179 0)
20965    (> c_stocka_179 0)
20966    (> s_stockb_180 0)
20967    (> s_stocka_180 0)
20968    (> a_stockb_180 0)
20969    (> a_stocka_180 0)
20970    (> b_stockb_180 0)
20971    (> b_stocka_180 0)
20972    (> c_stockb_180 0)
20973    (> c_stocka_180 0)
20974    (> s_stockb_181 0)
20975    (> s_stocka_181 0)
20976    (> a_stockb_181 0)
20977    (> a_stocka_181 0)
20978    (> b_stockb_181 0)
20979    (> b_stocka_181 0)
20980    (> c_stockb_181 0)
20981    (> c_stocka_181 0)
20982    (> s_stockb_182 0)
20983    (> s_stocka_182 0)
20984    (> a_stockb_182 0)
20985    (> a_stocka_182 0)
20986    (> b_stockb_182 0)
20987    (> b_stocka_182 0)
20988    (> c_stockb_182 0)
20989    (> c_stocka_182 0)
20990    (> s_stockb_183 0)
20991    (> s_stocka_183 0)
20992    (> a_stockb_183 0)
20993    (> a_stocka_183 0)
20994    (> b_stockb_183 0)
20995    (> b_stocka_183 0)
20996    (> c_stockb_183 0)
```

```
20997   (> c_stocka_183 0)
20998   (> s_stockb_184 0)
20999   (> s_stocka_184 0)
21000   (> a_stockb_184 0)
21001   (> a_stocka_184 0)
21002   (> b_stockb_184 0)
21003   (> b_stocka_184 0)
21004   (> c_stockb_184 0)
21005   (> c_stocka_184 0)
21006   (> s_stockb_185 0)
21007   (> s_stocka_185 0)
21008   (> a_stockb_185 0)
21009   (> a_stocka_185 0)
21010   (> b_stockb_185 0)
21011   (> b_stocka_185 0)
21012   (> c_stockb_185 0)
21013   (> c_stocka_185 0)
21014   (> s_stockb_186 0)
21015   (> s_stocka_186 0)
21016   (> a_stockb_186 0)
21017   (> a_stocka_186 0)
21018   (> b_stockb_186 0)
21019   (> b_stocka_186 0)
21020   (> c_stockb_186 0)
21021   (> c_stocka_186 0)
21022   (> s_stockb_187 0)
21023   (> s_stocka_187 0)
21024   (> a_stockb_187 0)
21025   (> a_stocka_187 0)
21026   (> b_stockb_187 0)
21027   (> b_stocka_187 0)
21028   (> c_stockb_187 0)
21029   (> c_stocka_187 0)
21030   (> s_stockb_188 0)
21031   (> s_stocka_188 0)
21032   (> a_stockb_188 0)
21033   (> a_stocka_188 0)
21034   (> b_stockb_188 0)
21035   (> b_stocka_188 0)
21036   (> c_stockb_188 0)
21037   (> c_stocka_188 0)
21038   (> s_stockb_189 0)
21039   (> s_stocka_189 0)
21040   (> a_stockb_189 0)
21041   (> a_stocka_189 0)
21042   (> b_stockb_189 0)
21043   (> b_stocka_189 0)
21044   (> c_stockb_189 0)
21045   (> c_stocka_189 0)
21046   (> s_stockb_190 0)
21047   (> s_stocka_190 0)
21048   (> a_stockb_190 0)
21049   (> a_stocka_190 0)
21050   (> b_stockb_190 0)
21051   (> b_stocka_190 0)
21052   (> c_stockb_190 0)
21053   (> c_stocka_190 0)
21054   (> s_stockb_191 0)
21055   (> s_stocka_191 0)
21056   (> a_stockb_191 0)
21057   (> a_stocka_191 0)
21058   (> b_stockb_191 0)
```

```
21059   (> b_stocka_191 0)
21060   (> c_stockb_191 0)
21061   (> c_stocka_191 0)
21062   (> s_stockb_192 0)
21063   (> s_stocka_192 0)
21064   (> a_stockb_192 0)
21065   (> a_stocka_192 0)
21066   (> b_stockb_192 0)
21067   (> b_stocka_192 0)
21068   (> c_stockb_192 0)
21069   (> c_stocka_192 0)
21070   (> s_stockb_193 0)
21071   (> s_stocka_193 0)
21072   (> a_stockb_193 0)
21073   (> a_stocka_193 0)
21074   (> b_stockb_193 0)
21075   (> b_stocka_193 0)
21076   (> c_stockb_193 0)
21077   (> c_stocka_193 0)
21078   (> s_stockb_194 0)
21079   (> s_stocka_194 0)
21080   (> a_stockb_194 0)
21081   (> a_stocka_194 0)
21082   (> b_stockb_194 0)
21083   (> b_stocka_194 0)
21084   (> c_stockb_194 0)
21085   (> c_stocka_194 0)
21086   (> s_stockb_195 0)
21087   (> s_stocka_195 0)
21088   (> a_stockb_195 0)
21089   (> a_stocka_195 0)
21090   (> b_stockb_195 0)
21091   (> b_stocka_195 0)
21092   (> c_stockb_195 0)
21093   (> c_stocka_195 0)
21094   (> s_stockb_196 0)
21095   (> s_stocka_196 0)
21096   (> a_stockb_196 0)
21097   (> a_stocka_196 0)
21098   (> b_stockb_196 0)
21099   (> b_stocka_196 0)
21100   (> c_stockb_196 0)
21101   (> c_stocka_196 0)
21102   (> s_stockb_197 0)
21103   (> s_stocka_197 0)
21104   (> a_stockb_197 0)
21105   (> a_stocka_197 0)
21106   (> b_stockb_197 0)
21107   (> b_stocka_197 0)
21108   (> c_stockb_197 0)
21109   (> c_stocka_197 0)
21110   (> s_stockb_198 0)
21111   (> s_stocka_198 0)
21112   (> a_stockb_198 0)
21113   (> a_stocka_198 0)
21114   (> b_stockb_198 0)
21115   (> b_stocka_198 0)
21116   (> c_stockb_198 0)
21117   (> c_stocka_198 0)
21118   (> s_stockb_199 0)
21119   (> s_stocka_199 0)
21120   (> a_stockb_199 0)
```

```
21121  (> a_stocka_199 0)
21122  (> b_stockb_199 0)
21123  (> b_stocka_199 0)
21124  (> c_stockb_199 0)
21125  (> c_stocka_199 0)
21126  ))
21127  (check-sat)
21128  (get-model)
```

Appendix 9

The generated output, filtering only the truck's location, for Question 1(b)

```
1  unsat
2  (error "line 21128 column 10: model is not available")
```

Appendix 10

The generated Prolog file for Question 2

```
1   %Rule 1
2   step([0|T], [1|T]).
3
4   %Rule 2
5   step([A,B|T], [B,A|T]) :-
6       A \= B.
7
8   %Rule 3
9   step(F, T) :-
10      rule3(F, T).
11  rule3([1,1,0|T], [0,0,1|T]).
12  rule3([H|Tf], [H|Tt]) :-
13      rule3(Tf, Tt).
14
15  %Step chain
16  nsteps(X, X, 0).
17  nsteps(X, Z, N) :-
18      step(Y, Z),
19      nsteps(X, Y, M),
20      N is M + 1.
21
22  %Query:
23  %gprolog --consult-file req.pl --query-goal "nsteps(
24  %[0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0], [0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,1], N)"
```

Appendix 11

The output generated by Prolog for Question 2

```
1   GNU Prolog 1.4.4 (64 bits)
2   Compiled Jan 15 2014, 20:38:19 with gcc
3   By Daniel Diaz
4   Copyright (C) 1999-2013 Daniel Diaz
5   compiling /home/robke/Documents/2IMF25/repo/6/req.pl for byte code...
6   /home/robke/Documents/2IMF25/repo/6/req.pl compiled, 24 lines read - 1956 bytes written, 9 ms
7   | ?- nsteps([0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0], [0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,1], N).
8
9   N = 4180 ?
10
11  (7 ms) yes
12
13  Prolog interruption (h for help) ?
```

Appendix 12

The python script for generating the smv for Question 2

```
1   #!/usr/bin/env python
2   import string
3
4   irange = range(0, 17)
5   bgn = [7]
6   end = [7, 16]
7   stepguess = 4180
8
9   ############################
10  ### Variable declarations ###
11  ############################
12  print("MODULE main")
13  print("VAR")
14  print("s: 0..%d;" % stepguess)
15  for i in irange:
16    print("a%d: boolean;" % i)
17
18  ####################
19  ### Initial values ###
20  ####################
21  print("\nINIT")
22  for i in irange:
23    print("%sa%d &" % ("" if i in bgn else "!", i))
24  print("s = 0")
25
26  ##################################################
27  ### Transitions (only if 's' does not overflow) ###
28  ##################################################
29  print("\nTRANS")
30  print("case")
31  print("  s < %d:" % stepguess)
32  print("    next(s) = s + 1 & (")
33  def rest(f, L):
34    return(string.join(["%snext(a%d) = a%d" % (f, x, x) for x in L], " &\n"))
35
36  ############
37  ### Rule 1 ###
38  ############
39  print("        (")
40  print("          next(a0) = TRUE &")
```

725

```
41  print(rest("          ", irange[1:]))
42  print("        ) |")
43
44  #############
45  ### Rule 2 ###
46  #############
47  print("        (")
48  print("            next(a0) = a1 &")
49  print("            next(a1) = a0 &")
50  print(rest("          ", irange[2:]))
51  print("        ) |")
52
53  #############
54  ### Rule 3 ###
55  #############
56  for i in irange[2:]:
57    print("        (")
58    print("            (a%d & a%d) &" % (i-2, i-1))
59    print("                next(a%d) = FALSE &" % (i-2))
60    print("                next(a%d) = FALSE &" % (i-1))
61    print("                next(a%d) = TRUE &" % i)
62    print(rest("              ", [x for x in irange if x not in [i-2, i-1, i]]))
63    print("        )" + ("" if i == irange[-1] else " |"))
64
65  #####################################
66  ### If 's' would overflow then bail ###
67  #####################################
68  print("      );")
69  print("  TRUE:")
70  print("      next(s) = s;")
71  print("esac")
72
73  ###########################################
74  ### Required state reachable in the guessed ###
75  ### number of steps but not in one less?   ###
76  ###########################################
77  for guess, neg in {stepguess: "", stepguess - 1: "!"}.iteritems():
78    print("\nSPEC %s EF (s > 0 &" % neg)
79    for i in end:
80      print("  a%d &" % i)
81    print("  s <= %d)" % guess)
```

Appendix 13

The generated smv for Question 2

```
 1   MODULE main
 2   VAR
 3   s: 0..4180;
 4   a0: boolean;
 5   a1: boolean;
 6   a2: boolean;
 7   a3: boolean;
 8   a4: boolean;
 9   a5: boolean;
10   a6: boolean;
11   a7: boolean;
12   a8: boolean;
13   a9: boolean;
14   a10: boolean;
15   a11: boolean;
16   a12: boolean;
17   a13: boolean;
18   a14: boolean;
19   a15: boolean;
20   a16: boolean;
21
22   INIT
23   !a0 &
24   !a1 &
25   !a2 &
26   !a3 &
27   !a4 &
28   !a5 &
29   !a6 &
30   a7 &
31   !a8 &
32   !a9 &
33   !a10 &
34   !a11 &
35   !a12 &
36   !a13 &
37   !a14 &
38   !a15 &
39   !a16 &
40   s = 0
41
42   TRANS
43   case
```

```
44    s < 4180:
45      next(s) = s + 1 & (
46        (
47          next(a0) = TRUE &
48          next(a1) = a1 &
49          next(a2) = a2 &
50          next(a3) = a3 &
51          next(a4) = a4 &
52          next(a5) = a5 &
53          next(a6) = a6 &
54          next(a7) = a7 &
55          next(a8) = a8 &
56          next(a9) = a9 &
57          next(a10) = a10 &
58          next(a11) = a11 &
59          next(a12) = a12 &
60          next(a13) = a13 &
61          next(a14) = a14 &
62          next(a15) = a15 &
63          next(a16) = a16
64        ) |
65        (
66          next(a0) = a1 &
67          next(a1) = a0 &
68          next(a2) = a2 &
69          next(a3) = a3 &
70          next(a4) = a4 &
71          next(a5) = a5 &
72          next(a6) = a6 &
73          next(a7) = a7 &
74          next(a8) = a8 &
75          next(a9) = a9 &
76          next(a10) = a10 &
77          next(a11) = a11 &
78          next(a12) = a12 &
79          next(a13) = a13 &
80          next(a14) = a14 &
81          next(a15) = a15 &
82          next(a16) = a16
83        ) |
84        (
85          (a0 & a1) &
86            next(a0) = FALSE &
87            next(a1) = FALSE &
88            next(a2) = TRUE &
89            next(a3) = a3 &
90            next(a4) = a4 &
91            next(a5) = a5 &
92            next(a6) = a6 &
93            next(a7) = a7 &
94            next(a8) = a8 &
95            next(a9) = a9 &
96            next(a10) = a10 &
97            next(a11) = a11 &
98            next(a12) = a12 &
99            next(a13) = a13 &
100           next(a14) = a14 &
101           next(a15) = a15 &
102           next(a16) = a16
103       ) |
104       (
105         (a1 & a2) &
```

```
106            next(a1) = FALSE &
107            next(a2) = FALSE &
108            next(a3) = TRUE &
109            next(a0) = a0 &
110            next(a4) = a4 &
111            next(a5) = a5 &
112            next(a6) = a6 &
113            next(a7) = a7 &
114            next(a8) = a8 &
115            next(a9) = a9 &
116            next(a10) = a10 &
117            next(a11) = a11 &
118            next(a12) = a12 &
119            next(a13) = a13 &
120            next(a14) = a14 &
121            next(a15) = a15 &
122            next(a16) = a16
123        ) |
124        (
125          (a2 & a3) &
126            next(a2) = FALSE &
127            next(a3) = FALSE &
128            next(a4) = TRUE &
129            next(a0) = a0 &
130            next(a1) = a1 &
131            next(a5) = a5 &
132            next(a6) = a6 &
133            next(a7) = a7 &
134            next(a8) = a8 &
135            next(a9) = a9 &
136            next(a10) = a10 &
137            next(a11) = a11 &
138            next(a12) = a12 &
139            next(a13) = a13 &
140            next(a14) = a14 &
141            next(a15) = a15 &
142            next(a16) = a16
143        ) |
144        (
145          (a3 & a4) &
146            next(a3) = FALSE &
147            next(a4) = FALSE &
148            next(a5) = TRUE &
149            next(a0) = a0 &
150            next(a1) = a1 &
151            next(a2) = a2 &
152            next(a6) = a6 &
153            next(a7) = a7 &
154            next(a8) = a8 &
155            next(a9) = a9 &
156            next(a10) = a10 &
157            next(a11) = a11 &
158            next(a12) = a12 &
159            next(a13) = a13 &
160            next(a14) = a14 &
161            next(a15) = a15 &
162            next(a16) = a16
163        ) |
164        (
165          (a4 & a5) &
166            next(a4) = FALSE &
167            next(a5) = FALSE &
```

```
168          next(a6) = TRUE &
169          next(a0) = a0 &
170          next(a1) = a1 &
171          next(a2) = a2 &
172          next(a3) = a3 &
173          next(a7) = a7 &
174          next(a8) = a8 &
175          next(a9) = a9 &
176          next(a10) = a10 &
177          next(a11) = a11 &
178          next(a12) = a12 &
179          next(a13) = a13 &
180          next(a14) = a14 &
181          next(a15) = a15 &
182          next(a16) = a16
183     ) |
184     (
185       (a5 & a6) &
186          next(a5) = FALSE &
187          next(a6) = FALSE &
188          next(a7) = TRUE &
189          next(a0) = a0 &
190          next(a1) = a1 &
191          next(a2) = a2 &
192          next(a3) = a3 &
193          next(a4) = a4 &
194          next(a8) = a8 &
195          next(a9) = a9 &
196          next(a10) = a10 &
197          next(a11) = a11 &
198          next(a12) = a12 &
199          next(a13) = a13 &
200          next(a14) = a14 &
201          next(a15) = a15 &
202          next(a16) = a16
203     ) |
204     (
205       (a6 & a7) &
206          next(a6) = FALSE &
207          next(a7) = FALSE &
208          next(a8) = TRUE &
209          next(a0) = a0 &
210          next(a1) = a1 &
211          next(a2) = a2 &
212          next(a3) = a3 &
213          next(a4) = a4 &
214          next(a5) = a5 &
215          next(a9) = a9 &
216          next(a10) = a10 &
217          next(a11) = a11 &
218          next(a12) = a12 &
219          next(a13) = a13 &
220          next(a14) = a14 &
221          next(a15) = a15 &
222          next(a16) = a16
223     ) |
224     (
225       (a7 & a8) &
226          next(a7) = FALSE &
227          next(a8) = FALSE &
228          next(a9) = TRUE &
229          next(a0) = a0 &
```

```
230          next(a1) = a1 &
231          next(a2) = a2 &
232          next(a3) = a3 &
233          next(a4) = a4 &
234          next(a5) = a5 &
235          next(a6) = a6 &
236          next(a10) = a10 &
237          next(a11) = a11 &
238          next(a12) = a12 &
239          next(a13) = a13 &
240          next(a14) = a14 &
241          next(a15) = a15 &
242          next(a16) = a16
243      ) |
244      (
245        (a8 & a9) &
246          next(a8) = FALSE &
247          next(a9) = FALSE &
248          next(a10) = TRUE &
249          next(a0) = a0 &
250          next(a1) = a1 &
251          next(a2) = a2 &
252          next(a3) = a3 &
253          next(a4) = a4 &
254          next(a5) = a5 &
255          next(a6) = a6 &
256          next(a7) = a7 &
257          next(a11) = a11 &
258          next(a12) = a12 &
259          next(a13) = a13 &
260          next(a14) = a14 &
261          next(a15) = a15 &
262          next(a16) = a16
263      ) |
264      (
265        (a9 & a10) &
266          next(a9) = FALSE &
267          next(a10) = FALSE &
268          next(a11) = TRUE &
269          next(a0) = a0 &
270          next(a1) = a1 &
271          next(a2) = a2 &
272          next(a3) = a3 &
273          next(a4) = a4 &
274          next(a5) = a5 &
275          next(a6) = a6 &
276          next(a7) = a7 &
277          next(a8) = a8 &
278          next(a12) = a12 &
279          next(a13) = a13 &
280          next(a14) = a14 &
281          next(a15) = a15 &
282          next(a16) = a16
283      ) |
284      (
285        (a10 & a11) &
286          next(a10) = FALSE &
287          next(a11) = FALSE &
288          next(a12) = TRUE &
289          next(a0) = a0 &
290          next(a1) = a1 &
291          next(a2) = a2 &
```

```
292          next(a3) = a3 &
293          next(a4) = a4 &
294          next(a5) = a5 &
295          next(a6) = a6 &
296          next(a7) = a7 &
297          next(a8) = a8 &
298          next(a9) = a9 &
299          next(a13) = a13 &
300          next(a14) = a14 &
301          next(a15) = a15 &
302          next(a16) = a16
303        ) |
304        (
305          (a11 & a12) &
306          next(a11) = FALSE &
307          next(a12) = FALSE &
308          next(a13) = TRUE &
309          next(a0) = a0 &
310          next(a1) = a1 &
311          next(a2) = a2 &
312          next(a3) = a3 &
313          next(a4) = a4 &
314          next(a5) = a5 &
315          next(a6) = a6 &
316          next(a7) = a7 &
317          next(a8) = a8 &
318          next(a9) = a9 &
319          next(a10) = a10 &
320          next(a14) = a14 &
321          next(a15) = a15 &
322          next(a16) = a16
323        ) |
324        (
325          (a12 & a13) &
326          next(a12) = FALSE &
327          next(a13) = FALSE &
328          next(a14) = TRUE &
329          next(a0) = a0 &
330          next(a1) = a1 &
331          next(a2) = a2 &
332          next(a3) = a3 &
333          next(a4) = a4 &
334          next(a5) = a5 &
335          next(a6) = a6 &
336          next(a7) = a7 &
337          next(a8) = a8 &
338          next(a9) = a9 &
339          next(a10) = a10 &
340          next(a11) = a11 &
341          next(a15) = a15 &
342          next(a16) = a16
343        ) |
344        (
345          (a13 & a14) &
346          next(a13) = FALSE &
347          next(a14) = FALSE &
348          next(a15) = TRUE &
349          next(a0) = a0 &
350          next(a1) = a1 &
351          next(a2) = a2 &
352          next(a3) = a3 &
353          next(a4) = a4 &
```

```
354         next(a5) = a5 &
355         next(a6) = a6 &
356         next(a7) = a7 &
357         next(a8) = a8 &
358         next(a9) = a9 &
359         next(a10) = a10 &
360         next(a11) = a11 &
361         next(a12) = a12 &
362         next(a16) = a16
363      ) |
364      (
365       (a14 & a15) &
366         next(a14) = FALSE &
367         next(a15) = FALSE &
368         next(a16) = TRUE &
369         next(a0) = a0 &
370         next(a1) = a1 &
371         next(a2) = a2 &
372         next(a3) = a3 &
373         next(a4) = a4 &
374         next(a5) = a5 &
375         next(a6) = a6 &
376         next(a7) = a7 &
377         next(a8) = a8 &
378         next(a9) = a9 &
379         next(a10) = a10 &
380         next(a11) = a11 &
381         next(a12) = a12 &
382         next(a13) = a13
383      )
384    );
385  TRUE:
386    next(s) = s;
387 esac
388
389 SPEC ! EF (s > 0 &
390    a7 &
391    a16 &
392    s <= 4179)
393
394 SPEC  EF (s > 0 &
395    a7 &
396    a16 &
397    s <= 4180)
```

Appendix 14

The output of NuSMV for Question 2

```
1   *** This is NuSMV 2.6.0 (compiled on Thu Jan  3 21:32:08 2019)
2   *** Enabled addons are: compass
3   *** For more information on NuSMV see <http://nusmv.fbk.eu>
4   *** or email to <nusmv-users@list.fbk.eu>.
5   *** Please report bugs to <Please report bugs to <nusmv-users@fbk.eu>>
6
7   *** Copyright (c) 2010-2014, Fondazione Bruno Kessler
8
9   *** This version of NuSMV is linked to the CUDD library version 2.4.1
10  *** Copyright (c) 1995-2004, Regents of the University of Colorado
11
12  *** This version of NuSMV is linked to the MiniSat SAT solver.
13  *** See http://minisat.se/MiniSat.html
14  *** Copyright (c) 2003-2006, Niklas Een, Niklas Sorensson
15  *** Copyright (c) 2007-2010, Niklas Sorensson
16
17  -- specification !(EF (((s > 0 & a7) & a16) & s <= 4179))  is true
18  -- specification EF (((s > 0 & a7) & a16) & s <= 4180)  is true
```

Appendix 15

The input for Prover9 for Question 3(a)

```
1   formulas(assumptions).
2   x * (y * z) = (x * y) * z.
3   x * I = x.
4   x * inv(x) = I.
5   p(x, base) = x.
6   p(x, s(y)) = x * p(x, y).
7   end_of_list.
8
9   formulas(goals).
10  I * x = x.
11  inv(inv(x)) = x.
12  inv(x) * x = I.
13  inv(x * y) = inv(y) * inv(x).
14  end_of_list.
```

Appendix 16

The output from Prover9 for Question 3(a)

```
1   ============================= Prover9 ===============================
2   Prover9 (64) version 2009-11A, November 2009.
3   Process 8744 was started by robke on insanity.insaniac.net,
4   Sat Jan  5 15:25:42 2019
5   The command was "../../prover9/LADR-2009-11A/bin/prover9 -f a1.p9".
6   ============================= end of head ===========================
7
8   ============================= INPUT ================================
9
10  % Reading from file a1.p9
11
12
13  formulas(assumptions).
14  x * (y * z) = (x * y) * z.
15  x * I = x.
16  x * inv(x) = I.
17  p(x,base) = x.
18  p(x,s(y)) = x * p(x,y).
19  end_of_list.
20
21  formulas(goals).
22  I * x = x.
23  inv(inv(x)) = x.
24  inv(x) * x = I.
25  inv(x * y) = inv(y) * inv(x).
26  end_of_list.
27
28  ============================= end of input =========================
29
30  ============================= PROCESS NON-CLAUSAL FORMULAS =========
31
32  % Formulas that are not ordinary clauses:
33  1 I * x = x # label(non_clause) # label(goal).  [goal].
34  2 inv(inv(x)) = x # label(non_clause) # label(goal).  [goal].
35  3 inv(x) * x = I # label(non_clause) # label(goal).  [goal].
36  4 inv(x * y) = inv(y) * inv(x) # label(non_clause) # label(goal).  [goal].
37
38  ============================= end of process non-clausal formulas ===
39
40  ============================= PROCESS INITIAL CLAUSES ==============
```

```
41
42  % Clauses before input processing:
43
44  formulas(usable).
45  end_of_list.
46
47  formulas(sos).
48  x * (y * z) = (x * y) * z.  [assumption].
49  x * I = x.  [assumption].
50  x * inv(x) = I.  [assumption].
51  p(x,base) = x.  [assumption].
52  p(x,s(y)) = x * p(x,y).  [assumption].
53  I * c1 != c1.  [deny(1)].
54  inv(inv(c2)) != c2.  [deny(2)].
55  inv(c3) * c3 != I.  [deny(3)].
56  inv(c4 * c5) != inv(c5) * inv(c4).  [deny(4)].
57  end_of_list.
58
59  formulas(demodulators).
60  end_of_list.
61
62  ============================== PREDICATE ELIMINATION =================
63
64  No predicates eliminated.
65
66  ============================== end predicate elimination =============
67
68  Auto_denials:
69    % assign(max_proofs, 4).  % (Horn set with more than one neg. clause)
70
71  WARNING, because some of the denials share constants,
72  some of the denials or their descendents may be subsumed,
73  preventing the target number of proofs from being found.
74  The shared constants are:  I.
75
76  Term ordering decisions:
77  Predicate symbol precedence:  predicate_order([ = ]).
78  Function symbol precedence:  function_order([ I, base, c1, c2, c3, c4, c5, *, p, inv, s ]).
79  After inverse_order: Function symbol precedence:  function_order([ I, base, c1, c2, c3, c4,
      ↪ c5, *, inv, p, s ]).
80  Unfolding symbols: (none).
81
82  Auto_inference settings:
83    % set(paramodulation).  % (positive equality literals)
84
85  Auto_process settings:  (no changes).
86
87            5 x * (y * z) = (x * y) * z.  [assumption].
88  kept:     6 (x * y) * z = x * (y * z).  [copy(5),flip(a)].
89  kept:     7 x * I = x.  [assumption].
90  kept:     8 x * inv(x) = I.  [assumption].
91  kept:     9 p(x,base) = x.  [assumption].
92  kept:     10 p(x,s(y)) = x * p(x,y).  [assumption].
93  kept:     11 I * c1 != c1.  [deny(1)].
94  kept:     12 inv(inv(c2)) != c2.  [deny(2)].
95  kept:     13 inv(c3) * c3 != I.  [deny(3)].
96  kept:     14 inv(c4 * c5) != inv(c5) * inv(c4).  [deny(4)].
97
98  ============================== end of process initial clauses ========
99
100 ============================== CLAUSES FOR SEARCH ====================
101
```

```
102   % Clauses after input processing:
103
104   formulas(usable).
105   end_of_list.
106
107   formulas(sos).
108   6 (x * y) * z = x * (y * z).  [copy(5),flip(a)].
109   7 x * I = x.  [assumption].
110   8 x * inv(x) = I.  [assumption].
111   9 p(x,base) = x.  [assumption].
112   10 p(x,s(y)) = x * p(x,y).  [assumption].
113   11 I * c1 != c1.  [deny(1)].
114   12 inv(inv(c2)) != c2.  [deny(2)].
115   13 inv(c3) * c3 != I.  [deny(3)].
116   14 inv(c4 * c5) != inv(c5) * inv(c4).  [deny(4)].
117   end_of_list.
118
119   formulas(demodulators).
120   6 (x * y) * z = x * (y * z).  [copy(5),flip(a)].
121   7 x * I = x.  [assumption].
122   8 x * inv(x) = I.  [assumption].
123   9 p(x,base) = x.  [assumption].
124   10 p(x,s(y)) = x * p(x,y).  [assumption].
125   end_of_list.
126
127   ============================= end of clauses for search =============
128
129   ============================= SEARCH ================================
130
131   % Starting search at 0.00 seconds.
132
133   given #1 (I,wt=11): 6 (x * y) * z = x * (y * z).  [copy(5),flip(a)].
134
135   given #2 (I,wt=5): 7 x * I = x.  [assumption].
136
137   given #3 (I,wt=6): 8 x * inv(x) = I.  [assumption].
138
139   given #4 (I,wt=5): 9 p(x,base) = x.  [assumption].
140
141   given #5 (I,wt=10): 10 p(x,s(y)) = x * p(x,y).  [assumption].
142
143   given #6 (I,wt=5): 11 I * c1 != c1.  [deny(1)].
144
145   given #7 (I,wt=5): 12 inv(inv(c2)) != c2.  [deny(2)].
146
147   given #8 (I,wt=6): 13 inv(c3) * c3 != I.  [deny(3)].
148
149   given #9 (I,wt=10): 14 inv(c4 * c5) != inv(c5) * inv(c4).  [deny(4)].
150
151   given #10 (A,wt=9): 15 x * (I * y) = x * y.  [para(7(a,1),6(a,1,1)),flip(a)].
152
153   given #11 (T,wt=6): 18 x * inv(I) = x.  [para(8(a,1),15(a,1,2)),rewrite([7(2)]),flip(a)].
154
155   given #12 (T,wt=10): 16 x * (inv(x) * y) = I * y.  [para(8(a,1),6(a,1,1)),flip(a)].
156
157   given #13 (T,wt=7): 21 I * inv(inv(x)) = x.  [para(8(a,1),16(a,1,2)),rewrite([7(2)]),flip(a)
      ↪ ].
158
159   ============================= PROOF ================================
160
161   % Proof 1 at 0.00 (+ 0.00) seconds.
162   % Length of proof is 12.
```

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```
163  % Level of proof is 6.
164  % Maximum clause weight is 11.000.
165  % Given clauses 13.
166
167  1 I * x = x # label(non_clause) # label(goal).  [goal].
168  5 x * (y * z) = (x * y) * z.  [assumption].
169  6 (x * y) * z = x * (y * z).  [copy(5),flip(a)].
170  7 x * I = x.  [assumption].
171  8 x * inv(x) = I.  [assumption].
172  11 I * c1 != c1.  [deny(1)].
173  15 x * (I * y) = x * y.  [para(7(a,1),6(a,1,1)),flip(a)].
174  16 x * (inv(x) * y) = I * y.  [para(8(a,1),6(a,1,1)),flip(a)].
175  21 I * inv(inv(x)) = x.  [para(8(a,1),16(a,1,2)),rewrite([7(2)]),flip(a)].
176  23 x * inv(inv(y)) = x * y.  [para(21(a,1),6(a,2,2)),rewrite([7(2)])].
177  24 I * x = x.  [para(21(a,1),15(a,2)),rewrite([23(5),15(4)])].
178  25 $F.  [resolve(24,a,11,a)].
179
180  ============================= end of proof ==========================
181  % Redundant proof: 29 $F.  [back_rewrite(11),rewrite([24(3)]),xx(a)].
182
183  % Disable descendants (x means already disabled):
184   11x
185
186  given #14 (T,wt=5): 24 I * x = x.  [para(21(a,1),15(a,2)),rewrite([23(5),15(4)])].
187
188  given #15 (A,wt=10): 17 x * (y * inv(x * y)) = I.  [para(8(a,1),6(a,1)),flip(a)].
189
190  given #16 (T,wt=4): 30 inv(I) = I.  [para(24(a,1),8(a,1))].
191
192  given #17 (T,wt=8): 28 x * (inv(x) * y) = y.  [back_rewrite(16),rewrite([24(5)])].
193
194  ============================= PROOF =================================
195
196  % Proof 2 at 0.01 (+ 0.00) seconds.
197  % Length of proof is 14.
198  % Level of proof is 8.
199  % Maximum clause weight is 11.000.
200  % Given clauses 17.
201
202  2 inv(inv(x)) = x # label(non_clause) # label(goal).  [goal].
203  5 x * (y * z) = (x * y) * z.  [assumption].
204  6 (x * y) * z = x * (y * z).  [copy(5),flip(a)].
205  7 x * I = x.  [assumption].
206  8 x * inv(x) = I.  [assumption].
207  12 inv(inv(c2)) != c2.  [deny(2)].
208  15 x * (I * y) = x * y.  [para(7(a,1),6(a,1,1)),flip(a)].
209  16 x * (inv(x) * y) = I * y.  [para(8(a,1),6(a,1,1)),flip(a)].
210  21 I * inv(inv(x)) = x.  [para(8(a,1),16(a,1,2)),rewrite([7(2)]),flip(a)].
211  23 x * inv(inv(y)) = x * y.  [para(21(a,1),6(a,2,2)),rewrite([7(2)])].
212  24 I * x = x.  [para(21(a,1),15(a,2)),rewrite([23(5),15(4)])].
213  28 x * (inv(x) * y) = y.  [back_rewrite(16),rewrite([24(5)])].
214  32 inv(inv(x)) = x.  [para(8(a,1),28(a,1,2)),rewrite([7(2)]),flip(a)].
215  33 $F.  [resolve(32,a,12,a)].
216
217  ============================= end of proof ==========================
218  % Redundant proof: 35 $F.  [back_rewrite(12),rewrite([32(3)]),xx(a)].
219
220  % Disable descendants (x means already disabled):
221   12x
222
223  given #18 (T,wt=5): 32 inv(inv(x)) = x.  [para(8(a,1),28(a,1,2)),rewrite([7(2)]),flip(a)].
224
```

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```
225  =========================== PROOF =================================
226
227  % Proof 3 at 0.01 (+ 0.00) seconds.
228  % Length of proof is 15.
229  % Level of proof is 9.
230  % Maximum clause weight is 11.000.
231  % Given clauses 18.
232
233  3 inv(x) * x = I # label(non_clause) # label(goal).  [goal].
234  5 x * (y * z) = (x * y) * z.  [assumption].
235  6 (x * y) * z = x * (y * z).  [copy(5),flip(a)].
236  7 x * I = x.  [assumption].
237  8 x * inv(x) = I.  [assumption].
238  13 inv(c3) * c3 != I.  [deny(3)].
239  15 x * (I * y) = x * y.  [para(7(a,1),6(a,1,1)),flip(a)].
240  16 x * (inv(x) * y) = I * y.  [para(8(a,1),6(a,1,1)),flip(a)].
241  21 I * inv(inv(x)) = x.  [para(8(a,1),16(a,1,2)),rewrite([7(2)]),flip(a)].
242  23 x * inv(inv(y)) = x * y.  [para(21(a,1),6(a,2,2)),rewrite([7(2)])].
243  24 I * x = x.  [para(21(a,1),15(a,2)),rewrite([23(5),15(4)])].
244  28 x * (inv(x) * y) = y.  [back_rewrite(16),rewrite([24(5)])].
245  32 inv(inv(x)) = x.  [para(8(a,1),28(a,1,2)),rewrite([7(2)]),flip(a)].
246  36 inv(x) * x = I.  [para(32(a,1),8(a,1,2))].
247  37 $F.  [resolve(36,a,13,a)].
248
249  ============================ end of proof ==========================
250  % Redundant proof: 39 $F.  [back_rewrite(13),rewrite([36(4)]),xx(a)].
251
252  % Disable descendants (x means already disabled):
253   13x
254
255  given #19 (T,wt=6): 36 inv(x) * x = I.  [para(32(a,1),8(a,1,2))].
256
257  given #20 (A,wt=12): 27 x * (y * (inv(x * y) * z)) = z.  [back_rewrite(20),rewrite([24(7)])].
258
259  given #21 (T,wt=8): 38 inv(x) * (x * y) = y.  [para(32(a,1),28(a,1,2,1))].
260
261  given #22 (T,wt=9): 44 x * inv(y * x) = inv(y).  [para(17(a,1),38(a,1,2)),rewrite([7(3)]),
         ↪ flip(a)].
262
263  =========================== PROOF =================================
264
265  % Proof 4 at 0.01 (+ 0.00) seconds.
266  % Length of proof is 18.
267  % Level of proof is 11.
268  % Maximum clause weight is 11.000.
269  % Given clauses 22.
270
271  4 inv(x * y) = inv(y) * inv(x) # label(non_clause) # label(goal).  [goal].
272  5 x * (y * z) = (x * y) * z.  [assumption].
273  6 (x * y) * z = x * (y * z).  [copy(5),flip(a)].
274  7 x * I = x.  [assumption].
275  8 x * inv(x) = I.  [assumption].
276  14 inv(c4 * c5) != inv(c5) * inv(c4).  [deny(4)].
277  15 x * (I * y) = x * y.  [para(7(a,1),6(a,1,1)),flip(a)].
278  16 x * (inv(x) * y) = I * y.  [para(8(a,1),6(a,1,1)),flip(a)].
279  17 x * (y * inv(x * y)) = I.  [para(8(a,1),6(a,1)),flip(a)].
280  21 I * inv(inv(x)) = x.  [para(8(a,1),16(a,1,2)),rewrite([7(2)]),flip(a)].
281  23 x * inv(inv(y)) = x * y.  [para(21(a,1),6(a,2,2)),rewrite([7(2)])].
282  24 I * x = x.  [para(21(a,1),15(a,2)),rewrite([23(5),15(4)])].
283  28 x * (inv(x) * y) = y.  [back_rewrite(16),rewrite([24(5)])].
284  32 inv(inv(x)) = x.  [para(8(a,1),28(a,1,2)),rewrite([7(2)]),flip(a)].
285  38 inv(x) * (x * y) = y.  [para(32(a,1),28(a,1,2,1))].
```

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```
286  44 x * inv(y * x) = inv(y).  [para(17(a,1),38(a,1,2)),rewrite([7(3)]),flip(a)].
287  49 inv(x * y) = inv(y) * inv(x).  [para(44(a,1),38(a,1,2)),flip(a)].
288  50 $F.  [resolve(49,a,14,a)].
289
290  ============================= end of proof =========================
291
292  ============================= STATISTICS ===========================
293
294  Given=22. Generated=212. Kept=38. proofs=4.
295  Usable=13. Sos=4. Demods=19. Limbo=3, Disabled=26. Hints=0.
296  Kept_by_rule=0, Deleted_by_rule=0.
297  Forward_subsumed=171. Back_subsumed=0.
298  Sos_limit_deleted=0. Sos_displaced=0. Sos_removed=0.
299  New_demodulators=33 (0 lex), Back_demodulated=17. Back_unit_deleted=0.
300  Demod_attempts=1527. Demod_rewrites=314.
301  Res_instance_prunes=0. Para_instance_prunes=0. Basic_paramod_prunes=0.
302  Nonunit_fsub_feature_tests=0. Nonunit_bsub_feature_tests=0.
303  Megabytes=0.09.
304  User_CPU=0.01, System_CPU=0.00, Wall_clock=0.
305
306  ============================= end of statistics ====================
307
308  ============================= end of search ========================
309
310  THEOREM PROVED
311
312  Exiting with 4 proofs.
313
314  Process 8744 exit (max_proofs) Sat Jan  5 15:25:42 2019
```

Appendix 17

The input for Mace4 for Question 3(a)

```
1   formulas(assumptions).
2   x * (y * z) = (x * y) * z.
3   x * I = x.
4   x * inv(x) = I.
5   p(x, base) = x.
6   p(x, s(y)) = x * p(x, y).
7   end_of_list.
8
9   formulas(goals).
10  inv(x * y) = inv(x) * inv(y).
11  end_of_list.
```

Appendix 18

The output from Mace4 for Question 3(a)

```
1   ============================= Mace4 ================================
2   Mace4 (64) version 2009-11A, November 2009.
3   Process 8836 was started by robke on insanity.insaniac.net,
4   Sat Jan  5 15:26:09 2019
5   The command was "../../prover9/LADR-2009-11A/bin/mace4 -f a2.m4".
6   ============================= end of head ==========================
7
8   ============================= INPUT ===============================
9
10  % Reading from file a2.m4
11
12
13  formulas(assumptions).
14  x * (y * z) = (x * y) * z.
15  x * I = x.
16  x * inv(x) = I.
17  p(x,base) = x.
18  p(x,s(y)) = x * p(x,y).
19  end_of_list.
20
21  formulas(goals).
22  inv(x * y) = inv(x) * inv(y).
23  end_of_list.
24
25  ============================= end of input ========================
26
27  ============================= PROCESS NON-CLAUSAL FORMULAS =========
28
29  % Formulas that are not ordinary clauses:
30  1 inv(x * y) = inv(x) * inv(y) # label(non_clause) # label(goal).  [goal].
31
32  ============================= end of process non-clausal formulas ===
33
34  ============================= CLAUSES FOR SEARCH ===================
35
36  formulas(mace4_clauses).
37  x * (y * z) = (x * y) * z.
38  x * I = x.
39  x * inv(x) = I.
40  p(x,base) = x.
```

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```
41  p(x,s(y)) = x * p(x,y).
42  inv(c1 * c2) != inv(c1) * inv(c2).
43  end_of_list.
44
45  ============================ end of clauses for search =============
46
47  % There are no natural numbers in the input.
48
49  ============================ DOMAIN SIZE 2 ========================
50
51  ============================ STATISTICS ===========================
52
53  For domain size 2.
54
55  Current CPU time: 0.00 seconds (total CPU time: 0.00 seconds).
56  Ground clauses: seen=19, kept=19.
57  Selections=8, assignments=15, propagations=18, current_models=0.
58  Rewrite_terms=142, rewrite_bools=32, indexes=16.
59  Rules_from_neg_clauses=6, cross_offs=6.
60
61  ============================ end of statistics ====================
62
63  ============================ DOMAIN SIZE 3 ========================
64
65  ============================ STATISTICS ===========================
66
67  For domain size 3.
68
69  Current CPU time: 0.00 seconds (total CPU time: 0.00 seconds).
70  Ground clauses: seen=46, kept=46.
71  Selections=23, assignments=63, propagations=101, current_models=0.
72  Rewrite_terms=887, rewrite_bools=201, indexes=130.
73  Rules_from_neg_clauses=30, cross_offs=70.
74
75  ============================ end of statistics ====================
76
77  ============================ DOMAIN SIZE 4 ========================
78
79  ============================ STATISTICS ===========================
80
81  For domain size 4.
82
83  Current CPU time: 0.00 seconds (total CPU time: 0.00 seconds).
84  Ground clauses: seen=93, kept=93.
85  Selections=174, assignments=671, propagations=664, current_models=0.
86  Rewrite_terms=8817, rewrite_bools=2022, indexes=852.
87  Rules_from_neg_clauses=148, cross_offs=587.
88
89  ============================ end of statistics ====================
90
91  ============================ DOMAIN SIZE 5 ========================
92
93  ============================ STATISTICS ===========================
94
95  For domain size 5.
96
97  Current CPU time: 0.00 seconds (total CPU time: 0.01 seconds).
98  Ground clauses: seen=166, kept=166.
99  Selections=317, assignments=1490, propagations=1926, current_models=0.
100  Rewrite_terms=20432, rewrite_bools=3909, indexes=3631.
101  Rules_from_neg_clauses=431, cross_offs=2229.
102
```

```
103  ============================== end of statistics ====================
104
105  ============================== DOMAIN SIZE 6 ========================
106
107  ============================== MODEL ================================
108
109  interpretation( 6, [number=1, seconds=0], [
110
111          function(I, [ 0 ]),
112
113          function(base, [ 0 ]),
114
115          function(c1, [ 1 ]),
116
117          function(c2, [ 2 ]),
118
119          function(inv(_), [ 0, 1, 2, 4, 3, 5 ]),
120
121          function(s(_), [ 1, 2, 3, 4, 5, 0 ]),
122
123          function(*(_,_), [
124                              0, 1, 2, 3, 4, 5,
125                              1, 0, 3, 2, 5, 4,
126                              2, 4, 0, 5, 1, 3,
127                              3, 5, 1, 4, 0, 2,
128                              4, 2, 5, 0, 3, 1,
129                              5, 3, 4, 1, 2, 0 ]),
130
131          function(p(_,_), [
132                              0, 0, 0, 0, 0, 0,
133                              1, 0, 1, 0, 1, 0,
134                              2, 0, 2, 0, 2, 0,
135                              3, 4, 0, 3, 4, 0,
136                              4, 3, 0, 4, 3, 0,
137                              5, 0, 5, 0, 5, 0 ])
138  ]).
139
140  ============================== end of model ========================
141
142  ============================== STATISTICS ==========================
143
144  For domain size 6.
145
146  Current CPU time: 0.00 seconds (total CPU time: 0.01 seconds).
147  Ground clauses: seen=271, kept=271.
148  Selections=43, assignments=176, propagations=418, current_models=1.
149  Rewrite_terms=5041, rewrite_bools=901, indexes=1206.
150  Rules_from_neg_clauses=68, cross_offs=616.
151
152  ============================== end of statistics ====================
153
154  User_CPU=0.01, System_CPU=0.00, Wall_clock=0.
155
156  Exiting with 1 model.
157
158  Process 8836 exit (max_models) Sat Jan  5 15:26:09 2019
159  The process finished Sat Jan  5 15:26:09 2019
```

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Appendix 19

The input for Mace4 for Question 3(b)

```
1  formulas(assumptions).
2  x * (y * z) = (x * y) * z.
3  x * I = x.
4  x * inv(x) = I.
5  p(x, base) = x.
6  p(x, s(y)) = x * p(x, y).
7  end_of_list.
8
9  formulas(goals).
10 x * y = y * x.
11 end_of_list.
```

Appendix 20

The output from Mace4 for Question 3(b)

```
1   ============================== Mace4 =================================
2   Mace4 (64) version 2009-11A, November 2009.
3   Process 8902 was started by robke on insanity.insaniac.net,
4   Sat Jan  5 15:26:25 2019
5   The command was "../../prover9/LADR-2009-11A/bin/mace4 -f b.m4".
6   ============================== end of head ==========================
7
8   ============================== INPUT ===============================
9
10  % Reading from file b.m4
11
12
13  formulas(assumptions).
14  x * (y * z) = (x * y) * z.
15  x * I = x.
16  x * inv(x) = I.
17  p(x,base) = x.
18  p(x,s(y)) = x * p(x,y).
19  end_of_list.
20
21  formulas(goals).
22  x * y = y * x.
23  end_of_list.
24
25  ============================== end of input =======================
26
27  ============================== PROCESS NON-CLAUSAL FORMULAS =========
28
29  % Formulas that are not ordinary clauses:
30  1 x * y = y * x # label(non_clause) # label(goal).  [goal].
31
32  ============================== end of process non-clausal formulas ===
33
34  ============================== CLAUSES FOR SEARCH ===================
35
36  formulas(mace4_clauses).
37  x * (y * z) = (x * y) * z.
38  x * I = x.
39  x * inv(x) = I.
40  p(x,base) = x.
```

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```
41  p(x,s(y)) = x * p(x,y).
42  c2 * c1 != c1 * c2.
43  end_of_list.
44
45  ============================ end of clauses for search =============
46
47  % There are no natural numbers in the input.
48
49  ============================ DOMAIN SIZE 2 ========================
50
51  ============================ STATISTICS ===========================
52
53  For domain size 2.
54
55  Current CPU time: 0.00 seconds (total CPU time: 0.00 seconds).
56  Ground clauses: seen=19, kept=19.
57  Selections=8, assignments=15, propagations=18, current_models=0.
58  Rewrite_terms=122, rewrite_bools=32, indexes=16.
59  Rules_from_neg_clauses=6, cross_offs=6.
60
61  ============================ end of statistics ====================
62
63  ============================ DOMAIN SIZE 3 ========================
64
65  ============================ STATISTICS ===========================
66
67  For domain size 3.
68
69  Current CPU time: 0.00 seconds (total CPU time: 0.00 seconds).
70  Ground clauses: seen=46, kept=46.
71  Selections=21, assignments=58, propagations=87, current_models=0.
72  Rewrite_terms=728, rewrite_bools=183, indexes=111.
73  Rules_from_neg_clauses=26, cross_offs=64.
74
75  ============================ end of statistics ====================
76
77  ============================ DOMAIN SIZE 4 ========================
78
79  ============================ STATISTICS ===========================
80
81  For domain size 4.
82
83  Current CPU time: 0.00 seconds (total CPU time: 0.01 seconds).
84  Ground clauses: seen=93, kept=93.
85  Selections=172, assignments=666, propagations=612, current_models=0.
86  Rewrite_terms=7218, rewrite_bools=1849, indexes=778.
87  Rules_from_neg_clauses=137, cross_offs=555.
88
89  ============================ end of statistics ====================
90
91  ============================ DOMAIN SIZE 5 ========================
92
93  ============================ STATISTICS ===========================
94
95  For domain size 5.
96
97  Current CPU time: 0.00 seconds (total CPU time: 0.01 seconds).
98  Ground clauses: seen=166, kept=166.
99  Selections=313, assignments=1477, propagations=1889, current_models=0.
100 Rewrite_terms=18210, rewrite_bools=3817, indexes=3475.
101 Rules_from_neg_clauses=424, cross_offs=2196.
102
```

```
103  =========================== end of statistics ====================
104
105  =========================== DOMAIN SIZE 6 ======================
106
107  =========================== MODEL ==============================
108
109  interpretation( 6, [number=1, seconds=0], [
110
111          function(I, [ 0 ]),
112
113          function(base, [ 0 ]),
114
115          function(c1, [ 1 ]),
116
117          function(c2, [ 2 ]),
118
119          function(inv(_), [ 0, 1, 2, 4, 3, 5 ]),
120
121          function(s(_), [ 1, 2, 3, 4, 5, 0 ]),
122
123          function(*(_,_), [
124                           0, 1, 2, 3, 4, 5,
125                           1, 0, 3, 2, 5, 4,
126                           2, 4, 0, 5, 1, 3,
127                           3, 5, 1, 4, 0, 2,
128                           4, 2, 5, 0, 3, 1,
129                           5, 3, 4, 1, 2, 0 ]),
130
131          function(p(_,_), [
132                           0, 0, 0, 0, 0, 0,
133                           1, 0, 1, 0, 1, 0,
134                           2, 0, 2, 0, 2, 0,
135                           3, 4, 0, 3, 4, 0,
136                           4, 3, 0, 4, 3, 0,
137                           5, 0, 5, 0, 5, 0 ])
138  ]).
139
140  =========================== end of model =======================
141
142  =========================== STATISTICS =========================
143
144  For domain size 6.
145
146  Current CPU time: 0.00 seconds (total CPU time: 0.01 seconds).
147  Ground clauses: seen=271, kept=271.
148  Selections=38, assignments=158, propagations=431, current_models=1.
149  Rewrite_terms=4962, rewrite_bools=908, indexes=1095.
150  Rules_from_neg_clauses=68, cross_offs=571.
151
152  =========================== end of statistics ==================
153
154  User_CPU=0.01, System_CPU=0.00, Wall_clock=0.
155
156  Exiting with 1 model.
157
158  Process 8902 exit (max_models) Sat Jan  5 15:26:25 2019
159  The process finished Sat Jan  5 15:26:25 2019
```

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Appendix 21

The input for Mace4 for Question 3(c) with $n = 2$

```
1   formulas(assumptions).
2   x * (y * z) = (x * y) * z.
3   x * I = x.
4   x * inv(x) = I.
5   p(x, base) = x.
6   p(x, s(y)) = x * p(x, y).
7   end_of_list.
8
9   formulas(goals).
10  (p(z, s(base)) = I) -> (x * y = y * x).
11  end_of_list.
```

Appendix 22

The output from Mace4 for Question 3(c) with $n = 2$

```
1   ============================= Mace4 =================================
2   Mace4 (64) version 2009-11A, November 2009.
3   Process 8975 was started by robke on insanity.insaniac.net,
4   Sat Jan  5 15:26:40 2019
5   The command was "../../prover9/LADR-2009-11A/bin/mace4 -f c2.m4".
6   ============================= end of head ==========================
7
8   ============================= INPUT ================================
9
10  % Reading from file c2.m4
11
12
13  formulas(assumptions).
14  x * (y * z) = (x * y) * z.
15  x * I = x.
16  x * inv(x) = I.
17  p(x,base) = x.
18  p(x,s(y)) = x * p(x,y).
19  end_of_list.
20
21  formulas(goals).
22  p(z,s(base)) = I -> x * y = y * x.
23  end_of_list.
24
25  ============================= end of input =========================
26
27  ============================= PROCESS NON-CLAUSAL FORMULAS =========
28
29  % Formulas that are not ordinary clauses:
30  1 p(z,s(base)) = I -> x * y = y * x # label(non_clause) # label(goal).  [goal].
31
32  ============================= end of process non-clausal formulas ===
33
34  ============================= CLAUSES FOR SEARCH ===================
35
36  formulas(mace4_clauses).
37  x * (y * z) = (x * y) * z.
38  x * I = x.
39  x * inv(x) = I.
40  p(x,base) = x.
```

```
41  p(x,s(y)) = x * p(x,y).
42  p(c1,s(base)) = I.
43  c3 * c2 != c2 * c3.
44  end_of_list.
45
46  ============================= end of clauses for search =============
47
48  % There are no natural numbers in the input.
49
50  ============================= DOMAIN SIZE 2 ========================
51
52  ============================= STATISTICS ===========================
53
54  For domain size 2.
55
56  Current CPU time: 0.00 seconds (total CPU time: 0.00 seconds).
57  Ground clauses: seen=20, kept=20.
58  Selections=16, assignments=31, propagations=18, current_models=0.
59  Rewrite_terms=175, rewrite_bools=44, indexes=18.
60  Rules_from_neg_clauses=6, cross_offs=6.
61
62  ============================= end of statistics ====================
63
64  ============================= DOMAIN SIZE 3 ========================
65
66  ============================= STATISTICS ===========================
67
68  For domain size 3.
69
70  Current CPU time: 0.00 seconds (total CPU time: 0.00 seconds).
71  Ground clauses: seen=47, kept=47.
72  Selections=23, assignments=63, propagations=107, current_models=0.
73  Rewrite_terms=862, rewrite_bools=215, indexes=139.
74  Rules_from_neg_clauses=34, cross_offs=81.
75
76  ============================= end of statistics ====================
77
78  ============================= DOMAIN SIZE 4 ========================
79
80  ============================= STATISTICS ===========================
81
82  For domain size 4.
83
84  Current CPU time: 0.00 seconds (total CPU time: 0.01 seconds).
85  Ground clauses: seen=94, kept=94.
86  Selections=486, assignments=1909, propagations=973, current_models=0.
87  Rewrite_terms=14659, rewrite_bools=3693, indexes=1208.
88  Rules_from_neg_clauses=232, cross_offs=921.
89
90  ============================= end of statistics ====================
91
92  ============================= DOMAIN SIZE 5 ========================
93
94  ============================= STATISTICS ===========================
95
96  For domain size 5.
97
98  Current CPU time: 0.00 seconds (total CPU time: 0.02 seconds).
99  Ground clauses: seen=167, kept=167.
100  Selections=369, assignments=1713, propagations=2418, current_models=0.
101  Rewrite_terms=24079, rewrite_bools=4894, indexes=4917.
102  Rules_from_neg_clauses=479, cross_offs=2775.
```

```
103
104   =========================== end of statistics ====================
105
106   =========================== DOMAIN SIZE 6 ========================
107
108   =========================== MODEL ================================
109
110   interpretation( 6, [number=1, seconds=0], [
111
112           function(I, [ 0 ]),
113
114           function(base, [ 0 ]),
115
116           function(c1, [ 0 ]),
117
118           function(c2, [ 1 ]),
119
120           function(c3, [ 2 ]),
121
122           function(inv(_), [ 0, 1, 2, 4, 3, 5 ]),
123
124           function(s(_), [ 1, 2, 3, 4, 5, 0 ]),
125
126           function(*(_,_), [
127                               0, 1, 2, 3, 4, 5,
128                               1, 0, 3, 2, 5, 4,
129                               2, 4, 0, 5, 1, 3,
130                               3, 5, 1, 4, 0, 2,
131                               4, 2, 5, 0, 3, 1,
132                               5, 3, 4, 1, 2, 0 ]),
133
134           function(p(_,_), [
135                               0, 0, 0, 0, 0, 0,
136                               1, 0, 1, 0, 1, 0,
137                               2, 0, 2, 0, 2, 0,
138                               3, 4, 0, 3, 4, 0,
139                               4, 3, 0, 4, 3, 0,
140                               5, 0, 5, 0, 5, 0 ])
141   ]).
142
143   =========================== end of model ========================
144
145   =========================== STATISTICS ==========================
146
147   For domain size 6.
148
149   Current CPU time: 0.00 seconds (total CPU time: 0.02 seconds).
150   Ground clauses: seen=272, kept=272.
151   Selections=39, assignments=159, propagations=431, current_models=1.
152   Rewrite_terms=4969, rewrite_bools=910, indexes=1096.
153   Rules_from_neg_clauses=68, cross_offs=571.
154
155   =========================== end of statistics ====================
156
157   User_CPU=0.02, System_CPU=0.00, Wall_clock=0.
158
159   Exiting with 1 model.
160
161   Process 8975 exit (max_models) Sat Jan  5 15:26:40 2019
162   The process finished Sat Jan  5 15:26:40 2019
```

Appendix 23

The input for Mace4 for Question 3(c) with $n = 3$

```
1   formulas(assumptions).
2   x * (y * z) = (x * y) * z.
3   x * I = x.
4   x * inv(x) = I.
5   p(x, base) = x.
6   p(x, s(y)) = x * p(x, y).
7   end_of_list.
8
9   formulas(goals).
10  (p(z, s(s(base))) = I) -> (x * y = y * x).
11  end_of_list.
```

Appendix 24

The output from Mace4 for Question 3(c) with $n = 3$

```
1  ============================= Mace4 =================================
2  Mace4 (64) version 2009-11A, November 2009.
3  Process 8996 was started by robke on insanity.insaniac.net,
4  Sat Jan  5 15:26:44 2019
5  The command was "../../prover9/LADR-2009-11A/bin/mace4 -f c3.m4".
6  ============================= end of head ==========================
7
8  ============================= INPUT ================================
9
10 % Reading from file c3.m4
11
12
13 formulas(assumptions).
14 x * (y * z) = (x * y) * z.
15 x * I = x.
16 x * inv(x) = I.
17 p(x,base) = x.
18 p(x,s(y)) = x * p(x,y).
19 end_of_list.
20
21 formulas(goals).
22 p(z,s(s(base))) = I -> x * y = y * x.
23 end_of_list.
24
25 ============================= end of input ========================
26
27 ============================= PROCESS NON-CLAUSAL FORMULAS =========
28
29 % Formulas that are not ordinary clauses:
30 1 p(z,s(s(base))) = I -> x * y = y * x # label(non_clause) # label(goal).  [goal].
31
32 ============================= end of process non-clausal formulas ===
33
34 ============================= CLAUSES FOR SEARCH ===================
35
36 formulas(mace4_clauses).
37 x * (y * z) = (x * y) * z.
38 x * I = x.
39 x * inv(x) = I.
40 p(x,base) = x.
```

```
41  p(x,s(y)) = x * p(x,y).
42  p(c1,s(s(base))) = I.
43  c3 * c2 != c2 * c3.
44  end_of_list.
45
46  ============================= end of clauses for search =============
47
48  % There are no natural numbers in the input.
49
50  ============================= DOMAIN SIZE 2 ========================
51
52  ============================= STATISTICS ===========================
53
54  For domain size 2.
55
56  Current CPU time: 0.00 seconds (total CPU time: 0.00 seconds).
57  Ground clauses: seen=20, kept=20.
58  Selections=8, assignments=15, propagations=20, current_models=0.
59  Rewrite_terms=133, rewrite_bools=34, indexes=20.
60  Rules_from_neg_clauses=8, cross_offs=8.
61
62  ============================= end of statistics ====================
63
64  ============================= DOMAIN SIZE 3 ========================
65
66  ============================= STATISTICS ===========================
67
68  For domain size 3.
69
70  Current CPU time: 0.00 seconds (total CPU time: 0.00 seconds).
71  Ground clauses: seen=47, kept=47.
72  Selections=51, assignments=147, propagations=122, current_models=0.
73  Rewrite_terms=1266, rewrite_bools=314, indexes=156.
74  Rules_from_neg_clauses=38, cross_offs=91.
75
76  ============================= end of statistics ====================
77
78  ============================= DOMAIN SIZE 4 ========================
79
80  ============================= STATISTICS ===========================
81
82  For domain size 4.
83
84  Current CPU time: 0.00 seconds (total CPU time: 0.00 seconds).
85  Ground clauses: seen=94, kept=94.
86  Selections=187, assignments=720, propagations=761, current_models=0.
87  Rewrite_terms=8603, rewrite_bools=2204, indexes=983.
88  Rules_from_neg_clauses=177, cross_offs=707.
89
90  ============================= end of statistics ====================
91
92  ============================= DOMAIN SIZE 5 ========================
93
94  ============================= STATISTICS ===========================
95
96  For domain size 5.
97
98  Current CPU time: 0.00 seconds (total CPU time: 0.01 seconds).
99  Ground clauses: seen=167, kept=167.
100 Selections=398, assignments=1852, propagations=2763, current_models=0.
101 Rewrite_terms=25944, rewrite_bools=5111, indexes=5216.
102 Rules_from_neg_clauses=618, cross_offs=3051.
```

```
103
104  ============================== end of statistics ====================
105
106  ============================== DOMAIN SIZE 6 ========================
107
108  ============================== MODEL ================================
109
110  interpretation( 6, [number=1, seconds=0], [
111
112          function(I, [ 0 ]),
113
114          function(base, [ 0 ]),
115
116          function(c1, [ 0 ]),
117
118          function(c2, [ 1 ]),
119
120          function(c3, [ 2 ]),
121
122          function(inv(_), [ 0, 1, 2, 4, 3, 5 ]),
123
124          function(s(_), [ 1, 2, 3, 4, 5, 0 ]),
125
126          function(*(_,_), [
127                            0, 1, 2, 3, 4, 5,
128                            1, 0, 3, 2, 5, 4,
129                            2, 4, 0, 5, 1, 3,
130                            3, 5, 1, 4, 0, 2,
131                            4, 2, 5, 0, 3, 1,
132                            5, 3, 4, 1, 2, 0 ]),
133
134          function(p(_,_), [
135                            0, 0, 0, 0, 0, 0,
136                            1, 0, 1, 0, 1, 0,
137                            2, 0, 2, 0, 2, 0,
138                            3, 4, 0, 3, 4, 0,
139                            4, 3, 0, 4, 3, 0,
140                            5, 0, 5, 0, 5, 0 ])
141  ]).
142
143  ============================== end of model ========================
144
145  ============================== STATISTICS ==========================
146
147  For domain size 6.
148
149  Current CPU time: 0.00 seconds (total CPU time: 0.01 seconds).
150  Ground clauses: seen=272, kept=272.
151  Selections=39, assignments=159, propagations=431, current_models=1.
152  Rewrite_terms=4975, rewrite_bools=912, indexes=1097.
153  Rules_from_neg_clauses=68, cross_offs=571.
154
155  ============================== end of statistics ====================
156
157  User_CPU=0.01, System_CPU=0.00, Wall_clock=0.
158
159  Exiting with 1 model.
160
161  Process 8996 exit (max_models) Sat Jan  5 15:26:44 2019
162  The process finished Sat Jan  5 15:26:44 2019
```

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Appendix 25

The input for Mace4 for Question 3(c) with $n = 4$

```
1   formulas(assumptions).
2   x * (y * z) = (x * y) * z.
3   x * I = x.
4   x * inv(x) = I.
5   p(x, base) = x.
6   p(x, s(y)) = x * p(x, y).
7   end_of_list.
8
9   formulas(goals).
10  (p(z, s(s(s(base)))) = I) -> (x * y = y * x).
11  end_of_list.
```

The output from Mace4 for Question 3(c) with $n = 4$

```
1   ============================== Mace4 =================================
2   Mace4 (64) version 2009-11A, November 2009.
3   Process 9016 was started by robke on insanity.insaniac.net,
4   Sat Jan  5 15:26:48 2019
5   The command was "../../prover9/LADR-2009-11A/bin/mace4 -f c4.m4".
6   ============================== end of head ==========================
7
8   ============================== INPUT ================================
9
10  % Reading from file c4.m4
11
12
13  formulas(assumptions).
14  x * (y * z) = (x * y) * z.
15  x * I = x.
16  x * inv(x) = I.
17  p(x,base) = x.
18  p(x,s(y)) = x * p(x,y).
19  end_of_list.
20
21  formulas(goals).
22  p(z,s(s(s(base)))) = I -> x * y = y * x.
23  end_of_list.
24
25  ============================== end of input ========================
26
27  ============================== PROCESS NON-CLAUSAL FORMULAS =========
28
29  % Formulas that are not ordinary clauses:
30  1 p(z,s(s(s(base)))) = I -> x * y = y * x # label(non_clause) # label(goal).  [goal].
31
32  ============================== end of process non-clausal formulas ===
33
34  ============================== CLAUSES FOR SEARCH ===================
35
36  formulas(mace4_clauses).
37  x * (y * z) = (x * y) * z.
38  x * I = x.
39  x * inv(x) = I.
40  p(x,base) = x.
```

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```
41  p(x,s(y)) = x * p(x,y).
42  p(c1,s(s(s(base)))) = I.
43  c3 * c2 != c2 * c3.
44  end_of_list.
45
46  ============================ end of clauses for search =============
47
48  % There are no natural numbers in the input.
49
50  ============================ DOMAIN SIZE 2 ========================
51
52  ============================ STATISTICS ===========================
53
54  For domain size 2.
55
56  Current CPU time: 0.00 seconds (total CPU time: 0.00 seconds).
57  Ground clauses: seen=20, kept=20.
58  Selections=16, assignments=31, propagations=18, current_models=0.
59  Rewrite_terms=179, rewrite_bools=44, indexes=20.
60  Rules_from_neg_clauses=6, cross_offs=6.
61
62  ============================ end of statistics ====================
63
64  ============================ DOMAIN SIZE 3 ========================
65
66  ============================ STATISTICS ===========================
67
68  For domain size 3.
69
70  Current CPU time: 0.00 seconds (total CPU time: 0.00 seconds).
71  Ground clauses: seen=47, kept=47.
72  Selections=25, assignments=69, propagations=122, current_models=0.
73  Rewrite_terms=991, rewrite_bools=246, indexes=162.
74  Rules_from_neg_clauses=38, cross_offs=91.
75
76  ============================ end of statistics ====================
77
78  ============================ DOMAIN SIZE 4 ========================
79
80  ============================ STATISTICS ===========================
81
82  For domain size 4.
83
84  Current CPU time: 0.00 seconds (total CPU time: 0.01 seconds).
85  Ground clauses: seen=94, kept=94.
86  Selections=613, assignments=2417, propagations=995, current_models=0.
87  Rewrite_terms=17006, rewrite_bools=4222, indexes=1316.
88  Rules_from_neg_clauses=230, cross_offs=928.
89
90  ============================ end of statistics ====================
91
92  ============================ DOMAIN SIZE 5 ========================
93
94  ============================ STATISTICS ===========================
95
96  For domain size 5.
97
98  Current CPU time: 0.00 seconds (total CPU time: 0.01 seconds).
99  Ground clauses: seen=167, kept=167.
100 Selections=395, assignments=1836, propagations=2723, current_models=0.
101 Rewrite_terms=26259, rewrite_bools=5397, indexes=5436.
102 Rules_from_neg_clauses=548, cross_offs=3114.
```

```
103
104  ============================= end of statistics ====================
105
106  ============================= DOMAIN SIZE 6 ========================
107
108  ============================= MODEL ================================
109
110  interpretation( 6, [number=1, seconds=0], [
111
112          function(I, [ 0 ]),
113
114          function(base, [ 0 ]),
115
116          function(c1, [ 0 ]),
117
118          function(c2, [ 1 ]),
119
120          function(c3, [ 2 ]),
121
122          function(inv(_), [ 0, 1, 2, 4, 3, 5 ]),
123
124          function(s(_), [ 1, 2, 3, 4, 5, 0 ]),
125
126          function(*(_,_), [
127                            0, 1, 2, 3, 4, 5,
128                            1, 0, 3, 2, 5, 4,
129                            2, 4, 0, 5, 1, 3,
130                            3, 5, 1, 4, 0, 2,
131                            4, 2, 5, 0, 3, 1,
132                            5, 3, 4, 1, 2, 0 ]),
133
134          function(p(_,_), [
135                            0, 0, 0, 0, 0, 0,
136                            1, 0, 1, 0, 1, 0,
137                            2, 0, 2, 0, 2, 0,
138                            3, 4, 0, 3, 4, 0,
139                            4, 3, 0, 4, 3, 0,
140                            5, 0, 5, 0, 5, 0 ])
141  ]).
142
143  ============================= end of model ========================
144
145  ============================= STATISTICS ==========================
146
147  For domain size 6.
148
149  Current CPU time: 0.00 seconds (total CPU time: 0.01 seconds).
150  Ground clauses: seen=272, kept=272.
151  Selections=39, assignments=159, propagations=431, current_models=1.
152  Rewrite_terms=4995, rewrite_bools=920, indexes=1098.
153  Rules_from_neg_clauses=68, cross_offs=571.
154
155  ============================= end of statistics ====================
156
157  User_CPU=0.01, System_CPU=0.01, Wall_clock=0.
158
159  Exiting with 1 model.
160
161  Process 9016 exit (max_models) Sat Jan  5 15:26:48 2019
162  The process finished Sat Jan  5 15:26:48 2019
```

Appendix 27

Python script for generating the constraints file for Question 4

```python
1   #!/usr/bin/env python
2   from itertools import permutations
3
4   num_channels = 11
5   hops = 3
6   graph = {
7     "a": ["b", "d"],
8     "b": ["c", "d"],
9     "c": [],
10    "d": ["e", "f"],
11    "e": ["g", "h", "i"],
12    "f": ["i", "j"],
13    "g": ["h", "k"],
14    "h": ["i", "k"],
15    "i": ["j", "l"],
16    "j": ["l", "n"],
17    "k": ["l", "m"],
18    "l": ["n", "p"],
19    "m": ["l", "o", "p"],
20    "n": ["q"],
21    "o": ["p"],
22    "p": ["n", "q"],
23    "q": [],
24  }
25
26  #########################
27  ### Declare constants ###
28  #########################
29  for x in graph:
30    print("(declare-const chan_%s Int)" % x)
31  for (x, y) in permutations(graph, 2):
32    for i in range(1, hops + 1):
33      print("(declare-const hop_%d_%s_%s Bool)" % (i, x, y))
34
35  #########################
36  ### Begin requirements ###
37  #########################
38  print("(assert")
39  print("(and")
40
```

```
41  ####################################
42  ### 1-hop neighbors (from graph) ###
43  ####################################
44  for (x, y) in permutations(graph, 2):
45    if x in graph[y] or y in graph[x]:
46      print("hop_1_%s_%s" % (x, y))
47    else:
48      print("(not hop_1_%s_%s)" % (x, y))
49
50  ################################################
51  ### i-hop neighbors (from (i-1)-hop neighbors) ###
52  ################################################
53  for i in range(1, hops):
54    for (x, y) in permutations(graph, 2):
55      print("(=> hop_%d_%s_%s hop_%d_%s_%s)" % (i, x, y, i + 1, x, y))
56    for (x, y, z) in permutations(graph, 3):
57      print("(=> (and hop_%d_%s_%s hop_1_%s_%s) hop_%d_%s_%s)" % (i, x, y, y, z, i + 1, x, z))
58
59  #################################################
60  ### Distinct channels in (hops)-hop neighborhood ###
61  #################################################
62  for (x, y) in permutations(graph, 2):
63    print("(=> hop_%d_%s_%s (not (= chan_%s chan_%s)))" % (hops, x, y, x, y))
64
65  ###########################################
66  ### Existing channels: 0..(num_channels-1) ###
67  ###########################################
68  for x in graph:
69    print("(>= chan_%s 0)" % x)
70    print("(<= chan_%s %d)" % (x, num_channels - 1))
71
72  #######################
73  ### End requirements ###
74  #######################
75  print("))")
76  print("(check-sat)")
77  print("(get-model)")
```

Appendix 28

The generated requirements for Question 4(a)

```
 1  (declare-const chan_a Int)
 2  (declare-const chan_c Int)
 3  (declare-const chan_b Int)
 4  (declare-const chan_e Int)
 5  (declare-const chan_d Int)
 6  (declare-const chan_g Int)
 7  (declare-const chan_f Int)
 8  (declare-const chan_i Int)
 9  (declare-const chan_h Int)
10  (declare-const chan_k Int)
11  (declare-const chan_j Int)
12  (declare-const chan_m Int)
13  (declare-const chan_l Int)
14  (declare-const chan_o Int)
15  (declare-const chan_n Int)
16  (declare-const chan_q Int)
17  (declare-const chan_p Int)
18  (declare-const hop_1_a_c Bool)
19  (declare-const hop_2_a_c Bool)
20  (declare-const hop_1_a_b Bool)
21  (declare-const hop_2_a_b Bool)
22  (declare-const hop_1_a_e Bool)
23  (declare-const hop_2_a_e Bool)
24  (declare-const hop_1_a_d Bool)
25  (declare-const hop_2_a_d Bool)
26  (declare-const hop_1_a_g Bool)
27  (declare-const hop_2_a_g Bool)
28  (declare-const hop_1_a_f Bool)
29  (declare-const hop_2_a_f Bool)
30  (declare-const hop_1_a_i Bool)
31  (declare-const hop_2_a_i Bool)
32  (declare-const hop_1_a_h Bool)
33  (declare-const hop_2_a_h Bool)
34  (declare-const hop_1_a_k Bool)
35  (declare-const hop_2_a_k Bool)
36  (declare-const hop_1_a_j Bool)
37  (declare-const hop_2_a_j Bool)
38  (declare-const hop_1_a_m Bool)
39  (declare-const hop_2_a_m Bool)
40  (declare-const hop_1_a_l Bool)
```

```
41   (declare-const hop_2_a_l Bool)
42   (declare-const hop_1_a_o Bool)
43   (declare-const hop_2_a_o Bool)
44   (declare-const hop_1_a_n Bool)
45   (declare-const hop_2_a_n Bool)
46   (declare-const hop_1_a_q Bool)
47   (declare-const hop_2_a_q Bool)
48   (declare-const hop_1_a_p Bool)
49   (declare-const hop_2_a_p Bool)
50   (declare-const hop_1_c_a Bool)
51   (declare-const hop_2_c_a Bool)
52   (declare-const hop_1_c_b Bool)
53   (declare-const hop_2_c_b Bool)
54   (declare-const hop_1_c_e Bool)
55   (declare-const hop_2_c_e Bool)
56   (declare-const hop_1_c_d Bool)
57   (declare-const hop_2_c_d Bool)
58   (declare-const hop_1_c_g Bool)
59   (declare-const hop_2_c_g Bool)
60   (declare-const hop_1_c_f Bool)
61   (declare-const hop_2_c_f Bool)
62   (declare-const hop_1_c_i Bool)
63   (declare-const hop_2_c_i Bool)
64   (declare-const hop_1_c_h Bool)
65   (declare-const hop_2_c_h Bool)
66   (declare-const hop_1_c_k Bool)
67   (declare-const hop_2_c_k Bool)
68   (declare-const hop_1_c_j Bool)
69   (declare-const hop_2_c_j Bool)
70   (declare-const hop_1_c_m Bool)
71   (declare-const hop_2_c_m Bool)
72   (declare-const hop_1_c_l Bool)
73   (declare-const hop_2_c_l Bool)
74   (declare-const hop_1_c_o Bool)
75   (declare-const hop_2_c_o Bool)
76   (declare-const hop_1_c_n Bool)
77   (declare-const hop_2_c_n Bool)
78   (declare-const hop_1_c_q Bool)
79   (declare-const hop_2_c_q Bool)
80   (declare-const hop_1_c_p Bool)
81   (declare-const hop_2_c_p Bool)
82   (declare-const hop_1_b_a Bool)
83   (declare-const hop_2_b_a Bool)
84   (declare-const hop_1_b_c Bool)
85   (declare-const hop_2_b_c Bool)
86   (declare-const hop_1_b_e Bool)
87   (declare-const hop_2_b_e Bool)
88   (declare-const hop_1_b_d Bool)
89   (declare-const hop_2_b_d Bool)
90   (declare-const hop_1_b_g Bool)
91   (declare-const hop_2_b_g Bool)
92   (declare-const hop_1_b_f Bool)
93   (declare-const hop_2_b_f Bool)
94   (declare-const hop_1_b_i Bool)
95   (declare-const hop_2_b_i Bool)
96   (declare-const hop_1_b_h Bool)
97   (declare-const hop_2_b_h Bool)
98   (declare-const hop_1_b_k Bool)
99   (declare-const hop_2_b_k Bool)
100  (declare-const hop_1_b_j Bool)
101  (declare-const hop_2_b_j Bool)
102  (declare-const hop_1_b_m Bool)
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103   (declare-const hop_2_b_m Bool)
104   (declare-const hop_1_b_l Bool)
105   (declare-const hop_2_b_l Bool)
106   (declare-const hop_1_b_o Bool)
107   (declare-const hop_2_b_o Bool)
108   (declare-const hop_1_b_n Bool)
109   (declare-const hop_2_b_n Bool)
110   (declare-const hop_1_b_q Bool)
111   (declare-const hop_2_b_q Bool)
112   (declare-const hop_1_b_p Bool)
113   (declare-const hop_2_b_p Bool)
114   (declare-const hop_1_e_a Bool)
115   (declare-const hop_2_e_a Bool)
116   (declare-const hop_1_e_c Bool)
117   (declare-const hop_2_e_c Bool)
118   (declare-const hop_1_e_b Bool)
119   (declare-const hop_2_e_b Bool)
120   (declare-const hop_1_e_d Bool)
121   (declare-const hop_2_e_d Bool)
122   (declare-const hop_1_e_g Bool)
123   (declare-const hop_2_e_g Bool)
124   (declare-const hop_1_e_f Bool)
125   (declare-const hop_2_e_f Bool)
126   (declare-const hop_1_e_i Bool)
127   (declare-const hop_2_e_i Bool)
128   (declare-const hop_1_e_h Bool)
129   (declare-const hop_2_e_h Bool)
130   (declare-const hop_1_e_k Bool)
131   (declare-const hop_2_e_k Bool)
132   (declare-const hop_1_e_j Bool)
133   (declare-const hop_2_e_j Bool)
134   (declare-const hop_1_e_m Bool)
135   (declare-const hop_2_e_m Bool)
136   (declare-const hop_1_e_l Bool)
137   (declare-const hop_2_e_l Bool)
138   (declare-const hop_1_e_o Bool)
139   (declare-const hop_2_e_o Bool)
140   (declare-const hop_1_e_n Bool)
141   (declare-const hop_2_e_n Bool)
142   (declare-const hop_1_e_q Bool)
143   (declare-const hop_2_e_q Bool)
144   (declare-const hop_1_e_p Bool)
145   (declare-const hop_2_e_p Bool)
146   (declare-const hop_1_d_a Bool)
147   (declare-const hop_2_d_a Bool)
148   (declare-const hop_1_d_c Bool)
149   (declare-const hop_2_d_c Bool)
150   (declare-const hop_1_d_b Bool)
151   (declare-const hop_2_d_b Bool)
152   (declare-const hop_1_d_e Bool)
153   (declare-const hop_2_d_e Bool)
154   (declare-const hop_1_d_g Bool)
155   (declare-const hop_2_d_g Bool)
156   (declare-const hop_1_d_f Bool)
157   (declare-const hop_2_d_f Bool)
158   (declare-const hop_1_d_i Bool)
159   (declare-const hop_2_d_i Bool)
160   (declare-const hop_1_d_h Bool)
161   (declare-const hop_2_d_h Bool)
162   (declare-const hop_1_d_k Bool)
163   (declare-const hop_2_d_k Bool)
164   (declare-const hop_1_d_j Bool)
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165   (declare-const hop_2_d_j Bool)
166   (declare-const hop_1_d_m Bool)
167   (declare-const hop_2_d_m Bool)
168   (declare-const hop_1_d_l Bool)
169   (declare-const hop_2_d_l Bool)
170   (declare-const hop_1_d_o Bool)
171   (declare-const hop_2_d_o Bool)
172   (declare-const hop_1_d_n Bool)
173   (declare-const hop_2_d_n Bool)
174   (declare-const hop_1_d_q Bool)
175   (declare-const hop_2_d_q Bool)
176   (declare-const hop_1_d_p Bool)
177   (declare-const hop_2_d_p Bool)
178   (declare-const hop_1_g_a Bool)
179   (declare-const hop_2_g_a Bool)
180   (declare-const hop_1_g_c Bool)
181   (declare-const hop_2_g_c Bool)
182   (declare-const hop_1_g_b Bool)
183   (declare-const hop_2_g_b Bool)
184   (declare-const hop_1_g_e Bool)
185   (declare-const hop_2_g_e Bool)
186   (declare-const hop_1_g_d Bool)
187   (declare-const hop_2_g_d Bool)
188   (declare-const hop_1_g_f Bool)
189   (declare-const hop_2_g_f Bool)
190   (declare-const hop_1_g_i Bool)
191   (declare-const hop_2_g_i Bool)
192   (declare-const hop_1_g_h Bool)
193   (declare-const hop_2_g_h Bool)
194   (declare-const hop_1_g_k Bool)
195   (declare-const hop_2_g_k Bool)
196   (declare-const hop_1_g_j Bool)
197   (declare-const hop_2_g_j Bool)
198   (declare-const hop_1_g_m Bool)
199   (declare-const hop_2_g_m Bool)
200   (declare-const hop_1_g_l Bool)
201   (declare-const hop_2_g_l Bool)
202   (declare-const hop_1_g_o Bool)
203   (declare-const hop_2_g_o Bool)
204   (declare-const hop_1_g_n Bool)
205   (declare-const hop_2_g_n Bool)
206   (declare-const hop_1_g_q Bool)
207   (declare-const hop_2_g_q Bool)
208   (declare-const hop_1_g_p Bool)
209   (declare-const hop_2_g_p Bool)
210   (declare-const hop_1_f_a Bool)
211   (declare-const hop_2_f_a Bool)
212   (declare-const hop_1_f_c Bool)
213   (declare-const hop_2_f_c Bool)
214   (declare-const hop_1_f_b Bool)
215   (declare-const hop_2_f_b Bool)
216   (declare-const hop_1_f_e Bool)
217   (declare-const hop_2_f_e Bool)
218   (declare-const hop_1_f_d Bool)
219   (declare-const hop_2_f_d Bool)
220   (declare-const hop_1_f_g Bool)
221   (declare-const hop_2_f_g Bool)
222   (declare-const hop_1_f_i Bool)
223   (declare-const hop_2_f_i Bool)
224   (declare-const hop_1_f_h Bool)
225   (declare-const hop_2_f_h Bool)
226   (declare-const hop_1_f_k Bool)
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227   (declare-const hop_2_f_k Bool)
228   (declare-const hop_1_f_j Bool)
229   (declare-const hop_2_f_j Bool)
230   (declare-const hop_1_f_m Bool)
231   (declare-const hop_2_f_m Bool)
232   (declare-const hop_1_f_l Bool)
233   (declare-const hop_2_f_l Bool)
234   (declare-const hop_1_f_o Bool)
235   (declare-const hop_2_f_o Bool)
236   (declare-const hop_1_f_n Bool)
237   (declare-const hop_2_f_n Bool)
238   (declare-const hop_1_f_q Bool)
239   (declare-const hop_2_f_q Bool)
240   (declare-const hop_1_f_p Bool)
241   (declare-const hop_2_f_p Bool)
242   (declare-const hop_1_i_a Bool)
243   (declare-const hop_2_i_a Bool)
244   (declare-const hop_1_i_c Bool)
245   (declare-const hop_2_i_c Bool)
246   (declare-const hop_1_i_b Bool)
247   (declare-const hop_2_i_b Bool)
248   (declare-const hop_1_i_e Bool)
249   (declare-const hop_2_i_e Bool)
250   (declare-const hop_1_i_d Bool)
251   (declare-const hop_2_i_d Bool)
252   (declare-const hop_1_i_g Bool)
253   (declare-const hop_2_i_g Bool)
254   (declare-const hop_1_i_f Bool)
255   (declare-const hop_2_i_f Bool)
256   (declare-const hop_1_i_h Bool)
257   (declare-const hop_2_i_h Bool)
258   (declare-const hop_1_i_k Bool)
259   (declare-const hop_2_i_k Bool)
260   (declare-const hop_1_i_j Bool)
261   (declare-const hop_2_i_j Bool)
262   (declare-const hop_1_i_m Bool)
263   (declare-const hop_2_i_m Bool)
264   (declare-const hop_1_i_l Bool)
265   (declare-const hop_2_i_l Bool)
266   (declare-const hop_1_i_o Bool)
267   (declare-const hop_2_i_o Bool)
268   (declare-const hop_1_i_n Bool)
269   (declare-const hop_2_i_n Bool)
270   (declare-const hop_1_i_q Bool)
271   (declare-const hop_2_i_q Bool)
272   (declare-const hop_1_i_p Bool)
273   (declare-const hop_2_i_p Bool)
274   (declare-const hop_1_h_a Bool)
275   (declare-const hop_2_h_a Bool)
276   (declare-const hop_1_h_c Bool)
277   (declare-const hop_2_h_c Bool)
278   (declare-const hop_1_h_b Bool)
279   (declare-const hop_2_h_b Bool)
280   (declare-const hop_1_h_e Bool)
281   (declare-const hop_2_h_e Bool)
282   (declare-const hop_1_h_d Bool)
283   (declare-const hop_2_h_d Bool)
284   (declare-const hop_1_h_g Bool)
285   (declare-const hop_2_h_g Bool)
286   (declare-const hop_1_h_f Bool)
287   (declare-const hop_2_h_f Bool)
288   (declare-const hop_1_h_i Bool)
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289    (declare-const hop_2_h_i Bool)
290    (declare-const hop_1_h_k Bool)
291    (declare-const hop_2_h_k Bool)
292    (declare-const hop_1_h_j Bool)
293    (declare-const hop_2_h_j Bool)
294    (declare-const hop_1_h_m Bool)
295    (declare-const hop_2_h_m Bool)
296    (declare-const hop_1_h_l Bool)
297    (declare-const hop_2_h_l Bool)
298    (declare-const hop_1_h_o Bool)
299    (declare-const hop_2_h_o Bool)
300    (declare-const hop_1_h_n Bool)
301    (declare-const hop_2_h_n Bool)
302    (declare-const hop_1_h_q Bool)
303    (declare-const hop_2_h_q Bool)
304    (declare-const hop_1_h_p Bool)
305    (declare-const hop_2_h_p Bool)
306    (declare-const hop_1_k_a Bool)
307    (declare-const hop_2_k_a Bool)
308    (declare-const hop_1_k_c Bool)
309    (declare-const hop_2_k_c Bool)
310    (declare-const hop_1_k_b Bool)
311    (declare-const hop_2_k_b Bool)
312    (declare-const hop_1_k_e Bool)
313    (declare-const hop_2_k_e Bool)
314    (declare-const hop_1_k_d Bool)
315    (declare-const hop_2_k_d Bool)
316    (declare-const hop_1_k_g Bool)
317    (declare-const hop_2_k_g Bool)
318    (declare-const hop_1_k_f Bool)
319    (declare-const hop_2_k_f Bool)
320    (declare-const hop_1_k_i Bool)
321    (declare-const hop_2_k_i Bool)
322    (declare-const hop_1_k_h Bool)
323    (declare-const hop_2_k_h Bool)
324    (declare-const hop_1_k_j Bool)
325    (declare-const hop_2_k_j Bool)
326    (declare-const hop_1_k_m Bool)
327    (declare-const hop_2_k_m Bool)
328    (declare-const hop_1_k_l Bool)
329    (declare-const hop_2_k_l Bool)
330    (declare-const hop_1_k_o Bool)
331    (declare-const hop_2_k_o Bool)
332    (declare-const hop_1_k_n Bool)
333    (declare-const hop_2_k_n Bool)
334    (declare-const hop_1_k_q Bool)
335    (declare-const hop_2_k_q Bool)
336    (declare-const hop_1_k_p Bool)
337    (declare-const hop_2_k_p Bool)
338    (declare-const hop_1_j_a Bool)
339    (declare-const hop_2_j_a Bool)
340    (declare-const hop_1_j_c Bool)
341    (declare-const hop_2_j_c Bool)
342    (declare-const hop_1_j_b Bool)
343    (declare-const hop_2_j_b Bool)
344    (declare-const hop_1_j_e Bool)
345    (declare-const hop_2_j_e Bool)
346    (declare-const hop_1_j_d Bool)
347    (declare-const hop_2_j_d Bool)
348    (declare-const hop_1_j_g Bool)
349    (declare-const hop_2_j_g Bool)
350    (declare-const hop_1_j_f Bool)
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351  (declare-const hop_2_j_f Bool)
352  (declare-const hop_1_j_i Bool)
353  (declare-const hop_2_j_i Bool)
354  (declare-const hop_1_j_h Bool)
355  (declare-const hop_2_j_h Bool)
356  (declare-const hop_1_j_k Bool)
357  (declare-const hop_2_j_k Bool)
358  (declare-const hop_1_j_m Bool)
359  (declare-const hop_2_j_m Bool)
360  (declare-const hop_1_j_l Bool)
361  (declare-const hop_2_j_l Bool)
362  (declare-const hop_1_j_o Bool)
363  (declare-const hop_2_j_o Bool)
364  (declare-const hop_1_j_n Bool)
365  (declare-const hop_2_j_n Bool)
366  (declare-const hop_1_j_q Bool)
367  (declare-const hop_2_j_q Bool)
368  (declare-const hop_1_j_p Bool)
369  (declare-const hop_2_j_p Bool)
370  (declare-const hop_1_m_a Bool)
371  (declare-const hop_2_m_a Bool)
372  (declare-const hop_1_m_c Bool)
373  (declare-const hop_2_m_c Bool)
374  (declare-const hop_1_m_b Bool)
375  (declare-const hop_2_m_b Bool)
376  (declare-const hop_1_m_e Bool)
377  (declare-const hop_2_m_e Bool)
378  (declare-const hop_1_m_d Bool)
379  (declare-const hop_2_m_d Bool)
380  (declare-const hop_1_m_g Bool)
381  (declare-const hop_2_m_g Bool)
382  (declare-const hop_1_m_f Bool)
383  (declare-const hop_2_m_f Bool)
384  (declare-const hop_1_m_i Bool)
385  (declare-const hop_2_m_i Bool)
386  (declare-const hop_1_m_h Bool)
387  (declare-const hop_2_m_h Bool)
388  (declare-const hop_1_m_k Bool)
389  (declare-const hop_2_m_k Bool)
390  (declare-const hop_1_m_j Bool)
391  (declare-const hop_2_m_j Bool)
392  (declare-const hop_1_m_l Bool)
393  (declare-const hop_2_m_l Bool)
394  (declare-const hop_1_m_o Bool)
395  (declare-const hop_2_m_o Bool)
396  (declare-const hop_1_m_n Bool)
397  (declare-const hop_2_m_n Bool)
398  (declare-const hop_1_m_q Bool)
399  (declare-const hop_2_m_q Bool)
400  (declare-const hop_1_m_p Bool)
401  (declare-const hop_2_m_p Bool)
402  (declare-const hop_1_l_a Bool)
403  (declare-const hop_2_l_a Bool)
404  (declare-const hop_1_l_c Bool)
405  (declare-const hop_2_l_c Bool)
406  (declare-const hop_1_l_b Bool)
407  (declare-const hop_2_l_b Bool)
408  (declare-const hop_1_l_e Bool)
409  (declare-const hop_2_l_e Bool)
410  (declare-const hop_1_l_d Bool)
411  (declare-const hop_2_l_d Bool)
412  (declare-const hop_1_l_g Bool)
```

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413  (declare-const hop_2_l_g Bool)
414  (declare-const hop_1_l_f Bool)
415  (declare-const hop_2_l_f Bool)
416  (declare-const hop_1_l_i Bool)
417  (declare-const hop_2_l_i Bool)
418  (declare-const hop_1_l_h Bool)
419  (declare-const hop_2_l_h Bool)
420  (declare-const hop_1_l_k Bool)
421  (declare-const hop_2_l_k Bool)
422  (declare-const hop_1_l_j Bool)
423  (declare-const hop_2_l_j Bool)
424  (declare-const hop_1_l_m Bool)
425  (declare-const hop_2_l_m Bool)
426  (declare-const hop_1_l_o Bool)
427  (declare-const hop_2_l_o Bool)
428  (declare-const hop_1_l_n Bool)
429  (declare-const hop_2_l_n Bool)
430  (declare-const hop_1_l_q Bool)
431  (declare-const hop_2_l_q Bool)
432  (declare-const hop_1_l_p Bool)
433  (declare-const hop_2_l_p Bool)
434  (declare-const hop_1_o_a Bool)
435  (declare-const hop_2_o_a Bool)
436  (declare-const hop_1_o_c Bool)
437  (declare-const hop_2_o_c Bool)
438  (declare-const hop_1_o_b Bool)
439  (declare-const hop_2_o_b Bool)
440  (declare-const hop_1_o_e Bool)
441  (declare-const hop_2_o_e Bool)
442  (declare-const hop_1_o_d Bool)
443  (declare-const hop_2_o_d Bool)
444  (declare-const hop_1_o_g Bool)
445  (declare-const hop_2_o_g Bool)
446  (declare-const hop_1_o_f Bool)
447  (declare-const hop_2_o_f Bool)
448  (declare-const hop_1_o_i Bool)
449  (declare-const hop_2_o_i Bool)
450  (declare-const hop_1_o_h Bool)
451  (declare-const hop_2_o_h Bool)
452  (declare-const hop_1_o_k Bool)
453  (declare-const hop_2_o_k Bool)
454  (declare-const hop_1_o_j Bool)
455  (declare-const hop_2_o_j Bool)
456  (declare-const hop_1_o_m Bool)
457  (declare-const hop_2_o_m Bool)
458  (declare-const hop_1_o_l Bool)
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460  (declare-const hop_1_o_n Bool)
461  (declare-const hop_2_o_n Bool)
462  (declare-const hop_1_o_q Bool)
463  (declare-const hop_2_o_q Bool)
464  (declare-const hop_1_o_p Bool)
465  (declare-const hop_2_o_p Bool)
466  (declare-const hop_1_n_a Bool)
467  (declare-const hop_2_n_a Bool)
468  (declare-const hop_1_n_c Bool)
469  (declare-const hop_2_n_c Bool)
470  (declare-const hop_1_n_b Bool)
471  (declare-const hop_2_n_b Bool)
472  (declare-const hop_1_n_e Bool)
473  (declare-const hop_2_n_e Bool)
474  (declare-const hop_1_n_d Bool)
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475  (declare-const hop_2_n_d Bool)
476  (declare-const hop_1_n_g Bool)
477  (declare-const hop_2_n_g Bool)
478  (declare-const hop_1_n_f Bool)
479  (declare-const hop_2_n_f Bool)
480  (declare-const hop_1_n_i Bool)
481  (declare-const hop_2_n_i Bool)
482  (declare-const hop_1_n_h Bool)
483  (declare-const hop_2_n_h Bool)
484  (declare-const hop_1_n_k Bool)
485  (declare-const hop_2_n_k Bool)
486  (declare-const hop_1_n_j Bool)
487  (declare-const hop_2_n_j Bool)
488  (declare-const hop_1_n_m Bool)
489  (declare-const hop_2_n_m Bool)
490  (declare-const hop_1_n_l Bool)
491  (declare-const hop_2_n_l Bool)
492  (declare-const hop_1_n_o Bool)
493  (declare-const hop_2_n_o Bool)
494  (declare-const hop_1_n_q Bool)
495  (declare-const hop_2_n_q Bool)
496  (declare-const hop_1_n_p Bool)
497  (declare-const hop_2_n_p Bool)
498  (declare-const hop_1_q_a Bool)
499  (declare-const hop_2_q_a Bool)
500  (declare-const hop_1_q_c Bool)
501  (declare-const hop_2_q_c Bool)
502  (declare-const hop_1_q_b Bool)
503  (declare-const hop_2_q_b Bool)
504  (declare-const hop_1_q_e Bool)
505  (declare-const hop_2_q_e Bool)
506  (declare-const hop_1_q_d Bool)
507  (declare-const hop_2_q_d Bool)
508  (declare-const hop_1_q_g Bool)
509  (declare-const hop_2_q_g Bool)
510  (declare-const hop_1_q_f Bool)
511  (declare-const hop_2_q_f Bool)
512  (declare-const hop_1_q_i Bool)
513  (declare-const hop_2_q_i Bool)
514  (declare-const hop_1_q_h Bool)
515  (declare-const hop_2_q_h Bool)
516  (declare-const hop_1_q_k Bool)
517  (declare-const hop_2_q_k Bool)
518  (declare-const hop_1_q_j Bool)
519  (declare-const hop_2_q_j Bool)
520  (declare-const hop_1_q_m Bool)
521  (declare-const hop_2_q_m Bool)
522  (declare-const hop_1_q_l Bool)
523  (declare-const hop_2_q_l Bool)
524  (declare-const hop_1_q_o Bool)
525  (declare-const hop_2_q_o Bool)
526  (declare-const hop_1_q_n Bool)
527  (declare-const hop_2_q_n Bool)
528  (declare-const hop_1_q_p Bool)
529  (declare-const hop_2_q_p Bool)
530  (declare-const hop_1_p_a Bool)
531  (declare-const hop_2_p_a Bool)
532  (declare-const hop_1_p_c Bool)
533  (declare-const hop_2_p_c Bool)
534  (declare-const hop_1_p_b Bool)
535  (declare-const hop_2_p_b Bool)
536  (declare-const hop_1_p_e Bool)
```

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537  (declare-const hop_2_p_e Bool)
538  (declare-const hop_1_p_d Bool)
539  (declare-const hop_2_p_d Bool)
540  (declare-const hop_1_p_g Bool)
541  (declare-const hop_2_p_g Bool)
542  (declare-const hop_1_p_f Bool)
543  (declare-const hop_2_p_f Bool)
544  (declare-const hop_1_p_i Bool)
545  (declare-const hop_2_p_i Bool)
546  (declare-const hop_1_p_h Bool)
547  (declare-const hop_2_p_h Bool)
548  (declare-const hop_1_p_k Bool)
549  (declare-const hop_2_p_k Bool)
550  (declare-const hop_1_p_j Bool)
551  (declare-const hop_2_p_j Bool)
552  (declare-const hop_1_p_m Bool)
553  (declare-const hop_2_p_m Bool)
554  (declare-const hop_1_p_l Bool)
555  (declare-const hop_2_p_l Bool)
556  (declare-const hop_1_p_o Bool)
557  (declare-const hop_2_p_o Bool)
558  (declare-const hop_1_p_n Bool)
559  (declare-const hop_2_p_n Bool)
560  (declare-const hop_1_p_q Bool)
561  (declare-const hop_2_p_q Bool)
562  (assert
563  (and
564  (not hop_1_a_c)
565  hop_1_a_b
566  (not hop_1_a_e)
567  hop_1_a_d
568  (not hop_1_a_g)
569  (not hop_1_a_f)
570  (not hop_1_a_i)
571  (not hop_1_a_h)
572  (not hop_1_a_k)
573  (not hop_1_a_j)
574  (not hop_1_a_m)
575  (not hop_1_a_l)
576  (not hop_1_a_o)
577  (not hop_1_a_n)
578  (not hop_1_a_q)
579  (not hop_1_a_p)
580  (not hop_1_c_a)
581  hop_1_c_b
582  (not hop_1_c_e)
583  (not hop_1_c_d)
584  (not hop_1_c_g)
585  (not hop_1_c_f)
586  (not hop_1_c_i)
587  (not hop_1_c_h)
588  (not hop_1_c_k)
589  (not hop_1_c_j)
590  (not hop_1_c_m)
591  (not hop_1_c_l)
592  (not hop_1_c_o)
593  (not hop_1_c_n)
594  (not hop_1_c_q)
595  (not hop_1_c_p)
596  hop_1_b_a
597  hop_1_b_c
598  (not hop_1_b_e)
```

```
599   hop_1_b_d
600   (not hop_1_b_g)
601   (not hop_1_b_f)
602   (not hop_1_b_i)
603   (not hop_1_b_h)
604   (not hop_1_b_k)
605   (not hop_1_b_j)
606   (not hop_1_b_m)
607   (not hop_1_b_l)
608   (not hop_1_b_o)
609   (not hop_1_b_n)
610   (not hop_1_b_q)
611   (not hop_1_b_p)
612   (not hop_1_e_a)
613   (not hop_1_e_c)
614   (not hop_1_e_b)
615   hop_1_e_d
616   hop_1_e_g
617   (not hop_1_e_f)
618   hop_1_e_i
619   hop_1_e_h
620   (not hop_1_e_k)
621   (not hop_1_e_j)
622   (not hop_1_e_m)
623   (not hop_1_e_l)
624   (not hop_1_e_o)
625   (not hop_1_e_n)
626   (not hop_1_e_q)
627   (not hop_1_e_p)
628   hop_1_d_a
629   (not hop_1_d_c)
630   hop_1_d_b
631   hop_1_d_e
632   (not hop_1_d_g)
633   hop_1_d_f
634   (not hop_1_d_i)
635   (not hop_1_d_h)
636   (not hop_1_d_k)
637   (not hop_1_d_j)
638   (not hop_1_d_m)
639   (not hop_1_d_l)
640   (not hop_1_d_o)
641   (not hop_1_d_n)
642   (not hop_1_d_q)
643   (not hop_1_d_p)
644   (not hop_1_g_a)
645   (not hop_1_g_c)
646   (not hop_1_g_b)
647   hop_1_g_e
648   (not hop_1_g_d)
649   (not hop_1_g_f)
650   (not hop_1_g_i)
651   hop_1_g_h
652   hop_1_g_k
653   (not hop_1_g_j)
654   (not hop_1_g_m)
655   (not hop_1_g_l)
656   (not hop_1_g_o)
657   (not hop_1_g_n)
658   (not hop_1_g_q)
659   (not hop_1_g_p)
660   (not hop_1_f_a)
```

```
661    (not hop_1_f_c)
662    (not hop_1_f_b)
663    (not hop_1_f_e)
664    hop_1_f_d
665    (not hop_1_f_g)
666    hop_1_f_i
667    (not hop_1_f_h)
668    (not hop_1_f_k)
669    hop_1_f_j
670    (not hop_1_f_m)
671    (not hop_1_f_l)
672    (not hop_1_f_o)
673    (not hop_1_f_n)
674    (not hop_1_f_q)
675    (not hop_1_f_p)
676    (not hop_1_i_a)
677    (not hop_1_i_c)
678    (not hop_1_i_b)
679    hop_1_i_e
680    (not hop_1_i_d)
681    (not hop_1_i_g)
682    hop_1_i_f
683    hop_1_i_h
684    (not hop_1_i_k)
685    hop_1_i_j
686    (not hop_1_i_m)
687    hop_1_i_l
688    (not hop_1_i_o)
689    (not hop_1_i_n)
690    (not hop_1_i_q)
691    (not hop_1_i_p)
692    (not hop_1_h_a)
693    (not hop_1_h_c)
694    (not hop_1_h_b)
695    hop_1_h_e
696    (not hop_1_h_d)
697    hop_1_h_g
698    (not hop_1_h_f)
699    hop_1_h_i
700    hop_1_h_k
701    (not hop_1_h_j)
702    (not hop_1_h_m)
703    (not hop_1_h_l)
704    (not hop_1_h_o)
705    (not hop_1_h_n)
706    (not hop_1_h_q)
707    (not hop_1_h_p)
708    (not hop_1_k_a)
709    (not hop_1_k_c)
710    (not hop_1_k_b)
711    (not hop_1_k_e)
712    (not hop_1_k_d)
713    hop_1_k_g
714    (not hop_1_k_f)
715    (not hop_1_k_i)
716    hop_1_k_h
717    (not hop_1_k_j)
718    hop_1_k_m
719    hop_1_k_l
720    (not hop_1_k_o)
721    (not hop_1_k_n)
722    (not hop_1_k_q)
```

```
723  (not hop_1_k_p)
724  (not hop_1_j_a)
725  (not hop_1_j_c)
726  (not hop_1_j_b)
727  (not hop_1_j_e)
728  (not hop_1_j_d)
729  (not hop_1_j_g)
730  hop_1_j_f
731  hop_1_j_i
732  (not hop_1_j_h)
733  (not hop_1_j_k)
734  (not hop_1_j_m)
735  hop_1_j_l
736  (not hop_1_j_o)
737  hop_1_j_n
738  (not hop_1_j_q)
739  (not hop_1_j_p)
740  (not hop_1_m_a)
741  (not hop_1_m_c)
742  (not hop_1_m_b)
743  (not hop_1_m_e)
744  (not hop_1_m_d)
745  (not hop_1_m_g)
746  (not hop_1_m_f)
747  (not hop_1_m_i)
748  (not hop_1_m_h)
749  hop_1_m_k
750  (not hop_1_m_j)
751  hop_1_m_l
752  hop_1_m_o
753  (not hop_1_m_n)
754  (not hop_1_m_q)
755  hop_1_m_p
756  (not hop_1_l_a)
757  (not hop_1_l_c)
758  (not hop_1_l_b)
759  (not hop_1_l_e)
760  (not hop_1_l_d)
761  (not hop_1_l_g)
762  (not hop_1_l_f)
763  hop_1_l_i
764  (not hop_1_l_h)
765  hop_1_l_k
766  hop_1_l_j
767  hop_1_l_m
768  (not hop_1_l_o)
769  hop_1_l_n
770  (not hop_1_l_q)
771  hop_1_l_p
772  (not hop_1_o_a)
773  (not hop_1_o_c)
774  (not hop_1_o_b)
775  (not hop_1_o_e)
776  (not hop_1_o_d)
777  (not hop_1_o_g)
778  (not hop_1_o_f)
779  (not hop_1_o_i)
780  (not hop_1_o_h)
781  (not hop_1_o_k)
782  (not hop_1_o_j)
783  hop_1_o_m
784  (not hop_1_o_l)
```

```
785   (not hop_1_o_n)
786   (not hop_1_o_q)
787   hop_1_o_p
788   (not hop_1_n_a)
789   (not hop_1_n_c)
790   (not hop_1_n_b)
791   (not hop_1_n_e)
792   (not hop_1_n_d)
793   (not hop_1_n_g)
794   (not hop_1_n_f)
795   (not hop_1_n_i)
796   (not hop_1_n_h)
797   (not hop_1_n_k)
798   hop_1_n_j
799   (not hop_1_n_m)
800   hop_1_n_l
801   (not hop_1_n_o)
802   hop_1_n_q
803   hop_1_n_p
804   (not hop_1_q_a)
805   (not hop_1_q_c)
806   (not hop_1_q_b)
807   (not hop_1_q_e)
808   (not hop_1_q_d)
809   (not hop_1_q_g)
810   (not hop_1_q_f)
811   (not hop_1_q_i)
812   (not hop_1_q_h)
813   (not hop_1_q_k)
814   (not hop_1_q_j)
815   (not hop_1_q_m)
816   (not hop_1_q_l)
817   (not hop_1_q_o)
818   hop_1_q_n
819   hop_1_q_p
820   (not hop_1_p_a)
821   (not hop_1_p_c)
822   (not hop_1_p_b)
823   (not hop_1_p_e)
824   (not hop_1_p_d)
825   (not hop_1_p_g)
826   (not hop_1_p_f)
827   (not hop_1_p_i)
828   (not hop_1_p_h)
829   (not hop_1_p_k)
830   (not hop_1_p_j)
831   hop_1_p_m
832   hop_1_p_l
833   hop_1_p_o
834   hop_1_p_n
835   hop_1_p_q
836   (=> hop_1_a_c hop_2_a_c)
837   (=> hop_1_a_b hop_2_a_b)
838   (=> hop_1_a_e hop_2_a_e)
839   (=> hop_1_a_d hop_2_a_d)
840   (=> hop_1_a_g hop_2_a_g)
841   (=> hop_1_a_f hop_2_a_f)
842   (=> hop_1_a_i hop_2_a_i)
843   (=> hop_1_a_h hop_2_a_h)
844   (=> hop_1_a_k hop_2_a_k)
845   (=> hop_1_a_j hop_2_a_j)
846   (=> hop_1_a_m hop_2_a_m)
```

```
847  (=> hop_1_a_l hop_2_a_l)
848  (=> hop_1_a_o hop_2_a_o)
849  (=> hop_1_a_n hop_2_a_n)
850  (=> hop_1_a_q hop_2_a_q)
851  (=> hop_1_a_p hop_2_a_p)
852  (=> hop_1_c_a hop_2_c_a)
853  (=> hop_1_c_b hop_2_c_b)
854  (=> hop_1_c_e hop_2_c_e)
855  (=> hop_1_c_d hop_2_c_d)
856  (=> hop_1_c_g hop_2_c_g)
857  (=> hop_1_c_f hop_2_c_f)
858  (=> hop_1_c_i hop_2_c_i)
859  (=> hop_1_c_h hop_2_c_h)
860  (=> hop_1_c_k hop_2_c_k)
861  (=> hop_1_c_j hop_2_c_j)
862  (=> hop_1_c_m hop_2_c_m)
863  (=> hop_1_c_l hop_2_c_l)
864  (=> hop_1_c_o hop_2_c_o)
865  (=> hop_1_c_n hop_2_c_n)
866  (=> hop_1_c_q hop_2_c_q)
867  (=> hop_1_c_p hop_2_c_p)
868  (=> hop_1_b_a hop_2_b_a)
869  (=> hop_1_b_c hop_2_b_c)
870  (=> hop_1_b_e hop_2_b_e)
871  (=> hop_1_b_d hop_2_b_d)
872  (=> hop_1_b_g hop_2_b_g)
873  (=> hop_1_b_f hop_2_b_f)
874  (=> hop_1_b_i hop_2_b_i)
875  (=> hop_1_b_h hop_2_b_h)
876  (=> hop_1_b_k hop_2_b_k)
877  (=> hop_1_b_j hop_2_b_j)
878  (=> hop_1_b_m hop_2_b_m)
879  (=> hop_1_b_l hop_2_b_l)
880  (=> hop_1_b_o hop_2_b_o)
881  (=> hop_1_b_n hop_2_b_n)
882  (=> hop_1_b_q hop_2_b_q)
883  (=> hop_1_b_p hop_2_b_p)
884  (=> hop_1_e_a hop_2_e_a)
885  (=> hop_1_e_c hop_2_e_c)
886  (=> hop_1_e_b hop_2_e_b)
887  (=> hop_1_e_d hop_2_e_d)
888  (=> hop_1_e_g hop_2_e_g)
889  (=> hop_1_e_f hop_2_e_f)
890  (=> hop_1_e_i hop_2_e_i)
891  (=> hop_1_e_h hop_2_e_h)
892  (=> hop_1_e_k hop_2_e_k)
893  (=> hop_1_e_j hop_2_e_j)
894  (=> hop_1_e_m hop_2_e_m)
895  (=> hop_1_e_l hop_2_e_l)
896  (=> hop_1_e_o hop_2_e_o)
897  (=> hop_1_e_n hop_2_e_n)
898  (=> hop_1_e_q hop_2_e_q)
899  (=> hop_1_e_p hop_2_e_p)
900  (=> hop_1_d_a hop_2_d_a)
901  (=> hop_1_d_c hop_2_d_c)
902  (=> hop_1_d_b hop_2_d_b)
903  (=> hop_1_d_e hop_2_d_e)
904  (=> hop_1_d_g hop_2_d_g)
905  (=> hop_1_d_f hop_2_d_f)
906  (=> hop_1_d_i hop_2_d_i)
907  (=> hop_1_d_h hop_2_d_h)
908  (=> hop_1_d_k hop_2_d_k)
```

```
909   (=> hop_1_d_j hop_2_d_j)
910   (=> hop_1_d_m hop_2_d_m)
911   (=> hop_1_d_l hop_2_d_l)
912   (=> hop_1_d_o hop_2_d_o)
913   (=> hop_1_d_n hop_2_d_n)
914   (=> hop_1_d_q hop_2_d_q)
915   (=> hop_1_d_p hop_2_d_p)
916   (=> hop_1_g_a hop_2_g_a)
917   (=> hop_1_g_c hop_2_g_c)
918   (=> hop_1_g_b hop_2_g_b)
919   (=> hop_1_g_e hop_2_g_e)
920   (=> hop_1_g_d hop_2_g_d)
921   (=> hop_1_g_f hop_2_g_f)
922   (=> hop_1_g_i hop_2_g_i)
923   (=> hop_1_g_h hop_2_g_h)
924   (=> hop_1_g_k hop_2_g_k)
925   (=> hop_1_g_j hop_2_g_j)
926   (=> hop_1_g_m hop_2_g_m)
927   (=> hop_1_g_l hop_2_g_l)
928   (=> hop_1_g_o hop_2_g_o)
929   (=> hop_1_g_n hop_2_g_n)
930   (=> hop_1_g_q hop_2_g_q)
931   (=> hop_1_g_p hop_2_g_p)
932   (=> hop_1_f_a hop_2_f_a)
933   (=> hop_1_f_c hop_2_f_c)
934   (=> hop_1_f_b hop_2_f_b)
935   (=> hop_1_f_e hop_2_f_e)
936   (=> hop_1_f_d hop_2_f_d)
937   (=> hop_1_f_g hop_2_f_g)
938   (=> hop_1_f_i hop_2_f_i)
939   (=> hop_1_f_h hop_2_f_h)
940   (=> hop_1_f_k hop_2_f_k)
941   (=> hop_1_f_j hop_2_f_j)
942   (=> hop_1_f_m hop_2_f_m)
943   (=> hop_1_f_l hop_2_f_l)
944   (=> hop_1_f_o hop_2_f_o)
945   (=> hop_1_f_n hop_2_f_n)
946   (=> hop_1_f_q hop_2_f_q)
947   (=> hop_1_f_p hop_2_f_p)
948   (=> hop_1_i_a hop_2_i_a)
949   (=> hop_1_i_c hop_2_i_c)
950   (=> hop_1_i_b hop_2_i_b)
951   (=> hop_1_i_e hop_2_i_e)
952   (=> hop_1_i_d hop_2_i_d)
953   (=> hop_1_i_g hop_2_i_g)
954   (=> hop_1_i_f hop_2_i_f)
955   (=> hop_1_i_h hop_2_i_h)
956   (=> hop_1_i_k hop_2_i_k)
957   (=> hop_1_i_j hop_2_i_j)
958   (=> hop_1_i_m hop_2_i_m)
959   (=> hop_1_i_l hop_2_i_l)
960   (=> hop_1_i_o hop_2_i_o)
961   (=> hop_1_i_n hop_2_i_n)
962   (=> hop_1_i_q hop_2_i_q)
963   (=> hop_1_i_p hop_2_i_p)
964   (=> hop_1_h_a hop_2_h_a)
965   (=> hop_1_h_c hop_2_h_c)
966   (=> hop_1_h_b hop_2_h_b)
967   (=> hop_1_h_e hop_2_h_e)
968   (=> hop_1_h_d hop_2_h_d)
969   (=> hop_1_h_g hop_2_h_g)
970   (=> hop_1_h_f hop_2_h_f)
```

779

```
971   (=> hop_1_h_i hop_2_h_i)
972   (=> hop_1_h_k hop_2_h_k)
973   (=> hop_1_h_j hop_2_h_j)
974   (=> hop_1_h_m hop_2_h_m)
975   (=> hop_1_h_l hop_2_h_l)
976   (=> hop_1_h_o hop_2_h_o)
977   (=> hop_1_h_n hop_2_h_n)
978   (=> hop_1_h_q hop_2_h_q)
979   (=> hop_1_h_p hop_2_h_p)
980   (=> hop_1_k_a hop_2_k_a)
981   (=> hop_1_k_c hop_2_k_c)
982   (=> hop_1_k_b hop_2_k_b)
983   (=> hop_1_k_e hop_2_k_e)
984   (=> hop_1_k_d hop_2_k_d)
985   (=> hop_1_k_g hop_2_k_g)
986   (=> hop_1_k_f hop_2_k_f)
987   (=> hop_1_k_i hop_2_k_i)
988   (=> hop_1_k_h hop_2_k_h)
989   (=> hop_1_k_j hop_2_k_j)
990   (=> hop_1_k_m hop_2_k_m)
991   (=> hop_1_k_l hop_2_k_l)
992   (=> hop_1_k_o hop_2_k_o)
993   (=> hop_1_k_n hop_2_k_n)
994   (=> hop_1_k_q hop_2_k_q)
995   (=> hop_1_k_p hop_2_k_p)
996   (=> hop_1_j_a hop_2_j_a)
997   (=> hop_1_j_c hop_2_j_c)
998   (=> hop_1_j_b hop_2_j_b)
999   (=> hop_1_j_e hop_2_j_e)
1000  (=> hop_1_j_d hop_2_j_d)
1001  (=> hop_1_j_g hop_2_j_g)
1002  (=> hop_1_j_f hop_2_j_f)
1003  (=> hop_1_j_i hop_2_j_i)
1004  (=> hop_1_j_h hop_2_j_h)
1005  (=> hop_1_j_k hop_2_j_k)
1006  (=> hop_1_j_m hop_2_j_m)
1007  (=> hop_1_j_l hop_2_j_l)
1008  (=> hop_1_j_o hop_2_j_o)
1009  (=> hop_1_j_n hop_2_j_n)
1010  (=> hop_1_j_q hop_2_j_q)
1011  (=> hop_1_j_p hop_2_j_p)
1012  (=> hop_1_m_a hop_2_m_a)
1013  (=> hop_1_m_c hop_2_m_c)
1014  (=> hop_1_m_b hop_2_m_b)
1015  (=> hop_1_m_e hop_2_m_e)
1016  (=> hop_1_m_d hop_2_m_d)
1017  (=> hop_1_m_g hop_2_m_g)
1018  (=> hop_1_m_f hop_2_m_f)
1019  (=> hop_1_m_i hop_2_m_i)
1020  (=> hop_1_m_h hop_2_m_h)
1021  (=> hop_1_m_k hop_2_m_k)
1022  (=> hop_1_m_j hop_2_m_j)
1023  (=> hop_1_m_l hop_2_m_l)
1024  (=> hop_1_m_o hop_2_m_o)
1025  (=> hop_1_m_n hop_2_m_n)
1026  (=> hop_1_m_q hop_2_m_q)
1027  (=> hop_1_m_p hop_2_m_p)
1028  (=> hop_1_l_a hop_2_l_a)
1029  (=> hop_1_l_c hop_2_l_c)
1030  (=> hop_1_l_b hop_2_l_b)
1031  (=> hop_1_l_e hop_2_l_e)
1032  (=> hop_1_l_d hop_2_l_d)
```

```
1033   (=> hop_1_l_g hop_2_l_g)
1034   (=> hop_1_l_f hop_2_l_f)
1035   (=> hop_1_l_i hop_2_l_i)
1036   (=> hop_1_l_h hop_2_l_h)
1037   (=> hop_1_l_k hop_2_l_k)
1038   (=> hop_1_l_j hop_2_l_j)
1039   (=> hop_1_l_m hop_2_l_m)
1040   (=> hop_1_l_o hop_2_l_o)
1041   (=> hop_1_l_n hop_2_l_n)
1042   (=> hop_1_l_q hop_2_l_q)
1043   (=> hop_1_l_p hop_2_l_p)
1044   (=> hop_1_o_a hop_2_o_a)
1045   (=> hop_1_o_c hop_2_o_c)
1046   (=> hop_1_o_b hop_2_o_b)
1047   (=> hop_1_o_e hop_2_o_e)
1048   (=> hop_1_o_d hop_2_o_d)
1049   (=> hop_1_o_g hop_2_o_g)
1050   (=> hop_1_o_f hop_2_o_f)
1051   (=> hop_1_o_i hop_2_o_i)
1052   (=> hop_1_o_h hop_2_o_h)
1053   (=> hop_1_o_k hop_2_o_k)
1054   (=> hop_1_o_j hop_2_o_j)
1055   (=> hop_1_o_m hop_2_o_m)
1056   (=> hop_1_o_l hop_2_o_l)
1057   (=> hop_1_o_n hop_2_o_n)
1058   (=> hop_1_o_q hop_2_o_q)
1059   (=> hop_1_o_p hop_2_o_p)
1060   (=> hop_1_n_a hop_2_n_a)
1061   (=> hop_1_n_c hop_2_n_c)
1062   (=> hop_1_n_b hop_2_n_b)
1063   (=> hop_1_n_e hop_2_n_e)
1064   (=> hop_1_n_d hop_2_n_d)
1065   (=> hop_1_n_g hop_2_n_g)
1066   (=> hop_1_n_f hop_2_n_f)
1067   (=> hop_1_n_i hop_2_n_i)
1068   (=> hop_1_n_h hop_2_n_h)
1069   (=> hop_1_n_k hop_2_n_k)
1070   (=> hop_1_n_j hop_2_n_j)
1071   (=> hop_1_n_m hop_2_n_m)
1072   (=> hop_1_n_l hop_2_n_l)
1073   (=> hop_1_n_o hop_2_n_o)
1074   (=> hop_1_n_q hop_2_n_q)
1075   (=> hop_1_n_p hop_2_n_p)
1076   (=> hop_1_q_a hop_2_q_a)
1077   (=> hop_1_q_c hop_2_q_c)
1078   (=> hop_1_q_b hop_2_q_b)
1079   (=> hop_1_q_e hop_2_q_e)
1080   (=> hop_1_q_d hop_2_q_d)
1081   (=> hop_1_q_g hop_2_q_g)
1082   (=> hop_1_q_f hop_2_q_f)
1083   (=> hop_1_q_i hop_2_q_i)
1084   (=> hop_1_q_h hop_2_q_h)
1085   (=> hop_1_q_k hop_2_q_k)
1086   (=> hop_1_q_j hop_2_q_j)
1087   (=> hop_1_q_m hop_2_q_m)
1088   (=> hop_1_q_l hop_2_q_l)
1089   (=> hop_1_q_o hop_2_q_o)
1090   (=> hop_1_q_n hop_2_q_n)
1091   (=> hop_1_q_p hop_2_q_p)
1092   (=> hop_1_p_a hop_2_p_a)
1093   (=> hop_1_p_c hop_2_p_c)
1094   (=> hop_1_p_b hop_2_p_b)
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1095  (=> hop_1_p_e hop_2_p_e)
1096  (=> hop_1_p_d hop_2_p_d)
1097  (=> hop_1_p_g hop_2_p_g)
1098  (=> hop_1_p_f hop_2_p_f)
1099  (=> hop_1_p_i hop_2_p_i)
1100  (=> hop_1_p_h hop_2_p_h)
1101  (=> hop_1_p_k hop_2_p_k)
1102  (=> hop_1_p_j hop_2_p_j)
1103  (=> hop_1_p_m hop_2_p_m)
1104  (=> hop_1_p_l hop_2_p_l)
1105  (=> hop_1_p_o hop_2_p_o)
1106  (=> hop_1_p_n hop_2_p_n)
1107  (=> hop_1_p_q hop_2_p_q)
1108  (=> (and hop_1_a_c hop_1_c_b) hop_2_a_b)
1109  (=> (and hop_1_a_c hop_1_c_e) hop_2_a_e)
1110  (=> (and hop_1_a_c hop_1_c_d) hop_2_a_d)
1111  (=> (and hop_1_a_c hop_1_c_g) hop_2_a_g)
1112  (=> (and hop_1_a_c hop_1_c_f) hop_2_a_f)
1113  (=> (and hop_1_a_c hop_1_c_i) hop_2_a_i)
1114  (=> (and hop_1_a_c hop_1_c_h) hop_2_a_h)
1115  (=> (and hop_1_a_c hop_1_c_k) hop_2_a_k)
1116  (=> (and hop_1_a_c hop_1_c_j) hop_2_a_j)
1117  (=> (and hop_1_a_c hop_1_c_m) hop_2_a_m)
1118  (=> (and hop_1_a_c hop_1_c_l) hop_2_a_l)
1119  (=> (and hop_1_a_c hop_1_c_o) hop_2_a_o)
1120  (=> (and hop_1_a_c hop_1_c_n) hop_2_a_n)
1121  (=> (and hop_1_a_c hop_1_c_q) hop_2_a_q)
1122  (=> (and hop_1_a_c hop_1_c_p) hop_2_a_p)
1123  (=> (and hop_1_a_b hop_1_b_c) hop_2_a_c)
1124  (=> (and hop_1_a_b hop_1_b_e) hop_2_a_e)
1125  (=> (and hop_1_a_b hop_1_b_d) hop_2_a_d)
1126  (=> (and hop_1_a_b hop_1_b_g) hop_2_a_g)
1127  (=> (and hop_1_a_b hop_1_b_f) hop_2_a_f)
1128  (=> (and hop_1_a_b hop_1_b_i) hop_2_a_i)
1129  (=> (and hop_1_a_b hop_1_b_h) hop_2_a_h)
1130  (=> (and hop_1_a_b hop_1_b_k) hop_2_a_k)
1131  (=> (and hop_1_a_b hop_1_b_j) hop_2_a_j)
1132  (=> (and hop_1_a_b hop_1_b_m) hop_2_a_m)
1133  (=> (and hop_1_a_b hop_1_b_l) hop_2_a_l)
1134  (=> (and hop_1_a_b hop_1_b_o) hop_2_a_o)
1135  (=> (and hop_1_a_b hop_1_b_n) hop_2_a_n)
1136  (=> (and hop_1_a_b hop_1_b_q) hop_2_a_q)
1137  (=> (and hop_1_a_b hop_1_b_p) hop_2_a_p)
1138  (=> (and hop_1_a_e hop_1_e_c) hop_2_a_c)
1139  (=> (and hop_1_a_e hop_1_e_b) hop_2_a_b)
1140  (=> (and hop_1_a_e hop_1_e_d) hop_2_a_d)
1141  (=> (and hop_1_a_e hop_1_e_g) hop_2_a_g)
1142  (=> (and hop_1_a_e hop_1_e_f) hop_2_a_f)
1143  (=> (and hop_1_a_e hop_1_e_i) hop_2_a_i)
1144  (=> (and hop_1_a_e hop_1_e_h) hop_2_a_h)
1145  (=> (and hop_1_a_e hop_1_e_k) hop_2_a_k)
1146  (=> (and hop_1_a_e hop_1_e_j) hop_2_a_j)
1147  (=> (and hop_1_a_e hop_1_e_m) hop_2_a_m)
1148  (=> (and hop_1_a_e hop_1_e_l) hop_2_a_l)
1149  (=> (and hop_1_a_e hop_1_e_o) hop_2_a_o)
1150  (=> (and hop_1_a_e hop_1_e_n) hop_2_a_n)
1151  (=> (and hop_1_a_e hop_1_e_q) hop_2_a_q)
1152  (=> (and hop_1_a_e hop_1_e_p) hop_2_a_p)
1153  (=> (and hop_1_a_d hop_1_d_c) hop_2_a_c)
1154  (=> (and hop_1_a_d hop_1_d_b) hop_2_a_b)
1155  (=> (and hop_1_a_d hop_1_d_e) hop_2_a_e)
1156  (=> (and hop_1_a_d hop_1_d_g) hop_2_a_g)
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1157   (=> (and hop_1_a_d hop_1_d_f) hop_2_a_f)
1158   (=> (and hop_1_a_d hop_1_d_i) hop_2_a_i)
1159   (=> (and hop_1_a_d hop_1_d_h) hop_2_a_h)
1160   (=> (and hop_1_a_d hop_1_d_k) hop_2_a_k)
1161   (=> (and hop_1_a_d hop_1_d_j) hop_2_a_j)
1162   (=> (and hop_1_a_d hop_1_d_m) hop_2_a_m)
1163   (=> (and hop_1_a_d hop_1_d_l) hop_2_a_l)
1164   (=> (and hop_1_a_d hop_1_d_o) hop_2_a_o)
1165   (=> (and hop_1_a_d hop_1_d_n) hop_2_a_n)
1166   (=> (and hop_1_a_d hop_1_d_q) hop_2_a_q)
1167   (=> (and hop_1_a_d hop_1_d_p) hop_2_a_p)
1168   (=> (and hop_1_a_g hop_1_g_c) hop_2_a_c)
1169   (=> (and hop_1_a_g hop_1_g_b) hop_2_a_b)
1170   (=> (and hop_1_a_g hop_1_g_e) hop_2_a_e)
1171   (=> (and hop_1_a_g hop_1_g_d) hop_2_a_d)
1172   (=> (and hop_1_a_g hop_1_g_f) hop_2_a_f)
1173   (=> (and hop_1_a_g hop_1_g_i) hop_2_a_i)
1174   (=> (and hop_1_a_g hop_1_g_h) hop_2_a_h)
1175   (=> (and hop_1_a_g hop_1_g_k) hop_2_a_k)
1176   (=> (and hop_1_a_g hop_1_g_j) hop_2_a_j)
1177   (=> (and hop_1_a_g hop_1_g_m) hop_2_a_m)
1178   (=> (and hop_1_a_g hop_1_g_l) hop_2_a_l)
1179   (=> (and hop_1_a_g hop_1_g_o) hop_2_a_o)
1180   (=> (and hop_1_a_g hop_1_g_n) hop_2_a_n)
1181   (=> (and hop_1_a_g hop_1_g_q) hop_2_a_q)
1182   (=> (and hop_1_a_g hop_1_g_p) hop_2_a_p)
1183   (=> (and hop_1_a_f hop_1_f_c) hop_2_a_c)
1184   (=> (and hop_1_a_f hop_1_f_b) hop_2_a_b)
1185   (=> (and hop_1_a_f hop_1_f_e) hop_2_a_e)
1186   (=> (and hop_1_a_f hop_1_f_d) hop_2_a_d)
1187   (=> (and hop_1_a_f hop_1_f_g) hop_2_a_g)
1188   (=> (and hop_1_a_f hop_1_f_i) hop_2_a_i)
1189   (=> (and hop_1_a_f hop_1_f_h) hop_2_a_h)
1190   (=> (and hop_1_a_f hop_1_f_k) hop_2_a_k)
1191   (=> (and hop_1_a_f hop_1_f_j) hop_2_a_j)
1192   (=> (and hop_1_a_f hop_1_f_m) hop_2_a_m)
1193   (=> (and hop_1_a_f hop_1_f_l) hop_2_a_l)
1194   (=> (and hop_1_a_f hop_1_f_o) hop_2_a_o)
1195   (=> (and hop_1_a_f hop_1_f_n) hop_2_a_n)
1196   (=> (and hop_1_a_f hop_1_f_q) hop_2_a_q)
1197   (=> (and hop_1_a_f hop_1_f_p) hop_2_a_p)
1198   (=> (and hop_1_a_i hop_1_i_c) hop_2_a_c)
1199   (=> (and hop_1_a_i hop_1_i_b) hop_2_a_b)
1200   (=> (and hop_1_a_i hop_1_i_e) hop_2_a_e)
1201   (=> (and hop_1_a_i hop_1_i_d) hop_2_a_d)
1202   (=> (and hop_1_a_i hop_1_i_g) hop_2_a_g)
1203   (=> (and hop_1_a_i hop_1_i_f) hop_2_a_f)
1204   (=> (and hop_1_a_i hop_1_i_h) hop_2_a_h)
1205   (=> (and hop_1_a_i hop_1_i_k) hop_2_a_k)
1206   (=> (and hop_1_a_i hop_1_i_j) hop_2_a_j)
1207   (=> (and hop_1_a_i hop_1_i_m) hop_2_a_m)
1208   (=> (and hop_1_a_i hop_1_i_l) hop_2_a_l)
1209   (=> (and hop_1_a_i hop_1_i_o) hop_2_a_o)
1210   (=> (and hop_1_a_i hop_1_i_n) hop_2_a_n)
1211   (=> (and hop_1_a_i hop_1_i_q) hop_2_a_q)
1212   (=> (and hop_1_a_i hop_1_i_p) hop_2_a_p)
1213   (=> (and hop_1_a_h hop_1_h_c) hop_2_a_c)
1214   (=> (and hop_1_a_h hop_1_h_b) hop_2_a_b)
1215   (=> (and hop_1_a_h hop_1_h_e) hop_2_a_e)
1216   (=> (and hop_1_a_h hop_1_h_d) hop_2_a_d)
1217   (=> (and hop_1_a_h hop_1_h_g) hop_2_a_g)
1218   (=> (and hop_1_a_h hop_1_h_f) hop_2_a_f)
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1219  (=> (and hop_1_a_h hop_1_h_i) hop_2_a_i)
1220  (=> (and hop_1_a_h hop_1_h_k) hop_2_a_k)
1221  (=> (and hop_1_a_h hop_1_h_j) hop_2_a_j)
1222  (=> (and hop_1_a_h hop_1_h_m) hop_2_a_m)
1223  (=> (and hop_1_a_h hop_1_h_l) hop_2_a_l)
1224  (=> (and hop_1_a_h hop_1_h_o) hop_2_a_o)
1225  (=> (and hop_1_a_h hop_1_h_n) hop_2_a_n)
1226  (=> (and hop_1_a_h hop_1_h_q) hop_2_a_q)
1227  (=> (and hop_1_a_h hop_1_h_p) hop_2_a_p)
1228  (=> (and hop_1_a_k hop_1_k_c) hop_2_a_c)
1229  (=> (and hop_1_a_k hop_1_k_b) hop_2_a_b)
1230  (=> (and hop_1_a_k hop_1_k_e) hop_2_a_e)
1231  (=> (and hop_1_a_k hop_1_k_d) hop_2_a_d)
1232  (=> (and hop_1_a_k hop_1_k_g) hop_2_a_g)
1233  (=> (and hop_1_a_k hop_1_k_f) hop_2_a_f)
1234  (=> (and hop_1_a_k hop_1_k_i) hop_2_a_i)
1235  (=> (and hop_1_a_k hop_1_k_h) hop_2_a_h)
1236  (=> (and hop_1_a_k hop_1_k_j) hop_2_a_j)
1237  (=> (and hop_1_a_k hop_1_k_m) hop_2_a_m)
1238  (=> (and hop_1_a_k hop_1_k_l) hop_2_a_l)
1239  (=> (and hop_1_a_k hop_1_k_o) hop_2_a_o)
1240  (=> (and hop_1_a_k hop_1_k_n) hop_2_a_n)
1241  (=> (and hop_1_a_k hop_1_k_q) hop_2_a_q)
1242  (=> (and hop_1_a_k hop_1_k_p) hop_2_a_p)
1243  (=> (and hop_1_a_j hop_1_j_c) hop_2_a_c)
1244  (=> (and hop_1_a_j hop_1_j_b) hop_2_a_b)
1245  (=> (and hop_1_a_j hop_1_j_e) hop_2_a_e)
1246  (=> (and hop_1_a_j hop_1_j_d) hop_2_a_d)
1247  (=> (and hop_1_a_j hop_1_j_g) hop_2_a_g)
1248  (=> (and hop_1_a_j hop_1_j_f) hop_2_a_f)
1249  (=> (and hop_1_a_j hop_1_j_i) hop_2_a_i)
1250  (=> (and hop_1_a_j hop_1_j_h) hop_2_a_h)
1251  (=> (and hop_1_a_j hop_1_j_k) hop_2_a_k)
1252  (=> (and hop_1_a_j hop_1_j_m) hop_2_a_m)
1253  (=> (and hop_1_a_j hop_1_j_l) hop_2_a_l)
1254  (=> (and hop_1_a_j hop_1_j_o) hop_2_a_o)
1255  (=> (and hop_1_a_j hop_1_j_n) hop_2_a_n)
1256  (=> (and hop_1_a_j hop_1_j_q) hop_2_a_q)
1257  (=> (and hop_1_a_j hop_1_j_p) hop_2_a_p)
1258  (=> (and hop_1_a_m hop_1_m_c) hop_2_a_c)
1259  (=> (and hop_1_a_m hop_1_m_b) hop_2_a_b)
1260  (=> (and hop_1_a_m hop_1_m_e) hop_2_a_e)
1261  (=> (and hop_1_a_m hop_1_m_d) hop_2_a_d)
1262  (=> (and hop_1_a_m hop_1_m_g) hop_2_a_g)
1263  (=> (and hop_1_a_m hop_1_m_f) hop_2_a_f)
1264  (=> (and hop_1_a_m hop_1_m_i) hop_2_a_i)
1265  (=> (and hop_1_a_m hop_1_m_h) hop_2_a_h)
1266  (=> (and hop_1_a_m hop_1_m_k) hop_2_a_k)
1267  (=> (and hop_1_a_m hop_1_m_j) hop_2_a_j)
1268  (=> (and hop_1_a_m hop_1_m_l) hop_2_a_l)
1269  (=> (and hop_1_a_m hop_1_m_o) hop_2_a_o)
1270  (=> (and hop_1_a_m hop_1_m_n) hop_2_a_n)
1271  (=> (and hop_1_a_m hop_1_m_q) hop_2_a_q)
1272  (=> (and hop_1_a_m hop_1_m_p) hop_2_a_p)
1273  (=> (and hop_1_a_l hop_1_l_c) hop_2_a_c)
1274  (=> (and hop_1_a_l hop_1_l_b) hop_2_a_b)
1275  (=> (and hop_1_a_l hop_1_l_e) hop_2_a_e)
1276  (=> (and hop_1_a_l hop_1_l_d) hop_2_a_d)
1277  (=> (and hop_1_a_l hop_1_l_g) hop_2_a_g)
1278  (=> (and hop_1_a_l hop_1_l_f) hop_2_a_f)
1279  (=> (and hop_1_a_l hop_1_l_i) hop_2_a_i)
1280  (=> (and hop_1_a_l hop_1_l_h) hop_2_a_h)
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1281  (=> (and hop_1_a_l hop_1_l_k) hop_2_a_k)
1282  (=> (and hop_1_a_l hop_1_l_j) hop_2_a_j)
1283  (=> (and hop_1_a_l hop_1_l_m) hop_2_a_m)
1284  (=> (and hop_1_a_l hop_1_l_o) hop_2_a_o)
1285  (=> (and hop_1_a_l hop_1_l_n) hop_2_a_n)
1286  (=> (and hop_1_a_l hop_1_l_q) hop_2_a_q)
1287  (=> (and hop_1_a_l hop_1_l_p) hop_2_a_p)
1288  (=> (and hop_1_a_o hop_1_o_c) hop_2_a_c)
1289  (=> (and hop_1_a_o hop_1_o_b) hop_2_a_b)
1290  (=> (and hop_1_a_o hop_1_o_e) hop_2_a_e)
1291  (=> (and hop_1_a_o hop_1_o_d) hop_2_a_d)
1292  (=> (and hop_1_a_o hop_1_o_g) hop_2_a_g)
1293  (=> (and hop_1_a_o hop_1_o_f) hop_2_a_f)
1294  (=> (and hop_1_a_o hop_1_o_i) hop_2_a_i)
1295  (=> (and hop_1_a_o hop_1_o_h) hop_2_a_h)
1296  (=> (and hop_1_a_o hop_1_o_k) hop_2_a_k)
1297  (=> (and hop_1_a_o hop_1_o_j) hop_2_a_j)
1298  (=> (and hop_1_a_o hop_1_o_m) hop_2_a_m)
1299  (=> (and hop_1_a_o hop_1_o_l) hop_2_a_l)
1300  (=> (and hop_1_a_o hop_1_o_n) hop_2_a_n)
1301  (=> (and hop_1_a_o hop_1_o_q) hop_2_a_q)
1302  (=> (and hop_1_a_o hop_1_o_p) hop_2_a_p)
1303  (=> (and hop_1_a_n hop_1_n_c) hop_2_a_c)
1304  (=> (and hop_1_a_n hop_1_n_b) hop_2_a_b)
1305  (=> (and hop_1_a_n hop_1_n_e) hop_2_a_e)
1306  (=> (and hop_1_a_n hop_1_n_d) hop_2_a_d)
1307  (=> (and hop_1_a_n hop_1_n_g) hop_2_a_g)
1308  (=> (and hop_1_a_n hop_1_n_f) hop_2_a_f)
1309  (=> (and hop_1_a_n hop_1_n_i) hop_2_a_i)
1310  (=> (and hop_1_a_n hop_1_n_h) hop_2_a_h)
1311  (=> (and hop_1_a_n hop_1_n_k) hop_2_a_k)
1312  (=> (and hop_1_a_n hop_1_n_j) hop_2_a_j)
1313  (=> (and hop_1_a_n hop_1_n_m) hop_2_a_m)
1314  (=> (and hop_1_a_n hop_1_n_l) hop_2_a_l)
1315  (=> (and hop_1_a_n hop_1_n_o) hop_2_a_o)
1316  (=> (and hop_1_a_n hop_1_n_q) hop_2_a_q)
1317  (=> (and hop_1_a_n hop_1_n_p) hop_2_a_p)
1318  (=> (and hop_1_a_q hop_1_q_c) hop_2_a_c)
1319  (=> (and hop_1_a_q hop_1_q_b) hop_2_a_b)
1320  (=> (and hop_1_a_q hop_1_q_e) hop_2_a_e)
1321  (=> (and hop_1_a_q hop_1_q_d) hop_2_a_d)
1322  (=> (and hop_1_a_q hop_1_q_g) hop_2_a_g)
1323  (=> (and hop_1_a_q hop_1_q_f) hop_2_a_f)
1324  (=> (and hop_1_a_q hop_1_q_i) hop_2_a_i)
1325  (=> (and hop_1_a_q hop_1_q_h) hop_2_a_h)
1326  (=> (and hop_1_a_q hop_1_q_k) hop_2_a_k)
1327  (=> (and hop_1_a_q hop_1_q_j) hop_2_a_j)
1328  (=> (and hop_1_a_q hop_1_q_m) hop_2_a_m)
1329  (=> (and hop_1_a_q hop_1_q_l) hop_2_a_l)
1330  (=> (and hop_1_a_q hop_1_q_o) hop_2_a_o)
1331  (=> (and hop_1_a_q hop_1_q_n) hop_2_a_n)
1332  (=> (and hop_1_a_q hop_1_q_p) hop_2_a_p)
1333  (=> (and hop_1_a_p hop_1_p_c) hop_2_a_c)
1334  (=> (and hop_1_a_p hop_1_p_b) hop_2_a_b)
1335  (=> (and hop_1_a_p hop_1_p_e) hop_2_a_e)
1336  (=> (and hop_1_a_p hop_1_p_d) hop_2_a_d)
1337  (=> (and hop_1_a_p hop_1_p_g) hop_2_a_g)
1338  (=> (and hop_1_a_p hop_1_p_f) hop_2_a_f)
1339  (=> (and hop_1_a_p hop_1_p_i) hop_2_a_i)
1340  (=> (and hop_1_a_p hop_1_p_h) hop_2_a_h)
1341  (=> (and hop_1_a_p hop_1_p_k) hop_2_a_k)
1342  (=> (and hop_1_a_p hop_1_p_j) hop_2_a_j)
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1343   (=> (and hop_1_a_p hop_1_p_m) hop_2_a_m)
1344   (=> (and hop_1_a_p hop_1_p_l) hop_2_a_l)
1345   (=> (and hop_1_a_p hop_1_p_o) hop_2_a_o)
1346   (=> (and hop_1_a_p hop_1_p_n) hop_2_a_n)
1347   (=> (and hop_1_a_p hop_1_p_q) hop_2_a_q)
1348   (=> (and hop_1_c_a hop_1_a_b) hop_2_c_b)
1349   (=> (and hop_1_c_a hop_1_a_e) hop_2_c_e)
1350   (=> (and hop_1_c_a hop_1_a_d) hop_2_c_d)
1351   (=> (and hop_1_c_a hop_1_a_g) hop_2_c_g)
1352   (=> (and hop_1_c_a hop_1_a_f) hop_2_c_f)
1353   (=> (and hop_1_c_a hop_1_a_i) hop_2_c_i)
1354   (=> (and hop_1_c_a hop_1_a_h) hop_2_c_h)
1355   (=> (and hop_1_c_a hop_1_a_k) hop_2_c_k)
1356   (=> (and hop_1_c_a hop_1_a_j) hop_2_c_j)
1357   (=> (and hop_1_c_a hop_1_a_m) hop_2_c_m)
1358   (=> (and hop_1_c_a hop_1_a_l) hop_2_c_l)
1359   (=> (and hop_1_c_a hop_1_a_o) hop_2_c_o)
1360   (=> (and hop_1_c_a hop_1_a_n) hop_2_c_n)
1361   (=> (and hop_1_c_a hop_1_a_q) hop_2_c_q)
1362   (=> (and hop_1_c_a hop_1_a_p) hop_2_c_p)
1363   (=> (and hop_1_c_b hop_1_b_a) hop_2_c_a)
1364   (=> (and hop_1_c_b hop_1_b_e) hop_2_c_e)
1365   (=> (and hop_1_c_b hop_1_b_d) hop_2_c_d)
1366   (=> (and hop_1_c_b hop_1_b_g) hop_2_c_g)
1367   (=> (and hop_1_c_b hop_1_b_f) hop_2_c_f)
1368   (=> (and hop_1_c_b hop_1_b_i) hop_2_c_i)
1369   (=> (and hop_1_c_b hop_1_b_h) hop_2_c_h)
1370   (=> (and hop_1_c_b hop_1_b_k) hop_2_c_k)
1371   (=> (and hop_1_c_b hop_1_b_j) hop_2_c_j)
1372   (=> (and hop_1_c_b hop_1_b_m) hop_2_c_m)
1373   (=> (and hop_1_c_b hop_1_b_l) hop_2_c_l)
1374   (=> (and hop_1_c_b hop_1_b_o) hop_2_c_o)
1375   (=> (and hop_1_c_b hop_1_b_n) hop_2_c_n)
1376   (=> (and hop_1_c_b hop_1_b_q) hop_2_c_q)
1377   (=> (and hop_1_c_b hop_1_b_p) hop_2_c_p)
1378   (=> (and hop_1_c_e hop_1_e_a) hop_2_c_a)
1379   (=> (and hop_1_c_e hop_1_e_b) hop_2_c_b)
1380   (=> (and hop_1_c_e hop_1_e_d) hop_2_c_d)
1381   (=> (and hop_1_c_e hop_1_e_g) hop_2_c_g)
1382   (=> (and hop_1_c_e hop_1_e_f) hop_2_c_f)
1383   (=> (and hop_1_c_e hop_1_e_i) hop_2_c_i)
1384   (=> (and hop_1_c_e hop_1_e_h) hop_2_c_h)
1385   (=> (and hop_1_c_e hop_1_e_k) hop_2_c_k)
1386   (=> (and hop_1_c_e hop_1_e_j) hop_2_c_j)
1387   (=> (and hop_1_c_e hop_1_e_m) hop_2_c_m)
1388   (=> (and hop_1_c_e hop_1_e_l) hop_2_c_l)
1389   (=> (and hop_1_c_e hop_1_e_o) hop_2_c_o)
1390   (=> (and hop_1_c_e hop_1_e_n) hop_2_c_n)
1391   (=> (and hop_1_c_e hop_1_e_q) hop_2_c_q)
1392   (=> (and hop_1_c_e hop_1_e_p) hop_2_c_p)
1393   (=> (and hop_1_c_d hop_1_d_a) hop_2_c_a)
1394   (=> (and hop_1_c_d hop_1_d_b) hop_2_c_b)
1395   (=> (and hop_1_c_d hop_1_d_e) hop_2_c_e)
1396   (=> (and hop_1_c_d hop_1_d_g) hop_2_c_g)
1397   (=> (and hop_1_c_d hop_1_d_f) hop_2_c_f)
1398   (=> (and hop_1_c_d hop_1_d_i) hop_2_c_i)
1399   (=> (and hop_1_c_d hop_1_d_h) hop_2_c_h)
1400   (=> (and hop_1_c_d hop_1_d_k) hop_2_c_k)
1401   (=> (and hop_1_c_d hop_1_d_j) hop_2_c_j)
1402   (=> (and hop_1_c_d hop_1_d_m) hop_2_c_m)
1403   (=> (and hop_1_c_d hop_1_d_l) hop_2_c_l)
1404   (=> (and hop_1_c_d hop_1_d_o) hop_2_c_o)
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1405  (=> (and hop_1_c_d hop_1_d_n) hop_2_c_n)
1406  (=> (and hop_1_c_d hop_1_d_q) hop_2_c_q)
1407  (=> (and hop_1_c_d hop_1_d_p) hop_2_c_p)
1408  (=> (and hop_1_c_g hop_1_g_a) hop_2_c_a)
1409  (=> (and hop_1_c_g hop_1_g_b) hop_2_c_b)
1410  (=> (and hop_1_c_g hop_1_g_e) hop_2_c_e)
1411  (=> (and hop_1_c_g hop_1_g_d) hop_2_c_d)
1412  (=> (and hop_1_c_g hop_1_g_f) hop_2_c_f)
1413  (=> (and hop_1_c_g hop_1_g_i) hop_2_c_i)
1414  (=> (and hop_1_c_g hop_1_g_h) hop_2_c_h)
1415  (=> (and hop_1_c_g hop_1_g_k) hop_2_c_k)
1416  (=> (and hop_1_c_g hop_1_g_j) hop_2_c_j)
1417  (=> (and hop_1_c_g hop_1_g_m) hop_2_c_m)
1418  (=> (and hop_1_c_g hop_1_g_l) hop_2_c_l)
1419  (=> (and hop_1_c_g hop_1_g_o) hop_2_c_o)
1420  (=> (and hop_1_c_g hop_1_g_n) hop_2_c_n)
1421  (=> (and hop_1_c_g hop_1_g_q) hop_2_c_q)
1422  (=> (and hop_1_c_g hop_1_g_p) hop_2_c_p)
1423  (=> (and hop_1_c_f hop_1_f_a) hop_2_c_a)
1424  (=> (and hop_1_c_f hop_1_f_b) hop_2_c_b)
1425  (=> (and hop_1_c_f hop_1_f_e) hop_2_c_e)
1426  (=> (and hop_1_c_f hop_1_f_d) hop_2_c_d)
1427  (=> (and hop_1_c_f hop_1_f_g) hop_2_c_g)
1428  (=> (and hop_1_c_f hop_1_f_i) hop_2_c_i)
1429  (=> (and hop_1_c_f hop_1_f_h) hop_2_c_h)
1430  (=> (and hop_1_c_f hop_1_f_k) hop_2_c_k)
1431  (=> (and hop_1_c_f hop_1_f_j) hop_2_c_j)
1432  (=> (and hop_1_c_f hop_1_f_m) hop_2_c_m)
1433  (=> (and hop_1_c_f hop_1_f_l) hop_2_c_l)
1434  (=> (and hop_1_c_f hop_1_f_o) hop_2_c_o)
1435  (=> (and hop_1_c_f hop_1_f_n) hop_2_c_n)
1436  (=> (and hop_1_c_f hop_1_f_q) hop_2_c_q)
1437  (=> (and hop_1_c_f hop_1_f_p) hop_2_c_p)
1438  (=> (and hop_1_c_i hop_1_i_a) hop_2_c_a)
1439  (=> (and hop_1_c_i hop_1_i_b) hop_2_c_b)
1440  (=> (and hop_1_c_i hop_1_i_e) hop_2_c_e)
1441  (=> (and hop_1_c_i hop_1_i_d) hop_2_c_d)
1442  (=> (and hop_1_c_i hop_1_i_g) hop_2_c_g)
1443  (=> (and hop_1_c_i hop_1_i_f) hop_2_c_f)
1444  (=> (and hop_1_c_i hop_1_i_h) hop_2_c_h)
1445  (=> (and hop_1_c_i hop_1_i_k) hop_2_c_k)
1446  (=> (and hop_1_c_i hop_1_i_j) hop_2_c_j)
1447  (=> (and hop_1_c_i hop_1_i_m) hop_2_c_m)
1448  (=> (and hop_1_c_i hop_1_i_l) hop_2_c_l)
1449  (=> (and hop_1_c_i hop_1_i_o) hop_2_c_o)
1450  (=> (and hop_1_c_i hop_1_i_n) hop_2_c_n)
1451  (=> (and hop_1_c_i hop_1_i_q) hop_2_c_q)
1452  (=> (and hop_1_c_i hop_1_i_p) hop_2_c_p)
1453  (=> (and hop_1_c_h hop_1_h_a) hop_2_c_a)
1454  (=> (and hop_1_c_h hop_1_h_b) hop_2_c_b)
1455  (=> (and hop_1_c_h hop_1_h_e) hop_2_c_e)
1456  (=> (and hop_1_c_h hop_1_h_d) hop_2_c_d)
1457  (=> (and hop_1_c_h hop_1_h_g) hop_2_c_g)
1458  (=> (and hop_1_c_h hop_1_h_f) hop_2_c_f)
1459  (=> (and hop_1_c_h hop_1_h_i) hop_2_c_i)
1460  (=> (and hop_1_c_h hop_1_h_k) hop_2_c_k)
1461  (=> (and hop_1_c_h hop_1_h_j) hop_2_c_j)
1462  (=> (and hop_1_c_h hop_1_h_m) hop_2_c_m)
1463  (=> (and hop_1_c_h hop_1_h_l) hop_2_c_l)
1464  (=> (and hop_1_c_h hop_1_h_o) hop_2_c_o)
1465  (=> (and hop_1_c_h hop_1_h_n) hop_2_c_n)
1466  (=> (and hop_1_c_h hop_1_h_q) hop_2_c_q)
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1467  (=> (and hop_1_c_h hop_1_h_p) hop_2_c_p)
1468  (=> (and hop_1_c_k hop_1_k_a) hop_2_c_a)
1469  (=> (and hop_1_c_k hop_1_k_b) hop_2_c_b)
1470  (=> (and hop_1_c_k hop_1_k_e) hop_2_c_e)
1471  (=> (and hop_1_c_k hop_1_k_d) hop_2_c_d)
1472  (=> (and hop_1_c_k hop_1_k_g) hop_2_c_g)
1473  (=> (and hop_1_c_k hop_1_k_f) hop_2_c_f)
1474  (=> (and hop_1_c_k hop_1_k_i) hop_2_c_i)
1475  (=> (and hop_1_c_k hop_1_k_h) hop_2_c_h)
1476  (=> (and hop_1_c_k hop_1_k_j) hop_2_c_j)
1477  (=> (and hop_1_c_k hop_1_k_m) hop_2_c_m)
1478  (=> (and hop_1_c_k hop_1_k_l) hop_2_c_l)
1479  (=> (and hop_1_c_k hop_1_k_o) hop_2_c_o)
1480  (=> (and hop_1_c_k hop_1_k_n) hop_2_c_n)
1481  (=> (and hop_1_c_k hop_1_k_q) hop_2_c_q)
1482  (=> (and hop_1_c_k hop_1_k_p) hop_2_c_p)
1483  (=> (and hop_1_c_j hop_1_j_a) hop_2_c_a)
1484  (=> (and hop_1_c_j hop_1_j_b) hop_2_c_b)
1485  (=> (and hop_1_c_j hop_1_j_e) hop_2_c_e)
1486  (=> (and hop_1_c_j hop_1_j_d) hop_2_c_d)
1487  (=> (and hop_1_c_j hop_1_j_g) hop_2_c_g)
1488  (=> (and hop_1_c_j hop_1_j_f) hop_2_c_f)
1489  (=> (and hop_1_c_j hop_1_j_i) hop_2_c_i)
1490  (=> (and hop_1_c_j hop_1_j_h) hop_2_c_h)
1491  (=> (and hop_1_c_j hop_1_j_k) hop_2_c_k)
1492  (=> (and hop_1_c_j hop_1_j_m) hop_2_c_m)
1493  (=> (and hop_1_c_j hop_1_j_l) hop_2_c_l)
1494  (=> (and hop_1_c_j hop_1_j_o) hop_2_c_o)
1495  (=> (and hop_1_c_j hop_1_j_n) hop_2_c_n)
1496  (=> (and hop_1_c_j hop_1_j_q) hop_2_c_q)
1497  (=> (and hop_1_c_j hop_1_j_p) hop_2_c_p)
1498  (=> (and hop_1_c_m hop_1_m_a) hop_2_c_a)
1499  (=> (and hop_1_c_m hop_1_m_b) hop_2_c_b)
1500  (=> (and hop_1_c_m hop_1_m_e) hop_2_c_e)
1501  (=> (and hop_1_c_m hop_1_m_d) hop_2_c_d)
1502  (=> (and hop_1_c_m hop_1_m_g) hop_2_c_g)
1503  (=> (and hop_1_c_m hop_1_m_f) hop_2_c_f)
1504  (=> (and hop_1_c_m hop_1_m_i) hop_2_c_i)
1505  (=> (and hop_1_c_m hop_1_m_h) hop_2_c_h)
1506  (=> (and hop_1_c_m hop_1_m_k) hop_2_c_k)
1507  (=> (and hop_1_c_m hop_1_m_j) hop_2_c_j)
1508  (=> (and hop_1_c_m hop_1_m_l) hop_2_c_l)
1509  (=> (and hop_1_c_m hop_1_m_o) hop_2_c_o)
1510  (=> (and hop_1_c_m hop_1_m_n) hop_2_c_n)
1511  (=> (and hop_1_c_m hop_1_m_q) hop_2_c_q)
1512  (=> (and hop_1_c_m hop_1_m_p) hop_2_c_p)
1513  (=> (and hop_1_c_l hop_1_l_a) hop_2_c_a)
1514  (=> (and hop_1_c_l hop_1_l_b) hop_2_c_b)
1515  (=> (and hop_1_c_l hop_1_l_e) hop_2_c_e)
1516  (=> (and hop_1_c_l hop_1_l_d) hop_2_c_d)
1517  (=> (and hop_1_c_l hop_1_l_g) hop_2_c_g)
1518  (=> (and hop_1_c_l hop_1_l_f) hop_2_c_f)
1519  (=> (and hop_1_c_l hop_1_l_i) hop_2_c_i)
1520  (=> (and hop_1_c_l hop_1_l_h) hop_2_c_h)
1521  (=> (and hop_1_c_l hop_1_l_k) hop_2_c_k)
1522  (=> (and hop_1_c_l hop_1_l_j) hop_2_c_j)
1523  (=> (and hop_1_c_l hop_1_l_m) hop_2_c_m)
1524  (=> (and hop_1_c_l hop_1_l_o) hop_2_c_o)
1525  (=> (and hop_1_c_l hop_1_l_n) hop_2_c_n)
1526  (=> (and hop_1_c_l hop_1_l_q) hop_2_c_q)
1527  (=> (and hop_1_c_l hop_1_l_p) hop_2_c_p)
1528  (=> (and hop_1_c_o hop_1_o_a) hop_2_c_a)
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1529  (=> (and hop_1_c_o hop_1_o_b) hop_2_c_b)
1530  (=> (and hop_1_c_o hop_1_o_e) hop_2_c_e)
1531  (=> (and hop_1_c_o hop_1_o_d) hop_2_c_d)
1532  (=> (and hop_1_c_o hop_1_o_g) hop_2_c_g)
1533  (=> (and hop_1_c_o hop_1_o_f) hop_2_c_f)
1534  (=> (and hop_1_c_o hop_1_o_i) hop_2_c_i)
1535  (=> (and hop_1_c_o hop_1_o_h) hop_2_c_h)
1536  (=> (and hop_1_c_o hop_1_o_k) hop_2_c_k)
1537  (=> (and hop_1_c_o hop_1_o_j) hop_2_c_j)
1538  (=> (and hop_1_c_o hop_1_o_m) hop_2_c_m)
1539  (=> (and hop_1_c_o hop_1_o_l) hop_2_c_l)
1540  (=> (and hop_1_c_o hop_1_o_n) hop_2_c_n)
1541  (=> (and hop_1_c_o hop_1_o_q) hop_2_c_q)
1542  (=> (and hop_1_c_o hop_1_o_p) hop_2_c_p)
1543  (=> (and hop_1_c_n hop_1_n_a) hop_2_c_a)
1544  (=> (and hop_1_c_n hop_1_n_b) hop_2_c_b)
1545  (=> (and hop_1_c_n hop_1_n_e) hop_2_c_e)
1546  (=> (and hop_1_c_n hop_1_n_d) hop_2_c_d)
1547  (=> (and hop_1_c_n hop_1_n_g) hop_2_c_g)
1548  (=> (and hop_1_c_n hop_1_n_f) hop_2_c_f)
1549  (=> (and hop_1_c_n hop_1_n_i) hop_2_c_i)
1550  (=> (and hop_1_c_n hop_1_n_h) hop_2_c_h)
1551  (=> (and hop_1_c_n hop_1_n_k) hop_2_c_k)
1552  (=> (and hop_1_c_n hop_1_n_j) hop_2_c_j)
1553  (=> (and hop_1_c_n hop_1_n_m) hop_2_c_m)
1554  (=> (and hop_1_c_n hop_1_n_l) hop_2_c_l)
1555  (=> (and hop_1_c_n hop_1_n_o) hop_2_c_o)
1556  (=> (and hop_1_c_n hop_1_n_q) hop_2_c_q)
1557  (=> (and hop_1_c_n hop_1_n_p) hop_2_c_p)
1558  (=> (and hop_1_c_q hop_1_q_a) hop_2_c_a)
1559  (=> (and hop_1_c_q hop_1_q_b) hop_2_c_b)
1560  (=> (and hop_1_c_q hop_1_q_e) hop_2_c_e)
1561  (=> (and hop_1_c_q hop_1_q_d) hop_2_c_d)
1562  (=> (and hop_1_c_q hop_1_q_g) hop_2_c_g)
1563  (=> (and hop_1_c_q hop_1_q_f) hop_2_c_f)
1564  (=> (and hop_1_c_q hop_1_q_i) hop_2_c_i)
1565  (=> (and hop_1_c_q hop_1_q_h) hop_2_c_h)
1566  (=> (and hop_1_c_q hop_1_q_k) hop_2_c_k)
1567  (=> (and hop_1_c_q hop_1_q_j) hop_2_c_j)
1568  (=> (and hop_1_c_q hop_1_q_m) hop_2_c_m)
1569  (=> (and hop_1_c_q hop_1_q_l) hop_2_c_l)
1570  (=> (and hop_1_c_q hop_1_q_o) hop_2_c_o)
1571  (=> (and hop_1_c_q hop_1_q_n) hop_2_c_n)
1572  (=> (and hop_1_c_q hop_1_q_p) hop_2_c_p)
1573  (=> (and hop_1_c_p hop_1_p_a) hop_2_c_a)
1574  (=> (and hop_1_c_p hop_1_p_b) hop_2_c_b)
1575  (=> (and hop_1_c_p hop_1_p_e) hop_2_c_e)
1576  (=> (and hop_1_c_p hop_1_p_d) hop_2_c_d)
1577  (=> (and hop_1_c_p hop_1_p_g) hop_2_c_g)
1578  (=> (and hop_1_c_p hop_1_p_f) hop_2_c_f)
1579  (=> (and hop_1_c_p hop_1_p_i) hop_2_c_i)
1580  (=> (and hop_1_c_p hop_1_p_h) hop_2_c_h)
1581  (=> (and hop_1_c_p hop_1_p_k) hop_2_c_k)
1582  (=> (and hop_1_c_p hop_1_p_j) hop_2_c_j)
1583  (=> (and hop_1_c_p hop_1_p_m) hop_2_c_m)
1584  (=> (and hop_1_c_p hop_1_p_l) hop_2_c_l)
1585  (=> (and hop_1_c_p hop_1_p_o) hop_2_c_o)
1586  (=> (and hop_1_c_p hop_1_p_n) hop_2_c_n)
1587  (=> (and hop_1_c_p hop_1_p_q) hop_2_c_q)
1588  (=> (and hop_1_b_a hop_1_a_c) hop_2_b_c)
1589  (=> (and hop_1_b_a hop_1_a_e) hop_2_b_e)
1590  (=> (and hop_1_b_a hop_1_a_d) hop_2_b_d)
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1591  (=> (and hop_1_b_a hop_1_a_g) hop_2_b_g)
1592  (=> (and hop_1_b_a hop_1_a_f) hop_2_b_f)
1593  (=> (and hop_1_b_a hop_1_a_i) hop_2_b_i)
1594  (=> (and hop_1_b_a hop_1_a_h) hop_2_b_h)
1595  (=> (and hop_1_b_a hop_1_a_k) hop_2_b_k)
1596  (=> (and hop_1_b_a hop_1_a_j) hop_2_b_j)
1597  (=> (and hop_1_b_a hop_1_a_m) hop_2_b_m)
1598  (=> (and hop_1_b_a hop_1_a_l) hop_2_b_l)
1599  (=> (and hop_1_b_a hop_1_a_o) hop_2_b_o)
1600  (=> (and hop_1_b_a hop_1_a_n) hop_2_b_n)
1601  (=> (and hop_1_b_a hop_1_a_q) hop_2_b_q)
1602  (=> (and hop_1_b_a hop_1_a_p) hop_2_b_p)
1603  (=> (and hop_1_b_c hop_1_c_a) hop_2_b_a)
1604  (=> (and hop_1_b_c hop_1_c_e) hop_2_b_e)
1605  (=> (and hop_1_b_c hop_1_c_d) hop_2_b_d)
1606  (=> (and hop_1_b_c hop_1_c_g) hop_2_b_g)
1607  (=> (and hop_1_b_c hop_1_c_f) hop_2_b_f)
1608  (=> (and hop_1_b_c hop_1_c_i) hop_2_b_i)
1609  (=> (and hop_1_b_c hop_1_c_h) hop_2_b_h)
1610  (=> (and hop_1_b_c hop_1_c_k) hop_2_b_k)
1611  (=> (and hop_1_b_c hop_1_c_j) hop_2_b_j)
1612  (=> (and hop_1_b_c hop_1_c_m) hop_2_b_m)
1613  (=> (and hop_1_b_c hop_1_c_l) hop_2_b_l)
1614  (=> (and hop_1_b_c hop_1_c_o) hop_2_b_o)
1615  (=> (and hop_1_b_c hop_1_c_n) hop_2_b_n)
1616  (=> (and hop_1_b_c hop_1_c_q) hop_2_b_q)
1617  (=> (and hop_1_b_c hop_1_c_p) hop_2_b_p)
1618  (=> (and hop_1_b_e hop_1_e_a) hop_2_b_a)
1619  (=> (and hop_1_b_e hop_1_e_c) hop_2_b_c)
1620  (=> (and hop_1_b_e hop_1_e_d) hop_2_b_d)
1621  (=> (and hop_1_b_e hop_1_e_g) hop_2_b_g)
1622  (=> (and hop_1_b_e hop_1_e_f) hop_2_b_f)
1623  (=> (and hop_1_b_e hop_1_e_i) hop_2_b_i)
1624  (=> (and hop_1_b_e hop_1_e_h) hop_2_b_h)
1625  (=> (and hop_1_b_e hop_1_e_k) hop_2_b_k)
1626  (=> (and hop_1_b_e hop_1_e_j) hop_2_b_j)
1627  (=> (and hop_1_b_e hop_1_e_m) hop_2_b_m)
1628  (=> (and hop_1_b_e hop_1_e_l) hop_2_b_l)
1629  (=> (and hop_1_b_e hop_1_e_o) hop_2_b_o)
1630  (=> (and hop_1_b_e hop_1_e_n) hop_2_b_n)
1631  (=> (and hop_1_b_e hop_1_e_q) hop_2_b_q)
1632  (=> (and hop_1_b_e hop_1_e_p) hop_2_b_p)
1633  (=> (and hop_1_b_d hop_1_d_a) hop_2_b_a)
1634  (=> (and hop_1_b_d hop_1_d_c) hop_2_b_c)
1635  (=> (and hop_1_b_d hop_1_d_e) hop_2_b_e)
1636  (=> (and hop_1_b_d hop_1_d_g) hop_2_b_g)
1637  (=> (and hop_1_b_d hop_1_d_f) hop_2_b_f)
1638  (=> (and hop_1_b_d hop_1_d_i) hop_2_b_i)
1639  (=> (and hop_1_b_d hop_1_d_h) hop_2_b_h)
1640  (=> (and hop_1_b_d hop_1_d_k) hop_2_b_k)
1641  (=> (and hop_1_b_d hop_1_d_j) hop_2_b_j)
1642  (=> (and hop_1_b_d hop_1_d_m) hop_2_b_m)
1643  (=> (and hop_1_b_d hop_1_d_l) hop_2_b_l)
1644  (=> (and hop_1_b_d hop_1_d_o) hop_2_b_o)
1645  (=> (and hop_1_b_d hop_1_d_n) hop_2_b_n)
1646  (=> (and hop_1_b_d hop_1_d_q) hop_2_b_q)
1647  (=> (and hop_1_b_d hop_1_d_p) hop_2_b_p)
1648  (=> (and hop_1_b_g hop_1_g_a) hop_2_b_a)
1649  (=> (and hop_1_b_g hop_1_g_c) hop_2_b_c)
1650  (=> (and hop_1_b_g hop_1_g_e) hop_2_b_e)
1651  (=> (and hop_1_b_g hop_1_g_d) hop_2_b_d)
1652  (=> (and hop_1_b_g hop_1_g_f) hop_2_b_f)
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1653  (=> (and hop_1_b_g hop_1_g_i) hop_2_b_i)
1654  (=> (and hop_1_b_g hop_1_g_h) hop_2_b_h)
1655  (=> (and hop_1_b_g hop_1_g_k) hop_2_b_k)
1656  (=> (and hop_1_b_g hop_1_g_j) hop_2_b_j)
1657  (=> (and hop_1_b_g hop_1_g_m) hop_2_b_m)
1658  (=> (and hop_1_b_g hop_1_g_l) hop_2_b_l)
1659  (=> (and hop_1_b_g hop_1_g_o) hop_2_b_o)
1660  (=> (and hop_1_b_g hop_1_g_n) hop_2_b_n)
1661  (=> (and hop_1_b_g hop_1_g_q) hop_2_b_q)
1662  (=> (and hop_1_b_g hop_1_g_p) hop_2_b_p)
1663  (=> (and hop_1_b_f hop_1_f_a) hop_2_b_a)
1664  (=> (and hop_1_b_f hop_1_f_c) hop_2_b_c)
1665  (=> (and hop_1_b_f hop_1_f_e) hop_2_b_e)
1666  (=> (and hop_1_b_f hop_1_f_d) hop_2_b_d)
1667  (=> (and hop_1_b_f hop_1_f_g) hop_2_b_g)
1668  (=> (and hop_1_b_f hop_1_f_i) hop_2_b_i)
1669  (=> (and hop_1_b_f hop_1_f_h) hop_2_b_h)
1670  (=> (and hop_1_b_f hop_1_f_k) hop_2_b_k)
1671  (=> (and hop_1_b_f hop_1_f_j) hop_2_b_j)
1672  (=> (and hop_1_b_f hop_1_f_m) hop_2_b_m)
1673  (=> (and hop_1_b_f hop_1_f_l) hop_2_b_l)
1674  (=> (and hop_1_b_f hop_1_f_o) hop_2_b_o)
1675  (=> (and hop_1_b_f hop_1_f_n) hop_2_b_n)
1676  (=> (and hop_1_b_f hop_1_f_q) hop_2_b_q)
1677  (=> (and hop_1_b_f hop_1_f_p) hop_2_b_p)
1678  (=> (and hop_1_b_i hop_1_i_a) hop_2_b_a)
1679  (=> (and hop_1_b_i hop_1_i_c) hop_2_b_c)
1680  (=> (and hop_1_b_i hop_1_i_e) hop_2_b_e)
1681  (=> (and hop_1_b_i hop_1_i_d) hop_2_b_d)
1682  (=> (and hop_1_b_i hop_1_i_g) hop_2_b_g)
1683  (=> (and hop_1_b_i hop_1_i_f) hop_2_b_f)
1684  (=> (and hop_1_b_i hop_1_i_h) hop_2_b_h)
1685  (=> (and hop_1_b_i hop_1_i_k) hop_2_b_k)
1686  (=> (and hop_1_b_i hop_1_i_j) hop_2_b_j)
1687  (=> (and hop_1_b_i hop_1_i_m) hop_2_b_m)
1688  (=> (and hop_1_b_i hop_1_i_l) hop_2_b_l)
1689  (=> (and hop_1_b_i hop_1_i_o) hop_2_b_o)
1690  (=> (and hop_1_b_i hop_1_i_n) hop_2_b_n)
1691  (=> (and hop_1_b_i hop_1_i_q) hop_2_b_q)
1692  (=> (and hop_1_b_i hop_1_i_p) hop_2_b_p)
1693  (=> (and hop_1_b_h hop_1_h_a) hop_2_b_a)
1694  (=> (and hop_1_b_h hop_1_h_c) hop_2_b_c)
1695  (=> (and hop_1_b_h hop_1_h_e) hop_2_b_e)
1696  (=> (and hop_1_b_h hop_1_h_d) hop_2_b_d)
1697  (=> (and hop_1_b_h hop_1_h_g) hop_2_b_g)
1698  (=> (and hop_1_b_h hop_1_h_f) hop_2_b_f)
1699  (=> (and hop_1_b_h hop_1_h_i) hop_2_b_i)
1700  (=> (and hop_1_b_h hop_1_h_k) hop_2_b_k)
1701  (=> (and hop_1_b_h hop_1_h_j) hop_2_b_j)
1702  (=> (and hop_1_b_h hop_1_h_m) hop_2_b_m)
1703  (=> (and hop_1_b_h hop_1_h_l) hop_2_b_l)
1704  (=> (and hop_1_b_h hop_1_h_o) hop_2_b_o)
1705  (=> (and hop_1_b_h hop_1_h_n) hop_2_b_n)
1706  (=> (and hop_1_b_h hop_1_h_q) hop_2_b_q)
1707  (=> (and hop_1_b_h hop_1_h_p) hop_2_b_p)
1708  (=> (and hop_1_b_k hop_1_k_a) hop_2_b_a)
1709  (=> (and hop_1_b_k hop_1_k_c) hop_2_b_c)
1710  (=> (and hop_1_b_k hop_1_k_e) hop_2_b_e)
1711  (=> (and hop_1_b_k hop_1_k_d) hop_2_b_d)
1712  (=> (and hop_1_b_k hop_1_k_g) hop_2_b_g)
1713  (=> (and hop_1_b_k hop_1_k_f) hop_2_b_f)
1714  (=> (and hop_1_b_k hop_1_k_i) hop_2_b_i)
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1715  (=> (and hop_1_b_k hop_1_k_h) hop_2_b_h)
1716  (=> (and hop_1_b_k hop_1_k_j) hop_2_b_j)
1717  (=> (and hop_1_b_k hop_1_k_m) hop_2_b_m)
1718  (=> (and hop_1_b_k hop_1_k_l) hop_2_b_l)
1719  (=> (and hop_1_b_k hop_1_k_o) hop_2_b_o)
1720  (=> (and hop_1_b_k hop_1_k_n) hop_2_b_n)
1721  (=> (and hop_1_b_k hop_1_k_q) hop_2_b_q)
1722  (=> (and hop_1_b_k hop_1_k_p) hop_2_b_p)
1723  (=> (and hop_1_b_j hop_1_j_a) hop_2_b_a)
1724  (=> (and hop_1_b_j hop_1_j_c) hop_2_b_c)
1725  (=> (and hop_1_b_j hop_1_j_e) hop_2_b_e)
1726  (=> (and hop_1_b_j hop_1_j_d) hop_2_b_d)
1727  (=> (and hop_1_b_j hop_1_j_g) hop_2_b_g)
1728  (=> (and hop_1_b_j hop_1_j_f) hop_2_b_f)
1729  (=> (and hop_1_b_j hop_1_j_i) hop_2_b_i)
1730  (=> (and hop_1_b_j hop_1_j_h) hop_2_b_h)
1731  (=> (and hop_1_b_j hop_1_j_k) hop_2_b_k)
1732  (=> (and hop_1_b_j hop_1_j_m) hop_2_b_m)
1733  (=> (and hop_1_b_j hop_1_j_l) hop_2_b_l)
1734  (=> (and hop_1_b_j hop_1_j_o) hop_2_b_o)
1735  (=> (and hop_1_b_j hop_1_j_n) hop_2_b_n)
1736  (=> (and hop_1_b_j hop_1_j_q) hop_2_b_q)
1737  (=> (and hop_1_b_j hop_1_j_p) hop_2_b_p)
1738  (=> (and hop_1_b_m hop_1_m_a) hop_2_b_a)
1739  (=> (and hop_1_b_m hop_1_m_c) hop_2_b_c)
1740  (=> (and hop_1_b_m hop_1_m_e) hop_2_b_e)
1741  (=> (and hop_1_b_m hop_1_m_d) hop_2_b_d)
1742  (=> (and hop_1_b_m hop_1_m_g) hop_2_b_g)
1743  (=> (and hop_1_b_m hop_1_m_f) hop_2_b_f)
1744  (=> (and hop_1_b_m hop_1_m_i) hop_2_b_i)
1745  (=> (and hop_1_b_m hop_1_m_h) hop_2_b_h)
1746  (=> (and hop_1_b_m hop_1_m_k) hop_2_b_k)
1747  (=> (and hop_1_b_m hop_1_m_j) hop_2_b_j)
1748  (=> (and hop_1_b_m hop_1_m_l) hop_2_b_l)
1749  (=> (and hop_1_b_m hop_1_m_o) hop_2_b_o)
1750  (=> (and hop_1_b_m hop_1_m_n) hop_2_b_n)
1751  (=> (and hop_1_b_m hop_1_m_q) hop_2_b_q)
1752  (=> (and hop_1_b_m hop_1_m_p) hop_2_b_p)
1753  (=> (and hop_1_b_l hop_1_l_a) hop_2_b_a)
1754  (=> (and hop_1_b_l hop_1_l_c) hop_2_b_c)
1755  (=> (and hop_1_b_l hop_1_l_e) hop_2_b_e)
1756  (=> (and hop_1_b_l hop_1_l_d) hop_2_b_d)
1757  (=> (and hop_1_b_l hop_1_l_g) hop_2_b_g)
1758  (=> (and hop_1_b_l hop_1_l_f) hop_2_b_f)
1759  (=> (and hop_1_b_l hop_1_l_i) hop_2_b_i)
1760  (=> (and hop_1_b_l hop_1_l_h) hop_2_b_h)
1761  (=> (and hop_1_b_l hop_1_l_k) hop_2_b_k)
1762  (=> (and hop_1_b_l hop_1_l_j) hop_2_b_j)
1763  (=> (and hop_1_b_l hop_1_l_m) hop_2_b_m)
1764  (=> (and hop_1_b_l hop_1_l_o) hop_2_b_o)
1765  (=> (and hop_1_b_l hop_1_l_n) hop_2_b_n)
1766  (=> (and hop_1_b_l hop_1_l_q) hop_2_b_q)
1767  (=> (and hop_1_b_l hop_1_l_p) hop_2_b_p)
1768  (=> (and hop_1_b_o hop_1_o_a) hop_2_b_a)
1769  (=> (and hop_1_b_o hop_1_o_c) hop_2_b_c)
1770  (=> (and hop_1_b_o hop_1_o_e) hop_2_b_e)
1771  (=> (and hop_1_b_o hop_1_o_d) hop_2_b_d)
1772  (=> (and hop_1_b_o hop_1_o_g) hop_2_b_g)
1773  (=> (and hop_1_b_o hop_1_o_f) hop_2_b_f)
1774  (=> (and hop_1_b_o hop_1_o_i) hop_2_b_i)
1775  (=> (and hop_1_b_o hop_1_o_h) hop_2_b_h)
1776  (=> (and hop_1_b_o hop_1_o_k) hop_2_b_k)
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1777  (=> (and hop_1_b_o hop_1_o_j) hop_2_b_j)
1778  (=> (and hop_1_b_o hop_1_o_m) hop_2_b_m)
1779  (=> (and hop_1_b_o hop_1_o_l) hop_2_b_l)
1780  (=> (and hop_1_b_o hop_1_o_n) hop_2_b_n)
1781  (=> (and hop_1_b_o hop_1_o_q) hop_2_b_q)
1782  (=> (and hop_1_b_o hop_1_o_p) hop_2_b_p)
1783  (=> (and hop_1_b_n hop_1_n_a) hop_2_b_a)
1784  (=> (and hop_1_b_n hop_1_n_c) hop_2_b_c)
1785  (=> (and hop_1_b_n hop_1_n_e) hop_2_b_e)
1786  (=> (and hop_1_b_n hop_1_n_d) hop_2_b_d)
1787  (=> (and hop_1_b_n hop_1_n_g) hop_2_b_g)
1788  (=> (and hop_1_b_n hop_1_n_f) hop_2_b_f)
1789  (=> (and hop_1_b_n hop_1_n_i) hop_2_b_i)
1790  (=> (and hop_1_b_n hop_1_n_h) hop_2_b_h)
1791  (=> (and hop_1_b_n hop_1_n_k) hop_2_b_k)
1792  (=> (and hop_1_b_n hop_1_n_j) hop_2_b_j)
1793  (=> (and hop_1_b_n hop_1_n_m) hop_2_b_m)
1794  (=> (and hop_1_b_n hop_1_n_l) hop_2_b_l)
1795  (=> (and hop_1_b_n hop_1_n_o) hop_2_b_o)
1796  (=> (and hop_1_b_n hop_1_n_q) hop_2_b_q)
1797  (=> (and hop_1_b_n hop_1_n_p) hop_2_b_p)
1798  (=> (and hop_1_b_q hop_1_q_a) hop_2_b_a)
1799  (=> (and hop_1_b_q hop_1_q_c) hop_2_b_c)
1800  (=> (and hop_1_b_q hop_1_q_e) hop_2_b_e)
1801  (=> (and hop_1_b_q hop_1_q_d) hop_2_b_d)
1802  (=> (and hop_1_b_q hop_1_q_g) hop_2_b_g)
1803  (=> (and hop_1_b_q hop_1_q_f) hop_2_b_f)
1804  (=> (and hop_1_b_q hop_1_q_i) hop_2_b_i)
1805  (=> (and hop_1_b_q hop_1_q_h) hop_2_b_h)
1806  (=> (and hop_1_b_q hop_1_q_k) hop_2_b_k)
1807  (=> (and hop_1_b_q hop_1_q_j) hop_2_b_j)
1808  (=> (and hop_1_b_q hop_1_q_m) hop_2_b_m)
1809  (=> (and hop_1_b_q hop_1_q_l) hop_2_b_l)
1810  (=> (and hop_1_b_q hop_1_q_o) hop_2_b_o)
1811  (=> (and hop_1_b_q hop_1_q_n) hop_2_b_n)
1812  (=> (and hop_1_b_q hop_1_q_p) hop_2_b_p)
1813  (=> (and hop_1_b_p hop_1_p_a) hop_2_b_a)
1814  (=> (and hop_1_b_p hop_1_p_c) hop_2_b_c)
1815  (=> (and hop_1_b_p hop_1_p_e) hop_2_b_e)
1816  (=> (and hop_1_b_p hop_1_p_d) hop_2_b_d)
1817  (=> (and hop_1_b_p hop_1_p_g) hop_2_b_g)
1818  (=> (and hop_1_b_p hop_1_p_f) hop_2_b_f)
1819  (=> (and hop_1_b_p hop_1_p_i) hop_2_b_i)
1820  (=> (and hop_1_b_p hop_1_p_h) hop_2_b_h)
1821  (=> (and hop_1_b_p hop_1_p_k) hop_2_b_k)
1822  (=> (and hop_1_b_p hop_1_p_j) hop_2_b_j)
1823  (=> (and hop_1_b_p hop_1_p_m) hop_2_b_m)
1824  (=> (and hop_1_b_p hop_1_p_l) hop_2_b_l)
1825  (=> (and hop_1_b_p hop_1_p_o) hop_2_b_o)
1826  (=> (and hop_1_b_p hop_1_p_n) hop_2_b_n)
1827  (=> (and hop_1_b_p hop_1_p_q) hop_2_b_q)
1828  (=> (and hop_1_e_a hop_1_a_c) hop_2_e_c)
1829  (=> (and hop_1_e_a hop_1_a_b) hop_2_e_b)
1830  (=> (and hop_1_e_a hop_1_a_d) hop_2_e_d)
1831  (=> (and hop_1_e_a hop_1_a_g) hop_2_e_g)
1832  (=> (and hop_1_e_a hop_1_a_f) hop_2_e_f)
1833  (=> (and hop_1_e_a hop_1_a_i) hop_2_e_i)
1834  (=> (and hop_1_e_a hop_1_a_h) hop_2_e_h)
1835  (=> (and hop_1_e_a hop_1_a_k) hop_2_e_k)
1836  (=> (and hop_1_e_a hop_1_a_j) hop_2_e_j)
1837  (=> (and hop_1_e_a hop_1_a_m) hop_2_e_m)
1838  (=> (and hop_1_e_a hop_1_a_l) hop_2_e_l)
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1839   (=> (and hop_1_e_a hop_1_a_o) hop_2_e_o)
1840   (=> (and hop_1_e_a hop_1_a_n) hop_2_e_n)
1841   (=> (and hop_1_e_a hop_1_a_q) hop_2_e_q)
1842   (=> (and hop_1_e_a hop_1_a_p) hop_2_e_p)
1843   (=> (and hop_1_e_c hop_1_c_a) hop_2_e_a)
1844   (=> (and hop_1_e_c hop_1_c_b) hop_2_e_b)
1845   (=> (and hop_1_e_c hop_1_c_d) hop_2_e_d)
1846   (=> (and hop_1_e_c hop_1_c_g) hop_2_e_g)
1847   (=> (and hop_1_e_c hop_1_c_f) hop_2_e_f)
1848   (=> (and hop_1_e_c hop_1_c_i) hop_2_e_i)
1849   (=> (and hop_1_e_c hop_1_c_h) hop_2_e_h)
1850   (=> (and hop_1_e_c hop_1_c_k) hop_2_e_k)
1851   (=> (and hop_1_e_c hop_1_c_j) hop_2_e_j)
1852   (=> (and hop_1_e_c hop_1_c_m) hop_2_e_m)
1853   (=> (and hop_1_e_c hop_1_c_l) hop_2_e_l)
1854   (=> (and hop_1_e_c hop_1_c_o) hop_2_e_o)
1855   (=> (and hop_1_e_c hop_1_c_n) hop_2_e_n)
1856   (=> (and hop_1_e_c hop_1_c_q) hop_2_e_q)
1857   (=> (and hop_1_e_c hop_1_c_p) hop_2_e_p)
1858   (=> (and hop_1_e_b hop_1_b_a) hop_2_e_a)
1859   (=> (and hop_1_e_b hop_1_b_c) hop_2_e_c)
1860   (=> (and hop_1_e_b hop_1_b_d) hop_2_e_d)
1861   (=> (and hop_1_e_b hop_1_b_g) hop_2_e_g)
1862   (=> (and hop_1_e_b hop_1_b_f) hop_2_e_f)
1863   (=> (and hop_1_e_b hop_1_b_i) hop_2_e_i)
1864   (=> (and hop_1_e_b hop_1_b_h) hop_2_e_h)
1865   (=> (and hop_1_e_b hop_1_b_k) hop_2_e_k)
1866   (=> (and hop_1_e_b hop_1_b_j) hop_2_e_j)
1867   (=> (and hop_1_e_b hop_1_b_m) hop_2_e_m)
1868   (=> (and hop_1_e_b hop_1_b_l) hop_2_e_l)
1869   (=> (and hop_1_e_b hop_1_b_o) hop_2_e_o)
1870   (=> (and hop_1_e_b hop_1_b_n) hop_2_e_n)
1871   (=> (and hop_1_e_b hop_1_b_q) hop_2_e_q)
1872   (=> (and hop_1_e_b hop_1_b_p) hop_2_e_p)
1873   (=> (and hop_1_e_d hop_1_d_a) hop_2_e_a)
1874   (=> (and hop_1_e_d hop_1_d_c) hop_2_e_c)
1875   (=> (and hop_1_e_d hop_1_d_b) hop_2_e_b)
1876   (=> (and hop_1_e_d hop_1_d_g) hop_2_e_g)
1877   (=> (and hop_1_e_d hop_1_d_f) hop_2_e_f)
1878   (=> (and hop_1_e_d hop_1_d_i) hop_2_e_i)
1879   (=> (and hop_1_e_d hop_1_d_h) hop_2_e_h)
1880   (=> (and hop_1_e_d hop_1_d_k) hop_2_e_k)
1881   (=> (and hop_1_e_d hop_1_d_j) hop_2_e_j)
1882   (=> (and hop_1_e_d hop_1_d_m) hop_2_e_m)
1883   (=> (and hop_1_e_d hop_1_d_l) hop_2_e_l)
1884   (=> (and hop_1_e_d hop_1_d_o) hop_2_e_o)
1885   (=> (and hop_1_e_d hop_1_d_n) hop_2_e_n)
1886   (=> (and hop_1_e_d hop_1_d_q) hop_2_e_q)
1887   (=> (and hop_1_e_d hop_1_d_p) hop_2_e_p)
1888   (=> (and hop_1_e_g hop_1_g_a) hop_2_e_a)
1889   (=> (and hop_1_e_g hop_1_g_c) hop_2_e_c)
1890   (=> (and hop_1_e_g hop_1_g_b) hop_2_e_b)
1891   (=> (and hop_1_e_g hop_1_g_d) hop_2_e_d)
1892   (=> (and hop_1_e_g hop_1_g_f) hop_2_e_f)
1893   (=> (and hop_1_e_g hop_1_g_i) hop_2_e_i)
1894   (=> (and hop_1_e_g hop_1_g_h) hop_2_e_h)
1895   (=> (and hop_1_e_g hop_1_g_k) hop_2_e_k)
1896   (=> (and hop_1_e_g hop_1_g_j) hop_2_e_j)
1897   (=> (and hop_1_e_g hop_1_g_m) hop_2_e_m)
1898   (=> (and hop_1_e_g hop_1_g_l) hop_2_e_l)
1899   (=> (and hop_1_e_g hop_1_g_o) hop_2_e_o)
1900   (=> (and hop_1_e_g hop_1_g_n) hop_2_e_n)
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1901  (=> (and hop_1_e_g hop_1_g_q) hop_2_e_q)
1902  (=> (and hop_1_e_g hop_1_g_p) hop_2_e_p)
1903  (=> (and hop_1_e_f hop_1_f_a) hop_2_e_a)
1904  (=> (and hop_1_e_f hop_1_f_c) hop_2_e_c)
1905  (=> (and hop_1_e_f hop_1_f_b) hop_2_e_b)
1906  (=> (and hop_1_e_f hop_1_f_d) hop_2_e_d)
1907  (=> (and hop_1_e_f hop_1_f_g) hop_2_e_g)
1908  (=> (and hop_1_e_f hop_1_f_i) hop_2_e_i)
1909  (=> (and hop_1_e_f hop_1_f_h) hop_2_e_h)
1910  (=> (and hop_1_e_f hop_1_f_k) hop_2_e_k)
1911  (=> (and hop_1_e_f hop_1_f_j) hop_2_e_j)
1912  (=> (and hop_1_e_f hop_1_f_m) hop_2_e_m)
1913  (=> (and hop_1_e_f hop_1_f_l) hop_2_e_l)
1914  (=> (and hop_1_e_f hop_1_f_o) hop_2_e_o)
1915  (=> (and hop_1_e_f hop_1_f_n) hop_2_e_n)
1916  (=> (and hop_1_e_f hop_1_f_q) hop_2_e_q)
1917  (=> (and hop_1_e_f hop_1_f_p) hop_2_e_p)
1918  (=> (and hop_1_e_i hop_1_i_a) hop_2_e_a)
1919  (=> (and hop_1_e_i hop_1_i_c) hop_2_e_c)
1920  (=> (and hop_1_e_i hop_1_i_b) hop_2_e_b)
1921  (=> (and hop_1_e_i hop_1_i_d) hop_2_e_d)
1922  (=> (and hop_1_e_i hop_1_i_g) hop_2_e_g)
1923  (=> (and hop_1_e_i hop_1_i_f) hop_2_e_f)
1924  (=> (and hop_1_e_i hop_1_i_h) hop_2_e_h)
1925  (=> (and hop_1_e_i hop_1_i_k) hop_2_e_k)
1926  (=> (and hop_1_e_i hop_1_i_j) hop_2_e_j)
1927  (=> (and hop_1_e_i hop_1_i_m) hop_2_e_m)
1928  (=> (and hop_1_e_i hop_1_i_l) hop_2_e_l)
1929  (=> (and hop_1_e_i hop_1_i_o) hop_2_e_o)
1930  (=> (and hop_1_e_i hop_1_i_n) hop_2_e_n)
1931  (=> (and hop_1_e_i hop_1_i_q) hop_2_e_q)
1932  (=> (and hop_1_e_i hop_1_i_p) hop_2_e_p)
1933  (=> (and hop_1_e_h hop_1_h_a) hop_2_e_a)
1934  (=> (and hop_1_e_h hop_1_h_c) hop_2_e_c)
1935  (=> (and hop_1_e_h hop_1_h_b) hop_2_e_b)
1936  (=> (and hop_1_e_h hop_1_h_d) hop_2_e_d)
1937  (=> (and hop_1_e_h hop_1_h_g) hop_2_e_g)
1938  (=> (and hop_1_e_h hop_1_h_f) hop_2_e_f)
1939  (=> (and hop_1_e_h hop_1_h_i) hop_2_e_i)
1940  (=> (and hop_1_e_h hop_1_h_k) hop_2_e_k)
1941  (=> (and hop_1_e_h hop_1_h_j) hop_2_e_j)
1942  (=> (and hop_1_e_h hop_1_h_m) hop_2_e_m)
1943  (=> (and hop_1_e_h hop_1_h_l) hop_2_e_l)
1944  (=> (and hop_1_e_h hop_1_h_o) hop_2_e_o)
1945  (=> (and hop_1_e_h hop_1_h_n) hop_2_e_n)
1946  (=> (and hop_1_e_h hop_1_h_q) hop_2_e_q)
1947  (=> (and hop_1_e_h hop_1_h_p) hop_2_e_p)
1948  (=> (and hop_1_e_k hop_1_k_a) hop_2_e_a)
1949  (=> (and hop_1_e_k hop_1_k_c) hop_2_e_c)
1950  (=> (and hop_1_e_k hop_1_k_b) hop_2_e_b)
1951  (=> (and hop_1_e_k hop_1_k_d) hop_2_e_d)
1952  (=> (and hop_1_e_k hop_1_k_g) hop_2_e_g)
1953  (=> (and hop_1_e_k hop_1_k_f) hop_2_e_f)
1954  (=> (and hop_1_e_k hop_1_k_i) hop_2_e_i)
1955  (=> (and hop_1_e_k hop_1_k_h) hop_2_e_h)
1956  (=> (and hop_1_e_k hop_1_k_j) hop_2_e_j)
1957  (=> (and hop_1_e_k hop_1_k_m) hop_2_e_m)
1958  (=> (and hop_1_e_k hop_1_k_l) hop_2_e_l)
1959  (=> (and hop_1_e_k hop_1_k_o) hop_2_e_o)
1960  (=> (and hop_1_e_k hop_1_k_n) hop_2_e_n)
1961  (=> (and hop_1_e_k hop_1_k_q) hop_2_e_q)
1962  (=> (and hop_1_e_k hop_1_k_p) hop_2_e_p)
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1963  (=> (and hop_1_e_j hop_1_j_a) hop_2_e_a)
1964  (=> (and hop_1_e_j hop_1_j_c) hop_2_e_c)
1965  (=> (and hop_1_e_j hop_1_j_b) hop_2_e_b)
1966  (=> (and hop_1_e_j hop_1_j_d) hop_2_e_d)
1967  (=> (and hop_1_e_j hop_1_j_g) hop_2_e_g)
1968  (=> (and hop_1_e_j hop_1_j_f) hop_2_e_f)
1969  (=> (and hop_1_e_j hop_1_j_i) hop_2_e_i)
1970  (=> (and hop_1_e_j hop_1_j_h) hop_2_e_h)
1971  (=> (and hop_1_e_j hop_1_j_k) hop_2_e_k)
1972  (=> (and hop_1_e_j hop_1_j_m) hop_2_e_m)
1973  (=> (and hop_1_e_j hop_1_j_l) hop_2_e_l)
1974  (=> (and hop_1_e_j hop_1_j_o) hop_2_e_o)
1975  (=> (and hop_1_e_j hop_1_j_n) hop_2_e_n)
1976  (=> (and hop_1_e_j hop_1_j_q) hop_2_e_q)
1977  (=> (and hop_1_e_j hop_1_j_p) hop_2_e_p)
1978  (=> (and hop_1_e_m hop_1_m_a) hop_2_e_a)
1979  (=> (and hop_1_e_m hop_1_m_c) hop_2_e_c)
1980  (=> (and hop_1_e_m hop_1_m_b) hop_2_e_b)
1981  (=> (and hop_1_e_m hop_1_m_d) hop_2_e_d)
1982  (=> (and hop_1_e_m hop_1_m_g) hop_2_e_g)
1983  (=> (and hop_1_e_m hop_1_m_f) hop_2_e_f)
1984  (=> (and hop_1_e_m hop_1_m_i) hop_2_e_i)
1985  (=> (and hop_1_e_m hop_1_m_h) hop_2_e_h)
1986  (=> (and hop_1_e_m hop_1_m_k) hop_2_e_k)
1987  (=> (and hop_1_e_m hop_1_m_j) hop_2_e_j)
1988  (=> (and hop_1_e_m hop_1_m_l) hop_2_e_l)
1989  (=> (and hop_1_e_m hop_1_m_o) hop_2_e_o)
1990  (=> (and hop_1_e_m hop_1_m_n) hop_2_e_n)
1991  (=> (and hop_1_e_m hop_1_m_q) hop_2_e_q)
1992  (=> (and hop_1_e_m hop_1_m_p) hop_2_e_p)
1993  (=> (and hop_1_e_l hop_1_l_a) hop_2_e_a)
1994  (=> (and hop_1_e_l hop_1_l_c) hop_2_e_c)
1995  (=> (and hop_1_e_l hop_1_l_b) hop_2_e_b)
1996  (=> (and hop_1_e_l hop_1_l_d) hop_2_e_d)
1997  (=> (and hop_1_e_l hop_1_l_g) hop_2_e_g)
1998  (=> (and hop_1_e_l hop_1_l_f) hop_2_e_f)
1999  (=> (and hop_1_e_l hop_1_l_i) hop_2_e_i)
2000  (=> (and hop_1_e_l hop_1_l_h) hop_2_e_h)
2001  (=> (and hop_1_e_l hop_1_l_k) hop_2_e_k)
2002  (=> (and hop_1_e_l hop_1_l_j) hop_2_e_j)
2003  (=> (and hop_1_e_l hop_1_l_m) hop_2_e_m)
2004  (=> (and hop_1_e_l hop_1_l_o) hop_2_e_o)
2005  (=> (and hop_1_e_l hop_1_l_n) hop_2_e_n)
2006  (=> (and hop_1_e_l hop_1_l_q) hop_2_e_q)
2007  (=> (and hop_1_e_l hop_1_l_p) hop_2_e_p)
2008  (=> (and hop_1_e_o hop_1_o_a) hop_2_e_a)
2009  (=> (and hop_1_e_o hop_1_o_c) hop_2_e_c)
2010  (=> (and hop_1_e_o hop_1_o_b) hop_2_e_b)
2011  (=> (and hop_1_e_o hop_1_o_d) hop_2_e_d)
2012  (=> (and hop_1_e_o hop_1_o_g) hop_2_e_g)
2013  (=> (and hop_1_e_o hop_1_o_f) hop_2_e_f)
2014  (=> (and hop_1_e_o hop_1_o_i) hop_2_e_i)
2015  (=> (and hop_1_e_o hop_1_o_h) hop_2_e_h)
2016  (=> (and hop_1_e_o hop_1_o_k) hop_2_e_k)
2017  (=> (and hop_1_e_o hop_1_o_j) hop_2_e_j)
2018  (=> (and hop_1_e_o hop_1_o_m) hop_2_e_m)
2019  (=> (and hop_1_e_o hop_1_o_l) hop_2_e_l)
2020  (=> (and hop_1_e_o hop_1_o_n) hop_2_e_n)
2021  (=> (and hop_1_e_o hop_1_o_q) hop_2_e_q)
2022  (=> (and hop_1_e_o hop_1_o_p) hop_2_e_p)
2023  (=> (and hop_1_e_n hop_1_n_a) hop_2_e_a)
2024  (=> (and hop_1_e_n hop_1_n_c) hop_2_e_c)
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2025    (=> (and hop_1_e_n hop_1_n_b) hop_2_e_b)
2026    (=> (and hop_1_e_n hop_1_n_d) hop_2_e_d)
2027    (=> (and hop_1_e_n hop_1_n_g) hop_2_e_g)
2028    (=> (and hop_1_e_n hop_1_n_f) hop_2_e_f)
2029    (=> (and hop_1_e_n hop_1_n_i) hop_2_e_i)
2030    (=> (and hop_1_e_n hop_1_n_h) hop_2_e_h)
2031    (=> (and hop_1_e_n hop_1_n_k) hop_2_e_k)
2032    (=> (and hop_1_e_n hop_1_n_j) hop_2_e_j)
2033    (=> (and hop_1_e_n hop_1_n_m) hop_2_e_m)
2034    (=> (and hop_1_e_n hop_1_n_l) hop_2_e_l)
2035    (=> (and hop_1_e_n hop_1_n_o) hop_2_e_o)
2036    (=> (and hop_1_e_n hop_1_n_q) hop_2_e_q)
2037    (=> (and hop_1_e_n hop_1_n_p) hop_2_e_p)
2038    (=> (and hop_1_e_q hop_1_q_a) hop_2_e_a)
2039    (=> (and hop_1_e_q hop_1_q_c) hop_2_e_c)
2040    (=> (and hop_1_e_q hop_1_q_b) hop_2_e_b)
2041    (=> (and hop_1_e_q hop_1_q_d) hop_2_e_d)
2042    (=> (and hop_1_e_q hop_1_q_g) hop_2_e_g)
2043    (=> (and hop_1_e_q hop_1_q_f) hop_2_e_f)
2044    (=> (and hop_1_e_q hop_1_q_i) hop_2_e_i)
2045    (=> (and hop_1_e_q hop_1_q_h) hop_2_e_h)
2046    (=> (and hop_1_e_q hop_1_q_k) hop_2_e_k)
2047    (=> (and hop_1_e_q hop_1_q_j) hop_2_e_j)
2048    (=> (and hop_1_e_q hop_1_q_m) hop_2_e_m)
2049    (=> (and hop_1_e_q hop_1_q_l) hop_2_e_l)
2050    (=> (and hop_1_e_q hop_1_q_o) hop_2_e_o)
2051    (=> (and hop_1_e_q hop_1_q_n) hop_2_e_n)
2052    (=> (and hop_1_e_q hop_1_q_p) hop_2_e_p)
2053    (=> (and hop_1_e_p hop_1_p_a) hop_2_e_a)
2054    (=> (and hop_1_e_p hop_1_p_c) hop_2_e_c)
2055    (=> (and hop_1_e_p hop_1_p_b) hop_2_e_b)
2056    (=> (and hop_1_e_p hop_1_p_d) hop_2_e_d)
2057    (=> (and hop_1_e_p hop_1_p_g) hop_2_e_g)
2058    (=> (and hop_1_e_p hop_1_p_f) hop_2_e_f)
2059    (=> (and hop_1_e_p hop_1_p_i) hop_2_e_i)
2060    (=> (and hop_1_e_p hop_1_p_h) hop_2_e_h)
2061    (=> (and hop_1_e_p hop_1_p_k) hop_2_e_k)
2062    (=> (and hop_1_e_p hop_1_p_j) hop_2_e_j)
2063    (=> (and hop_1_e_p hop_1_p_m) hop_2_e_m)
2064    (=> (and hop_1_e_p hop_1_p_l) hop_2_e_l)
2065    (=> (and hop_1_e_p hop_1_p_o) hop_2_e_o)
2066    (=> (and hop_1_e_p hop_1_p_n) hop_2_e_n)
2067    (=> (and hop_1_e_p hop_1_p_q) hop_2_e_q)
2068    (=> (and hop_1_d_a hop_1_a_c) hop_2_d_c)
2069    (=> (and hop_1_d_a hop_1_a_b) hop_2_d_b)
2070    (=> (and hop_1_d_a hop_1_a_e) hop_2_d_e)
2071    (=> (and hop_1_d_a hop_1_a_g) hop_2_d_g)
2072    (=> (and hop_1_d_a hop_1_a_f) hop_2_d_f)
2073    (=> (and hop_1_d_a hop_1_a_i) hop_2_d_i)
2074    (=> (and hop_1_d_a hop_1_a_h) hop_2_d_h)
2075    (=> (and hop_1_d_a hop_1_a_k) hop_2_d_k)
2076    (=> (and hop_1_d_a hop_1_a_j) hop_2_d_j)
2077    (=> (and hop_1_d_a hop_1_a_m) hop_2_d_m)
2078    (=> (and hop_1_d_a hop_1_a_l) hop_2_d_l)
2079    (=> (and hop_1_d_a hop_1_a_o) hop_2_d_o)
2080    (=> (and hop_1_d_a hop_1_a_n) hop_2_d_n)
2081    (=> (and hop_1_d_a hop_1_a_q) hop_2_d_q)
2082    (=> (and hop_1_d_a hop_1_a_p) hop_2_d_p)
2083    (=> (and hop_1_d_c hop_1_c_a) hop_2_d_a)
2084    (=> (and hop_1_d_c hop_1_c_b) hop_2_d_b)
2085    (=> (and hop_1_d_c hop_1_c_e) hop_2_d_e)
2086    (=> (and hop_1_d_c hop_1_c_g) hop_2_d_g)
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2087   (=> (and hop_1_d_c hop_1_c_f) hop_2_d_f)
2088   (=> (and hop_1_d_c hop_1_c_i) hop_2_d_i)
2089   (=> (and hop_1_d_c hop_1_c_h) hop_2_d_h)
2090   (=> (and hop_1_d_c hop_1_c_k) hop_2_d_k)
2091   (=> (and hop_1_d_c hop_1_c_j) hop_2_d_j)
2092   (=> (and hop_1_d_c hop_1_c_m) hop_2_d_m)
2093   (=> (and hop_1_d_c hop_1_c_l) hop_2_d_l)
2094   (=> (and hop_1_d_c hop_1_c_o) hop_2_d_o)
2095   (=> (and hop_1_d_c hop_1_c_n) hop_2_d_n)
2096   (=> (and hop_1_d_c hop_1_c_q) hop_2_d_q)
2097   (=> (and hop_1_d_c hop_1_c_p) hop_2_d_p)
2098   (=> (and hop_1_d_b hop_1_b_a) hop_2_d_a)
2099   (=> (and hop_1_d_b hop_1_b_c) hop_2_d_c)
2100   (=> (and hop_1_d_b hop_1_b_e) hop_2_d_e)
2101   (=> (and hop_1_d_b hop_1_b_g) hop_2_d_g)
2102   (=> (and hop_1_d_b hop_1_b_f) hop_2_d_f)
2103   (=> (and hop_1_d_b hop_1_b_i) hop_2_d_i)
2104   (=> (and hop_1_d_b hop_1_b_h) hop_2_d_h)
2105   (=> (and hop_1_d_b hop_1_b_k) hop_2_d_k)
2106   (=> (and hop_1_d_b hop_1_b_j) hop_2_d_j)
2107   (=> (and hop_1_d_b hop_1_b_m) hop_2_d_m)
2108   (=> (and hop_1_d_b hop_1_b_l) hop_2_d_l)
2109   (=> (and hop_1_d_b hop_1_b_o) hop_2_d_o)
2110   (=> (and hop_1_d_b hop_1_b_n) hop_2_d_n)
2111   (=> (and hop_1_d_b hop_1_b_q) hop_2_d_q)
2112   (=> (and hop_1_d_b hop_1_b_p) hop_2_d_p)
2113   (=> (and hop_1_d_e hop_1_e_a) hop_2_d_a)
2114   (=> (and hop_1_d_e hop_1_e_c) hop_2_d_c)
2115   (=> (and hop_1_d_e hop_1_e_b) hop_2_d_b)
2116   (=> (and hop_1_d_e hop_1_e_g) hop_2_d_g)
2117   (=> (and hop_1_d_e hop_1_e_f) hop_2_d_f)
2118   (=> (and hop_1_d_e hop_1_e_i) hop_2_d_i)
2119   (=> (and hop_1_d_e hop_1_e_h) hop_2_d_h)
2120   (=> (and hop_1_d_e hop_1_e_k) hop_2_d_k)
2121   (=> (and hop_1_d_e hop_1_e_j) hop_2_d_j)
2122   (=> (and hop_1_d_e hop_1_e_m) hop_2_d_m)
2123   (=> (and hop_1_d_e hop_1_e_l) hop_2_d_l)
2124   (=> (and hop_1_d_e hop_1_e_o) hop_2_d_o)
2125   (=> (and hop_1_d_e hop_1_e_n) hop_2_d_n)
2126   (=> (and hop_1_d_e hop_1_e_q) hop_2_d_q)
2127   (=> (and hop_1_d_e hop_1_e_p) hop_2_d_p)
2128   (=> (and hop_1_d_g hop_1_g_a) hop_2_d_a)
2129   (=> (and hop_1_d_g hop_1_g_c) hop_2_d_c)
2130   (=> (and hop_1_d_g hop_1_g_b) hop_2_d_b)
2131   (=> (and hop_1_d_g hop_1_g_e) hop_2_d_e)
2132   (=> (and hop_1_d_g hop_1_g_f) hop_2_d_f)
2133   (=> (and hop_1_d_g hop_1_g_i) hop_2_d_i)
2134   (=> (and hop_1_d_g hop_1_g_h) hop_2_d_h)
2135   (=> (and hop_1_d_g hop_1_g_k) hop_2_d_k)
2136   (=> (and hop_1_d_g hop_1_g_j) hop_2_d_j)
2137   (=> (and hop_1_d_g hop_1_g_m) hop_2_d_m)
2138   (=> (and hop_1_d_g hop_1_g_l) hop_2_d_l)
2139   (=> (and hop_1_d_g hop_1_g_o) hop_2_d_o)
2140   (=> (and hop_1_d_g hop_1_g_n) hop_2_d_n)
2141   (=> (and hop_1_d_g hop_1_g_q) hop_2_d_q)
2142   (=> (and hop_1_d_g hop_1_g_p) hop_2_d_p)
2143   (=> (and hop_1_d_f hop_1_f_a) hop_2_d_a)
2144   (=> (and hop_1_d_f hop_1_f_c) hop_2_d_c)
2145   (=> (and hop_1_d_f hop_1_f_b) hop_2_d_b)
2146   (=> (and hop_1_d_f hop_1_f_e) hop_2_d_e)
2147   (=> (and hop_1_d_f hop_1_f_g) hop_2_d_g)
2148   (=> (and hop_1_d_f hop_1_f_i) hop_2_d_i)
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2149  (=> (and hop_1_d_f hop_1_f_h) hop_2_d_h)
2150  (=> (and hop_1_d_f hop_1_f_k) hop_2_d_k)
2151  (=> (and hop_1_d_f hop_1_f_j) hop_2_d_j)
2152  (=> (and hop_1_d_f hop_1_f_m) hop_2_d_m)
2153  (=> (and hop_1_d_f hop_1_f_l) hop_2_d_l)
2154  (=> (and hop_1_d_f hop_1_f_o) hop_2_d_o)
2155  (=> (and hop_1_d_f hop_1_f_n) hop_2_d_n)
2156  (=> (and hop_1_d_f hop_1_f_q) hop_2_d_q)
2157  (=> (and hop_1_d_f hop_1_f_p) hop_2_d_p)
2158  (=> (and hop_1_d_i hop_1_i_a) hop_2_d_a)
2159  (=> (and hop_1_d_i hop_1_i_c) hop_2_d_c)
2160  (=> (and hop_1_d_i hop_1_i_b) hop_2_d_b)
2161  (=> (and hop_1_d_i hop_1_i_e) hop_2_d_e)
2162  (=> (and hop_1_d_i hop_1_i_g) hop_2_d_g)
2163  (=> (and hop_1_d_i hop_1_i_f) hop_2_d_f)
2164  (=> (and hop_1_d_i hop_1_i_h) hop_2_d_h)
2165  (=> (and hop_1_d_i hop_1_i_k) hop_2_d_k)
2166  (=> (and hop_1_d_i hop_1_i_j) hop_2_d_j)
2167  (=> (and hop_1_d_i hop_1_i_m) hop_2_d_m)
2168  (=> (and hop_1_d_i hop_1_i_l) hop_2_d_l)
2169  (=> (and hop_1_d_i hop_1_i_o) hop_2_d_o)
2170  (=> (and hop_1_d_i hop_1_i_n) hop_2_d_n)
2171  (=> (and hop_1_d_i hop_1_i_q) hop_2_d_q)
2172  (=> (and hop_1_d_i hop_1_i_p) hop_2_d_p)
2173  (=> (and hop_1_d_h hop_1_h_a) hop_2_d_a)
2174  (=> (and hop_1_d_h hop_1_h_c) hop_2_d_c)
2175  (=> (and hop_1_d_h hop_1_h_b) hop_2_d_b)
2176  (=> (and hop_1_d_h hop_1_h_e) hop_2_d_e)
2177  (=> (and hop_1_d_h hop_1_h_g) hop_2_d_g)
2178  (=> (and hop_1_d_h hop_1_h_f) hop_2_d_f)
2179  (=> (and hop_1_d_h hop_1_h_i) hop_2_d_i)
2180  (=> (and hop_1_d_h hop_1_h_k) hop_2_d_k)
2181  (=> (and hop_1_d_h hop_1_h_j) hop_2_d_j)
2182  (=> (and hop_1_d_h hop_1_h_m) hop_2_d_m)
2183  (=> (and hop_1_d_h hop_1_h_l) hop_2_d_l)
2184  (=> (and hop_1_d_h hop_1_h_o) hop_2_d_o)
2185  (=> (and hop_1_d_h hop_1_h_n) hop_2_d_n)
2186  (=> (and hop_1_d_h hop_1_h_q) hop_2_d_q)
2187  (=> (and hop_1_d_h hop_1_h_p) hop_2_d_p)
2188  (=> (and hop_1_d_k hop_1_k_a) hop_2_d_a)
2189  (=> (and hop_1_d_k hop_1_k_c) hop_2_d_c)
2190  (=> (and hop_1_d_k hop_1_k_b) hop_2_d_b)
2191  (=> (and hop_1_d_k hop_1_k_e) hop_2_d_e)
2192  (=> (and hop_1_d_k hop_1_k_g) hop_2_d_g)
2193  (=> (and hop_1_d_k hop_1_k_f) hop_2_d_f)
2194  (=> (and hop_1_d_k hop_1_k_i) hop_2_d_i)
2195  (=> (and hop_1_d_k hop_1_k_h) hop_2_d_h)
2196  (=> (and hop_1_d_k hop_1_k_j) hop_2_d_j)
2197  (=> (and hop_1_d_k hop_1_k_m) hop_2_d_m)
2198  (=> (and hop_1_d_k hop_1_k_l) hop_2_d_l)
2199  (=> (and hop_1_d_k hop_1_k_o) hop_2_d_o)
2200  (=> (and hop_1_d_k hop_1_k_n) hop_2_d_n)
2201  (=> (and hop_1_d_k hop_1_k_q) hop_2_d_q)
2202  (=> (and hop_1_d_k hop_1_k_p) hop_2_d_p)
2203  (=> (and hop_1_d_j hop_1_j_a) hop_2_d_a)
2204  (=> (and hop_1_d_j hop_1_j_c) hop_2_d_c)
2205  (=> (and hop_1_d_j hop_1_j_b) hop_2_d_b)
2206  (=> (and hop_1_d_j hop_1_j_e) hop_2_d_e)
2207  (=> (and hop_1_d_j hop_1_j_g) hop_2_d_g)
2208  (=> (and hop_1_d_j hop_1_j_f) hop_2_d_f)
2209  (=> (and hop_1_d_j hop_1_j_i) hop_2_d_i)
2210  (=> (and hop_1_d_j hop_1_j_h) hop_2_d_h)
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2211  (=> (and hop_1_d_j hop_1_j_k) hop_2_d_k)
2212  (=> (and hop_1_d_j hop_1_j_m) hop_2_d_m)
2213  (=> (and hop_1_d_j hop_1_j_l) hop_2_d_l)
2214  (=> (and hop_1_d_j hop_1_j_o) hop_2_d_o)
2215  (=> (and hop_1_d_j hop_1_j_n) hop_2_d_n)
2216  (=> (and hop_1_d_j hop_1_j_q) hop_2_d_q)
2217  (=> (and hop_1_d_j hop_1_j_p) hop_2_d_p)
2218  (=> (and hop_1_d_m hop_1_m_a) hop_2_d_a)
2219  (=> (and hop_1_d_m hop_1_m_c) hop_2_d_c)
2220  (=> (and hop_1_d_m hop_1_m_b) hop_2_d_b)
2221  (=> (and hop_1_d_m hop_1_m_e) hop_2_d_e)
2222  (=> (and hop_1_d_m hop_1_m_g) hop_2_d_g)
2223  (=> (and hop_1_d_m hop_1_m_f) hop_2_d_f)
2224  (=> (and hop_1_d_m hop_1_m_i) hop_2_d_i)
2225  (=> (and hop_1_d_m hop_1_m_h) hop_2_d_h)
2226  (=> (and hop_1_d_m hop_1_m_k) hop_2_d_k)
2227  (=> (and hop_1_d_m hop_1_m_j) hop_2_d_j)
2228  (=> (and hop_1_d_m hop_1_m_l) hop_2_d_l)
2229  (=> (and hop_1_d_m hop_1_m_o) hop_2_d_o)
2230  (=> (and hop_1_d_m hop_1_m_n) hop_2_d_n)
2231  (=> (and hop_1_d_m hop_1_m_q) hop_2_d_q)
2232  (=> (and hop_1_d_m hop_1_m_p) hop_2_d_p)
2233  (=> (and hop_1_d_l hop_1_l_a) hop_2_d_a)
2234  (=> (and hop_1_d_l hop_1_l_c) hop_2_d_c)
2235  (=> (and hop_1_d_l hop_1_l_b) hop_2_d_b)
2236  (=> (and hop_1_d_l hop_1_l_e) hop_2_d_e)
2237  (=> (and hop_1_d_l hop_1_l_g) hop_2_d_g)
2238  (=> (and hop_1_d_l hop_1_l_f) hop_2_d_f)
2239  (=> (and hop_1_d_l hop_1_l_i) hop_2_d_i)
2240  (=> (and hop_1_d_l hop_1_l_h) hop_2_d_h)
2241  (=> (and hop_1_d_l hop_1_l_k) hop_2_d_k)
2242  (=> (and hop_1_d_l hop_1_l_j) hop_2_d_j)
2243  (=> (and hop_1_d_l hop_1_l_m) hop_2_d_m)
2244  (=> (and hop_1_d_l hop_1_l_o) hop_2_d_o)
2245  (=> (and hop_1_d_l hop_1_l_n) hop_2_d_n)
2246  (=> (and hop_1_d_l hop_1_l_q) hop_2_d_q)
2247  (=> (and hop_1_d_l hop_1_l_p) hop_2_d_p)
2248  (=> (and hop_1_d_o hop_1_o_a) hop_2_d_a)
2249  (=> (and hop_1_d_o hop_1_o_c) hop_2_d_c)
2250  (=> (and hop_1_d_o hop_1_o_b) hop_2_d_b)
2251  (=> (and hop_1_d_o hop_1_o_e) hop_2_d_e)
2252  (=> (and hop_1_d_o hop_1_o_g) hop_2_d_g)
2253  (=> (and hop_1_d_o hop_1_o_f) hop_2_d_f)
2254  (=> (and hop_1_d_o hop_1_o_i) hop_2_d_i)
2255  (=> (and hop_1_d_o hop_1_o_h) hop_2_d_h)
2256  (=> (and hop_1_d_o hop_1_o_k) hop_2_d_k)
2257  (=> (and hop_1_d_o hop_1_o_j) hop_2_d_j)
2258  (=> (and hop_1_d_o hop_1_o_m) hop_2_d_m)
2259  (=> (and hop_1_d_o hop_1_o_l) hop_2_d_l)
2260  (=> (and hop_1_d_o hop_1_o_n) hop_2_d_n)
2261  (=> (and hop_1_d_o hop_1_o_q) hop_2_d_q)
2262  (=> (and hop_1_d_o hop_1_o_p) hop_2_d_p)
2263  (=> (and hop_1_d_n hop_1_n_a) hop_2_d_a)
2264  (=> (and hop_1_d_n hop_1_n_c) hop_2_d_c)
2265  (=> (and hop_1_d_n hop_1_n_b) hop_2_d_b)
2266  (=> (and hop_1_d_n hop_1_n_e) hop_2_d_e)
2267  (=> (and hop_1_d_n hop_1_n_g) hop_2_d_g)
2268  (=> (and hop_1_d_n hop_1_n_f) hop_2_d_f)
2269  (=> (and hop_1_d_n hop_1_n_i) hop_2_d_i)
2270  (=> (and hop_1_d_n hop_1_n_h) hop_2_d_h)
2271  (=> (and hop_1_d_n hop_1_n_k) hop_2_d_k)
2272  (=> (and hop_1_d_n hop_1_n_j) hop_2_d_j)
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2273   (=> (and hop_1_d_n hop_1_n_m) hop_2_d_m)
2274   (=> (and hop_1_d_n hop_1_n_l) hop_2_d_l)
2275   (=> (and hop_1_d_n hop_1_n_o) hop_2_d_o)
2276   (=> (and hop_1_d_n hop_1_n_q) hop_2_d_q)
2277   (=> (and hop_1_d_n hop_1_n_p) hop_2_d_p)
2278   (=> (and hop_1_d_q hop_1_q_a) hop_2_d_a)
2279   (=> (and hop_1_d_q hop_1_q_c) hop_2_d_c)
2280   (=> (and hop_1_d_q hop_1_q_b) hop_2_d_b)
2281   (=> (and hop_1_d_q hop_1_q_e) hop_2_d_e)
2282   (=> (and hop_1_d_q hop_1_q_g) hop_2_d_g)
2283   (=> (and hop_1_d_q hop_1_q_f) hop_2_d_f)
2284   (=> (and hop_1_d_q hop_1_q_i) hop_2_d_i)
2285   (=> (and hop_1_d_q hop_1_q_h) hop_2_d_h)
2286   (=> (and hop_1_d_q hop_1_q_k) hop_2_d_k)
2287   (=> (and hop_1_d_q hop_1_q_j) hop_2_d_j)
2288   (=> (and hop_1_d_q hop_1_q_m) hop_2_d_m)
2289   (=> (and hop_1_d_q hop_1_q_l) hop_2_d_l)
2290   (=> (and hop_1_d_q hop_1_q_o) hop_2_d_o)
2291   (=> (and hop_1_d_q hop_1_q_n) hop_2_d_n)
2292   (=> (and hop_1_d_q hop_1_q_p) hop_2_d_p)
2293   (=> (and hop_1_d_p hop_1_p_a) hop_2_d_a)
2294   (=> (and hop_1_d_p hop_1_p_c) hop_2_d_c)
2295   (=> (and hop_1_d_p hop_1_p_b) hop_2_d_b)
2296   (=> (and hop_1_d_p hop_1_p_e) hop_2_d_e)
2297   (=> (and hop_1_d_p hop_1_p_g) hop_2_d_g)
2298   (=> (and hop_1_d_p hop_1_p_f) hop_2_d_f)
2299   (=> (and hop_1_d_p hop_1_p_i) hop_2_d_i)
2300   (=> (and hop_1_d_p hop_1_p_h) hop_2_d_h)
2301   (=> (and hop_1_d_p hop_1_p_k) hop_2_d_k)
2302   (=> (and hop_1_d_p hop_1_p_j) hop_2_d_j)
2303   (=> (and hop_1_d_p hop_1_p_m) hop_2_d_m)
2304   (=> (and hop_1_d_p hop_1_p_l) hop_2_d_l)
2305   (=> (and hop_1_d_p hop_1_p_o) hop_2_d_o)
2306   (=> (and hop_1_d_p hop_1_p_n) hop_2_d_n)
2307   (=> (and hop_1_d_p hop_1_p_q) hop_2_d_q)
2308   (=> (and hop_1_g_a hop_1_a_c) hop_2_g_c)
2309   (=> (and hop_1_g_a hop_1_a_b) hop_2_g_b)
2310   (=> (and hop_1_g_a hop_1_a_e) hop_2_g_e)
2311   (=> (and hop_1_g_a hop_1_a_d) hop_2_g_d)
2312   (=> (and hop_1_g_a hop_1_a_f) hop_2_g_f)
2313   (=> (and hop_1_g_a hop_1_a_i) hop_2_g_i)
2314   (=> (and hop_1_g_a hop_1_a_h) hop_2_g_h)
2315   (=> (and hop_1_g_a hop_1_a_k) hop_2_g_k)
2316   (=> (and hop_1_g_a hop_1_a_j) hop_2_g_j)
2317   (=> (and hop_1_g_a hop_1_a_m) hop_2_g_m)
2318   (=> (and hop_1_g_a hop_1_a_l) hop_2_g_l)
2319   (=> (and hop_1_g_a hop_1_a_o) hop_2_g_o)
2320   (=> (and hop_1_g_a hop_1_a_n) hop_2_g_n)
2321   (=> (and hop_1_g_a hop_1_a_q) hop_2_g_q)
2322   (=> (and hop_1_g_a hop_1_a_p) hop_2_g_p)
2323   (=> (and hop_1_g_c hop_1_c_a) hop_2_g_a)
2324   (=> (and hop_1_g_c hop_1_c_b) hop_2_g_b)
2325   (=> (and hop_1_g_c hop_1_c_e) hop_2_g_e)
2326   (=> (and hop_1_g_c hop_1_c_d) hop_2_g_d)
2327   (=> (and hop_1_g_c hop_1_c_f) hop_2_g_f)
2328   (=> (and hop_1_g_c hop_1_c_i) hop_2_g_i)
2329   (=> (and hop_1_g_c hop_1_c_h) hop_2_g_h)
2330   (=> (and hop_1_g_c hop_1_c_k) hop_2_g_k)
2331   (=> (and hop_1_g_c hop_1_c_j) hop_2_g_j)
2332   (=> (and hop_1_g_c hop_1_c_m) hop_2_g_m)
2333   (=> (and hop_1_g_c hop_1_c_l) hop_2_g_l)
2334   (=> (and hop_1_g_c hop_1_c_o) hop_2_g_o)
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2335  (=> (and hop_1_g_c hop_1_c_n) hop_2_g_n)
2336  (=> (and hop_1_g_c hop_1_c_q) hop_2_g_q)
2337  (=> (and hop_1_g_c hop_1_c_p) hop_2_g_p)
2338  (=> (and hop_1_g_b hop_1_b_a) hop_2_g_a)
2339  (=> (and hop_1_g_b hop_1_b_c) hop_2_g_c)
2340  (=> (and hop_1_g_b hop_1_b_e) hop_2_g_e)
2341  (=> (and hop_1_g_b hop_1_b_d) hop_2_g_d)
2342  (=> (and hop_1_g_b hop_1_b_f) hop_2_g_f)
2343  (=> (and hop_1_g_b hop_1_b_i) hop_2_g_i)
2344  (=> (and hop_1_g_b hop_1_b_h) hop_2_g_h)
2345  (=> (and hop_1_g_b hop_1_b_k) hop_2_g_k)
2346  (=> (and hop_1_g_b hop_1_b_j) hop_2_g_j)
2347  (=> (and hop_1_g_b hop_1_b_m) hop_2_g_m)
2348  (=> (and hop_1_g_b hop_1_b_l) hop_2_g_l)
2349  (=> (and hop_1_g_b hop_1_b_o) hop_2_g_o)
2350  (=> (and hop_1_g_b hop_1_b_n) hop_2_g_n)
2351  (=> (and hop_1_g_b hop_1_b_q) hop_2_g_q)
2352  (=> (and hop_1_g_b hop_1_b_p) hop_2_g_p)
2353  (=> (and hop_1_g_e hop_1_e_a) hop_2_g_a)
2354  (=> (and hop_1_g_e hop_1_e_c) hop_2_g_c)
2355  (=> (and hop_1_g_e hop_1_e_b) hop_2_g_b)
2356  (=> (and hop_1_g_e hop_1_e_d) hop_2_g_d)
2357  (=> (and hop_1_g_e hop_1_e_f) hop_2_g_f)
2358  (=> (and hop_1_g_e hop_1_e_i) hop_2_g_i)
2359  (=> (and hop_1_g_e hop_1_e_h) hop_2_g_h)
2360  (=> (and hop_1_g_e hop_1_e_k) hop_2_g_k)
2361  (=> (and hop_1_g_e hop_1_e_j) hop_2_g_j)
2362  (=> (and hop_1_g_e hop_1_e_m) hop_2_g_m)
2363  (=> (and hop_1_g_e hop_1_e_l) hop_2_g_l)
2364  (=> (and hop_1_g_e hop_1_e_o) hop_2_g_o)
2365  (=> (and hop_1_g_e hop_1_e_n) hop_2_g_n)
2366  (=> (and hop_1_g_e hop_1_e_q) hop_2_g_q)
2367  (=> (and hop_1_g_e hop_1_e_p) hop_2_g_p)
2368  (=> (and hop_1_g_d hop_1_d_a) hop_2_g_a)
2369  (=> (and hop_1_g_d hop_1_d_c) hop_2_g_c)
2370  (=> (and hop_1_g_d hop_1_d_b) hop_2_g_b)
2371  (=> (and hop_1_g_d hop_1_d_e) hop_2_g_e)
2372  (=> (and hop_1_g_d hop_1_d_f) hop_2_g_f)
2373  (=> (and hop_1_g_d hop_1_d_i) hop_2_g_i)
2374  (=> (and hop_1_g_d hop_1_d_h) hop_2_g_h)
2375  (=> (and hop_1_g_d hop_1_d_k) hop_2_g_k)
2376  (=> (and hop_1_g_d hop_1_d_j) hop_2_g_j)
2377  (=> (and hop_1_g_d hop_1_d_m) hop_2_g_m)
2378  (=> (and hop_1_g_d hop_1_d_l) hop_2_g_l)
2379  (=> (and hop_1_g_d hop_1_d_o) hop_2_g_o)
2380  (=> (and hop_1_g_d hop_1_d_n) hop_2_g_n)
2381  (=> (and hop_1_g_d hop_1_d_q) hop_2_g_q)
2382  (=> (and hop_1_g_d hop_1_d_p) hop_2_g_p)
2383  (=> (and hop_1_g_f hop_1_f_a) hop_2_g_a)
2384  (=> (and hop_1_g_f hop_1_f_c) hop_2_g_c)
2385  (=> (and hop_1_g_f hop_1_f_b) hop_2_g_b)
2386  (=> (and hop_1_g_f hop_1_f_e) hop_2_g_e)
2387  (=> (and hop_1_g_f hop_1_f_d) hop_2_g_d)
2388  (=> (and hop_1_g_f hop_1_f_i) hop_2_g_i)
2389  (=> (and hop_1_g_f hop_1_f_h) hop_2_g_h)
2390  (=> (and hop_1_g_f hop_1_f_k) hop_2_g_k)
2391  (=> (and hop_1_g_f hop_1_f_j) hop_2_g_j)
2392  (=> (and hop_1_g_f hop_1_f_m) hop_2_g_m)
2393  (=> (and hop_1_g_f hop_1_f_l) hop_2_g_l)
2394  (=> (and hop_1_g_f hop_1_f_o) hop_2_g_o)
2395  (=> (and hop_1_g_f hop_1_f_n) hop_2_g_n)
2396  (=> (and hop_1_g_f hop_1_f_q) hop_2_g_q)
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2397  (=> (and hop_1_g_f hop_1_f_p) hop_2_g_p)
2398  (=> (and hop_1_g_i hop_1_i_a) hop_2_g_a)
2399  (=> (and hop_1_g_i hop_1_i_c) hop_2_g_c)
2400  (=> (and hop_1_g_i hop_1_i_b) hop_2_g_b)
2401  (=> (and hop_1_g_i hop_1_i_e) hop_2_g_e)
2402  (=> (and hop_1_g_i hop_1_i_d) hop_2_g_d)
2403  (=> (and hop_1_g_i hop_1_i_f) hop_2_g_f)
2404  (=> (and hop_1_g_i hop_1_i_h) hop_2_g_h)
2405  (=> (and hop_1_g_i hop_1_i_k) hop_2_g_k)
2406  (=> (and hop_1_g_i hop_1_i_j) hop_2_g_j)
2407  (=> (and hop_1_g_i hop_1_i_m) hop_2_g_m)
2408  (=> (and hop_1_g_i hop_1_i_l) hop_2_g_l)
2409  (=> (and hop_1_g_i hop_1_i_o) hop_2_g_o)
2410  (=> (and hop_1_g_i hop_1_i_n) hop_2_g_n)
2411  (=> (and hop_1_g_i hop_1_i_q) hop_2_g_q)
2412  (=> (and hop_1_g_i hop_1_i_p) hop_2_g_p)
2413  (=> (and hop_1_g_h hop_1_h_a) hop_2_g_a)
2414  (=> (and hop_1_g_h hop_1_h_c) hop_2_g_c)
2415  (=> (and hop_1_g_h hop_1_h_b) hop_2_g_b)
2416  (=> (and hop_1_g_h hop_1_h_e) hop_2_g_e)
2417  (=> (and hop_1_g_h hop_1_h_d) hop_2_g_d)
2418  (=> (and hop_1_g_h hop_1_h_f) hop_2_g_f)
2419  (=> (and hop_1_g_h hop_1_h_i) hop_2_g_i)
2420  (=> (and hop_1_g_h hop_1_h_k) hop_2_g_k)
2421  (=> (and hop_1_g_h hop_1_h_j) hop_2_g_j)
2422  (=> (and hop_1_g_h hop_1_h_m) hop_2_g_m)
2423  (=> (and hop_1_g_h hop_1_h_l) hop_2_g_l)
2424  (=> (and hop_1_g_h hop_1_h_o) hop_2_g_o)
2425  (=> (and hop_1_g_h hop_1_h_n) hop_2_g_n)
2426  (=> (and hop_1_g_h hop_1_h_q) hop_2_g_q)
2427  (=> (and hop_1_g_h hop_1_h_p) hop_2_g_p)
2428  (=> (and hop_1_g_k hop_1_k_a) hop_2_g_a)
2429  (=> (and hop_1_g_k hop_1_k_c) hop_2_g_c)
2430  (=> (and hop_1_g_k hop_1_k_b) hop_2_g_b)
2431  (=> (and hop_1_g_k hop_1_k_e) hop_2_g_e)
2432  (=> (and hop_1_g_k hop_1_k_d) hop_2_g_d)
2433  (=> (and hop_1_g_k hop_1_k_f) hop_2_g_f)
2434  (=> (and hop_1_g_k hop_1_k_i) hop_2_g_i)
2435  (=> (and hop_1_g_k hop_1_k_h) hop_2_g_h)
2436  (=> (and hop_1_g_k hop_1_k_j) hop_2_g_j)
2437  (=> (and hop_1_g_k hop_1_k_m) hop_2_g_m)
2438  (=> (and hop_1_g_k hop_1_k_l) hop_2_g_l)
2439  (=> (and hop_1_g_k hop_1_k_o) hop_2_g_o)
2440  (=> (and hop_1_g_k hop_1_k_n) hop_2_g_n)
2441  (=> (and hop_1_g_k hop_1_k_q) hop_2_g_q)
2442  (=> (and hop_1_g_k hop_1_k_p) hop_2_g_p)
2443  (=> (and hop_1_g_j hop_1_j_a) hop_2_g_a)
2444  (=> (and hop_1_g_j hop_1_j_c) hop_2_g_c)
2445  (=> (and hop_1_g_j hop_1_j_b) hop_2_g_b)
2446  (=> (and hop_1_g_j hop_1_j_e) hop_2_g_e)
2447  (=> (and hop_1_g_j hop_1_j_d) hop_2_g_d)
2448  (=> (and hop_1_g_j hop_1_j_f) hop_2_g_f)
2449  (=> (and hop_1_g_j hop_1_j_i) hop_2_g_i)
2450  (=> (and hop_1_g_j hop_1_j_h) hop_2_g_h)
2451  (=> (and hop_1_g_j hop_1_j_k) hop_2_g_k)
2452  (=> (and hop_1_g_j hop_1_j_m) hop_2_g_m)
2453  (=> (and hop_1_g_j hop_1_j_l) hop_2_g_l)
2454  (=> (and hop_1_g_j hop_1_j_o) hop_2_g_o)
2455  (=> (and hop_1_g_j hop_1_j_n) hop_2_g_n)
2456  (=> (and hop_1_g_j hop_1_j_q) hop_2_g_q)
2457  (=> (and hop_1_g_j hop_1_j_p) hop_2_g_p)
2458  (=> (and hop_1_g_m hop_1_m_a) hop_2_g_a)
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2459  (=> (and hop_1_g_m hop_1_m_c) hop_2_g_c)
2460  (=> (and hop_1_g_m hop_1_m_b) hop_2_g_b)
2461  (=> (and hop_1_g_m hop_1_m_e) hop_2_g_e)
2462  (=> (and hop_1_g_m hop_1_m_d) hop_2_g_d)
2463  (=> (and hop_1_g_m hop_1_m_f) hop_2_g_f)
2464  (=> (and hop_1_g_m hop_1_m_i) hop_2_g_i)
2465  (=> (and hop_1_g_m hop_1_m_h) hop_2_g_h)
2466  (=> (and hop_1_g_m hop_1_m_k) hop_2_g_k)
2467  (=> (and hop_1_g_m hop_1_m_j) hop_2_g_j)
2468  (=> (and hop_1_g_m hop_1_m_l) hop_2_g_l)
2469  (=> (and hop_1_g_m hop_1_m_o) hop_2_g_o)
2470  (=> (and hop_1_g_m hop_1_m_n) hop_2_g_n)
2471  (=> (and hop_1_g_m hop_1_m_q) hop_2_g_q)
2472  (=> (and hop_1_g_m hop_1_m_p) hop_2_g_p)
2473  (=> (and hop_1_g_l hop_1_l_a) hop_2_g_a)
2474  (=> (and hop_1_g_l hop_1_l_c) hop_2_g_c)
2475  (=> (and hop_1_g_l hop_1_l_b) hop_2_g_b)
2476  (=> (and hop_1_g_l hop_1_l_e) hop_2_g_e)
2477  (=> (and hop_1_g_l hop_1_l_d) hop_2_g_d)
2478  (=> (and hop_1_g_l hop_1_l_f) hop_2_g_f)
2479  (=> (and hop_1_g_l hop_1_l_i) hop_2_g_i)
2480  (=> (and hop_1_g_l hop_1_l_h) hop_2_g_h)
2481  (=> (and hop_1_g_l hop_1_l_k) hop_2_g_k)
2482  (=> (and hop_1_g_l hop_1_l_j) hop_2_g_j)
2483  (=> (and hop_1_g_l hop_1_l_m) hop_2_g_m)
2484  (=> (and hop_1_g_l hop_1_l_o) hop_2_g_o)
2485  (=> (and hop_1_g_l hop_1_l_n) hop_2_g_n)
2486  (=> (and hop_1_g_l hop_1_l_q) hop_2_g_q)
2487  (=> (and hop_1_g_l hop_1_l_p) hop_2_g_p)
2488  (=> (and hop_1_g_o hop_1_o_a) hop_2_g_a)
2489  (=> (and hop_1_g_o hop_1_o_c) hop_2_g_c)
2490  (=> (and hop_1_g_o hop_1_o_b) hop_2_g_b)
2491  (=> (and hop_1_g_o hop_1_o_e) hop_2_g_e)
2492  (=> (and hop_1_g_o hop_1_o_d) hop_2_g_d)
2493  (=> (and hop_1_g_o hop_1_o_f) hop_2_g_f)
2494  (=> (and hop_1_g_o hop_1_o_i) hop_2_g_i)
2495  (=> (and hop_1_g_o hop_1_o_h) hop_2_g_h)
2496  (=> (and hop_1_g_o hop_1_o_k) hop_2_g_k)
2497  (=> (and hop_1_g_o hop_1_o_j) hop_2_g_j)
2498  (=> (and hop_1_g_o hop_1_o_m) hop_2_g_m)
2499  (=> (and hop_1_g_o hop_1_o_l) hop_2_g_l)
2500  (=> (and hop_1_g_o hop_1_o_n) hop_2_g_n)
2501  (=> (and hop_1_g_o hop_1_o_q) hop_2_g_q)
2502  (=> (and hop_1_g_o hop_1_o_p) hop_2_g_p)
2503  (=> (and hop_1_g_n hop_1_n_a) hop_2_g_a)
2504  (=> (and hop_1_g_n hop_1_n_c) hop_2_g_c)
2505  (=> (and hop_1_g_n hop_1_n_b) hop_2_g_b)
2506  (=> (and hop_1_g_n hop_1_n_e) hop_2_g_e)
2507  (=> (and hop_1_g_n hop_1_n_d) hop_2_g_d)
2508  (=> (and hop_1_g_n hop_1_n_f) hop_2_g_f)
2509  (=> (and hop_1_g_n hop_1_n_i) hop_2_g_i)
2510  (=> (and hop_1_g_n hop_1_n_h) hop_2_g_h)
2511  (=> (and hop_1_g_n hop_1_n_k) hop_2_g_k)
2512  (=> (and hop_1_g_n hop_1_n_j) hop_2_g_j)
2513  (=> (and hop_1_g_n hop_1_n_m) hop_2_g_m)
2514  (=> (and hop_1_g_n hop_1_n_l) hop_2_g_l)
2515  (=> (and hop_1_g_n hop_1_n_o) hop_2_g_o)
2516  (=> (and hop_1_g_n hop_1_n_q) hop_2_g_q)
2517  (=> (and hop_1_g_n hop_1_n_p) hop_2_g_p)
2518  (=> (and hop_1_g_q hop_1_q_a) hop_2_g_a)
2519  (=> (and hop_1_g_q hop_1_q_c) hop_2_g_c)
2520  (=> (and hop_1_g_q hop_1_q_b) hop_2_g_b)
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2521  (=> (and hop_1_g_q hop_1_q_e) hop_2_g_e)
2522  (=> (and hop_1_g_q hop_1_q_d) hop_2_g_d)
2523  (=> (and hop_1_g_q hop_1_q_f) hop_2_g_f)
2524  (=> (and hop_1_g_q hop_1_q_i) hop_2_g_i)
2525  (=> (and hop_1_g_q hop_1_q_h) hop_2_g_h)
2526  (=> (and hop_1_g_q hop_1_q_k) hop_2_g_k)
2527  (=> (and hop_1_g_q hop_1_q_j) hop_2_g_j)
2528  (=> (and hop_1_g_q hop_1_q_m) hop_2_g_m)
2529  (=> (and hop_1_g_q hop_1_q_l) hop_2_g_l)
2530  (=> (and hop_1_g_q hop_1_q_o) hop_2_g_o)
2531  (=> (and hop_1_g_q hop_1_q_n) hop_2_g_n)
2532  (=> (and hop_1_g_q hop_1_q_p) hop_2_g_p)
2533  (=> (and hop_1_g_p hop_1_p_a) hop_2_g_a)
2534  (=> (and hop_1_g_p hop_1_p_c) hop_2_g_c)
2535  (=> (and hop_1_g_p hop_1_p_b) hop_2_g_b)
2536  (=> (and hop_1_g_p hop_1_p_e) hop_2_g_e)
2537  (=> (and hop_1_g_p hop_1_p_d) hop_2_g_d)
2538  (=> (and hop_1_g_p hop_1_p_f) hop_2_g_f)
2539  (=> (and hop_1_g_p hop_1_p_i) hop_2_g_i)
2540  (=> (and hop_1_g_p hop_1_p_h) hop_2_g_h)
2541  (=> (and hop_1_g_p hop_1_p_k) hop_2_g_k)
2542  (=> (and hop_1_g_p hop_1_p_j) hop_2_g_j)
2543  (=> (and hop_1_g_p hop_1_p_m) hop_2_g_m)
2544  (=> (and hop_1_g_p hop_1_p_l) hop_2_g_l)
2545  (=> (and hop_1_g_p hop_1_p_o) hop_2_g_o)
2546  (=> (and hop_1_g_p hop_1_p_n) hop_2_g_n)
2547  (=> (and hop_1_g_p hop_1_p_q) hop_2_g_q)
2548  (=> (and hop_1_f_a hop_1_a_c) hop_2_f_c)
2549  (=> (and hop_1_f_a hop_1_a_b) hop_2_f_b)
2550  (=> (and hop_1_f_a hop_1_a_e) hop_2_f_e)
2551  (=> (and hop_1_f_a hop_1_a_d) hop_2_f_d)
2552  (=> (and hop_1_f_a hop_1_a_g) hop_2_f_g)
2553  (=> (and hop_1_f_a hop_1_a_i) hop_2_f_i)
2554  (=> (and hop_1_f_a hop_1_a_h) hop_2_f_h)
2555  (=> (and hop_1_f_a hop_1_a_k) hop_2_f_k)
2556  (=> (and hop_1_f_a hop_1_a_j) hop_2_f_j)
2557  (=> (and hop_1_f_a hop_1_a_m) hop_2_f_m)
2558  (=> (and hop_1_f_a hop_1_a_l) hop_2_f_l)
2559  (=> (and hop_1_f_a hop_1_a_o) hop_2_f_o)
2560  (=> (and hop_1_f_a hop_1_a_n) hop_2_f_n)
2561  (=> (and hop_1_f_a hop_1_a_q) hop_2_f_q)
2562  (=> (and hop_1_f_a hop_1_a_p) hop_2_f_p)
2563  (=> (and hop_1_f_c hop_1_c_a) hop_2_f_a)
2564  (=> (and hop_1_f_c hop_1_c_b) hop_2_f_b)
2565  (=> (and hop_1_f_c hop_1_c_e) hop_2_f_e)
2566  (=> (and hop_1_f_c hop_1_c_d) hop_2_f_d)
2567  (=> (and hop_1_f_c hop_1_c_g) hop_2_f_g)
2568  (=> (and hop_1_f_c hop_1_c_i) hop_2_f_i)
2569  (=> (and hop_1_f_c hop_1_c_h) hop_2_f_h)
2570  (=> (and hop_1_f_c hop_1_c_k) hop_2_f_k)
2571  (=> (and hop_1_f_c hop_1_c_j) hop_2_f_j)
2572  (=> (and hop_1_f_c hop_1_c_m) hop_2_f_m)
2573  (=> (and hop_1_f_c hop_1_c_l) hop_2_f_l)
2574  (=> (and hop_1_f_c hop_1_c_o) hop_2_f_o)
2575  (=> (and hop_1_f_c hop_1_c_n) hop_2_f_n)
2576  (=> (and hop_1_f_c hop_1_c_q) hop_2_f_q)
2577  (=> (and hop_1_f_c hop_1_c_p) hop_2_f_p)
2578  (=> (and hop_1_f_b hop_1_b_a) hop_2_f_a)
2579  (=> (and hop_1_f_b hop_1_b_c) hop_2_f_c)
2580  (=> (and hop_1_f_b hop_1_b_e) hop_2_f_e)
2581  (=> (and hop_1_f_b hop_1_b_d) hop_2_f_d)
2582  (=> (and hop_1_f_b hop_1_b_g) hop_2_f_g)
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2583   (=> (and hop_1_f_b hop_1_b_i) hop_2_f_i)
2584   (=> (and hop_1_f_b hop_1_b_h) hop_2_f_h)
2585   (=> (and hop_1_f_b hop_1_b_k) hop_2_f_k)
2586   (=> (and hop_1_f_b hop_1_b_j) hop_2_f_j)
2587   (=> (and hop_1_f_b hop_1_b_m) hop_2_f_m)
2588   (=> (and hop_1_f_b hop_1_b_l) hop_2_f_l)
2589   (=> (and hop_1_f_b hop_1_b_o) hop_2_f_o)
2590   (=> (and hop_1_f_b hop_1_b_n) hop_2_f_n)
2591   (=> (and hop_1_f_b hop_1_b_q) hop_2_f_q)
2592   (=> (and hop_1_f_b hop_1_b_p) hop_2_f_p)
2593   (=> (and hop_1_f_e hop_1_e_a) hop_2_f_a)
2594   (=> (and hop_1_f_e hop_1_e_c) hop_2_f_c)
2595   (=> (and hop_1_f_e hop_1_e_b) hop_2_f_b)
2596   (=> (and hop_1_f_e hop_1_e_d) hop_2_f_d)
2597   (=> (and hop_1_f_e hop_1_e_g) hop_2_f_g)
2598   (=> (and hop_1_f_e hop_1_e_i) hop_2_f_i)
2599   (=> (and hop_1_f_e hop_1_e_h) hop_2_f_h)
2600   (=> (and hop_1_f_e hop_1_e_k) hop_2_f_k)
2601   (=> (and hop_1_f_e hop_1_e_j) hop_2_f_j)
2602   (=> (and hop_1_f_e hop_1_e_m) hop_2_f_m)
2603   (=> (and hop_1_f_e hop_1_e_l) hop_2_f_l)
2604   (=> (and hop_1_f_e hop_1_e_o) hop_2_f_o)
2605   (=> (and hop_1_f_e hop_1_e_n) hop_2_f_n)
2606   (=> (and hop_1_f_e hop_1_e_q) hop_2_f_q)
2607   (=> (and hop_1_f_e hop_1_e_p) hop_2_f_p)
2608   (=> (and hop_1_f_d hop_1_d_a) hop_2_f_a)
2609   (=> (and hop_1_f_d hop_1_d_c) hop_2_f_c)
2610   (=> (and hop_1_f_d hop_1_d_b) hop_2_f_b)
2611   (=> (and hop_1_f_d hop_1_d_e) hop_2_f_e)
2612   (=> (and hop_1_f_d hop_1_d_g) hop_2_f_g)
2613   (=> (and hop_1_f_d hop_1_d_i) hop_2_f_i)
2614   (=> (and hop_1_f_d hop_1_d_h) hop_2_f_h)
2615   (=> (and hop_1_f_d hop_1_d_k) hop_2_f_k)
2616   (=> (and hop_1_f_d hop_1_d_j) hop_2_f_j)
2617   (=> (and hop_1_f_d hop_1_d_m) hop_2_f_m)
2618   (=> (and hop_1_f_d hop_1_d_l) hop_2_f_l)
2619   (=> (and hop_1_f_d hop_1_d_o) hop_2_f_o)
2620   (=> (and hop_1_f_d hop_1_d_n) hop_2_f_n)
2621   (=> (and hop_1_f_d hop_1_d_q) hop_2_f_q)
2622   (=> (and hop_1_f_d hop_1_d_p) hop_2_f_p)
2623   (=> (and hop_1_f_g hop_1_g_a) hop_2_f_a)
2624   (=> (and hop_1_f_g hop_1_g_c) hop_2_f_c)
2625   (=> (and hop_1_f_g hop_1_g_b) hop_2_f_b)
2626   (=> (and hop_1_f_g hop_1_g_e) hop_2_f_e)
2627   (=> (and hop_1_f_g hop_1_g_d) hop_2_f_d)
2628   (=> (and hop_1_f_g hop_1_g_i) hop_2_f_i)
2629   (=> (and hop_1_f_g hop_1_g_h) hop_2_f_h)
2630   (=> (and hop_1_f_g hop_1_g_k) hop_2_f_k)
2631   (=> (and hop_1_f_g hop_1_g_j) hop_2_f_j)
2632   (=> (and hop_1_f_g hop_1_g_m) hop_2_f_m)
2633   (=> (and hop_1_f_g hop_1_g_l) hop_2_f_l)
2634   (=> (and hop_1_f_g hop_1_g_o) hop_2_f_o)
2635   (=> (and hop_1_f_g hop_1_g_n) hop_2_f_n)
2636   (=> (and hop_1_f_g hop_1_g_q) hop_2_f_q)
2637   (=> (and hop_1_f_g hop_1_g_p) hop_2_f_p)
2638   (=> (and hop_1_f_i hop_1_i_a) hop_2_f_a)
2639   (=> (and hop_1_f_i hop_1_i_c) hop_2_f_c)
2640   (=> (and hop_1_f_i hop_1_i_b) hop_2_f_b)
2641   (=> (and hop_1_f_i hop_1_i_e) hop_2_f_e)
2642   (=> (and hop_1_f_i hop_1_i_d) hop_2_f_d)
2643   (=> (and hop_1_f_i hop_1_i_g) hop_2_f_g)
2644   (=> (and hop_1_f_i hop_1_i_h) hop_2_f_h)
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2645    (=> (and hop_1_f_i hop_1_i_k) hop_2_f_k)
2646    (=> (and hop_1_f_i hop_1_i_j) hop_2_f_j)
2647    (=> (and hop_1_f_i hop_1_i_m) hop_2_f_m)
2648    (=> (and hop_1_f_i hop_1_i_l) hop_2_f_l)
2649    (=> (and hop_1_f_i hop_1_i_o) hop_2_f_o)
2650    (=> (and hop_1_f_i hop_1_i_n) hop_2_f_n)
2651    (=> (and hop_1_f_i hop_1_i_q) hop_2_f_q)
2652    (=> (and hop_1_f_i hop_1_i_p) hop_2_f_p)
2653    (=> (and hop_1_f_h hop_1_h_a) hop_2_f_a)
2654    (=> (and hop_1_f_h hop_1_h_c) hop_2_f_c)
2655    (=> (and hop_1_f_h hop_1_h_b) hop_2_f_b)
2656    (=> (and hop_1_f_h hop_1_h_e) hop_2_f_e)
2657    (=> (and hop_1_f_h hop_1_h_d) hop_2_f_d)
2658    (=> (and hop_1_f_h hop_1_h_g) hop_2_f_g)
2659    (=> (and hop_1_f_h hop_1_h_i) hop_2_f_i)
2660    (=> (and hop_1_f_h hop_1_h_k) hop_2_f_k)
2661    (=> (and hop_1_f_h hop_1_h_j) hop_2_f_j)
2662    (=> (and hop_1_f_h hop_1_h_m) hop_2_f_m)
2663    (=> (and hop_1_f_h hop_1_h_l) hop_2_f_l)
2664    (=> (and hop_1_f_h hop_1_h_o) hop_2_f_o)
2665    (=> (and hop_1_f_h hop_1_h_n) hop_2_f_n)
2666    (=> (and hop_1_f_h hop_1_h_q) hop_2_f_q)
2667    (=> (and hop_1_f_h hop_1_h_p) hop_2_f_p)
2668    (=> (and hop_1_f_k hop_1_k_a) hop_2_f_a)
2669    (=> (and hop_1_f_k hop_1_k_c) hop_2_f_c)
2670    (=> (and hop_1_f_k hop_1_k_b) hop_2_f_b)
2671    (=> (and hop_1_f_k hop_1_k_e) hop_2_f_e)
2672    (=> (and hop_1_f_k hop_1_k_d) hop_2_f_d)
2673    (=> (and hop_1_f_k hop_1_k_g) hop_2_f_g)
2674    (=> (and hop_1_f_k hop_1_k_i) hop_2_f_i)
2675    (=> (and hop_1_f_k hop_1_k_h) hop_2_f_h)
2676    (=> (and hop_1_f_k hop_1_k_j) hop_2_f_j)
2677    (=> (and hop_1_f_k hop_1_k_m) hop_2_f_m)
2678    (=> (and hop_1_f_k hop_1_k_l) hop_2_f_l)
2679    (=> (and hop_1_f_k hop_1_k_o) hop_2_f_o)
2680    (=> (and hop_1_f_k hop_1_k_n) hop_2_f_n)
2681    (=> (and hop_1_f_k hop_1_k_q) hop_2_f_q)
2682    (=> (and hop_1_f_k hop_1_k_p) hop_2_f_p)
2683    (=> (and hop_1_f_j hop_1_j_a) hop_2_f_a)
2684    (=> (and hop_1_f_j hop_1_j_c) hop_2_f_c)
2685    (=> (and hop_1_f_j hop_1_j_b) hop_2_f_b)
2686    (=> (and hop_1_f_j hop_1_j_e) hop_2_f_e)
2687    (=> (and hop_1_f_j hop_1_j_d) hop_2_f_d)
2688    (=> (and hop_1_f_j hop_1_j_g) hop_2_f_g)
2689    (=> (and hop_1_f_j hop_1_j_i) hop_2_f_i)
2690    (=> (and hop_1_f_j hop_1_j_h) hop_2_f_h)
2691    (=> (and hop_1_f_j hop_1_j_k) hop_2_f_k)
2692    (=> (and hop_1_f_j hop_1_j_m) hop_2_f_m)
2693    (=> (and hop_1_f_j hop_1_j_l) hop_2_f_l)
2694    (=> (and hop_1_f_j hop_1_j_o) hop_2_f_o)
2695    (=> (and hop_1_f_j hop_1_j_n) hop_2_f_n)
2696    (=> (and hop_1_f_j hop_1_j_q) hop_2_f_q)
2697    (=> (and hop_1_f_j hop_1_j_p) hop_2_f_p)
2698    (=> (and hop_1_f_m hop_1_m_a) hop_2_f_a)
2699    (=> (and hop_1_f_m hop_1_m_c) hop_2_f_c)
2700    (=> (and hop_1_f_m hop_1_m_b) hop_2_f_b)
2701    (=> (and hop_1_f_m hop_1_m_e) hop_2_f_e)
2702    (=> (and hop_1_f_m hop_1_m_d) hop_2_f_d)
2703    (=> (and hop_1_f_m hop_1_m_g) hop_2_f_g)
2704    (=> (and hop_1_f_m hop_1_m_i) hop_2_f_i)
2705    (=> (and hop_1_f_m hop_1_m_h) hop_2_f_h)
2706    (=> (and hop_1_f_m hop_1_m_k) hop_2_f_k)
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2707   (=> (and hop_1_f_m hop_1_m_j) hop_2_f_j)
2708   (=> (and hop_1_f_m hop_1_m_l) hop_2_f_l)
2709   (=> (and hop_1_f_m hop_1_m_o) hop_2_f_o)
2710   (=> (and hop_1_f_m hop_1_m_n) hop_2_f_n)
2711   (=> (and hop_1_f_m hop_1_m_q) hop_2_f_q)
2712   (=> (and hop_1_f_m hop_1_m_p) hop_2_f_p)
2713   (=> (and hop_1_f_l hop_1_l_a) hop_2_f_a)
2714   (=> (and hop_1_f_l hop_1_l_c) hop_2_f_c)
2715   (=> (and hop_1_f_l hop_1_l_b) hop_2_f_b)
2716   (=> (and hop_1_f_l hop_1_l_e) hop_2_f_e)
2717   (=> (and hop_1_f_l hop_1_l_d) hop_2_f_d)
2718   (=> (and hop_1_f_l hop_1_l_g) hop_2_f_g)
2719   (=> (and hop_1_f_l hop_1_l_i) hop_2_f_i)
2720   (=> (and hop_1_f_l hop_1_l_h) hop_2_f_h)
2721   (=> (and hop_1_f_l hop_1_l_k) hop_2_f_k)
2722   (=> (and hop_1_f_l hop_1_l_j) hop_2_f_j)
2723   (=> (and hop_1_f_l hop_1_l_m) hop_2_f_m)
2724   (=> (and hop_1_f_l hop_1_l_o) hop_2_f_o)
2725   (=> (and hop_1_f_l hop_1_l_n) hop_2_f_n)
2726   (=> (and hop_1_f_l hop_1_l_q) hop_2_f_q)
2727   (=> (and hop_1_f_l hop_1_l_p) hop_2_f_p)
2728   (=> (and hop_1_f_o hop_1_o_a) hop_2_f_a)
2729   (=> (and hop_1_f_o hop_1_o_c) hop_2_f_c)
2730   (=> (and hop_1_f_o hop_1_o_b) hop_2_f_b)
2731   (=> (and hop_1_f_o hop_1_o_e) hop_2_f_e)
2732   (=> (and hop_1_f_o hop_1_o_d) hop_2_f_d)
2733   (=> (and hop_1_f_o hop_1_o_g) hop_2_f_g)
2734   (=> (and hop_1_f_o hop_1_o_i) hop_2_f_i)
2735   (=> (and hop_1_f_o hop_1_o_h) hop_2_f_h)
2736   (=> (and hop_1_f_o hop_1_o_k) hop_2_f_k)
2737   (=> (and hop_1_f_o hop_1_o_j) hop_2_f_j)
2738   (=> (and hop_1_f_o hop_1_o_m) hop_2_f_m)
2739   (=> (and hop_1_f_o hop_1_o_l) hop_2_f_l)
2740   (=> (and hop_1_f_o hop_1_o_n) hop_2_f_n)
2741   (=> (and hop_1_f_o hop_1_o_q) hop_2_f_q)
2742   (=> (and hop_1_f_o hop_1_o_p) hop_2_f_p)
2743   (=> (and hop_1_f_n hop_1_n_a) hop_2_f_a)
2744   (=> (and hop_1_f_n hop_1_n_c) hop_2_f_c)
2745   (=> (and hop_1_f_n hop_1_n_b) hop_2_f_b)
2746   (=> (and hop_1_f_n hop_1_n_e) hop_2_f_e)
2747   (=> (and hop_1_f_n hop_1_n_d) hop_2_f_d)
2748   (=> (and hop_1_f_n hop_1_n_g) hop_2_f_g)
2749   (=> (and hop_1_f_n hop_1_n_i) hop_2_f_i)
2750   (=> (and hop_1_f_n hop_1_n_h) hop_2_f_h)
2751   (=> (and hop_1_f_n hop_1_n_k) hop_2_f_k)
2752   (=> (and hop_1_f_n hop_1_n_j) hop_2_f_j)
2753   (=> (and hop_1_f_n hop_1_n_m) hop_2_f_m)
2754   (=> (and hop_1_f_n hop_1_n_l) hop_2_f_l)
2755   (=> (and hop_1_f_n hop_1_n_o) hop_2_f_o)
2756   (=> (and hop_1_f_n hop_1_n_q) hop_2_f_q)
2757   (=> (and hop_1_f_n hop_1_n_p) hop_2_f_p)
2758   (=> (and hop_1_f_q hop_1_q_a) hop_2_f_a)
2759   (=> (and hop_1_f_q hop_1_q_c) hop_2_f_c)
2760   (=> (and hop_1_f_q hop_1_q_b) hop_2_f_b)
2761   (=> (and hop_1_f_q hop_1_q_e) hop_2_f_e)
2762   (=> (and hop_1_f_q hop_1_q_d) hop_2_f_d)
2763   (=> (and hop_1_f_q hop_1_q_g) hop_2_f_g)
2764   (=> (and hop_1_f_q hop_1_q_i) hop_2_f_i)
2765   (=> (and hop_1_f_q hop_1_q_h) hop_2_f_h)
2766   (=> (and hop_1_f_q hop_1_q_k) hop_2_f_k)
2767   (=> (and hop_1_f_q hop_1_q_j) hop_2_f_j)
2768   (=> (and hop_1_f_q hop_1_q_m) hop_2_f_m)
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2769  (=> (and hop_1_f_q hop_1_q_l) hop_2_f_l)
2770  (=> (and hop_1_f_q hop_1_q_o) hop_2_f_o)
2771  (=> (and hop_1_f_q hop_1_q_n) hop_2_f_n)
2772  (=> (and hop_1_f_q hop_1_q_p) hop_2_f_p)
2773  (=> (and hop_1_f_p hop_1_p_a) hop_2_f_a)
2774  (=> (and hop_1_f_p hop_1_p_c) hop_2_f_c)
2775  (=> (and hop_1_f_p hop_1_p_b) hop_2_f_b)
2776  (=> (and hop_1_f_p hop_1_p_e) hop_2_f_e)
2777  (=> (and hop_1_f_p hop_1_p_d) hop_2_f_d)
2778  (=> (and hop_1_f_p hop_1_p_g) hop_2_f_g)
2779  (=> (and hop_1_f_p hop_1_p_i) hop_2_f_i)
2780  (=> (and hop_1_f_p hop_1_p_h) hop_2_f_h)
2781  (=> (and hop_1_f_p hop_1_p_k) hop_2_f_k)
2782  (=> (and hop_1_f_p hop_1_p_j) hop_2_f_j)
2783  (=> (and hop_1_f_p hop_1_p_m) hop_2_f_m)
2784  (=> (and hop_1_f_p hop_1_p_l) hop_2_f_l)
2785  (=> (and hop_1_f_p hop_1_p_o) hop_2_f_o)
2786  (=> (and hop_1_f_p hop_1_p_n) hop_2_f_n)
2787  (=> (and hop_1_f_p hop_1_p_q) hop_2_f_q)
2788  (=> (and hop_1_i_a hop_1_a_c) hop_2_i_c)
2789  (=> (and hop_1_i_a hop_1_a_b) hop_2_i_b)
2790  (=> (and hop_1_i_a hop_1_a_e) hop_2_i_e)
2791  (=> (and hop_1_i_a hop_1_a_d) hop_2_i_d)
2792  (=> (and hop_1_i_a hop_1_a_g) hop_2_i_g)
2793  (=> (and hop_1_i_a hop_1_a_f) hop_2_i_f)
2794  (=> (and hop_1_i_a hop_1_a_h) hop_2_i_h)
2795  (=> (and hop_1_i_a hop_1_a_k) hop_2_i_k)
2796  (=> (and hop_1_i_a hop_1_a_j) hop_2_i_j)
2797  (=> (and hop_1_i_a hop_1_a_m) hop_2_i_m)
2798  (=> (and hop_1_i_a hop_1_a_l) hop_2_i_l)
2799  (=> (and hop_1_i_a hop_1_a_o) hop_2_i_o)
2800  (=> (and hop_1_i_a hop_1_a_n) hop_2_i_n)
2801  (=> (and hop_1_i_a hop_1_a_q) hop_2_i_q)
2802  (=> (and hop_1_i_a hop_1_a_p) hop_2_i_p)
2803  (=> (and hop_1_i_c hop_1_c_a) hop_2_i_a)
2804  (=> (and hop_1_i_c hop_1_c_b) hop_2_i_b)
2805  (=> (and hop_1_i_c hop_1_c_e) hop_2_i_e)
2806  (=> (and hop_1_i_c hop_1_c_d) hop_2_i_d)
2807  (=> (and hop_1_i_c hop_1_c_g) hop_2_i_g)
2808  (=> (and hop_1_i_c hop_1_c_f) hop_2_i_f)
2809  (=> (and hop_1_i_c hop_1_c_h) hop_2_i_h)
2810  (=> (and hop_1_i_c hop_1_c_k) hop_2_i_k)
2811  (=> (and hop_1_i_c hop_1_c_j) hop_2_i_j)
2812  (=> (and hop_1_i_c hop_1_c_m) hop_2_i_m)
2813  (=> (and hop_1_i_c hop_1_c_l) hop_2_i_l)
2814  (=> (and hop_1_i_c hop_1_c_o) hop_2_i_o)
2815  (=> (and hop_1_i_c hop_1_c_n) hop_2_i_n)
2816  (=> (and hop_1_i_c hop_1_c_q) hop_2_i_q)
2817  (=> (and hop_1_i_c hop_1_c_p) hop_2_i_p)
2818  (=> (and hop_1_i_b hop_1_b_a) hop_2_i_a)
2819  (=> (and hop_1_i_b hop_1_b_c) hop_2_i_c)
2820  (=> (and hop_1_i_b hop_1_b_e) hop_2_i_e)
2821  (=> (and hop_1_i_b hop_1_b_d) hop_2_i_d)
2822  (=> (and hop_1_i_b hop_1_b_g) hop_2_i_g)
2823  (=> (and hop_1_i_b hop_1_b_f) hop_2_i_f)
2824  (=> (and hop_1_i_b hop_1_b_h) hop_2_i_h)
2825  (=> (and hop_1_i_b hop_1_b_k) hop_2_i_k)
2826  (=> (and hop_1_i_b hop_1_b_j) hop_2_i_j)
2827  (=> (and hop_1_i_b hop_1_b_m) hop_2_i_m)
2828  (=> (and hop_1_i_b hop_1_b_l) hop_2_i_l)
2829  (=> (and hop_1_i_b hop_1_b_o) hop_2_i_o)
2830  (=> (and hop_1_i_b hop_1_b_n) hop_2_i_n)
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2831  (=> (and hop_1_i_b hop_1_b_q) hop_2_i_q)
2832  (=> (and hop_1_i_b hop_1_b_p) hop_2_i_p)
2833  (=> (and hop_1_i_e hop_1_e_a) hop_2_i_a)
2834  (=> (and hop_1_i_e hop_1_e_c) hop_2_i_c)
2835  (=> (and hop_1_i_e hop_1_e_b) hop_2_i_b)
2836  (=> (and hop_1_i_e hop_1_e_d) hop_2_i_d)
2837  (=> (and hop_1_i_e hop_1_e_g) hop_2_i_g)
2838  (=> (and hop_1_i_e hop_1_e_f) hop_2_i_f)
2839  (=> (and hop_1_i_e hop_1_e_h) hop_2_i_h)
2840  (=> (and hop_1_i_e hop_1_e_k) hop_2_i_k)
2841  (=> (and hop_1_i_e hop_1_e_j) hop_2_i_j)
2842  (=> (and hop_1_i_e hop_1_e_m) hop_2_i_m)
2843  (=> (and hop_1_i_e hop_1_e_l) hop_2_i_l)
2844  (=> (and hop_1_i_e hop_1_e_o) hop_2_i_o)
2845  (=> (and hop_1_i_e hop_1_e_n) hop_2_i_n)
2846  (=> (and hop_1_i_e hop_1_e_q) hop_2_i_q)
2847  (=> (and hop_1_i_e hop_1_e_p) hop_2_i_p)
2848  (=> (and hop_1_i_d hop_1_d_a) hop_2_i_a)
2849  (=> (and hop_1_i_d hop_1_d_c) hop_2_i_c)
2850  (=> (and hop_1_i_d hop_1_d_b) hop_2_i_b)
2851  (=> (and hop_1_i_d hop_1_d_e) hop_2_i_e)
2852  (=> (and hop_1_i_d hop_1_d_g) hop_2_i_g)
2853  (=> (and hop_1_i_d hop_1_d_f) hop_2_i_f)
2854  (=> (and hop_1_i_d hop_1_d_h) hop_2_i_h)
2855  (=> (and hop_1_i_d hop_1_d_k) hop_2_i_k)
2856  (=> (and hop_1_i_d hop_1_d_j) hop_2_i_j)
2857  (=> (and hop_1_i_d hop_1_d_m) hop_2_i_m)
2858  (=> (and hop_1_i_d hop_1_d_l) hop_2_i_l)
2859  (=> (and hop_1_i_d hop_1_d_o) hop_2_i_o)
2860  (=> (and hop_1_i_d hop_1_d_n) hop_2_i_n)
2861  (=> (and hop_1_i_d hop_1_d_q) hop_2_i_q)
2862  (=> (and hop_1_i_d hop_1_d_p) hop_2_i_p)
2863  (=> (and hop_1_i_g hop_1_g_a) hop_2_i_a)
2864  (=> (and hop_1_i_g hop_1_g_c) hop_2_i_c)
2865  (=> (and hop_1_i_g hop_1_g_b) hop_2_i_b)
2866  (=> (and hop_1_i_g hop_1_g_e) hop_2_i_e)
2867  (=> (and hop_1_i_g hop_1_g_d) hop_2_i_d)
2868  (=> (and hop_1_i_g hop_1_g_f) hop_2_i_f)
2869  (=> (and hop_1_i_g hop_1_g_h) hop_2_i_h)
2870  (=> (and hop_1_i_g hop_1_g_k) hop_2_i_k)
2871  (=> (and hop_1_i_g hop_1_g_j) hop_2_i_j)
2872  (=> (and hop_1_i_g hop_1_g_m) hop_2_i_m)
2873  (=> (and hop_1_i_g hop_1_g_l) hop_2_i_l)
2874  (=> (and hop_1_i_g hop_1_g_o) hop_2_i_o)
2875  (=> (and hop_1_i_g hop_1_g_n) hop_2_i_n)
2876  (=> (and hop_1_i_g hop_1_g_q) hop_2_i_q)
2877  (=> (and hop_1_i_g hop_1_g_p) hop_2_i_p)
2878  (=> (and hop_1_i_f hop_1_f_a) hop_2_i_a)
2879  (=> (and hop_1_i_f hop_1_f_c) hop_2_i_c)
2880  (=> (and hop_1_i_f hop_1_f_b) hop_2_i_b)
2881  (=> (and hop_1_i_f hop_1_f_e) hop_2_i_e)
2882  (=> (and hop_1_i_f hop_1_f_d) hop_2_i_d)
2883  (=> (and hop_1_i_f hop_1_f_g) hop_2_i_g)
2884  (=> (and hop_1_i_f hop_1_f_h) hop_2_i_h)
2885  (=> (and hop_1_i_f hop_1_f_k) hop_2_i_k)
2886  (=> (and hop_1_i_f hop_1_f_j) hop_2_i_j)
2887  (=> (and hop_1_i_f hop_1_f_m) hop_2_i_m)
2888  (=> (and hop_1_i_f hop_1_f_l) hop_2_i_l)
2889  (=> (and hop_1_i_f hop_1_f_o) hop_2_i_o)
2890  (=> (and hop_1_i_f hop_1_f_n) hop_2_i_n)
2891  (=> (and hop_1_i_f hop_1_f_q) hop_2_i_q)
2892  (=> (and hop_1_i_f hop_1_f_p) hop_2_i_p)
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2893  (=> (and hop_1_i_h hop_1_h_a) hop_2_i_a)
2894  (=> (and hop_1_i_h hop_1_h_c) hop_2_i_c)
2895  (=> (and hop_1_i_h hop_1_h_b) hop_2_i_b)
2896  (=> (and hop_1_i_h hop_1_h_e) hop_2_i_e)
2897  (=> (and hop_1_i_h hop_1_h_d) hop_2_i_d)
2898  (=> (and hop_1_i_h hop_1_h_g) hop_2_i_g)
2899  (=> (and hop_1_i_h hop_1_h_f) hop_2_i_f)
2900  (=> (and hop_1_i_h hop_1_h_k) hop_2_i_k)
2901  (=> (and hop_1_i_h hop_1_h_j) hop_2_i_j)
2902  (=> (and hop_1_i_h hop_1_h_m) hop_2_i_m)
2903  (=> (and hop_1_i_h hop_1_h_l) hop_2_i_l)
2904  (=> (and hop_1_i_h hop_1_h_o) hop_2_i_o)
2905  (=> (and hop_1_i_h hop_1_h_n) hop_2_i_n)
2906  (=> (and hop_1_i_h hop_1_h_q) hop_2_i_q)
2907  (=> (and hop_1_i_h hop_1_h_p) hop_2_i_p)
2908  (=> (and hop_1_i_k hop_1_k_a) hop_2_i_a)
2909  (=> (and hop_1_i_k hop_1_k_c) hop_2_i_c)
2910  (=> (and hop_1_i_k hop_1_k_b) hop_2_i_b)
2911  (=> (and hop_1_i_k hop_1_k_e) hop_2_i_e)
2912  (=> (and hop_1_i_k hop_1_k_d) hop_2_i_d)
2913  (=> (and hop_1_i_k hop_1_k_g) hop_2_i_g)
2914  (=> (and hop_1_i_k hop_1_k_f) hop_2_i_f)
2915  (=> (and hop_1_i_k hop_1_k_h) hop_2_i_h)
2916  (=> (and hop_1_i_k hop_1_k_j) hop_2_i_j)
2917  (=> (and hop_1_i_k hop_1_k_m) hop_2_i_m)
2918  (=> (and hop_1_i_k hop_1_k_l) hop_2_i_l)
2919  (=> (and hop_1_i_k hop_1_k_o) hop_2_i_o)
2920  (=> (and hop_1_i_k hop_1_k_n) hop_2_i_n)
2921  (=> (and hop_1_i_k hop_1_k_q) hop_2_i_q)
2922  (=> (and hop_1_i_k hop_1_k_p) hop_2_i_p)
2923  (=> (and hop_1_i_j hop_1_j_a) hop_2_i_a)
2924  (=> (and hop_1_i_j hop_1_j_c) hop_2_i_c)
2925  (=> (and hop_1_i_j hop_1_j_b) hop_2_i_b)
2926  (=> (and hop_1_i_j hop_1_j_e) hop_2_i_e)
2927  (=> (and hop_1_i_j hop_1_j_d) hop_2_i_d)
2928  (=> (and hop_1_i_j hop_1_j_g) hop_2_i_g)
2929  (=> (and hop_1_i_j hop_1_j_f) hop_2_i_f)
2930  (=> (and hop_1_i_j hop_1_j_h) hop_2_i_h)
2931  (=> (and hop_1_i_j hop_1_j_k) hop_2_i_k)
2932  (=> (and hop_1_i_j hop_1_j_m) hop_2_i_m)
2933  (=> (and hop_1_i_j hop_1_j_l) hop_2_i_l)
2934  (=> (and hop_1_i_j hop_1_j_o) hop_2_i_o)
2935  (=> (and hop_1_i_j hop_1_j_n) hop_2_i_n)
2936  (=> (and hop_1_i_j hop_1_j_q) hop_2_i_q)
2937  (=> (and hop_1_i_j hop_1_j_p) hop_2_i_p)
2938  (=> (and hop_1_i_m hop_1_m_a) hop_2_i_a)
2939  (=> (and hop_1_i_m hop_1_m_c) hop_2_i_c)
2940  (=> (and hop_1_i_m hop_1_m_b) hop_2_i_b)
2941  (=> (and hop_1_i_m hop_1_m_e) hop_2_i_e)
2942  (=> (and hop_1_i_m hop_1_m_d) hop_2_i_d)
2943  (=> (and hop_1_i_m hop_1_m_g) hop_2_i_g)
2944  (=> (and hop_1_i_m hop_1_m_f) hop_2_i_f)
2945  (=> (and hop_1_i_m hop_1_m_h) hop_2_i_h)
2946  (=> (and hop_1_i_m hop_1_m_k) hop_2_i_k)
2947  (=> (and hop_1_i_m hop_1_m_j) hop_2_i_j)
2948  (=> (and hop_1_i_m hop_1_m_l) hop_2_i_l)
2949  (=> (and hop_1_i_m hop_1_m_o) hop_2_i_o)
2950  (=> (and hop_1_i_m hop_1_m_n) hop_2_i_n)
2951  (=> (and hop_1_i_m hop_1_m_q) hop_2_i_q)
2952  (=> (and hop_1_i_m hop_1_m_p) hop_2_i_p)
2953  (=> (and hop_1_i_l hop_1_l_a) hop_2_i_a)
2954  (=> (and hop_1_i_l hop_1_l_c) hop_2_i_c)
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2955  (=> (and hop_1_i_l hop_1_l_b) hop_2_i_b)
2956  (=> (and hop_1_i_l hop_1_l_e) hop_2_i_e)
2957  (=> (and hop_1_i_l hop_1_l_d) hop_2_i_d)
2958  (=> (and hop_1_i_l hop_1_l_g) hop_2_i_g)
2959  (=> (and hop_1_i_l hop_1_l_f) hop_2_i_f)
2960  (=> (and hop_1_i_l hop_1_l_h) hop_2_i_h)
2961  (=> (and hop_1_i_l hop_1_l_k) hop_2_i_k)
2962  (=> (and hop_1_i_l hop_1_l_j) hop_2_i_j)
2963  (=> (and hop_1_i_l hop_1_l_m) hop_2_i_m)
2964  (=> (and hop_1_i_l hop_1_l_o) hop_2_i_o)
2965  (=> (and hop_1_i_l hop_1_l_n) hop_2_i_n)
2966  (=> (and hop_1_i_l hop_1_l_q) hop_2_i_q)
2967  (=> (and hop_1_i_l hop_1_l_p) hop_2_i_p)
2968  (=> (and hop_1_i_o hop_1_o_a) hop_2_i_a)
2969  (=> (and hop_1_i_o hop_1_o_c) hop_2_i_c)
2970  (=> (and hop_1_i_o hop_1_o_b) hop_2_i_b)
2971  (=> (and hop_1_i_o hop_1_o_e) hop_2_i_e)
2972  (=> (and hop_1_i_o hop_1_o_d) hop_2_i_d)
2973  (=> (and hop_1_i_o hop_1_o_g) hop_2_i_g)
2974  (=> (and hop_1_i_o hop_1_o_f) hop_2_i_f)
2975  (=> (and hop_1_i_o hop_1_o_h) hop_2_i_h)
2976  (=> (and hop_1_i_o hop_1_o_k) hop_2_i_k)
2977  (=> (and hop_1_i_o hop_1_o_j) hop_2_i_j)
2978  (=> (and hop_1_i_o hop_1_o_m) hop_2_i_m)
2979  (=> (and hop_1_i_o hop_1_o_l) hop_2_i_l)
2980  (=> (and hop_1_i_o hop_1_o_n) hop_2_i_n)
2981  (=> (and hop_1_i_o hop_1_o_q) hop_2_i_q)
2982  (=> (and hop_1_i_o hop_1_o_p) hop_2_i_p)
2983  (=> (and hop_1_i_n hop_1_n_a) hop_2_i_a)
2984  (=> (and hop_1_i_n hop_1_n_c) hop_2_i_c)
2985  (=> (and hop_1_i_n hop_1_n_b) hop_2_i_b)
2986  (=> (and hop_1_i_n hop_1_n_e) hop_2_i_e)
2987  (=> (and hop_1_i_n hop_1_n_d) hop_2_i_d)
2988  (=> (and hop_1_i_n hop_1_n_g) hop_2_i_g)
2989  (=> (and hop_1_i_n hop_1_n_f) hop_2_i_f)
2990  (=> (and hop_1_i_n hop_1_n_h) hop_2_i_h)
2991  (=> (and hop_1_i_n hop_1_n_k) hop_2_i_k)
2992  (=> (and hop_1_i_n hop_1_n_j) hop_2_i_j)
2993  (=> (and hop_1_i_n hop_1_n_m) hop_2_i_m)
2994  (=> (and hop_1_i_n hop_1_n_l) hop_2_i_l)
2995  (=> (and hop_1_i_n hop_1_n_o) hop_2_i_o)
2996  (=> (and hop_1_i_n hop_1_n_q) hop_2_i_q)
2997  (=> (and hop_1_i_n hop_1_n_p) hop_2_i_p)
2998  (=> (and hop_1_i_q hop_1_q_a) hop_2_i_a)
2999  (=> (and hop_1_i_q hop_1_q_c) hop_2_i_c)
3000  (=> (and hop_1_i_q hop_1_q_b) hop_2_i_b)
3001  (=> (and hop_1_i_q hop_1_q_e) hop_2_i_e)
3002  (=> (and hop_1_i_q hop_1_q_d) hop_2_i_d)
3003  (=> (and hop_1_i_q hop_1_q_g) hop_2_i_g)
3004  (=> (and hop_1_i_q hop_1_q_f) hop_2_i_f)
3005  (=> (and hop_1_i_q hop_1_q_h) hop_2_i_h)
3006  (=> (and hop_1_i_q hop_1_q_k) hop_2_i_k)
3007  (=> (and hop_1_i_q hop_1_q_j) hop_2_i_j)
3008  (=> (and hop_1_i_q hop_1_q_m) hop_2_i_m)
3009  (=> (and hop_1_i_q hop_1_q_l) hop_2_i_l)
3010  (=> (and hop_1_i_q hop_1_q_o) hop_2_i_o)
3011  (=> (and hop_1_i_q hop_1_q_n) hop_2_i_n)
3012  (=> (and hop_1_i_q hop_1_q_p) hop_2_i_p)
3013  (=> (and hop_1_i_p hop_1_p_a) hop_2_i_a)
3014  (=> (and hop_1_i_p hop_1_p_c) hop_2_i_c)
3015  (=> (and hop_1_i_p hop_1_p_b) hop_2_i_b)
3016  (=> (and hop_1_i_p hop_1_p_e) hop_2_i_e)
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3017  (=> (and hop_1_i_p hop_1_p_d) hop_2_i_d)
3018  (=> (and hop_1_i_p hop_1_p_g) hop_2_i_g)
3019  (=> (and hop_1_i_p hop_1_p_f) hop_2_i_f)
3020  (=> (and hop_1_i_p hop_1_p_h) hop_2_i_h)
3021  (=> (and hop_1_i_p hop_1_p_k) hop_2_i_k)
3022  (=> (and hop_1_i_p hop_1_p_j) hop_2_i_j)
3023  (=> (and hop_1_i_p hop_1_p_m) hop_2_i_m)
3024  (=> (and hop_1_i_p hop_1_p_l) hop_2_i_l)
3025  (=> (and hop_1_i_p hop_1_p_o) hop_2_i_o)
3026  (=> (and hop_1_i_p hop_1_p_n) hop_2_i_n)
3027  (=> (and hop_1_i_p hop_1_p_q) hop_2_i_q)
3028  (=> (and hop_1_h_a hop_1_a_c) hop_2_h_c)
3029  (=> (and hop_1_h_a hop_1_a_b) hop_2_h_b)
3030  (=> (and hop_1_h_a hop_1_a_e) hop_2_h_e)
3031  (=> (and hop_1_h_a hop_1_a_d) hop_2_h_d)
3032  (=> (and hop_1_h_a hop_1_a_g) hop_2_h_g)
3033  (=> (and hop_1_h_a hop_1_a_f) hop_2_h_f)
3034  (=> (and hop_1_h_a hop_1_a_i) hop_2_h_i)
3035  (=> (and hop_1_h_a hop_1_a_k) hop_2_h_k)
3036  (=> (and hop_1_h_a hop_1_a_j) hop_2_h_j)
3037  (=> (and hop_1_h_a hop_1_a_m) hop_2_h_m)
3038  (=> (and hop_1_h_a hop_1_a_l) hop_2_h_l)
3039  (=> (and hop_1_h_a hop_1_a_o) hop_2_h_o)
3040  (=> (and hop_1_h_a hop_1_a_n) hop_2_h_n)
3041  (=> (and hop_1_h_a hop_1_a_q) hop_2_h_q)
3042  (=> (and hop_1_h_a hop_1_a_p) hop_2_h_p)
3043  (=> (and hop_1_h_c hop_1_c_a) hop_2_h_a)
3044  (=> (and hop_1_h_c hop_1_c_b) hop_2_h_b)
3045  (=> (and hop_1_h_c hop_1_c_e) hop_2_h_e)
3046  (=> (and hop_1_h_c hop_1_c_d) hop_2_h_d)
3047  (=> (and hop_1_h_c hop_1_c_g) hop_2_h_g)
3048  (=> (and hop_1_h_c hop_1_c_f) hop_2_h_f)
3049  (=> (and hop_1_h_c hop_1_c_i) hop_2_h_i)
3050  (=> (and hop_1_h_c hop_1_c_k) hop_2_h_k)
3051  (=> (and hop_1_h_c hop_1_c_j) hop_2_h_j)
3052  (=> (and hop_1_h_c hop_1_c_m) hop_2_h_m)
3053  (=> (and hop_1_h_c hop_1_c_l) hop_2_h_l)
3054  (=> (and hop_1_h_c hop_1_c_o) hop_2_h_o)
3055  (=> (and hop_1_h_c hop_1_c_n) hop_2_h_n)
3056  (=> (and hop_1_h_c hop_1_c_q) hop_2_h_q)
3057  (=> (and hop_1_h_c hop_1_c_p) hop_2_h_p)
3058  (=> (and hop_1_h_b hop_1_b_a) hop_2_h_a)
3059  (=> (and hop_1_h_b hop_1_b_c) hop_2_h_c)
3060  (=> (and hop_1_h_b hop_1_b_e) hop_2_h_e)
3061  (=> (and hop_1_h_b hop_1_b_d) hop_2_h_d)
3062  (=> (and hop_1_h_b hop_1_b_g) hop_2_h_g)
3063  (=> (and hop_1_h_b hop_1_b_f) hop_2_h_f)
3064  (=> (and hop_1_h_b hop_1_b_i) hop_2_h_i)
3065  (=> (and hop_1_h_b hop_1_b_k) hop_2_h_k)
3066  (=> (and hop_1_h_b hop_1_b_j) hop_2_h_j)
3067  (=> (and hop_1_h_b hop_1_b_m) hop_2_h_m)
3068  (=> (and hop_1_h_b hop_1_b_l) hop_2_h_l)
3069  (=> (and hop_1_h_b hop_1_b_o) hop_2_h_o)
3070  (=> (and hop_1_h_b hop_1_b_n) hop_2_h_n)
3071  (=> (and hop_1_h_b hop_1_b_q) hop_2_h_q)
3072  (=> (and hop_1_h_b hop_1_b_p) hop_2_h_p)
3073  (=> (and hop_1_h_e hop_1_e_a) hop_2_h_a)
3074  (=> (and hop_1_h_e hop_1_e_c) hop_2_h_c)
3075  (=> (and hop_1_h_e hop_1_e_b) hop_2_h_b)
3076  (=> (and hop_1_h_e hop_1_e_d) hop_2_h_d)
3077  (=> (and hop_1_h_e hop_1_e_g) hop_2_h_g)
3078  (=> (and hop_1_h_e hop_1_e_f) hop_2_h_f)
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3079   (=> (and hop_1_h_e hop_1_e_i) hop_2_h_i)
3080   (=> (and hop_1_h_e hop_1_e_k) hop_2_h_k)
3081   (=> (and hop_1_h_e hop_1_e_j) hop_2_h_j)
3082   (=> (and hop_1_h_e hop_1_e_m) hop_2_h_m)
3083   (=> (and hop_1_h_e hop_1_e_l) hop_2_h_l)
3084   (=> (and hop_1_h_e hop_1_e_o) hop_2_h_o)
3085   (=> (and hop_1_h_e hop_1_e_n) hop_2_h_n)
3086   (=> (and hop_1_h_e hop_1_e_q) hop_2_h_q)
3087   (=> (and hop_1_h_e hop_1_e_p) hop_2_h_p)
3088   (=> (and hop_1_h_d hop_1_d_a) hop_2_h_a)
3089   (=> (and hop_1_h_d hop_1_d_c) hop_2_h_c)
3090   (=> (and hop_1_h_d hop_1_d_b) hop_2_h_b)
3091   (=> (and hop_1_h_d hop_1_d_e) hop_2_h_e)
3092   (=> (and hop_1_h_d hop_1_d_g) hop_2_h_g)
3093   (=> (and hop_1_h_d hop_1_d_f) hop_2_h_f)
3094   (=> (and hop_1_h_d hop_1_d_i) hop_2_h_i)
3095   (=> (and hop_1_h_d hop_1_d_k) hop_2_h_k)
3096   (=> (and hop_1_h_d hop_1_d_j) hop_2_h_j)
3097   (=> (and hop_1_h_d hop_1_d_m) hop_2_h_m)
3098   (=> (and hop_1_h_d hop_1_d_l) hop_2_h_l)
3099   (=> (and hop_1_h_d hop_1_d_o) hop_2_h_o)
3100   (=> (and hop_1_h_d hop_1_d_n) hop_2_h_n)
3101   (=> (and hop_1_h_d hop_1_d_q) hop_2_h_q)
3102   (=> (and hop_1_h_d hop_1_d_p) hop_2_h_p)
3103   (=> (and hop_1_h_g hop_1_g_a) hop_2_h_a)
3104   (=> (and hop_1_h_g hop_1_g_c) hop_2_h_c)
3105   (=> (and hop_1_h_g hop_1_g_b) hop_2_h_b)
3106   (=> (and hop_1_h_g hop_1_g_e) hop_2_h_e)
3107   (=> (and hop_1_h_g hop_1_g_d) hop_2_h_d)
3108   (=> (and hop_1_h_g hop_1_g_f) hop_2_h_f)
3109   (=> (and hop_1_h_g hop_1_g_i) hop_2_h_i)
3110   (=> (and hop_1_h_g hop_1_g_k) hop_2_h_k)
3111   (=> (and hop_1_h_g hop_1_g_j) hop_2_h_j)
3112   (=> (and hop_1_h_g hop_1_g_m) hop_2_h_m)
3113   (=> (and hop_1_h_g hop_1_g_l) hop_2_h_l)
3114   (=> (and hop_1_h_g hop_1_g_o) hop_2_h_o)
3115   (=> (and hop_1_h_g hop_1_g_n) hop_2_h_n)
3116   (=> (and hop_1_h_g hop_1_g_q) hop_2_h_q)
3117   (=> (and hop_1_h_g hop_1_g_p) hop_2_h_p)
3118   (=> (and hop_1_h_f hop_1_f_a) hop_2_h_a)
3119   (=> (and hop_1_h_f hop_1_f_c) hop_2_h_c)
3120   (=> (and hop_1_h_f hop_1_f_b) hop_2_h_b)
3121   (=> (and hop_1_h_f hop_1_f_e) hop_2_h_e)
3122   (=> (and hop_1_h_f hop_1_f_d) hop_2_h_d)
3123   (=> (and hop_1_h_f hop_1_f_g) hop_2_h_g)
3124   (=> (and hop_1_h_f hop_1_f_i) hop_2_h_i)
3125   (=> (and hop_1_h_f hop_1_f_k) hop_2_h_k)
3126   (=> (and hop_1_h_f hop_1_f_j) hop_2_h_j)
3127   (=> (and hop_1_h_f hop_1_f_m) hop_2_h_m)
3128   (=> (and hop_1_h_f hop_1_f_l) hop_2_h_l)
3129   (=> (and hop_1_h_f hop_1_f_o) hop_2_h_o)
3130   (=> (and hop_1_h_f hop_1_f_n) hop_2_h_n)
3131   (=> (and hop_1_h_f hop_1_f_q) hop_2_h_q)
3132   (=> (and hop_1_h_f hop_1_f_p) hop_2_h_p)
3133   (=> (and hop_1_h_i hop_1_i_a) hop_2_h_a)
3134   (=> (and hop_1_h_i hop_1_i_c) hop_2_h_c)
3135   (=> (and hop_1_h_i hop_1_i_b) hop_2_h_b)
3136   (=> (and hop_1_h_i hop_1_i_e) hop_2_h_e)
3137   (=> (and hop_1_h_i hop_1_i_d) hop_2_h_d)
3138   (=> (and hop_1_h_i hop_1_i_g) hop_2_h_g)
3139   (=> (and hop_1_h_i hop_1_i_f) hop_2_h_f)
3140   (=> (and hop_1_h_i hop_1_i_k) hop_2_h_k)
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3141  (=> (and hop_1_h_i hop_1_i_j) hop_2_h_j)
3142  (=> (and hop_1_h_i hop_1_i_m) hop_2_h_m)
3143  (=> (and hop_1_h_i hop_1_i_l) hop_2_h_l)
3144  (=> (and hop_1_h_i hop_1_i_o) hop_2_h_o)
3145  (=> (and hop_1_h_i hop_1_i_n) hop_2_h_n)
3146  (=> (and hop_1_h_i hop_1_i_q) hop_2_h_q)
3147  (=> (and hop_1_h_i hop_1_i_p) hop_2_h_p)
3148  (=> (and hop_1_h_k hop_1_k_a) hop_2_h_a)
3149  (=> (and hop_1_h_k hop_1_k_c) hop_2_h_c)
3150  (=> (and hop_1_h_k hop_1_k_b) hop_2_h_b)
3151  (=> (and hop_1_h_k hop_1_k_e) hop_2_h_e)
3152  (=> (and hop_1_h_k hop_1_k_d) hop_2_h_d)
3153  (=> (and hop_1_h_k hop_1_k_g) hop_2_h_g)
3154  (=> (and hop_1_h_k hop_1_k_f) hop_2_h_f)
3155  (=> (and hop_1_h_k hop_1_k_i) hop_2_h_i)
3156  (=> (and hop_1_h_k hop_1_k_j) hop_2_h_j)
3157  (=> (and hop_1_h_k hop_1_k_m) hop_2_h_m)
3158  (=> (and hop_1_h_k hop_1_k_l) hop_2_h_l)
3159  (=> (and hop_1_h_k hop_1_k_o) hop_2_h_o)
3160  (=> (and hop_1_h_k hop_1_k_n) hop_2_h_n)
3161  (=> (and hop_1_h_k hop_1_k_q) hop_2_h_q)
3162  (=> (and hop_1_h_k hop_1_k_p) hop_2_h_p)
3163  (=> (and hop_1_h_j hop_1_j_a) hop_2_h_a)
3164  (=> (and hop_1_h_j hop_1_j_c) hop_2_h_c)
3165  (=> (and hop_1_h_j hop_1_j_b) hop_2_h_b)
3166  (=> (and hop_1_h_j hop_1_j_e) hop_2_h_e)
3167  (=> (and hop_1_h_j hop_1_j_d) hop_2_h_d)
3168  (=> (and hop_1_h_j hop_1_j_g) hop_2_h_g)
3169  (=> (and hop_1_h_j hop_1_j_f) hop_2_h_f)
3170  (=> (and hop_1_h_j hop_1_j_i) hop_2_h_i)
3171  (=> (and hop_1_h_j hop_1_j_k) hop_2_h_k)
3172  (=> (and hop_1_h_j hop_1_j_m) hop_2_h_m)
3173  (=> (and hop_1_h_j hop_1_j_l) hop_2_h_l)
3174  (=> (and hop_1_h_j hop_1_j_o) hop_2_h_o)
3175  (=> (and hop_1_h_j hop_1_j_n) hop_2_h_n)
3176  (=> (and hop_1_h_j hop_1_j_q) hop_2_h_q)
3177  (=> (and hop_1_h_j hop_1_j_p) hop_2_h_p)
3178  (=> (and hop_1_h_m hop_1_m_a) hop_2_h_a)
3179  (=> (and hop_1_h_m hop_1_m_c) hop_2_h_c)
3180  (=> (and hop_1_h_m hop_1_m_b) hop_2_h_b)
3181  (=> (and hop_1_h_m hop_1_m_e) hop_2_h_e)
3182  (=> (and hop_1_h_m hop_1_m_d) hop_2_h_d)
3183  (=> (and hop_1_h_m hop_1_m_g) hop_2_h_g)
3184  (=> (and hop_1_h_m hop_1_m_f) hop_2_h_f)
3185  (=> (and hop_1_h_m hop_1_m_i) hop_2_h_i)
3186  (=> (and hop_1_h_m hop_1_m_k) hop_2_h_k)
3187  (=> (and hop_1_h_m hop_1_m_j) hop_2_h_j)
3188  (=> (and hop_1_h_m hop_1_m_l) hop_2_h_l)
3189  (=> (and hop_1_h_m hop_1_m_o) hop_2_h_o)
3190  (=> (and hop_1_h_m hop_1_m_n) hop_2_h_n)
3191  (=> (and hop_1_h_m hop_1_m_q) hop_2_h_q)
3192  (=> (and hop_1_h_m hop_1_m_p) hop_2_h_p)
3193  (=> (and hop_1_h_l hop_1_l_a) hop_2_h_a)
3194  (=> (and hop_1_h_l hop_1_l_c) hop_2_h_c)
3195  (=> (and hop_1_h_l hop_1_l_b) hop_2_h_b)
3196  (=> (and hop_1_h_l hop_1_l_e) hop_2_h_e)
3197  (=> (and hop_1_h_l hop_1_l_d) hop_2_h_d)
3198  (=> (and hop_1_h_l hop_1_l_g) hop_2_h_g)
3199  (=> (and hop_1_h_l hop_1_l_f) hop_2_h_f)
3200  (=> (and hop_1_h_l hop_1_l_i) hop_2_h_i)
3201  (=> (and hop_1_h_l hop_1_l_k) hop_2_h_k)
3202  (=> (and hop_1_h_l hop_1_l_j) hop_2_h_j)
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3203  (=> (and hop_1_h_l hop_1_l_m) hop_2_h_m)
3204  (=> (and hop_1_h_l hop_1_l_o) hop_2_h_o)
3205  (=> (and hop_1_h_l hop_1_l_n) hop_2_h_n)
3206  (=> (and hop_1_h_l hop_1_l_q) hop_2_h_q)
3207  (=> (and hop_1_h_l hop_1_l_p) hop_2_h_p)
3208  (=> (and hop_1_h_o hop_1_o_a) hop_2_h_a)
3209  (=> (and hop_1_h_o hop_1_o_c) hop_2_h_c)
3210  (=> (and hop_1_h_o hop_1_o_b) hop_2_h_b)
3211  (=> (and hop_1_h_o hop_1_o_e) hop_2_h_e)
3212  (=> (and hop_1_h_o hop_1_o_d) hop_2_h_d)
3213  (=> (and hop_1_h_o hop_1_o_g) hop_2_h_g)
3214  (=> (and hop_1_h_o hop_1_o_f) hop_2_h_f)
3215  (=> (and hop_1_h_o hop_1_o_i) hop_2_h_i)
3216  (=> (and hop_1_h_o hop_1_o_k) hop_2_h_k)
3217  (=> (and hop_1_h_o hop_1_o_j) hop_2_h_j)
3218  (=> (and hop_1_h_o hop_1_o_m) hop_2_h_m)
3219  (=> (and hop_1_h_o hop_1_o_l) hop_2_h_l)
3220  (=> (and hop_1_h_o hop_1_o_n) hop_2_h_n)
3221  (=> (and hop_1_h_o hop_1_o_q) hop_2_h_q)
3222  (=> (and hop_1_h_o hop_1_o_p) hop_2_h_p)
3223  (=> (and hop_1_h_n hop_1_n_a) hop_2_h_a)
3224  (=> (and hop_1_h_n hop_1_n_c) hop_2_h_c)
3225  (=> (and hop_1_h_n hop_1_n_b) hop_2_h_b)
3226  (=> (and hop_1_h_n hop_1_n_e) hop_2_h_e)
3227  (=> (and hop_1_h_n hop_1_n_d) hop_2_h_d)
3228  (=> (and hop_1_h_n hop_1_n_g) hop_2_h_g)
3229  (=> (and hop_1_h_n hop_1_n_f) hop_2_h_f)
3230  (=> (and hop_1_h_n hop_1_n_i) hop_2_h_i)
3231  (=> (and hop_1_h_n hop_1_n_k) hop_2_h_k)
3232  (=> (and hop_1_h_n hop_1_n_j) hop_2_h_j)
3233  (=> (and hop_1_h_n hop_1_n_m) hop_2_h_m)
3234  (=> (and hop_1_h_n hop_1_n_l) hop_2_h_l)
3235  (=> (and hop_1_h_n hop_1_n_o) hop_2_h_o)
3236  (=> (and hop_1_h_n hop_1_n_q) hop_2_h_q)
3237  (=> (and hop_1_h_n hop_1_n_p) hop_2_h_p)
3238  (=> (and hop_1_h_q hop_1_q_a) hop_2_h_a)
3239  (=> (and hop_1_h_q hop_1_q_c) hop_2_h_c)
3240  (=> (and hop_1_h_q hop_1_q_b) hop_2_h_b)
3241  (=> (and hop_1_h_q hop_1_q_e) hop_2_h_e)
3242  (=> (and hop_1_h_q hop_1_q_d) hop_2_h_d)
3243  (=> (and hop_1_h_q hop_1_q_g) hop_2_h_g)
3244  (=> (and hop_1_h_q hop_1_q_f) hop_2_h_f)
3245  (=> (and hop_1_h_q hop_1_q_i) hop_2_h_i)
3246  (=> (and hop_1_h_q hop_1_q_k) hop_2_h_k)
3247  (=> (and hop_1_h_q hop_1_q_j) hop_2_h_j)
3248  (=> (and hop_1_h_q hop_1_q_m) hop_2_h_m)
3249  (=> (and hop_1_h_q hop_1_q_l) hop_2_h_l)
3250  (=> (and hop_1_h_q hop_1_q_o) hop_2_h_o)
3251  (=> (and hop_1_h_q hop_1_q_n) hop_2_h_n)
3252  (=> (and hop_1_h_q hop_1_q_p) hop_2_h_p)
3253  (=> (and hop_1_h_p hop_1_p_a) hop_2_h_a)
3254  (=> (and hop_1_h_p hop_1_p_c) hop_2_h_c)
3255  (=> (and hop_1_h_p hop_1_p_b) hop_2_h_b)
3256  (=> (and hop_1_h_p hop_1_p_e) hop_2_h_e)
3257  (=> (and hop_1_h_p hop_1_p_d) hop_2_h_d)
3258  (=> (and hop_1_h_p hop_1_p_g) hop_2_h_g)
3259  (=> (and hop_1_h_p hop_1_p_f) hop_2_h_f)
3260  (=> (and hop_1_h_p hop_1_p_i) hop_2_h_i)
3261  (=> (and hop_1_h_p hop_1_p_k) hop_2_h_k)
3262  (=> (and hop_1_h_p hop_1_p_j) hop_2_h_j)
3263  (=> (and hop_1_h_p hop_1_p_m) hop_2_h_m)
3264  (=> (and hop_1_h_p hop_1_p_l) hop_2_h_l)
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3265  (=> (and hop_1_h_p hop_1_p_o) hop_2_h_o)
3266  (=> (and hop_1_h_p hop_1_p_n) hop_2_h_n)
3267  (=> (and hop_1_h_p hop_1_p_q) hop_2_h_q)
3268  (=> (and hop_1_k_a hop_1_a_c) hop_2_k_c)
3269  (=> (and hop_1_k_a hop_1_a_b) hop_2_k_b)
3270  (=> (and hop_1_k_a hop_1_a_e) hop_2_k_e)
3271  (=> (and hop_1_k_a hop_1_a_d) hop_2_k_d)
3272  (=> (and hop_1_k_a hop_1_a_g) hop_2_k_g)
3273  (=> (and hop_1_k_a hop_1_a_f) hop_2_k_f)
3274  (=> (and hop_1_k_a hop_1_a_i) hop_2_k_i)
3275  (=> (and hop_1_k_a hop_1_a_h) hop_2_k_h)
3276  (=> (and hop_1_k_a hop_1_a_j) hop_2_k_j)
3277  (=> (and hop_1_k_a hop_1_a_m) hop_2_k_m)
3278  (=> (and hop_1_k_a hop_1_a_l) hop_2_k_l)
3279  (=> (and hop_1_k_a hop_1_a_o) hop_2_k_o)
3280  (=> (and hop_1_k_a hop_1_a_n) hop_2_k_n)
3281  (=> (and hop_1_k_a hop_1_a_q) hop_2_k_q)
3282  (=> (and hop_1_k_a hop_1_a_p) hop_2_k_p)
3283  (=> (and hop_1_k_c hop_1_c_a) hop_2_k_a)
3284  (=> (and hop_1_k_c hop_1_c_b) hop_2_k_b)
3285  (=> (and hop_1_k_c hop_1_c_e) hop_2_k_e)
3286  (=> (and hop_1_k_c hop_1_c_d) hop_2_k_d)
3287  (=> (and hop_1_k_c hop_1_c_g) hop_2_k_g)
3288  (=> (and hop_1_k_c hop_1_c_f) hop_2_k_f)
3289  (=> (and hop_1_k_c hop_1_c_i) hop_2_k_i)
3290  (=> (and hop_1_k_c hop_1_c_h) hop_2_k_h)
3291  (=> (and hop_1_k_c hop_1_c_j) hop_2_k_j)
3292  (=> (and hop_1_k_c hop_1_c_m) hop_2_k_m)
3293  (=> (and hop_1_k_c hop_1_c_l) hop_2_k_l)
3294  (=> (and hop_1_k_c hop_1_c_o) hop_2_k_o)
3295  (=> (and hop_1_k_c hop_1_c_n) hop_2_k_n)
3296  (=> (and hop_1_k_c hop_1_c_q) hop_2_k_q)
3297  (=> (and hop_1_k_c hop_1_c_p) hop_2_k_p)
3298  (=> (and hop_1_k_b hop_1_b_a) hop_2_k_a)
3299  (=> (and hop_1_k_b hop_1_b_c) hop_2_k_c)
3300  (=> (and hop_1_k_b hop_1_b_e) hop_2_k_e)
3301  (=> (and hop_1_k_b hop_1_b_d) hop_2_k_d)
3302  (=> (and hop_1_k_b hop_1_b_g) hop_2_k_g)
3303  (=> (and hop_1_k_b hop_1_b_f) hop_2_k_f)
3304  (=> (and hop_1_k_b hop_1_b_i) hop_2_k_i)
3305  (=> (and hop_1_k_b hop_1_b_h) hop_2_k_h)
3306  (=> (and hop_1_k_b hop_1_b_j) hop_2_k_j)
3307  (=> (and hop_1_k_b hop_1_b_m) hop_2_k_m)
3308  (=> (and hop_1_k_b hop_1_b_l) hop_2_k_l)
3309  (=> (and hop_1_k_b hop_1_b_o) hop_2_k_o)
3310  (=> (and hop_1_k_b hop_1_b_n) hop_2_k_n)
3311  (=> (and hop_1_k_b hop_1_b_q) hop_2_k_q)
3312  (=> (and hop_1_k_b hop_1_b_p) hop_2_k_p)
3313  (=> (and hop_1_k_e hop_1_e_a) hop_2_k_a)
3314  (=> (and hop_1_k_e hop_1_e_c) hop_2_k_c)
3315  (=> (and hop_1_k_e hop_1_e_b) hop_2_k_b)
3316  (=> (and hop_1_k_e hop_1_e_d) hop_2_k_d)
3317  (=> (and hop_1_k_e hop_1_e_g) hop_2_k_g)
3318  (=> (and hop_1_k_e hop_1_e_f) hop_2_k_f)
3319  (=> (and hop_1_k_e hop_1_e_i) hop_2_k_i)
3320  (=> (and hop_1_k_e hop_1_e_h) hop_2_k_h)
3321  (=> (and hop_1_k_e hop_1_e_j) hop_2_k_j)
3322  (=> (and hop_1_k_e hop_1_e_m) hop_2_k_m)
3323  (=> (and hop_1_k_e hop_1_e_l) hop_2_k_l)
3324  (=> (and hop_1_k_e hop_1_e_o) hop_2_k_o)
3325  (=> (and hop_1_k_e hop_1_e_n) hop_2_k_n)
3326  (=> (and hop_1_k_e hop_1_e_q) hop_2_k_q)
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3327  (=> (and hop_1_k_e hop_1_e_p) hop_2_k_p)
3328  (=> (and hop_1_k_d hop_1_d_a) hop_2_k_a)
3329  (=> (and hop_1_k_d hop_1_d_c) hop_2_k_c)
3330  (=> (and hop_1_k_d hop_1_d_b) hop_2_k_b)
3331  (=> (and hop_1_k_d hop_1_d_e) hop_2_k_e)
3332  (=> (and hop_1_k_d hop_1_d_g) hop_2_k_g)
3333  (=> (and hop_1_k_d hop_1_d_f) hop_2_k_f)
3334  (=> (and hop_1_k_d hop_1_d_i) hop_2_k_i)
3335  (=> (and hop_1_k_d hop_1_d_h) hop_2_k_h)
3336  (=> (and hop_1_k_d hop_1_d_j) hop_2_k_j)
3337  (=> (and hop_1_k_d hop_1_d_m) hop_2_k_m)
3338  (=> (and hop_1_k_d hop_1_d_l) hop_2_k_l)
3339  (=> (and hop_1_k_d hop_1_d_o) hop_2_k_o)
3340  (=> (and hop_1_k_d hop_1_d_n) hop_2_k_n)
3341  (=> (and hop_1_k_d hop_1_d_q) hop_2_k_q)
3342  (=> (and hop_1_k_d hop_1_d_p) hop_2_k_p)
3343  (=> (and hop_1_k_g hop_1_g_a) hop_2_k_a)
3344  (=> (and hop_1_k_g hop_1_g_c) hop_2_k_c)
3345  (=> (and hop_1_k_g hop_1_g_b) hop_2_k_b)
3346  (=> (and hop_1_k_g hop_1_g_e) hop_2_k_e)
3347  (=> (and hop_1_k_g hop_1_g_d) hop_2_k_d)
3348  (=> (and hop_1_k_g hop_1_g_f) hop_2_k_f)
3349  (=> (and hop_1_k_g hop_1_g_i) hop_2_k_i)
3350  (=> (and hop_1_k_g hop_1_g_h) hop_2_k_h)
3351  (=> (and hop_1_k_g hop_1_g_j) hop_2_k_j)
3352  (=> (and hop_1_k_g hop_1_g_m) hop_2_k_m)
3353  (=> (and hop_1_k_g hop_1_g_l) hop_2_k_l)
3354  (=> (and hop_1_k_g hop_1_g_o) hop_2_k_o)
3355  (=> (and hop_1_k_g hop_1_g_n) hop_2_k_n)
3356  (=> (and hop_1_k_g hop_1_g_q) hop_2_k_q)
3357  (=> (and hop_1_k_g hop_1_g_p) hop_2_k_p)
3358  (=> (and hop_1_k_f hop_1_f_a) hop_2_k_a)
3359  (=> (and hop_1_k_f hop_1_f_c) hop_2_k_c)
3360  (=> (and hop_1_k_f hop_1_f_b) hop_2_k_b)
3361  (=> (and hop_1_k_f hop_1_f_e) hop_2_k_e)
3362  (=> (and hop_1_k_f hop_1_f_d) hop_2_k_d)
3363  (=> (and hop_1_k_f hop_1_f_g) hop_2_k_g)
3364  (=> (and hop_1_k_f hop_1_f_i) hop_2_k_i)
3365  (=> (and hop_1_k_f hop_1_f_h) hop_2_k_h)
3366  (=> (and hop_1_k_f hop_1_f_j) hop_2_k_j)
3367  (=> (and hop_1_k_f hop_1_f_m) hop_2_k_m)
3368  (=> (and hop_1_k_f hop_1_f_l) hop_2_k_l)
3369  (=> (and hop_1_k_f hop_1_f_o) hop_2_k_o)
3370  (=> (and hop_1_k_f hop_1_f_n) hop_2_k_n)
3371  (=> (and hop_1_k_f hop_1_f_q) hop_2_k_q)
3372  (=> (and hop_1_k_f hop_1_f_p) hop_2_k_p)
3373  (=> (and hop_1_k_i hop_1_i_a) hop_2_k_a)
3374  (=> (and hop_1_k_i hop_1_i_c) hop_2_k_c)
3375  (=> (and hop_1_k_i hop_1_i_b) hop_2_k_b)
3376  (=> (and hop_1_k_i hop_1_i_e) hop_2_k_e)
3377  (=> (and hop_1_k_i hop_1_i_d) hop_2_k_d)
3378  (=> (and hop_1_k_i hop_1_i_g) hop_2_k_g)
3379  (=> (and hop_1_k_i hop_1_i_f) hop_2_k_f)
3380  (=> (and hop_1_k_i hop_1_i_h) hop_2_k_h)
3381  (=> (and hop_1_k_i hop_1_i_j) hop_2_k_j)
3382  (=> (and hop_1_k_i hop_1_i_m) hop_2_k_m)
3383  (=> (and hop_1_k_i hop_1_i_l) hop_2_k_l)
3384  (=> (and hop_1_k_i hop_1_i_o) hop_2_k_o)
3385  (=> (and hop_1_k_i hop_1_i_n) hop_2_k_n)
3386  (=> (and hop_1_k_i hop_1_i_q) hop_2_k_q)
3387  (=> (and hop_1_k_i hop_1_i_p) hop_2_k_p)
3388  (=> (and hop_1_k_h hop_1_h_a) hop_2_k_a)
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3389  (=> (and hop_1_k_h hop_1_h_c) hop_2_k_c)
3390  (=> (and hop_1_k_h hop_1_h_b) hop_2_k_b)
3391  (=> (and hop_1_k_h hop_1_h_e) hop_2_k_e)
3392  (=> (and hop_1_k_h hop_1_h_d) hop_2_k_d)
3393  (=> (and hop_1_k_h hop_1_h_g) hop_2_k_g)
3394  (=> (and hop_1_k_h hop_1_h_f) hop_2_k_f)
3395  (=> (and hop_1_k_h hop_1_h_i) hop_2_k_i)
3396  (=> (and hop_1_k_h hop_1_h_j) hop_2_k_j)
3397  (=> (and hop_1_k_h hop_1_h_m) hop_2_k_m)
3398  (=> (and hop_1_k_h hop_1_h_l) hop_2_k_l)
3399  (=> (and hop_1_k_h hop_1_h_o) hop_2_k_o)
3400  (=> (and hop_1_k_h hop_1_h_n) hop_2_k_n)
3401  (=> (and hop_1_k_h hop_1_h_q) hop_2_k_q)
3402  (=> (and hop_1_k_h hop_1_h_p) hop_2_k_p)
3403  (=> (and hop_1_k_j hop_1_j_a) hop_2_k_a)
3404  (=> (and hop_1_k_j hop_1_j_c) hop_2_k_c)
3405  (=> (and hop_1_k_j hop_1_j_b) hop_2_k_b)
3406  (=> (and hop_1_k_j hop_1_j_e) hop_2_k_e)
3407  (=> (and hop_1_k_j hop_1_j_d) hop_2_k_d)
3408  (=> (and hop_1_k_j hop_1_j_g) hop_2_k_g)
3409  (=> (and hop_1_k_j hop_1_j_f) hop_2_k_f)
3410  (=> (and hop_1_k_j hop_1_j_i) hop_2_k_i)
3411  (=> (and hop_1_k_j hop_1_j_h) hop_2_k_h)
3412  (=> (and hop_1_k_j hop_1_j_m) hop_2_k_m)
3413  (=> (and hop_1_k_j hop_1_j_l) hop_2_k_l)
3414  (=> (and hop_1_k_j hop_1_j_o) hop_2_k_o)
3415  (=> (and hop_1_k_j hop_1_j_n) hop_2_k_n)
3416  (=> (and hop_1_k_j hop_1_j_q) hop_2_k_q)
3417  (=> (and hop_1_k_j hop_1_j_p) hop_2_k_p)
3418  (=> (and hop_1_k_m hop_1_m_a) hop_2_k_a)
3419  (=> (and hop_1_k_m hop_1_m_c) hop_2_k_c)
3420  (=> (and hop_1_k_m hop_1_m_b) hop_2_k_b)
3421  (=> (and hop_1_k_m hop_1_m_e) hop_2_k_e)
3422  (=> (and hop_1_k_m hop_1_m_d) hop_2_k_d)
3423  (=> (and hop_1_k_m hop_1_m_g) hop_2_k_g)
3424  (=> (and hop_1_k_m hop_1_m_f) hop_2_k_f)
3425  (=> (and hop_1_k_m hop_1_m_i) hop_2_k_i)
3426  (=> (and hop_1_k_m hop_1_m_h) hop_2_k_h)
3427  (=> (and hop_1_k_m hop_1_m_j) hop_2_k_j)
3428  (=> (and hop_1_k_m hop_1_m_l) hop_2_k_l)
3429  (=> (and hop_1_k_m hop_1_m_o) hop_2_k_o)
3430  (=> (and hop_1_k_m hop_1_m_n) hop_2_k_n)
3431  (=> (and hop_1_k_m hop_1_m_q) hop_2_k_q)
3432  (=> (and hop_1_k_m hop_1_m_p) hop_2_k_p)
3433  (=> (and hop_1_k_l hop_1_l_a) hop_2_k_a)
3434  (=> (and hop_1_k_l hop_1_l_c) hop_2_k_c)
3435  (=> (and hop_1_k_l hop_1_l_b) hop_2_k_b)
3436  (=> (and hop_1_k_l hop_1_l_e) hop_2_k_e)
3437  (=> (and hop_1_k_l hop_1_l_d) hop_2_k_d)
3438  (=> (and hop_1_k_l hop_1_l_g) hop_2_k_g)
3439  (=> (and hop_1_k_l hop_1_l_f) hop_2_k_f)
3440  (=> (and hop_1_k_l hop_1_l_i) hop_2_k_i)
3441  (=> (and hop_1_k_l hop_1_l_h) hop_2_k_h)
3442  (=> (and hop_1_k_l hop_1_l_j) hop_2_k_j)
3443  (=> (and hop_1_k_l hop_1_l_m) hop_2_k_m)
3444  (=> (and hop_1_k_l hop_1_l_o) hop_2_k_o)
3445  (=> (and hop_1_k_l hop_1_l_n) hop_2_k_n)
3446  (=> (and hop_1_k_l hop_1_l_q) hop_2_k_q)
3447  (=> (and hop_1_k_l hop_1_l_p) hop_2_k_p)
3448  (=> (and hop_1_k_o hop_1_o_a) hop_2_k_a)
3449  (=> (and hop_1_k_o hop_1_o_c) hop_2_k_c)
3450  (=> (and hop_1_k_o hop_1_o_b) hop_2_k_b)
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3451   (=> (and hop_1_k_o hop_1_o_e) hop_2_k_e)
3452   (=> (and hop_1_k_o hop_1_o_d) hop_2_k_d)
3453   (=> (and hop_1_k_o hop_1_o_g) hop_2_k_g)
3454   (=> (and hop_1_k_o hop_1_o_f) hop_2_k_f)
3455   (=> (and hop_1_k_o hop_1_o_i) hop_2_k_i)
3456   (=> (and hop_1_k_o hop_1_o_h) hop_2_k_h)
3457   (=> (and hop_1_k_o hop_1_o_j) hop_2_k_j)
3458   (=> (and hop_1_k_o hop_1_o_m) hop_2_k_m)
3459   (=> (and hop_1_k_o hop_1_o_l) hop_2_k_l)
3460   (=> (and hop_1_k_o hop_1_o_n) hop_2_k_n)
3461   (=> (and hop_1_k_o hop_1_o_q) hop_2_k_q)
3462   (=> (and hop_1_k_o hop_1_o_p) hop_2_k_p)
3463   (=> (and hop_1_k_n hop_1_n_a) hop_2_k_a)
3464   (=> (and hop_1_k_n hop_1_n_c) hop_2_k_c)
3465   (=> (and hop_1_k_n hop_1_n_b) hop_2_k_b)
3466   (=> (and hop_1_k_n hop_1_n_e) hop_2_k_e)
3467   (=> (and hop_1_k_n hop_1_n_d) hop_2_k_d)
3468   (=> (and hop_1_k_n hop_1_n_g) hop_2_k_g)
3469   (=> (and hop_1_k_n hop_1_n_f) hop_2_k_f)
3470   (=> (and hop_1_k_n hop_1_n_i) hop_2_k_i)
3471   (=> (and hop_1_k_n hop_1_n_h) hop_2_k_h)
3472   (=> (and hop_1_k_n hop_1_n_j) hop_2_k_j)
3473   (=> (and hop_1_k_n hop_1_n_m) hop_2_k_m)
3474   (=> (and hop_1_k_n hop_1_n_l) hop_2_k_l)
3475   (=> (and hop_1_k_n hop_1_n_o) hop_2_k_o)
3476   (=> (and hop_1_k_n hop_1_n_q) hop_2_k_q)
3477   (=> (and hop_1_k_n hop_1_n_p) hop_2_k_p)
3478   (=> (and hop_1_k_q hop_1_q_a) hop_2_k_a)
3479   (=> (and hop_1_k_q hop_1_q_c) hop_2_k_c)
3480   (=> (and hop_1_k_q hop_1_q_b) hop_2_k_b)
3481   (=> (and hop_1_k_q hop_1_q_e) hop_2_k_e)
3482   (=> (and hop_1_k_q hop_1_q_d) hop_2_k_d)
3483   (=> (and hop_1_k_q hop_1_q_g) hop_2_k_g)
3484   (=> (and hop_1_k_q hop_1_q_f) hop_2_k_f)
3485   (=> (and hop_1_k_q hop_1_q_i) hop_2_k_i)
3486   (=> (and hop_1_k_q hop_1_q_h) hop_2_k_h)
3487   (=> (and hop_1_k_q hop_1_q_j) hop_2_k_j)
3488   (=> (and hop_1_k_q hop_1_q_m) hop_2_k_m)
3489   (=> (and hop_1_k_q hop_1_q_l) hop_2_k_l)
3490   (=> (and hop_1_k_q hop_1_q_o) hop_2_k_o)
3491   (=> (and hop_1_k_q hop_1_q_n) hop_2_k_n)
3492   (=> (and hop_1_k_q hop_1_q_p) hop_2_k_p)
3493   (=> (and hop_1_k_p hop_1_p_a) hop_2_k_a)
3494   (=> (and hop_1_k_p hop_1_p_c) hop_2_k_c)
3495   (=> (and hop_1_k_p hop_1_p_b) hop_2_k_b)
3496   (=> (and hop_1_k_p hop_1_p_e) hop_2_k_e)
3497   (=> (and hop_1_k_p hop_1_p_d) hop_2_k_d)
3498   (=> (and hop_1_k_p hop_1_p_g) hop_2_k_g)
3499   (=> (and hop_1_k_p hop_1_p_f) hop_2_k_f)
3500   (=> (and hop_1_k_p hop_1_p_i) hop_2_k_i)
3501   (=> (and hop_1_k_p hop_1_p_h) hop_2_k_h)
3502   (=> (and hop_1_k_p hop_1_p_j) hop_2_k_j)
3503   (=> (and hop_1_k_p hop_1_p_m) hop_2_k_m)
3504   (=> (and hop_1_k_p hop_1_p_l) hop_2_k_l)
3505   (=> (and hop_1_k_p hop_1_p_o) hop_2_k_o)
3506   (=> (and hop_1_k_p hop_1_p_n) hop_2_k_n)
3507   (=> (and hop_1_k_p hop_1_p_q) hop_2_k_q)
3508   (=> (and hop_1_j_a hop_1_a_c) hop_2_j_c)
3509   (=> (and hop_1_j_a hop_1_a_b) hop_2_j_b)
3510   (=> (and hop_1_j_a hop_1_a_e) hop_2_j_e)
3511   (=> (and hop_1_j_a hop_1_a_d) hop_2_j_d)
3512   (=> (and hop_1_j_a hop_1_a_g) hop_2_j_g)
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3513   (=> (and hop_1_j_a hop_1_a_f) hop_2_j_f)
3514   (=> (and hop_1_j_a hop_1_a_i) hop_2_j_i)
3515   (=> (and hop_1_j_a hop_1_a_h) hop_2_j_h)
3516   (=> (and hop_1_j_a hop_1_a_k) hop_2_j_k)
3517   (=> (and hop_1_j_a hop_1_a_m) hop_2_j_m)
3518   (=> (and hop_1_j_a hop_1_a_l) hop_2_j_l)
3519   (=> (and hop_1_j_a hop_1_a_o) hop_2_j_o)
3520   (=> (and hop_1_j_a hop_1_a_n) hop_2_j_n)
3521   (=> (and hop_1_j_a hop_1_a_q) hop_2_j_q)
3522   (=> (and hop_1_j_a hop_1_a_p) hop_2_j_p)
3523   (=> (and hop_1_j_c hop_1_c_a) hop_2_j_a)
3524   (=> (and hop_1_j_c hop_1_c_b) hop_2_j_b)
3525   (=> (and hop_1_j_c hop_1_c_e) hop_2_j_e)
3526   (=> (and hop_1_j_c hop_1_c_d) hop_2_j_d)
3527   (=> (and hop_1_j_c hop_1_c_g) hop_2_j_g)
3528   (=> (and hop_1_j_c hop_1_c_f) hop_2_j_f)
3529   (=> (and hop_1_j_c hop_1_c_i) hop_2_j_i)
3530   (=> (and hop_1_j_c hop_1_c_h) hop_2_j_h)
3531   (=> (and hop_1_j_c hop_1_c_k) hop_2_j_k)
3532   (=> (and hop_1_j_c hop_1_c_m) hop_2_j_m)
3533   (=> (and hop_1_j_c hop_1_c_l) hop_2_j_l)
3534   (=> (and hop_1_j_c hop_1_c_o) hop_2_j_o)
3535   (=> (and hop_1_j_c hop_1_c_n) hop_2_j_n)
3536   (=> (and hop_1_j_c hop_1_c_q) hop_2_j_q)
3537   (=> (and hop_1_j_c hop_1_c_p) hop_2_j_p)
3538   (=> (and hop_1_j_b hop_1_b_a) hop_2_j_a)
3539   (=> (and hop_1_j_b hop_1_b_c) hop_2_j_c)
3540   (=> (and hop_1_j_b hop_1_b_e) hop_2_j_e)
3541   (=> (and hop_1_j_b hop_1_b_d) hop_2_j_d)
3542   (=> (and hop_1_j_b hop_1_b_g) hop_2_j_g)
3543   (=> (and hop_1_j_b hop_1_b_f) hop_2_j_f)
3544   (=> (and hop_1_j_b hop_1_b_i) hop_2_j_i)
3545   (=> (and hop_1_j_b hop_1_b_h) hop_2_j_h)
3546   (=> (and hop_1_j_b hop_1_b_k) hop_2_j_k)
3547   (=> (and hop_1_j_b hop_1_b_m) hop_2_j_m)
3548   (=> (and hop_1_j_b hop_1_b_l) hop_2_j_l)
3549   (=> (and hop_1_j_b hop_1_b_o) hop_2_j_o)
3550   (=> (and hop_1_j_b hop_1_b_n) hop_2_j_n)
3551   (=> (and hop_1_j_b hop_1_b_q) hop_2_j_q)
3552   (=> (and hop_1_j_b hop_1_b_p) hop_2_j_p)
3553   (=> (and hop_1_j_e hop_1_e_a) hop_2_j_a)
3554   (=> (and hop_1_j_e hop_1_e_c) hop_2_j_c)
3555   (=> (and hop_1_j_e hop_1_e_b) hop_2_j_b)
3556   (=> (and hop_1_j_e hop_1_e_d) hop_2_j_d)
3557   (=> (and hop_1_j_e hop_1_e_g) hop_2_j_g)
3558   (=> (and hop_1_j_e hop_1_e_f) hop_2_j_f)
3559   (=> (and hop_1_j_e hop_1_e_i) hop_2_j_i)
3560   (=> (and hop_1_j_e hop_1_e_h) hop_2_j_h)
3561   (=> (and hop_1_j_e hop_1_e_k) hop_2_j_k)
3562   (=> (and hop_1_j_e hop_1_e_m) hop_2_j_m)
3563   (=> (and hop_1_j_e hop_1_e_l) hop_2_j_l)
3564   (=> (and hop_1_j_e hop_1_e_o) hop_2_j_o)
3565   (=> (and hop_1_j_e hop_1_e_n) hop_2_j_n)
3566   (=> (and hop_1_j_e hop_1_e_q) hop_2_j_q)
3567   (=> (and hop_1_j_e hop_1_e_p) hop_2_j_p)
3568   (=> (and hop_1_j_d hop_1_d_a) hop_2_j_a)
3569   (=> (and hop_1_j_d hop_1_d_c) hop_2_j_c)
3570   (=> (and hop_1_j_d hop_1_d_b) hop_2_j_b)
3571   (=> (and hop_1_j_d hop_1_d_e) hop_2_j_e)
3572   (=> (and hop_1_j_d hop_1_d_g) hop_2_j_g)
3573   (=> (and hop_1_j_d hop_1_d_f) hop_2_j_f)
3574   (=> (and hop_1_j_d hop_1_d_i) hop_2_j_i)
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3575   (=> (and hop_1_j_d hop_1_d_h) hop_2_j_h)
3576   (=> (and hop_1_j_d hop_1_d_k) hop_2_j_k)
3577   (=> (and hop_1_j_d hop_1_d_m) hop_2_j_m)
3578   (=> (and hop_1_j_d hop_1_d_l) hop_2_j_l)
3579   (=> (and hop_1_j_d hop_1_d_o) hop_2_j_o)
3580   (=> (and hop_1_j_d hop_1_d_n) hop_2_j_n)
3581   (=> (and hop_1_j_d hop_1_d_q) hop_2_j_q)
3582   (=> (and hop_1_j_d hop_1_d_p) hop_2_j_p)
3583   (=> (and hop_1_j_g hop_1_g_a) hop_2_j_a)
3584   (=> (and hop_1_j_g hop_1_g_c) hop_2_j_c)
3585   (=> (and hop_1_j_g hop_1_g_b) hop_2_j_b)
3586   (=> (and hop_1_j_g hop_1_g_e) hop_2_j_e)
3587   (=> (and hop_1_j_g hop_1_g_d) hop_2_j_d)
3588   (=> (and hop_1_j_g hop_1_g_f) hop_2_j_f)
3589   (=> (and hop_1_j_g hop_1_g_i) hop_2_j_i)
3590   (=> (and hop_1_j_g hop_1_g_h) hop_2_j_h)
3591   (=> (and hop_1_j_g hop_1_g_k) hop_2_j_k)
3592   (=> (and hop_1_j_g hop_1_g_m) hop_2_j_m)
3593   (=> (and hop_1_j_g hop_1_g_l) hop_2_j_l)
3594   (=> (and hop_1_j_g hop_1_g_o) hop_2_j_o)
3595   (=> (and hop_1_j_g hop_1_g_n) hop_2_j_n)
3596   (=> (and hop_1_j_g hop_1_g_q) hop_2_j_q)
3597   (=> (and hop_1_j_g hop_1_g_p) hop_2_j_p)
3598   (=> (and hop_1_j_f hop_1_f_a) hop_2_j_a)
3599   (=> (and hop_1_j_f hop_1_f_c) hop_2_j_c)
3600   (=> (and hop_1_j_f hop_1_f_b) hop_2_j_b)
3601   (=> (and hop_1_j_f hop_1_f_e) hop_2_j_e)
3602   (=> (and hop_1_j_f hop_1_f_d) hop_2_j_d)
3603   (=> (and hop_1_j_f hop_1_f_g) hop_2_j_g)
3604   (=> (and hop_1_j_f hop_1_f_i) hop_2_j_i)
3605   (=> (and hop_1_j_f hop_1_f_h) hop_2_j_h)
3606   (=> (and hop_1_j_f hop_1_f_k) hop_2_j_k)
3607   (=> (and hop_1_j_f hop_1_f_m) hop_2_j_m)
3608   (=> (and hop_1_j_f hop_1_f_l) hop_2_j_l)
3609   (=> (and hop_1_j_f hop_1_f_o) hop_2_j_o)
3610   (=> (and hop_1_j_f hop_1_f_n) hop_2_j_n)
3611   (=> (and hop_1_j_f hop_1_f_q) hop_2_j_q)
3612   (=> (and hop_1_j_f hop_1_f_p) hop_2_j_p)
3613   (=> (and hop_1_j_i hop_1_i_a) hop_2_j_a)
3614   (=> (and hop_1_j_i hop_1_i_c) hop_2_j_c)
3615   (=> (and hop_1_j_i hop_1_i_b) hop_2_j_b)
3616   (=> (and hop_1_j_i hop_1_i_e) hop_2_j_e)
3617   (=> (and hop_1_j_i hop_1_i_d) hop_2_j_d)
3618   (=> (and hop_1_j_i hop_1_i_g) hop_2_j_g)
3619   (=> (and hop_1_j_i hop_1_i_f) hop_2_j_f)
3620   (=> (and hop_1_j_i hop_1_i_h) hop_2_j_h)
3621   (=> (and hop_1_j_i hop_1_i_k) hop_2_j_k)
3622   (=> (and hop_1_j_i hop_1_i_m) hop_2_j_m)
3623   (=> (and hop_1_j_i hop_1_i_l) hop_2_j_l)
3624   (=> (and hop_1_j_i hop_1_i_o) hop_2_j_o)
3625   (=> (and hop_1_j_i hop_1_i_n) hop_2_j_n)
3626   (=> (and hop_1_j_i hop_1_i_q) hop_2_j_q)
3627   (=> (and hop_1_j_i hop_1_i_p) hop_2_j_p)
3628   (=> (and hop_1_j_h hop_1_h_a) hop_2_j_a)
3629   (=> (and hop_1_j_h hop_1_h_c) hop_2_j_c)
3630   (=> (and hop_1_j_h hop_1_h_b) hop_2_j_b)
3631   (=> (and hop_1_j_h hop_1_h_e) hop_2_j_e)
3632   (=> (and hop_1_j_h hop_1_h_d) hop_2_j_d)
3633   (=> (and hop_1_j_h hop_1_h_g) hop_2_j_g)
3634   (=> (and hop_1_j_h hop_1_h_f) hop_2_j_f)
3635   (=> (and hop_1_j_h hop_1_h_i) hop_2_j_i)
3636   (=> (and hop_1_j_h hop_1_h_k) hop_2_j_k)
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3637  (=> (and hop_1_j_h hop_1_h_m) hop_2_j_m)
3638  (=> (and hop_1_j_h hop_1_h_l) hop_2_j_l)
3639  (=> (and hop_1_j_h hop_1_h_o) hop_2_j_o)
3640  (=> (and hop_1_j_h hop_1_h_n) hop_2_j_n)
3641  (=> (and hop_1_j_h hop_1_h_q) hop_2_j_q)
3642  (=> (and hop_1_j_h hop_1_h_p) hop_2_j_p)
3643  (=> (and hop_1_j_k hop_1_k_a) hop_2_j_a)
3644  (=> (and hop_1_j_k hop_1_k_c) hop_2_j_c)
3645  (=> (and hop_1_j_k hop_1_k_b) hop_2_j_b)
3646  (=> (and hop_1_j_k hop_1_k_e) hop_2_j_e)
3647  (=> (and hop_1_j_k hop_1_k_d) hop_2_j_d)
3648  (=> (and hop_1_j_k hop_1_k_g) hop_2_j_g)
3649  (=> (and hop_1_j_k hop_1_k_f) hop_2_j_f)
3650  (=> (and hop_1_j_k hop_1_k_i) hop_2_j_i)
3651  (=> (and hop_1_j_k hop_1_k_h) hop_2_j_h)
3652  (=> (and hop_1_j_k hop_1_k_m) hop_2_j_m)
3653  (=> (and hop_1_j_k hop_1_k_l) hop_2_j_l)
3654  (=> (and hop_1_j_k hop_1_k_o) hop_2_j_o)
3655  (=> (and hop_1_j_k hop_1_k_n) hop_2_j_n)
3656  (=> (and hop_1_j_k hop_1_k_q) hop_2_j_q)
3657  (=> (and hop_1_j_k hop_1_k_p) hop_2_j_p)
3658  (=> (and hop_1_j_m hop_1_m_a) hop_2_j_a)
3659  (=> (and hop_1_j_m hop_1_m_c) hop_2_j_c)
3660  (=> (and hop_1_j_m hop_1_m_b) hop_2_j_b)
3661  (=> (and hop_1_j_m hop_1_m_e) hop_2_j_e)
3662  (=> (and hop_1_j_m hop_1_m_d) hop_2_j_d)
3663  (=> (and hop_1_j_m hop_1_m_g) hop_2_j_g)
3664  (=> (and hop_1_j_m hop_1_m_f) hop_2_j_f)
3665  (=> (and hop_1_j_m hop_1_m_i) hop_2_j_i)
3666  (=> (and hop_1_j_m hop_1_m_h) hop_2_j_h)
3667  (=> (and hop_1_j_m hop_1_m_k) hop_2_j_k)
3668  (=> (and hop_1_j_m hop_1_m_l) hop_2_j_l)
3669  (=> (and hop_1_j_m hop_1_m_o) hop_2_j_o)
3670  (=> (and hop_1_j_m hop_1_m_n) hop_2_j_n)
3671  (=> (and hop_1_j_m hop_1_m_q) hop_2_j_q)
3672  (=> (and hop_1_j_m hop_1_m_p) hop_2_j_p)
3673  (=> (and hop_1_j_l hop_1_l_a) hop_2_j_a)
3674  (=> (and hop_1_j_l hop_1_l_c) hop_2_j_c)
3675  (=> (and hop_1_j_l hop_1_l_b) hop_2_j_b)
3676  (=> (and hop_1_j_l hop_1_l_e) hop_2_j_e)
3677  (=> (and hop_1_j_l hop_1_l_d) hop_2_j_d)
3678  (=> (and hop_1_j_l hop_1_l_g) hop_2_j_g)
3679  (=> (and hop_1_j_l hop_1_l_f) hop_2_j_f)
3680  (=> (and hop_1_j_l hop_1_l_i) hop_2_j_i)
3681  (=> (and hop_1_j_l hop_1_l_h) hop_2_j_h)
3682  (=> (and hop_1_j_l hop_1_l_k) hop_2_j_k)
3683  (=> (and hop_1_j_l hop_1_l_m) hop_2_j_m)
3684  (=> (and hop_1_j_l hop_1_l_o) hop_2_j_o)
3685  (=> (and hop_1_j_l hop_1_l_n) hop_2_j_n)
3686  (=> (and hop_1_j_l hop_1_l_q) hop_2_j_q)
3687  (=> (and hop_1_j_l hop_1_l_p) hop_2_j_p)
3688  (=> (and hop_1_j_o hop_1_o_a) hop_2_j_a)
3689  (=> (and hop_1_j_o hop_1_o_c) hop_2_j_c)
3690  (=> (and hop_1_j_o hop_1_o_b) hop_2_j_b)
3691  (=> (and hop_1_j_o hop_1_o_e) hop_2_j_e)
3692  (=> (and hop_1_j_o hop_1_o_d) hop_2_j_d)
3693  (=> (and hop_1_j_o hop_1_o_g) hop_2_j_g)
3694  (=> (and hop_1_j_o hop_1_o_f) hop_2_j_f)
3695  (=> (and hop_1_j_o hop_1_o_i) hop_2_j_i)
3696  (=> (and hop_1_j_o hop_1_o_h) hop_2_j_h)
3697  (=> (and hop_1_j_o hop_1_o_k) hop_2_j_k)
3698  (=> (and hop_1_j_o hop_1_o_m) hop_2_j_m)
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3699  (=> (and hop_1_j_o hop_1_o_l) hop_2_j_l)
3700  (=> (and hop_1_j_o hop_1_o_n) hop_2_j_n)
3701  (=> (and hop_1_j_o hop_1_o_q) hop_2_j_q)
3702  (=> (and hop_1_j_o hop_1_o_p) hop_2_j_p)
3703  (=> (and hop_1_j_n hop_1_n_a) hop_2_j_a)
3704  (=> (and hop_1_j_n hop_1_n_c) hop_2_j_c)
3705  (=> (and hop_1_j_n hop_1_n_b) hop_2_j_b)
3706  (=> (and hop_1_j_n hop_1_n_e) hop_2_j_e)
3707  (=> (and hop_1_j_n hop_1_n_d) hop_2_j_d)
3708  (=> (and hop_1_j_n hop_1_n_g) hop_2_j_g)
3709  (=> (and hop_1_j_n hop_1_n_f) hop_2_j_f)
3710  (=> (and hop_1_j_n hop_1_n_i) hop_2_j_i)
3711  (=> (and hop_1_j_n hop_1_n_h) hop_2_j_h)
3712  (=> (and hop_1_j_n hop_1_n_k) hop_2_j_k)
3713  (=> (and hop_1_j_n hop_1_n_m) hop_2_j_m)
3714  (=> (and hop_1_j_n hop_1_n_l) hop_2_j_l)
3715  (=> (and hop_1_j_n hop_1_n_o) hop_2_j_o)
3716  (=> (and hop_1_j_n hop_1_n_q) hop_2_j_q)
3717  (=> (and hop_1_j_n hop_1_n_p) hop_2_j_p)
3718  (=> (and hop_1_j_q hop_1_q_a) hop_2_j_a)
3719  (=> (and hop_1_j_q hop_1_q_c) hop_2_j_c)
3720  (=> (and hop_1_j_q hop_1_q_b) hop_2_j_b)
3721  (=> (and hop_1_j_q hop_1_q_e) hop_2_j_e)
3722  (=> (and hop_1_j_q hop_1_q_d) hop_2_j_d)
3723  (=> (and hop_1_j_q hop_1_q_g) hop_2_j_g)
3724  (=> (and hop_1_j_q hop_1_q_f) hop_2_j_f)
3725  (=> (and hop_1_j_q hop_1_q_i) hop_2_j_i)
3726  (=> (and hop_1_j_q hop_1_q_h) hop_2_j_h)
3727  (=> (and hop_1_j_q hop_1_q_k) hop_2_j_k)
3728  (=> (and hop_1_j_q hop_1_q_m) hop_2_j_m)
3729  (=> (and hop_1_j_q hop_1_q_l) hop_2_j_l)
3730  (=> (and hop_1_j_q hop_1_q_o) hop_2_j_o)
3731  (=> (and hop_1_j_q hop_1_q_n) hop_2_j_n)
3732  (=> (and hop_1_j_q hop_1_q_p) hop_2_j_p)
3733  (=> (and hop_1_j_p hop_1_p_a) hop_2_j_a)
3734  (=> (and hop_1_j_p hop_1_p_c) hop_2_j_c)
3735  (=> (and hop_1_j_p hop_1_p_b) hop_2_j_b)
3736  (=> (and hop_1_j_p hop_1_p_e) hop_2_j_e)
3737  (=> (and hop_1_j_p hop_1_p_d) hop_2_j_d)
3738  (=> (and hop_1_j_p hop_1_p_g) hop_2_j_g)
3739  (=> (and hop_1_j_p hop_1_p_f) hop_2_j_f)
3740  (=> (and hop_1_j_p hop_1_p_i) hop_2_j_i)
3741  (=> (and hop_1_j_p hop_1_p_h) hop_2_j_h)
3742  (=> (and hop_1_j_p hop_1_p_k) hop_2_j_k)
3743  (=> (and hop_1_j_p hop_1_p_m) hop_2_j_m)
3744  (=> (and hop_1_j_p hop_1_p_l) hop_2_j_l)
3745  (=> (and hop_1_j_p hop_1_p_o) hop_2_j_o)
3746  (=> (and hop_1_j_p hop_1_p_n) hop_2_j_n)
3747  (=> (and hop_1_j_p hop_1_p_q) hop_2_j_q)
3748  (=> (and hop_1_m_a hop_1_a_c) hop_2_m_c)
3749  (=> (and hop_1_m_a hop_1_a_b) hop_2_m_b)
3750  (=> (and hop_1_m_a hop_1_a_e) hop_2_m_e)
3751  (=> (and hop_1_m_a hop_1_a_d) hop_2_m_d)
3752  (=> (and hop_1_m_a hop_1_a_g) hop_2_m_g)
3753  (=> (and hop_1_m_a hop_1_a_f) hop_2_m_f)
3754  (=> (and hop_1_m_a hop_1_a_i) hop_2_m_i)
3755  (=> (and hop_1_m_a hop_1_a_h) hop_2_m_h)
3756  (=> (and hop_1_m_a hop_1_a_k) hop_2_m_k)
3757  (=> (and hop_1_m_a hop_1_a_j) hop_2_m_j)
3758  (=> (and hop_1_m_a hop_1_a_l) hop_2_m_l)
3759  (=> (and hop_1_m_a hop_1_a_o) hop_2_m_o)
3760  (=> (and hop_1_m_a hop_1_a_n) hop_2_m_n)
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3761  (=> (and hop_1_m_a hop_1_a_q) hop_2_m_q)
3762  (=> (and hop_1_m_a hop_1_a_p) hop_2_m_p)
3763  (=> (and hop_1_m_c hop_1_c_a) hop_2_m_a)
3764  (=> (and hop_1_m_c hop_1_c_b) hop_2_m_b)
3765  (=> (and hop_1_m_c hop_1_c_e) hop_2_m_e)
3766  (=> (and hop_1_m_c hop_1_c_d) hop_2_m_d)
3767  (=> (and hop_1_m_c hop_1_c_g) hop_2_m_g)
3768  (=> (and hop_1_m_c hop_1_c_f) hop_2_m_f)
3769  (=> (and hop_1_m_c hop_1_c_i) hop_2_m_i)
3770  (=> (and hop_1_m_c hop_1_c_h) hop_2_m_h)
3771  (=> (and hop_1_m_c hop_1_c_k) hop_2_m_k)
3772  (=> (and hop_1_m_c hop_1_c_j) hop_2_m_j)
3773  (=> (and hop_1_m_c hop_1_c_l) hop_2_m_l)
3774  (=> (and hop_1_m_c hop_1_c_o) hop_2_m_o)
3775  (=> (and hop_1_m_c hop_1_c_n) hop_2_m_n)
3776  (=> (and hop_1_m_c hop_1_c_q) hop_2_m_q)
3777  (=> (and hop_1_m_c hop_1_c_p) hop_2_m_p)
3778  (=> (and hop_1_m_b hop_1_b_a) hop_2_m_a)
3779  (=> (and hop_1_m_b hop_1_b_c) hop_2_m_c)
3780  (=> (and hop_1_m_b hop_1_b_e) hop_2_m_e)
3781  (=> (and hop_1_m_b hop_1_b_d) hop_2_m_d)
3782  (=> (and hop_1_m_b hop_1_b_g) hop_2_m_g)
3783  (=> (and hop_1_m_b hop_1_b_f) hop_2_m_f)
3784  (=> (and hop_1_m_b hop_1_b_i) hop_2_m_i)
3785  (=> (and hop_1_m_b hop_1_b_h) hop_2_m_h)
3786  (=> (and hop_1_m_b hop_1_b_k) hop_2_m_k)
3787  (=> (and hop_1_m_b hop_1_b_j) hop_2_m_j)
3788  (=> (and hop_1_m_b hop_1_b_l) hop_2_m_l)
3789  (=> (and hop_1_m_b hop_1_b_o) hop_2_m_o)
3790  (=> (and hop_1_m_b hop_1_b_n) hop_2_m_n)
3791  (=> (and hop_1_m_b hop_1_b_q) hop_2_m_q)
3792  (=> (and hop_1_m_b hop_1_b_p) hop_2_m_p)
3793  (=> (and hop_1_m_e hop_1_e_a) hop_2_m_a)
3794  (=> (and hop_1_m_e hop_1_e_c) hop_2_m_c)
3795  (=> (and hop_1_m_e hop_1_e_b) hop_2_m_b)
3796  (=> (and hop_1_m_e hop_1_e_d) hop_2_m_d)
3797  (=> (and hop_1_m_e hop_1_e_g) hop_2_m_g)
3798  (=> (and hop_1_m_e hop_1_e_f) hop_2_m_f)
3799  (=> (and hop_1_m_e hop_1_e_i) hop_2_m_i)
3800  (=> (and hop_1_m_e hop_1_e_h) hop_2_m_h)
3801  (=> (and hop_1_m_e hop_1_e_k) hop_2_m_k)
3802  (=> (and hop_1_m_e hop_1_e_j) hop_2_m_j)
3803  (=> (and hop_1_m_e hop_1_e_l) hop_2_m_l)
3804  (=> (and hop_1_m_e hop_1_e_o) hop_2_m_o)
3805  (=> (and hop_1_m_e hop_1_e_n) hop_2_m_n)
3806  (=> (and hop_1_m_e hop_1_e_q) hop_2_m_q)
3807  (=> (and hop_1_m_e hop_1_e_p) hop_2_m_p)
3808  (=> (and hop_1_m_d hop_1_d_a) hop_2_m_a)
3809  (=> (and hop_1_m_d hop_1_d_c) hop_2_m_c)
3810  (=> (and hop_1_m_d hop_1_d_b) hop_2_m_b)
3811  (=> (and hop_1_m_d hop_1_d_e) hop_2_m_e)
3812  (=> (and hop_1_m_d hop_1_d_g) hop_2_m_g)
3813  (=> (and hop_1_m_d hop_1_d_f) hop_2_m_f)
3814  (=> (and hop_1_m_d hop_1_d_i) hop_2_m_i)
3815  (=> (and hop_1_m_d hop_1_d_h) hop_2_m_h)
3816  (=> (and hop_1_m_d hop_1_d_k) hop_2_m_k)
3817  (=> (and hop_1_m_d hop_1_d_j) hop_2_m_j)
3818  (=> (and hop_1_m_d hop_1_d_l) hop_2_m_l)
3819  (=> (and hop_1_m_d hop_1_d_o) hop_2_m_o)
3820  (=> (and hop_1_m_d hop_1_d_n) hop_2_m_n)
3821  (=> (and hop_1_m_d hop_1_d_q) hop_2_m_q)
3822  (=> (and hop_1_m_d hop_1_d_p) hop_2_m_p)
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3823  (=> (and hop_1_m_g hop_1_g_a) hop_2_m_a)
3824  (=> (and hop_1_m_g hop_1_g_c) hop_2_m_c)
3825  (=> (and hop_1_m_g hop_1_g_b) hop_2_m_b)
3826  (=> (and hop_1_m_g hop_1_g_e) hop_2_m_e)
3827  (=> (and hop_1_m_g hop_1_g_d) hop_2_m_d)
3828  (=> (and hop_1_m_g hop_1_g_f) hop_2_m_f)
3829  (=> (and hop_1_m_g hop_1_g_i) hop_2_m_i)
3830  (=> (and hop_1_m_g hop_1_g_h) hop_2_m_h)
3831  (=> (and hop_1_m_g hop_1_g_k) hop_2_m_k)
3832  (=> (and hop_1_m_g hop_1_g_j) hop_2_m_j)
3833  (=> (and hop_1_m_g hop_1_g_l) hop_2_m_l)
3834  (=> (and hop_1_m_g hop_1_g_o) hop_2_m_o)
3835  (=> (and hop_1_m_g hop_1_g_n) hop_2_m_n)
3836  (=> (and hop_1_m_g hop_1_g_q) hop_2_m_q)
3837  (=> (and hop_1_m_g hop_1_g_p) hop_2_m_p)
3838  (=> (and hop_1_m_f hop_1_f_a) hop_2_m_a)
3839  (=> (and hop_1_m_f hop_1_f_c) hop_2_m_c)
3840  (=> (and hop_1_m_f hop_1_f_b) hop_2_m_b)
3841  (=> (and hop_1_m_f hop_1_f_e) hop_2_m_e)
3842  (=> (and hop_1_m_f hop_1_f_d) hop_2_m_d)
3843  (=> (and hop_1_m_f hop_1_f_g) hop_2_m_g)
3844  (=> (and hop_1_m_f hop_1_f_i) hop_2_m_i)
3845  (=> (and hop_1_m_f hop_1_f_h) hop_2_m_h)
3846  (=> (and hop_1_m_f hop_1_f_k) hop_2_m_k)
3847  (=> (and hop_1_m_f hop_1_f_j) hop_2_m_j)
3848  (=> (and hop_1_m_f hop_1_f_l) hop_2_m_l)
3849  (=> (and hop_1_m_f hop_1_f_o) hop_2_m_o)
3850  (=> (and hop_1_m_f hop_1_f_n) hop_2_m_n)
3851  (=> (and hop_1_m_f hop_1_f_q) hop_2_m_q)
3852  (=> (and hop_1_m_f hop_1_f_p) hop_2_m_p)
3853  (=> (and hop_1_m_i hop_1_i_a) hop_2_m_a)
3854  (=> (and hop_1_m_i hop_1_i_c) hop_2_m_c)
3855  (=> (and hop_1_m_i hop_1_i_b) hop_2_m_b)
3856  (=> (and hop_1_m_i hop_1_i_e) hop_2_m_e)
3857  (=> (and hop_1_m_i hop_1_i_d) hop_2_m_d)
3858  (=> (and hop_1_m_i hop_1_i_g) hop_2_m_g)
3859  (=> (and hop_1_m_i hop_1_i_f) hop_2_m_f)
3860  (=> (and hop_1_m_i hop_1_i_h) hop_2_m_h)
3861  (=> (and hop_1_m_i hop_1_i_k) hop_2_m_k)
3862  (=> (and hop_1_m_i hop_1_i_j) hop_2_m_j)
3863  (=> (and hop_1_m_i hop_1_i_l) hop_2_m_l)
3864  (=> (and hop_1_m_i hop_1_i_o) hop_2_m_o)
3865  (=> (and hop_1_m_i hop_1_i_n) hop_2_m_n)
3866  (=> (and hop_1_m_i hop_1_i_q) hop_2_m_q)
3867  (=> (and hop_1_m_i hop_1_i_p) hop_2_m_p)
3868  (=> (and hop_1_m_h hop_1_h_a) hop_2_m_a)
3869  (=> (and hop_1_m_h hop_1_h_c) hop_2_m_c)
3870  (=> (and hop_1_m_h hop_1_h_b) hop_2_m_b)
3871  (=> (and hop_1_m_h hop_1_h_e) hop_2_m_e)
3872  (=> (and hop_1_m_h hop_1_h_d) hop_2_m_d)
3873  (=> (and hop_1_m_h hop_1_h_g) hop_2_m_g)
3874  (=> (and hop_1_m_h hop_1_h_f) hop_2_m_f)
3875  (=> (and hop_1_m_h hop_1_h_i) hop_2_m_i)
3876  (=> (and hop_1_m_h hop_1_h_k) hop_2_m_k)
3877  (=> (and hop_1_m_h hop_1_h_j) hop_2_m_j)
3878  (=> (and hop_1_m_h hop_1_h_l) hop_2_m_l)
3879  (=> (and hop_1_m_h hop_1_h_o) hop_2_m_o)
3880  (=> (and hop_1_m_h hop_1_h_n) hop_2_m_n)
3881  (=> (and hop_1_m_h hop_1_h_q) hop_2_m_q)
3882  (=> (and hop_1_m_h hop_1_h_p) hop_2_m_p)
3883  (=> (and hop_1_m_k hop_1_k_a) hop_2_m_a)
3884  (=> (and hop_1_m_k hop_1_k_c) hop_2_m_c)
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3885  (=> (and hop_1_m_k hop_1_k_b) hop_2_m_b)
3886  (=> (and hop_1_m_k hop_1_k_e) hop_2_m_e)
3887  (=> (and hop_1_m_k hop_1_k_d) hop_2_m_d)
3888  (=> (and hop_1_m_k hop_1_k_g) hop_2_m_g)
3889  (=> (and hop_1_m_k hop_1_k_f) hop_2_m_f)
3890  (=> (and hop_1_m_k hop_1_k_i) hop_2_m_i)
3891  (=> (and hop_1_m_k hop_1_k_h) hop_2_m_h)
3892  (=> (and hop_1_m_k hop_1_k_j) hop_2_m_j)
3893  (=> (and hop_1_m_k hop_1_k_l) hop_2_m_l)
3894  (=> (and hop_1_m_k hop_1_k_o) hop_2_m_o)
3895  (=> (and hop_1_m_k hop_1_k_n) hop_2_m_n)
3896  (=> (and hop_1_m_k hop_1_k_q) hop_2_m_q)
3897  (=> (and hop_1_m_k hop_1_k_p) hop_2_m_p)
3898  (=> (and hop_1_m_j hop_1_j_a) hop_2_m_a)
3899  (=> (and hop_1_m_j hop_1_j_c) hop_2_m_c)
3900  (=> (and hop_1_m_j hop_1_j_b) hop_2_m_b)
3901  (=> (and hop_1_m_j hop_1_j_e) hop_2_m_e)
3902  (=> (and hop_1_m_j hop_1_j_d) hop_2_m_d)
3903  (=> (and hop_1_m_j hop_1_j_g) hop_2_m_g)
3904  (=> (and hop_1_m_j hop_1_j_f) hop_2_m_f)
3905  (=> (and hop_1_m_j hop_1_j_i) hop_2_m_i)
3906  (=> (and hop_1_m_j hop_1_j_h) hop_2_m_h)
3907  (=> (and hop_1_m_j hop_1_j_k) hop_2_m_k)
3908  (=> (and hop_1_m_j hop_1_j_l) hop_2_m_l)
3909  (=> (and hop_1_m_j hop_1_j_o) hop_2_m_o)
3910  (=> (and hop_1_m_j hop_1_j_n) hop_2_m_n)
3911  (=> (and hop_1_m_j hop_1_j_q) hop_2_m_q)
3912  (=> (and hop_1_m_j hop_1_j_p) hop_2_m_p)
3913  (=> (and hop_1_m_l hop_1_l_a) hop_2_m_a)
3914  (=> (and hop_1_m_l hop_1_l_c) hop_2_m_c)
3915  (=> (and hop_1_m_l hop_1_l_b) hop_2_m_b)
3916  (=> (and hop_1_m_l hop_1_l_e) hop_2_m_e)
3917  (=> (and hop_1_m_l hop_1_l_d) hop_2_m_d)
3918  (=> (and hop_1_m_l hop_1_l_g) hop_2_m_g)
3919  (=> (and hop_1_m_l hop_1_l_f) hop_2_m_f)
3920  (=> (and hop_1_m_l hop_1_l_i) hop_2_m_i)
3921  (=> (and hop_1_m_l hop_1_l_h) hop_2_m_h)
3922  (=> (and hop_1_m_l hop_1_l_k) hop_2_m_k)
3923  (=> (and hop_1_m_l hop_1_l_j) hop_2_m_j)
3924  (=> (and hop_1_m_l hop_1_l_o) hop_2_m_o)
3925  (=> (and hop_1_m_l hop_1_l_n) hop_2_m_n)
3926  (=> (and hop_1_m_l hop_1_l_q) hop_2_m_q)
3927  (=> (and hop_1_m_l hop_1_l_p) hop_2_m_p)
3928  (=> (and hop_1_m_o hop_1_o_a) hop_2_m_a)
3929  (=> (and hop_1_m_o hop_1_o_c) hop_2_m_c)
3930  (=> (and hop_1_m_o hop_1_o_b) hop_2_m_b)
3931  (=> (and hop_1_m_o hop_1_o_e) hop_2_m_e)
3932  (=> (and hop_1_m_o hop_1_o_d) hop_2_m_d)
3933  (=> (and hop_1_m_o hop_1_o_g) hop_2_m_g)
3934  (=> (and hop_1_m_o hop_1_o_f) hop_2_m_f)
3935  (=> (and hop_1_m_o hop_1_o_i) hop_2_m_i)
3936  (=> (and hop_1_m_o hop_1_o_h) hop_2_m_h)
3937  (=> (and hop_1_m_o hop_1_o_k) hop_2_m_k)
3938  (=> (and hop_1_m_o hop_1_o_j) hop_2_m_j)
3939  (=> (and hop_1_m_o hop_1_o_l) hop_2_m_l)
3940  (=> (and hop_1_m_o hop_1_o_n) hop_2_m_n)
3941  (=> (and hop_1_m_o hop_1_o_q) hop_2_m_q)
3942  (=> (and hop_1_m_o hop_1_o_p) hop_2_m_p)
3943  (=> (and hop_1_m_n hop_1_n_a) hop_2_m_a)
3944  (=> (and hop_1_m_n hop_1_n_c) hop_2_m_c)
3945  (=> (and hop_1_m_n hop_1_n_b) hop_2_m_b)
3946  (=> (and hop_1_m_n hop_1_n_e) hop_2_m_e)
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3947  (=> (and hop_1_m_n hop_1_n_d) hop_2_m_d)
3948  (=> (and hop_1_m_n hop_1_n_g) hop_2_m_g)
3949  (=> (and hop_1_m_n hop_1_n_f) hop_2_m_f)
3950  (=> (and hop_1_m_n hop_1_n_i) hop_2_m_i)
3951  (=> (and hop_1_m_n hop_1_n_h) hop_2_m_h)
3952  (=> (and hop_1_m_n hop_1_n_k) hop_2_m_k)
3953  (=> (and hop_1_m_n hop_1_n_j) hop_2_m_j)
3954  (=> (and hop_1_m_n hop_1_n_l) hop_2_m_l)
3955  (=> (and hop_1_m_n hop_1_n_o) hop_2_m_o)
3956  (=> (and hop_1_m_n hop_1_n_q) hop_2_m_q)
3957  (=> (and hop_1_m_n hop_1_n_p) hop_2_m_p)
3958  (=> (and hop_1_m_q hop_1_q_a) hop_2_m_a)
3959  (=> (and hop_1_m_q hop_1_q_c) hop_2_m_c)
3960  (=> (and hop_1_m_q hop_1_q_b) hop_2_m_b)
3961  (=> (and hop_1_m_q hop_1_q_e) hop_2_m_e)
3962  (=> (and hop_1_m_q hop_1_q_d) hop_2_m_d)
3963  (=> (and hop_1_m_q hop_1_q_g) hop_2_m_g)
3964  (=> (and hop_1_m_q hop_1_q_f) hop_2_m_f)
3965  (=> (and hop_1_m_q hop_1_q_i) hop_2_m_i)
3966  (=> (and hop_1_m_q hop_1_q_h) hop_2_m_h)
3967  (=> (and hop_1_m_q hop_1_q_k) hop_2_m_k)
3968  (=> (and hop_1_m_q hop_1_q_j) hop_2_m_j)
3969  (=> (and hop_1_m_q hop_1_q_l) hop_2_m_l)
3970  (=> (and hop_1_m_q hop_1_q_o) hop_2_m_o)
3971  (=> (and hop_1_m_q hop_1_q_n) hop_2_m_n)
3972  (=> (and hop_1_m_q hop_1_q_p) hop_2_m_p)
3973  (=> (and hop_1_m_p hop_1_p_a) hop_2_m_a)
3974  (=> (and hop_1_m_p hop_1_p_c) hop_2_m_c)
3975  (=> (and hop_1_m_p hop_1_p_b) hop_2_m_b)
3976  (=> (and hop_1_m_p hop_1_p_e) hop_2_m_e)
3977  (=> (and hop_1_m_p hop_1_p_d) hop_2_m_d)
3978  (=> (and hop_1_m_p hop_1_p_g) hop_2_m_g)
3979  (=> (and hop_1_m_p hop_1_p_f) hop_2_m_f)
3980  (=> (and hop_1_m_p hop_1_p_i) hop_2_m_i)
3981  (=> (and hop_1_m_p hop_1_p_h) hop_2_m_h)
3982  (=> (and hop_1_m_p hop_1_p_k) hop_2_m_k)
3983  (=> (and hop_1_m_p hop_1_p_j) hop_2_m_j)
3984  (=> (and hop_1_m_p hop_1_p_l) hop_2_m_l)
3985  (=> (and hop_1_m_p hop_1_p_o) hop_2_m_o)
3986  (=> (and hop_1_m_p hop_1_p_n) hop_2_m_n)
3987  (=> (and hop_1_m_p hop_1_p_q) hop_2_m_q)
3988  (=> (and hop_1_l_a hop_1_a_c) hop_2_l_c)
3989  (=> (and hop_1_l_a hop_1_a_b) hop_2_l_b)
3990  (=> (and hop_1_l_a hop_1_a_e) hop_2_l_e)
3991  (=> (and hop_1_l_a hop_1_a_d) hop_2_l_d)
3992  (=> (and hop_1_l_a hop_1_a_g) hop_2_l_g)
3993  (=> (and hop_1_l_a hop_1_a_f) hop_2_l_f)
3994  (=> (and hop_1_l_a hop_1_a_i) hop_2_l_i)
3995  (=> (and hop_1_l_a hop_1_a_h) hop_2_l_h)
3996  (=> (and hop_1_l_a hop_1_a_k) hop_2_l_k)
3997  (=> (and hop_1_l_a hop_1_a_j) hop_2_l_j)
3998  (=> (and hop_1_l_a hop_1_a_m) hop_2_l_m)
3999  (=> (and hop_1_l_a hop_1_a_o) hop_2_l_o)
4000  (=> (and hop_1_l_a hop_1_a_n) hop_2_l_n)
4001  (=> (and hop_1_l_a hop_1_a_q) hop_2_l_q)
4002  (=> (and hop_1_l_a hop_1_a_p) hop_2_l_p)
4003  (=> (and hop_1_l_c hop_1_c_a) hop_2_l_a)
4004  (=> (and hop_1_l_c hop_1_c_b) hop_2_l_b)
4005  (=> (and hop_1_l_c hop_1_c_e) hop_2_l_e)
4006  (=> (and hop_1_l_c hop_1_c_d) hop_2_l_d)
4007  (=> (and hop_1_l_c hop_1_c_g) hop_2_l_g)
4008  (=> (and hop_1_l_c hop_1_c_f) hop_2_l_f)
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4009  (=> (and hop_1_l_c hop_1_c_i) hop_2_l_i)
4010  (=> (and hop_1_l_c hop_1_c_h) hop_2_l_h)
4011  (=> (and hop_1_l_c hop_1_c_k) hop_2_l_k)
4012  (=> (and hop_1_l_c hop_1_c_j) hop_2_l_j)
4013  (=> (and hop_1_l_c hop_1_c_m) hop_2_l_m)
4014  (=> (and hop_1_l_c hop_1_c_o) hop_2_l_o)
4015  (=> (and hop_1_l_c hop_1_c_n) hop_2_l_n)
4016  (=> (and hop_1_l_c hop_1_c_q) hop_2_l_q)
4017  (=> (and hop_1_l_c hop_1_c_p) hop_2_l_p)
4018  (=> (and hop_1_l_b hop_1_b_a) hop_2_l_a)
4019  (=> (and hop_1_l_b hop_1_b_c) hop_2_l_c)
4020  (=> (and hop_1_l_b hop_1_b_e) hop_2_l_e)
4021  (=> (and hop_1_l_b hop_1_b_d) hop_2_l_d)
4022  (=> (and hop_1_l_b hop_1_b_g) hop_2_l_g)
4023  (=> (and hop_1_l_b hop_1_b_f) hop_2_l_f)
4024  (=> (and hop_1_l_b hop_1_b_i) hop_2_l_i)
4025  (=> (and hop_1_l_b hop_1_b_h) hop_2_l_h)
4026  (=> (and hop_1_l_b hop_1_b_k) hop_2_l_k)
4027  (=> (and hop_1_l_b hop_1_b_j) hop_2_l_j)
4028  (=> (and hop_1_l_b hop_1_b_m) hop_2_l_m)
4029  (=> (and hop_1_l_b hop_1_b_o) hop_2_l_o)
4030  (=> (and hop_1_l_b hop_1_b_n) hop_2_l_n)
4031  (=> (and hop_1_l_b hop_1_b_q) hop_2_l_q)
4032  (=> (and hop_1_l_b hop_1_b_p) hop_2_l_p)
4033  (=> (and hop_1_l_e hop_1_e_a) hop_2_l_a)
4034  (=> (and hop_1_l_e hop_1_e_c) hop_2_l_c)
4035  (=> (and hop_1_l_e hop_1_e_b) hop_2_l_b)
4036  (=> (and hop_1_l_e hop_1_e_d) hop_2_l_d)
4037  (=> (and hop_1_l_e hop_1_e_g) hop_2_l_g)
4038  (=> (and hop_1_l_e hop_1_e_f) hop_2_l_f)
4039  (=> (and hop_1_l_e hop_1_e_i) hop_2_l_i)
4040  (=> (and hop_1_l_e hop_1_e_h) hop_2_l_h)
4041  (=> (and hop_1_l_e hop_1_e_k) hop_2_l_k)
4042  (=> (and hop_1_l_e hop_1_e_j) hop_2_l_j)
4043  (=> (and hop_1_l_e hop_1_e_m) hop_2_l_m)
4044  (=> (and hop_1_l_e hop_1_e_o) hop_2_l_o)
4045  (=> (and hop_1_l_e hop_1_e_n) hop_2_l_n)
4046  (=> (and hop_1_l_e hop_1_e_q) hop_2_l_q)
4047  (=> (and hop_1_l_e hop_1_e_p) hop_2_l_p)
4048  (=> (and hop_1_l_d hop_1_d_a) hop_2_l_a)
4049  (=> (and hop_1_l_d hop_1_d_c) hop_2_l_c)
4050  (=> (and hop_1_l_d hop_1_d_b) hop_2_l_b)
4051  (=> (and hop_1_l_d hop_1_d_e) hop_2_l_e)
4052  (=> (and hop_1_l_d hop_1_d_g) hop_2_l_g)
4053  (=> (and hop_1_l_d hop_1_d_f) hop_2_l_f)
4054  (=> (and hop_1_l_d hop_1_d_i) hop_2_l_i)
4055  (=> (and hop_1_l_d hop_1_d_h) hop_2_l_h)
4056  (=> (and hop_1_l_d hop_1_d_k) hop_2_l_k)
4057  (=> (and hop_1_l_d hop_1_d_j) hop_2_l_j)
4058  (=> (and hop_1_l_d hop_1_d_m) hop_2_l_m)
4059  (=> (and hop_1_l_d hop_1_d_o) hop_2_l_o)
4060  (=> (and hop_1_l_d hop_1_d_n) hop_2_l_n)
4061  (=> (and hop_1_l_d hop_1_d_q) hop_2_l_q)
4062  (=> (and hop_1_l_d hop_1_d_p) hop_2_l_p)
4063  (=> (and hop_1_l_g hop_1_g_a) hop_2_l_a)
4064  (=> (and hop_1_l_g hop_1_g_c) hop_2_l_c)
4065  (=> (and hop_1_l_g hop_1_g_b) hop_2_l_b)
4066  (=> (and hop_1_l_g hop_1_g_e) hop_2_l_e)
4067  (=> (and hop_1_l_g hop_1_g_d) hop_2_l_d)
4068  (=> (and hop_1_l_g hop_1_g_f) hop_2_l_f)
4069  (=> (and hop_1_l_g hop_1_g_i) hop_2_l_i)
4070  (=> (and hop_1_l_g hop_1_g_h) hop_2_l_h)
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4071  (=> (and hop_1_l_g hop_1_g_k) hop_2_l_k)
4072  (=> (and hop_1_l_g hop_1_g_j) hop_2_l_j)
4073  (=> (and hop_1_l_g hop_1_g_m) hop_2_l_m)
4074  (=> (and hop_1_l_g hop_1_g_o) hop_2_l_o)
4075  (=> (and hop_1_l_g hop_1_g_n) hop_2_l_n)
4076  (=> (and hop_1_l_g hop_1_g_q) hop_2_l_q)
4077  (=> (and hop_1_l_g hop_1_g_p) hop_2_l_p)
4078  (=> (and hop_1_l_f hop_1_f_a) hop_2_l_a)
4079  (=> (and hop_1_l_f hop_1_f_c) hop_2_l_c)
4080  (=> (and hop_1_l_f hop_1_f_b) hop_2_l_b)
4081  (=> (and hop_1_l_f hop_1_f_e) hop_2_l_e)
4082  (=> (and hop_1_l_f hop_1_f_d) hop_2_l_d)
4083  (=> (and hop_1_l_f hop_1_f_g) hop_2_l_g)
4084  (=> (and hop_1_l_f hop_1_f_i) hop_2_l_i)
4085  (=> (and hop_1_l_f hop_1_f_h) hop_2_l_h)
4086  (=> (and hop_1_l_f hop_1_f_k) hop_2_l_k)
4087  (=> (and hop_1_l_f hop_1_f_j) hop_2_l_j)
4088  (=> (and hop_1_l_f hop_1_f_m) hop_2_l_m)
4089  (=> (and hop_1_l_f hop_1_f_o) hop_2_l_o)
4090  (=> (and hop_1_l_f hop_1_f_n) hop_2_l_n)
4091  (=> (and hop_1_l_f hop_1_f_q) hop_2_l_q)
4092  (=> (and hop_1_l_f hop_1_f_p) hop_2_l_p)
4093  (=> (and hop_1_l_i hop_1_i_a) hop_2_l_a)
4094  (=> (and hop_1_l_i hop_1_i_c) hop_2_l_c)
4095  (=> (and hop_1_l_i hop_1_i_b) hop_2_l_b)
4096  (=> (and hop_1_l_i hop_1_i_e) hop_2_l_e)
4097  (=> (and hop_1_l_i hop_1_i_d) hop_2_l_d)
4098  (=> (and hop_1_l_i hop_1_i_g) hop_2_l_g)
4099  (=> (and hop_1_l_i hop_1_i_f) hop_2_l_f)
4100  (=> (and hop_1_l_i hop_1_i_h) hop_2_l_h)
4101  (=> (and hop_1_l_i hop_1_i_k) hop_2_l_k)
4102  (=> (and hop_1_l_i hop_1_i_j) hop_2_l_j)
4103  (=> (and hop_1_l_i hop_1_i_m) hop_2_l_m)
4104  (=> (and hop_1_l_i hop_1_i_o) hop_2_l_o)
4105  (=> (and hop_1_l_i hop_1_i_n) hop_2_l_n)
4106  (=> (and hop_1_l_i hop_1_i_q) hop_2_l_q)
4107  (=> (and hop_1_l_i hop_1_i_p) hop_2_l_p)
4108  (=> (and hop_1_l_h hop_1_h_a) hop_2_l_a)
4109  (=> (and hop_1_l_h hop_1_h_c) hop_2_l_c)
4110  (=> (and hop_1_l_h hop_1_h_b) hop_2_l_b)
4111  (=> (and hop_1_l_h hop_1_h_e) hop_2_l_e)
4112  (=> (and hop_1_l_h hop_1_h_d) hop_2_l_d)
4113  (=> (and hop_1_l_h hop_1_h_g) hop_2_l_g)
4114  (=> (and hop_1_l_h hop_1_h_f) hop_2_l_f)
4115  (=> (and hop_1_l_h hop_1_h_i) hop_2_l_i)
4116  (=> (and hop_1_l_h hop_1_h_k) hop_2_l_k)
4117  (=> (and hop_1_l_h hop_1_h_j) hop_2_l_j)
4118  (=> (and hop_1_l_h hop_1_h_m) hop_2_l_m)
4119  (=> (and hop_1_l_h hop_1_h_o) hop_2_l_o)
4120  (=> (and hop_1_l_h hop_1_h_n) hop_2_l_n)
4121  (=> (and hop_1_l_h hop_1_h_q) hop_2_l_q)
4122  (=> (and hop_1_l_h hop_1_h_p) hop_2_l_p)
4123  (=> (and hop_1_l_k hop_1_k_a) hop_2_l_a)
4124  (=> (and hop_1_l_k hop_1_k_c) hop_2_l_c)
4125  (=> (and hop_1_l_k hop_1_k_b) hop_2_l_b)
4126  (=> (and hop_1_l_k hop_1_k_e) hop_2_l_e)
4127  (=> (and hop_1_l_k hop_1_k_d) hop_2_l_d)
4128  (=> (and hop_1_l_k hop_1_k_g) hop_2_l_g)
4129  (=> (and hop_1_l_k hop_1_k_f) hop_2_l_f)
4130  (=> (and hop_1_l_k hop_1_k_i) hop_2_l_i)
4131  (=> (and hop_1_l_k hop_1_k_h) hop_2_l_h)
4132  (=> (and hop_1_l_k hop_1_k_j) hop_2_l_j)
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4133   (=> (and hop_1_l_k hop_1_k_m) hop_2_l_m)
4134   (=> (and hop_1_l_k hop_1_k_o) hop_2_l_o)
4135   (=> (and hop_1_l_k hop_1_k_n) hop_2_l_n)
4136   (=> (and hop_1_l_k hop_1_k_q) hop_2_l_q)
4137   (=> (and hop_1_l_k hop_1_k_p) hop_2_l_p)
4138   (=> (and hop_1_l_j hop_1_j_a) hop_2_l_a)
4139   (=> (and hop_1_l_j hop_1_j_c) hop_2_l_c)
4140   (=> (and hop_1_l_j hop_1_j_b) hop_2_l_b)
4141   (=> (and hop_1_l_j hop_1_j_e) hop_2_l_e)
4142   (=> (and hop_1_l_j hop_1_j_d) hop_2_l_d)
4143   (=> (and hop_1_l_j hop_1_j_g) hop_2_l_g)
4144   (=> (and hop_1_l_j hop_1_j_f) hop_2_l_f)
4145   (=> (and hop_1_l_j hop_1_j_i) hop_2_l_i)
4146   (=> (and hop_1_l_j hop_1_j_h) hop_2_l_h)
4147   (=> (and hop_1_l_j hop_1_j_k) hop_2_l_k)
4148   (=> (and hop_1_l_j hop_1_j_m) hop_2_l_m)
4149   (=> (and hop_1_l_j hop_1_j_o) hop_2_l_o)
4150   (=> (and hop_1_l_j hop_1_j_n) hop_2_l_n)
4151   (=> (and hop_1_l_j hop_1_j_q) hop_2_l_q)
4152   (=> (and hop_1_l_j hop_1_j_p) hop_2_l_p)
4153   (=> (and hop_1_l_m hop_1_m_a) hop_2_l_a)
4154   (=> (and hop_1_l_m hop_1_m_c) hop_2_l_c)
4155   (=> (and hop_1_l_m hop_1_m_b) hop_2_l_b)
4156   (=> (and hop_1_l_m hop_1_m_e) hop_2_l_e)
4157   (=> (and hop_1_l_m hop_1_m_d) hop_2_l_d)
4158   (=> (and hop_1_l_m hop_1_m_g) hop_2_l_g)
4159   (=> (and hop_1_l_m hop_1_m_f) hop_2_l_f)
4160   (=> (and hop_1_l_m hop_1_m_i) hop_2_l_i)
4161   (=> (and hop_1_l_m hop_1_m_h) hop_2_l_h)
4162   (=> (and hop_1_l_m hop_1_m_k) hop_2_l_k)
4163   (=> (and hop_1_l_m hop_1_m_j) hop_2_l_j)
4164   (=> (and hop_1_l_m hop_1_m_o) hop_2_l_o)
4165   (=> (and hop_1_l_m hop_1_m_n) hop_2_l_n)
4166   (=> (and hop_1_l_m hop_1_m_q) hop_2_l_q)
4167   (=> (and hop_1_l_m hop_1_m_p) hop_2_l_p)
4168   (=> (and hop_1_l_o hop_1_o_a) hop_2_l_a)
4169   (=> (and hop_1_l_o hop_1_o_c) hop_2_l_c)
4170   (=> (and hop_1_l_o hop_1_o_b) hop_2_l_b)
4171   (=> (and hop_1_l_o hop_1_o_e) hop_2_l_e)
4172   (=> (and hop_1_l_o hop_1_o_d) hop_2_l_d)
4173   (=> (and hop_1_l_o hop_1_o_g) hop_2_l_g)
4174   (=> (and hop_1_l_o hop_1_o_f) hop_2_l_f)
4175   (=> (and hop_1_l_o hop_1_o_i) hop_2_l_i)
4176   (=> (and hop_1_l_o hop_1_o_h) hop_2_l_h)
4177   (=> (and hop_1_l_o hop_1_o_k) hop_2_l_k)
4178   (=> (and hop_1_l_o hop_1_o_j) hop_2_l_j)
4179   (=> (and hop_1_l_o hop_1_o_m) hop_2_l_m)
4180   (=> (and hop_1_l_o hop_1_o_n) hop_2_l_n)
4181   (=> (and hop_1_l_o hop_1_o_q) hop_2_l_q)
4182   (=> (and hop_1_l_o hop_1_o_p) hop_2_l_p)
4183   (=> (and hop_1_l_n hop_1_n_a) hop_2_l_a)
4184   (=> (and hop_1_l_n hop_1_n_c) hop_2_l_c)
4185   (=> (and hop_1_l_n hop_1_n_b) hop_2_l_b)
4186   (=> (and hop_1_l_n hop_1_n_e) hop_2_l_e)
4187   (=> (and hop_1_l_n hop_1_n_d) hop_2_l_d)
4188   (=> (and hop_1_l_n hop_1_n_g) hop_2_l_g)
4189   (=> (and hop_1_l_n hop_1_n_f) hop_2_l_f)
4190   (=> (and hop_1_l_n hop_1_n_i) hop_2_l_i)
4191   (=> (and hop_1_l_n hop_1_n_h) hop_2_l_h)
4192   (=> (and hop_1_l_n hop_1_n_k) hop_2_l_k)
4193   (=> (and hop_1_l_n hop_1_n_j) hop_2_l_j)
4194   (=> (and hop_1_l_n hop_1_n_m) hop_2_l_m)
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4195  (=> (and hop_1_l_n hop_1_n_o) hop_2_l_o)
4196  (=> (and hop_1_l_n hop_1_n_q) hop_2_l_q)
4197  (=> (and hop_1_l_n hop_1_n_p) hop_2_l_p)
4198  (=> (and hop_1_l_q hop_1_q_a) hop_2_l_a)
4199  (=> (and hop_1_l_q hop_1_q_c) hop_2_l_c)
4200  (=> (and hop_1_l_q hop_1_q_b) hop_2_l_b)
4201  (=> (and hop_1_l_q hop_1_q_e) hop_2_l_e)
4202  (=> (and hop_1_l_q hop_1_q_d) hop_2_l_d)
4203  (=> (and hop_1_l_q hop_1_q_g) hop_2_l_g)
4204  (=> (and hop_1_l_q hop_1_q_f) hop_2_l_f)
4205  (=> (and hop_1_l_q hop_1_q_i) hop_2_l_i)
4206  (=> (and hop_1_l_q hop_1_q_h) hop_2_l_h)
4207  (=> (and hop_1_l_q hop_1_q_k) hop_2_l_k)
4208  (=> (and hop_1_l_q hop_1_q_j) hop_2_l_j)
4209  (=> (and hop_1_l_q hop_1_q_m) hop_2_l_m)
4210  (=> (and hop_1_l_q hop_1_q_o) hop_2_l_o)
4211  (=> (and hop_1_l_q hop_1_q_n) hop_2_l_n)
4212  (=> (and hop_1_l_q hop_1_q_p) hop_2_l_p)
4213  (=> (and hop_1_l_p hop_1_p_a) hop_2_l_a)
4214  (=> (and hop_1_l_p hop_1_p_c) hop_2_l_c)
4215  (=> (and hop_1_l_p hop_1_p_b) hop_2_l_b)
4216  (=> (and hop_1_l_p hop_1_p_e) hop_2_l_e)
4217  (=> (and hop_1_l_p hop_1_p_d) hop_2_l_d)
4218  (=> (and hop_1_l_p hop_1_p_g) hop_2_l_g)
4219  (=> (and hop_1_l_p hop_1_p_f) hop_2_l_f)
4220  (=> (and hop_1_l_p hop_1_p_i) hop_2_l_i)
4221  (=> (and hop_1_l_p hop_1_p_h) hop_2_l_h)
4222  (=> (and hop_1_l_p hop_1_p_k) hop_2_l_k)
4223  (=> (and hop_1_l_p hop_1_p_j) hop_2_l_j)
4224  (=> (and hop_1_l_p hop_1_p_m) hop_2_l_m)
4225  (=> (and hop_1_l_p hop_1_p_o) hop_2_l_o)
4226  (=> (and hop_1_l_p hop_1_p_n) hop_2_l_n)
4227  (=> (and hop_1_l_p hop_1_p_q) hop_2_l_q)
4228  (=> (and hop_1_o_a hop_1_a_c) hop_2_o_c)
4229  (=> (and hop_1_o_a hop_1_a_b) hop_2_o_b)
4230  (=> (and hop_1_o_a hop_1_a_e) hop_2_o_e)
4231  (=> (and hop_1_o_a hop_1_a_d) hop_2_o_d)
4232  (=> (and hop_1_o_a hop_1_a_g) hop_2_o_g)
4233  (=> (and hop_1_o_a hop_1_a_f) hop_2_o_f)
4234  (=> (and hop_1_o_a hop_1_a_i) hop_2_o_i)
4235  (=> (and hop_1_o_a hop_1_a_h) hop_2_o_h)
4236  (=> (and hop_1_o_a hop_1_a_k) hop_2_o_k)
4237  (=> (and hop_1_o_a hop_1_a_j) hop_2_o_j)
4238  (=> (and hop_1_o_a hop_1_a_m) hop_2_o_m)
4239  (=> (and hop_1_o_a hop_1_a_l) hop_2_o_l)
4240  (=> (and hop_1_o_a hop_1_a_n) hop_2_o_n)
4241  (=> (and hop_1_o_a hop_1_a_q) hop_2_o_q)
4242  (=> (and hop_1_o_a hop_1_a_p) hop_2_o_p)
4243  (=> (and hop_1_o_c hop_1_c_a) hop_2_o_a)
4244  (=> (and hop_1_o_c hop_1_c_b) hop_2_o_b)
4245  (=> (and hop_1_o_c hop_1_c_e) hop_2_o_e)
4246  (=> (and hop_1_o_c hop_1_c_d) hop_2_o_d)
4247  (=> (and hop_1_o_c hop_1_c_g) hop_2_o_g)
4248  (=> (and hop_1_o_c hop_1_c_f) hop_2_o_f)
4249  (=> (and hop_1_o_c hop_1_c_i) hop_2_o_i)
4250  (=> (and hop_1_o_c hop_1_c_h) hop_2_o_h)
4251  (=> (and hop_1_o_c hop_1_c_k) hop_2_o_k)
4252  (=> (and hop_1_o_c hop_1_c_j) hop_2_o_j)
4253  (=> (and hop_1_o_c hop_1_c_m) hop_2_o_m)
4254  (=> (and hop_1_o_c hop_1_c_l) hop_2_o_l)
4255  (=> (and hop_1_o_c hop_1_c_n) hop_2_o_n)
4256  (=> (and hop_1_o_c hop_1_c_q) hop_2_o_q)
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4257  (=> (and hop_1_o_c hop_1_c_p) hop_2_o_p)
4258  (=> (and hop_1_o_b hop_1_b_a) hop_2_o_a)
4259  (=> (and hop_1_o_b hop_1_b_c) hop_2_o_c)
4260  (=> (and hop_1_o_b hop_1_b_e) hop_2_o_e)
4261  (=> (and hop_1_o_b hop_1_b_d) hop_2_o_d)
4262  (=> (and hop_1_o_b hop_1_b_g) hop_2_o_g)
4263  (=> (and hop_1_o_b hop_1_b_f) hop_2_o_f)
4264  (=> (and hop_1_o_b hop_1_b_i) hop_2_o_i)
4265  (=> (and hop_1_o_b hop_1_b_h) hop_2_o_h)
4266  (=> (and hop_1_o_b hop_1_b_k) hop_2_o_k)
4267  (=> (and hop_1_o_b hop_1_b_j) hop_2_o_j)
4268  (=> (and hop_1_o_b hop_1_b_m) hop_2_o_m)
4269  (=> (and hop_1_o_b hop_1_b_l) hop_2_o_l)
4270  (=> (and hop_1_o_b hop_1_b_n) hop_2_o_n)
4271  (=> (and hop_1_o_b hop_1_b_q) hop_2_o_q)
4272  (=> (and hop_1_o_b hop_1_b_p) hop_2_o_p)
4273  (=> (and hop_1_o_e hop_1_e_a) hop_2_o_a)
4274  (=> (and hop_1_o_e hop_1_e_c) hop_2_o_c)
4275  (=> (and hop_1_o_e hop_1_e_b) hop_2_o_b)
4276  (=> (and hop_1_o_e hop_1_e_d) hop_2_o_d)
4277  (=> (and hop_1_o_e hop_1_e_g) hop_2_o_g)
4278  (=> (and hop_1_o_e hop_1_e_f) hop_2_o_f)
4279  (=> (and hop_1_o_e hop_1_e_i) hop_2_o_i)
4280  (=> (and hop_1_o_e hop_1_e_h) hop_2_o_h)
4281  (=> (and hop_1_o_e hop_1_e_k) hop_2_o_k)
4282  (=> (and hop_1_o_e hop_1_e_j) hop_2_o_j)
4283  (=> (and hop_1_o_e hop_1_e_m) hop_2_o_m)
4284  (=> (and hop_1_o_e hop_1_e_l) hop_2_o_l)
4285  (=> (and hop_1_o_e hop_1_e_n) hop_2_o_n)
4286  (=> (and hop_1_o_e hop_1_e_q) hop_2_o_q)
4287  (=> (and hop_1_o_e hop_1_e_p) hop_2_o_p)
4288  (=> (and hop_1_o_d hop_1_d_a) hop_2_o_a)
4289  (=> (and hop_1_o_d hop_1_d_c) hop_2_o_c)
4290  (=> (and hop_1_o_d hop_1_d_b) hop_2_o_b)
4291  (=> (and hop_1_o_d hop_1_d_e) hop_2_o_e)
4292  (=> (and hop_1_o_d hop_1_d_g) hop_2_o_g)
4293  (=> (and hop_1_o_d hop_1_d_f) hop_2_o_f)
4294  (=> (and hop_1_o_d hop_1_d_i) hop_2_o_i)
4295  (=> (and hop_1_o_d hop_1_d_h) hop_2_o_h)
4296  (=> (and hop_1_o_d hop_1_d_k) hop_2_o_k)
4297  (=> (and hop_1_o_d hop_1_d_j) hop_2_o_j)
4298  (=> (and hop_1_o_d hop_1_d_m) hop_2_o_m)
4299  (=> (and hop_1_o_d hop_1_d_l) hop_2_o_l)
4300  (=> (and hop_1_o_d hop_1_d_n) hop_2_o_n)
4301  (=> (and hop_1_o_d hop_1_d_q) hop_2_o_q)
4302  (=> (and hop_1_o_d hop_1_d_p) hop_2_o_p)
4303  (=> (and hop_1_o_g hop_1_g_a) hop_2_o_a)
4304  (=> (and hop_1_o_g hop_1_g_c) hop_2_o_c)
4305  (=> (and hop_1_o_g hop_1_g_b) hop_2_o_b)
4306  (=> (and hop_1_o_g hop_1_g_e) hop_2_o_e)
4307  (=> (and hop_1_o_g hop_1_g_d) hop_2_o_d)
4308  (=> (and hop_1_o_g hop_1_g_f) hop_2_o_f)
4309  (=> (and hop_1_o_g hop_1_g_i) hop_2_o_i)
4310  (=> (and hop_1_o_g hop_1_g_h) hop_2_o_h)
4311  (=> (and hop_1_o_g hop_1_g_k) hop_2_o_k)
4312  (=> (and hop_1_o_g hop_1_g_j) hop_2_o_j)
4313  (=> (and hop_1_o_g hop_1_g_m) hop_2_o_m)
4314  (=> (and hop_1_o_g hop_1_g_l) hop_2_o_l)
4315  (=> (and hop_1_o_g hop_1_g_n) hop_2_o_n)
4316  (=> (and hop_1_o_g hop_1_g_q) hop_2_o_q)
4317  (=> (and hop_1_o_g hop_1_g_p) hop_2_o_p)
4318  (=> (and hop_1_o_f hop_1_f_a) hop_2_o_a)
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```
4319  (=> (and hop_1_o_f hop_1_f_c) hop_2_o_c)
4320  (=> (and hop_1_o_f hop_1_f_b) hop_2_o_b)
4321  (=> (and hop_1_o_f hop_1_f_e) hop_2_o_e)
4322  (=> (and hop_1_o_f hop_1_f_d) hop_2_o_d)
4323  (=> (and hop_1_o_f hop_1_f_g) hop_2_o_g)
4324  (=> (and hop_1_o_f hop_1_f_i) hop_2_o_i)
4325  (=> (and hop_1_o_f hop_1_f_h) hop_2_o_h)
4326  (=> (and hop_1_o_f hop_1_f_k) hop_2_o_k)
4327  (=> (and hop_1_o_f hop_1_f_j) hop_2_o_j)
4328  (=> (and hop_1_o_f hop_1_f_m) hop_2_o_m)
4329  (=> (and hop_1_o_f hop_1_f_l) hop_2_o_l)
4330  (=> (and hop_1_o_f hop_1_f_n) hop_2_o_n)
4331  (=> (and hop_1_o_f hop_1_f_q) hop_2_o_q)
4332  (=> (and hop_1_o_f hop_1_f_p) hop_2_o_p)
4333  (=> (and hop_1_o_i hop_1_i_a) hop_2_o_a)
4334  (=> (and hop_1_o_i hop_1_i_c) hop_2_o_c)
4335  (=> (and hop_1_o_i hop_1_i_b) hop_2_o_b)
4336  (=> (and hop_1_o_i hop_1_i_e) hop_2_o_e)
4337  (=> (and hop_1_o_i hop_1_i_d) hop_2_o_d)
4338  (=> (and hop_1_o_i hop_1_i_g) hop_2_o_g)
4339  (=> (and hop_1_o_i hop_1_i_f) hop_2_o_f)
4340  (=> (and hop_1_o_i hop_1_i_h) hop_2_o_h)
4341  (=> (and hop_1_o_i hop_1_i_k) hop_2_o_k)
4342  (=> (and hop_1_o_i hop_1_i_j) hop_2_o_j)
4343  (=> (and hop_1_o_i hop_1_i_m) hop_2_o_m)
4344  (=> (and hop_1_o_i hop_1_i_l) hop_2_o_l)
4345  (=> (and hop_1_o_i hop_1_i_n) hop_2_o_n)
4346  (=> (and hop_1_o_i hop_1_i_q) hop_2_o_q)
4347  (=> (and hop_1_o_i hop_1_i_p) hop_2_o_p)
4348  (=> (and hop_1_o_h hop_1_h_a) hop_2_o_a)
4349  (=> (and hop_1_o_h hop_1_h_c) hop_2_o_c)
4350  (=> (and hop_1_o_h hop_1_h_b) hop_2_o_b)
4351  (=> (and hop_1_o_h hop_1_h_e) hop_2_o_e)
4352  (=> (and hop_1_o_h hop_1_h_d) hop_2_o_d)
4353  (=> (and hop_1_o_h hop_1_h_g) hop_2_o_g)
4354  (=> (and hop_1_o_h hop_1_h_f) hop_2_o_f)
4355  (=> (and hop_1_o_h hop_1_h_i) hop_2_o_i)
4356  (=> (and hop_1_o_h hop_1_h_k) hop_2_o_k)
4357  (=> (and hop_1_o_h hop_1_h_j) hop_2_o_j)
4358  (=> (and hop_1_o_h hop_1_h_m) hop_2_o_m)
4359  (=> (and hop_1_o_h hop_1_h_l) hop_2_o_l)
4360  (=> (and hop_1_o_h hop_1_h_n) hop_2_o_n)
4361  (=> (and hop_1_o_h hop_1_h_q) hop_2_o_q)
4362  (=> (and hop_1_o_h hop_1_h_p) hop_2_o_p)
4363  (=> (and hop_1_o_k hop_1_k_a) hop_2_o_a)
4364  (=> (and hop_1_o_k hop_1_k_c) hop_2_o_c)
4365  (=> (and hop_1_o_k hop_1_k_b) hop_2_o_b)
4366  (=> (and hop_1_o_k hop_1_k_e) hop_2_o_e)
4367  (=> (and hop_1_o_k hop_1_k_d) hop_2_o_d)
4368  (=> (and hop_1_o_k hop_1_k_g) hop_2_o_g)
4369  (=> (and hop_1_o_k hop_1_k_f) hop_2_o_f)
4370  (=> (and hop_1_o_k hop_1_k_i) hop_2_o_i)
4371  (=> (and hop_1_o_k hop_1_k_h) hop_2_o_h)
4372  (=> (and hop_1_o_k hop_1_k_j) hop_2_o_j)
4373  (=> (and hop_1_o_k hop_1_k_m) hop_2_o_m)
4374  (=> (and hop_1_o_k hop_1_k_l) hop_2_o_l)
4375  (=> (and hop_1_o_k hop_1_k_n) hop_2_o_n)
4376  (=> (and hop_1_o_k hop_1_k_q) hop_2_o_q)
4377  (=> (and hop_1_o_k hop_1_k_p) hop_2_o_p)
4378  (=> (and hop_1_o_j hop_1_j_a) hop_2_o_a)
4379  (=> (and hop_1_o_j hop_1_j_c) hop_2_o_c)
4380  (=> (and hop_1_o_j hop_1_j_b) hop_2_o_b)
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4381  (=> (and hop_1_o_j hop_1_j_e) hop_2_o_e)
4382  (=> (and hop_1_o_j hop_1_j_d) hop_2_o_d)
4383  (=> (and hop_1_o_j hop_1_j_g) hop_2_o_g)
4384  (=> (and hop_1_o_j hop_1_j_f) hop_2_o_f)
4385  (=> (and hop_1_o_j hop_1_j_i) hop_2_o_i)
4386  (=> (and hop_1_o_j hop_1_j_h) hop_2_o_h)
4387  (=> (and hop_1_o_j hop_1_j_k) hop_2_o_k)
4388  (=> (and hop_1_o_j hop_1_j_m) hop_2_o_m)
4389  (=> (and hop_1_o_j hop_1_j_l) hop_2_o_l)
4390  (=> (and hop_1_o_j hop_1_j_n) hop_2_o_n)
4391  (=> (and hop_1_o_j hop_1_j_q) hop_2_o_q)
4392  (=> (and hop_1_o_j hop_1_j_p) hop_2_o_p)
4393  (=> (and hop_1_o_m hop_1_m_a) hop_2_o_a)
4394  (=> (and hop_1_o_m hop_1_m_c) hop_2_o_c)
4395  (=> (and hop_1_o_m hop_1_m_b) hop_2_o_b)
4396  (=> (and hop_1_o_m hop_1_m_e) hop_2_o_e)
4397  (=> (and hop_1_o_m hop_1_m_d) hop_2_o_d)
4398  (=> (and hop_1_o_m hop_1_m_g) hop_2_o_g)
4399  (=> (and hop_1_o_m hop_1_m_f) hop_2_o_f)
4400  (=> (and hop_1_o_m hop_1_m_i) hop_2_o_i)
4401  (=> (and hop_1_o_m hop_1_m_h) hop_2_o_h)
4402  (=> (and hop_1_o_m hop_1_m_k) hop_2_o_k)
4403  (=> (and hop_1_o_m hop_1_m_j) hop_2_o_j)
4404  (=> (and hop_1_o_m hop_1_m_l) hop_2_o_l)
4405  (=> (and hop_1_o_m hop_1_m_n) hop_2_o_n)
4406  (=> (and hop_1_o_m hop_1_m_q) hop_2_o_q)
4407  (=> (and hop_1_o_m hop_1_m_p) hop_2_o_p)
4408  (=> (and hop_1_o_l hop_1_l_a) hop_2_o_a)
4409  (=> (and hop_1_o_l hop_1_l_c) hop_2_o_c)
4410  (=> (and hop_1_o_l hop_1_l_b) hop_2_o_b)
4411  (=> (and hop_1_o_l hop_1_l_e) hop_2_o_e)
4412  (=> (and hop_1_o_l hop_1_l_d) hop_2_o_d)
4413  (=> (and hop_1_o_l hop_1_l_g) hop_2_o_g)
4414  (=> (and hop_1_o_l hop_1_l_f) hop_2_o_f)
4415  (=> (and hop_1_o_l hop_1_l_i) hop_2_o_i)
4416  (=> (and hop_1_o_l hop_1_l_h) hop_2_o_h)
4417  (=> (and hop_1_o_l hop_1_l_k) hop_2_o_k)
4418  (=> (and hop_1_o_l hop_1_l_j) hop_2_o_j)
4419  (=> (and hop_1_o_l hop_1_l_m) hop_2_o_m)
4420  (=> (and hop_1_o_l hop_1_l_n) hop_2_o_n)
4421  (=> (and hop_1_o_l hop_1_l_q) hop_2_o_q)
4422  (=> (and hop_1_o_l hop_1_l_p) hop_2_o_p)
4423  (=> (and hop_1_o_n hop_1_n_a) hop_2_o_a)
4424  (=> (and hop_1_o_n hop_1_n_c) hop_2_o_c)
4425  (=> (and hop_1_o_n hop_1_n_b) hop_2_o_b)
4426  (=> (and hop_1_o_n hop_1_n_e) hop_2_o_e)
4427  (=> (and hop_1_o_n hop_1_n_d) hop_2_o_d)
4428  (=> (and hop_1_o_n hop_1_n_g) hop_2_o_g)
4429  (=> (and hop_1_o_n hop_1_n_f) hop_2_o_f)
4430  (=> (and hop_1_o_n hop_1_n_i) hop_2_o_i)
4431  (=> (and hop_1_o_n hop_1_n_h) hop_2_o_h)
4432  (=> (and hop_1_o_n hop_1_n_k) hop_2_o_k)
4433  (=> (and hop_1_o_n hop_1_n_j) hop_2_o_j)
4434  (=> (and hop_1_o_n hop_1_n_m) hop_2_o_m)
4435  (=> (and hop_1_o_n hop_1_n_l) hop_2_o_l)
4436  (=> (and hop_1_o_n hop_1_n_q) hop_2_o_q)
4437  (=> (and hop_1_o_n hop_1_n_p) hop_2_o_p)
4438  (=> (and hop_1_o_q hop_1_q_a) hop_2_o_a)
4439  (=> (and hop_1_o_q hop_1_q_c) hop_2_o_c)
4440  (=> (and hop_1_o_q hop_1_q_b) hop_2_o_b)
4441  (=> (and hop_1_o_q hop_1_q_e) hop_2_o_e)
4442  (=> (and hop_1_o_q hop_1_q_d) hop_2_o_d)
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4443  (=> (and hop_1_o_q hop_1_q_g) hop_2_o_g)
4444  (=> (and hop_1_o_q hop_1_q_f) hop_2_o_f)
4445  (=> (and hop_1_o_q hop_1_q_i) hop_2_o_i)
4446  (=> (and hop_1_o_q hop_1_q_h) hop_2_o_h)
4447  (=> (and hop_1_o_q hop_1_q_k) hop_2_o_k)
4448  (=> (and hop_1_o_q hop_1_q_j) hop_2_o_j)
4449  (=> (and hop_1_o_q hop_1_q_m) hop_2_o_m)
4450  (=> (and hop_1_o_q hop_1_q_l) hop_2_o_l)
4451  (=> (and hop_1_o_q hop_1_q_n) hop_2_o_n)
4452  (=> (and hop_1_o_q hop_1_q_p) hop_2_o_p)
4453  (=> (and hop_1_o_p hop_1_p_a) hop_2_o_a)
4454  (=> (and hop_1_o_p hop_1_p_c) hop_2_o_c)
4455  (=> (and hop_1_o_p hop_1_p_b) hop_2_o_b)
4456  (=> (and hop_1_o_p hop_1_p_e) hop_2_o_e)
4457  (=> (and hop_1_o_p hop_1_p_d) hop_2_o_d)
4458  (=> (and hop_1_o_p hop_1_p_g) hop_2_o_g)
4459  (=> (and hop_1_o_p hop_1_p_f) hop_2_o_f)
4460  (=> (and hop_1_o_p hop_1_p_i) hop_2_o_i)
4461  (=> (and hop_1_o_p hop_1_p_h) hop_2_o_h)
4462  (=> (and hop_1_o_p hop_1_p_k) hop_2_o_k)
4463  (=> (and hop_1_o_p hop_1_p_j) hop_2_o_j)
4464  (=> (and hop_1_o_p hop_1_p_m) hop_2_o_m)
4465  (=> (and hop_1_o_p hop_1_p_l) hop_2_o_l)
4466  (=> (and hop_1_o_p hop_1_p_n) hop_2_o_n)
4467  (=> (and hop_1_o_p hop_1_p_q) hop_2_o_q)
4468  (=> (and hop_1_n_a hop_1_a_c) hop_2_n_c)
4469  (=> (and hop_1_n_a hop_1_a_b) hop_2_n_b)
4470  (=> (and hop_1_n_a hop_1_a_e) hop_2_n_e)
4471  (=> (and hop_1_n_a hop_1_a_d) hop_2_n_d)
4472  (=> (and hop_1_n_a hop_1_a_g) hop_2_n_g)
4473  (=> (and hop_1_n_a hop_1_a_f) hop_2_n_f)
4474  (=> (and hop_1_n_a hop_1_a_i) hop_2_n_i)
4475  (=> (and hop_1_n_a hop_1_a_h) hop_2_n_h)
4476  (=> (and hop_1_n_a hop_1_a_k) hop_2_n_k)
4477  (=> (and hop_1_n_a hop_1_a_j) hop_2_n_j)
4478  (=> (and hop_1_n_a hop_1_a_m) hop_2_n_m)
4479  (=> (and hop_1_n_a hop_1_a_l) hop_2_n_l)
4480  (=> (and hop_1_n_a hop_1_a_o) hop_2_n_o)
4481  (=> (and hop_1_n_a hop_1_a_q) hop_2_n_q)
4482  (=> (and hop_1_n_a hop_1_a_p) hop_2_n_p)
4483  (=> (and hop_1_n_c hop_1_c_a) hop_2_n_a)
4484  (=> (and hop_1_n_c hop_1_c_b) hop_2_n_b)
4485  (=> (and hop_1_n_c hop_1_c_e) hop_2_n_e)
4486  (=> (and hop_1_n_c hop_1_c_d) hop_2_n_d)
4487  (=> (and hop_1_n_c hop_1_c_g) hop_2_n_g)
4488  (=> (and hop_1_n_c hop_1_c_f) hop_2_n_f)
4489  (=> (and hop_1_n_c hop_1_c_i) hop_2_n_i)
4490  (=> (and hop_1_n_c hop_1_c_h) hop_2_n_h)
4491  (=> (and hop_1_n_c hop_1_c_k) hop_2_n_k)
4492  (=> (and hop_1_n_c hop_1_c_j) hop_2_n_j)
4493  (=> (and hop_1_n_c hop_1_c_m) hop_2_n_m)
4494  (=> (and hop_1_n_c hop_1_c_l) hop_2_n_l)
4495  (=> (and hop_1_n_c hop_1_c_o) hop_2_n_o)
4496  (=> (and hop_1_n_c hop_1_c_q) hop_2_n_q)
4497  (=> (and hop_1_n_c hop_1_c_p) hop_2_n_p)
4498  (=> (and hop_1_n_b hop_1_b_a) hop_2_n_a)
4499  (=> (and hop_1_n_b hop_1_b_c) hop_2_n_c)
4500  (=> (and hop_1_n_b hop_1_b_e) hop_2_n_e)
4501  (=> (and hop_1_n_b hop_1_b_d) hop_2_n_d)
4502  (=> (and hop_1_n_b hop_1_b_g) hop_2_n_g)
4503  (=> (and hop_1_n_b hop_1_b_f) hop_2_n_f)
4504  (=> (and hop_1_n_b hop_1_b_i) hop_2_n_i)
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4505   (=> (and hop_1_n_b hop_1_b_h) hop_2_n_h)
4506   (=> (and hop_1_n_b hop_1_b_k) hop_2_n_k)
4507   (=> (and hop_1_n_b hop_1_b_j) hop_2_n_j)
4508   (=> (and hop_1_n_b hop_1_b_m) hop_2_n_m)
4509   (=> (and hop_1_n_b hop_1_b_l) hop_2_n_l)
4510   (=> (and hop_1_n_b hop_1_b_o) hop_2_n_o)
4511   (=> (and hop_1_n_b hop_1_b_q) hop_2_n_q)
4512   (=> (and hop_1_n_b hop_1_b_p) hop_2_n_p)
4513   (=> (and hop_1_n_e hop_1_e_a) hop_2_n_a)
4514   (=> (and hop_1_n_e hop_1_e_c) hop_2_n_c)
4515   (=> (and hop_1_n_e hop_1_e_b) hop_2_n_b)
4516   (=> (and hop_1_n_e hop_1_e_d) hop_2_n_d)
4517   (=> (and hop_1_n_e hop_1_e_g) hop_2_n_g)
4518   (=> (and hop_1_n_e hop_1_e_f) hop_2_n_f)
4519   (=> (and hop_1_n_e hop_1_e_i) hop_2_n_i)
4520   (=> (and hop_1_n_e hop_1_e_h) hop_2_n_h)
4521   (=> (and hop_1_n_e hop_1_e_k) hop_2_n_k)
4522   (=> (and hop_1_n_e hop_1_e_j) hop_2_n_j)
4523   (=> (and hop_1_n_e hop_1_e_m) hop_2_n_m)
4524   (=> (and hop_1_n_e hop_1_e_l) hop_2_n_l)
4525   (=> (and hop_1_n_e hop_1_e_o) hop_2_n_o)
4526   (=> (and hop_1_n_e hop_1_e_q) hop_2_n_q)
4527   (=> (and hop_1_n_e hop_1_e_p) hop_2_n_p)
4528   (=> (and hop_1_n_d hop_1_d_a) hop_2_n_a)
4529   (=> (and hop_1_n_d hop_1_d_c) hop_2_n_c)
4530   (=> (and hop_1_n_d hop_1_d_b) hop_2_n_b)
4531   (=> (and hop_1_n_d hop_1_d_e) hop_2_n_e)
4532   (=> (and hop_1_n_d hop_1_d_g) hop_2_n_g)
4533   (=> (and hop_1_n_d hop_1_d_f) hop_2_n_f)
4534   (=> (and hop_1_n_d hop_1_d_i) hop_2_n_i)
4535   (=> (and hop_1_n_d hop_1_d_h) hop_2_n_h)
4536   (=> (and hop_1_n_d hop_1_d_k) hop_2_n_k)
4537   (=> (and hop_1_n_d hop_1_d_j) hop_2_n_j)
4538   (=> (and hop_1_n_d hop_1_d_m) hop_2_n_m)
4539   (=> (and hop_1_n_d hop_1_d_l) hop_2_n_l)
4540   (=> (and hop_1_n_d hop_1_d_o) hop_2_n_o)
4541   (=> (and hop_1_n_d hop_1_d_q) hop_2_n_q)
4542   (=> (and hop_1_n_d hop_1_d_p) hop_2_n_p)
4543   (=> (and hop_1_n_g hop_1_g_a) hop_2_n_a)
4544   (=> (and hop_1_n_g hop_1_g_c) hop_2_n_c)
4545   (=> (and hop_1_n_g hop_1_g_b) hop_2_n_b)
4546   (=> (and hop_1_n_g hop_1_g_e) hop_2_n_e)
4547   (=> (and hop_1_n_g hop_1_g_d) hop_2_n_d)
4548   (=> (and hop_1_n_g hop_1_g_f) hop_2_n_f)
4549   (=> (and hop_1_n_g hop_1_g_i) hop_2_n_i)
4550   (=> (and hop_1_n_g hop_1_g_h) hop_2_n_h)
4551   (=> (and hop_1_n_g hop_1_g_k) hop_2_n_k)
4552   (=> (and hop_1_n_g hop_1_g_j) hop_2_n_j)
4553   (=> (and hop_1_n_g hop_1_g_m) hop_2_n_m)
4554   (=> (and hop_1_n_g hop_1_g_l) hop_2_n_l)
4555   (=> (and hop_1_n_g hop_1_g_o) hop_2_n_o)
4556   (=> (and hop_1_n_g hop_1_g_q) hop_2_n_q)
4557   (=> (and hop_1_n_g hop_1_g_p) hop_2_n_p)
4558   (=> (and hop_1_n_f hop_1_f_a) hop_2_n_a)
4559   (=> (and hop_1_n_f hop_1_f_c) hop_2_n_c)
4560   (=> (and hop_1_n_f hop_1_f_b) hop_2_n_b)
4561   (=> (and hop_1_n_f hop_1_f_e) hop_2_n_e)
4562   (=> (and hop_1_n_f hop_1_f_d) hop_2_n_d)
4563   (=> (and hop_1_n_f hop_1_f_g) hop_2_n_g)
4564   (=> (and hop_1_n_f hop_1_f_i) hop_2_n_i)
4565   (=> (and hop_1_n_f hop_1_f_h) hop_2_n_h)
4566   (=> (and hop_1_n_f hop_1_f_k) hop_2_n_k)
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4567    (=> (and hop_1_n_f hop_1_f_j) hop_2_n_j)
4568    (=> (and hop_1_n_f hop_1_f_m) hop_2_n_m)
4569    (=> (and hop_1_n_f hop_1_f_l) hop_2_n_l)
4570    (=> (and hop_1_n_f hop_1_f_o) hop_2_n_o)
4571    (=> (and hop_1_n_f hop_1_f_q) hop_2_n_q)
4572    (=> (and hop_1_n_f hop_1_f_p) hop_2_n_p)
4573    (=> (and hop_1_n_i hop_1_i_a) hop_2_n_a)
4574    (=> (and hop_1_n_i hop_1_i_c) hop_2_n_c)
4575    (=> (and hop_1_n_i hop_1_i_b) hop_2_n_b)
4576    (=> (and hop_1_n_i hop_1_i_e) hop_2_n_e)
4577    (=> (and hop_1_n_i hop_1_i_d) hop_2_n_d)
4578    (=> (and hop_1_n_i hop_1_i_g) hop_2_n_g)
4579    (=> (and hop_1_n_i hop_1_i_f) hop_2_n_f)
4580    (=> (and hop_1_n_i hop_1_i_h) hop_2_n_h)
4581    (=> (and hop_1_n_i hop_1_i_k) hop_2_n_k)
4582    (=> (and hop_1_n_i hop_1_i_j) hop_2_n_j)
4583    (=> (and hop_1_n_i hop_1_i_m) hop_2_n_m)
4584    (=> (and hop_1_n_i hop_1_i_l) hop_2_n_l)
4585    (=> (and hop_1_n_i hop_1_i_o) hop_2_n_o)
4586    (=> (and hop_1_n_i hop_1_i_q) hop_2_n_q)
4587    (=> (and hop_1_n_i hop_1_i_p) hop_2_n_p)
4588    (=> (and hop_1_n_h hop_1_h_a) hop_2_n_a)
4589    (=> (and hop_1_n_h hop_1_h_c) hop_2_n_c)
4590    (=> (and hop_1_n_h hop_1_h_b) hop_2_n_b)
4591    (=> (and hop_1_n_h hop_1_h_e) hop_2_n_e)
4592    (=> (and hop_1_n_h hop_1_h_d) hop_2_n_d)
4593    (=> (and hop_1_n_h hop_1_h_g) hop_2_n_g)
4594    (=> (and hop_1_n_h hop_1_h_f) hop_2_n_f)
4595    (=> (and hop_1_n_h hop_1_h_i) hop_2_n_i)
4596    (=> (and hop_1_n_h hop_1_h_k) hop_2_n_k)
4597    (=> (and hop_1_n_h hop_1_h_j) hop_2_n_j)
4598    (=> (and hop_1_n_h hop_1_h_m) hop_2_n_m)
4599    (=> (and hop_1_n_h hop_1_h_l) hop_2_n_l)
4600    (=> (and hop_1_n_h hop_1_h_o) hop_2_n_o)
4601    (=> (and hop_1_n_h hop_1_h_q) hop_2_n_q)
4602    (=> (and hop_1_n_h hop_1_h_p) hop_2_n_p)
4603    (=> (and hop_1_n_k hop_1_k_a) hop_2_n_a)
4604    (=> (and hop_1_n_k hop_1_k_c) hop_2_n_c)
4605    (=> (and hop_1_n_k hop_1_k_b) hop_2_n_b)
4606    (=> (and hop_1_n_k hop_1_k_e) hop_2_n_e)
4607    (=> (and hop_1_n_k hop_1_k_d) hop_2_n_d)
4608    (=> (and hop_1_n_k hop_1_k_g) hop_2_n_g)
4609    (=> (and hop_1_n_k hop_1_k_f) hop_2_n_f)
4610    (=> (and hop_1_n_k hop_1_k_i) hop_2_n_i)
4611    (=> (and hop_1_n_k hop_1_k_h) hop_2_n_h)
4612    (=> (and hop_1_n_k hop_1_k_j) hop_2_n_j)
4613    (=> (and hop_1_n_k hop_1_k_m) hop_2_n_m)
4614    (=> (and hop_1_n_k hop_1_k_l) hop_2_n_l)
4615    (=> (and hop_1_n_k hop_1_k_o) hop_2_n_o)
4616    (=> (and hop_1_n_k hop_1_k_q) hop_2_n_q)
4617    (=> (and hop_1_n_k hop_1_k_p) hop_2_n_p)
4618    (=> (and hop_1_n_j hop_1_j_a) hop_2_n_a)
4619    (=> (and hop_1_n_j hop_1_j_c) hop_2_n_c)
4620    (=> (and hop_1_n_j hop_1_j_b) hop_2_n_b)
4621    (=> (and hop_1_n_j hop_1_j_e) hop_2_n_e)
4622    (=> (and hop_1_n_j hop_1_j_d) hop_2_n_d)
4623    (=> (and hop_1_n_j hop_1_j_g) hop_2_n_g)
4624    (=> (and hop_1_n_j hop_1_j_f) hop_2_n_f)
4625    (=> (and hop_1_n_j hop_1_j_i) hop_2_n_i)
4626    (=> (and hop_1_n_j hop_1_j_h) hop_2_n_h)
4627    (=> (and hop_1_n_j hop_1_j_k) hop_2_n_k)
4628    (=> (and hop_1_n_j hop_1_j_m) hop_2_n_m)
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4629  (=> (and hop_1_n_j hop_1_j_l) hop_2_n_l)
4630  (=> (and hop_1_n_j hop_1_j_o) hop_2_n_o)
4631  (=> (and hop_1_n_j hop_1_j_q) hop_2_n_q)
4632  (=> (and hop_1_n_j hop_1_j_p) hop_2_n_p)
4633  (=> (and hop_1_n_m hop_1_m_a) hop_2_n_a)
4634  (=> (and hop_1_n_m hop_1_m_c) hop_2_n_c)
4635  (=> (and hop_1_n_m hop_1_m_b) hop_2_n_b)
4636  (=> (and hop_1_n_m hop_1_m_e) hop_2_n_e)
4637  (=> (and hop_1_n_m hop_1_m_d) hop_2_n_d)
4638  (=> (and hop_1_n_m hop_1_m_g) hop_2_n_g)
4639  (=> (and hop_1_n_m hop_1_m_f) hop_2_n_f)
4640  (=> (and hop_1_n_m hop_1_m_i) hop_2_n_i)
4641  (=> (and hop_1_n_m hop_1_m_h) hop_2_n_h)
4642  (=> (and hop_1_n_m hop_1_m_k) hop_2_n_k)
4643  (=> (and hop_1_n_m hop_1_m_j) hop_2_n_j)
4644  (=> (and hop_1_n_m hop_1_m_l) hop_2_n_l)
4645  (=> (and hop_1_n_m hop_1_m_o) hop_2_n_o)
4646  (=> (and hop_1_n_m hop_1_m_q) hop_2_n_q)
4647  (=> (and hop_1_n_m hop_1_m_p) hop_2_n_p)
4648  (=> (and hop_1_n_l hop_1_l_a) hop_2_n_a)
4649  (=> (and hop_1_n_l hop_1_l_c) hop_2_n_c)
4650  (=> (and hop_1_n_l hop_1_l_b) hop_2_n_b)
4651  (=> (and hop_1_n_l hop_1_l_e) hop_2_n_e)
4652  (=> (and hop_1_n_l hop_1_l_d) hop_2_n_d)
4653  (=> (and hop_1_n_l hop_1_l_g) hop_2_n_g)
4654  (=> (and hop_1_n_l hop_1_l_f) hop_2_n_f)
4655  (=> (and hop_1_n_l hop_1_l_i) hop_2_n_i)
4656  (=> (and hop_1_n_l hop_1_l_h) hop_2_n_h)
4657  (=> (and hop_1_n_l hop_1_l_k) hop_2_n_k)
4658  (=> (and hop_1_n_l hop_1_l_j) hop_2_n_j)
4659  (=> (and hop_1_n_l hop_1_l_m) hop_2_n_m)
4660  (=> (and hop_1_n_l hop_1_l_o) hop_2_n_o)
4661  (=> (and hop_1_n_l hop_1_l_q) hop_2_n_q)
4662  (=> (and hop_1_n_l hop_1_l_p) hop_2_n_p)
4663  (=> (and hop_1_n_o hop_1_o_a) hop_2_n_a)
4664  (=> (and hop_1_n_o hop_1_o_c) hop_2_n_c)
4665  (=> (and hop_1_n_o hop_1_o_b) hop_2_n_b)
4666  (=> (and hop_1_n_o hop_1_o_e) hop_2_n_e)
4667  (=> (and hop_1_n_o hop_1_o_d) hop_2_n_d)
4668  (=> (and hop_1_n_o hop_1_o_g) hop_2_n_g)
4669  (=> (and hop_1_n_o hop_1_o_f) hop_2_n_f)
4670  (=> (and hop_1_n_o hop_1_o_i) hop_2_n_i)
4671  (=> (and hop_1_n_o hop_1_o_h) hop_2_n_h)
4672  (=> (and hop_1_n_o hop_1_o_k) hop_2_n_k)
4673  (=> (and hop_1_n_o hop_1_o_j) hop_2_n_j)
4674  (=> (and hop_1_n_o hop_1_o_m) hop_2_n_m)
4675  (=> (and hop_1_n_o hop_1_o_l) hop_2_n_l)
4676  (=> (and hop_1_n_o hop_1_o_q) hop_2_n_q)
4677  (=> (and hop_1_n_o hop_1_o_p) hop_2_n_p)
4678  (=> (and hop_1_n_q hop_1_q_a) hop_2_n_a)
4679  (=> (and hop_1_n_q hop_1_q_c) hop_2_n_c)
4680  (=> (and hop_1_n_q hop_1_q_b) hop_2_n_b)
4681  (=> (and hop_1_n_q hop_1_q_e) hop_2_n_e)
4682  (=> (and hop_1_n_q hop_1_q_d) hop_2_n_d)
4683  (=> (and hop_1_n_q hop_1_q_g) hop_2_n_g)
4684  (=> (and hop_1_n_q hop_1_q_f) hop_2_n_f)
4685  (=> (and hop_1_n_q hop_1_q_i) hop_2_n_i)
4686  (=> (and hop_1_n_q hop_1_q_h) hop_2_n_h)
4687  (=> (and hop_1_n_q hop_1_q_k) hop_2_n_k)
4688  (=> (and hop_1_n_q hop_1_q_j) hop_2_n_j)
4689  (=> (and hop_1_n_q hop_1_q_m) hop_2_n_m)
4690  (=> (and hop_1_n_q hop_1_q_l) hop_2_n_l)
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4691  (=> (and hop_1_n_q hop_1_q_o) hop_2_n_o)
4692  (=> (and hop_1_n_q hop_1_q_p) hop_2_n_p)
4693  (=> (and hop_1_n_p hop_1_p_a) hop_2_n_a)
4694  (=> (and hop_1_n_p hop_1_p_c) hop_2_n_c)
4695  (=> (and hop_1_n_p hop_1_p_b) hop_2_n_b)
4696  (=> (and hop_1_n_p hop_1_p_e) hop_2_n_e)
4697  (=> (and hop_1_n_p hop_1_p_d) hop_2_n_d)
4698  (=> (and hop_1_n_p hop_1_p_g) hop_2_n_g)
4699  (=> (and hop_1_n_p hop_1_p_f) hop_2_n_f)
4700  (=> (and hop_1_n_p hop_1_p_i) hop_2_n_i)
4701  (=> (and hop_1_n_p hop_1_p_h) hop_2_n_h)
4702  (=> (and hop_1_n_p hop_1_p_k) hop_2_n_k)
4703  (=> (and hop_1_n_p hop_1_p_j) hop_2_n_j)
4704  (=> (and hop_1_n_p hop_1_p_m) hop_2_n_m)
4705  (=> (and hop_1_n_p hop_1_p_l) hop_2_n_l)
4706  (=> (and hop_1_n_p hop_1_p_o) hop_2_n_o)
4707  (=> (and hop_1_n_p hop_1_p_q) hop_2_n_q)
4708  (=> (and hop_1_q_a hop_1_a_c) hop_2_q_c)
4709  (=> (and hop_1_q_a hop_1_a_b) hop_2_q_b)
4710  (=> (and hop_1_q_a hop_1_a_e) hop_2_q_e)
4711  (=> (and hop_1_q_a hop_1_a_d) hop_2_q_d)
4712  (=> (and hop_1_q_a hop_1_a_g) hop_2_q_g)
4713  (=> (and hop_1_q_a hop_1_a_f) hop_2_q_f)
4714  (=> (and hop_1_q_a hop_1_a_i) hop_2_q_i)
4715  (=> (and hop_1_q_a hop_1_a_h) hop_2_q_h)
4716  (=> (and hop_1_q_a hop_1_a_k) hop_2_q_k)
4717  (=> (and hop_1_q_a hop_1_a_j) hop_2_q_j)
4718  (=> (and hop_1_q_a hop_1_a_m) hop_2_q_m)
4719  (=> (and hop_1_q_a hop_1_a_l) hop_2_q_l)
4720  (=> (and hop_1_q_a hop_1_a_o) hop_2_q_o)
4721  (=> (and hop_1_q_a hop_1_a_n) hop_2_q_n)
4722  (=> (and hop_1_q_a hop_1_a_p) hop_2_q_p)
4723  (=> (and hop_1_q_c hop_1_c_a) hop_2_q_a)
4724  (=> (and hop_1_q_c hop_1_c_b) hop_2_q_b)
4725  (=> (and hop_1_q_c hop_1_c_e) hop_2_q_e)
4726  (=> (and hop_1_q_c hop_1_c_d) hop_2_q_d)
4727  (=> (and hop_1_q_c hop_1_c_g) hop_2_q_g)
4728  (=> (and hop_1_q_c hop_1_c_f) hop_2_q_f)
4729  (=> (and hop_1_q_c hop_1_c_i) hop_2_q_i)
4730  (=> (and hop_1_q_c hop_1_c_h) hop_2_q_h)
4731  (=> (and hop_1_q_c hop_1_c_k) hop_2_q_k)
4732  (=> (and hop_1_q_c hop_1_c_j) hop_2_q_j)
4733  (=> (and hop_1_q_c hop_1_c_m) hop_2_q_m)
4734  (=> (and hop_1_q_c hop_1_c_l) hop_2_q_l)
4735  (=> (and hop_1_q_c hop_1_c_o) hop_2_q_o)
4736  (=> (and hop_1_q_c hop_1_c_n) hop_2_q_n)
4737  (=> (and hop_1_q_c hop_1_c_p) hop_2_q_p)
4738  (=> (and hop_1_q_b hop_1_b_a) hop_2_q_a)
4739  (=> (and hop_1_q_b hop_1_b_c) hop_2_q_c)
4740  (=> (and hop_1_q_b hop_1_b_e) hop_2_q_e)
4741  (=> (and hop_1_q_b hop_1_b_d) hop_2_q_d)
4742  (=> (and hop_1_q_b hop_1_b_g) hop_2_q_g)
4743  (=> (and hop_1_q_b hop_1_b_f) hop_2_q_f)
4744  (=> (and hop_1_q_b hop_1_b_i) hop_2_q_i)
4745  (=> (and hop_1_q_b hop_1_b_h) hop_2_q_h)
4746  (=> (and hop_1_q_b hop_1_b_k) hop_2_q_k)
4747  (=> (and hop_1_q_b hop_1_b_j) hop_2_q_j)
4748  (=> (and hop_1_q_b hop_1_b_m) hop_2_q_m)
4749  (=> (and hop_1_q_b hop_1_b_l) hop_2_q_l)
4750  (=> (and hop_1_q_b hop_1_b_o) hop_2_q_o)
4751  (=> (and hop_1_q_b hop_1_b_n) hop_2_q_n)
4752  (=> (and hop_1_q_b hop_1_b_p) hop_2_q_p)
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4753   (=> (and hop_1_q_e hop_1_e_a) hop_2_q_a)
4754   (=> (and hop_1_q_e hop_1_e_c) hop_2_q_c)
4755   (=> (and hop_1_q_e hop_1_e_b) hop_2_q_b)
4756   (=> (and hop_1_q_e hop_1_e_d) hop_2_q_d)
4757   (=> (and hop_1_q_e hop_1_e_g) hop_2_q_g)
4758   (=> (and hop_1_q_e hop_1_e_f) hop_2_q_f)
4759   (=> (and hop_1_q_e hop_1_e_i) hop_2_q_i)
4760   (=> (and hop_1_q_e hop_1_e_h) hop_2_q_h)
4761   (=> (and hop_1_q_e hop_1_e_k) hop_2_q_k)
4762   (=> (and hop_1_q_e hop_1_e_j) hop_2_q_j)
4763   (=> (and hop_1_q_e hop_1_e_m) hop_2_q_m)
4764   (=> (and hop_1_q_e hop_1_e_l) hop_2_q_l)
4765   (=> (and hop_1_q_e hop_1_e_o) hop_2_q_o)
4766   (=> (and hop_1_q_e hop_1_e_n) hop_2_q_n)
4767   (=> (and hop_1_q_e hop_1_e_p) hop_2_q_p)
4768   (=> (and hop_1_q_d hop_1_d_a) hop_2_q_a)
4769   (=> (and hop_1_q_d hop_1_d_c) hop_2_q_c)
4770   (=> (and hop_1_q_d hop_1_d_b) hop_2_q_b)
4771   (=> (and hop_1_q_d hop_1_d_e) hop_2_q_e)
4772   (=> (and hop_1_q_d hop_1_d_g) hop_2_q_g)
4773   (=> (and hop_1_q_d hop_1_d_f) hop_2_q_f)
4774   (=> (and hop_1_q_d hop_1_d_i) hop_2_q_i)
4775   (=> (and hop_1_q_d hop_1_d_h) hop_2_q_h)
4776   (=> (and hop_1_q_d hop_1_d_k) hop_2_q_k)
4777   (=> (and hop_1_q_d hop_1_d_j) hop_2_q_j)
4778   (=> (and hop_1_q_d hop_1_d_m) hop_2_q_m)
4779   (=> (and hop_1_q_d hop_1_d_l) hop_2_q_l)
4780   (=> (and hop_1_q_d hop_1_d_o) hop_2_q_o)
4781   (=> (and hop_1_q_d hop_1_d_n) hop_2_q_n)
4782   (=> (and hop_1_q_d hop_1_d_p) hop_2_q_p)
4783   (=> (and hop_1_q_g hop_1_g_a) hop_2_q_a)
4784   (=> (and hop_1_q_g hop_1_g_c) hop_2_q_c)
4785   (=> (and hop_1_q_g hop_1_g_b) hop_2_q_b)
4786   (=> (and hop_1_q_g hop_1_g_e) hop_2_q_e)
4787   (=> (and hop_1_q_g hop_1_g_d) hop_2_q_d)
4788   (=> (and hop_1_q_g hop_1_g_f) hop_2_q_f)
4789   (=> (and hop_1_q_g hop_1_g_i) hop_2_q_i)
4790   (=> (and hop_1_q_g hop_1_g_h) hop_2_q_h)
4791   (=> (and hop_1_q_g hop_1_g_k) hop_2_q_k)
4792   (=> (and hop_1_q_g hop_1_g_j) hop_2_q_j)
4793   (=> (and hop_1_q_g hop_1_g_m) hop_2_q_m)
4794   (=> (and hop_1_q_g hop_1_g_l) hop_2_q_l)
4795   (=> (and hop_1_q_g hop_1_g_o) hop_2_q_o)
4796   (=> (and hop_1_q_g hop_1_g_n) hop_2_q_n)
4797   (=> (and hop_1_q_g hop_1_g_p) hop_2_q_p)
4798   (=> (and hop_1_q_f hop_1_f_a) hop_2_q_a)
4799   (=> (and hop_1_q_f hop_1_f_c) hop_2_q_c)
4800   (=> (and hop_1_q_f hop_1_f_b) hop_2_q_b)
4801   (=> (and hop_1_q_f hop_1_f_e) hop_2_q_e)
4802   (=> (and hop_1_q_f hop_1_f_d) hop_2_q_d)
4803   (=> (and hop_1_q_f hop_1_f_g) hop_2_q_g)
4804   (=> (and hop_1_q_f hop_1_f_i) hop_2_q_i)
4805   (=> (and hop_1_q_f hop_1_f_h) hop_2_q_h)
4806   (=> (and hop_1_q_f hop_1_f_k) hop_2_q_k)
4807   (=> (and hop_1_q_f hop_1_f_j) hop_2_q_j)
4808   (=> (and hop_1_q_f hop_1_f_m) hop_2_q_m)
4809   (=> (and hop_1_q_f hop_1_f_l) hop_2_q_l)
4810   (=> (and hop_1_q_f hop_1_f_o) hop_2_q_o)
4811   (=> (and hop_1_q_f hop_1_f_n) hop_2_q_n)
4812   (=> (and hop_1_q_f hop_1_f_p) hop_2_q_p)
4813   (=> (and hop_1_q_i hop_1_i_a) hop_2_q_a)
4814   (=> (and hop_1_q_i hop_1_i_c) hop_2_q_c)
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4815  (=> (and hop_1_q_i hop_1_i_b) hop_2_q_b)
4816  (=> (and hop_1_q_i hop_1_i_e) hop_2_q_e)
4817  (=> (and hop_1_q_i hop_1_i_d) hop_2_q_d)
4818  (=> (and hop_1_q_i hop_1_i_g) hop_2_q_g)
4819  (=> (and hop_1_q_i hop_1_i_f) hop_2_q_f)
4820  (=> (and hop_1_q_i hop_1_i_h) hop_2_q_h)
4821  (=> (and hop_1_q_i hop_1_i_k) hop_2_q_k)
4822  (=> (and hop_1_q_i hop_1_i_j) hop_2_q_j)
4823  (=> (and hop_1_q_i hop_1_i_m) hop_2_q_m)
4824  (=> (and hop_1_q_i hop_1_i_l) hop_2_q_l)
4825  (=> (and hop_1_q_i hop_1_i_o) hop_2_q_o)
4826  (=> (and hop_1_q_i hop_1_i_n) hop_2_q_n)
4827  (=> (and hop_1_q_i hop_1_i_p) hop_2_q_p)
4828  (=> (and hop_1_q_h hop_1_h_a) hop_2_q_a)
4829  (=> (and hop_1_q_h hop_1_h_c) hop_2_q_c)
4830  (=> (and hop_1_q_h hop_1_h_b) hop_2_q_b)
4831  (=> (and hop_1_q_h hop_1_h_e) hop_2_q_e)
4832  (=> (and hop_1_q_h hop_1_h_d) hop_2_q_d)
4833  (=> (and hop_1_q_h hop_1_h_g) hop_2_q_g)
4834  (=> (and hop_1_q_h hop_1_h_f) hop_2_q_f)
4835  (=> (and hop_1_q_h hop_1_h_i) hop_2_q_i)
4836  (=> (and hop_1_q_h hop_1_h_k) hop_2_q_k)
4837  (=> (and hop_1_q_h hop_1_h_j) hop_2_q_j)
4838  (=> (and hop_1_q_h hop_1_h_m) hop_2_q_m)
4839  (=> (and hop_1_q_h hop_1_h_l) hop_2_q_l)
4840  (=> (and hop_1_q_h hop_1_h_o) hop_2_q_o)
4841  (=> (and hop_1_q_h hop_1_h_n) hop_2_q_n)
4842  (=> (and hop_1_q_h hop_1_h_p) hop_2_q_p)
4843  (=> (and hop_1_q_k hop_1_k_a) hop_2_q_a)
4844  (=> (and hop_1_q_k hop_1_k_c) hop_2_q_c)
4845  (=> (and hop_1_q_k hop_1_k_b) hop_2_q_b)
4846  (=> (and hop_1_q_k hop_1_k_e) hop_2_q_e)
4847  (=> (and hop_1_q_k hop_1_k_d) hop_2_q_d)
4848  (=> (and hop_1_q_k hop_1_k_g) hop_2_q_g)
4849  (=> (and hop_1_q_k hop_1_k_f) hop_2_q_f)
4850  (=> (and hop_1_q_k hop_1_k_i) hop_2_q_i)
4851  (=> (and hop_1_q_k hop_1_k_h) hop_2_q_h)
4852  (=> (and hop_1_q_k hop_1_k_j) hop_2_q_j)
4853  (=> (and hop_1_q_k hop_1_k_m) hop_2_q_m)
4854  (=> (and hop_1_q_k hop_1_k_l) hop_2_q_l)
4855  (=> (and hop_1_q_k hop_1_k_o) hop_2_q_o)
4856  (=> (and hop_1_q_k hop_1_k_n) hop_2_q_n)
4857  (=> (and hop_1_q_k hop_1_k_p) hop_2_q_p)
4858  (=> (and hop_1_q_j hop_1_j_a) hop_2_q_a)
4859  (=> (and hop_1_q_j hop_1_j_c) hop_2_q_c)
4860  (=> (and hop_1_q_j hop_1_j_b) hop_2_q_b)
4861  (=> (and hop_1_q_j hop_1_j_e) hop_2_q_e)
4862  (=> (and hop_1_q_j hop_1_j_d) hop_2_q_d)
4863  (=> (and hop_1_q_j hop_1_j_g) hop_2_q_g)
4864  (=> (and hop_1_q_j hop_1_j_f) hop_2_q_f)
4865  (=> (and hop_1_q_j hop_1_j_i) hop_2_q_i)
4866  (=> (and hop_1_q_j hop_1_j_h) hop_2_q_h)
4867  (=> (and hop_1_q_j hop_1_j_k) hop_2_q_k)
4868  (=> (and hop_1_q_j hop_1_j_m) hop_2_q_m)
4869  (=> (and hop_1_q_j hop_1_j_l) hop_2_q_l)
4870  (=> (and hop_1_q_j hop_1_j_o) hop_2_q_o)
4871  (=> (and hop_1_q_j hop_1_j_n) hop_2_q_n)
4872  (=> (and hop_1_q_j hop_1_j_p) hop_2_q_p)
4873  (=> (and hop_1_q_m hop_1_m_a) hop_2_q_a)
4874  (=> (and hop_1_q_m hop_1_m_c) hop_2_q_c)
4875  (=> (and hop_1_q_m hop_1_m_b) hop_2_q_b)
4876  (=> (and hop_1_q_m hop_1_m_e) hop_2_q_e)
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4877  (=> (and hop_1_q_m hop_1_m_d) hop_2_q_d)
4878  (=> (and hop_1_q_m hop_1_m_g) hop_2_q_g)
4879  (=> (and hop_1_q_m hop_1_m_f) hop_2_q_f)
4880  (=> (and hop_1_q_m hop_1_m_i) hop_2_q_i)
4881  (=> (and hop_1_q_m hop_1_m_h) hop_2_q_h)
4882  (=> (and hop_1_q_m hop_1_m_k) hop_2_q_k)
4883  (=> (and hop_1_q_m hop_1_m_j) hop_2_q_j)
4884  (=> (and hop_1_q_m hop_1_m_l) hop_2_q_l)
4885  (=> (and hop_1_q_m hop_1_m_o) hop_2_q_o)
4886  (=> (and hop_1_q_m hop_1_m_n) hop_2_q_n)
4887  (=> (and hop_1_q_m hop_1_m_p) hop_2_q_p)
4888  (=> (and hop_1_q_l hop_1_l_a) hop_2_q_a)
4889  (=> (and hop_1_q_l hop_1_l_c) hop_2_q_c)
4890  (=> (and hop_1_q_l hop_1_l_b) hop_2_q_b)
4891  (=> (and hop_1_q_l hop_1_l_e) hop_2_q_e)
4892  (=> (and hop_1_q_l hop_1_l_d) hop_2_q_d)
4893  (=> (and hop_1_q_l hop_1_l_g) hop_2_q_g)
4894  (=> (and hop_1_q_l hop_1_l_f) hop_2_q_f)
4895  (=> (and hop_1_q_l hop_1_l_i) hop_2_q_i)
4896  (=> (and hop_1_q_l hop_1_l_h) hop_2_q_h)
4897  (=> (and hop_1_q_l hop_1_l_k) hop_2_q_k)
4898  (=> (and hop_1_q_l hop_1_l_j) hop_2_q_j)
4899  (=> (and hop_1_q_l hop_1_l_m) hop_2_q_m)
4900  (=> (and hop_1_q_l hop_1_l_o) hop_2_q_o)
4901  (=> (and hop_1_q_l hop_1_l_n) hop_2_q_n)
4902  (=> (and hop_1_q_l hop_1_l_p) hop_2_q_p)
4903  (=> (and hop_1_q_o hop_1_o_a) hop_2_q_a)
4904  (=> (and hop_1_q_o hop_1_o_c) hop_2_q_c)
4905  (=> (and hop_1_q_o hop_1_o_b) hop_2_q_b)
4906  (=> (and hop_1_q_o hop_1_o_e) hop_2_q_e)
4907  (=> (and hop_1_q_o hop_1_o_d) hop_2_q_d)
4908  (=> (and hop_1_q_o hop_1_o_g) hop_2_q_g)
4909  (=> (and hop_1_q_o hop_1_o_f) hop_2_q_f)
4910  (=> (and hop_1_q_o hop_1_o_i) hop_2_q_i)
4911  (=> (and hop_1_q_o hop_1_o_h) hop_2_q_h)
4912  (=> (and hop_1_q_o hop_1_o_k) hop_2_q_k)
4913  (=> (and hop_1_q_o hop_1_o_j) hop_2_q_j)
4914  (=> (and hop_1_q_o hop_1_o_m) hop_2_q_m)
4915  (=> (and hop_1_q_o hop_1_o_l) hop_2_q_l)
4916  (=> (and hop_1_q_o hop_1_o_n) hop_2_q_n)
4917  (=> (and hop_1_q_o hop_1_o_p) hop_2_q_p)
4918  (=> (and hop_1_q_n hop_1_n_a) hop_2_q_a)
4919  (=> (and hop_1_q_n hop_1_n_c) hop_2_q_c)
4920  (=> (and hop_1_q_n hop_1_n_b) hop_2_q_b)
4921  (=> (and hop_1_q_n hop_1_n_e) hop_2_q_e)
4922  (=> (and hop_1_q_n hop_1_n_d) hop_2_q_d)
4923  (=> (and hop_1_q_n hop_1_n_g) hop_2_q_g)
4924  (=> (and hop_1_q_n hop_1_n_f) hop_2_q_f)
4925  (=> (and hop_1_q_n hop_1_n_i) hop_2_q_i)
4926  (=> (and hop_1_q_n hop_1_n_h) hop_2_q_h)
4927  (=> (and hop_1_q_n hop_1_n_k) hop_2_q_k)
4928  (=> (and hop_1_q_n hop_1_n_j) hop_2_q_j)
4929  (=> (and hop_1_q_n hop_1_n_m) hop_2_q_m)
4930  (=> (and hop_1_q_n hop_1_n_l) hop_2_q_l)
4931  (=> (and hop_1_q_n hop_1_n_o) hop_2_q_o)
4932  (=> (and hop_1_q_n hop_1_n_p) hop_2_q_p)
4933  (=> (and hop_1_q_p hop_1_p_a) hop_2_q_a)
4934  (=> (and hop_1_q_p hop_1_p_c) hop_2_q_c)
4935  (=> (and hop_1_q_p hop_1_p_b) hop_2_q_b)
4936  (=> (and hop_1_q_p hop_1_p_e) hop_2_q_e)
4937  (=> (and hop_1_q_p hop_1_p_d) hop_2_q_d)
4938  (=> (and hop_1_q_p hop_1_p_g) hop_2_q_g)
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4939  (=> (and hop_1_q_p hop_1_p_f) hop_2_q_f)
4940  (=> (and hop_1_q_p hop_1_p_i) hop_2_q_i)
4941  (=> (and hop_1_q_p hop_1_p_h) hop_2_q_h)
4942  (=> (and hop_1_q_p hop_1_p_k) hop_2_q_k)
4943  (=> (and hop_1_q_p hop_1_p_j) hop_2_q_j)
4944  (=> (and hop_1_q_p hop_1_p_m) hop_2_q_m)
4945  (=> (and hop_1_q_p hop_1_p_l) hop_2_q_l)
4946  (=> (and hop_1_q_p hop_1_p_o) hop_2_q_o)
4947  (=> (and hop_1_q_p hop_1_p_n) hop_2_q_n)
4948  (=> (and hop_1_p_a hop_1_a_c) hop_2_p_c)
4949  (=> (and hop_1_p_a hop_1_a_b) hop_2_p_b)
4950  (=> (and hop_1_p_a hop_1_a_e) hop_2_p_e)
4951  (=> (and hop_1_p_a hop_1_a_d) hop_2_p_d)
4952  (=> (and hop_1_p_a hop_1_a_g) hop_2_p_g)
4953  (=> (and hop_1_p_a hop_1_a_f) hop_2_p_f)
4954  (=> (and hop_1_p_a hop_1_a_i) hop_2_p_i)
4955  (=> (and hop_1_p_a hop_1_a_h) hop_2_p_h)
4956  (=> (and hop_1_p_a hop_1_a_k) hop_2_p_k)
4957  (=> (and hop_1_p_a hop_1_a_j) hop_2_p_j)
4958  (=> (and hop_1_p_a hop_1_a_m) hop_2_p_m)
4959  (=> (and hop_1_p_a hop_1_a_l) hop_2_p_l)
4960  (=> (and hop_1_p_a hop_1_a_o) hop_2_p_o)
4961  (=> (and hop_1_p_a hop_1_a_n) hop_2_p_n)
4962  (=> (and hop_1_p_a hop_1_a_q) hop_2_p_q)
4963  (=> (and hop_1_p_c hop_1_c_a) hop_2_p_a)
4964  (=> (and hop_1_p_c hop_1_c_b) hop_2_p_b)
4965  (=> (and hop_1_p_c hop_1_c_e) hop_2_p_e)
4966  (=> (and hop_1_p_c hop_1_c_d) hop_2_p_d)
4967  (=> (and hop_1_p_c hop_1_c_g) hop_2_p_g)
4968  (=> (and hop_1_p_c hop_1_c_f) hop_2_p_f)
4969  (=> (and hop_1_p_c hop_1_c_i) hop_2_p_i)
4970  (=> (and hop_1_p_c hop_1_c_h) hop_2_p_h)
4971  (=> (and hop_1_p_c hop_1_c_k) hop_2_p_k)
4972  (=> (and hop_1_p_c hop_1_c_j) hop_2_p_j)
4973  (=> (and hop_1_p_c hop_1_c_m) hop_2_p_m)
4974  (=> (and hop_1_p_c hop_1_c_l) hop_2_p_l)
4975  (=> (and hop_1_p_c hop_1_c_o) hop_2_p_o)
4976  (=> (and hop_1_p_c hop_1_c_n) hop_2_p_n)
4977  (=> (and hop_1_p_c hop_1_c_q) hop_2_p_q)
4978  (=> (and hop_1_p_b hop_1_b_a) hop_2_p_a)
4979  (=> (and hop_1_p_b hop_1_b_c) hop_2_p_c)
4980  (=> (and hop_1_p_b hop_1_b_e) hop_2_p_e)
4981  (=> (and hop_1_p_b hop_1_b_d) hop_2_p_d)
4982  (=> (and hop_1_p_b hop_1_b_g) hop_2_p_g)
4983  (=> (and hop_1_p_b hop_1_b_f) hop_2_p_f)
4984  (=> (and hop_1_p_b hop_1_b_i) hop_2_p_i)
4985  (=> (and hop_1_p_b hop_1_b_h) hop_2_p_h)
4986  (=> (and hop_1_p_b hop_1_b_k) hop_2_p_k)
4987  (=> (and hop_1_p_b hop_1_b_j) hop_2_p_j)
4988  (=> (and hop_1_p_b hop_1_b_m) hop_2_p_m)
4989  (=> (and hop_1_p_b hop_1_b_l) hop_2_p_l)
4990  (=> (and hop_1_p_b hop_1_b_o) hop_2_p_o)
4991  (=> (and hop_1_p_b hop_1_b_n) hop_2_p_n)
4992  (=> (and hop_1_p_b hop_1_b_q) hop_2_p_q)
4993  (=> (and hop_1_p_e hop_1_e_a) hop_2_p_a)
4994  (=> (and hop_1_p_e hop_1_e_c) hop_2_p_c)
4995  (=> (and hop_1_p_e hop_1_e_b) hop_2_p_b)
4996  (=> (and hop_1_p_e hop_1_e_d) hop_2_p_d)
4997  (=> (and hop_1_p_e hop_1_e_g) hop_2_p_g)
4998  (=> (and hop_1_p_e hop_1_e_f) hop_2_p_f)
4999  (=> (and hop_1_p_e hop_1_e_i) hop_2_p_i)
5000  (=> (and hop_1_p_e hop_1_e_h) hop_2_p_h)
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5001  (=> (and hop_1_p_e hop_1_e_k) hop_2_p_k)
5002  (=> (and hop_1_p_e hop_1_e_j) hop_2_p_j)
5003  (=> (and hop_1_p_e hop_1_e_m) hop_2_p_m)
5004  (=> (and hop_1_p_e hop_1_e_l) hop_2_p_l)
5005  (=> (and hop_1_p_e hop_1_e_o) hop_2_p_o)
5006  (=> (and hop_1_p_e hop_1_e_n) hop_2_p_n)
5007  (=> (and hop_1_p_e hop_1_e_q) hop_2_p_q)
5008  (=> (and hop_1_p_d hop_1_d_a) hop_2_p_a)
5009  (=> (and hop_1_p_d hop_1_d_c) hop_2_p_c)
5010  (=> (and hop_1_p_d hop_1_d_b) hop_2_p_b)
5011  (=> (and hop_1_p_d hop_1_d_e) hop_2_p_e)
5012  (=> (and hop_1_p_d hop_1_d_g) hop_2_p_g)
5013  (=> (and hop_1_p_d hop_1_d_f) hop_2_p_f)
5014  (=> (and hop_1_p_d hop_1_d_i) hop_2_p_i)
5015  (=> (and hop_1_p_d hop_1_d_h) hop_2_p_h)
5016  (=> (and hop_1_p_d hop_1_d_k) hop_2_p_k)
5017  (=> (and hop_1_p_d hop_1_d_j) hop_2_p_j)
5018  (=> (and hop_1_p_d hop_1_d_m) hop_2_p_m)
5019  (=> (and hop_1_p_d hop_1_d_l) hop_2_p_l)
5020  (=> (and hop_1_p_d hop_1_d_o) hop_2_p_o)
5021  (=> (and hop_1_p_d hop_1_d_n) hop_2_p_n)
5022  (=> (and hop_1_p_d hop_1_d_q) hop_2_p_q)
5023  (=> (and hop_1_p_g hop_1_g_a) hop_2_p_a)
5024  (=> (and hop_1_p_g hop_1_g_c) hop_2_p_c)
5025  (=> (and hop_1_p_g hop_1_g_b) hop_2_p_b)
5026  (=> (and hop_1_p_g hop_1_g_e) hop_2_p_e)
5027  (=> (and hop_1_p_g hop_1_g_d) hop_2_p_d)
5028  (=> (and hop_1_p_g hop_1_g_f) hop_2_p_f)
5029  (=> (and hop_1_p_g hop_1_g_i) hop_2_p_i)
5030  (=> (and hop_1_p_g hop_1_g_h) hop_2_p_h)
5031  (=> (and hop_1_p_g hop_1_g_k) hop_2_p_k)
5032  (=> (and hop_1_p_g hop_1_g_j) hop_2_p_j)
5033  (=> (and hop_1_p_g hop_1_g_m) hop_2_p_m)
5034  (=> (and hop_1_p_g hop_1_g_l) hop_2_p_l)
5035  (=> (and hop_1_p_g hop_1_g_o) hop_2_p_o)
5036  (=> (and hop_1_p_g hop_1_g_n) hop_2_p_n)
5037  (=> (and hop_1_p_g hop_1_g_q) hop_2_p_q)
5038  (=> (and hop_1_p_f hop_1_f_a) hop_2_p_a)
5039  (=> (and hop_1_p_f hop_1_f_c) hop_2_p_c)
5040  (=> (and hop_1_p_f hop_1_f_b) hop_2_p_b)
5041  (=> (and hop_1_p_f hop_1_f_e) hop_2_p_e)
5042  (=> (and hop_1_p_f hop_1_f_d) hop_2_p_d)
5043  (=> (and hop_1_p_f hop_1_f_g) hop_2_p_g)
5044  (=> (and hop_1_p_f hop_1_f_i) hop_2_p_i)
5045  (=> (and hop_1_p_f hop_1_f_h) hop_2_p_h)
5046  (=> (and hop_1_p_f hop_1_f_k) hop_2_p_k)
5047  (=> (and hop_1_p_f hop_1_f_j) hop_2_p_j)
5048  (=> (and hop_1_p_f hop_1_f_m) hop_2_p_m)
5049  (=> (and hop_1_p_f hop_1_f_l) hop_2_p_l)
5050  (=> (and hop_1_p_f hop_1_f_o) hop_2_p_o)
5051  (=> (and hop_1_p_f hop_1_f_n) hop_2_p_n)
5052  (=> (and hop_1_p_f hop_1_f_q) hop_2_p_q)
5053  (=> (and hop_1_p_i hop_1_i_a) hop_2_p_a)
5054  (=> (and hop_1_p_i hop_1_i_c) hop_2_p_c)
5055  (=> (and hop_1_p_i hop_1_i_b) hop_2_p_b)
5056  (=> (and hop_1_p_i hop_1_i_e) hop_2_p_e)
5057  (=> (and hop_1_p_i hop_1_i_d) hop_2_p_d)
5058  (=> (and hop_1_p_i hop_1_i_g) hop_2_p_g)
5059  (=> (and hop_1_p_i hop_1_i_f) hop_2_p_f)
5060  (=> (and hop_1_p_i hop_1_i_h) hop_2_p_h)
5061  (=> (and hop_1_p_i hop_1_i_k) hop_2_p_k)
5062  (=> (and hop_1_p_i hop_1_i_j) hop_2_p_j)
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```
5063  (=> (and hop_1_p_i hop_1_i_m) hop_2_p_m)
5064  (=> (and hop_1_p_i hop_1_i_l) hop_2_p_l)
5065  (=> (and hop_1_p_i hop_1_i_o) hop_2_p_o)
5066  (=> (and hop_1_p_i hop_1_i_n) hop_2_p_n)
5067  (=> (and hop_1_p_i hop_1_i_q) hop_2_p_q)
5068  (=> (and hop_1_p_h hop_1_h_a) hop_2_p_a)
5069  (=> (and hop_1_p_h hop_1_h_c) hop_2_p_c)
5070  (=> (and hop_1_p_h hop_1_h_b) hop_2_p_b)
5071  (=> (and hop_1_p_h hop_1_h_e) hop_2_p_e)
5072  (=> (and hop_1_p_h hop_1_h_d) hop_2_p_d)
5073  (=> (and hop_1_p_h hop_1_h_g) hop_2_p_g)
5074  (=> (and hop_1_p_h hop_1_h_f) hop_2_p_f)
5075  (=> (and hop_1_p_h hop_1_h_i) hop_2_p_i)
5076  (=> (and hop_1_p_h hop_1_h_k) hop_2_p_k)
5077  (=> (and hop_1_p_h hop_1_h_j) hop_2_p_j)
5078  (=> (and hop_1_p_h hop_1_h_m) hop_2_p_m)
5079  (=> (and hop_1_p_h hop_1_h_l) hop_2_p_l)
5080  (=> (and hop_1_p_h hop_1_h_o) hop_2_p_o)
5081  (=> (and hop_1_p_h hop_1_h_n) hop_2_p_n)
5082  (=> (and hop_1_p_h hop_1_h_q) hop_2_p_q)
5083  (=> (and hop_1_p_k hop_1_k_a) hop_2_p_a)
5084  (=> (and hop_1_p_k hop_1_k_c) hop_2_p_c)
5085  (=> (and hop_1_p_k hop_1_k_b) hop_2_p_b)
5086  (=> (and hop_1_p_k hop_1_k_e) hop_2_p_e)
5087  (=> (and hop_1_p_k hop_1_k_d) hop_2_p_d)
5088  (=> (and hop_1_p_k hop_1_k_g) hop_2_p_g)
5089  (=> (and hop_1_p_k hop_1_k_f) hop_2_p_f)
5090  (=> (and hop_1_p_k hop_1_k_i) hop_2_p_i)
5091  (=> (and hop_1_p_k hop_1_k_h) hop_2_p_h)
5092  (=> (and hop_1_p_k hop_1_k_j) hop_2_p_j)
5093  (=> (and hop_1_p_k hop_1_k_m) hop_2_p_m)
5094  (=> (and hop_1_p_k hop_1_k_l) hop_2_p_l)
5095  (=> (and hop_1_p_k hop_1_k_o) hop_2_p_o)
5096  (=> (and hop_1_p_k hop_1_k_n) hop_2_p_n)
5097  (=> (and hop_1_p_k hop_1_k_q) hop_2_p_q)
5098  (=> (and hop_1_p_j hop_1_j_a) hop_2_p_a)
5099  (=> (and hop_1_p_j hop_1_j_c) hop_2_p_c)
5100  (=> (and hop_1_p_j hop_1_j_b) hop_2_p_b)
5101  (=> (and hop_1_p_j hop_1_j_e) hop_2_p_e)
5102  (=> (and hop_1_p_j hop_1_j_d) hop_2_p_d)
5103  (=> (and hop_1_p_j hop_1_j_g) hop_2_p_g)
5104  (=> (and hop_1_p_j hop_1_j_f) hop_2_p_f)
5105  (=> (and hop_1_p_j hop_1_j_i) hop_2_p_i)
5106  (=> (and hop_1_p_j hop_1_j_h) hop_2_p_h)
5107  (=> (and hop_1_p_j hop_1_j_k) hop_2_p_k)
5108  (=> (and hop_1_p_j hop_1_j_m) hop_2_p_m)
5109  (=> (and hop_1_p_j hop_1_j_l) hop_2_p_l)
5110  (=> (and hop_1_p_j hop_1_j_o) hop_2_p_o)
5111  (=> (and hop_1_p_j hop_1_j_n) hop_2_p_n)
5112  (=> (and hop_1_p_j hop_1_j_q) hop_2_p_q)
5113  (=> (and hop_1_p_m hop_1_m_a) hop_2_p_a)
5114  (=> (and hop_1_p_m hop_1_m_c) hop_2_p_c)
5115  (=> (and hop_1_p_m hop_1_m_b) hop_2_p_b)
5116  (=> (and hop_1_p_m hop_1_m_e) hop_2_p_e)
5117  (=> (and hop_1_p_m hop_1_m_d) hop_2_p_d)
5118  (=> (and hop_1_p_m hop_1_m_g) hop_2_p_g)
5119  (=> (and hop_1_p_m hop_1_m_f) hop_2_p_f)
5120  (=> (and hop_1_p_m hop_1_m_i) hop_2_p_i)
5121  (=> (and hop_1_p_m hop_1_m_h) hop_2_p_h)
5122  (=> (and hop_1_p_m hop_1_m_k) hop_2_p_k)
5123  (=> (and hop_1_p_m hop_1_m_j) hop_2_p_j)
5124  (=> (and hop_1_p_m hop_1_m_l) hop_2_p_l)
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5125   (=> (and hop_1_p_m hop_1_m_o) hop_2_p_o)
5126   (=> (and hop_1_p_m hop_1_m_n) hop_2_p_n)
5127   (=> (and hop_1_p_m hop_1_m_q) hop_2_p_q)
5128   (=> (and hop_1_p_l hop_1_l_a) hop_2_p_a)
5129   (=> (and hop_1_p_l hop_1_l_c) hop_2_p_c)
5130   (=> (and hop_1_p_l hop_1_l_b) hop_2_p_b)
5131   (=> (and hop_1_p_l hop_1_l_e) hop_2_p_e)
5132   (=> (and hop_1_p_l hop_1_l_d) hop_2_p_d)
5133   (=> (and hop_1_p_l hop_1_l_g) hop_2_p_g)
5134   (=> (and hop_1_p_l hop_1_l_f) hop_2_p_f)
5135   (=> (and hop_1_p_l hop_1_l_i) hop_2_p_i)
5136   (=> (and hop_1_p_l hop_1_l_h) hop_2_p_h)
5137   (=> (and hop_1_p_l hop_1_l_k) hop_2_p_k)
5138   (=> (and hop_1_p_l hop_1_l_j) hop_2_p_j)
5139   (=> (and hop_1_p_l hop_1_l_m) hop_2_p_m)
5140   (=> (and hop_1_p_l hop_1_l_o) hop_2_p_o)
5141   (=> (and hop_1_p_l hop_1_l_n) hop_2_p_n)
5142   (=> (and hop_1_p_l hop_1_l_q) hop_2_p_q)
5143   (=> (and hop_1_p_o hop_1_o_a) hop_2_p_a)
5144   (=> (and hop_1_p_o hop_1_o_c) hop_2_p_c)
5145   (=> (and hop_1_p_o hop_1_o_b) hop_2_p_b)
5146   (=> (and hop_1_p_o hop_1_o_e) hop_2_p_e)
5147   (=> (and hop_1_p_o hop_1_o_d) hop_2_p_d)
5148   (=> (and hop_1_p_o hop_1_o_g) hop_2_p_g)
5149   (=> (and hop_1_p_o hop_1_o_f) hop_2_p_f)
5150   (=> (and hop_1_p_o hop_1_o_i) hop_2_p_i)
5151   (=> (and hop_1_p_o hop_1_o_h) hop_2_p_h)
5152   (=> (and hop_1_p_o hop_1_o_k) hop_2_p_k)
5153   (=> (and hop_1_p_o hop_1_o_j) hop_2_p_j)
5154   (=> (and hop_1_p_o hop_1_o_m) hop_2_p_m)
5155   (=> (and hop_1_p_o hop_1_o_l) hop_2_p_l)
5156   (=> (and hop_1_p_o hop_1_o_n) hop_2_p_n)
5157   (=> (and hop_1_p_o hop_1_o_q) hop_2_p_q)
5158   (=> (and hop_1_p_n hop_1_n_a) hop_2_p_a)
5159   (=> (and hop_1_p_n hop_1_n_c) hop_2_p_c)
5160   (=> (and hop_1_p_n hop_1_n_b) hop_2_p_b)
5161   (=> (and hop_1_p_n hop_1_n_e) hop_2_p_e)
5162   (=> (and hop_1_p_n hop_1_n_d) hop_2_p_d)
5163   (=> (and hop_1_p_n hop_1_n_g) hop_2_p_g)
5164   (=> (and hop_1_p_n hop_1_n_f) hop_2_p_f)
5165   (=> (and hop_1_p_n hop_1_n_i) hop_2_p_i)
5166   (=> (and hop_1_p_n hop_1_n_h) hop_2_p_h)
5167   (=> (and hop_1_p_n hop_1_n_k) hop_2_p_k)
5168   (=> (and hop_1_p_n hop_1_n_j) hop_2_p_j)
5169   (=> (and hop_1_p_n hop_1_n_m) hop_2_p_m)
5170   (=> (and hop_1_p_n hop_1_n_l) hop_2_p_l)
5171   (=> (and hop_1_p_n hop_1_n_o) hop_2_p_o)
5172   (=> (and hop_1_p_n hop_1_n_q) hop_2_p_q)
5173   (=> (and hop_1_p_q hop_1_q_a) hop_2_p_a)
5174   (=> (and hop_1_p_q hop_1_q_c) hop_2_p_c)
5175   (=> (and hop_1_p_q hop_1_q_b) hop_2_p_b)
5176   (=> (and hop_1_p_q hop_1_q_e) hop_2_p_e)
5177   (=> (and hop_1_p_q hop_1_q_d) hop_2_p_d)
5178   (=> (and hop_1_p_q hop_1_q_g) hop_2_p_g)
5179   (=> (and hop_1_p_q hop_1_q_f) hop_2_p_f)
5180   (=> (and hop_1_p_q hop_1_q_i) hop_2_p_i)
5181   (=> (and hop_1_p_q hop_1_q_h) hop_2_p_h)
5182   (=> (and hop_1_p_q hop_1_q_k) hop_2_p_k)
5183   (=> (and hop_1_p_q hop_1_q_j) hop_2_p_j)
5184   (=> (and hop_1_p_q hop_1_q_m) hop_2_p_m)
5185   (=> (and hop_1_p_q hop_1_q_l) hop_2_p_l)
5186   (=> (and hop_1_p_q hop_1_q_o) hop_2_p_o)
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5187  (=> (and hop_1_p_q hop_1_q_n) hop_2_p_n)
5188  (=> hop_2_a_c (not (= chan_a chan_c)))
5189  (=> hop_2_a_b (not (= chan_a chan_b)))
5190  (=> hop_2_a_e (not (= chan_a chan_e)))
5191  (=> hop_2_a_d (not (= chan_a chan_d)))
5192  (=> hop_2_a_g (not (= chan_a chan_g)))
5193  (=> hop_2_a_f (not (= chan_a chan_f)))
5194  (=> hop_2_a_i (not (= chan_a chan_i)))
5195  (=> hop_2_a_h (not (= chan_a chan_h)))
5196  (=> hop_2_a_k (not (= chan_a chan_k)))
5197  (=> hop_2_a_j (not (= chan_a chan_j)))
5198  (=> hop_2_a_m (not (= chan_a chan_m)))
5199  (=> hop_2_a_l (not (= chan_a chan_l)))
5200  (=> hop_2_a_o (not (= chan_a chan_o)))
5201  (=> hop_2_a_n (not (= chan_a chan_n)))
5202  (=> hop_2_a_q (not (= chan_a chan_q)))
5203  (=> hop_2_a_p (not (= chan_a chan_p)))
5204  (=> hop_2_c_a (not (= chan_c chan_a)))
5205  (=> hop_2_c_b (not (= chan_c chan_b)))
5206  (=> hop_2_c_e (not (= chan_c chan_e)))
5207  (=> hop_2_c_d (not (= chan_c chan_d)))
5208  (=> hop_2_c_g (not (= chan_c chan_g)))
5209  (=> hop_2_c_f (not (= chan_c chan_f)))
5210  (=> hop_2_c_i (not (= chan_c chan_i)))
5211  (=> hop_2_c_h (not (= chan_c chan_h)))
5212  (=> hop_2_c_k (not (= chan_c chan_k)))
5213  (=> hop_2_c_j (not (= chan_c chan_j)))
5214  (=> hop_2_c_m (not (= chan_c chan_m)))
5215  (=> hop_2_c_l (not (= chan_c chan_l)))
5216  (=> hop_2_c_o (not (= chan_c chan_o)))
5217  (=> hop_2_c_n (not (= chan_c chan_n)))
5218  (=> hop_2_c_q (not (= chan_c chan_q)))
5219  (=> hop_2_c_p (not (= chan_c chan_p)))
5220  (=> hop_2_b_a (not (= chan_b chan_a)))
5221  (=> hop_2_b_c (not (= chan_b chan_c)))
5222  (=> hop_2_b_e (not (= chan_b chan_e)))
5223  (=> hop_2_b_d (not (= chan_b chan_d)))
5224  (=> hop_2_b_g (not (= chan_b chan_g)))
5225  (=> hop_2_b_f (not (= chan_b chan_f)))
5226  (=> hop_2_b_i (not (= chan_b chan_i)))
5227  (=> hop_2_b_h (not (= chan_b chan_h)))
5228  (=> hop_2_b_k (not (= chan_b chan_k)))
5229  (=> hop_2_b_j (not (= chan_b chan_j)))
5230  (=> hop_2_b_m (not (= chan_b chan_m)))
5231  (=> hop_2_b_l (not (= chan_b chan_l)))
5232  (=> hop_2_b_o (not (= chan_b chan_o)))
5233  (=> hop_2_b_n (not (= chan_b chan_n)))
5234  (=> hop_2_b_q (not (= chan_b chan_q)))
5235  (=> hop_2_b_p (not (= chan_b chan_p)))
5236  (=> hop_2_e_a (not (= chan_e chan_a)))
5237  (=> hop_2_e_c (not (= chan_e chan_c)))
5238  (=> hop_2_e_b (not (= chan_e chan_b)))
5239  (=> hop_2_e_d (not (= chan_e chan_d)))
5240  (=> hop_2_e_g (not (= chan_e chan_g)))
5241  (=> hop_2_e_f (not (= chan_e chan_f)))
5242  (=> hop_2_e_i (not (= chan_e chan_i)))
5243  (=> hop_2_e_h (not (= chan_e chan_h)))
5244  (=> hop_2_e_k (not (= chan_e chan_k)))
5245  (=> hop_2_e_j (not (= chan_e chan_j)))
5246  (=> hop_2_e_m (not (= chan_e chan_m)))
5247  (=> hop_2_e_l (not (= chan_e chan_l)))
5248  (=> hop_2_e_o (not (= chan_e chan_o)))
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5249    (=> hop_2_e_n (not (= chan_e chan_n)))
5250    (=> hop_2_e_q (not (= chan_e chan_q)))
5251    (=> hop_2_e_p (not (= chan_e chan_p)))
5252    (=> hop_2_d_a (not (= chan_d chan_a)))
5253    (=> hop_2_d_c (not (= chan_d chan_c)))
5254    (=> hop_2_d_b (not (= chan_d chan_b)))
5255    (=> hop_2_d_e (not (= chan_d chan_e)))
5256    (=> hop_2_d_g (not (= chan_d chan_g)))
5257    (=> hop_2_d_f (not (= chan_d chan_f)))
5258    (=> hop_2_d_i (not (= chan_d chan_i)))
5259    (=> hop_2_d_h (not (= chan_d chan_h)))
5260    (=> hop_2_d_k (not (= chan_d chan_k)))
5261    (=> hop_2_d_j (not (= chan_d chan_j)))
5262    (=> hop_2_d_m (not (= chan_d chan_m)))
5263    (=> hop_2_d_l (not (= chan_d chan_l)))
5264    (=> hop_2_d_o (not (= chan_d chan_o)))
5265    (=> hop_2_d_n (not (= chan_d chan_n)))
5266    (=> hop_2_d_q (not (= chan_d chan_q)))
5267    (=> hop_2_d_p (not (= chan_d chan_p)))
5268    (=> hop_2_g_a (not (= chan_g chan_a)))
5269    (=> hop_2_g_c (not (= chan_g chan_c)))
5270    (=> hop_2_g_b (not (= chan_g chan_b)))
5271    (=> hop_2_g_e (not (= chan_g chan_e)))
5272    (=> hop_2_g_d (not (= chan_g chan_d)))
5273    (=> hop_2_g_f (not (= chan_g chan_f)))
5274    (=> hop_2_g_i (not (= chan_g chan_i)))
5275    (=> hop_2_g_h (not (= chan_g chan_h)))
5276    (=> hop_2_g_k (not (= chan_g chan_k)))
5277    (=> hop_2_g_j (not (= chan_g chan_j)))
5278    (=> hop_2_g_m (not (= chan_g chan_m)))
5279    (=> hop_2_g_l (not (= chan_g chan_l)))
5280    (=> hop_2_g_o (not (= chan_g chan_o)))
5281    (=> hop_2_g_n (not (= chan_g chan_n)))
5282    (=> hop_2_g_q (not (= chan_g chan_q)))
5283    (=> hop_2_g_p (not (= chan_g chan_p)))
5284    (=> hop_2_f_a (not (= chan_f chan_a)))
5285    (=> hop_2_f_c (not (= chan_f chan_c)))
5286    (=> hop_2_f_b (not (= chan_f chan_b)))
5287    (=> hop_2_f_e (not (= chan_f chan_e)))
5288    (=> hop_2_f_d (not (= chan_f chan_d)))
5289    (=> hop_2_f_g (not (= chan_f chan_g)))
5290    (=> hop_2_f_i (not (= chan_f chan_i)))
5291    (=> hop_2_f_h (not (= chan_f chan_h)))
5292    (=> hop_2_f_k (not (= chan_f chan_k)))
5293    (=> hop_2_f_j (not (= chan_f chan_j)))
5294    (=> hop_2_f_m (not (= chan_f chan_m)))
5295    (=> hop_2_f_l (not (= chan_f chan_l)))
5296    (=> hop_2_f_o (not (= chan_f chan_o)))
5297    (=> hop_2_f_n (not (= chan_f chan_n)))
5298    (=> hop_2_f_q (not (= chan_f chan_q)))
5299    (=> hop_2_f_p (not (= chan_f chan_p)))
5300    (=> hop_2_i_a (not (= chan_i chan_a)))
5301    (=> hop_2_i_c (not (= chan_i chan_c)))
5302    (=> hop_2_i_b (not (= chan_i chan_b)))
5303    (=> hop_2_i_e (not (= chan_i chan_e)))
5304    (=> hop_2_i_d (not (= chan_i chan_d)))
5305    (=> hop_2_i_g (not (= chan_i chan_g)))
5306    (=> hop_2_i_f (not (= chan_i chan_f)))
5307    (=> hop_2_i_h (not (= chan_i chan_h)))
5308    (=> hop_2_i_k (not (= chan_i chan_k)))
5309    (=> hop_2_i_j (not (= chan_i chan_j)))
5310    (=> hop_2_i_m (not (= chan_i chan_m)))
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5311  (=> hop_2_i_l (not (= chan_i chan_l)))
5312  (=> hop_2_i_o (not (= chan_i chan_o)))
5313  (=> hop_2_i_n (not (= chan_i chan_n)))
5314  (=> hop_2_i_q (not (= chan_i chan_q)))
5315  (=> hop_2_i_p (not (= chan_i chan_p)))
5316  (=> hop_2_h_a (not (= chan_h chan_a)))
5317  (=> hop_2_h_c (not (= chan_h chan_c)))
5318  (=> hop_2_h_b (not (= chan_h chan_b)))
5319  (=> hop_2_h_e (not (= chan_h chan_e)))
5320  (=> hop_2_h_d (not (= chan_h chan_d)))
5321  (=> hop_2_h_g (not (= chan_h chan_g)))
5322  (=> hop_2_h_f (not (= chan_h chan_f)))
5323  (=> hop_2_h_i (not (= chan_h chan_i)))
5324  (=> hop_2_h_k (not (= chan_h chan_k)))
5325  (=> hop_2_h_j (not (= chan_h chan_j)))
5326  (=> hop_2_h_m (not (= chan_h chan_m)))
5327  (=> hop_2_h_l (not (= chan_h chan_l)))
5328  (=> hop_2_h_o (not (= chan_h chan_o)))
5329  (=> hop_2_h_n (not (= chan_h chan_n)))
5330  (=> hop_2_h_q (not (= chan_h chan_q)))
5331  (=> hop_2_h_p (not (= chan_h chan_p)))
5332  (=> hop_2_k_a (not (= chan_k chan_a)))
5333  (=> hop_2_k_c (not (= chan_k chan_c)))
5334  (=> hop_2_k_b (not (= chan_k chan_b)))
5335  (=> hop_2_k_e (not (= chan_k chan_e)))
5336  (=> hop_2_k_d (not (= chan_k chan_d)))
5337  (=> hop_2_k_g (not (= chan_k chan_g)))
5338  (=> hop_2_k_f (not (= chan_k chan_f)))
5339  (=> hop_2_k_i (not (= chan_k chan_i)))
5340  (=> hop_2_k_h (not (= chan_k chan_h)))
5341  (=> hop_2_k_j (not (= chan_k chan_j)))
5342  (=> hop_2_k_m (not (= chan_k chan_m)))
5343  (=> hop_2_k_l (not (= chan_k chan_l)))
5344  (=> hop_2_k_o (not (= chan_k chan_o)))
5345  (=> hop_2_k_n (not (= chan_k chan_n)))
5346  (=> hop_2_k_q (not (= chan_k chan_q)))
5347  (=> hop_2_k_p (not (= chan_k chan_p)))
5348  (=> hop_2_j_a (not (= chan_j chan_a)))
5349  (=> hop_2_j_c (not (= chan_j chan_c)))
5350  (=> hop_2_j_b (not (= chan_j chan_b)))
5351  (=> hop_2_j_e (not (= chan_j chan_e)))
5352  (=> hop_2_j_d (not (= chan_j chan_d)))
5353  (=> hop_2_j_g (not (= chan_j chan_g)))
5354  (=> hop_2_j_f (not (= chan_j chan_f)))
5355  (=> hop_2_j_i (not (= chan_j chan_i)))
5356  (=> hop_2_j_h (not (= chan_j chan_h)))
5357  (=> hop_2_j_k (not (= chan_j chan_k)))
5358  (=> hop_2_j_m (not (= chan_j chan_m)))
5359  (=> hop_2_j_l (not (= chan_j chan_l)))
5360  (=> hop_2_j_o (not (= chan_j chan_o)))
5361  (=> hop_2_j_n (not (= chan_j chan_n)))
5362  (=> hop_2_j_q (not (= chan_j chan_q)))
5363  (=> hop_2_j_p (not (= chan_j chan_p)))
5364  (=> hop_2_m_a (not (= chan_m chan_a)))
5365  (=> hop_2_m_c (not (= chan_m chan_c)))
5366  (=> hop_2_m_b (not (= chan_m chan_b)))
5367  (=> hop_2_m_e (not (= chan_m chan_e)))
5368  (=> hop_2_m_d (not (= chan_m chan_d)))
5369  (=> hop_2_m_g (not (= chan_m chan_g)))
5370  (=> hop_2_m_f (not (= chan_m chan_f)))
5371  (=> hop_2_m_i (not (= chan_m chan_i)))
5372  (=> hop_2_m_h (not (= chan_m chan_h)))
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5373   (=> hop_2_m_k (not (= chan_m chan_k)))
5374   (=> hop_2_m_j (not (= chan_m chan_j)))
5375   (=> hop_2_m_l (not (= chan_m chan_l)))
5376   (=> hop_2_m_o (not (= chan_m chan_o)))
5377   (=> hop_2_m_n (not (= chan_m chan_n)))
5378   (=> hop_2_m_q (not (= chan_m chan_q)))
5379   (=> hop_2_m_p (not (= chan_m chan_p)))
5380   (=> hop_2_l_a (not (= chan_l chan_a)))
5381   (=> hop_2_l_c (not (= chan_l chan_c)))
5382   (=> hop_2_l_b (not (= chan_l chan_b)))
5383   (=> hop_2_l_e (not (= chan_l chan_e)))
5384   (=> hop_2_l_d (not (= chan_l chan_d)))
5385   (=> hop_2_l_g (not (= chan_l chan_g)))
5386   (=> hop_2_l_f (not (= chan_l chan_f)))
5387   (=> hop_2_l_i (not (= chan_l chan_i)))
5388   (=> hop_2_l_h (not (= chan_l chan_h)))
5389   (=> hop_2_l_k (not (= chan_l chan_k)))
5390   (=> hop_2_l_j (not (= chan_l chan_j)))
5391   (=> hop_2_l_m (not (= chan_l chan_m)))
5392   (=> hop_2_l_o (not (= chan_l chan_o)))
5393   (=> hop_2_l_n (not (= chan_l chan_n)))
5394   (=> hop_2_l_q (not (= chan_l chan_q)))
5395   (=> hop_2_l_p (not (= chan_l chan_p)))
5396   (=> hop_2_o_a (not (= chan_o chan_a)))
5397   (=> hop_2_o_c (not (= chan_o chan_c)))
5398   (=> hop_2_o_b (not (= chan_o chan_b)))
5399   (=> hop_2_o_e (not (= chan_o chan_e)))
5400   (=> hop_2_o_d (not (= chan_o chan_d)))
5401   (=> hop_2_o_g (not (= chan_o chan_g)))
5402   (=> hop_2_o_f (not (= chan_o chan_f)))
5403   (=> hop_2_o_i (not (= chan_o chan_i)))
5404   (=> hop_2_o_h (not (= chan_o chan_h)))
5405   (=> hop_2_o_k (not (= chan_o chan_k)))
5406   (=> hop_2_o_j (not (= chan_o chan_j)))
5407   (=> hop_2_o_m (not (= chan_o chan_m)))
5408   (=> hop_2_o_l (not (= chan_o chan_l)))
5409   (=> hop_2_o_n (not (= chan_o chan_n)))
5410   (=> hop_2_o_q (not (= chan_o chan_q)))
5411   (=> hop_2_o_p (not (= chan_o chan_p)))
5412   (=> hop_2_n_a (not (= chan_n chan_a)))
5413   (=> hop_2_n_c (not (= chan_n chan_c)))
5414   (=> hop_2_n_b (not (= chan_n chan_b)))
5415   (=> hop_2_n_e (not (= chan_n chan_e)))
5416   (=> hop_2_n_d (not (= chan_n chan_d)))
5417   (=> hop_2_n_g (not (= chan_n chan_g)))
5418   (=> hop_2_n_f (not (= chan_n chan_f)))
5419   (=> hop_2_n_i (not (= chan_n chan_i)))
5420   (=> hop_2_n_h (not (= chan_n chan_h)))
5421   (=> hop_2_n_k (not (= chan_n chan_k)))
5422   (=> hop_2_n_j (not (= chan_n chan_j)))
5423   (=> hop_2_n_m (not (= chan_n chan_m)))
5424   (=> hop_2_n_l (not (= chan_n chan_l)))
5425   (=> hop_2_n_o (not (= chan_n chan_o)))
5426   (=> hop_2_n_q (not (= chan_n chan_q)))
5427   (=> hop_2_n_p (not (= chan_n chan_p)))
5428   (=> hop_2_q_a (not (= chan_q chan_a)))
5429   (=> hop_2_q_c (not (= chan_q chan_c)))
5430   (=> hop_2_q_b (not (= chan_q chan_b)))
5431   (=> hop_2_q_e (not (= chan_q chan_e)))
5432   (=> hop_2_q_d (not (= chan_q chan_d)))
5433   (=> hop_2_q_g (not (= chan_q chan_g)))
5434   (=> hop_2_q_f (not (= chan_q chan_f)))
```

```
5435    (=> hop_2_q_i (not (= chan_q chan_i)))
5436    (=> hop_2_q_h (not (= chan_q chan_h)))
5437    (=> hop_2_q_k (not (= chan_q chan_k)))
5438    (=> hop_2_q_j (not (= chan_q chan_j)))
5439    (=> hop_2_q_m (not (= chan_q chan_m)))
5440    (=> hop_2_q_l (not (= chan_q chan_l)))
5441    (=> hop_2_q_o (not (= chan_q chan_o)))
5442    (=> hop_2_q_n (not (= chan_q chan_n)))
5443    (=> hop_2_q_p (not (= chan_q chan_p)))
5444    (=> hop_2_p_a (not (= chan_p chan_a)))
5445    (=> hop_2_p_c (not (= chan_p chan_c)))
5446    (=> hop_2_p_b (not (= chan_p chan_b)))
5447    (=> hop_2_p_e (not (= chan_p chan_e)))
5448    (=> hop_2_p_d (not (= chan_p chan_d)))
5449    (=> hop_2_p_g (not (= chan_p chan_g)))
5450    (=> hop_2_p_f (not (= chan_p chan_f)))
5451    (=> hop_2_p_i (not (= chan_p chan_i)))
5452    (=> hop_2_p_h (not (= chan_p chan_h)))
5453    (=> hop_2_p_k (not (= chan_p chan_k)))
5454    (=> hop_2_p_j (not (= chan_p chan_j)))
5455    (=> hop_2_p_m (not (= chan_p chan_m)))
5456    (=> hop_2_p_l (not (= chan_p chan_l)))
5457    (=> hop_2_p_o (not (= chan_p chan_o)))
5458    (=> hop_2_p_n (not (= chan_p chan_n)))
5459    (=> hop_2_p_q (not (= chan_p chan_q)))
5460    (>= chan_a 0)
5461    (<= chan_a 8)
5462    (>= chan_c 0)
5463    (<= chan_c 8)
5464    (>= chan_b 0)
5465    (<= chan_b 8)
5466    (>= chan_e 0)
5467    (<= chan_e 8)
5468    (>= chan_d 0)
5469    (<= chan_d 8)
5470    (>= chan_g 0)
5471    (<= chan_g 8)
5472    (>= chan_f 0)
5473    (<= chan_f 8)
5474    (>= chan_i 0)
5475    (<= chan_i 8)
5476    (>= chan_h 0)
5477    (<= chan_h 8)
5478    (>= chan_k 0)
5479    (<= chan_k 8)
5480    (>= chan_j 0)
5481    (<= chan_j 8)
5482    (>= chan_m 0)
5483    (<= chan_m 8)
5484    (>= chan_l 0)
5485    (<= chan_l 8)
5486    (>= chan_o 0)
5487    (<= chan_o 8)
5488    (>= chan_n 0)
5489    (<= chan_n 8)
5490    (>= chan_q 0)
5491    (<= chan_q 8)
5492    (>= chan_p 0)
5493    (<= chan_p 8)
5494    ))
5495    (check-sat)
5496    (get-model)
```

Appendix 29

The generated output for Question 4(a)

```
1   sat
2   (model
3     (define-fun chan_h () Int
4       7)
5     (define-fun chan_a () Int
6       3)
7     (define-fun chan_k () Int
8       0)
9     (define-fun chan_g () Int
10      1)
11    (define-fun chan_e () Int
12      5)
13    (define-fun chan_q () Int
14      6)
15    (define-fun chan_p () Int
16      7)
17    (define-fun chan_d () Int
18      0)
19    (define-fun chan_o () Int
20      4)
21    (define-fun chan_l () Int
22      3)
23    (define-fun chan_c () Int
24      5)
25    (define-fun chan_n () Int
26      5)
27    (define-fun chan_i () Int
28      8)
29    (define-fun chan_f () Int
30      4)
31    (define-fun chan_m () Int
32      2)
33    (define-fun chan_b () Int
34      6)
35    (define-fun chan_j () Int
36      1)
37    (define-fun hop_2_p_h () Bool
38      false)
39    (define-fun hop_2_p_f () Bool
40      true)
```

```
41    (define-fun hop_2_p_g () Bool
42      true)
43    (define-fun hop_2_p_d () Bool
44      true)
45    (define-fun hop_2_p_e () Bool
46      true)
47    (define-fun hop_2_p_b () Bool
48      true)
49    (define-fun hop_2_p_c () Bool
50      true)
51    (define-fun hop_2_p_a () Bool
52      true)
53    (define-fun hop_2_q_k () Bool
54      true)
55    (define-fun hop_2_q_h () Bool
56      true)
57    (define-fun hop_2_q_i () Bool
58      true)
59    (define-fun hop_2_q_f () Bool
60      true)
61    (define-fun hop_2_q_g () Bool
62      true)
63    (define-fun hop_2_q_d () Bool
64      true)
65    (define-fun hop_2_q_e () Bool
66      true)
67    (define-fun hop_2_q_b () Bool
68      false)
69    (define-fun hop_2_q_c () Bool
70      true)
71    (define-fun hop_2_q_a () Bool
72      true)
73    (define-fun hop_2_n_h () Bool
74      true)
75    (define-fun hop_2_n_g () Bool
76      true)
77    (define-fun hop_2_n_d () Bool
78      true)
79    (define-fun hop_2_n_e () Bool
80      false)
81    (define-fun hop_2_n_b () Bool
82      true)
83    (define-fun hop_2_n_c () Bool
84      false)
85    (define-fun hop_2_n_a () Bool
86      true)
87    (define-fun hop_2_o_j () Bool
88      true)
89    (define-fun hop_2_o_h () Bool
90      true)
91    (define-fun hop_2_o_i () Bool
92      true)
93    (define-fun hop_2_o_f () Bool
94      false)
95    (define-fun hop_2_o_g () Bool
96      true)
97    (define-fun hop_2_o_d () Bool
98      true)
99    (define-fun hop_2_o_e () Bool
100     true)
101   (define-fun hop_2_o_b () Bool
102     true)
```

```
103    (define-fun hop_2_o_c () Bool
104      true)
105    (define-fun hop_2_o_a () Bool
106      true)
107    (define-fun hop_2_l_d () Bool
108      true)
109    (define-fun hop_2_l_b () Bool
110      true)
111    (define-fun hop_2_l_c () Bool
112      true)
113    (define-fun hop_2_l_a () Bool
114      false)
115    (define-fun hop_2_m_f () Bool
116      true)
117    (define-fun hop_2_m_d () Bool
118      true)
119    (define-fun hop_2_m_e () Bool
120      true)
121    (define-fun hop_2_m_b () Bool
122      true)
123    (define-fun hop_2_m_c () Bool
124      true)
125    (define-fun hop_2_m_a () Bool
126      true)
127    (define-fun hop_2_j_o () Bool
128      true)
129    (define-fun hop_2_j_g () Bool
130      false)
131    (define-fun hop_2_j_b () Bool
132      true)
133    (define-fun hop_2_j_c () Bool
134      true)
135    (define-fun hop_2_j_a () Bool
136      true)
137    (define-fun hop_2_k_q () Bool
138      true)
139    (define-fun hop_2_k_f () Bool
140      true)
141    (define-fun hop_2_k_d () Bool
142      false)
143    (define-fun hop_2_k_b () Bool
144      true)
145    (define-fun hop_2_k_c () Bool
146      true)
147    (define-fun hop_2_k_a () Bool
148      true)
149    (define-fun hop_2_h_p () Bool
150      false)
151    (define-fun hop_2_h_q () Bool
152      true)
153    (define-fun hop_2_h_n () Bool
154      true)
155    (define-fun hop_2_h_o () Bool
156      true)
157    (define-fun hop_2_h_b () Bool
158      true)
159    (define-fun hop_2_h_c () Bool
160      true)
161    (define-fun hop_2_h_a () Bool
162      true)
163    (define-fun hop_2_i_q () Bool
164      true)
```

```
165    (define-fun hop_2_i_o () Bool
166      true)
167    (define-fun hop_2_i_b () Bool
168      true)
169    (define-fun hop_2_i_c () Bool
170      true)
171    (define-fun hop_2_i_a () Bool
172      true)
173    (define-fun hop_2_f_p () Bool
174      true)
175    (define-fun hop_2_f_q () Bool
176      true)
177    (define-fun hop_2_f_o () Bool
178      false)
179    (define-fun hop_2_f_m () Bool
180      true)
181    (define-fun hop_2_f_k () Bool
182      true)
183    (define-fun hop_2_f_g () Bool
184      true)
185    (define-fun hop_2_f_c () Bool
186      true)
187    (define-fun hop_2_g_p () Bool
188      true)
189    (define-fun hop_2_g_q () Bool
190      true)
191    (define-fun hop_2_g_n () Bool
192      true)
193    (define-fun hop_2_g_o () Bool
194      true)
195    (define-fun hop_2_g_j () Bool
196      false)
197    (define-fun hop_2_g_f () Bool
198      true)
199    (define-fun hop_2_g_b () Bool
200      true)
201    (define-fun hop_2_g_c () Bool
202      true)
203    (define-fun hop_2_g_a () Bool
204      true)
205    (define-fun hop_2_d_p () Bool
206      true)
207    (define-fun hop_2_d_q () Bool
208      true)
209    (define-fun hop_2_d_n () Bool
210      true)
211    (define-fun hop_2_d_o () Bool
212      true)
213    (define-fun hop_2_d_l () Bool
214      true)
215    (define-fun hop_2_d_m () Bool
216      true)
217    (define-fun hop_2_d_k () Bool
218      false)
219    (define-fun hop_2_e_p () Bool
220      true)
221    (define-fun hop_2_e_q () Bool
222      true)
223    (define-fun hop_2_e_n () Bool
224      false)
225    (define-fun hop_2_e_o () Bool
226      true)
```

```
227    (define-fun hop_2_e_m () Bool
228      true)
229    (define-fun hop_2_e_c () Bool
230      false)
231    (define-fun hop_2_b_p () Bool
232      true)
233    (define-fun hop_2_b_q () Bool
234      false)
235    (define-fun hop_2_b_n () Bool
236      true)
237    (define-fun hop_2_b_o () Bool
238      true)
239    (define-fun hop_2_b_l () Bool
240      true)
241    (define-fun hop_2_b_m () Bool
242      true)
243    (define-fun hop_2_b_j () Bool
244      true)
245    (define-fun hop_2_b_k () Bool
246      true)
247    (define-fun hop_2_b_h () Bool
248      true)
249    (define-fun hop_2_b_i () Bool
250      true)
251    (define-fun hop_2_b_g () Bool
252      true)
253    (define-fun hop_2_c_p () Bool
254      true)
255    (define-fun hop_2_c_q () Bool
256      true)
257    (define-fun hop_2_c_n () Bool
258      false)
259    (define-fun hop_2_c_o () Bool
260      true)
261    (define-fun hop_2_c_l () Bool
262      true)
263    (define-fun hop_2_c_m () Bool
264      true)
265    (define-fun hop_2_c_j () Bool
266      true)
267    (define-fun hop_2_c_k () Bool
268      true)
269    (define-fun hop_2_c_h () Bool
270      true)
271    (define-fun hop_2_c_i () Bool
272      true)
273    (define-fun hop_2_c_f () Bool
274      true)
275    (define-fun hop_2_c_g () Bool
276      true)
277    (define-fun hop_2_c_e () Bool
278      false)
279    (define-fun hop_2_a_p () Bool
280      true)
281    (define-fun hop_2_a_q () Bool
282      true)
283    (define-fun hop_2_a_n () Bool
284      true)
285    (define-fun hop_2_a_o () Bool
286      true)
287    (define-fun hop_2_a_l () Bool
288      false)
```

```
289    (define-fun hop_2_a_m () Bool
290      true)
291    (define-fun hop_2_a_j () Bool
292      true)
293    (define-fun hop_2_a_k () Bool
294      true)
295    (define-fun hop_2_a_h () Bool
296      true)
297    (define-fun hop_2_a_i () Bool
298      true)
299    (define-fun hop_2_a_g () Bool
300      true)
301    (define-fun hop_2_p_j () Bool
302      true)
303    (define-fun hop_2_p_i () Bool
304      true)
305    (define-fun hop_2_p_k () Bool
306      true)
307    (define-fun hop_2_q_o () Bool
308      true)
309    (define-fun hop_2_q_m () Bool
310      true)
311    (define-fun hop_2_q_l () Bool
312      true)
313    (define-fun hop_2_q_j () Bool
314      true)
315    (define-fun hop_2_n_o () Bool
316      true)
317    (define-fun hop_2_n_m () Bool
318      true)
319    (define-fun hop_2_n_k () Bool
320      true)
321    (define-fun hop_2_n_i () Bool
322      true)
323    (define-fun hop_2_n_f () Bool
324      true)
325    (define-fun hop_2_o_q () Bool
326      true)
327    (define-fun hop_2_o_n () Bool
328      true)
329    (define-fun hop_2_o_l () Bool
330      true)
331    (define-fun hop_2_o_k () Bool
332      true)
333    (define-fun hop_2_l_q () Bool
334      true)
335    (define-fun hop_2_l_o () Bool
336      true)
337    (define-fun hop_2_l_g () Bool
338      true)
339    (define-fun hop_2_l_h () Bool
340      true)
341    (define-fun hop_2_l_f () Bool
342      true)
343    (define-fun hop_2_l_e () Bool
344      true)
345    (define-fun hop_2_m_q () Bool
346      true)
347    (define-fun hop_2_m_n () Bool
348      true)
349    (define-fun hop_2_m_j () Bool
350      true)
```

```
351    (define-fun hop_2_m_i () Bool
352      true)
353    (define-fun hop_2_m_h () Bool
354      true)
355    (define-fun hop_2_m_g () Bool
356      true)
357    (define-fun hop_2_j_q () Bool
358      true)
359    (define-fun hop_2_j_p () Bool
360      true)
361    (define-fun hop_2_j_m () Bool
362      true)
363    (define-fun hop_2_j_k () Bool
364      true)
365    (define-fun hop_2_j_h () Bool
366      true)
367    (define-fun hop_2_j_e () Bool
368      true)
369    (define-fun hop_2_j_d () Bool
370      true)
371    (define-fun hop_2_k_n () Bool
372      true)
373    (define-fun hop_2_k_j () Bool
374      true)
375    (define-fun hop_2_k_p () Bool
376      true)
377    (define-fun hop_2_k_o () Bool
378      true)
379    (define-fun hop_2_k_i () Bool
380      true)
381    (define-fun hop_2_k_e () Bool
382      true)
383    (define-fun hop_2_h_m () Bool
384      true)
385    (define-fun hop_2_h_l () Bool
386      true)
387    (define-fun hop_2_h_j () Bool
388      true)
389    (define-fun hop_2_h_f () Bool
390      true)
391    (define-fun hop_2_h_d () Bool
392      true)
393    (define-fun hop_2_i_p () Bool
394      true)
395    (define-fun hop_2_i_m () Bool
396      true)
397    (define-fun hop_2_i_n () Bool
398      true)
399    (define-fun hop_2_i_k () Bool
400      true)
401    (define-fun hop_2_i_g () Bool
402      true)
403    (define-fun hop_2_i_d () Bool
404      true)
405    (define-fun hop_2_f_n () Bool
406      true)
407    (define-fun hop_2_f_l () Bool
408      true)
409    (define-fun hop_2_f_h () Bool
410      true)
411    (define-fun hop_2_f_e () Bool
412      true)
```

```
413    (define-fun hop_2_f_b () Bool
414      true)
415    (define-fun hop_2_f_a () Bool
416      true)
417    (define-fun hop_2_g_l () Bool
418      true)
419    (define-fun hop_2_g_m () Bool
420      true)
421    (define-fun hop_2_g_i () Bool
422      true)
423    (define-fun hop_2_g_d () Bool
424      true)
425    (define-fun hop_2_d_j () Bool
426      true)
427    (define-fun hop_2_d_h () Bool
428      true)
429    (define-fun hop_2_d_i () Bool
430      true)
431    (define-fun hop_2_d_g () Bool
432      true)
433    (define-fun hop_2_d_c () Bool
434      true)
435    (define-fun hop_2_e_l () Bool
436      true)
437    (define-fun hop_2_e_j () Bool
438      true)
439    (define-fun hop_2_e_k () Bool
440      true)
441    (define-fun hop_2_e_f () Bool
442      true)
443    (define-fun hop_2_e_b () Bool
444      true)
445    (define-fun hop_2_e_a () Bool
446      true)
447    (define-fun hop_2_b_f () Bool
448      true)
449    (define-fun hop_2_b_e () Bool
450      true)
451    (define-fun hop_2_c_d () Bool
452      true)
453    (define-fun hop_2_c_a () Bool
454      true)
455    (define-fun hop_2_a_f () Bool
456      true)
457    (define-fun hop_2_a_e () Bool
458      true)
459    (define-fun hop_2_a_c () Bool
460      true)
461    (define-fun hop_2_p_q () Bool
462      true)
463    (define-fun hop_2_p_n () Bool
464      true)
465    (define-fun hop_2_p_o () Bool
466      true)
467    (define-fun hop_2_p_l () Bool
468      true)
469    (define-fun hop_2_p_m () Bool
470      true)
471    (define-fun hop_2_q_p () Bool
472      true)
473    (define-fun hop_2_q_n () Bool
474      true)
```

```
475     (define-fun hop_2_n_p () Bool
476       true)
477     (define-fun hop_2_n_q () Bool
478       true)
479     (define-fun hop_2_n_l () Bool
480       true)
481     (define-fun hop_2_n_j () Bool
482       true)
483     (define-fun hop_2_o_p () Bool
484       true)
485     (define-fun hop_2_o_m () Bool
486       true)
487     (define-fun hop_2_l_p () Bool
488       true)
489     (define-fun hop_2_l_n () Bool
490       true)
491     (define-fun hop_2_l_m () Bool
492       true)
493     (define-fun hop_2_l_j () Bool
494       true)
495     (define-fun hop_2_l_k () Bool
496       true)
497     (define-fun hop_2_l_i () Bool
498       true)
499     (define-fun hop_2_m_p () Bool
500       true)
501     (define-fun hop_2_m_o () Bool
502       true)
503     (define-fun hop_2_m_l () Bool
504       true)
505     (define-fun hop_2_m_k () Bool
506       true)
507     (define-fun hop_2_j_n () Bool
508       true)
509     (define-fun hop_2_j_l () Bool
510       true)
511     (define-fun hop_2_j_i () Bool
512       true)
513     (define-fun hop_2_j_f () Bool
514       true)
515     (define-fun hop_2_k_l () Bool
516       true)
517     (define-fun hop_2_k_m () Bool
518       true)
519     (define-fun hop_2_k_h () Bool
520       true)
521     (define-fun hop_2_k_g () Bool
522       true)
523     (define-fun hop_2_h_k () Bool
524       true)
525     (define-fun hop_2_h_i () Bool
526       true)
527     (define-fun hop_2_h_g () Bool
528       true)
529     (define-fun hop_2_h_e () Bool
530       true)
531     (define-fun hop_2_i_l () Bool
532       true)
533     (define-fun hop_2_i_j () Bool
534       true)
535     (define-fun hop_2_i_h () Bool
536       true)
```

```
537    (define-fun hop_2_i_f () Bool
538       true)
539    (define-fun hop_2_i_e () Bool
540       true)
541    (define-fun hop_2_f_j () Bool
542       true)
543    (define-fun hop_2_f_i () Bool
544       true)
545    (define-fun hop_2_f_d () Bool
546       true)
547    (define-fun hop_2_g_k () Bool
548       true)
549    (define-fun hop_2_g_h () Bool
550       true)
551    (define-fun hop_2_g_e () Bool
552       true)
553    (define-fun hop_2_d_f () Bool
554       true)
555    (define-fun hop_2_d_e () Bool
556       true)
557    (define-fun hop_2_d_b () Bool
558       true)
559    (define-fun hop_2_d_a () Bool
560       true)
561    (define-fun hop_2_e_h () Bool
562       true)
563    (define-fun hop_2_e_i () Bool
564       true)
565    (define-fun hop_2_e_g () Bool
566       true)
567    (define-fun hop_2_e_d () Bool
568       true)
569    (define-fun hop_2_b_d () Bool
570       true)
571    (define-fun hop_2_b_c () Bool
572       true)
573    (define-fun hop_2_b_a () Bool
574       true)
575    (define-fun hop_2_c_b () Bool
576       true)
577    (define-fun hop_2_a_d () Bool
578       true)
579    (define-fun hop_2_a_b () Bool
580       true)
581    (define-fun hop_1_p_q () Bool
582       true)
583    (define-fun hop_1_p_n () Bool
584       true)
585    (define-fun hop_1_p_o () Bool
586       true)
587    (define-fun hop_1_p_l () Bool
588       true)
589    (define-fun hop_1_p_m () Bool
590       true)
591    (define-fun hop_1_p_j () Bool
592       false)
593    (define-fun hop_1_p_k () Bool
594       false)
595    (define-fun hop_1_p_h () Bool
596       false)
597    (define-fun hop_1_p_i () Bool
598       false)
```

```
599    (define-fun hop_1_p_f () Bool
600      false)
601    (define-fun hop_1_p_g () Bool
602      false)
603    (define-fun hop_1_p_d () Bool
604      false)
605    (define-fun hop_1_p_e () Bool
606      false)
607    (define-fun hop_1_p_b () Bool
608      false)
609    (define-fun hop_1_p_c () Bool
610      false)
611    (define-fun hop_1_p_a () Bool
612      false)
613    (define-fun hop_1_q_p () Bool
614      true)
615    (define-fun hop_1_q_n () Bool
616      true)
617    (define-fun hop_1_q_o () Bool
618      false)
619    (define-fun hop_1_q_l () Bool
620      false)
621    (define-fun hop_1_q_m () Bool
622      false)
623    (define-fun hop_1_q_j () Bool
624      false)
625    (define-fun hop_1_q_k () Bool
626      false)
627    (define-fun hop_1_q_h () Bool
628      false)
629    (define-fun hop_1_q_i () Bool
630      false)
631    (define-fun hop_1_q_f () Bool
632      false)
633    (define-fun hop_1_q_g () Bool
634      false)
635    (define-fun hop_1_q_d () Bool
636      false)
637    (define-fun hop_1_q_e () Bool
638      false)
639    (define-fun hop_1_q_b () Bool
640      false)
641    (define-fun hop_1_q_c () Bool
642      false)
643    (define-fun hop_1_q_a () Bool
644      false)
645    (define-fun hop_1_n_p () Bool
646      true)
647    (define-fun hop_1_n_q () Bool
648      true)
649    (define-fun hop_1_n_o () Bool
650      false)
651    (define-fun hop_1_n_l () Bool
652      true)
653    (define-fun hop_1_n_m () Bool
654      false)
655    (define-fun hop_1_n_j () Bool
656      true)
657    (define-fun hop_1_n_k () Bool
658      false)
659    (define-fun hop_1_n_h () Bool
660      false)
```

863

```
661    (define-fun hop_1_n_i () Bool
662      false)
663    (define-fun hop_1_n_f () Bool
664      false)
665    (define-fun hop_1_n_g () Bool
666      false)
667    (define-fun hop_1_n_d () Bool
668      false)
669    (define-fun hop_1_n_e () Bool
670      false)
671    (define-fun hop_1_n_b () Bool
672      false)
673    (define-fun hop_1_n_c () Bool
674      false)
675    (define-fun hop_1_n_a () Bool
676      false)
677    (define-fun hop_1_o_p () Bool
678      true)
679    (define-fun hop_1_o_q () Bool
680      false)
681    (define-fun hop_1_o_n () Bool
682      false)
683    (define-fun hop_1_o_l () Bool
684      false)
685    (define-fun hop_1_o_m () Bool
686      true)
687    (define-fun hop_1_o_j () Bool
688      false)
689    (define-fun hop_1_o_k () Bool
690      false)
691    (define-fun hop_1_o_h () Bool
692      false)
693    (define-fun hop_1_o_i () Bool
694      false)
695    (define-fun hop_1_o_f () Bool
696      false)
697    (define-fun hop_1_o_g () Bool
698      false)
699    (define-fun hop_1_o_d () Bool
700      false)
701    (define-fun hop_1_o_e () Bool
702      false)
703    (define-fun hop_1_o_b () Bool
704      false)
705    (define-fun hop_1_o_c () Bool
706      false)
707    (define-fun hop_1_o_a () Bool
708      false)
709    (define-fun hop_1_l_p () Bool
710      true)
711    (define-fun hop_1_l_q () Bool
712      false)
713    (define-fun hop_1_l_n () Bool
714      true)
715    (define-fun hop_1_l_o () Bool
716      false)
717    (define-fun hop_1_l_m () Bool
718      true)
719    (define-fun hop_1_l_j () Bool
720      true)
721    (define-fun hop_1_l_k () Bool
722      true)
```

```
723    (define-fun hop_1_l_h () Bool
724      false)
725    (define-fun hop_1_l_i () Bool
726      true)
727    (define-fun hop_1_l_f () Bool
728      false)
729    (define-fun hop_1_l_g () Bool
730      false)
731    (define-fun hop_1_l_d () Bool
732      false)
733    (define-fun hop_1_l_e () Bool
734      false)
735    (define-fun hop_1_l_b () Bool
736      false)
737    (define-fun hop_1_l_c () Bool
738      false)
739    (define-fun hop_1_l_a () Bool
740      false)
741    (define-fun hop_1_m_p () Bool
742      true)
743    (define-fun hop_1_m_q () Bool
744      false)
745    (define-fun hop_1_m_n () Bool
746      false)
747    (define-fun hop_1_m_o () Bool
748      true)
749    (define-fun hop_1_m_l () Bool
750      true)
751    (define-fun hop_1_m_j () Bool
752      false)
753    (define-fun hop_1_m_k () Bool
754      true)
755    (define-fun hop_1_m_h () Bool
756      false)
757    (define-fun hop_1_m_i () Bool
758      false)
759    (define-fun hop_1_m_f () Bool
760      false)
761    (define-fun hop_1_m_g () Bool
762      false)
763    (define-fun hop_1_m_d () Bool
764      false)
765    (define-fun hop_1_m_e () Bool
766      false)
767    (define-fun hop_1_m_b () Bool
768      false)
769    (define-fun hop_1_m_c () Bool
770      false)
771    (define-fun hop_1_m_a () Bool
772      false)
773    (define-fun hop_1_j_p () Bool
774      false)
775    (define-fun hop_1_j_q () Bool
776      false)
777    (define-fun hop_1_j_n () Bool
778      true)
779    (define-fun hop_1_j_o () Bool
780      false)
781    (define-fun hop_1_j_l () Bool
782      true)
783    (define-fun hop_1_j_m () Bool
784      false)
```

```
785    (define-fun hop_1_j_k () Bool
786      false)
787    (define-fun hop_1_j_h () Bool
788      false)
789    (define-fun hop_1_j_i () Bool
790      true)
791    (define-fun hop_1_j_f () Bool
792      true)
793    (define-fun hop_1_j_g () Bool
794      false)
795    (define-fun hop_1_j_d () Bool
796      false)
797    (define-fun hop_1_j_e () Bool
798      false)
799    (define-fun hop_1_j_b () Bool
800      false)
801    (define-fun hop_1_j_c () Bool
802      false)
803    (define-fun hop_1_j_a () Bool
804      false)
805    (define-fun hop_1_k_p () Bool
806      false)
807    (define-fun hop_1_k_q () Bool
808      false)
809    (define-fun hop_1_k_n () Bool
810      false)
811    (define-fun hop_1_k_o () Bool
812      false)
813    (define-fun hop_1_k_l () Bool
814      true)
815    (define-fun hop_1_k_m () Bool
816      true)
817    (define-fun hop_1_k_j () Bool
818      false)
819    (define-fun hop_1_k_h () Bool
820      true)
821    (define-fun hop_1_k_i () Bool
822      false)
823    (define-fun hop_1_k_f () Bool
824      false)
825    (define-fun hop_1_k_g () Bool
826      true)
827    (define-fun hop_1_k_d () Bool
828      false)
829    (define-fun hop_1_k_e () Bool
830      false)
831    (define-fun hop_1_k_b () Bool
832      false)
833    (define-fun hop_1_k_c () Bool
834      false)
835    (define-fun hop_1_k_a () Bool
836      false)
837    (define-fun hop_1_h_p () Bool
838      false)
839    (define-fun hop_1_h_q () Bool
840      false)
841    (define-fun hop_1_h_n () Bool
842      false)
843    (define-fun hop_1_h_o () Bool
844      false)
845    (define-fun hop_1_h_l () Bool
846      false)
```

```
847    (define-fun hop_1_h_m () Bool
848      false)
849    (define-fun hop_1_h_j () Bool
850      false)
851    (define-fun hop_1_h_k () Bool
852      true)
853    (define-fun hop_1_h_i () Bool
854      true)
855    (define-fun hop_1_h_f () Bool
856      false)
857    (define-fun hop_1_h_g () Bool
858      true)
859    (define-fun hop_1_h_d () Bool
860      false)
861    (define-fun hop_1_h_e () Bool
862      true)
863    (define-fun hop_1_h_b () Bool
864      false)
865    (define-fun hop_1_h_c () Bool
866      false)
867    (define-fun hop_1_h_a () Bool
868      false)
869    (define-fun hop_1_i_p () Bool
870      false)
871    (define-fun hop_1_i_q () Bool
872      false)
873    (define-fun hop_1_i_n () Bool
874      false)
875    (define-fun hop_1_i_o () Bool
876      false)
877    (define-fun hop_1_i_l () Bool
878      true)
879    (define-fun hop_1_i_m () Bool
880      false)
881    (define-fun hop_1_i_j () Bool
882      true)
883    (define-fun hop_1_i_k () Bool
884      false)
885    (define-fun hop_1_i_h () Bool
886      true)
887    (define-fun hop_1_i_f () Bool
888      true)
889    (define-fun hop_1_i_g () Bool
890      false)
891    (define-fun hop_1_i_d () Bool
892      false)
893    (define-fun hop_1_i_e () Bool
894      true)
895    (define-fun hop_1_i_b () Bool
896      false)
897    (define-fun hop_1_i_c () Bool
898      false)
899    (define-fun hop_1_i_a () Bool
900      false)
901    (define-fun hop_1_f_p () Bool
902      false)
903    (define-fun hop_1_f_q () Bool
904      false)
905    (define-fun hop_1_f_n () Bool
906      false)
907    (define-fun hop_1_f_o () Bool
908      false)
```

```
909    (define-fun hop_1_f_l () Bool
910      false)
911    (define-fun hop_1_f_m () Bool
912      false)
913    (define-fun hop_1_f_j () Bool
914      true)
915    (define-fun hop_1_f_k () Bool
916      false)
917    (define-fun hop_1_f_h () Bool
918      false)
919    (define-fun hop_1_f_i () Bool
920      true)
921    (define-fun hop_1_f_g () Bool
922      false)
923    (define-fun hop_1_f_d () Bool
924      true)
925    (define-fun hop_1_f_e () Bool
926      false)
927    (define-fun hop_1_f_b () Bool
928      false)
929    (define-fun hop_1_f_c () Bool
930      false)
931    (define-fun hop_1_f_a () Bool
932      false)
933    (define-fun hop_1_g_p () Bool
934      false)
935    (define-fun hop_1_g_q () Bool
936      false)
937    (define-fun hop_1_g_n () Bool
938      false)
939    (define-fun hop_1_g_o () Bool
940      false)
941    (define-fun hop_1_g_l () Bool
942      false)
943    (define-fun hop_1_g_m () Bool
944      false)
945    (define-fun hop_1_g_j () Bool
946      false)
947    (define-fun hop_1_g_k () Bool
948      true)
949    (define-fun hop_1_g_h () Bool
950      true)
951    (define-fun hop_1_g_i () Bool
952      false)
953    (define-fun hop_1_g_f () Bool
954      false)
955    (define-fun hop_1_g_d () Bool
956      false)
957    (define-fun hop_1_g_e () Bool
958      true)
959    (define-fun hop_1_g_b () Bool
960      false)
961    (define-fun hop_1_g_c () Bool
962      false)
963    (define-fun hop_1_g_a () Bool
964      false)
965    (define-fun hop_1_d_p () Bool
966      false)
967    (define-fun hop_1_d_q () Bool
968      false)
969    (define-fun hop_1_d_n () Bool
970      false)
```

868

```
971    (define-fun hop_1_d_o () Bool
972      false)
973    (define-fun hop_1_d_l () Bool
974      false)
975    (define-fun hop_1_d_m () Bool
976      false)
977    (define-fun hop_1_d_j () Bool
978      false)
979    (define-fun hop_1_d_k () Bool
980      false)
981    (define-fun hop_1_d_h () Bool
982      false)
983    (define-fun hop_1_d_i () Bool
984      false)
985    (define-fun hop_1_d_f () Bool
986      true)
987    (define-fun hop_1_d_g () Bool
988      false)
989    (define-fun hop_1_d_e () Bool
990      true)
991    (define-fun hop_1_d_b () Bool
992      true)
993    (define-fun hop_1_d_c () Bool
994      false)
995    (define-fun hop_1_d_a () Bool
996      true)
997    (define-fun hop_1_e_p () Bool
998      false)
999    (define-fun hop_1_e_q () Bool
1000     false)
1001   (define-fun hop_1_e_n () Bool
1002     false)
1003   (define-fun hop_1_e_o () Bool
1004     false)
1005   (define-fun hop_1_e_l () Bool
1006     false)
1007   (define-fun hop_1_e_m () Bool
1008     false)
1009   (define-fun hop_1_e_j () Bool
1010     false)
1011   (define-fun hop_1_e_k () Bool
1012     false)
1013   (define-fun hop_1_e_h () Bool
1014     true)
1015   (define-fun hop_1_e_i () Bool
1016     true)
1017   (define-fun hop_1_e_f () Bool
1018     false)
1019   (define-fun hop_1_e_g () Bool
1020     true)
1021   (define-fun hop_1_e_d () Bool
1022     true)
1023   (define-fun hop_1_e_b () Bool
1024     false)
1025   (define-fun hop_1_e_c () Bool
1026     false)
1027   (define-fun hop_1_e_a () Bool
1028     false)
1029   (define-fun hop_1_b_p () Bool
1030     false)
1031   (define-fun hop_1_b_q () Bool
1032     false)
```

```
1033    (define-fun hop_1_b_n () Bool
1034      false)
1035    (define-fun hop_1_b_o () Bool
1036      false)
1037    (define-fun hop_1_b_l () Bool
1038      false)
1039    (define-fun hop_1_b_m () Bool
1040      false)
1041    (define-fun hop_1_b_j () Bool
1042      false)
1043    (define-fun hop_1_b_k () Bool
1044      false)
1045    (define-fun hop_1_b_h () Bool
1046      false)
1047    (define-fun hop_1_b_i () Bool
1048      false)
1049    (define-fun hop_1_b_f () Bool
1050      false)
1051    (define-fun hop_1_b_g () Bool
1052      false)
1053    (define-fun hop_1_b_d () Bool
1054      true)
1055    (define-fun hop_1_b_e () Bool
1056      false)
1057    (define-fun hop_1_b_c () Bool
1058      true)
1059    (define-fun hop_1_b_a () Bool
1060      true)
1061    (define-fun hop_1_c_p () Bool
1062      false)
1063    (define-fun hop_1_c_q () Bool
1064      false)
1065    (define-fun hop_1_c_n () Bool
1066      false)
1067    (define-fun hop_1_c_o () Bool
1068      false)
1069    (define-fun hop_1_c_l () Bool
1070      false)
1071    (define-fun hop_1_c_m () Bool
1072      false)
1073    (define-fun hop_1_c_j () Bool
1074      false)
1075    (define-fun hop_1_c_k () Bool
1076      false)
1077    (define-fun hop_1_c_h () Bool
1078      false)
1079    (define-fun hop_1_c_i () Bool
1080      false)
1081    (define-fun hop_1_c_f () Bool
1082      false)
1083    (define-fun hop_1_c_g () Bool
1084      false)
1085    (define-fun hop_1_c_d () Bool
1086      false)
1087    (define-fun hop_1_c_e () Bool
1088      false)
1089    (define-fun hop_1_c_b () Bool
1090      true)
1091    (define-fun hop_1_c_a () Bool
1092      false)
1093    (define-fun hop_1_a_p () Bool
1094      false)
```

```
1095    (define-fun hop_1_a_q () Bool
1096      false)
1097    (define-fun hop_1_a_n () Bool
1098      false)
1099    (define-fun hop_1_a_o () Bool
1100      false)
1101    (define-fun hop_1_a_l () Bool
1102      false)
1103    (define-fun hop_1_a_m () Bool
1104      false)
1105    (define-fun hop_1_a_j () Bool
1106      false)
1107    (define-fun hop_1_a_k () Bool
1108      false)
1109    (define-fun hop_1_a_h () Bool
1110      false)
1111    (define-fun hop_1_a_i () Bool
1112      false)
1113    (define-fun hop_1_a_f () Bool
1114      false)
1115    (define-fun hop_1_a_g () Bool
1116      false)
1117    (define-fun hop_1_a_d () Bool
1118      true)
1119    (define-fun hop_1_a_e () Bool
1120      false)
1121    (define-fun hop_1_a_b () Bool
1122      true)
1123    (define-fun hop_1_a_c () Bool
1124      false)
1125  )
```

Appendix 30

The generated requirements for Question 4(b) with $chan\_x \leq 6$

```
 1   (declare-const chan_a Int)
 2   (declare-const chan_c Int)
 3   (declare-const chan_b Int)
 4   (declare-const chan_e Int)
 5   (declare-const chan_d Int)
 6   (declare-const chan_g Int)
 7   (declare-const chan_f Int)
 8   (declare-const chan_i Int)
 9   (declare-const chan_h Int)
10   (declare-const chan_k Int)
11   (declare-const chan_j Int)
12   (declare-const chan_m Int)
13   (declare-const chan_l Int)
14   (declare-const chan_o Int)
15   (declare-const chan_n Int)
16   (declare-const chan_q Int)
17   (declare-const chan_p Int)
18   (declare-const hop_1_a_c Bool)
19   (declare-const hop_2_a_c Bool)
20   (declare-const hop_1_a_b Bool)
21   (declare-const hop_2_a_b Bool)
22   (declare-const hop_1_a_e Bool)
23   (declare-const hop_2_a_e Bool)
24   (declare-const hop_1_a_d Bool)
25   (declare-const hop_2_a_d Bool)
26   (declare-const hop_1_a_g Bool)
27   (declare-const hop_2_a_g Bool)
28   (declare-const hop_1_a_f Bool)
29   (declare-const hop_2_a_f Bool)
30   (declare-const hop_1_a_i Bool)
31   (declare-const hop_2_a_i Bool)
32   (declare-const hop_1_a_h Bool)
33   (declare-const hop_2_a_h Bool)
34   (declare-const hop_1_a_k Bool)
35   (declare-const hop_2_a_k Bool)
36   (declare-const hop_1_a_j Bool)
37   (declare-const hop_2_a_j Bool)
38   (declare-const hop_1_a_m Bool)
39   (declare-const hop_2_a_m Bool)
40   (declare-const hop_1_a_l Bool)
```

```
41   (declare-const hop_2_a_l Bool)
42   (declare-const hop_1_a_o Bool)
43   (declare-const hop_2_a_o Bool)
44   (declare-const hop_1_a_n Bool)
45   (declare-const hop_2_a_n Bool)
46   (declare-const hop_1_a_q Bool)
47   (declare-const hop_2_a_q Bool)
48   (declare-const hop_1_a_p Bool)
49   (declare-const hop_2_a_p Bool)
50   (declare-const hop_1_c_a Bool)
51   (declare-const hop_2_c_a Bool)
52   (declare-const hop_1_c_b Bool)
53   (declare-const hop_2_c_b Bool)
54   (declare-const hop_1_c_e Bool)
55   (declare-const hop_2_c_e Bool)
56   (declare-const hop_1_c_d Bool)
57   (declare-const hop_2_c_d Bool)
58   (declare-const hop_1_c_g Bool)
59   (declare-const hop_2_c_g Bool)
60   (declare-const hop_1_c_f Bool)
61   (declare-const hop_2_c_f Bool)
62   (declare-const hop_1_c_i Bool)
63   (declare-const hop_2_c_i Bool)
64   (declare-const hop_1_c_h Bool)
65   (declare-const hop_2_c_h Bool)
66   (declare-const hop_1_c_k Bool)
67   (declare-const hop_2_c_k Bool)
68   (declare-const hop_1_c_j Bool)
69   (declare-const hop_2_c_j Bool)
70   (declare-const hop_1_c_m Bool)
71   (declare-const hop_2_c_m Bool)
72   (declare-const hop_1_c_l Bool)
73   (declare-const hop_2_c_l Bool)
74   (declare-const hop_1_c_o Bool)
75   (declare-const hop_2_c_o Bool)
76   (declare-const hop_1_c_n Bool)
77   (declare-const hop_2_c_n Bool)
78   (declare-const hop_1_c_q Bool)
79   (declare-const hop_2_c_q Bool)
80   (declare-const hop_1_c_p Bool)
81   (declare-const hop_2_c_p Bool)
82   (declare-const hop_1_b_a Bool)
83   (declare-const hop_2_b_a Bool)
84   (declare-const hop_1_b_c Bool)
85   (declare-const hop_2_b_c Bool)
86   (declare-const hop_1_b_e Bool)
87   (declare-const hop_2_b_e Bool)
88   (declare-const hop_1_b_d Bool)
89   (declare-const hop_2_b_d Bool)
90   (declare-const hop_1_b_g Bool)
91   (declare-const hop_2_b_g Bool)
92   (declare-const hop_1_b_f Bool)
93   (declare-const hop_2_b_f Bool)
94   (declare-const hop_1_b_i Bool)
95   (declare-const hop_2_b_i Bool)
96   (declare-const hop_1_b_h Bool)
97   (declare-const hop_2_b_h Bool)
98   (declare-const hop_1_b_k Bool)
99   (declare-const hop_2_b_k Bool)
100  (declare-const hop_1_b_j Bool)
101  (declare-const hop_2_b_j Bool)
102  (declare-const hop_1_b_m Bool)
```

```
103  (declare-const hop_2_b_m Bool)
104  (declare-const hop_1_b_l Bool)
105  (declare-const hop_2_b_l Bool)
106  (declare-const hop_1_b_o Bool)
107  (declare-const hop_2_b_o Bool)
108  (declare-const hop_1_b_n Bool)
109  (declare-const hop_2_b_n Bool)
110  (declare-const hop_1_b_q Bool)
111  (declare-const hop_2_b_q Bool)
112  (declare-const hop_1_b_p Bool)
113  (declare-const hop_2_b_p Bool)
114  (declare-const hop_1_e_a Bool)
115  (declare-const hop_2_e_a Bool)
116  (declare-const hop_1_e_c Bool)
117  (declare-const hop_2_e_c Bool)
118  (declare-const hop_1_e_b Bool)
119  (declare-const hop_2_e_b Bool)
120  (declare-const hop_1_e_d Bool)
121  (declare-const hop_2_e_d Bool)
122  (declare-const hop_1_e_g Bool)
123  (declare-const hop_2_e_g Bool)
124  (declare-const hop_1_e_f Bool)
125  (declare-const hop_2_e_f Bool)
126  (declare-const hop_1_e_i Bool)
127  (declare-const hop_2_e_i Bool)
128  (declare-const hop_1_e_h Bool)
129  (declare-const hop_2_e_h Bool)
130  (declare-const hop_1_e_k Bool)
131  (declare-const hop_2_e_k Bool)
132  (declare-const hop_1_e_j Bool)
133  (declare-const hop_2_e_j Bool)
134  (declare-const hop_1_e_m Bool)
135  (declare-const hop_2_e_m Bool)
136  (declare-const hop_1_e_l Bool)
137  (declare-const hop_2_e_l Bool)
138  (declare-const hop_1_e_o Bool)
139  (declare-const hop_2_e_o Bool)
140  (declare-const hop_1_e_n Bool)
141  (declare-const hop_2_e_n Bool)
142  (declare-const hop_1_e_q Bool)
143  (declare-const hop_2_e_q Bool)
144  (declare-const hop_1_e_p Bool)
145  (declare-const hop_2_e_p Bool)
146  (declare-const hop_1_d_a Bool)
147  (declare-const hop_2_d_a Bool)
148  (declare-const hop_1_d_c Bool)
149  (declare-const hop_2_d_c Bool)
150  (declare-const hop_1_d_b Bool)
151  (declare-const hop_2_d_b Bool)
152  (declare-const hop_1_d_e Bool)
153  (declare-const hop_2_d_e Bool)
154  (declare-const hop_1_d_g Bool)
155  (declare-const hop_2_d_g Bool)
156  (declare-const hop_1_d_f Bool)
157  (declare-const hop_2_d_f Bool)
158  (declare-const hop_1_d_i Bool)
159  (declare-const hop_2_d_i Bool)
160  (declare-const hop_1_d_h Bool)
161  (declare-const hop_2_d_h Bool)
162  (declare-const hop_1_d_k Bool)
163  (declare-const hop_2_d_k Bool)
164  (declare-const hop_1_d_j Bool)
```

```
165    (declare-const hop_2_d_j Bool)
166    (declare-const hop_1_d_m Bool)
167    (declare-const hop_2_d_m Bool)
168    (declare-const hop_1_d_l Bool)
169    (declare-const hop_2_d_l Bool)
170    (declare-const hop_1_d_o Bool)
171    (declare-const hop_2_d_o Bool)
172    (declare-const hop_1_d_n Bool)
173    (declare-const hop_2_d_n Bool)
174    (declare-const hop_1_d_q Bool)
175    (declare-const hop_2_d_q Bool)
176    (declare-const hop_1_d_p Bool)
177    (declare-const hop_2_d_p Bool)
178    (declare-const hop_1_g_a Bool)
179    (declare-const hop_2_g_a Bool)
180    (declare-const hop_1_g_c Bool)
181    (declare-const hop_2_g_c Bool)
182    (declare-const hop_1_g_b Bool)
183    (declare-const hop_2_g_b Bool)
184    (declare-const hop_1_g_e Bool)
185    (declare-const hop_2_g_e Bool)
186    (declare-const hop_1_g_d Bool)
187    (declare-const hop_2_g_d Bool)
188    (declare-const hop_1_g_f Bool)
189    (declare-const hop_2_g_f Bool)
190    (declare-const hop_1_g_i Bool)
191    (declare-const hop_2_g_i Bool)
192    (declare-const hop_1_g_h Bool)
193    (declare-const hop_2_g_h Bool)
194    (declare-const hop_1_g_k Bool)
195    (declare-const hop_2_g_k Bool)
196    (declare-const hop_1_g_j Bool)
197    (declare-const hop_2_g_j Bool)
198    (declare-const hop_1_g_m Bool)
199    (declare-const hop_2_g_m Bool)
200    (declare-const hop_1_g_l Bool)
201    (declare-const hop_2_g_l Bool)
202    (declare-const hop_1_g_o Bool)
203    (declare-const hop_2_g_o Bool)
204    (declare-const hop_1_g_n Bool)
205    (declare-const hop_2_g_n Bool)
206    (declare-const hop_1_g_q Bool)
207    (declare-const hop_2_g_q Bool)
208    (declare-const hop_1_g_p Bool)
209    (declare-const hop_2_g_p Bool)
210    (declare-const hop_1_f_a Bool)
211    (declare-const hop_2_f_a Bool)
212    (declare-const hop_1_f_c Bool)
213    (declare-const hop_2_f_c Bool)
214    (declare-const hop_1_f_b Bool)
215    (declare-const hop_2_f_b Bool)
216    (declare-const hop_1_f_e Bool)
217    (declare-const hop_2_f_e Bool)
218    (declare-const hop_1_f_d Bool)
219    (declare-const hop_2_f_d Bool)
220    (declare-const hop_1_f_g Bool)
221    (declare-const hop_2_f_g Bool)
222    (declare-const hop_1_f_i Bool)
223    (declare-const hop_2_f_i Bool)
224    (declare-const hop_1_f_h Bool)
225    (declare-const hop_2_f_h Bool)
226    (declare-const hop_1_f_k Bool)
```

```
227  (declare-const hop_2_f_k Bool)
228  (declare-const hop_1_f_j Bool)
229  (declare-const hop_2_f_j Bool)
230  (declare-const hop_1_f_m Bool)
231  (declare-const hop_2_f_m Bool)
232  (declare-const hop_1_f_l Bool)
233  (declare-const hop_2_f_l Bool)
234  (declare-const hop_1_f_o Bool)
235  (declare-const hop_2_f_o Bool)
236  (declare-const hop_1_f_n Bool)
237  (declare-const hop_2_f_n Bool)
238  (declare-const hop_1_f_q Bool)
239  (declare-const hop_2_f_q Bool)
240  (declare-const hop_1_f_p Bool)
241  (declare-const hop_2_f_p Bool)
242  (declare-const hop_1_i_a Bool)
243  (declare-const hop_2_i_a Bool)
244  (declare-const hop_1_i_c Bool)
245  (declare-const hop_2_i_c Bool)
246  (declare-const hop_1_i_b Bool)
247  (declare-const hop_2_i_b Bool)
248  (declare-const hop_1_i_e Bool)
249  (declare-const hop_2_i_e Bool)
250  (declare-const hop_1_i_d Bool)
251  (declare-const hop_2_i_d Bool)
252  (declare-const hop_1_i_g Bool)
253  (declare-const hop_2_i_g Bool)
254  (declare-const hop_1_i_f Bool)
255  (declare-const hop_2_i_f Bool)
256  (declare-const hop_1_i_h Bool)
257  (declare-const hop_2_i_h Bool)
258  (declare-const hop_1_i_k Bool)
259  (declare-const hop_2_i_k Bool)
260  (declare-const hop_1_i_j Bool)
261  (declare-const hop_2_i_j Bool)
262  (declare-const hop_1_i_m Bool)
263  (declare-const hop_2_i_m Bool)
264  (declare-const hop_1_i_l Bool)
265  (declare-const hop_2_i_l Bool)
266  (declare-const hop_1_i_o Bool)
267  (declare-const hop_2_i_o Bool)
268  (declare-const hop_1_i_n Bool)
269  (declare-const hop_2_i_n Bool)
270  (declare-const hop_1_i_q Bool)
271  (declare-const hop_2_i_q Bool)
272  (declare-const hop_1_i_p Bool)
273  (declare-const hop_2_i_p Bool)
274  (declare-const hop_1_h_a Bool)
275  (declare-const hop_2_h_a Bool)
276  (declare-const hop_1_h_c Bool)
277  (declare-const hop_2_h_c Bool)
278  (declare-const hop_1_h_b Bool)
279  (declare-const hop_2_h_b Bool)
280  (declare-const hop_1_h_e Bool)
281  (declare-const hop_2_h_e Bool)
282  (declare-const hop_1_h_d Bool)
283  (declare-const hop_2_h_d Bool)
284  (declare-const hop_1_h_g Bool)
285  (declare-const hop_2_h_g Bool)
286  (declare-const hop_1_h_f Bool)
287  (declare-const hop_2_h_f Bool)
288  (declare-const hop_1_h_i Bool)
```

```
289  (declare-const hop_2_h_i Bool)
290  (declare-const hop_1_h_k Bool)
291  (declare-const hop_2_h_k Bool)
292  (declare-const hop_1_h_j Bool)
293  (declare-const hop_2_h_j Bool)
294  (declare-const hop_1_h_m Bool)
295  (declare-const hop_2_h_m Bool)
296  (declare-const hop_1_h_l Bool)
297  (declare-const hop_2_h_l Bool)
298  (declare-const hop_1_h_o Bool)
299  (declare-const hop_2_h_o Bool)
300  (declare-const hop_1_h_n Bool)
301  (declare-const hop_2_h_n Bool)
302  (declare-const hop_1_h_q Bool)
303  (declare-const hop_2_h_q Bool)
304  (declare-const hop_1_h_p Bool)
305  (declare-const hop_2_h_p Bool)
306  (declare-const hop_1_k_a Bool)
307  (declare-const hop_2_k_a Bool)
308  (declare-const hop_1_k_c Bool)
309  (declare-const hop_2_k_c Bool)
310  (declare-const hop_1_k_b Bool)
311  (declare-const hop_2_k_b Bool)
312  (declare-const hop_1_k_e Bool)
313  (declare-const hop_2_k_e Bool)
314  (declare-const hop_1_k_d Bool)
315  (declare-const hop_2_k_d Bool)
316  (declare-const hop_1_k_g Bool)
317  (declare-const hop_2_k_g Bool)
318  (declare-const hop_1_k_f Bool)
319  (declare-const hop_2_k_f Bool)
320  (declare-const hop_1_k_i Bool)
321  (declare-const hop_2_k_i Bool)
322  (declare-const hop_1_k_h Bool)
323  (declare-const hop_2_k_h Bool)
324  (declare-const hop_1_k_j Bool)
325  (declare-const hop_2_k_j Bool)
326  (declare-const hop_1_k_m Bool)
327  (declare-const hop_2_k_m Bool)
328  (declare-const hop_1_k_l Bool)
329  (declare-const hop_2_k_l Bool)
330  (declare-const hop_1_k_o Bool)
331  (declare-const hop_2_k_o Bool)
332  (declare-const hop_1_k_n Bool)
333  (declare-const hop_2_k_n Bool)
334  (declare-const hop_1_k_q Bool)
335  (declare-const hop_2_k_q Bool)
336  (declare-const hop_1_k_p Bool)
337  (declare-const hop_2_k_p Bool)
338  (declare-const hop_1_j_a Bool)
339  (declare-const hop_2_j_a Bool)
340  (declare-const hop_1_j_c Bool)
341  (declare-const hop_2_j_c Bool)
342  (declare-const hop_1_j_b Bool)
343  (declare-const hop_2_j_b Bool)
344  (declare-const hop_1_j_e Bool)
345  (declare-const hop_2_j_e Bool)
346  (declare-const hop_1_j_d Bool)
347  (declare-const hop_2_j_d Bool)
348  (declare-const hop_1_j_g Bool)
349  (declare-const hop_2_j_g Bool)
350  (declare-const hop_1_j_f Bool)
```

```
351   (declare-const hop_2_j_f Bool)
352   (declare-const hop_1_j_i Bool)
353   (declare-const hop_2_j_i Bool)
354   (declare-const hop_1_j_h Bool)
355   (declare-const hop_2_j_h Bool)
356   (declare-const hop_1_j_k Bool)
357   (declare-const hop_2_j_k Bool)
358   (declare-const hop_1_j_m Bool)
359   (declare-const hop_2_j_m Bool)
360   (declare-const hop_1_j_l Bool)
361   (declare-const hop_2_j_l Bool)
362   (declare-const hop_1_j_o Bool)
363   (declare-const hop_2_j_o Bool)
364   (declare-const hop_1_j_n Bool)
365   (declare-const hop_2_j_n Bool)
366   (declare-const hop_1_j_q Bool)
367   (declare-const hop_2_j_q Bool)
368   (declare-const hop_1_j_p Bool)
369   (declare-const hop_2_j_p Bool)
370   (declare-const hop_1_m_a Bool)
371   (declare-const hop_2_m_a Bool)
372   (declare-const hop_1_m_c Bool)
373   (declare-const hop_2_m_c Bool)
374   (declare-const hop_1_m_b Bool)
375   (declare-const hop_2_m_b Bool)
376   (declare-const hop_1_m_e Bool)
377   (declare-const hop_2_m_e Bool)
378   (declare-const hop_1_m_d Bool)
379   (declare-const hop_2_m_d Bool)
380   (declare-const hop_1_m_g Bool)
381   (declare-const hop_2_m_g Bool)
382   (declare-const hop_1_m_f Bool)
383   (declare-const hop_2_m_f Bool)
384   (declare-const hop_1_m_i Bool)
385   (declare-const hop_2_m_i Bool)
386   (declare-const hop_1_m_h Bool)
387   (declare-const hop_2_m_h Bool)
388   (declare-const hop_1_m_k Bool)
389   (declare-const hop_2_m_k Bool)
390   (declare-const hop_1_m_j Bool)
391   (declare-const hop_2_m_j Bool)
392   (declare-const hop_1_m_l Bool)
393   (declare-const hop_2_m_l Bool)
394   (declare-const hop_1_m_o Bool)
395   (declare-const hop_2_m_o Bool)
396   (declare-const hop_1_m_n Bool)
397   (declare-const hop_2_m_n Bool)
398   (declare-const hop_1_m_q Bool)
399   (declare-const hop_2_m_q Bool)
400   (declare-const hop_1_m_p Bool)
401   (declare-const hop_2_m_p Bool)
402   (declare-const hop_1_l_a Bool)
403   (declare-const hop_2_l_a Bool)
404   (declare-const hop_1_l_c Bool)
405   (declare-const hop_2_l_c Bool)
406   (declare-const hop_1_l_b Bool)
407   (declare-const hop_2_l_b Bool)
408   (declare-const hop_1_l_e Bool)
409   (declare-const hop_2_l_e Bool)
410   (declare-const hop_1_l_d Bool)
411   (declare-const hop_2_l_d Bool)
412   (declare-const hop_1_l_g Bool)
```

```
413  (declare-const hop_2_l_g Bool)
414  (declare-const hop_1_l_f Bool)
415  (declare-const hop_2_l_f Bool)
416  (declare-const hop_1_l_i Bool)
417  (declare-const hop_2_l_i Bool)
418  (declare-const hop_1_l_h Bool)
419  (declare-const hop_2_l_h Bool)
420  (declare-const hop_1_l_k Bool)
421  (declare-const hop_2_l_k Bool)
422  (declare-const hop_1_l_j Bool)
423  (declare-const hop_2_l_j Bool)
424  (declare-const hop_1_l_m Bool)
425  (declare-const hop_2_l_m Bool)
426  (declare-const hop_1_l_o Bool)
427  (declare-const hop_2_l_o Bool)
428  (declare-const hop_1_l_n Bool)
429  (declare-const hop_2_l_n Bool)
430  (declare-const hop_1_l_q Bool)
431  (declare-const hop_2_l_q Bool)
432  (declare-const hop_1_l_p Bool)
433  (declare-const hop_2_l_p Bool)
434  (declare-const hop_1_o_a Bool)
435  (declare-const hop_2_o_a Bool)
436  (declare-const hop_1_o_c Bool)
437  (declare-const hop_2_o_c Bool)
438  (declare-const hop_1_o_b Bool)
439  (declare-const hop_2_o_b Bool)
440  (declare-const hop_1_o_e Bool)
441  (declare-const hop_2_o_e Bool)
442  (declare-const hop_1_o_d Bool)
443  (declare-const hop_2_o_d Bool)
444  (declare-const hop_1_o_g Bool)
445  (declare-const hop_2_o_g Bool)
446  (declare-const hop_1_o_f Bool)
447  (declare-const hop_2_o_f Bool)
448  (declare-const hop_1_o_i Bool)
449  (declare-const hop_2_o_i Bool)
450  (declare-const hop_1_o_h Bool)
451  (declare-const hop_2_o_h Bool)
452  (declare-const hop_1_o_k Bool)
453  (declare-const hop_2_o_k Bool)
454  (declare-const hop_1_o_j Bool)
455  (declare-const hop_2_o_j Bool)
456  (declare-const hop_1_o_m Bool)
457  (declare-const hop_2_o_m Bool)
458  (declare-const hop_1_o_l Bool)
459  (declare-const hop_2_o_l Bool)
460  (declare-const hop_1_o_n Bool)
461  (declare-const hop_2_o_n Bool)
462  (declare-const hop_1_o_q Bool)
463  (declare-const hop_2_o_q Bool)
464  (declare-const hop_1_o_p Bool)
465  (declare-const hop_2_o_p Bool)
466  (declare-const hop_1_n_a Bool)
467  (declare-const hop_2_n_a Bool)
468  (declare-const hop_1_n_c Bool)
469  (declare-const hop_2_n_c Bool)
470  (declare-const hop_1_n_b Bool)
471  (declare-const hop_2_n_b Bool)
472  (declare-const hop_1_n_e Bool)
473  (declare-const hop_2_n_e Bool)
474  (declare-const hop_1_n_d Bool)
```

```
475  (declare-const hop_2_n_d Bool)
476  (declare-const hop_1_n_g Bool)
477  (declare-const hop_2_n_g Bool)
478  (declare-const hop_1_n_f Bool)
479  (declare-const hop_2_n_f Bool)
480  (declare-const hop_1_n_i Bool)
481  (declare-const hop_2_n_i Bool)
482  (declare-const hop_1_n_h Bool)
483  (declare-const hop_2_n_h Bool)
484  (declare-const hop_1_n_k Bool)
485  (declare-const hop_2_n_k Bool)
486  (declare-const hop_1_n_j Bool)
487  (declare-const hop_2_n_j Bool)
488  (declare-const hop_1_n_m Bool)
489  (declare-const hop_2_n_m Bool)
490  (declare-const hop_1_n_l Bool)
491  (declare-const hop_2_n_l Bool)
492  (declare-const hop_1_n_o Bool)
493  (declare-const hop_2_n_o Bool)
494  (declare-const hop_1_n_q Bool)
495  (declare-const hop_2_n_q Bool)
496  (declare-const hop_1_n_p Bool)
497  (declare-const hop_2_n_p Bool)
498  (declare-const hop_1_q_a Bool)
499  (declare-const hop_2_q_a Bool)
500  (declare-const hop_1_q_c Bool)
501  (declare-const hop_2_q_c Bool)
502  (declare-const hop_1_q_b Bool)
503  (declare-const hop_2_q_b Bool)
504  (declare-const hop_1_q_e Bool)
505  (declare-const hop_2_q_e Bool)
506  (declare-const hop_1_q_d Bool)
507  (declare-const hop_2_q_d Bool)
508  (declare-const hop_1_q_g Bool)
509  (declare-const hop_2_q_g Bool)
510  (declare-const hop_1_q_f Bool)
511  (declare-const hop_2_q_f Bool)
512  (declare-const hop_1_q_i Bool)
513  (declare-const hop_2_q_i Bool)
514  (declare-const hop_1_q_h Bool)
515  (declare-const hop_2_q_h Bool)
516  (declare-const hop_1_q_k Bool)
517  (declare-const hop_2_q_k Bool)
518  (declare-const hop_1_q_j Bool)
519  (declare-const hop_2_q_j Bool)
520  (declare-const hop_1_q_m Bool)
521  (declare-const hop_2_q_m Bool)
522  (declare-const hop_1_q_l Bool)
523  (declare-const hop_2_q_l Bool)
524  (declare-const hop_1_q_o Bool)
525  (declare-const hop_2_q_o Bool)
526  (declare-const hop_1_q_n Bool)
527  (declare-const hop_2_q_n Bool)
528  (declare-const hop_1_q_p Bool)
529  (declare-const hop_2_q_p Bool)
530  (declare-const hop_1_p_a Bool)
531  (declare-const hop_2_p_a Bool)
532  (declare-const hop_1_p_c Bool)
533  (declare-const hop_2_p_c Bool)
534  (declare-const hop_1_p_b Bool)
535  (declare-const hop_2_p_b Bool)
536  (declare-const hop_1_p_e Bool)
```

```
537    (declare-const hop_2_p_e Bool)
538    (declare-const hop_1_p_d Bool)
539    (declare-const hop_2_p_d Bool)
540    (declare-const hop_1_p_g Bool)
541    (declare-const hop_2_p_g Bool)
542    (declare-const hop_1_p_f Bool)
543    (declare-const hop_2_p_f Bool)
544    (declare-const hop_1_p_i Bool)
545    (declare-const hop_2_p_i Bool)
546    (declare-const hop_1_p_h Bool)
547    (declare-const hop_2_p_h Bool)
548    (declare-const hop_1_p_k Bool)
549    (declare-const hop_2_p_k Bool)
550    (declare-const hop_1_p_j Bool)
551    (declare-const hop_2_p_j Bool)
552    (declare-const hop_1_p_m Bool)
553    (declare-const hop_2_p_m Bool)
554    (declare-const hop_1_p_l Bool)
555    (declare-const hop_2_p_l Bool)
556    (declare-const hop_1_p_o Bool)
557    (declare-const hop_2_p_o Bool)
558    (declare-const hop_1_p_n Bool)
559    (declare-const hop_2_p_n Bool)
560    (declare-const hop_1_p_q Bool)
561    (declare-const hop_2_p_q Bool)
562    (assert
563    (and
564    (not hop_1_a_c)
565    hop_1_a_b
566    (not hop_1_a_e)
567    hop_1_a_d
568    (not hop_1_a_g)
569    (not hop_1_a_f)
570    (not hop_1_a_i)
571    (not hop_1_a_h)
572    (not hop_1_a_k)
573    (not hop_1_a_j)
574    (not hop_1_a_m)
575    (not hop_1_a_l)
576    (not hop_1_a_o)
577    (not hop_1_a_n)
578    (not hop_1_a_q)
579    (not hop_1_a_p)
580    (not hop_1_c_a)
581    hop_1_c_b
582    (not hop_1_c_e)
583    (not hop_1_c_d)
584    (not hop_1_c_g)
585    (not hop_1_c_f)
586    (not hop_1_c_i)
587    (not hop_1_c_h)
588    (not hop_1_c_k)
589    (not hop_1_c_j)
590    (not hop_1_c_m)
591    (not hop_1_c_l)
592    (not hop_1_c_o)
593    (not hop_1_c_n)
594    (not hop_1_c_q)
595    (not hop_1_c_p)
596    hop_1_b_a
597    hop_1_b_c
598    (not hop_1_b_e)
```

```
599   hop_1_b_d
600   (not hop_1_b_g)
601   (not hop_1_b_f)
602   (not hop_1_b_i)
603   (not hop_1_b_h)
604   (not hop_1_b_k)
605   (not hop_1_b_j)
606   (not hop_1_b_m)
607   (not hop_1_b_l)
608   (not hop_1_b_o)
609   (not hop_1_b_n)
610   (not hop_1_b_q)
611   (not hop_1_b_p)
612   (not hop_1_e_a)
613   (not hop_1_e_c)
614   (not hop_1_e_b)
615   hop_1_e_d
616   hop_1_e_g
617   (not hop_1_e_f)
618   hop_1_e_i
619   hop_1_e_h
620   (not hop_1_e_k)
621   (not hop_1_e_j)
622   (not hop_1_e_m)
623   (not hop_1_e_l)
624   (not hop_1_e_o)
625   (not hop_1_e_n)
626   (not hop_1_e_q)
627   (not hop_1_e_p)
628   hop_1_d_a
629   (not hop_1_d_c)
630   hop_1_d_b
631   hop_1_d_e
632   (not hop_1_d_g)
633   hop_1_d_f
634   (not hop_1_d_i)
635   (not hop_1_d_h)
636   (not hop_1_d_k)
637   (not hop_1_d_j)
638   (not hop_1_d_m)
639   (not hop_1_d_l)
640   (not hop_1_d_o)
641   (not hop_1_d_n)
642   (not hop_1_d_q)
643   (not hop_1_d_p)
644   (not hop_1_g_a)
645   (not hop_1_g_c)
646   (not hop_1_g_b)
647   hop_1_g_e
648   (not hop_1_g_d)
649   (not hop_1_g_f)
650   (not hop_1_g_i)
651   hop_1_g_h
652   hop_1_g_k
653   (not hop_1_g_j)
654   (not hop_1_g_m)
655   (not hop_1_g_l)
656   (not hop_1_g_o)
657   (not hop_1_g_n)
658   (not hop_1_g_q)
659   (not hop_1_g_p)
660   (not hop_1_f_a)
```

```
661   (not hop_1_f_c)
662   (not hop_1_f_b)
663   (not hop_1_f_e)
664   hop_1_f_d
665   (not hop_1_f_g)
666   hop_1_f_i
667   (not hop_1_f_h)
668   (not hop_1_f_k)
669   hop_1_f_j
670   (not hop_1_f_m)
671   (not hop_1_f_l)
672   (not hop_1_f_o)
673   (not hop_1_f_n)
674   (not hop_1_f_q)
675   (not hop_1_f_p)
676   (not hop_1_i_a)
677   (not hop_1_i_c)
678   (not hop_1_i_b)
679   hop_1_i_e
680   (not hop_1_i_d)
681   (not hop_1_i_g)
682   hop_1_i_f
683   hop_1_i_h
684   (not hop_1_i_k)
685   hop_1_i_j
686   (not hop_1_i_m)
687   hop_1_i_l
688   (not hop_1_i_o)
689   (not hop_1_i_n)
690   (not hop_1_i_q)
691   (not hop_1_i_p)
692   (not hop_1_h_a)
693   (not hop_1_h_c)
694   (not hop_1_h_b)
695   hop_1_h_e
696   (not hop_1_h_d)
697   hop_1_h_g
698   (not hop_1_h_f)
699   hop_1_h_i
700   hop_1_h_k
701   (not hop_1_h_j)
702   (not hop_1_h_m)
703   (not hop_1_h_l)
704   (not hop_1_h_o)
705   (not hop_1_h_n)
706   (not hop_1_h_q)
707   (not hop_1_h_p)
708   (not hop_1_k_a)
709   (not hop_1_k_c)
710   (not hop_1_k_b)
711   (not hop_1_k_e)
712   (not hop_1_k_d)
713   hop_1_k_g
714   (not hop_1_k_f)
715   (not hop_1_k_i)
716   hop_1_k_h
717   (not hop_1_k_j)
718   hop_1_k_m
719   hop_1_k_l
720   (not hop_1_k_o)
721   (not hop_1_k_n)
722   (not hop_1_k_q)
```

```
723  (not hop_1_k_p)
724  (not hop_1_j_a)
725  (not hop_1_j_c)
726  (not hop_1_j_b)
727  (not hop_1_j_e)
728  (not hop_1_j_d)
729  (not hop_1_j_g)
730  hop_1_j_f
731  hop_1_j_i
732  (not hop_1_j_h)
733  (not hop_1_j_k)
734  (not hop_1_j_m)
735  hop_1_j_l
736  (not hop_1_j_o)
737  hop_1_j_n
738  (not hop_1_j_q)
739  (not hop_1_j_p)
740  (not hop_1_m_a)
741  (not hop_1_m_c)
742  (not hop_1_m_b)
743  (not hop_1_m_e)
744  (not hop_1_m_d)
745  (not hop_1_m_g)
746  (not hop_1_m_f)
747  (not hop_1_m_i)
748  (not hop_1_m_h)
749  hop_1_m_k
750  (not hop_1_m_j)
751  hop_1_m_l
752  hop_1_m_o
753  (not hop_1_m_n)
754  (not hop_1_m_q)
755  hop_1_m_p
756  (not hop_1_l_a)
757  (not hop_1_l_c)
758  (not hop_1_l_b)
759  (not hop_1_l_e)
760  (not hop_1_l_d)
761  (not hop_1_l_g)
762  (not hop_1_l_f)
763  hop_1_l_i
764  (not hop_1_l_h)
765  hop_1_l_k
766  hop_1_l_j
767  hop_1_l_m
768  (not hop_1_l_o)
769  hop_1_l_n
770  (not hop_1_l_q)
771  hop_1_l_p
772  (not hop_1_o_a)
773  (not hop_1_o_c)
774  (not hop_1_o_b)
775  (not hop_1_o_e)
776  (not hop_1_o_d)
777  (not hop_1_o_g)
778  (not hop_1_o_f)
779  (not hop_1_o_i)
780  (not hop_1_o_h)
781  (not hop_1_o_k)
782  (not hop_1_o_j)
783  hop_1_o_m
784  (not hop_1_o_l)
```

```
785    (not hop_1_o_n)
786    (not hop_1_o_q)
787    hop_1_o_p
788    (not hop_1_n_a)
789    (not hop_1_n_c)
790    (not hop_1_n_b)
791    (not hop_1_n_e)
792    (not hop_1_n_d)
793    (not hop_1_n_g)
794    (not hop_1_n_f)
795    (not hop_1_n_i)
796    (not hop_1_n_h)
797    (not hop_1_n_k)
798    hop_1_n_j
799    (not hop_1_n_m)
800    hop_1_n_l
801    (not hop_1_n_o)
802    hop_1_n_q
803    hop_1_n_p
804    (not hop_1_q_a)
805    (not hop_1_q_c)
806    (not hop_1_q_b)
807    (not hop_1_q_e)
808    (not hop_1_q_d)
809    (not hop_1_q_g)
810    (not hop_1_q_f)
811    (not hop_1_q_i)
812    (not hop_1_q_h)
813    (not hop_1_q_k)
814    (not hop_1_q_j)
815    (not hop_1_q_m)
816    (not hop_1_q_l)
817    (not hop_1_q_o)
818    hop_1_q_n
819    hop_1_q_p
820    (not hop_1_p_a)
821    (not hop_1_p_c)
822    (not hop_1_p_b)
823    (not hop_1_p_e)
824    (not hop_1_p_d)
825    (not hop_1_p_g)
826    (not hop_1_p_f)
827    (not hop_1_p_i)
828    (not hop_1_p_h)
829    (not hop_1_p_k)
830    (not hop_1_p_j)
831    hop_1_p_m
832    hop_1_p_l
833    hop_1_p_o
834    hop_1_p_n
835    hop_1_p_q
836    (=> hop_1_a_c hop_2_a_c)
837    (=> hop_1_a_b hop_2_a_b)
838    (=> hop_1_a_e hop_2_a_e)
839    (=> hop_1_a_d hop_2_a_d)
840    (=> hop_1_a_g hop_2_a_g)
841    (=> hop_1_a_f hop_2_a_f)
842    (=> hop_1_a_i hop_2_a_i)
843    (=> hop_1_a_h hop_2_a_h)
844    (=> hop_1_a_k hop_2_a_k)
845    (=> hop_1_a_j hop_2_a_j)
846    (=> hop_1_a_m hop_2_a_m)
```

```
847   (=> hop_1_a_l hop_2_a_l)
848   (=> hop_1_a_o hop_2_a_o)
849   (=> hop_1_a_n hop_2_a_n)
850   (=> hop_1_a_q hop_2_a_q)
851   (=> hop_1_a_p hop_2_a_p)
852   (=> hop_1_c_a hop_2_c_a)
853   (=> hop_1_c_b hop_2_c_b)
854   (=> hop_1_c_e hop_2_c_e)
855   (=> hop_1_c_d hop_2_c_d)
856   (=> hop_1_c_g hop_2_c_g)
857   (=> hop_1_c_f hop_2_c_f)
858   (=> hop_1_c_i hop_2_c_i)
859   (=> hop_1_c_h hop_2_c_h)
860   (=> hop_1_c_k hop_2_c_k)
861   (=> hop_1_c_j hop_2_c_j)
862   (=> hop_1_c_m hop_2_c_m)
863   (=> hop_1_c_l hop_2_c_l)
864   (=> hop_1_c_o hop_2_c_o)
865   (=> hop_1_c_n hop_2_c_n)
866   (=> hop_1_c_q hop_2_c_q)
867   (=> hop_1_c_p hop_2_c_p)
868   (=> hop_1_b_a hop_2_b_a)
869   (=> hop_1_b_c hop_2_b_c)
870   (=> hop_1_b_e hop_2_b_e)
871   (=> hop_1_b_d hop_2_b_d)
872   (=> hop_1_b_g hop_2_b_g)
873   (=> hop_1_b_f hop_2_b_f)
874   (=> hop_1_b_i hop_2_b_i)
875   (=> hop_1_b_h hop_2_b_h)
876   (=> hop_1_b_k hop_2_b_k)
877   (=> hop_1_b_j hop_2_b_j)
878   (=> hop_1_b_m hop_2_b_m)
879   (=> hop_1_b_l hop_2_b_l)
880   (=> hop_1_b_o hop_2_b_o)
881   (=> hop_1_b_n hop_2_b_n)
882   (=> hop_1_b_q hop_2_b_q)
883   (=> hop_1_b_p hop_2_b_p)
884   (=> hop_1_e_a hop_2_e_a)
885   (=> hop_1_e_c hop_2_e_c)
886   (=> hop_1_e_b hop_2_e_b)
887   (=> hop_1_e_d hop_2_e_d)
888   (=> hop_1_e_g hop_2_e_g)
889   (=> hop_1_e_f hop_2_e_f)
890   (=> hop_1_e_i hop_2_e_i)
891   (=> hop_1_e_h hop_2_e_h)
892   (=> hop_1_e_k hop_2_e_k)
893   (=> hop_1_e_j hop_2_e_j)
894   (=> hop_1_e_m hop_2_e_m)
895   (=> hop_1_e_l hop_2_e_l)
896   (=> hop_1_e_o hop_2_e_o)
897   (=> hop_1_e_n hop_2_e_n)
898   (=> hop_1_e_q hop_2_e_q)
899   (=> hop_1_e_p hop_2_e_p)
900   (=> hop_1_d_a hop_2_d_a)
901   (=> hop_1_d_c hop_2_d_c)
902   (=> hop_1_d_b hop_2_d_b)
903   (=> hop_1_d_e hop_2_d_e)
904   (=> hop_1_d_g hop_2_d_g)
905   (=> hop_1_d_f hop_2_d_f)
906   (=> hop_1_d_i hop_2_d_i)
907   (=> hop_1_d_h hop_2_d_h)
908   (=> hop_1_d_k hop_2_d_k)
```

886

```
909  (=> hop_1_d_j hop_2_d_j)
910  (=> hop_1_d_m hop_2_d_m)
911  (=> hop_1_d_l hop_2_d_l)
912  (=> hop_1_d_o hop_2_d_o)
913  (=> hop_1_d_n hop_2_d_n)
914  (=> hop_1_d_q hop_2_d_q)
915  (=> hop_1_d_p hop_2_d_p)
916  (=> hop_1_g_a hop_2_g_a)
917  (=> hop_1_g_c hop_2_g_c)
918  (=> hop_1_g_b hop_2_g_b)
919  (=> hop_1_g_e hop_2_g_e)
920  (=> hop_1_g_d hop_2_g_d)
921  (=> hop_1_g_f hop_2_g_f)
922  (=> hop_1_g_i hop_2_g_i)
923  (=> hop_1_g_h hop_2_g_h)
924  (=> hop_1_g_k hop_2_g_k)
925  (=> hop_1_g_j hop_2_g_j)
926  (=> hop_1_g_m hop_2_g_m)
927  (=> hop_1_g_l hop_2_g_l)
928  (=> hop_1_g_o hop_2_g_o)
929  (=> hop_1_g_n hop_2_g_n)
930  (=> hop_1_g_q hop_2_g_q)
931  (=> hop_1_g_p hop_2_g_p)
932  (=> hop_1_f_a hop_2_f_a)
933  (=> hop_1_f_c hop_2_f_c)
934  (=> hop_1_f_b hop_2_f_b)
935  (=> hop_1_f_e hop_2_f_e)
936  (=> hop_1_f_d hop_2_f_d)
937  (=> hop_1_f_g hop_2_f_g)
938  (=> hop_1_f_i hop_2_f_i)
939  (=> hop_1_f_h hop_2_f_h)
940  (=> hop_1_f_k hop_2_f_k)
941  (=> hop_1_f_j hop_2_f_j)
942  (=> hop_1_f_m hop_2_f_m)
943  (=> hop_1_f_l hop_2_f_l)
944  (=> hop_1_f_o hop_2_f_o)
945  (=> hop_1_f_n hop_2_f_n)
946  (=> hop_1_f_q hop_2_f_q)
947  (=> hop_1_f_p hop_2_f_p)
948  (=> hop_1_i_a hop_2_i_a)
949  (=> hop_1_i_c hop_2_i_c)
950  (=> hop_1_i_b hop_2_i_b)
951  (=> hop_1_i_e hop_2_i_e)
952  (=> hop_1_i_d hop_2_i_d)
953  (=> hop_1_i_g hop_2_i_g)
954  (=> hop_1_i_f hop_2_i_f)
955  (=> hop_1_i_h hop_2_i_h)
956  (=> hop_1_i_k hop_2_i_k)
957  (=> hop_1_i_j hop_2_i_j)
958  (=> hop_1_i_m hop_2_i_m)
959  (=> hop_1_i_l hop_2_i_l)
960  (=> hop_1_i_o hop_2_i_o)
961  (=> hop_1_i_n hop_2_i_n)
962  (=> hop_1_i_q hop_2_i_q)
963  (=> hop_1_i_p hop_2_i_p)
964  (=> hop_1_h_a hop_2_h_a)
965  (=> hop_1_h_c hop_2_h_c)
966  (=> hop_1_h_b hop_2_h_b)
967  (=> hop_1_h_e hop_2_h_e)
968  (=> hop_1_h_d hop_2_h_d)
969  (=> hop_1_h_g hop_2_h_g)
970  (=> hop_1_h_f hop_2_h_f)
```

```
971   (=> hop_1_h_i hop_2_h_i)
972   (=> hop_1_h_k hop_2_h_k)
973   (=> hop_1_h_j hop_2_h_j)
974   (=> hop_1_h_m hop_2_h_m)
975   (=> hop_1_h_l hop_2_h_l)
976   (=> hop_1_h_o hop_2_h_o)
977   (=> hop_1_h_n hop_2_h_n)
978   (=> hop_1_h_q hop_2_h_q)
979   (=> hop_1_h_p hop_2_h_p)
980   (=> hop_1_k_a hop_2_k_a)
981   (=> hop_1_k_c hop_2_k_c)
982   (=> hop_1_k_b hop_2_k_b)
983   (=> hop_1_k_e hop_2_k_e)
984   (=> hop_1_k_d hop_2_k_d)
985   (=> hop_1_k_g hop_2_k_g)
986   (=> hop_1_k_f hop_2_k_f)
987   (=> hop_1_k_i hop_2_k_i)
988   (=> hop_1_k_h hop_2_k_h)
989   (=> hop_1_k_j hop_2_k_j)
990   (=> hop_1_k_m hop_2_k_m)
991   (=> hop_1_k_l hop_2_k_l)
992   (=> hop_1_k_o hop_2_k_o)
993   (=> hop_1_k_n hop_2_k_n)
994   (=> hop_1_k_q hop_2_k_q)
995   (=> hop_1_k_p hop_2_k_p)
996   (=> hop_1_j_a hop_2_j_a)
997   (=> hop_1_j_c hop_2_j_c)
998   (=> hop_1_j_b hop_2_j_b)
999   (=> hop_1_j_e hop_2_j_e)
1000  (=> hop_1_j_d hop_2_j_d)
1001  (=> hop_1_j_g hop_2_j_g)
1002  (=> hop_1_j_f hop_2_j_f)
1003  (=> hop_1_j_i hop_2_j_i)
1004  (=> hop_1_j_h hop_2_j_h)
1005  (=> hop_1_j_k hop_2_j_k)
1006  (=> hop_1_j_m hop_2_j_m)
1007  (=> hop_1_j_l hop_2_j_l)
1008  (=> hop_1_j_o hop_2_j_o)
1009  (=> hop_1_j_n hop_2_j_n)
1010  (=> hop_1_j_q hop_2_j_q)
1011  (=> hop_1_j_p hop_2_j_p)
1012  (=> hop_1_m_a hop_2_m_a)
1013  (=> hop_1_m_c hop_2_m_c)
1014  (=> hop_1_m_b hop_2_m_b)
1015  (=> hop_1_m_e hop_2_m_e)
1016  (=> hop_1_m_d hop_2_m_d)
1017  (=> hop_1_m_g hop_2_m_g)
1018  (=> hop_1_m_f hop_2_m_f)
1019  (=> hop_1_m_i hop_2_m_i)
1020  (=> hop_1_m_h hop_2_m_h)
1021  (=> hop_1_m_k hop_2_m_k)
1022  (=> hop_1_m_j hop_2_m_j)
1023  (=> hop_1_m_l hop_2_m_l)
1024  (=> hop_1_m_o hop_2_m_o)
1025  (=> hop_1_m_n hop_2_m_n)
1026  (=> hop_1_m_q hop_2_m_q)
1027  (=> hop_1_m_p hop_2_m_p)
1028  (=> hop_1_l_a hop_2_l_a)
1029  (=> hop_1_l_c hop_2_l_c)
1030  (=> hop_1_l_b hop_2_l_b)
1031  (=> hop_1_l_e hop_2_l_e)
1032  (=> hop_1_l_d hop_2_l_d)
```

```
1033   (=> hop_1_l_g hop_2_l_g)
1034   (=> hop_1_l_f hop_2_l_f)
1035   (=> hop_1_l_i hop_2_l_i)
1036   (=> hop_1_l_h hop_2_l_h)
1037   (=> hop_1_l_k hop_2_l_k)
1038   (=> hop_1_l_j hop_2_l_j)
1039   (=> hop_1_l_m hop_2_l_m)
1040   (=> hop_1_l_o hop_2_l_o)
1041   (=> hop_1_l_n hop_2_l_n)
1042   (=> hop_1_l_q hop_2_l_q)
1043   (=> hop_1_l_p hop_2_l_p)
1044   (=> hop_1_o_a hop_2_o_a)
1045   (=> hop_1_o_c hop_2_o_c)
1046   (=> hop_1_o_b hop_2_o_b)
1047   (=> hop_1_o_e hop_2_o_e)
1048   (=> hop_1_o_d hop_2_o_d)
1049   (=> hop_1_o_g hop_2_o_g)
1050   (=> hop_1_o_f hop_2_o_f)
1051   (=> hop_1_o_i hop_2_o_i)
1052   (=> hop_1_o_h hop_2_o_h)
1053   (=> hop_1_o_k hop_2_o_k)
1054   (=> hop_1_o_j hop_2_o_j)
1055   (=> hop_1_o_m hop_2_o_m)
1056   (=> hop_1_o_l hop_2_o_l)
1057   (=> hop_1_o_n hop_2_o_n)
1058   (=> hop_1_o_q hop_2_o_q)
1059   (=> hop_1_o_p hop_2_o_p)
1060   (=> hop_1_n_a hop_2_n_a)
1061   (=> hop_1_n_c hop_2_n_c)
1062   (=> hop_1_n_b hop_2_n_b)
1063   (=> hop_1_n_e hop_2_n_e)
1064   (=> hop_1_n_d hop_2_n_d)
1065   (=> hop_1_n_g hop_2_n_g)
1066   (=> hop_1_n_f hop_2_n_f)
1067   (=> hop_1_n_i hop_2_n_i)
1068   (=> hop_1_n_h hop_2_n_h)
1069   (=> hop_1_n_k hop_2_n_k)
1070   (=> hop_1_n_j hop_2_n_j)
1071   (=> hop_1_n_m hop_2_n_m)
1072   (=> hop_1_n_l hop_2_n_l)
1073   (=> hop_1_n_o hop_2_n_o)
1074   (=> hop_1_n_q hop_2_n_q)
1075   (=> hop_1_n_p hop_2_n_p)
1076   (=> hop_1_q_a hop_2_q_a)
1077   (=> hop_1_q_c hop_2_q_c)
1078   (=> hop_1_q_b hop_2_q_b)
1079   (=> hop_1_q_e hop_2_q_e)
1080   (=> hop_1_q_d hop_2_q_d)
1081   (=> hop_1_q_g hop_2_q_g)
1082   (=> hop_1_q_f hop_2_q_f)
1083   (=> hop_1_q_i hop_2_q_i)
1084   (=> hop_1_q_h hop_2_q_h)
1085   (=> hop_1_q_k hop_2_q_k)
1086   (=> hop_1_q_j hop_2_q_j)
1087   (=> hop_1_q_m hop_2_q_m)
1088   (=> hop_1_q_l hop_2_q_l)
1089   (=> hop_1_q_o hop_2_q_o)
1090   (=> hop_1_q_n hop_2_q_n)
1091   (=> hop_1_q_p hop_2_q_p)
1092   (=> hop_1_p_a hop_2_p_a)
1093   (=> hop_1_p_c hop_2_p_c)
1094   (=> hop_1_p_b hop_2_p_b)
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1095  (=> hop_1_p_e hop_2_p_e)
1096  (=> hop_1_p_d hop_2_p_d)
1097  (=> hop_1_p_g hop_2_p_g)
1098  (=> hop_1_p_f hop_2_p_f)
1099  (=> hop_1_p_i hop_2_p_i)
1100  (=> hop_1_p_h hop_2_p_h)
1101  (=> hop_1_p_k hop_2_p_k)
1102  (=> hop_1_p_j hop_2_p_j)
1103  (=> hop_1_p_m hop_2_p_m)
1104  (=> hop_1_p_l hop_2_p_l)
1105  (=> hop_1_p_o hop_2_p_o)
1106  (=> hop_1_p_n hop_2_p_n)
1107  (=> hop_1_p_q hop_2_p_q)
1108  (=> (and hop_1_a_c hop_1_c_b) hop_2_a_b)
1109  (=> (and hop_1_a_c hop_1_c_e) hop_2_a_e)
1110  (=> (and hop_1_a_c hop_1_c_d) hop_2_a_d)
1111  (=> (and hop_1_a_c hop_1_c_g) hop_2_a_g)
1112  (=> (and hop_1_a_c hop_1_c_f) hop_2_a_f)
1113  (=> (and hop_1_a_c hop_1_c_i) hop_2_a_i)
1114  (=> (and hop_1_a_c hop_1_c_h) hop_2_a_h)
1115  (=> (and hop_1_a_c hop_1_c_k) hop_2_a_k)
1116  (=> (and hop_1_a_c hop_1_c_j) hop_2_a_j)
1117  (=> (and hop_1_a_c hop_1_c_m) hop_2_a_m)
1118  (=> (and hop_1_a_c hop_1_c_l) hop_2_a_l)
1119  (=> (and hop_1_a_c hop_1_c_o) hop_2_a_o)
1120  (=> (and hop_1_a_c hop_1_c_n) hop_2_a_n)
1121  (=> (and hop_1_a_c hop_1_c_q) hop_2_a_q)
1122  (=> (and hop_1_a_c hop_1_c_p) hop_2_a_p)
1123  (=> (and hop_1_a_b hop_1_b_c) hop_2_a_c)
1124  (=> (and hop_1_a_b hop_1_b_e) hop_2_a_e)
1125  (=> (and hop_1_a_b hop_1_b_d) hop_2_a_d)
1126  (=> (and hop_1_a_b hop_1_b_g) hop_2_a_g)
1127  (=> (and hop_1_a_b hop_1_b_f) hop_2_a_f)
1128  (=> (and hop_1_a_b hop_1_b_i) hop_2_a_i)
1129  (=> (and hop_1_a_b hop_1_b_h) hop_2_a_h)
1130  (=> (and hop_1_a_b hop_1_b_k) hop_2_a_k)
1131  (=> (and hop_1_a_b hop_1_b_j) hop_2_a_j)
1132  (=> (and hop_1_a_b hop_1_b_m) hop_2_a_m)
1133  (=> (and hop_1_a_b hop_1_b_l) hop_2_a_l)
1134  (=> (and hop_1_a_b hop_1_b_o) hop_2_a_o)
1135  (=> (and hop_1_a_b hop_1_b_n) hop_2_a_n)
1136  (=> (and hop_1_a_b hop_1_b_q) hop_2_a_q)
1137  (=> (and hop_1_a_b hop_1_b_p) hop_2_a_p)
1138  (=> (and hop_1_a_e hop_1_e_c) hop_2_a_c)
1139  (=> (and hop_1_a_e hop_1_e_b) hop_2_a_b)
1140  (=> (and hop_1_a_e hop_1_e_d) hop_2_a_d)
1141  (=> (and hop_1_a_e hop_1_e_g) hop_2_a_g)
1142  (=> (and hop_1_a_e hop_1_e_f) hop_2_a_f)
1143  (=> (and hop_1_a_e hop_1_e_i) hop_2_a_i)
1144  (=> (and hop_1_a_e hop_1_e_h) hop_2_a_h)
1145  (=> (and hop_1_a_e hop_1_e_k) hop_2_a_k)
1146  (=> (and hop_1_a_e hop_1_e_j) hop_2_a_j)
1147  (=> (and hop_1_a_e hop_1_e_m) hop_2_a_m)
1148  (=> (and hop_1_a_e hop_1_e_l) hop_2_a_l)
1149  (=> (and hop_1_a_e hop_1_e_o) hop_2_a_o)
1150  (=> (and hop_1_a_e hop_1_e_n) hop_2_a_n)
1151  (=> (and hop_1_a_e hop_1_e_q) hop_2_a_q)
1152  (=> (and hop_1_a_e hop_1_e_p) hop_2_a_p)
1153  (=> (and hop_1_a_d hop_1_d_c) hop_2_a_c)
1154  (=> (and hop_1_a_d hop_1_d_b) hop_2_a_b)
1155  (=> (and hop_1_a_d hop_1_d_e) hop_2_a_e)
1156  (=> (and hop_1_a_d hop_1_d_g) hop_2_a_g)
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1157   (=> (and hop_1_a_d hop_1_d_f) hop_2_a_f)
1158   (=> (and hop_1_a_d hop_1_d_i) hop_2_a_i)
1159   (=> (and hop_1_a_d hop_1_d_h) hop_2_a_h)
1160   (=> (and hop_1_a_d hop_1_d_k) hop_2_a_k)
1161   (=> (and hop_1_a_d hop_1_d_j) hop_2_a_j)
1162   (=> (and hop_1_a_d hop_1_d_m) hop_2_a_m)
1163   (=> (and hop_1_a_d hop_1_d_l) hop_2_a_l)
1164   (=> (and hop_1_a_d hop_1_d_o) hop_2_a_o)
1165   (=> (and hop_1_a_d hop_1_d_n) hop_2_a_n)
1166   (=> (and hop_1_a_d hop_1_d_q) hop_2_a_q)
1167   (=> (and hop_1_a_d hop_1_d_p) hop_2_a_p)
1168   (=> (and hop_1_a_g hop_1_g_c) hop_2_a_c)
1169   (=> (and hop_1_a_g hop_1_g_b) hop_2_a_b)
1170   (=> (and hop_1_a_g hop_1_g_e) hop_2_a_e)
1171   (=> (and hop_1_a_g hop_1_g_d) hop_2_a_d)
1172   (=> (and hop_1_a_g hop_1_g_f) hop_2_a_f)
1173   (=> (and hop_1_a_g hop_1_g_i) hop_2_a_i)
1174   (=> (and hop_1_a_g hop_1_g_h) hop_2_a_h)
1175   (=> (and hop_1_a_g hop_1_g_k) hop_2_a_k)
1176   (=> (and hop_1_a_g hop_1_g_j) hop_2_a_j)
1177   (=> (and hop_1_a_g hop_1_g_m) hop_2_a_m)
1178   (=> (and hop_1_a_g hop_1_g_l) hop_2_a_l)
1179   (=> (and hop_1_a_g hop_1_g_o) hop_2_a_o)
1180   (=> (and hop_1_a_g hop_1_g_n) hop_2_a_n)
1181   (=> (and hop_1_a_g hop_1_g_q) hop_2_a_q)
1182   (=> (and hop_1_a_g hop_1_g_p) hop_2_a_p)
1183   (=> (and hop_1_a_f hop_1_f_c) hop_2_a_c)
1184   (=> (and hop_1_a_f hop_1_f_b) hop_2_a_b)
1185   (=> (and hop_1_a_f hop_1_f_e) hop_2_a_e)
1186   (=> (and hop_1_a_f hop_1_f_d) hop_2_a_d)
1187   (=> (and hop_1_a_f hop_1_f_g) hop_2_a_g)
1188   (=> (and hop_1_a_f hop_1_f_i) hop_2_a_i)
1189   (=> (and hop_1_a_f hop_1_f_h) hop_2_a_h)
1190   (=> (and hop_1_a_f hop_1_f_k) hop_2_a_k)
1191   (=> (and hop_1_a_f hop_1_f_j) hop_2_a_j)
1192   (=> (and hop_1_a_f hop_1_f_m) hop_2_a_m)
1193   (=> (and hop_1_a_f hop_1_f_l) hop_2_a_l)
1194   (=> (and hop_1_a_f hop_1_f_o) hop_2_a_o)
1195   (=> (and hop_1_a_f hop_1_f_n) hop_2_a_n)
1196   (=> (and hop_1_a_f hop_1_f_q) hop_2_a_q)
1197   (=> (and hop_1_a_f hop_1_f_p) hop_2_a_p)
1198   (=> (and hop_1_a_i hop_1_i_c) hop_2_a_c)
1199   (=> (and hop_1_a_i hop_1_i_b) hop_2_a_b)
1200   (=> (and hop_1_a_i hop_1_i_e) hop_2_a_e)
1201   (=> (and hop_1_a_i hop_1_i_d) hop_2_a_d)
1202   (=> (and hop_1_a_i hop_1_i_g) hop_2_a_g)
1203   (=> (and hop_1_a_i hop_1_i_f) hop_2_a_f)
1204   (=> (and hop_1_a_i hop_1_i_h) hop_2_a_h)
1205   (=> (and hop_1_a_i hop_1_i_k) hop_2_a_k)
1206   (=> (and hop_1_a_i hop_1_i_j) hop_2_a_j)
1207   (=> (and hop_1_a_i hop_1_i_m) hop_2_a_m)
1208   (=> (and hop_1_a_i hop_1_i_l) hop_2_a_l)
1209   (=> (and hop_1_a_i hop_1_i_o) hop_2_a_o)
1210   (=> (and hop_1_a_i hop_1_i_n) hop_2_a_n)
1211   (=> (and hop_1_a_i hop_1_i_q) hop_2_a_q)
1212   (=> (and hop_1_a_i hop_1_i_p) hop_2_a_p)
1213   (=> (and hop_1_a_h hop_1_h_c) hop_2_a_c)
1214   (=> (and hop_1_a_h hop_1_h_b) hop_2_a_b)
1215   (=> (and hop_1_a_h hop_1_h_e) hop_2_a_e)
1216   (=> (and hop_1_a_h hop_1_h_d) hop_2_a_d)
1217   (=> (and hop_1_a_h hop_1_h_g) hop_2_a_g)
1218   (=> (and hop_1_a_h hop_1_h_f) hop_2_a_f)
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1219  (=> (and hop_1_a_h hop_1_h_i) hop_2_a_i)
1220  (=> (and hop_1_a_h hop_1_h_k) hop_2_a_k)
1221  (=> (and hop_1_a_h hop_1_h_j) hop_2_a_j)
1222  (=> (and hop_1_a_h hop_1_h_m) hop_2_a_m)
1223  (=> (and hop_1_a_h hop_1_h_l) hop_2_a_l)
1224  (=> (and hop_1_a_h hop_1_h_o) hop_2_a_o)
1225  (=> (and hop_1_a_h hop_1_h_n) hop_2_a_n)
1226  (=> (and hop_1_a_h hop_1_h_q) hop_2_a_q)
1227  (=> (and hop_1_a_h hop_1_h_p) hop_2_a_p)
1228  (=> (and hop_1_a_k hop_1_k_c) hop_2_a_c)
1229  (=> (and hop_1_a_k hop_1_k_b) hop_2_a_b)
1230  (=> (and hop_1_a_k hop_1_k_e) hop_2_a_e)
1231  (=> (and hop_1_a_k hop_1_k_d) hop_2_a_d)
1232  (=> (and hop_1_a_k hop_1_k_g) hop_2_a_g)
1233  (=> (and hop_1_a_k hop_1_k_f) hop_2_a_f)
1234  (=> (and hop_1_a_k hop_1_k_i) hop_2_a_i)
1235  (=> (and hop_1_a_k hop_1_k_h) hop_2_a_h)
1236  (=> (and hop_1_a_k hop_1_k_j) hop_2_a_j)
1237  (=> (and hop_1_a_k hop_1_k_m) hop_2_a_m)
1238  (=> (and hop_1_a_k hop_1_k_l) hop_2_a_l)
1239  (=> (and hop_1_a_k hop_1_k_o) hop_2_a_o)
1240  (=> (and hop_1_a_k hop_1_k_n) hop_2_a_n)
1241  (=> (and hop_1_a_k hop_1_k_q) hop_2_a_q)
1242  (=> (and hop_1_a_k hop_1_k_p) hop_2_a_p)
1243  (=> (and hop_1_a_j hop_1_j_c) hop_2_a_c)
1244  (=> (and hop_1_a_j hop_1_j_b) hop_2_a_b)
1245  (=> (and hop_1_a_j hop_1_j_e) hop_2_a_e)
1246  (=> (and hop_1_a_j hop_1_j_d) hop_2_a_d)
1247  (=> (and hop_1_a_j hop_1_j_g) hop_2_a_g)
1248  (=> (and hop_1_a_j hop_1_j_f) hop_2_a_f)
1249  (=> (and hop_1_a_j hop_1_j_i) hop_2_a_i)
1250  (=> (and hop_1_a_j hop_1_j_h) hop_2_a_h)
1251  (=> (and hop_1_a_j hop_1_j_k) hop_2_a_k)
1252  (=> (and hop_1_a_j hop_1_j_m) hop_2_a_m)
1253  (=> (and hop_1_a_j hop_1_j_l) hop_2_a_l)
1254  (=> (and hop_1_a_j hop_1_j_o) hop_2_a_o)
1255  (=> (and hop_1_a_j hop_1_j_n) hop_2_a_n)
1256  (=> (and hop_1_a_j hop_1_j_q) hop_2_a_q)
1257  (=> (and hop_1_a_j hop_1_j_p) hop_2_a_p)
1258  (=> (and hop_1_a_m hop_1_m_c) hop_2_a_c)
1259  (=> (and hop_1_a_m hop_1_m_b) hop_2_a_b)
1260  (=> (and hop_1_a_m hop_1_m_e) hop_2_a_e)
1261  (=> (and hop_1_a_m hop_1_m_d) hop_2_a_d)
1262  (=> (and hop_1_a_m hop_1_m_g) hop_2_a_g)
1263  (=> (and hop_1_a_m hop_1_m_f) hop_2_a_f)
1264  (=> (and hop_1_a_m hop_1_m_i) hop_2_a_i)
1265  (=> (and hop_1_a_m hop_1_m_h) hop_2_a_h)
1266  (=> (and hop_1_a_m hop_1_m_k) hop_2_a_k)
1267  (=> (and hop_1_a_m hop_1_m_j) hop_2_a_j)
1268  (=> (and hop_1_a_m hop_1_m_l) hop_2_a_l)
1269  (=> (and hop_1_a_m hop_1_m_o) hop_2_a_o)
1270  (=> (and hop_1_a_m hop_1_m_n) hop_2_a_n)
1271  (=> (and hop_1_a_m hop_1_m_q) hop_2_a_q)
1272  (=> (and hop_1_a_m hop_1_m_p) hop_2_a_p)
1273  (=> (and hop_1_a_l hop_1_l_c) hop_2_a_c)
1274  (=> (and hop_1_a_l hop_1_l_b) hop_2_a_b)
1275  (=> (and hop_1_a_l hop_1_l_e) hop_2_a_e)
1276  (=> (and hop_1_a_l hop_1_l_d) hop_2_a_d)
1277  (=> (and hop_1_a_l hop_1_l_g) hop_2_a_g)
1278  (=> (and hop_1_a_l hop_1_l_f) hop_2_a_f)
1279  (=> (and hop_1_a_l hop_1_l_i) hop_2_a_i)
1280  (=> (and hop_1_a_l hop_1_l_h) hop_2_a_h)
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1281   (=> (and hop_1_a_l hop_1_l_k) hop_2_a_k)
1282   (=> (and hop_1_a_l hop_1_l_j) hop_2_a_j)
1283   (=> (and hop_1_a_l hop_1_l_m) hop_2_a_m)
1284   (=> (and hop_1_a_l hop_1_l_o) hop_2_a_o)
1285   (=> (and hop_1_a_l hop_1_l_n) hop_2_a_n)
1286   (=> (and hop_1_a_l hop_1_l_q) hop_2_a_q)
1287   (=> (and hop_1_a_l hop_1_l_p) hop_2_a_p)
1288   (=> (and hop_1_a_o hop_1_o_c) hop_2_a_c)
1289   (=> (and hop_1_a_o hop_1_o_b) hop_2_a_b)
1290   (=> (and hop_1_a_o hop_1_o_e) hop_2_a_e)
1291   (=> (and hop_1_a_o hop_1_o_d) hop_2_a_d)
1292   (=> (and hop_1_a_o hop_1_o_g) hop_2_a_g)
1293   (=> (and hop_1_a_o hop_1_o_f) hop_2_a_f)
1294   (=> (and hop_1_a_o hop_1_o_i) hop_2_a_i)
1295   (=> (and hop_1_a_o hop_1_o_h) hop_2_a_h)
1296   (=> (and hop_1_a_o hop_1_o_k) hop_2_a_k)
1297   (=> (and hop_1_a_o hop_1_o_j) hop_2_a_j)
1298   (=> (and hop_1_a_o hop_1_o_m) hop_2_a_m)
1299   (=> (and hop_1_a_o hop_1_o_l) hop_2_a_l)
1300   (=> (and hop_1_a_o hop_1_o_n) hop_2_a_n)
1301   (=> (and hop_1_a_o hop_1_o_q) hop_2_a_q)
1302   (=> (and hop_1_a_o hop_1_o_p) hop_2_a_p)
1303   (=> (and hop_1_a_n hop_1_n_c) hop_2_a_c)
1304   (=> (and hop_1_a_n hop_1_n_b) hop_2_a_b)
1305   (=> (and hop_1_a_n hop_1_n_e) hop_2_a_e)
1306   (=> (and hop_1_a_n hop_1_n_d) hop_2_a_d)
1307   (=> (and hop_1_a_n hop_1_n_g) hop_2_a_g)
1308   (=> (and hop_1_a_n hop_1_n_f) hop_2_a_f)
1309   (=> (and hop_1_a_n hop_1_n_i) hop_2_a_i)
1310   (=> (and hop_1_a_n hop_1_n_h) hop_2_a_h)
1311   (=> (and hop_1_a_n hop_1_n_k) hop_2_a_k)
1312   (=> (and hop_1_a_n hop_1_n_j) hop_2_a_j)
1313   (=> (and hop_1_a_n hop_1_n_m) hop_2_a_m)
1314   (=> (and hop_1_a_n hop_1_n_l) hop_2_a_l)
1315   (=> (and hop_1_a_n hop_1_n_o) hop_2_a_o)
1316   (=> (and hop_1_a_n hop_1_n_q) hop_2_a_q)
1317   (=> (and hop_1_a_n hop_1_n_p) hop_2_a_p)
1318   (=> (and hop_1_a_q hop_1_q_c) hop_2_a_c)
1319   (=> (and hop_1_a_q hop_1_q_b) hop_2_a_b)
1320   (=> (and hop_1_a_q hop_1_q_e) hop_2_a_e)
1321   (=> (and hop_1_a_q hop_1_q_d) hop_2_a_d)
1322   (=> (and hop_1_a_q hop_1_q_g) hop_2_a_g)
1323   (=> (and hop_1_a_q hop_1_q_f) hop_2_a_f)
1324   (=> (and hop_1_a_q hop_1_q_i) hop_2_a_i)
1325   (=> (and hop_1_a_q hop_1_q_h) hop_2_a_h)
1326   (=> (and hop_1_a_q hop_1_q_k) hop_2_a_k)
1327   (=> (and hop_1_a_q hop_1_q_j) hop_2_a_j)
1328   (=> (and hop_1_a_q hop_1_q_m) hop_2_a_m)
1329   (=> (and hop_1_a_q hop_1_q_l) hop_2_a_l)
1330   (=> (and hop_1_a_q hop_1_q_o) hop_2_a_o)
1331   (=> (and hop_1_a_q hop_1_q_n) hop_2_a_n)
1332   (=> (and hop_1_a_q hop_1_q_p) hop_2_a_p)
1333   (=> (and hop_1_a_p hop_1_p_c) hop_2_a_c)
1334   (=> (and hop_1_a_p hop_1_p_b) hop_2_a_b)
1335   (=> (and hop_1_a_p hop_1_p_e) hop_2_a_e)
1336   (=> (and hop_1_a_p hop_1_p_d) hop_2_a_d)
1337   (=> (and hop_1_a_p hop_1_p_g) hop_2_a_g)
1338   (=> (and hop_1_a_p hop_1_p_f) hop_2_a_f)
1339   (=> (and hop_1_a_p hop_1_p_i) hop_2_a_i)
1340   (=> (and hop_1_a_p hop_1_p_h) hop_2_a_h)
1341   (=> (and hop_1_a_p hop_1_p_k) hop_2_a_k)
1342   (=> (and hop_1_a_p hop_1_p_j) hop_2_a_j)
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1343  (=> (and hop_1_a_p hop_1_p_m) hop_2_a_m)
1344  (=> (and hop_1_a_p hop_1_p_l) hop_2_a_l)
1345  (=> (and hop_1_a_p hop_1_p_o) hop_2_a_o)
1346  (=> (and hop_1_a_p hop_1_p_n) hop_2_a_n)
1347  (=> (and hop_1_a_p hop_1_p_q) hop_2_a_q)
1348  (=> (and hop_1_c_a hop_1_a_b) hop_2_c_b)
1349  (=> (and hop_1_c_a hop_1_a_e) hop_2_c_e)
1350  (=> (and hop_1_c_a hop_1_a_d) hop_2_c_d)
1351  (=> (and hop_1_c_a hop_1_a_g) hop_2_c_g)
1352  (=> (and hop_1_c_a hop_1_a_f) hop_2_c_f)
1353  (=> (and hop_1_c_a hop_1_a_i) hop_2_c_i)
1354  (=> (and hop_1_c_a hop_1_a_h) hop_2_c_h)
1355  (=> (and hop_1_c_a hop_1_a_k) hop_2_c_k)
1356  (=> (and hop_1_c_a hop_1_a_j) hop_2_c_j)
1357  (=> (and hop_1_c_a hop_1_a_m) hop_2_c_m)
1358  (=> (and hop_1_c_a hop_1_a_l) hop_2_c_l)
1359  (=> (and hop_1_c_a hop_1_a_o) hop_2_c_o)
1360  (=> (and hop_1_c_a hop_1_a_n) hop_2_c_n)
1361  (=> (and hop_1_c_a hop_1_a_q) hop_2_c_q)
1362  (=> (and hop_1_c_a hop_1_a_p) hop_2_c_p)
1363  (=> (and hop_1_c_b hop_1_b_a) hop_2_c_a)
1364  (=> (and hop_1_c_b hop_1_b_e) hop_2_c_e)
1365  (=> (and hop_1_c_b hop_1_b_d) hop_2_c_d)
1366  (=> (and hop_1_c_b hop_1_b_g) hop_2_c_g)
1367  (=> (and hop_1_c_b hop_1_b_f) hop_2_c_f)
1368  (=> (and hop_1_c_b hop_1_b_i) hop_2_c_i)
1369  (=> (and hop_1_c_b hop_1_b_h) hop_2_c_h)
1370  (=> (and hop_1_c_b hop_1_b_k) hop_2_c_k)
1371  (=> (and hop_1_c_b hop_1_b_j) hop_2_c_j)
1372  (=> (and hop_1_c_b hop_1_b_m) hop_2_c_m)
1373  (=> (and hop_1_c_b hop_1_b_l) hop_2_c_l)
1374  (=> (and hop_1_c_b hop_1_b_o) hop_2_c_o)
1375  (=> (and hop_1_c_b hop_1_b_n) hop_2_c_n)
1376  (=> (and hop_1_c_b hop_1_b_q) hop_2_c_q)
1377  (=> (and hop_1_c_b hop_1_b_p) hop_2_c_p)
1378  (=> (and hop_1_c_e hop_1_e_a) hop_2_c_a)
1379  (=> (and hop_1_c_e hop_1_e_b) hop_2_c_b)
1380  (=> (and hop_1_c_e hop_1_e_d) hop_2_c_d)
1381  (=> (and hop_1_c_e hop_1_e_g) hop_2_c_g)
1382  (=> (and hop_1_c_e hop_1_e_f) hop_2_c_f)
1383  (=> (and hop_1_c_e hop_1_e_i) hop_2_c_i)
1384  (=> (and hop_1_c_e hop_1_e_h) hop_2_c_h)
1385  (=> (and hop_1_c_e hop_1_e_k) hop_2_c_k)
1386  (=> (and hop_1_c_e hop_1_e_j) hop_2_c_j)
1387  (=> (and hop_1_c_e hop_1_e_m) hop_2_c_m)
1388  (=> (and hop_1_c_e hop_1_e_l) hop_2_c_l)
1389  (=> (and hop_1_c_e hop_1_e_o) hop_2_c_o)
1390  (=> (and hop_1_c_e hop_1_e_n) hop_2_c_n)
1391  (=> (and hop_1_c_e hop_1_e_q) hop_2_c_q)
1392  (=> (and hop_1_c_e hop_1_e_p) hop_2_c_p)
1393  (=> (and hop_1_c_d hop_1_d_a) hop_2_c_a)
1394  (=> (and hop_1_c_d hop_1_d_b) hop_2_c_b)
1395  (=> (and hop_1_c_d hop_1_d_e) hop_2_c_e)
1396  (=> (and hop_1_c_d hop_1_d_g) hop_2_c_g)
1397  (=> (and hop_1_c_d hop_1_d_f) hop_2_c_f)
1398  (=> (and hop_1_c_d hop_1_d_i) hop_2_c_i)
1399  (=> (and hop_1_c_d hop_1_d_h) hop_2_c_h)
1400  (=> (and hop_1_c_d hop_1_d_k) hop_2_c_k)
1401  (=> (and hop_1_c_d hop_1_d_j) hop_2_c_j)
1402  (=> (and hop_1_c_d hop_1_d_m) hop_2_c_m)
1403  (=> (and hop_1_c_d hop_1_d_l) hop_2_c_l)
1404  (=> (and hop_1_c_d hop_1_d_o) hop_2_c_o)
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1405  (=> (and hop_1_c_d hop_1_d_n) hop_2_c_n)
1406  (=> (and hop_1_c_d hop_1_d_q) hop_2_c_q)
1407  (=> (and hop_1_c_d hop_1_d_p) hop_2_c_p)
1408  (=> (and hop_1_c_g hop_1_g_a) hop_2_c_a)
1409  (=> (and hop_1_c_g hop_1_g_b) hop_2_c_b)
1410  (=> (and hop_1_c_g hop_1_g_e) hop_2_c_e)
1411  (=> (and hop_1_c_g hop_1_g_d) hop_2_c_d)
1412  (=> (and hop_1_c_g hop_1_g_f) hop_2_c_f)
1413  (=> (and hop_1_c_g hop_1_g_i) hop_2_c_i)
1414  (=> (and hop_1_c_g hop_1_g_h) hop_2_c_h)
1415  (=> (and hop_1_c_g hop_1_g_k) hop_2_c_k)
1416  (=> (and hop_1_c_g hop_1_g_j) hop_2_c_j)
1417  (=> (and hop_1_c_g hop_1_g_m) hop_2_c_m)
1418  (=> (and hop_1_c_g hop_1_g_l) hop_2_c_l)
1419  (=> (and hop_1_c_g hop_1_g_o) hop_2_c_o)
1420  (=> (and hop_1_c_g hop_1_g_n) hop_2_c_n)
1421  (=> (and hop_1_c_g hop_1_g_q) hop_2_c_q)
1422  (=> (and hop_1_c_g hop_1_g_p) hop_2_c_p)
1423  (=> (and hop_1_c_f hop_1_f_a) hop_2_c_a)
1424  (=> (and hop_1_c_f hop_1_f_b) hop_2_c_b)
1425  (=> (and hop_1_c_f hop_1_f_e) hop_2_c_e)
1426  (=> (and hop_1_c_f hop_1_f_d) hop_2_c_d)
1427  (=> (and hop_1_c_f hop_1_f_g) hop_2_c_g)
1428  (=> (and hop_1_c_f hop_1_f_i) hop_2_c_i)
1429  (=> (and hop_1_c_f hop_1_f_h) hop_2_c_h)
1430  (=> (and hop_1_c_f hop_1_f_k) hop_2_c_k)
1431  (=> (and hop_1_c_f hop_1_f_j) hop_2_c_j)
1432  (=> (and hop_1_c_f hop_1_f_m) hop_2_c_m)
1433  (=> (and hop_1_c_f hop_1_f_l) hop_2_c_l)
1434  (=> (and hop_1_c_f hop_1_f_o) hop_2_c_o)
1435  (=> (and hop_1_c_f hop_1_f_n) hop_2_c_n)
1436  (=> (and hop_1_c_f hop_1_f_q) hop_2_c_q)
1437  (=> (and hop_1_c_f hop_1_f_p) hop_2_c_p)
1438  (=> (and hop_1_c_i hop_1_i_a) hop_2_c_a)
1439  (=> (and hop_1_c_i hop_1_i_b) hop_2_c_b)
1440  (=> (and hop_1_c_i hop_1_i_e) hop_2_c_e)
1441  (=> (and hop_1_c_i hop_1_i_d) hop_2_c_d)
1442  (=> (and hop_1_c_i hop_1_i_g) hop_2_c_g)
1443  (=> (and hop_1_c_i hop_1_i_f) hop_2_c_f)
1444  (=> (and hop_1_c_i hop_1_i_h) hop_2_c_h)
1445  (=> (and hop_1_c_i hop_1_i_k) hop_2_c_k)
1446  (=> (and hop_1_c_i hop_1_i_j) hop_2_c_j)
1447  (=> (and hop_1_c_i hop_1_i_m) hop_2_c_m)
1448  (=> (and hop_1_c_i hop_1_i_l) hop_2_c_l)
1449  (=> (and hop_1_c_i hop_1_i_o) hop_2_c_o)
1450  (=> (and hop_1_c_i hop_1_i_n) hop_2_c_n)
1451  (=> (and hop_1_c_i hop_1_i_q) hop_2_c_q)
1452  (=> (and hop_1_c_i hop_1_i_p) hop_2_c_p)
1453  (=> (and hop_1_c_h hop_1_h_a) hop_2_c_a)
1454  (=> (and hop_1_c_h hop_1_h_b) hop_2_c_b)
1455  (=> (and hop_1_c_h hop_1_h_e) hop_2_c_e)
1456  (=> (and hop_1_c_h hop_1_h_d) hop_2_c_d)
1457  (=> (and hop_1_c_h hop_1_h_g) hop_2_c_g)
1458  (=> (and hop_1_c_h hop_1_h_f) hop_2_c_f)
1459  (=> (and hop_1_c_h hop_1_h_i) hop_2_c_i)
1460  (=> (and hop_1_c_h hop_1_h_k) hop_2_c_k)
1461  (=> (and hop_1_c_h hop_1_h_j) hop_2_c_j)
1462  (=> (and hop_1_c_h hop_1_h_m) hop_2_c_m)
1463  (=> (and hop_1_c_h hop_1_h_l) hop_2_c_l)
1464  (=> (and hop_1_c_h hop_1_h_o) hop_2_c_o)
1465  (=> (and hop_1_c_h hop_1_h_n) hop_2_c_n)
1466  (=> (and hop_1_c_h hop_1_h_q) hop_2_c_q)
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1467  (=> (and hop_1_c_h hop_1_h_p) hop_2_c_p)
1468  (=> (and hop_1_c_k hop_1_k_a) hop_2_c_a)
1469  (=> (and hop_1_c_k hop_1_k_b) hop_2_c_b)
1470  (=> (and hop_1_c_k hop_1_k_e) hop_2_c_e)
1471  (=> (and hop_1_c_k hop_1_k_d) hop_2_c_d)
1472  (=> (and hop_1_c_k hop_1_k_g) hop_2_c_g)
1473  (=> (and hop_1_c_k hop_1_k_f) hop_2_c_f)
1474  (=> (and hop_1_c_k hop_1_k_i) hop_2_c_i)
1475  (=> (and hop_1_c_k hop_1_k_h) hop_2_c_h)
1476  (=> (and hop_1_c_k hop_1_k_j) hop_2_c_j)
1477  (=> (and hop_1_c_k hop_1_k_m) hop_2_c_m)
1478  (=> (and hop_1_c_k hop_1_k_l) hop_2_c_l)
1479  (=> (and hop_1_c_k hop_1_k_o) hop_2_c_o)
1480  (=> (and hop_1_c_k hop_1_k_n) hop_2_c_n)
1481  (=> (and hop_1_c_k hop_1_k_q) hop_2_c_q)
1482  (=> (and hop_1_c_k hop_1_k_p) hop_2_c_p)
1483  (=> (and hop_1_c_j hop_1_j_a) hop_2_c_a)
1484  (=> (and hop_1_c_j hop_1_j_b) hop_2_c_b)
1485  (=> (and hop_1_c_j hop_1_j_e) hop_2_c_e)
1486  (=> (and hop_1_c_j hop_1_j_d) hop_2_c_d)
1487  (=> (and hop_1_c_j hop_1_j_g) hop_2_c_g)
1488  (=> (and hop_1_c_j hop_1_j_f) hop_2_c_f)
1489  (=> (and hop_1_c_j hop_1_j_i) hop_2_c_i)
1490  (=> (and hop_1_c_j hop_1_j_h) hop_2_c_h)
1491  (=> (and hop_1_c_j hop_1_j_k) hop_2_c_k)
1492  (=> (and hop_1_c_j hop_1_j_m) hop_2_c_m)
1493  (=> (and hop_1_c_j hop_1_j_l) hop_2_c_l)
1494  (=> (and hop_1_c_j hop_1_j_o) hop_2_c_o)
1495  (=> (and hop_1_c_j hop_1_j_n) hop_2_c_n)
1496  (=> (and hop_1_c_j hop_1_j_q) hop_2_c_q)
1497  (=> (and hop_1_c_j hop_1_j_p) hop_2_c_p)
1498  (=> (and hop_1_c_m hop_1_m_a) hop_2_c_a)
1499  (=> (and hop_1_c_m hop_1_m_b) hop_2_c_b)
1500  (=> (and hop_1_c_m hop_1_m_e) hop_2_c_e)
1501  (=> (and hop_1_c_m hop_1_m_d) hop_2_c_d)
1502  (=> (and hop_1_c_m hop_1_m_g) hop_2_c_g)
1503  (=> (and hop_1_c_m hop_1_m_f) hop_2_c_f)
1504  (=> (and hop_1_c_m hop_1_m_i) hop_2_c_i)
1505  (=> (and hop_1_c_m hop_1_m_h) hop_2_c_h)
1506  (=> (and hop_1_c_m hop_1_m_k) hop_2_c_k)
1507  (=> (and hop_1_c_m hop_1_m_j) hop_2_c_j)
1508  (=> (and hop_1_c_m hop_1_m_l) hop_2_c_l)
1509  (=> (and hop_1_c_m hop_1_m_o) hop_2_c_o)
1510  (=> (and hop_1_c_m hop_1_m_n) hop_2_c_n)
1511  (=> (and hop_1_c_m hop_1_m_q) hop_2_c_q)
1512  (=> (and hop_1_c_m hop_1_m_p) hop_2_c_p)
1513  (=> (and hop_1_c_l hop_1_l_a) hop_2_c_a)
1514  (=> (and hop_1_c_l hop_1_l_b) hop_2_c_b)
1515  (=> (and hop_1_c_l hop_1_l_e) hop_2_c_e)
1516  (=> (and hop_1_c_l hop_1_l_d) hop_2_c_d)
1517  (=> (and hop_1_c_l hop_1_l_g) hop_2_c_g)
1518  (=> (and hop_1_c_l hop_1_l_f) hop_2_c_f)
1519  (=> (and hop_1_c_l hop_1_l_i) hop_2_c_i)
1520  (=> (and hop_1_c_l hop_1_l_h) hop_2_c_h)
1521  (=> (and hop_1_c_l hop_1_l_k) hop_2_c_k)
1522  (=> (and hop_1_c_l hop_1_l_j) hop_2_c_j)
1523  (=> (and hop_1_c_l hop_1_l_m) hop_2_c_m)
1524  (=> (and hop_1_c_l hop_1_l_o) hop_2_c_o)
1525  (=> (and hop_1_c_l hop_1_l_n) hop_2_c_n)
1526  (=> (and hop_1_c_l hop_1_l_q) hop_2_c_q)
1527  (=> (and hop_1_c_l hop_1_l_p) hop_2_c_p)
1528  (=> (and hop_1_c_o hop_1_o_a) hop_2_c_a)
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1529  (=> (and hop_1_c_o hop_1_o_b) hop_2_c_b)
1530  (=> (and hop_1_c_o hop_1_o_e) hop_2_c_e)
1531  (=> (and hop_1_c_o hop_1_o_d) hop_2_c_d)
1532  (=> (and hop_1_c_o hop_1_o_g) hop_2_c_g)
1533  (=> (and hop_1_c_o hop_1_o_f) hop_2_c_f)
1534  (=> (and hop_1_c_o hop_1_o_i) hop_2_c_i)
1535  (=> (and hop_1_c_o hop_1_o_h) hop_2_c_h)
1536  (=> (and hop_1_c_o hop_1_o_k) hop_2_c_k)
1537  (=> (and hop_1_c_o hop_1_o_j) hop_2_c_j)
1538  (=> (and hop_1_c_o hop_1_o_m) hop_2_c_m)
1539  (=> (and hop_1_c_o hop_1_o_l) hop_2_c_l)
1540  (=> (and hop_1_c_o hop_1_o_n) hop_2_c_n)
1541  (=> (and hop_1_c_o hop_1_o_q) hop_2_c_q)
1542  (=> (and hop_1_c_o hop_1_o_p) hop_2_c_p)
1543  (=> (and hop_1_c_n hop_1_n_a) hop_2_c_a)
1544  (=> (and hop_1_c_n hop_1_n_b) hop_2_c_b)
1545  (=> (and hop_1_c_n hop_1_n_e) hop_2_c_e)
1546  (=> (and hop_1_c_n hop_1_n_d) hop_2_c_d)
1547  (=> (and hop_1_c_n hop_1_n_g) hop_2_c_g)
1548  (=> (and hop_1_c_n hop_1_n_f) hop_2_c_f)
1549  (=> (and hop_1_c_n hop_1_n_i) hop_2_c_i)
1550  (=> (and hop_1_c_n hop_1_n_h) hop_2_c_h)
1551  (=> (and hop_1_c_n hop_1_n_k) hop_2_c_k)
1552  (=> (and hop_1_c_n hop_1_n_j) hop_2_c_j)
1553  (=> (and hop_1_c_n hop_1_n_m) hop_2_c_m)
1554  (=> (and hop_1_c_n hop_1_n_l) hop_2_c_l)
1555  (=> (and hop_1_c_n hop_1_n_o) hop_2_c_o)
1556  (=> (and hop_1_c_n hop_1_n_q) hop_2_c_q)
1557  (=> (and hop_1_c_n hop_1_n_p) hop_2_c_p)
1558  (=> (and hop_1_c_q hop_1_q_a) hop_2_c_a)
1559  (=> (and hop_1_c_q hop_1_q_b) hop_2_c_b)
1560  (=> (and hop_1_c_q hop_1_q_e) hop_2_c_e)
1561  (=> (and hop_1_c_q hop_1_q_d) hop_2_c_d)
1562  (=> (and hop_1_c_q hop_1_q_g) hop_2_c_g)
1563  (=> (and hop_1_c_q hop_1_q_f) hop_2_c_f)
1564  (=> (and hop_1_c_q hop_1_q_i) hop_2_c_i)
1565  (=> (and hop_1_c_q hop_1_q_h) hop_2_c_h)
1566  (=> (and hop_1_c_q hop_1_q_k) hop_2_c_k)
1567  (=> (and hop_1_c_q hop_1_q_j) hop_2_c_j)
1568  (=> (and hop_1_c_q hop_1_q_m) hop_2_c_m)
1569  (=> (and hop_1_c_q hop_1_q_l) hop_2_c_l)
1570  (=> (and hop_1_c_q hop_1_q_o) hop_2_c_o)
1571  (=> (and hop_1_c_q hop_1_q_n) hop_2_c_n)
1572  (=> (and hop_1_c_q hop_1_q_p) hop_2_c_p)
1573  (=> (and hop_1_c_p hop_1_p_a) hop_2_c_a)
1574  (=> (and hop_1_c_p hop_1_p_b) hop_2_c_b)
1575  (=> (and hop_1_c_p hop_1_p_e) hop_2_c_e)
1576  (=> (and hop_1_c_p hop_1_p_d) hop_2_c_d)
1577  (=> (and hop_1_c_p hop_1_p_g) hop_2_c_g)
1578  (=> (and hop_1_c_p hop_1_p_f) hop_2_c_f)
1579  (=> (and hop_1_c_p hop_1_p_i) hop_2_c_i)
1580  (=> (and hop_1_c_p hop_1_p_h) hop_2_c_h)
1581  (=> (and hop_1_c_p hop_1_p_k) hop_2_c_k)
1582  (=> (and hop_1_c_p hop_1_p_j) hop_2_c_j)
1583  (=> (and hop_1_c_p hop_1_p_m) hop_2_c_m)
1584  (=> (and hop_1_c_p hop_1_p_l) hop_2_c_l)
1585  (=> (and hop_1_c_p hop_1_p_o) hop_2_c_o)
1586  (=> (and hop_1_c_p hop_1_p_n) hop_2_c_n)
1587  (=> (and hop_1_c_p hop_1_p_q) hop_2_c_q)
1588  (=> (and hop_1_b_a hop_1_a_c) hop_2_b_c)
1589  (=> (and hop_1_b_a hop_1_a_e) hop_2_b_e)
1590  (=> (and hop_1_b_a hop_1_a_d) hop_2_b_d)
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1591   (=> (and hop_1_b_a hop_1_a_g) hop_2_b_g)
1592   (=> (and hop_1_b_a hop_1_a_f) hop_2_b_f)
1593   (=> (and hop_1_b_a hop_1_a_i) hop_2_b_i)
1594   (=> (and hop_1_b_a hop_1_a_h) hop_2_b_h)
1595   (=> (and hop_1_b_a hop_1_a_k) hop_2_b_k)
1596   (=> (and hop_1_b_a hop_1_a_j) hop_2_b_j)
1597   (=> (and hop_1_b_a hop_1_a_m) hop_2_b_m)
1598   (=> (and hop_1_b_a hop_1_a_l) hop_2_b_l)
1599   (=> (and hop_1_b_a hop_1_a_o) hop_2_b_o)
1600   (=> (and hop_1_b_a hop_1_a_n) hop_2_b_n)
1601   (=> (and hop_1_b_a hop_1_a_q) hop_2_b_q)
1602   (=> (and hop_1_b_a hop_1_a_p) hop_2_b_p)
1603   (=> (and hop_1_b_c hop_1_c_a) hop_2_b_a)
1604   (=> (and hop_1_b_c hop_1_c_e) hop_2_b_e)
1605   (=> (and hop_1_b_c hop_1_c_d) hop_2_b_d)
1606   (=> (and hop_1_b_c hop_1_c_g) hop_2_b_g)
1607   (=> (and hop_1_b_c hop_1_c_f) hop_2_b_f)
1608   (=> (and hop_1_b_c hop_1_c_i) hop_2_b_i)
1609   (=> (and hop_1_b_c hop_1_c_h) hop_2_b_h)
1610   (=> (and hop_1_b_c hop_1_c_k) hop_2_b_k)
1611   (=> (and hop_1_b_c hop_1_c_j) hop_2_b_j)
1612   (=> (and hop_1_b_c hop_1_c_m) hop_2_b_m)
1613   (=> (and hop_1_b_c hop_1_c_l) hop_2_b_l)
1614   (=> (and hop_1_b_c hop_1_c_o) hop_2_b_o)
1615   (=> (and hop_1_b_c hop_1_c_n) hop_2_b_n)
1616   (=> (and hop_1_b_c hop_1_c_q) hop_2_b_q)
1617   (=> (and hop_1_b_c hop_1_c_p) hop_2_b_p)
1618   (=> (and hop_1_b_e hop_1_e_a) hop_2_b_a)
1619   (=> (and hop_1_b_e hop_1_e_c) hop_2_b_c)
1620   (=> (and hop_1_b_e hop_1_e_d) hop_2_b_d)
1621   (=> (and hop_1_b_e hop_1_e_g) hop_2_b_g)
1622   (=> (and hop_1_b_e hop_1_e_f) hop_2_b_f)
1623   (=> (and hop_1_b_e hop_1_e_i) hop_2_b_i)
1624   (=> (and hop_1_b_e hop_1_e_h) hop_2_b_h)
1625   (=> (and hop_1_b_e hop_1_e_k) hop_2_b_k)
1626   (=> (and hop_1_b_e hop_1_e_j) hop_2_b_j)
1627   (=> (and hop_1_b_e hop_1_e_m) hop_2_b_m)
1628   (=> (and hop_1_b_e hop_1_e_l) hop_2_b_l)
1629   (=> (and hop_1_b_e hop_1_e_o) hop_2_b_o)
1630   (=> (and hop_1_b_e hop_1_e_n) hop_2_b_n)
1631   (=> (and hop_1_b_e hop_1_e_q) hop_2_b_q)
1632   (=> (and hop_1_b_e hop_1_e_p) hop_2_b_p)
1633   (=> (and hop_1_b_d hop_1_d_a) hop_2_b_a)
1634   (=> (and hop_1_b_d hop_1_d_c) hop_2_b_c)
1635   (=> (and hop_1_b_d hop_1_d_e) hop_2_b_e)
1636   (=> (and hop_1_b_d hop_1_d_g) hop_2_b_g)
1637   (=> (and hop_1_b_d hop_1_d_f) hop_2_b_f)
1638   (=> (and hop_1_b_d hop_1_d_i) hop_2_b_i)
1639   (=> (and hop_1_b_d hop_1_d_h) hop_2_b_h)
1640   (=> (and hop_1_b_d hop_1_d_k) hop_2_b_k)
1641   (=> (and hop_1_b_d hop_1_d_j) hop_2_b_j)
1642   (=> (and hop_1_b_d hop_1_d_m) hop_2_b_m)
1643   (=> (and hop_1_b_d hop_1_d_l) hop_2_b_l)
1644   (=> (and hop_1_b_d hop_1_d_o) hop_2_b_o)
1645   (=> (and hop_1_b_d hop_1_d_n) hop_2_b_n)
1646   (=> (and hop_1_b_d hop_1_d_q) hop_2_b_q)
1647   (=> (and hop_1_b_d hop_1_d_p) hop_2_b_p)
1648   (=> (and hop_1_b_g hop_1_g_a) hop_2_b_a)
1649   (=> (and hop_1_b_g hop_1_g_c) hop_2_b_c)
1650   (=> (and hop_1_b_g hop_1_g_e) hop_2_b_e)
1651   (=> (and hop_1_b_g hop_1_g_d) hop_2_b_d)
1652   (=> (and hop_1_b_g hop_1_g_f) hop_2_b_f)
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1653  (=> (and hop_1_b_g hop_1_g_i) hop_2_b_i)
1654  (=> (and hop_1_b_g hop_1_g_h) hop_2_b_h)
1655  (=> (and hop_1_b_g hop_1_g_k) hop_2_b_k)
1656  (=> (and hop_1_b_g hop_1_g_j) hop_2_b_j)
1657  (=> (and hop_1_b_g hop_1_g_m) hop_2_b_m)
1658  (=> (and hop_1_b_g hop_1_g_l) hop_2_b_l)
1659  (=> (and hop_1_b_g hop_1_g_o) hop_2_b_o)
1660  (=> (and hop_1_b_g hop_1_g_n) hop_2_b_n)
1661  (=> (and hop_1_b_g hop_1_g_q) hop_2_b_q)
1662  (=> (and hop_1_b_g hop_1_g_p) hop_2_b_p)
1663  (=> (and hop_1_b_f hop_1_f_a) hop_2_b_a)
1664  (=> (and hop_1_b_f hop_1_f_c) hop_2_b_c)
1665  (=> (and hop_1_b_f hop_1_f_e) hop_2_b_e)
1666  (=> (and hop_1_b_f hop_1_f_d) hop_2_b_d)
1667  (=> (and hop_1_b_f hop_1_f_g) hop_2_b_g)
1668  (=> (and hop_1_b_f hop_1_f_i) hop_2_b_i)
1669  (=> (and hop_1_b_f hop_1_f_h) hop_2_b_h)
1670  (=> (and hop_1_b_f hop_1_f_k) hop_2_b_k)
1671  (=> (and hop_1_b_f hop_1_f_j) hop_2_b_j)
1672  (=> (and hop_1_b_f hop_1_f_m) hop_2_b_m)
1673  (=> (and hop_1_b_f hop_1_f_l) hop_2_b_l)
1674  (=> (and hop_1_b_f hop_1_f_o) hop_2_b_o)
1675  (=> (and hop_1_b_f hop_1_f_n) hop_2_b_n)
1676  (=> (and hop_1_b_f hop_1_f_q) hop_2_b_q)
1677  (=> (and hop_1_b_f hop_1_f_p) hop_2_b_p)
1678  (=> (and hop_1_b_i hop_1_i_a) hop_2_b_a)
1679  (=> (and hop_1_b_i hop_1_i_c) hop_2_b_c)
1680  (=> (and hop_1_b_i hop_1_i_e) hop_2_b_e)
1681  (=> (and hop_1_b_i hop_1_i_d) hop_2_b_d)
1682  (=> (and hop_1_b_i hop_1_i_g) hop_2_b_g)
1683  (=> (and hop_1_b_i hop_1_i_f) hop_2_b_f)
1684  (=> (and hop_1_b_i hop_1_i_h) hop_2_b_h)
1685  (=> (and hop_1_b_i hop_1_i_k) hop_2_b_k)
1686  (=> (and hop_1_b_i hop_1_i_j) hop_2_b_j)
1687  (=> (and hop_1_b_i hop_1_i_m) hop_2_b_m)
1688  (=> (and hop_1_b_i hop_1_i_l) hop_2_b_l)
1689  (=> (and hop_1_b_i hop_1_i_o) hop_2_b_o)
1690  (=> (and hop_1_b_i hop_1_i_n) hop_2_b_n)
1691  (=> (and hop_1_b_i hop_1_i_q) hop_2_b_q)
1692  (=> (and hop_1_b_i hop_1_i_p) hop_2_b_p)
1693  (=> (and hop_1_b_h hop_1_h_a) hop_2_b_a)
1694  (=> (and hop_1_b_h hop_1_h_c) hop_2_b_c)
1695  (=> (and hop_1_b_h hop_1_h_e) hop_2_b_e)
1696  (=> (and hop_1_b_h hop_1_h_d) hop_2_b_d)
1697  (=> (and hop_1_b_h hop_1_h_g) hop_2_b_g)
1698  (=> (and hop_1_b_h hop_1_h_f) hop_2_b_f)
1699  (=> (and hop_1_b_h hop_1_h_i) hop_2_b_i)
1700  (=> (and hop_1_b_h hop_1_h_k) hop_2_b_k)
1701  (=> (and hop_1_b_h hop_1_h_j) hop_2_b_j)
1702  (=> (and hop_1_b_h hop_1_h_m) hop_2_b_m)
1703  (=> (and hop_1_b_h hop_1_h_l) hop_2_b_l)
1704  (=> (and hop_1_b_h hop_1_h_o) hop_2_b_o)
1705  (=> (and hop_1_b_h hop_1_h_n) hop_2_b_n)
1706  (=> (and hop_1_b_h hop_1_h_q) hop_2_b_q)
1707  (=> (and hop_1_b_h hop_1_h_p) hop_2_b_p)
1708  (=> (and hop_1_b_k hop_1_k_a) hop_2_b_a)
1709  (=> (and hop_1_b_k hop_1_k_c) hop_2_b_c)
1710  (=> (and hop_1_b_k hop_1_k_e) hop_2_b_e)
1711  (=> (and hop_1_b_k hop_1_k_d) hop_2_b_d)
1712  (=> (and hop_1_b_k hop_1_k_g) hop_2_b_g)
1713  (=> (and hop_1_b_k hop_1_k_f) hop_2_b_f)
1714  (=> (and hop_1_b_k hop_1_k_i) hop_2_b_i)
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1715  (=> (and hop_1_b_k hop_1_k_h) hop_2_b_h)
1716  (=> (and hop_1_b_k hop_1_k_j) hop_2_b_j)
1717  (=> (and hop_1_b_k hop_1_k_m) hop_2_b_m)
1718  (=> (and hop_1_b_k hop_1_k_l) hop_2_b_l)
1719  (=> (and hop_1_b_k hop_1_k_o) hop_2_b_o)
1720  (=> (and hop_1_b_k hop_1_k_n) hop_2_b_n)
1721  (=> (and hop_1_b_k hop_1_k_q) hop_2_b_q)
1722  (=> (and hop_1_b_k hop_1_k_p) hop_2_b_p)
1723  (=> (and hop_1_b_j hop_1_j_a) hop_2_b_a)
1724  (=> (and hop_1_b_j hop_1_j_c) hop_2_b_c)
1725  (=> (and hop_1_b_j hop_1_j_e) hop_2_b_e)
1726  (=> (and hop_1_b_j hop_1_j_d) hop_2_b_d)
1727  (=> (and hop_1_b_j hop_1_j_g) hop_2_b_g)
1728  (=> (and hop_1_b_j hop_1_j_f) hop_2_b_f)
1729  (=> (and hop_1_b_j hop_1_j_i) hop_2_b_i)
1730  (=> (and hop_1_b_j hop_1_j_h) hop_2_b_h)
1731  (=> (and hop_1_b_j hop_1_j_k) hop_2_b_k)
1732  (=> (and hop_1_b_j hop_1_j_m) hop_2_b_m)
1733  (=> (and hop_1_b_j hop_1_j_l) hop_2_b_l)
1734  (=> (and hop_1_b_j hop_1_j_o) hop_2_b_o)
1735  (=> (and hop_1_b_j hop_1_j_n) hop_2_b_n)
1736  (=> (and hop_1_b_j hop_1_j_q) hop_2_b_q)
1737  (=> (and hop_1_b_j hop_1_j_p) hop_2_b_p)
1738  (=> (and hop_1_b_m hop_1_m_a) hop_2_b_a)
1739  (=> (and hop_1_b_m hop_1_m_c) hop_2_b_c)
1740  (=> (and hop_1_b_m hop_1_m_e) hop_2_b_e)
1741  (=> (and hop_1_b_m hop_1_m_d) hop_2_b_d)
1742  (=> (and hop_1_b_m hop_1_m_g) hop_2_b_g)
1743  (=> (and hop_1_b_m hop_1_m_f) hop_2_b_f)
1744  (=> (and hop_1_b_m hop_1_m_i) hop_2_b_i)
1745  (=> (and hop_1_b_m hop_1_m_h) hop_2_b_h)
1746  (=> (and hop_1_b_m hop_1_m_k) hop_2_b_k)
1747  (=> (and hop_1_b_m hop_1_m_j) hop_2_b_j)
1748  (=> (and hop_1_b_m hop_1_m_l) hop_2_b_l)
1749  (=> (and hop_1_b_m hop_1_m_o) hop_2_b_o)
1750  (=> (and hop_1_b_m hop_1_m_n) hop_2_b_n)
1751  (=> (and hop_1_b_m hop_1_m_q) hop_2_b_q)
1752  (=> (and hop_1_b_m hop_1_m_p) hop_2_b_p)
1753  (=> (and hop_1_b_l hop_1_l_a) hop_2_b_a)
1754  (=> (and hop_1_b_l hop_1_l_c) hop_2_b_c)
1755  (=> (and hop_1_b_l hop_1_l_e) hop_2_b_e)
1756  (=> (and hop_1_b_l hop_1_l_d) hop_2_b_d)
1757  (=> (and hop_1_b_l hop_1_l_g) hop_2_b_g)
1758  (=> (and hop_1_b_l hop_1_l_f) hop_2_b_f)
1759  (=> (and hop_1_b_l hop_1_l_i) hop_2_b_i)
1760  (=> (and hop_1_b_l hop_1_l_h) hop_2_b_h)
1761  (=> (and hop_1_b_l hop_1_l_k) hop_2_b_k)
1762  (=> (and hop_1_b_l hop_1_l_j) hop_2_b_j)
1763  (=> (and hop_1_b_l hop_1_l_m) hop_2_b_m)
1764  (=> (and hop_1_b_l hop_1_l_o) hop_2_b_o)
1765  (=> (and hop_1_b_l hop_1_l_n) hop_2_b_n)
1766  (=> (and hop_1_b_l hop_1_l_q) hop_2_b_q)
1767  (=> (and hop_1_b_l hop_1_l_p) hop_2_b_p)
1768  (=> (and hop_1_b_o hop_1_o_a) hop_2_b_a)
1769  (=> (and hop_1_b_o hop_1_o_c) hop_2_b_c)
1770  (=> (and hop_1_b_o hop_1_o_e) hop_2_b_e)
1771  (=> (and hop_1_b_o hop_1_o_d) hop_2_b_d)
1772  (=> (and hop_1_b_o hop_1_o_g) hop_2_b_g)
1773  (=> (and hop_1_b_o hop_1_o_f) hop_2_b_f)
1774  (=> (and hop_1_b_o hop_1_o_i) hop_2_b_i)
1775  (=> (and hop_1_b_o hop_1_o_h) hop_2_b_h)
1776  (=> (and hop_1_b_o hop_1_o_k) hop_2_b_k)
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1777   (=> (and hop_1_b_o hop_1_o_j) hop_2_b_j)
1778   (=> (and hop_1_b_o hop_1_o_m) hop_2_b_m)
1779   (=> (and hop_1_b_o hop_1_o_l) hop_2_b_l)
1780   (=> (and hop_1_b_o hop_1_o_n) hop_2_b_n)
1781   (=> (and hop_1_b_o hop_1_o_q) hop_2_b_q)
1782   (=> (and hop_1_b_o hop_1_o_p) hop_2_b_p)
1783   (=> (and hop_1_b_n hop_1_n_a) hop_2_b_a)
1784   (=> (and hop_1_b_n hop_1_n_c) hop_2_b_c)
1785   (=> (and hop_1_b_n hop_1_n_e) hop_2_b_e)
1786   (=> (and hop_1_b_n hop_1_n_d) hop_2_b_d)
1787   (=> (and hop_1_b_n hop_1_n_g) hop_2_b_g)
1788   (=> (and hop_1_b_n hop_1_n_f) hop_2_b_f)
1789   (=> (and hop_1_b_n hop_1_n_i) hop_2_b_i)
1790   (=> (and hop_1_b_n hop_1_n_h) hop_2_b_h)
1791   (=> (and hop_1_b_n hop_1_n_k) hop_2_b_k)
1792   (=> (and hop_1_b_n hop_1_n_j) hop_2_b_j)
1793   (=> (and hop_1_b_n hop_1_n_m) hop_2_b_m)
1794   (=> (and hop_1_b_n hop_1_n_l) hop_2_b_l)
1795   (=> (and hop_1_b_n hop_1_n_o) hop_2_b_o)
1796   (=> (and hop_1_b_n hop_1_n_q) hop_2_b_q)
1797   (=> (and hop_1_b_n hop_1_n_p) hop_2_b_p)
1798   (=> (and hop_1_b_q hop_1_q_a) hop_2_b_a)
1799   (=> (and hop_1_b_q hop_1_q_c) hop_2_b_c)
1800   (=> (and hop_1_b_q hop_1_q_e) hop_2_b_e)
1801   (=> (and hop_1_b_q hop_1_q_d) hop_2_b_d)
1802   (=> (and hop_1_b_q hop_1_q_g) hop_2_b_g)
1803   (=> (and hop_1_b_q hop_1_q_f) hop_2_b_f)
1804   (=> (and hop_1_b_q hop_1_q_i) hop_2_b_i)
1805   (=> (and hop_1_b_q hop_1_q_h) hop_2_b_h)
1806   (=> (and hop_1_b_q hop_1_q_k) hop_2_b_k)
1807   (=> (and hop_1_b_q hop_1_q_j) hop_2_b_j)
1808   (=> (and hop_1_b_q hop_1_q_m) hop_2_b_m)
1809   (=> (and hop_1_b_q hop_1_q_l) hop_2_b_l)
1810   (=> (and hop_1_b_q hop_1_q_o) hop_2_b_o)
1811   (=> (and hop_1_b_q hop_1_q_n) hop_2_b_n)
1812   (=> (and hop_1_b_q hop_1_q_p) hop_2_b_p)
1813   (=> (and hop_1_b_p hop_1_p_a) hop_2_b_a)
1814   (=> (and hop_1_b_p hop_1_p_c) hop_2_b_c)
1815   (=> (and hop_1_b_p hop_1_p_e) hop_2_b_e)
1816   (=> (and hop_1_b_p hop_1_p_d) hop_2_b_d)
1817   (=> (and hop_1_b_p hop_1_p_g) hop_2_b_g)
1818   (=> (and hop_1_b_p hop_1_p_f) hop_2_b_f)
1819   (=> (and hop_1_b_p hop_1_p_i) hop_2_b_i)
1820   (=> (and hop_1_b_p hop_1_p_h) hop_2_b_h)
1821   (=> (and hop_1_b_p hop_1_p_k) hop_2_b_k)
1822   (=> (and hop_1_b_p hop_1_p_j) hop_2_b_j)
1823   (=> (and hop_1_b_p hop_1_p_m) hop_2_b_m)
1824   (=> (and hop_1_b_p hop_1_p_l) hop_2_b_l)
1825   (=> (and hop_1_b_p hop_1_p_o) hop_2_b_o)
1826   (=> (and hop_1_b_p hop_1_p_n) hop_2_b_n)
1827   (=> (and hop_1_b_p hop_1_p_q) hop_2_b_q)
1828   (=> (and hop_1_e_a hop_1_a_c) hop_2_e_c)
1829   (=> (and hop_1_e_a hop_1_a_b) hop_2_e_b)
1830   (=> (and hop_1_e_a hop_1_a_d) hop_2_e_d)
1831   (=> (and hop_1_e_a hop_1_a_g) hop_2_e_g)
1832   (=> (and hop_1_e_a hop_1_a_f) hop_2_e_f)
1833   (=> (and hop_1_e_a hop_1_a_i) hop_2_e_i)
1834   (=> (and hop_1_e_a hop_1_a_h) hop_2_e_h)
1835   (=> (and hop_1_e_a hop_1_a_k) hop_2_e_k)
1836   (=> (and hop_1_e_a hop_1_a_j) hop_2_e_j)
1837   (=> (and hop_1_e_a hop_1_a_m) hop_2_e_m)
1838   (=> (and hop_1_e_a hop_1_a_l) hop_2_e_l)
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1839  (=> (and hop_1_e_a hop_1_a_o) hop_2_e_o)
1840  (=> (and hop_1_e_a hop_1_a_n) hop_2_e_n)
1841  (=> (and hop_1_e_a hop_1_a_q) hop_2_e_q)
1842  (=> (and hop_1_e_a hop_1_a_p) hop_2_e_p)
1843  (=> (and hop_1_e_c hop_1_c_a) hop_2_e_a)
1844  (=> (and hop_1_e_c hop_1_c_b) hop_2_e_b)
1845  (=> (and hop_1_e_c hop_1_c_d) hop_2_e_d)
1846  (=> (and hop_1_e_c hop_1_c_g) hop_2_e_g)
1847  (=> (and hop_1_e_c hop_1_c_f) hop_2_e_f)
1848  (=> (and hop_1_e_c hop_1_c_i) hop_2_e_i)
1849  (=> (and hop_1_e_c hop_1_c_h) hop_2_e_h)
1850  (=> (and hop_1_e_c hop_1_c_k) hop_2_e_k)
1851  (=> (and hop_1_e_c hop_1_c_j) hop_2_e_j)
1852  (=> (and hop_1_e_c hop_1_c_m) hop_2_e_m)
1853  (=> (and hop_1_e_c hop_1_c_l) hop_2_e_l)
1854  (=> (and hop_1_e_c hop_1_c_o) hop_2_e_o)
1855  (=> (and hop_1_e_c hop_1_c_n) hop_2_e_n)
1856  (=> (and hop_1_e_c hop_1_c_q) hop_2_e_q)
1857  (=> (and hop_1_e_c hop_1_c_p) hop_2_e_p)
1858  (=> (and hop_1_e_b hop_1_b_a) hop_2_e_a)
1859  (=> (and hop_1_e_b hop_1_b_c) hop_2_e_c)
1860  (=> (and hop_1_e_b hop_1_b_d) hop_2_e_d)
1861  (=> (and hop_1_e_b hop_1_b_g) hop_2_e_g)
1862  (=> (and hop_1_e_b hop_1_b_f) hop_2_e_f)
1863  (=> (and hop_1_e_b hop_1_b_i) hop_2_e_i)
1864  (=> (and hop_1_e_b hop_1_b_h) hop_2_e_h)
1865  (=> (and hop_1_e_b hop_1_b_k) hop_2_e_k)
1866  (=> (and hop_1_e_b hop_1_b_j) hop_2_e_j)
1867  (=> (and hop_1_e_b hop_1_b_m) hop_2_e_m)
1868  (=> (and hop_1_e_b hop_1_b_l) hop_2_e_l)
1869  (=> (and hop_1_e_b hop_1_b_o) hop_2_e_o)
1870  (=> (and hop_1_e_b hop_1_b_n) hop_2_e_n)
1871  (=> (and hop_1_e_b hop_1_b_q) hop_2_e_q)
1872  (=> (and hop_1_e_b hop_1_b_p) hop_2_e_p)
1873  (=> (and hop_1_e_d hop_1_d_a) hop_2_e_a)
1874  (=> (and hop_1_e_d hop_1_d_c) hop_2_e_c)
1875  (=> (and hop_1_e_d hop_1_d_b) hop_2_e_b)
1876  (=> (and hop_1_e_d hop_1_d_g) hop_2_e_g)
1877  (=> (and hop_1_e_d hop_1_d_f) hop_2_e_f)
1878  (=> (and hop_1_e_d hop_1_d_i) hop_2_e_i)
1879  (=> (and hop_1_e_d hop_1_d_h) hop_2_e_h)
1880  (=> (and hop_1_e_d hop_1_d_k) hop_2_e_k)
1881  (=> (and hop_1_e_d hop_1_d_j) hop_2_e_j)
1882  (=> (and hop_1_e_d hop_1_d_m) hop_2_e_m)
1883  (=> (and hop_1_e_d hop_1_d_l) hop_2_e_l)
1884  (=> (and hop_1_e_d hop_1_d_o) hop_2_e_o)
1885  (=> (and hop_1_e_d hop_1_d_n) hop_2_e_n)
1886  (=> (and hop_1_e_d hop_1_d_q) hop_2_e_q)
1887  (=> (and hop_1_e_d hop_1_d_p) hop_2_e_p)
1888  (=> (and hop_1_e_g hop_1_g_a) hop_2_e_a)
1889  (=> (and hop_1_e_g hop_1_g_c) hop_2_e_c)
1890  (=> (and hop_1_e_g hop_1_g_b) hop_2_e_b)
1891  (=> (and hop_1_e_g hop_1_g_d) hop_2_e_d)
1892  (=> (and hop_1_e_g hop_1_g_f) hop_2_e_f)
1893  (=> (and hop_1_e_g hop_1_g_i) hop_2_e_i)
1894  (=> (and hop_1_e_g hop_1_g_h) hop_2_e_h)
1895  (=> (and hop_1_e_g hop_1_g_k) hop_2_e_k)
1896  (=> (and hop_1_e_g hop_1_g_j) hop_2_e_j)
1897  (=> (and hop_1_e_g hop_1_g_m) hop_2_e_m)
1898  (=> (and hop_1_e_g hop_1_g_l) hop_2_e_l)
1899  (=> (and hop_1_e_g hop_1_g_o) hop_2_e_o)
1900  (=> (and hop_1_e_g hop_1_g_n) hop_2_e_n)
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1901  (=> (and hop_1_e_g hop_1_g_q) hop_2_e_q)
1902  (=> (and hop_1_e_g hop_1_g_p) hop_2_e_p)
1903  (=> (and hop_1_e_f hop_1_f_a) hop_2_e_a)
1904  (=> (and hop_1_e_f hop_1_f_c) hop_2_e_c)
1905  (=> (and hop_1_e_f hop_1_f_b) hop_2_e_b)
1906  (=> (and hop_1_e_f hop_1_f_d) hop_2_e_d)
1907  (=> (and hop_1_e_f hop_1_f_g) hop_2_e_g)
1908  (=> (and hop_1_e_f hop_1_f_i) hop_2_e_i)
1909  (=> (and hop_1_e_f hop_1_f_h) hop_2_e_h)
1910  (=> (and hop_1_e_f hop_1_f_k) hop_2_e_k)
1911  (=> (and hop_1_e_f hop_1_f_j) hop_2_e_j)
1912  (=> (and hop_1_e_f hop_1_f_m) hop_2_e_m)
1913  (=> (and hop_1_e_f hop_1_f_l) hop_2_e_l)
1914  (=> (and hop_1_e_f hop_1_f_o) hop_2_e_o)
1915  (=> (and hop_1_e_f hop_1_f_n) hop_2_e_n)
1916  (=> (and hop_1_e_f hop_1_f_q) hop_2_e_q)
1917  (=> (and hop_1_e_f hop_1_f_p) hop_2_e_p)
1918  (=> (and hop_1_e_i hop_1_i_a) hop_2_e_a)
1919  (=> (and hop_1_e_i hop_1_i_c) hop_2_e_c)
1920  (=> (and hop_1_e_i hop_1_i_b) hop_2_e_b)
1921  (=> (and hop_1_e_i hop_1_i_d) hop_2_e_d)
1922  (=> (and hop_1_e_i hop_1_i_g) hop_2_e_g)
1923  (=> (and hop_1_e_i hop_1_i_f) hop_2_e_f)
1924  (=> (and hop_1_e_i hop_1_i_h) hop_2_e_h)
1925  (=> (and hop_1_e_i hop_1_i_k) hop_2_e_k)
1926  (=> (and hop_1_e_i hop_1_i_j) hop_2_e_j)
1927  (=> (and hop_1_e_i hop_1_i_m) hop_2_e_m)
1928  (=> (and hop_1_e_i hop_1_i_l) hop_2_e_l)
1929  (=> (and hop_1_e_i hop_1_i_o) hop_2_e_o)
1930  (=> (and hop_1_e_i hop_1_i_n) hop_2_e_n)
1931  (=> (and hop_1_e_i hop_1_i_q) hop_2_e_q)
1932  (=> (and hop_1_e_i hop_1_i_p) hop_2_e_p)
1933  (=> (and hop_1_e_h hop_1_h_a) hop_2_e_a)
1934  (=> (and hop_1_e_h hop_1_h_c) hop_2_e_c)
1935  (=> (and hop_1_e_h hop_1_h_b) hop_2_e_b)
1936  (=> (and hop_1_e_h hop_1_h_d) hop_2_e_d)
1937  (=> (and hop_1_e_h hop_1_h_g) hop_2_e_g)
1938  (=> (and hop_1_e_h hop_1_h_f) hop_2_e_f)
1939  (=> (and hop_1_e_h hop_1_h_i) hop_2_e_i)
1940  (=> (and hop_1_e_h hop_1_h_k) hop_2_e_k)
1941  (=> (and hop_1_e_h hop_1_h_j) hop_2_e_j)
1942  (=> (and hop_1_e_h hop_1_h_m) hop_2_e_m)
1943  (=> (and hop_1_e_h hop_1_h_l) hop_2_e_l)
1944  (=> (and hop_1_e_h hop_1_h_o) hop_2_e_o)
1945  (=> (and hop_1_e_h hop_1_h_n) hop_2_e_n)
1946  (=> (and hop_1_e_h hop_1_h_q) hop_2_e_q)
1947  (=> (and hop_1_e_h hop_1_h_p) hop_2_e_p)
1948  (=> (and hop_1_e_k hop_1_k_a) hop_2_e_a)
1949  (=> (and hop_1_e_k hop_1_k_c) hop_2_e_c)
1950  (=> (and hop_1_e_k hop_1_k_b) hop_2_e_b)
1951  (=> (and hop_1_e_k hop_1_k_d) hop_2_e_d)
1952  (=> (and hop_1_e_k hop_1_k_g) hop_2_e_g)
1953  (=> (and hop_1_e_k hop_1_k_f) hop_2_e_f)
1954  (=> (and hop_1_e_k hop_1_k_i) hop_2_e_i)
1955  (=> (and hop_1_e_k hop_1_k_h) hop_2_e_h)
1956  (=> (and hop_1_e_k hop_1_k_j) hop_2_e_j)
1957  (=> (and hop_1_e_k hop_1_k_m) hop_2_e_m)
1958  (=> (and hop_1_e_k hop_1_k_l) hop_2_e_l)
1959  (=> (and hop_1_e_k hop_1_k_o) hop_2_e_o)
1960  (=> (and hop_1_e_k hop_1_k_n) hop_2_e_n)
1961  (=> (and hop_1_e_k hop_1_k_q) hop_2_e_q)
1962  (=> (and hop_1_e_k hop_1_k_p) hop_2_e_p)
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1963  (=> (and hop_1_e_j hop_1_j_a) hop_2_e_a)
1964  (=> (and hop_1_e_j hop_1_j_c) hop_2_e_c)
1965  (=> (and hop_1_e_j hop_1_j_b) hop_2_e_b)
1966  (=> (and hop_1_e_j hop_1_j_d) hop_2_e_d)
1967  (=> (and hop_1_e_j hop_1_j_g) hop_2_e_g)
1968  (=> (and hop_1_e_j hop_1_j_f) hop_2_e_f)
1969  (=> (and hop_1_e_j hop_1_j_i) hop_2_e_i)
1970  (=> (and hop_1_e_j hop_1_j_h) hop_2_e_h)
1971  (=> (and hop_1_e_j hop_1_j_k) hop_2_e_k)
1972  (=> (and hop_1_e_j hop_1_j_m) hop_2_e_m)
1973  (=> (and hop_1_e_j hop_1_j_l) hop_2_e_l)
1974  (=> (and hop_1_e_j hop_1_j_o) hop_2_e_o)
1975  (=> (and hop_1_e_j hop_1_j_n) hop_2_e_n)
1976  (=> (and hop_1_e_j hop_1_j_q) hop_2_e_q)
1977  (=> (and hop_1_e_j hop_1_j_p) hop_2_e_p)
1978  (=> (and hop_1_e_m hop_1_m_a) hop_2_e_a)
1979  (=> (and hop_1_e_m hop_1_m_c) hop_2_e_c)
1980  (=> (and hop_1_e_m hop_1_m_b) hop_2_e_b)
1981  (=> (and hop_1_e_m hop_1_m_d) hop_2_e_d)
1982  (=> (and hop_1_e_m hop_1_m_g) hop_2_e_g)
1983  (=> (and hop_1_e_m hop_1_m_f) hop_2_e_f)
1984  (=> (and hop_1_e_m hop_1_m_i) hop_2_e_i)
1985  (=> (and hop_1_e_m hop_1_m_h) hop_2_e_h)
1986  (=> (and hop_1_e_m hop_1_m_k) hop_2_e_k)
1987  (=> (and hop_1_e_m hop_1_m_j) hop_2_e_j)
1988  (=> (and hop_1_e_m hop_1_m_l) hop_2_e_l)
1989  (=> (and hop_1_e_m hop_1_m_o) hop_2_e_o)
1990  (=> (and hop_1_e_m hop_1_m_n) hop_2_e_n)
1991  (=> (and hop_1_e_m hop_1_m_q) hop_2_e_q)
1992  (=> (and hop_1_e_m hop_1_m_p) hop_2_e_p)
1993  (=> (and hop_1_e_l hop_1_l_a) hop_2_e_a)
1994  (=> (and hop_1_e_l hop_1_l_c) hop_2_e_c)
1995  (=> (and hop_1_e_l hop_1_l_b) hop_2_e_b)
1996  (=> (and hop_1_e_l hop_1_l_d) hop_2_e_d)
1997  (=> (and hop_1_e_l hop_1_l_g) hop_2_e_g)
1998  (=> (and hop_1_e_l hop_1_l_f) hop_2_e_f)
1999  (=> (and hop_1_e_l hop_1_l_i) hop_2_e_i)
2000  (=> (and hop_1_e_l hop_1_l_h) hop_2_e_h)
2001  (=> (and hop_1_e_l hop_1_l_k) hop_2_e_k)
2002  (=> (and hop_1_e_l hop_1_l_j) hop_2_e_j)
2003  (=> (and hop_1_e_l hop_1_l_m) hop_2_e_m)
2004  (=> (and hop_1_e_l hop_1_l_o) hop_2_e_o)
2005  (=> (and hop_1_e_l hop_1_l_n) hop_2_e_n)
2006  (=> (and hop_1_e_l hop_1_l_q) hop_2_e_q)
2007  (=> (and hop_1_e_l hop_1_l_p) hop_2_e_p)
2008  (=> (and hop_1_e_o hop_1_o_a) hop_2_e_a)
2009  (=> (and hop_1_e_o hop_1_o_c) hop_2_e_c)
2010  (=> (and hop_1_e_o hop_1_o_b) hop_2_e_b)
2011  (=> (and hop_1_e_o hop_1_o_d) hop_2_e_d)
2012  (=> (and hop_1_e_o hop_1_o_g) hop_2_e_g)
2013  (=> (and hop_1_e_o hop_1_o_f) hop_2_e_f)
2014  (=> (and hop_1_e_o hop_1_o_i) hop_2_e_i)
2015  (=> (and hop_1_e_o hop_1_o_h) hop_2_e_h)
2016  (=> (and hop_1_e_o hop_1_o_k) hop_2_e_k)
2017  (=> (and hop_1_e_o hop_1_o_j) hop_2_e_j)
2018  (=> (and hop_1_e_o hop_1_o_m) hop_2_e_m)
2019  (=> (and hop_1_e_o hop_1_o_l) hop_2_e_l)
2020  (=> (and hop_1_e_o hop_1_o_n) hop_2_e_n)
2021  (=> (and hop_1_e_o hop_1_o_q) hop_2_e_q)
2022  (=> (and hop_1_e_o hop_1_o_p) hop_2_e_p)
2023  (=> (and hop_1_e_n hop_1_n_a) hop_2_e_a)
2024  (=> (and hop_1_e_n hop_1_n_c) hop_2_e_c)
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2025  (=> (and hop_1_e_n hop_1_n_b) hop_2_e_b)
2026  (=> (and hop_1_e_n hop_1_n_d) hop_2_e_d)
2027  (=> (and hop_1_e_n hop_1_n_g) hop_2_e_g)
2028  (=> (and hop_1_e_n hop_1_n_f) hop_2_e_f)
2029  (=> (and hop_1_e_n hop_1_n_i) hop_2_e_i)
2030  (=> (and hop_1_e_n hop_1_n_h) hop_2_e_h)
2031  (=> (and hop_1_e_n hop_1_n_k) hop_2_e_k)
2032  (=> (and hop_1_e_n hop_1_n_j) hop_2_e_j)
2033  (=> (and hop_1_e_n hop_1_n_m) hop_2_e_m)
2034  (=> (and hop_1_e_n hop_1_n_l) hop_2_e_l)
2035  (=> (and hop_1_e_n hop_1_n_o) hop_2_e_o)
2036  (=> (and hop_1_e_n hop_1_n_q) hop_2_e_q)
2037  (=> (and hop_1_e_n hop_1_n_p) hop_2_e_p)
2038  (=> (and hop_1_e_q hop_1_q_a) hop_2_e_a)
2039  (=> (and hop_1_e_q hop_1_q_c) hop_2_e_c)
2040  (=> (and hop_1_e_q hop_1_q_b) hop_2_e_b)
2041  (=> (and hop_1_e_q hop_1_q_d) hop_2_e_d)
2042  (=> (and hop_1_e_q hop_1_q_g) hop_2_e_g)
2043  (=> (and hop_1_e_q hop_1_q_f) hop_2_e_f)
2044  (=> (and hop_1_e_q hop_1_q_i) hop_2_e_i)
2045  (=> (and hop_1_e_q hop_1_q_h) hop_2_e_h)
2046  (=> (and hop_1_e_q hop_1_q_k) hop_2_e_k)
2047  (=> (and hop_1_e_q hop_1_q_j) hop_2_e_j)
2048  (=> (and hop_1_e_q hop_1_q_m) hop_2_e_m)
2049  (=> (and hop_1_e_q hop_1_q_l) hop_2_e_l)
2050  (=> (and hop_1_e_q hop_1_q_o) hop_2_e_o)
2051  (=> (and hop_1_e_q hop_1_q_n) hop_2_e_n)
2052  (=> (and hop_1_e_q hop_1_q_p) hop_2_e_p)
2053  (=> (and hop_1_e_p hop_1_p_a) hop_2_e_a)
2054  (=> (and hop_1_e_p hop_1_p_c) hop_2_e_c)
2055  (=> (and hop_1_e_p hop_1_p_b) hop_2_e_b)
2056  (=> (and hop_1_e_p hop_1_p_d) hop_2_e_d)
2057  (=> (and hop_1_e_p hop_1_p_g) hop_2_e_g)
2058  (=> (and hop_1_e_p hop_1_p_f) hop_2_e_f)
2059  (=> (and hop_1_e_p hop_1_p_i) hop_2_e_i)
2060  (=> (and hop_1_e_p hop_1_p_h) hop_2_e_h)
2061  (=> (and hop_1_e_p hop_1_p_k) hop_2_e_k)
2062  (=> (and hop_1_e_p hop_1_p_j) hop_2_e_j)
2063  (=> (and hop_1_e_p hop_1_p_m) hop_2_e_m)
2064  (=> (and hop_1_e_p hop_1_p_l) hop_2_e_l)
2065  (=> (and hop_1_e_p hop_1_p_o) hop_2_e_o)
2066  (=> (and hop_1_e_p hop_1_p_n) hop_2_e_n)
2067  (=> (and hop_1_e_p hop_1_p_q) hop_2_e_q)
2068  (=> (and hop_1_d_a hop_1_a_c) hop_2_d_c)
2069  (=> (and hop_1_d_a hop_1_a_b) hop_2_d_b)
2070  (=> (and hop_1_d_a hop_1_a_e) hop_2_d_e)
2071  (=> (and hop_1_d_a hop_1_a_g) hop_2_d_g)
2072  (=> (and hop_1_d_a hop_1_a_f) hop_2_d_f)
2073  (=> (and hop_1_d_a hop_1_a_i) hop_2_d_i)
2074  (=> (and hop_1_d_a hop_1_a_h) hop_2_d_h)
2075  (=> (and hop_1_d_a hop_1_a_k) hop_2_d_k)
2076  (=> (and hop_1_d_a hop_1_a_j) hop_2_d_j)
2077  (=> (and hop_1_d_a hop_1_a_m) hop_2_d_m)
2078  (=> (and hop_1_d_a hop_1_a_l) hop_2_d_l)
2079  (=> (and hop_1_d_a hop_1_a_o) hop_2_d_o)
2080  (=> (and hop_1_d_a hop_1_a_n) hop_2_d_n)
2081  (=> (and hop_1_d_a hop_1_a_q) hop_2_d_q)
2082  (=> (and hop_1_d_a hop_1_a_p) hop_2_d_p)
2083  (=> (and hop_1_d_c hop_1_c_a) hop_2_d_a)
2084  (=> (and hop_1_d_c hop_1_c_b) hop_2_d_b)
2085  (=> (and hop_1_d_c hop_1_c_e) hop_2_d_e)
2086  (=> (and hop_1_d_c hop_1_c_g) hop_2_d_g)
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2087   (=> (and hop_1_d_c hop_1_c_f) hop_2_d_f)
2088   (=> (and hop_1_d_c hop_1_c_i) hop_2_d_i)
2089   (=> (and hop_1_d_c hop_1_c_h) hop_2_d_h)
2090   (=> (and hop_1_d_c hop_1_c_k) hop_2_d_k)
2091   (=> (and hop_1_d_c hop_1_c_j) hop_2_d_j)
2092   (=> (and hop_1_d_c hop_1_c_m) hop_2_d_m)
2093   (=> (and hop_1_d_c hop_1_c_l) hop_2_d_l)
2094   (=> (and hop_1_d_c hop_1_c_o) hop_2_d_o)
2095   (=> (and hop_1_d_c hop_1_c_n) hop_2_d_n)
2096   (=> (and hop_1_d_c hop_1_c_q) hop_2_d_q)
2097   (=> (and hop_1_d_c hop_1_c_p) hop_2_d_p)
2098   (=> (and hop_1_d_b hop_1_b_a) hop_2_d_a)
2099   (=> (and hop_1_d_b hop_1_b_c) hop_2_d_c)
2100   (=> (and hop_1_d_b hop_1_b_e) hop_2_d_e)
2101   (=> (and hop_1_d_b hop_1_b_g) hop_2_d_g)
2102   (=> (and hop_1_d_b hop_1_b_f) hop_2_d_f)
2103   (=> (and hop_1_d_b hop_1_b_i) hop_2_d_i)
2104   (=> (and hop_1_d_b hop_1_b_h) hop_2_d_h)
2105   (=> (and hop_1_d_b hop_1_b_k) hop_2_d_k)
2106   (=> (and hop_1_d_b hop_1_b_j) hop_2_d_j)
2107   (=> (and hop_1_d_b hop_1_b_m) hop_2_d_m)
2108   (=> (and hop_1_d_b hop_1_b_l) hop_2_d_l)
2109   (=> (and hop_1_d_b hop_1_b_o) hop_2_d_o)
2110   (=> (and hop_1_d_b hop_1_b_n) hop_2_d_n)
2111   (=> (and hop_1_d_b hop_1_b_q) hop_2_d_q)
2112   (=> (and hop_1_d_b hop_1_b_p) hop_2_d_p)
2113   (=> (and hop_1_d_e hop_1_e_a) hop_2_d_a)
2114   (=> (and hop_1_d_e hop_1_e_c) hop_2_d_c)
2115   (=> (and hop_1_d_e hop_1_e_b) hop_2_d_b)
2116   (=> (and hop_1_d_e hop_1_e_g) hop_2_d_g)
2117   (=> (and hop_1_d_e hop_1_e_f) hop_2_d_f)
2118   (=> (and hop_1_d_e hop_1_e_i) hop_2_d_i)
2119   (=> (and hop_1_d_e hop_1_e_h) hop_2_d_h)
2120   (=> (and hop_1_d_e hop_1_e_k) hop_2_d_k)
2121   (=> (and hop_1_d_e hop_1_e_j) hop_2_d_j)
2122   (=> (and hop_1_d_e hop_1_e_m) hop_2_d_m)
2123   (=> (and hop_1_d_e hop_1_e_l) hop_2_d_l)
2124   (=> (and hop_1_d_e hop_1_e_o) hop_2_d_o)
2125   (=> (and hop_1_d_e hop_1_e_n) hop_2_d_n)
2126   (=> (and hop_1_d_e hop_1_e_q) hop_2_d_q)
2127   (=> (and hop_1_d_e hop_1_e_p) hop_2_d_p)
2128   (=> (and hop_1_d_g hop_1_g_a) hop_2_d_a)
2129   (=> (and hop_1_d_g hop_1_g_c) hop_2_d_c)
2130   (=> (and hop_1_d_g hop_1_g_b) hop_2_d_b)
2131   (=> (and hop_1_d_g hop_1_g_e) hop_2_d_e)
2132   (=> (and hop_1_d_g hop_1_g_f) hop_2_d_f)
2133   (=> (and hop_1_d_g hop_1_g_i) hop_2_d_i)
2134   (=> (and hop_1_d_g hop_1_g_h) hop_2_d_h)
2135   (=> (and hop_1_d_g hop_1_g_k) hop_2_d_k)
2136   (=> (and hop_1_d_g hop_1_g_j) hop_2_d_j)
2137   (=> (and hop_1_d_g hop_1_g_m) hop_2_d_m)
2138   (=> (and hop_1_d_g hop_1_g_l) hop_2_d_l)
2139   (=> (and hop_1_d_g hop_1_g_o) hop_2_d_o)
2140   (=> (and hop_1_d_g hop_1_g_n) hop_2_d_n)
2141   (=> (and hop_1_d_g hop_1_g_q) hop_2_d_q)
2142   (=> (and hop_1_d_g hop_1_g_p) hop_2_d_p)
2143   (=> (and hop_1_d_f hop_1_f_a) hop_2_d_a)
2144   (=> (and hop_1_d_f hop_1_f_c) hop_2_d_c)
2145   (=> (and hop_1_d_f hop_1_f_b) hop_2_d_b)
2146   (=> (and hop_1_d_f hop_1_f_e) hop_2_d_e)
2147   (=> (and hop_1_d_f hop_1_f_g) hop_2_d_g)
2148   (=> (and hop_1_d_f hop_1_f_i) hop_2_d_i)
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```
2149  (=> (and hop_1_d_f hop_1_f_h) hop_2_d_h)
2150  (=> (and hop_1_d_f hop_1_f_k) hop_2_d_k)
2151  (=> (and hop_1_d_f hop_1_f_j) hop_2_d_j)
2152  (=> (and hop_1_d_f hop_1_f_m) hop_2_d_m)
2153  (=> (and hop_1_d_f hop_1_f_l) hop_2_d_l)
2154  (=> (and hop_1_d_f hop_1_f_o) hop_2_d_o)
2155  (=> (and hop_1_d_f hop_1_f_n) hop_2_d_n)
2156  (=> (and hop_1_d_f hop_1_f_q) hop_2_d_q)
2157  (=> (and hop_1_d_f hop_1_f_p) hop_2_d_p)
2158  (=> (and hop_1_d_i hop_1_i_a) hop_2_d_a)
2159  (=> (and hop_1_d_i hop_1_i_c) hop_2_d_c)
2160  (=> (and hop_1_d_i hop_1_i_b) hop_2_d_b)
2161  (=> (and hop_1_d_i hop_1_i_e) hop_2_d_e)
2162  (=> (and hop_1_d_i hop_1_i_g) hop_2_d_g)
2163  (=> (and hop_1_d_i hop_1_i_f) hop_2_d_f)
2164  (=> (and hop_1_d_i hop_1_i_h) hop_2_d_h)
2165  (=> (and hop_1_d_i hop_1_i_k) hop_2_d_k)
2166  (=> (and hop_1_d_i hop_1_i_j) hop_2_d_j)
2167  (=> (and hop_1_d_i hop_1_i_m) hop_2_d_m)
2168  (=> (and hop_1_d_i hop_1_i_l) hop_2_d_l)
2169  (=> (and hop_1_d_i hop_1_i_o) hop_2_d_o)
2170  (=> (and hop_1_d_i hop_1_i_n) hop_2_d_n)
2171  (=> (and hop_1_d_i hop_1_i_q) hop_2_d_q)
2172  (=> (and hop_1_d_i hop_1_i_p) hop_2_d_p)
2173  (=> (and hop_1_d_h hop_1_h_a) hop_2_d_a)
2174  (=> (and hop_1_d_h hop_1_h_c) hop_2_d_c)
2175  (=> (and hop_1_d_h hop_1_h_b) hop_2_d_b)
2176  (=> (and hop_1_d_h hop_1_h_e) hop_2_d_e)
2177  (=> (and hop_1_d_h hop_1_h_g) hop_2_d_g)
2178  (=> (and hop_1_d_h hop_1_h_f) hop_2_d_f)
2179  (=> (and hop_1_d_h hop_1_h_i) hop_2_d_i)
2180  (=> (and hop_1_d_h hop_1_h_k) hop_2_d_k)
2181  (=> (and hop_1_d_h hop_1_h_j) hop_2_d_j)
2182  (=> (and hop_1_d_h hop_1_h_m) hop_2_d_m)
2183  (=> (and hop_1_d_h hop_1_h_l) hop_2_d_l)
2184  (=> (and hop_1_d_h hop_1_h_o) hop_2_d_o)
2185  (=> (and hop_1_d_h hop_1_h_n) hop_2_d_n)
2186  (=> (and hop_1_d_h hop_1_h_q) hop_2_d_q)
2187  (=> (and hop_1_d_h hop_1_h_p) hop_2_d_p)
2188  (=> (and hop_1_d_k hop_1_k_a) hop_2_d_a)
2189  (=> (and hop_1_d_k hop_1_k_c) hop_2_d_c)
2190  (=> (and hop_1_d_k hop_1_k_b) hop_2_d_b)
2191  (=> (and hop_1_d_k hop_1_k_e) hop_2_d_e)
2192  (=> (and hop_1_d_k hop_1_k_g) hop_2_d_g)
2193  (=> (and hop_1_d_k hop_1_k_f) hop_2_d_f)
2194  (=> (and hop_1_d_k hop_1_k_i) hop_2_d_i)
2195  (=> (and hop_1_d_k hop_1_k_h) hop_2_d_h)
2196  (=> (and hop_1_d_k hop_1_k_j) hop_2_d_j)
2197  (=> (and hop_1_d_k hop_1_k_m) hop_2_d_m)
2198  (=> (and hop_1_d_k hop_1_k_l) hop_2_d_l)
2199  (=> (and hop_1_d_k hop_1_k_o) hop_2_d_o)
2200  (=> (and hop_1_d_k hop_1_k_n) hop_2_d_n)
2201  (=> (and hop_1_d_k hop_1_k_q) hop_2_d_q)
2202  (=> (and hop_1_d_k hop_1_k_p) hop_2_d_p)
2203  (=> (and hop_1_d_j hop_1_j_a) hop_2_d_a)
2204  (=> (and hop_1_d_j hop_1_j_c) hop_2_d_c)
2205  (=> (and hop_1_d_j hop_1_j_b) hop_2_d_b)
2206  (=> (and hop_1_d_j hop_1_j_e) hop_2_d_e)
2207  (=> (and hop_1_d_j hop_1_j_g) hop_2_d_g)
2208  (=> (and hop_1_d_j hop_1_j_f) hop_2_d_f)
2209  (=> (and hop_1_d_j hop_1_j_i) hop_2_d_i)
2210  (=> (and hop_1_d_j hop_1_j_h) hop_2_d_h)
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```
2211  (=> (and hop_1_d_j hop_1_j_k) hop_2_d_k)
2212  (=> (and hop_1_d_j hop_1_j_m) hop_2_d_m)
2213  (=> (and hop_1_d_j hop_1_j_l) hop_2_d_l)
2214  (=> (and hop_1_d_j hop_1_j_o) hop_2_d_o)
2215  (=> (and hop_1_d_j hop_1_j_n) hop_2_d_n)
2216  (=> (and hop_1_d_j hop_1_j_q) hop_2_d_q)
2217  (=> (and hop_1_d_j hop_1_j_p) hop_2_d_p)
2218  (=> (and hop_1_d_m hop_1_m_a) hop_2_d_a)
2219  (=> (and hop_1_d_m hop_1_m_c) hop_2_d_c)
2220  (=> (and hop_1_d_m hop_1_m_b) hop_2_d_b)
2221  (=> (and hop_1_d_m hop_1_m_e) hop_2_d_e)
2222  (=> (and hop_1_d_m hop_1_m_g) hop_2_d_g)
2223  (=> (and hop_1_d_m hop_1_m_f) hop_2_d_f)
2224  (=> (and hop_1_d_m hop_1_m_i) hop_2_d_i)
2225  (=> (and hop_1_d_m hop_1_m_h) hop_2_d_h)
2226  (=> (and hop_1_d_m hop_1_m_k) hop_2_d_k)
2227  (=> (and hop_1_d_m hop_1_m_j) hop_2_d_j)
2228  (=> (and hop_1_d_m hop_1_m_l) hop_2_d_l)
2229  (=> (and hop_1_d_m hop_1_m_o) hop_2_d_o)
2230  (=> (and hop_1_d_m hop_1_m_n) hop_2_d_n)
2231  (=> (and hop_1_d_m hop_1_m_q) hop_2_d_q)
2232  (=> (and hop_1_d_m hop_1_m_p) hop_2_d_p)
2233  (=> (and hop_1_d_l hop_1_l_a) hop_2_d_a)
2234  (=> (and hop_1_d_l hop_1_l_c) hop_2_d_c)
2235  (=> (and hop_1_d_l hop_1_l_b) hop_2_d_b)
2236  (=> (and hop_1_d_l hop_1_l_e) hop_2_d_e)
2237  (=> (and hop_1_d_l hop_1_l_g) hop_2_d_g)
2238  (=> (and hop_1_d_l hop_1_l_f) hop_2_d_f)
2239  (=> (and hop_1_d_l hop_1_l_i) hop_2_d_i)
2240  (=> (and hop_1_d_l hop_1_l_h) hop_2_d_h)
2241  (=> (and hop_1_d_l hop_1_l_k) hop_2_d_k)
2242  (=> (and hop_1_d_l hop_1_l_j) hop_2_d_j)
2243  (=> (and hop_1_d_l hop_1_l_m) hop_2_d_m)
2244  (=> (and hop_1_d_l hop_1_l_o) hop_2_d_o)
2245  (=> (and hop_1_d_l hop_1_l_n) hop_2_d_n)
2246  (=> (and hop_1_d_l hop_1_l_q) hop_2_d_q)
2247  (=> (and hop_1_d_l hop_1_l_p) hop_2_d_p)
2248  (=> (and hop_1_d_o hop_1_o_a) hop_2_d_a)
2249  (=> (and hop_1_d_o hop_1_o_c) hop_2_d_c)
2250  (=> (and hop_1_d_o hop_1_o_b) hop_2_d_b)
2251  (=> (and hop_1_d_o hop_1_o_e) hop_2_d_e)
2252  (=> (and hop_1_d_o hop_1_o_g) hop_2_d_g)
2253  (=> (and hop_1_d_o hop_1_o_f) hop_2_d_f)
2254  (=> (and hop_1_d_o hop_1_o_i) hop_2_d_i)
2255  (=> (and hop_1_d_o hop_1_o_h) hop_2_d_h)
2256  (=> (and hop_1_d_o hop_1_o_k) hop_2_d_k)
2257  (=> (and hop_1_d_o hop_1_o_j) hop_2_d_j)
2258  (=> (and hop_1_d_o hop_1_o_m) hop_2_d_m)
2259  (=> (and hop_1_d_o hop_1_o_l) hop_2_d_l)
2260  (=> (and hop_1_d_o hop_1_o_n) hop_2_d_n)
2261  (=> (and hop_1_d_o hop_1_o_q) hop_2_d_q)
2262  (=> (and hop_1_d_o hop_1_o_p) hop_2_d_p)
2263  (=> (and hop_1_d_n hop_1_n_a) hop_2_d_a)
2264  (=> (and hop_1_d_n hop_1_n_c) hop_2_d_c)
2265  (=> (and hop_1_d_n hop_1_n_b) hop_2_d_b)
2266  (=> (and hop_1_d_n hop_1_n_e) hop_2_d_e)
2267  (=> (and hop_1_d_n hop_1_n_g) hop_2_d_g)
2268  (=> (and hop_1_d_n hop_1_n_f) hop_2_d_f)
2269  (=> (and hop_1_d_n hop_1_n_i) hop_2_d_i)
2270  (=> (and hop_1_d_n hop_1_n_h) hop_2_d_h)
2271  (=> (and hop_1_d_n hop_1_n_k) hop_2_d_k)
2272  (=> (and hop_1_d_n hop_1_n_j) hop_2_d_j)
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```
2273  (=> (and hop_1_d_n hop_1_n_m) hop_2_d_m)
2274  (=> (and hop_1_d_n hop_1_n_l) hop_2_d_l)
2275  (=> (and hop_1_d_n hop_1_n_o) hop_2_d_o)
2276  (=> (and hop_1_d_n hop_1_n_q) hop_2_d_q)
2277  (=> (and hop_1_d_n hop_1_n_p) hop_2_d_p)
2278  (=> (and hop_1_d_q hop_1_q_a) hop_2_d_a)
2279  (=> (and hop_1_d_q hop_1_q_c) hop_2_d_c)
2280  (=> (and hop_1_d_q hop_1_q_b) hop_2_d_b)
2281  (=> (and hop_1_d_q hop_1_q_e) hop_2_d_e)
2282  (=> (and hop_1_d_q hop_1_q_g) hop_2_d_g)
2283  (=> (and hop_1_d_q hop_1_q_f) hop_2_d_f)
2284  (=> (and hop_1_d_q hop_1_q_i) hop_2_d_i)
2285  (=> (and hop_1_d_q hop_1_q_h) hop_2_d_h)
2286  (=> (and hop_1_d_q hop_1_q_k) hop_2_d_k)
2287  (=> (and hop_1_d_q hop_1_q_j) hop_2_d_j)
2288  (=> (and hop_1_d_q hop_1_q_m) hop_2_d_m)
2289  (=> (and hop_1_d_q hop_1_q_l) hop_2_d_l)
2290  (=> (and hop_1_d_q hop_1_q_o) hop_2_d_o)
2291  (=> (and hop_1_d_q hop_1_q_n) hop_2_d_n)
2292  (=> (and hop_1_d_q hop_1_q_p) hop_2_d_p)
2293  (=> (and hop_1_d_p hop_1_p_a) hop_2_d_a)
2294  (=> (and hop_1_d_p hop_1_p_c) hop_2_d_c)
2295  (=> (and hop_1_d_p hop_1_p_b) hop_2_d_b)
2296  (=> (and hop_1_d_p hop_1_p_e) hop_2_d_e)
2297  (=> (and hop_1_d_p hop_1_p_g) hop_2_d_g)
2298  (=> (and hop_1_d_p hop_1_p_f) hop_2_d_f)
2299  (=> (and hop_1_d_p hop_1_p_i) hop_2_d_i)
2300  (=> (and hop_1_d_p hop_1_p_h) hop_2_d_h)
2301  (=> (and hop_1_d_p hop_1_p_k) hop_2_d_k)
2302  (=> (and hop_1_d_p hop_1_p_j) hop_2_d_j)
2303  (=> (and hop_1_d_p hop_1_p_m) hop_2_d_m)
2304  (=> (and hop_1_d_p hop_1_p_l) hop_2_d_l)
2305  (=> (and hop_1_d_p hop_1_p_o) hop_2_d_o)
2306  (=> (and hop_1_d_p hop_1_p_n) hop_2_d_n)
2307  (=> (and hop_1_d_p hop_1_p_q) hop_2_d_q)
2308  (=> (and hop_1_g_a hop_1_a_c) hop_2_g_c)
2309  (=> (and hop_1_g_a hop_1_a_b) hop_2_g_b)
2310  (=> (and hop_1_g_a hop_1_a_e) hop_2_g_e)
2311  (=> (and hop_1_g_a hop_1_a_d) hop_2_g_d)
2312  (=> (and hop_1_g_a hop_1_a_f) hop_2_g_f)
2313  (=> (and hop_1_g_a hop_1_a_i) hop_2_g_i)
2314  (=> (and hop_1_g_a hop_1_a_h) hop_2_g_h)
2315  (=> (and hop_1_g_a hop_1_a_k) hop_2_g_k)
2316  (=> (and hop_1_g_a hop_1_a_j) hop_2_g_j)
2317  (=> (and hop_1_g_a hop_1_a_m) hop_2_g_m)
2318  (=> (and hop_1_g_a hop_1_a_l) hop_2_g_l)
2319  (=> (and hop_1_g_a hop_1_a_o) hop_2_g_o)
2320  (=> (and hop_1_g_a hop_1_a_n) hop_2_g_n)
2321  (=> (and hop_1_g_a hop_1_a_q) hop_2_g_q)
2322  (=> (and hop_1_g_a hop_1_a_p) hop_2_g_p)
2323  (=> (and hop_1_g_c hop_1_c_a) hop_2_g_a)
2324  (=> (and hop_1_g_c hop_1_c_b) hop_2_g_b)
2325  (=> (and hop_1_g_c hop_1_c_e) hop_2_g_e)
2326  (=> (and hop_1_g_c hop_1_c_d) hop_2_g_d)
2327  (=> (and hop_1_g_c hop_1_c_f) hop_2_g_f)
2328  (=> (and hop_1_g_c hop_1_c_i) hop_2_g_i)
2329  (=> (and hop_1_g_c hop_1_c_h) hop_2_g_h)
2330  (=> (and hop_1_g_c hop_1_c_k) hop_2_g_k)
2331  (=> (and hop_1_g_c hop_1_c_j) hop_2_g_j)
2332  (=> (and hop_1_g_c hop_1_c_m) hop_2_g_m)
2333  (=> (and hop_1_g_c hop_1_c_l) hop_2_g_l)
2334  (=> (and hop_1_g_c hop_1_c_o) hop_2_g_o)
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```
2335   (=> (and hop_1_g_c hop_1_c_n) hop_2_g_n)
2336   (=> (and hop_1_g_c hop_1_c_q) hop_2_g_q)
2337   (=> (and hop_1_g_c hop_1_c_p) hop_2_g_p)
2338   (=> (and hop_1_g_b hop_1_b_a) hop_2_g_a)
2339   (=> (and hop_1_g_b hop_1_b_c) hop_2_g_c)
2340   (=> (and hop_1_g_b hop_1_b_e) hop_2_g_e)
2341   (=> (and hop_1_g_b hop_1_b_d) hop_2_g_d)
2342   (=> (and hop_1_g_b hop_1_b_f) hop_2_g_f)
2343   (=> (and hop_1_g_b hop_1_b_i) hop_2_g_i)
2344   (=> (and hop_1_g_b hop_1_b_h) hop_2_g_h)
2345   (=> (and hop_1_g_b hop_1_b_k) hop_2_g_k)
2346   (=> (and hop_1_g_b hop_1_b_j) hop_2_g_j)
2347   (=> (and hop_1_g_b hop_1_b_m) hop_2_g_m)
2348   (=> (and hop_1_g_b hop_1_b_l) hop_2_g_l)
2349   (=> (and hop_1_g_b hop_1_b_o) hop_2_g_o)
2350   (=> (and hop_1_g_b hop_1_b_n) hop_2_g_n)
2351   (=> (and hop_1_g_b hop_1_b_q) hop_2_g_q)
2352   (=> (and hop_1_g_b hop_1_b_p) hop_2_g_p)
2353   (=> (and hop_1_g_e hop_1_e_a) hop_2_g_a)
2354   (=> (and hop_1_g_e hop_1_e_c) hop_2_g_c)
2355   (=> (and hop_1_g_e hop_1_e_b) hop_2_g_b)
2356   (=> (and hop_1_g_e hop_1_e_d) hop_2_g_d)
2357   (=> (and hop_1_g_e hop_1_e_f) hop_2_g_f)
2358   (=> (and hop_1_g_e hop_1_e_i) hop_2_g_i)
2359   (=> (and hop_1_g_e hop_1_e_h) hop_2_g_h)
2360   (=> (and hop_1_g_e hop_1_e_k) hop_2_g_k)
2361   (=> (and hop_1_g_e hop_1_e_j) hop_2_g_j)
2362   (=> (and hop_1_g_e hop_1_e_m) hop_2_g_m)
2363   (=> (and hop_1_g_e hop_1_e_l) hop_2_g_l)
2364   (=> (and hop_1_g_e hop_1_e_o) hop_2_g_o)
2365   (=> (and hop_1_g_e hop_1_e_n) hop_2_g_n)
2366   (=> (and hop_1_g_e hop_1_e_q) hop_2_g_q)
2367   (=> (and hop_1_g_e hop_1_e_p) hop_2_g_p)
2368   (=> (and hop_1_g_d hop_1_d_a) hop_2_g_a)
2369   (=> (and hop_1_g_d hop_1_d_c) hop_2_g_c)
2370   (=> (and hop_1_g_d hop_1_d_b) hop_2_g_b)
2371   (=> (and hop_1_g_d hop_1_d_e) hop_2_g_e)
2372   (=> (and hop_1_g_d hop_1_d_f) hop_2_g_f)
2373   (=> (and hop_1_g_d hop_1_d_i) hop_2_g_i)
2374   (=> (and hop_1_g_d hop_1_d_h) hop_2_g_h)
2375   (=> (and hop_1_g_d hop_1_d_k) hop_2_g_k)
2376   (=> (and hop_1_g_d hop_1_d_j) hop_2_g_j)
2377   (=> (and hop_1_g_d hop_1_d_m) hop_2_g_m)
2378   (=> (and hop_1_g_d hop_1_d_l) hop_2_g_l)
2379   (=> (and hop_1_g_d hop_1_d_o) hop_2_g_o)
2380   (=> (and hop_1_g_d hop_1_d_n) hop_2_g_n)
2381   (=> (and hop_1_g_d hop_1_d_q) hop_2_g_q)
2382   (=> (and hop_1_g_d hop_1_d_p) hop_2_g_p)
2383   (=> (and hop_1_g_f hop_1_f_a) hop_2_g_a)
2384   (=> (and hop_1_g_f hop_1_f_c) hop_2_g_c)
2385   (=> (and hop_1_g_f hop_1_f_b) hop_2_g_b)
2386   (=> (and hop_1_g_f hop_1_f_e) hop_2_g_e)
2387   (=> (and hop_1_g_f hop_1_f_d) hop_2_g_d)
2388   (=> (and hop_1_g_f hop_1_f_i) hop_2_g_i)
2389   (=> (and hop_1_g_f hop_1_f_h) hop_2_g_h)
2390   (=> (and hop_1_g_f hop_1_f_k) hop_2_g_k)
2391   (=> (and hop_1_g_f hop_1_f_j) hop_2_g_j)
2392   (=> (and hop_1_g_f hop_1_f_m) hop_2_g_m)
2393   (=> (and hop_1_g_f hop_1_f_l) hop_2_g_l)
2394   (=> (and hop_1_g_f hop_1_f_o) hop_2_g_o)
2395   (=> (and hop_1_g_f hop_1_f_n) hop_2_g_n)
2396   (=> (and hop_1_g_f hop_1_f_q) hop_2_g_q)
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2397  (=> (and hop_1_g_f hop_1_f_p) hop_2_g_p)
2398  (=> (and hop_1_g_i hop_1_i_a) hop_2_g_a)
2399  (=> (and hop_1_g_i hop_1_i_c) hop_2_g_c)
2400  (=> (and hop_1_g_i hop_1_i_b) hop_2_g_b)
2401  (=> (and hop_1_g_i hop_1_i_e) hop_2_g_e)
2402  (=> (and hop_1_g_i hop_1_i_d) hop_2_g_d)
2403  (=> (and hop_1_g_i hop_1_i_f) hop_2_g_f)
2404  (=> (and hop_1_g_i hop_1_i_h) hop_2_g_h)
2405  (=> (and hop_1_g_i hop_1_i_k) hop_2_g_k)
2406  (=> (and hop_1_g_i hop_1_i_j) hop_2_g_j)
2407  (=> (and hop_1_g_i hop_1_i_m) hop_2_g_m)
2408  (=> (and hop_1_g_i hop_1_i_l) hop_2_g_l)
2409  (=> (and hop_1_g_i hop_1_i_o) hop_2_g_o)
2410  (=> (and hop_1_g_i hop_1_i_n) hop_2_g_n)
2411  (=> (and hop_1_g_i hop_1_i_q) hop_2_g_q)
2412  (=> (and hop_1_g_i hop_1_i_p) hop_2_g_p)
2413  (=> (and hop_1_g_h hop_1_h_a) hop_2_g_a)
2414  (=> (and hop_1_g_h hop_1_h_c) hop_2_g_c)
2415  (=> (and hop_1_g_h hop_1_h_b) hop_2_g_b)
2416  (=> (and hop_1_g_h hop_1_h_e) hop_2_g_e)
2417  (=> (and hop_1_g_h hop_1_h_d) hop_2_g_d)
2418  (=> (and hop_1_g_h hop_1_h_f) hop_2_g_f)
2419  (=> (and hop_1_g_h hop_1_h_i) hop_2_g_i)
2420  (=> (and hop_1_g_h hop_1_h_k) hop_2_g_k)
2421  (=> (and hop_1_g_h hop_1_h_j) hop_2_g_j)
2422  (=> (and hop_1_g_h hop_1_h_m) hop_2_g_m)
2423  (=> (and hop_1_g_h hop_1_h_l) hop_2_g_l)
2424  (=> (and hop_1_g_h hop_1_h_o) hop_2_g_o)
2425  (=> (and hop_1_g_h hop_1_h_n) hop_2_g_n)
2426  (=> (and hop_1_g_h hop_1_h_q) hop_2_g_q)
2427  (=> (and hop_1_g_h hop_1_h_p) hop_2_g_p)
2428  (=> (and hop_1_g_k hop_1_k_a) hop_2_g_a)
2429  (=> (and hop_1_g_k hop_1_k_c) hop_2_g_c)
2430  (=> (and hop_1_g_k hop_1_k_b) hop_2_g_b)
2431  (=> (and hop_1_g_k hop_1_k_e) hop_2_g_e)
2432  (=> (and hop_1_g_k hop_1_k_d) hop_2_g_d)
2433  (=> (and hop_1_g_k hop_1_k_f) hop_2_g_f)
2434  (=> (and hop_1_g_k hop_1_k_i) hop_2_g_i)
2435  (=> (and hop_1_g_k hop_1_k_h) hop_2_g_h)
2436  (=> (and hop_1_g_k hop_1_k_j) hop_2_g_j)
2437  (=> (and hop_1_g_k hop_1_k_m) hop_2_g_m)
2438  (=> (and hop_1_g_k hop_1_k_l) hop_2_g_l)
2439  (=> (and hop_1_g_k hop_1_k_o) hop_2_g_o)
2440  (=> (and hop_1_g_k hop_1_k_n) hop_2_g_n)
2441  (=> (and hop_1_g_k hop_1_k_q) hop_2_g_q)
2442  (=> (and hop_1_g_k hop_1_k_p) hop_2_g_p)
2443  (=> (and hop_1_g_j hop_1_j_a) hop_2_g_a)
2444  (=> (and hop_1_g_j hop_1_j_c) hop_2_g_c)
2445  (=> (and hop_1_g_j hop_1_j_b) hop_2_g_b)
2446  (=> (and hop_1_g_j hop_1_j_e) hop_2_g_e)
2447  (=> (and hop_1_g_j hop_1_j_d) hop_2_g_d)
2448  (=> (and hop_1_g_j hop_1_j_f) hop_2_g_f)
2449  (=> (and hop_1_g_j hop_1_j_i) hop_2_g_i)
2450  (=> (and hop_1_g_j hop_1_j_h) hop_2_g_h)
2451  (=> (and hop_1_g_j hop_1_j_k) hop_2_g_k)
2452  (=> (and hop_1_g_j hop_1_j_m) hop_2_g_m)
2453  (=> (and hop_1_g_j hop_1_j_l) hop_2_g_l)
2454  (=> (and hop_1_g_j hop_1_j_o) hop_2_g_o)
2455  (=> (and hop_1_g_j hop_1_j_n) hop_2_g_n)
2456  (=> (and hop_1_g_j hop_1_j_q) hop_2_g_q)
2457  (=> (and hop_1_g_j hop_1_j_p) hop_2_g_p)
2458  (=> (and hop_1_g_m hop_1_m_a) hop_2_g_a)
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2459   (=> (and hop_1_g_m hop_1_m_c) hop_2_g_c)
2460   (=> (and hop_1_g_m hop_1_m_b) hop_2_g_b)
2461   (=> (and hop_1_g_m hop_1_m_e) hop_2_g_e)
2462   (=> (and hop_1_g_m hop_1_m_d) hop_2_g_d)
2463   (=> (and hop_1_g_m hop_1_m_f) hop_2_g_f)
2464   (=> (and hop_1_g_m hop_1_m_i) hop_2_g_i)
2465   (=> (and hop_1_g_m hop_1_m_h) hop_2_g_h)
2466   (=> (and hop_1_g_m hop_1_m_k) hop_2_g_k)
2467   (=> (and hop_1_g_m hop_1_m_j) hop_2_g_j)
2468   (=> (and hop_1_g_m hop_1_m_l) hop_2_g_l)
2469   (=> (and hop_1_g_m hop_1_m_o) hop_2_g_o)
2470   (=> (and hop_1_g_m hop_1_m_n) hop_2_g_n)
2471   (=> (and hop_1_g_m hop_1_m_q) hop_2_g_q)
2472   (=> (and hop_1_g_m hop_1_m_p) hop_2_g_p)
2473   (=> (and hop_1_g_l hop_1_l_a) hop_2_g_a)
2474   (=> (and hop_1_g_l hop_1_l_c) hop_2_g_c)
2475   (=> (and hop_1_g_l hop_1_l_b) hop_2_g_b)
2476   (=> (and hop_1_g_l hop_1_l_e) hop_2_g_e)
2477   (=> (and hop_1_g_l hop_1_l_d) hop_2_g_d)
2478   (=> (and hop_1_g_l hop_1_l_f) hop_2_g_f)
2479   (=> (and hop_1_g_l hop_1_l_i) hop_2_g_i)
2480   (=> (and hop_1_g_l hop_1_l_h) hop_2_g_h)
2481   (=> (and hop_1_g_l hop_1_l_k) hop_2_g_k)
2482   (=> (and hop_1_g_l hop_1_l_j) hop_2_g_j)
2483   (=> (and hop_1_g_l hop_1_l_m) hop_2_g_m)
2484   (=> (and hop_1_g_l hop_1_l_o) hop_2_g_o)
2485   (=> (and hop_1_g_l hop_1_l_n) hop_2_g_n)
2486   (=> (and hop_1_g_l hop_1_l_q) hop_2_g_q)
2487   (=> (and hop_1_g_l hop_1_l_p) hop_2_g_p)
2488   (=> (and hop_1_g_o hop_1_o_a) hop_2_g_a)
2489   (=> (and hop_1_g_o hop_1_o_c) hop_2_g_c)
2490   (=> (and hop_1_g_o hop_1_o_b) hop_2_g_b)
2491   (=> (and hop_1_g_o hop_1_o_e) hop_2_g_e)
2492   (=> (and hop_1_g_o hop_1_o_d) hop_2_g_d)
2493   (=> (and hop_1_g_o hop_1_o_f) hop_2_g_f)
2494   (=> (and hop_1_g_o hop_1_o_i) hop_2_g_i)
2495   (=> (and hop_1_g_o hop_1_o_h) hop_2_g_h)
2496   (=> (and hop_1_g_o hop_1_o_k) hop_2_g_k)
2497   (=> (and hop_1_g_o hop_1_o_j) hop_2_g_j)
2498   (=> (and hop_1_g_o hop_1_o_m) hop_2_g_m)
2499   (=> (and hop_1_g_o hop_1_o_l) hop_2_g_l)
2500   (=> (and hop_1_g_o hop_1_o_n) hop_2_g_n)
2501   (=> (and hop_1_g_o hop_1_o_q) hop_2_g_q)
2502   (=> (and hop_1_g_o hop_1_o_p) hop_2_g_p)
2503   (=> (and hop_1_g_n hop_1_n_a) hop_2_g_a)
2504   (=> (and hop_1_g_n hop_1_n_c) hop_2_g_c)
2505   (=> (and hop_1_g_n hop_1_n_b) hop_2_g_b)
2506   (=> (and hop_1_g_n hop_1_n_e) hop_2_g_e)
2507   (=> (and hop_1_g_n hop_1_n_d) hop_2_g_d)
2508   (=> (and hop_1_g_n hop_1_n_f) hop_2_g_f)
2509   (=> (and hop_1_g_n hop_1_n_i) hop_2_g_i)
2510   (=> (and hop_1_g_n hop_1_n_h) hop_2_g_h)
2511   (=> (and hop_1_g_n hop_1_n_k) hop_2_g_k)
2512   (=> (and hop_1_g_n hop_1_n_j) hop_2_g_j)
2513   (=> (and hop_1_g_n hop_1_n_m) hop_2_g_m)
2514   (=> (and hop_1_g_n hop_1_n_l) hop_2_g_l)
2515   (=> (and hop_1_g_n hop_1_n_o) hop_2_g_o)
2516   (=> (and hop_1_g_n hop_1_n_q) hop_2_g_q)
2517   (=> (and hop_1_g_n hop_1_n_p) hop_2_g_p)
2518   (=> (and hop_1_g_q hop_1_q_a) hop_2_g_a)
2519   (=> (and hop_1_g_q hop_1_q_c) hop_2_g_c)
2520   (=> (and hop_1_g_q hop_1_q_b) hop_2_g_b)
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2521  (=> (and hop_1_g_q hop_1_q_e) hop_2_g_e)
2522  (=> (and hop_1_g_q hop_1_q_d) hop_2_g_d)
2523  (=> (and hop_1_g_q hop_1_q_f) hop_2_g_f)
2524  (=> (and hop_1_g_q hop_1_q_i) hop_2_g_i)
2525  (=> (and hop_1_g_q hop_1_q_h) hop_2_g_h)
2526  (=> (and hop_1_g_q hop_1_q_k) hop_2_g_k)
2527  (=> (and hop_1_g_q hop_1_q_j) hop_2_g_j)
2528  (=> (and hop_1_g_q hop_1_q_m) hop_2_g_m)
2529  (=> (and hop_1_g_q hop_1_q_l) hop_2_g_l)
2530  (=> (and hop_1_g_q hop_1_q_o) hop_2_g_o)
2531  (=> (and hop_1_g_q hop_1_q_n) hop_2_g_n)
2532  (=> (and hop_1_g_q hop_1_q_p) hop_2_g_p)
2533  (=> (and hop_1_g_p hop_1_p_a) hop_2_g_a)
2534  (=> (and hop_1_g_p hop_1_p_c) hop_2_g_c)
2535  (=> (and hop_1_g_p hop_1_p_b) hop_2_g_b)
2536  (=> (and hop_1_g_p hop_1_p_e) hop_2_g_e)
2537  (=> (and hop_1_g_p hop_1_p_d) hop_2_g_d)
2538  (=> (and hop_1_g_p hop_1_p_f) hop_2_g_f)
2539  (=> (and hop_1_g_p hop_1_p_i) hop_2_g_i)
2540  (=> (and hop_1_g_p hop_1_p_h) hop_2_g_h)
2541  (=> (and hop_1_g_p hop_1_p_k) hop_2_g_k)
2542  (=> (and hop_1_g_p hop_1_p_j) hop_2_g_j)
2543  (=> (and hop_1_g_p hop_1_p_m) hop_2_g_m)
2544  (=> (and hop_1_g_p hop_1_p_l) hop_2_g_l)
2545  (=> (and hop_1_g_p hop_1_p_o) hop_2_g_o)
2546  (=> (and hop_1_g_p hop_1_p_n) hop_2_g_n)
2547  (=> (and hop_1_g_p hop_1_p_q) hop_2_g_q)
2548  (=> (and hop_1_f_a hop_1_a_c) hop_2_f_c)
2549  (=> (and hop_1_f_a hop_1_a_b) hop_2_f_b)
2550  (=> (and hop_1_f_a hop_1_a_e) hop_2_f_e)
2551  (=> (and hop_1_f_a hop_1_a_d) hop_2_f_d)
2552  (=> (and hop_1_f_a hop_1_a_g) hop_2_f_g)
2553  (=> (and hop_1_f_a hop_1_a_i) hop_2_f_i)
2554  (=> (and hop_1_f_a hop_1_a_h) hop_2_f_h)
2555  (=> (and hop_1_f_a hop_1_a_k) hop_2_f_k)
2556  (=> (and hop_1_f_a hop_1_a_j) hop_2_f_j)
2557  (=> (and hop_1_f_a hop_1_a_m) hop_2_f_m)
2558  (=> (and hop_1_f_a hop_1_a_l) hop_2_f_l)
2559  (=> (and hop_1_f_a hop_1_a_o) hop_2_f_o)
2560  (=> (and hop_1_f_a hop_1_a_n) hop_2_f_n)
2561  (=> (and hop_1_f_a hop_1_a_q) hop_2_f_q)
2562  (=> (and hop_1_f_a hop_1_a_p) hop_2_f_p)
2563  (=> (and hop_1_f_c hop_1_c_a) hop_2_f_a)
2564  (=> (and hop_1_f_c hop_1_c_b) hop_2_f_b)
2565  (=> (and hop_1_f_c hop_1_c_e) hop_2_f_e)
2566  (=> (and hop_1_f_c hop_1_c_d) hop_2_f_d)
2567  (=> (and hop_1_f_c hop_1_c_g) hop_2_f_g)
2568  (=> (and hop_1_f_c hop_1_c_i) hop_2_f_i)
2569  (=> (and hop_1_f_c hop_1_c_h) hop_2_f_h)
2570  (=> (and hop_1_f_c hop_1_c_k) hop_2_f_k)
2571  (=> (and hop_1_f_c hop_1_c_j) hop_2_f_j)
2572  (=> (and hop_1_f_c hop_1_c_m) hop_2_f_m)
2573  (=> (and hop_1_f_c hop_1_c_l) hop_2_f_l)
2574  (=> (and hop_1_f_c hop_1_c_o) hop_2_f_o)
2575  (=> (and hop_1_f_c hop_1_c_n) hop_2_f_n)
2576  (=> (and hop_1_f_c hop_1_c_q) hop_2_f_q)
2577  (=> (and hop_1_f_c hop_1_c_p) hop_2_f_p)
2578  (=> (and hop_1_f_b hop_1_b_a) hop_2_f_a)
2579  (=> (and hop_1_f_b hop_1_b_c) hop_2_f_c)
2580  (=> (and hop_1_f_b hop_1_b_e) hop_2_f_e)
2581  (=> (and hop_1_f_b hop_1_b_d) hop_2_f_d)
2582  (=> (and hop_1_f_b hop_1_b_g) hop_2_f_g)
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2583  (=> (and hop_1_f_b hop_1_b_i) hop_2_f_i)
2584  (=> (and hop_1_f_b hop_1_b_h) hop_2_f_h)
2585  (=> (and hop_1_f_b hop_1_b_k) hop_2_f_k)
2586  (=> (and hop_1_f_b hop_1_b_j) hop_2_f_j)
2587  (=> (and hop_1_f_b hop_1_b_m) hop_2_f_m)
2588  (=> (and hop_1_f_b hop_1_b_l) hop_2_f_l)
2589  (=> (and hop_1_f_b hop_1_b_o) hop_2_f_o)
2590  (=> (and hop_1_f_b hop_1_b_n) hop_2_f_n)
2591  (=> (and hop_1_f_b hop_1_b_q) hop_2_f_q)
2592  (=> (and hop_1_f_b hop_1_b_p) hop_2_f_p)
2593  (=> (and hop_1_f_e hop_1_e_a) hop_2_f_a)
2594  (=> (and hop_1_f_e hop_1_e_c) hop_2_f_c)
2595  (=> (and hop_1_f_e hop_1_e_b) hop_2_f_b)
2596  (=> (and hop_1_f_e hop_1_e_d) hop_2_f_d)
2597  (=> (and hop_1_f_e hop_1_e_g) hop_2_f_g)
2598  (=> (and hop_1_f_e hop_1_e_i) hop_2_f_i)
2599  (=> (and hop_1_f_e hop_1_e_h) hop_2_f_h)
2600  (=> (and hop_1_f_e hop_1_e_k) hop_2_f_k)
2601  (=> (and hop_1_f_e hop_1_e_j) hop_2_f_j)
2602  (=> (and hop_1_f_e hop_1_e_m) hop_2_f_m)
2603  (=> (and hop_1_f_e hop_1_e_l) hop_2_f_l)
2604  (=> (and hop_1_f_e hop_1_e_o) hop_2_f_o)
2605  (=> (and hop_1_f_e hop_1_e_n) hop_2_f_n)
2606  (=> (and hop_1_f_e hop_1_e_q) hop_2_f_q)
2607  (=> (and hop_1_f_e hop_1_e_p) hop_2_f_p)
2608  (=> (and hop_1_f_d hop_1_d_a) hop_2_f_a)
2609  (=> (and hop_1_f_d hop_1_d_c) hop_2_f_c)
2610  (=> (and hop_1_f_d hop_1_d_b) hop_2_f_b)
2611  (=> (and hop_1_f_d hop_1_d_e) hop_2_f_e)
2612  (=> (and hop_1_f_d hop_1_d_g) hop_2_f_g)
2613  (=> (and hop_1_f_d hop_1_d_i) hop_2_f_i)
2614  (=> (and hop_1_f_d hop_1_d_h) hop_2_f_h)
2615  (=> (and hop_1_f_d hop_1_d_k) hop_2_f_k)
2616  (=> (and hop_1_f_d hop_1_d_j) hop_2_f_j)
2617  (=> (and hop_1_f_d hop_1_d_m) hop_2_f_m)
2618  (=> (and hop_1_f_d hop_1_d_l) hop_2_f_l)
2619  (=> (and hop_1_f_d hop_1_d_o) hop_2_f_o)
2620  (=> (and hop_1_f_d hop_1_d_n) hop_2_f_n)
2621  (=> (and hop_1_f_d hop_1_d_q) hop_2_f_q)
2622  (=> (and hop_1_f_d hop_1_d_p) hop_2_f_p)
2623  (=> (and hop_1_f_g hop_1_g_a) hop_2_f_a)
2624  (=> (and hop_1_f_g hop_1_g_c) hop_2_f_c)
2625  (=> (and hop_1_f_g hop_1_g_b) hop_2_f_b)
2626  (=> (and hop_1_f_g hop_1_g_e) hop_2_f_e)
2627  (=> (and hop_1_f_g hop_1_g_d) hop_2_f_d)
2628  (=> (and hop_1_f_g hop_1_g_i) hop_2_f_i)
2629  (=> (and hop_1_f_g hop_1_g_h) hop_2_f_h)
2630  (=> (and hop_1_f_g hop_1_g_k) hop_2_f_k)
2631  (=> (and hop_1_f_g hop_1_g_j) hop_2_f_j)
2632  (=> (and hop_1_f_g hop_1_g_m) hop_2_f_m)
2633  (=> (and hop_1_f_g hop_1_g_l) hop_2_f_l)
2634  (=> (and hop_1_f_g hop_1_g_o) hop_2_f_o)
2635  (=> (and hop_1_f_g hop_1_g_n) hop_2_f_n)
2636  (=> (and hop_1_f_g hop_1_g_q) hop_2_f_q)
2637  (=> (and hop_1_f_g hop_1_g_p) hop_2_f_p)
2638  (=> (and hop_1_f_i hop_1_i_a) hop_2_f_a)
2639  (=> (and hop_1_f_i hop_1_i_c) hop_2_f_c)
2640  (=> (and hop_1_f_i hop_1_i_b) hop_2_f_b)
2641  (=> (and hop_1_f_i hop_1_i_e) hop_2_f_e)
2642  (=> (and hop_1_f_i hop_1_i_d) hop_2_f_d)
2643  (=> (and hop_1_f_i hop_1_i_g) hop_2_f_g)
2644  (=> (and hop_1_f_i hop_1_i_h) hop_2_f_h)
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2645   (=> (and hop_1_f_i hop_1_i_k) hop_2_f_k)
2646   (=> (and hop_1_f_i hop_1_i_j) hop_2_f_j)
2647   (=> (and hop_1_f_i hop_1_i_m) hop_2_f_m)
2648   (=> (and hop_1_f_i hop_1_i_l) hop_2_f_l)
2649   (=> (and hop_1_f_i hop_1_i_o) hop_2_f_o)
2650   (=> (and hop_1_f_i hop_1_i_n) hop_2_f_n)
2651   (=> (and hop_1_f_i hop_1_i_q) hop_2_f_q)
2652   (=> (and hop_1_f_i hop_1_i_p) hop_2_f_p)
2653   (=> (and hop_1_f_h hop_1_h_a) hop_2_f_a)
2654   (=> (and hop_1_f_h hop_1_h_c) hop_2_f_c)
2655   (=> (and hop_1_f_h hop_1_h_b) hop_2_f_b)
2656   (=> (and hop_1_f_h hop_1_h_e) hop_2_f_e)
2657   (=> (and hop_1_f_h hop_1_h_d) hop_2_f_d)
2658   (=> (and hop_1_f_h hop_1_h_g) hop_2_f_g)
2659   (=> (and hop_1_f_h hop_1_h_i) hop_2_f_i)
2660   (=> (and hop_1_f_h hop_1_h_k) hop_2_f_k)
2661   (=> (and hop_1_f_h hop_1_h_j) hop_2_f_j)
2662   (=> (and hop_1_f_h hop_1_h_m) hop_2_f_m)
2663   (=> (and hop_1_f_h hop_1_h_l) hop_2_f_l)
2664   (=> (and hop_1_f_h hop_1_h_o) hop_2_f_o)
2665   (=> (and hop_1_f_h hop_1_h_n) hop_2_f_n)
2666   (=> (and hop_1_f_h hop_1_h_q) hop_2_f_q)
2667   (=> (and hop_1_f_h hop_1_h_p) hop_2_f_p)
2668   (=> (and hop_1_f_k hop_1_k_a) hop_2_f_a)
2669   (=> (and hop_1_f_k hop_1_k_c) hop_2_f_c)
2670   (=> (and hop_1_f_k hop_1_k_b) hop_2_f_b)
2671   (=> (and hop_1_f_k hop_1_k_e) hop_2_f_e)
2672   (=> (and hop_1_f_k hop_1_k_d) hop_2_f_d)
2673   (=> (and hop_1_f_k hop_1_k_g) hop_2_f_g)
2674   (=> (and hop_1_f_k hop_1_k_i) hop_2_f_i)
2675   (=> (and hop_1_f_k hop_1_k_h) hop_2_f_h)
2676   (=> (and hop_1_f_k hop_1_k_j) hop_2_f_j)
2677   (=> (and hop_1_f_k hop_1_k_m) hop_2_f_m)
2678   (=> (and hop_1_f_k hop_1_k_l) hop_2_f_l)
2679   (=> (and hop_1_f_k hop_1_k_o) hop_2_f_o)
2680   (=> (and hop_1_f_k hop_1_k_n) hop_2_f_n)
2681   (=> (and hop_1_f_k hop_1_k_q) hop_2_f_q)
2682   (=> (and hop_1_f_k hop_1_k_p) hop_2_f_p)
2683   (=> (and hop_1_f_j hop_1_j_a) hop_2_f_a)
2684   (=> (and hop_1_f_j hop_1_j_c) hop_2_f_c)
2685   (=> (and hop_1_f_j hop_1_j_b) hop_2_f_b)
2686   (=> (and hop_1_f_j hop_1_j_e) hop_2_f_e)
2687   (=> (and hop_1_f_j hop_1_j_d) hop_2_f_d)
2688   (=> (and hop_1_f_j hop_1_j_g) hop_2_f_g)
2689   (=> (and hop_1_f_j hop_1_j_i) hop_2_f_i)
2690   (=> (and hop_1_f_j hop_1_j_h) hop_2_f_h)
2691   (=> (and hop_1_f_j hop_1_j_k) hop_2_f_k)
2692   (=> (and hop_1_f_j hop_1_j_m) hop_2_f_m)
2693   (=> (and hop_1_f_j hop_1_j_l) hop_2_f_l)
2694   (=> (and hop_1_f_j hop_1_j_o) hop_2_f_o)
2695   (=> (and hop_1_f_j hop_1_j_n) hop_2_f_n)
2696   (=> (and hop_1_f_j hop_1_j_q) hop_2_f_q)
2697   (=> (and hop_1_f_j hop_1_j_p) hop_2_f_p)
2698   (=> (and hop_1_f_m hop_1_m_a) hop_2_f_a)
2699   (=> (and hop_1_f_m hop_1_m_c) hop_2_f_c)
2700   (=> (and hop_1_f_m hop_1_m_b) hop_2_f_b)
2701   (=> (and hop_1_f_m hop_1_m_e) hop_2_f_e)
2702   (=> (and hop_1_f_m hop_1_m_d) hop_2_f_d)
2703   (=> (and hop_1_f_m hop_1_m_g) hop_2_f_g)
2704   (=> (and hop_1_f_m hop_1_m_i) hop_2_f_i)
2705   (=> (and hop_1_f_m hop_1_m_h) hop_2_f_h)
2706   (=> (and hop_1_f_m hop_1_m_k) hop_2_f_k)
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2707  (=> (and hop_1_f_m hop_1_m_j) hop_2_f_j)
2708  (=> (and hop_1_f_m hop_1_m_l) hop_2_f_l)
2709  (=> (and hop_1_f_m hop_1_m_o) hop_2_f_o)
2710  (=> (and hop_1_f_m hop_1_m_n) hop_2_f_n)
2711  (=> (and hop_1_f_m hop_1_m_q) hop_2_f_q)
2712  (=> (and hop_1_f_m hop_1_m_p) hop_2_f_p)
2713  (=> (and hop_1_f_l hop_1_l_a) hop_2_f_a)
2714  (=> (and hop_1_f_l hop_1_l_c) hop_2_f_c)
2715  (=> (and hop_1_f_l hop_1_l_b) hop_2_f_b)
2716  (=> (and hop_1_f_l hop_1_l_e) hop_2_f_e)
2717  (=> (and hop_1_f_l hop_1_l_d) hop_2_f_d)
2718  (=> (and hop_1_f_l hop_1_l_g) hop_2_f_g)
2719  (=> (and hop_1_f_l hop_1_l_i) hop_2_f_i)
2720  (=> (and hop_1_f_l hop_1_l_h) hop_2_f_h)
2721  (=> (and hop_1_f_l hop_1_l_k) hop_2_f_k)
2722  (=> (and hop_1_f_l hop_1_l_j) hop_2_f_j)
2723  (=> (and hop_1_f_l hop_1_l_m) hop_2_f_m)
2724  (=> (and hop_1_f_l hop_1_l_o) hop_2_f_o)
2725  (=> (and hop_1_f_l hop_1_l_n) hop_2_f_n)
2726  (=> (and hop_1_f_l hop_1_l_q) hop_2_f_q)
2727  (=> (and hop_1_f_l hop_1_l_p) hop_2_f_p)
2728  (=> (and hop_1_f_o hop_1_o_a) hop_2_f_a)
2729  (=> (and hop_1_f_o hop_1_o_c) hop_2_f_c)
2730  (=> (and hop_1_f_o hop_1_o_b) hop_2_f_b)
2731  (=> (and hop_1_f_o hop_1_o_e) hop_2_f_e)
2732  (=> (and hop_1_f_o hop_1_o_d) hop_2_f_d)
2733  (=> (and hop_1_f_o hop_1_o_g) hop_2_f_g)
2734  (=> (and hop_1_f_o hop_1_o_i) hop_2_f_i)
2735  (=> (and hop_1_f_o hop_1_o_h) hop_2_f_h)
2736  (=> (and hop_1_f_o hop_1_o_k) hop_2_f_k)
2737  (=> (and hop_1_f_o hop_1_o_j) hop_2_f_j)
2738  (=> (and hop_1_f_o hop_1_o_m) hop_2_f_m)
2739  (=> (and hop_1_f_o hop_1_o_l) hop_2_f_l)
2740  (=> (and hop_1_f_o hop_1_o_n) hop_2_f_n)
2741  (=> (and hop_1_f_o hop_1_o_q) hop_2_f_q)
2742  (=> (and hop_1_f_o hop_1_o_p) hop_2_f_p)
2743  (=> (and hop_1_f_n hop_1_n_a) hop_2_f_a)
2744  (=> (and hop_1_f_n hop_1_n_c) hop_2_f_c)
2745  (=> (and hop_1_f_n hop_1_n_b) hop_2_f_b)
2746  (=> (and hop_1_f_n hop_1_n_e) hop_2_f_e)
2747  (=> (and hop_1_f_n hop_1_n_d) hop_2_f_d)
2748  (=> (and hop_1_f_n hop_1_n_g) hop_2_f_g)
2749  (=> (and hop_1_f_n hop_1_n_i) hop_2_f_i)
2750  (=> (and hop_1_f_n hop_1_n_h) hop_2_f_h)
2751  (=> (and hop_1_f_n hop_1_n_k) hop_2_f_k)
2752  (=> (and hop_1_f_n hop_1_n_j) hop_2_f_j)
2753  (=> (and hop_1_f_n hop_1_n_m) hop_2_f_m)
2754  (=> (and hop_1_f_n hop_1_n_l) hop_2_f_l)
2755  (=> (and hop_1_f_n hop_1_n_o) hop_2_f_o)
2756  (=> (and hop_1_f_n hop_1_n_q) hop_2_f_q)
2757  (=> (and hop_1_f_n hop_1_n_p) hop_2_f_p)
2758  (=> (and hop_1_f_q hop_1_q_a) hop_2_f_a)
2759  (=> (and hop_1_f_q hop_1_q_c) hop_2_f_c)
2760  (=> (and hop_1_f_q hop_1_q_b) hop_2_f_b)
2761  (=> (and hop_1_f_q hop_1_q_e) hop_2_f_e)
2762  (=> (and hop_1_f_q hop_1_q_d) hop_2_f_d)
2763  (=> (and hop_1_f_q hop_1_q_g) hop_2_f_g)
2764  (=> (and hop_1_f_q hop_1_q_i) hop_2_f_i)
2765  (=> (and hop_1_f_q hop_1_q_h) hop_2_f_h)
2766  (=> (and hop_1_f_q hop_1_q_k) hop_2_f_k)
2767  (=> (and hop_1_f_q hop_1_q_j) hop_2_f_j)
2768  (=> (and hop_1_f_q hop_1_q_m) hop_2_f_m)
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2769  (=> (and hop_1_f_q hop_1_q_l) hop_2_f_l)
2770  (=> (and hop_1_f_q hop_1_q_o) hop_2_f_o)
2771  (=> (and hop_1_f_q hop_1_q_n) hop_2_f_n)
2772  (=> (and hop_1_f_q hop_1_q_p) hop_2_f_p)
2773  (=> (and hop_1_f_p hop_1_p_a) hop_2_f_a)
2774  (=> (and hop_1_f_p hop_1_p_c) hop_2_f_c)
2775  (=> (and hop_1_f_p hop_1_p_b) hop_2_f_b)
2776  (=> (and hop_1_f_p hop_1_p_e) hop_2_f_e)
2777  (=> (and hop_1_f_p hop_1_p_d) hop_2_f_d)
2778  (=> (and hop_1_f_p hop_1_p_g) hop_2_f_g)
2779  (=> (and hop_1_f_p hop_1_p_i) hop_2_f_i)
2780  (=> (and hop_1_f_p hop_1_p_h) hop_2_f_h)
2781  (=> (and hop_1_f_p hop_1_p_k) hop_2_f_k)
2782  (=> (and hop_1_f_p hop_1_p_j) hop_2_f_j)
2783  (=> (and hop_1_f_p hop_1_p_m) hop_2_f_m)
2784  (=> (and hop_1_f_p hop_1_p_l) hop_2_f_l)
2785  (=> (and hop_1_f_p hop_1_p_o) hop_2_f_o)
2786  (=> (and hop_1_f_p hop_1_p_n) hop_2_f_n)
2787  (=> (and hop_1_f_p hop_1_p_q) hop_2_f_q)
2788  (=> (and hop_1_i_a hop_1_a_c) hop_2_i_c)
2789  (=> (and hop_1_i_a hop_1_a_b) hop_2_i_b)
2790  (=> (and hop_1_i_a hop_1_a_e) hop_2_i_e)
2791  (=> (and hop_1_i_a hop_1_a_d) hop_2_i_d)
2792  (=> (and hop_1_i_a hop_1_a_g) hop_2_i_g)
2793  (=> (and hop_1_i_a hop_1_a_f) hop_2_i_f)
2794  (=> (and hop_1_i_a hop_1_a_h) hop_2_i_h)
2795  (=> (and hop_1_i_a hop_1_a_k) hop_2_i_k)
2796  (=> (and hop_1_i_a hop_1_a_j) hop_2_i_j)
2797  (=> (and hop_1_i_a hop_1_a_m) hop_2_i_m)
2798  (=> (and hop_1_i_a hop_1_a_l) hop_2_i_l)
2799  (=> (and hop_1_i_a hop_1_a_o) hop_2_i_o)
2800  (=> (and hop_1_i_a hop_1_a_n) hop_2_i_n)
2801  (=> (and hop_1_i_a hop_1_a_q) hop_2_i_q)
2802  (=> (and hop_1_i_a hop_1_a_p) hop_2_i_p)
2803  (=> (and hop_1_i_c hop_1_c_a) hop_2_i_a)
2804  (=> (and hop_1_i_c hop_1_c_b) hop_2_i_b)
2805  (=> (and hop_1_i_c hop_1_c_e) hop_2_i_e)
2806  (=> (and hop_1_i_c hop_1_c_d) hop_2_i_d)
2807  (=> (and hop_1_i_c hop_1_c_g) hop_2_i_g)
2808  (=> (and hop_1_i_c hop_1_c_f) hop_2_i_f)
2809  (=> (and hop_1_i_c hop_1_c_h) hop_2_i_h)
2810  (=> (and hop_1_i_c hop_1_c_k) hop_2_i_k)
2811  (=> (and hop_1_i_c hop_1_c_j) hop_2_i_j)
2812  (=> (and hop_1_i_c hop_1_c_m) hop_2_i_m)
2813  (=> (and hop_1_i_c hop_1_c_l) hop_2_i_l)
2814  (=> (and hop_1_i_c hop_1_c_o) hop_2_i_o)
2815  (=> (and hop_1_i_c hop_1_c_n) hop_2_i_n)
2816  (=> (and hop_1_i_c hop_1_c_q) hop_2_i_q)
2817  (=> (and hop_1_i_c hop_1_c_p) hop_2_i_p)
2818  (=> (and hop_1_i_b hop_1_b_a) hop_2_i_a)
2819  (=> (and hop_1_i_b hop_1_b_c) hop_2_i_c)
2820  (=> (and hop_1_i_b hop_1_b_e) hop_2_i_e)
2821  (=> (and hop_1_i_b hop_1_b_d) hop_2_i_d)
2822  (=> (and hop_1_i_b hop_1_b_g) hop_2_i_g)
2823  (=> (and hop_1_i_b hop_1_b_f) hop_2_i_f)
2824  (=> (and hop_1_i_b hop_1_b_h) hop_2_i_h)
2825  (=> (and hop_1_i_b hop_1_b_k) hop_2_i_k)
2826  (=> (and hop_1_i_b hop_1_b_j) hop_2_i_j)
2827  (=> (and hop_1_i_b hop_1_b_m) hop_2_i_m)
2828  (=> (and hop_1_i_b hop_1_b_l) hop_2_i_l)
2829  (=> (and hop_1_i_b hop_1_b_o) hop_2_i_o)
2830  (=> (and hop_1_i_b hop_1_b_n) hop_2_i_n)
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2831  (=> (and hop_1_i_b hop_1_b_q) hop_2_i_q)
2832  (=> (and hop_1_i_b hop_1_b_p) hop_2_i_p)
2833  (=> (and hop_1_i_e hop_1_e_a) hop_2_i_a)
2834  (=> (and hop_1_i_e hop_1_e_c) hop_2_i_c)
2835  (=> (and hop_1_i_e hop_1_e_b) hop_2_i_b)
2836  (=> (and hop_1_i_e hop_1_e_d) hop_2_i_d)
2837  (=> (and hop_1_i_e hop_1_e_g) hop_2_i_g)
2838  (=> (and hop_1_i_e hop_1_e_f) hop_2_i_f)
2839  (=> (and hop_1_i_e hop_1_e_h) hop_2_i_h)
2840  (=> (and hop_1_i_e hop_1_e_k) hop_2_i_k)
2841  (=> (and hop_1_i_e hop_1_e_j) hop_2_i_j)
2842  (=> (and hop_1_i_e hop_1_e_m) hop_2_i_m)
2843  (=> (and hop_1_i_e hop_1_e_l) hop_2_i_l)
2844  (=> (and hop_1_i_e hop_1_e_o) hop_2_i_o)
2845  (=> (and hop_1_i_e hop_1_e_n) hop_2_i_n)
2846  (=> (and hop_1_i_e hop_1_e_q) hop_2_i_q)
2847  (=> (and hop_1_i_e hop_1_e_p) hop_2_i_p)
2848  (=> (and hop_1_i_d hop_1_d_a) hop_2_i_a)
2849  (=> (and hop_1_i_d hop_1_d_c) hop_2_i_c)
2850  (=> (and hop_1_i_d hop_1_d_b) hop_2_i_b)
2851  (=> (and hop_1_i_d hop_1_d_e) hop_2_i_e)
2852  (=> (and hop_1_i_d hop_1_d_g) hop_2_i_g)
2853  (=> (and hop_1_i_d hop_1_d_f) hop_2_i_f)
2854  (=> (and hop_1_i_d hop_1_d_h) hop_2_i_h)
2855  (=> (and hop_1_i_d hop_1_d_k) hop_2_i_k)
2856  (=> (and hop_1_i_d hop_1_d_j) hop_2_i_j)
2857  (=> (and hop_1_i_d hop_1_d_m) hop_2_i_m)
2858  (=> (and hop_1_i_d hop_1_d_l) hop_2_i_l)
2859  (=> (and hop_1_i_d hop_1_d_o) hop_2_i_o)
2860  (=> (and hop_1_i_d hop_1_d_n) hop_2_i_n)
2861  (=> (and hop_1_i_d hop_1_d_q) hop_2_i_q)
2862  (=> (and hop_1_i_d hop_1_d_p) hop_2_i_p)
2863  (=> (and hop_1_i_g hop_1_g_a) hop_2_i_a)
2864  (=> (and hop_1_i_g hop_1_g_c) hop_2_i_c)
2865  (=> (and hop_1_i_g hop_1_g_b) hop_2_i_b)
2866  (=> (and hop_1_i_g hop_1_g_e) hop_2_i_e)
2867  (=> (and hop_1_i_g hop_1_g_d) hop_2_i_d)
2868  (=> (and hop_1_i_g hop_1_g_f) hop_2_i_f)
2869  (=> (and hop_1_i_g hop_1_g_h) hop_2_i_h)
2870  (=> (and hop_1_i_g hop_1_g_k) hop_2_i_k)
2871  (=> (and hop_1_i_g hop_1_g_j) hop_2_i_j)
2872  (=> (and hop_1_i_g hop_1_g_m) hop_2_i_m)
2873  (=> (and hop_1_i_g hop_1_g_l) hop_2_i_l)
2874  (=> (and hop_1_i_g hop_1_g_o) hop_2_i_o)
2875  (=> (and hop_1_i_g hop_1_g_n) hop_2_i_n)
2876  (=> (and hop_1_i_g hop_1_g_q) hop_2_i_q)
2877  (=> (and hop_1_i_g hop_1_g_p) hop_2_i_p)
2878  (=> (and hop_1_i_f hop_1_f_a) hop_2_i_a)
2879  (=> (and hop_1_i_f hop_1_f_c) hop_2_i_c)
2880  (=> (and hop_1_i_f hop_1_f_b) hop_2_i_b)
2881  (=> (and hop_1_i_f hop_1_f_e) hop_2_i_e)
2882  (=> (and hop_1_i_f hop_1_f_d) hop_2_i_d)
2883  (=> (and hop_1_i_f hop_1_f_g) hop_2_i_g)
2884  (=> (and hop_1_i_f hop_1_f_h) hop_2_i_h)
2885  (=> (and hop_1_i_f hop_1_f_k) hop_2_i_k)
2886  (=> (and hop_1_i_f hop_1_f_j) hop_2_i_j)
2887  (=> (and hop_1_i_f hop_1_f_m) hop_2_i_m)
2888  (=> (and hop_1_i_f hop_1_f_l) hop_2_i_l)
2889  (=> (and hop_1_i_f hop_1_f_o) hop_2_i_o)
2890  (=> (and hop_1_i_f hop_1_f_n) hop_2_i_n)
2891  (=> (and hop_1_i_f hop_1_f_q) hop_2_i_q)
2892  (=> (and hop_1_i_f hop_1_f_p) hop_2_i_p)
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2893  (=> (and hop_1_i_h hop_1_h_a) hop_2_i_a)
2894  (=> (and hop_1_i_h hop_1_h_c) hop_2_i_c)
2895  (=> (and hop_1_i_h hop_1_h_b) hop_2_i_b)
2896  (=> (and hop_1_i_h hop_1_h_e) hop_2_i_e)
2897  (=> (and hop_1_i_h hop_1_h_d) hop_2_i_d)
2898  (=> (and hop_1_i_h hop_1_h_g) hop_2_i_g)
2899  (=> (and hop_1_i_h hop_1_h_f) hop_2_i_f)
2900  (=> (and hop_1_i_h hop_1_h_k) hop_2_i_k)
2901  (=> (and hop_1_i_h hop_1_h_j) hop_2_i_j)
2902  (=> (and hop_1_i_h hop_1_h_m) hop_2_i_m)
2903  (=> (and hop_1_i_h hop_1_h_l) hop_2_i_l)
2904  (=> (and hop_1_i_h hop_1_h_o) hop_2_i_o)
2905  (=> (and hop_1_i_h hop_1_h_n) hop_2_i_n)
2906  (=> (and hop_1_i_h hop_1_h_q) hop_2_i_q)
2907  (=> (and hop_1_i_h hop_1_h_p) hop_2_i_p)
2908  (=> (and hop_1_i_k hop_1_k_a) hop_2_i_a)
2909  (=> (and hop_1_i_k hop_1_k_c) hop_2_i_c)
2910  (=> (and hop_1_i_k hop_1_k_b) hop_2_i_b)
2911  (=> (and hop_1_i_k hop_1_k_e) hop_2_i_e)
2912  (=> (and hop_1_i_k hop_1_k_d) hop_2_i_d)
2913  (=> (and hop_1_i_k hop_1_k_g) hop_2_i_g)
2914  (=> (and hop_1_i_k hop_1_k_f) hop_2_i_f)
2915  (=> (and hop_1_i_k hop_1_k_h) hop_2_i_h)
2916  (=> (and hop_1_i_k hop_1_k_j) hop_2_i_j)
2917  (=> (and hop_1_i_k hop_1_k_m) hop_2_i_m)
2918  (=> (and hop_1_i_k hop_1_k_l) hop_2_i_l)
2919  (=> (and hop_1_i_k hop_1_k_o) hop_2_i_o)
2920  (=> (and hop_1_i_k hop_1_k_n) hop_2_i_n)
2921  (=> (and hop_1_i_k hop_1_k_q) hop_2_i_q)
2922  (=> (and hop_1_i_k hop_1_k_p) hop_2_i_p)
2923  (=> (and hop_1_i_j hop_1_j_a) hop_2_i_a)
2924  (=> (and hop_1_i_j hop_1_j_c) hop_2_i_c)
2925  (=> (and hop_1_i_j hop_1_j_b) hop_2_i_b)
2926  (=> (and hop_1_i_j hop_1_j_e) hop_2_i_e)
2927  (=> (and hop_1_i_j hop_1_j_d) hop_2_i_d)
2928  (=> (and hop_1_i_j hop_1_j_g) hop_2_i_g)
2929  (=> (and hop_1_i_j hop_1_j_f) hop_2_i_f)
2930  (=> (and hop_1_i_j hop_1_j_h) hop_2_i_h)
2931  (=> (and hop_1_i_j hop_1_j_k) hop_2_i_k)
2932  (=> (and hop_1_i_j hop_1_j_m) hop_2_i_m)
2933  (=> (and hop_1_i_j hop_1_j_l) hop_2_i_l)
2934  (=> (and hop_1_i_j hop_1_j_o) hop_2_i_o)
2935  (=> (and hop_1_i_j hop_1_j_n) hop_2_i_n)
2936  (=> (and hop_1_i_j hop_1_j_q) hop_2_i_q)
2937  (=> (and hop_1_i_j hop_1_j_p) hop_2_i_p)
2938  (=> (and hop_1_i_m hop_1_m_a) hop_2_i_a)
2939  (=> (and hop_1_i_m hop_1_m_c) hop_2_i_c)
2940  (=> (and hop_1_i_m hop_1_m_b) hop_2_i_b)
2941  (=> (and hop_1_i_m hop_1_m_e) hop_2_i_e)
2942  (=> (and hop_1_i_m hop_1_m_d) hop_2_i_d)
2943  (=> (and hop_1_i_m hop_1_m_g) hop_2_i_g)
2944  (=> (and hop_1_i_m hop_1_m_f) hop_2_i_f)
2945  (=> (and hop_1_i_m hop_1_m_h) hop_2_i_h)
2946  (=> (and hop_1_i_m hop_1_m_k) hop_2_i_k)
2947  (=> (and hop_1_i_m hop_1_m_j) hop_2_i_j)
2948  (=> (and hop_1_i_m hop_1_m_l) hop_2_i_l)
2949  (=> (and hop_1_i_m hop_1_m_o) hop_2_i_o)
2950  (=> (and hop_1_i_m hop_1_m_n) hop_2_i_n)
2951  (=> (and hop_1_i_m hop_1_m_q) hop_2_i_q)
2952  (=> (and hop_1_i_m hop_1_m_p) hop_2_i_p)
2953  (=> (and hop_1_i_l hop_1_l_a) hop_2_i_a)
2954  (=> (and hop_1_i_l hop_1_l_c) hop_2_i_c)
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2955  (=> (and hop_1_i_l hop_1_l_b) hop_2_i_b)
2956  (=> (and hop_1_i_l hop_1_l_e) hop_2_i_e)
2957  (=> (and hop_1_i_l hop_1_l_d) hop_2_i_d)
2958  (=> (and hop_1_i_l hop_1_l_g) hop_2_i_g)
2959  (=> (and hop_1_i_l hop_1_l_f) hop_2_i_f)
2960  (=> (and hop_1_i_l hop_1_l_h) hop_2_i_h)
2961  (=> (and hop_1_i_l hop_1_l_k) hop_2_i_k)
2962  (=> (and hop_1_i_l hop_1_l_j) hop_2_i_j)
2963  (=> (and hop_1_i_l hop_1_l_m) hop_2_i_m)
2964  (=> (and hop_1_i_l hop_1_l_o) hop_2_i_o)
2965  (=> (and hop_1_i_l hop_1_l_n) hop_2_i_n)
2966  (=> (and hop_1_i_l hop_1_l_q) hop_2_i_q)
2967  (=> (and hop_1_i_l hop_1_l_p) hop_2_i_p)
2968  (=> (and hop_1_i_o hop_1_o_a) hop_2_i_a)
2969  (=> (and hop_1_i_o hop_1_o_c) hop_2_i_c)
2970  (=> (and hop_1_i_o hop_1_o_b) hop_2_i_b)
2971  (=> (and hop_1_i_o hop_1_o_e) hop_2_i_e)
2972  (=> (and hop_1_i_o hop_1_o_d) hop_2_i_d)
2973  (=> (and hop_1_i_o hop_1_o_g) hop_2_i_g)
2974  (=> (and hop_1_i_o hop_1_o_f) hop_2_i_f)
2975  (=> (and hop_1_i_o hop_1_o_h) hop_2_i_h)
2976  (=> (and hop_1_i_o hop_1_o_k) hop_2_i_k)
2977  (=> (and hop_1_i_o hop_1_o_j) hop_2_i_j)
2978  (=> (and hop_1_i_o hop_1_o_m) hop_2_i_m)
2979  (=> (and hop_1_i_o hop_1_o_l) hop_2_i_l)
2980  (=> (and hop_1_i_o hop_1_o_n) hop_2_i_n)
2981  (=> (and hop_1_i_o hop_1_o_q) hop_2_i_q)
2982  (=> (and hop_1_i_o hop_1_o_p) hop_2_i_p)
2983  (=> (and hop_1_i_n hop_1_n_a) hop_2_i_a)
2984  (=> (and hop_1_i_n hop_1_n_c) hop_2_i_c)
2985  (=> (and hop_1_i_n hop_1_n_b) hop_2_i_b)
2986  (=> (and hop_1_i_n hop_1_n_e) hop_2_i_e)
2987  (=> (and hop_1_i_n hop_1_n_d) hop_2_i_d)
2988  (=> (and hop_1_i_n hop_1_n_g) hop_2_i_g)
2989  (=> (and hop_1_i_n hop_1_n_f) hop_2_i_f)
2990  (=> (and hop_1_i_n hop_1_n_h) hop_2_i_h)
2991  (=> (and hop_1_i_n hop_1_n_k) hop_2_i_k)
2992  (=> (and hop_1_i_n hop_1_n_j) hop_2_i_j)
2993  (=> (and hop_1_i_n hop_1_n_m) hop_2_i_m)
2994  (=> (and hop_1_i_n hop_1_n_l) hop_2_i_l)
2995  (=> (and hop_1_i_n hop_1_n_o) hop_2_i_o)
2996  (=> (and hop_1_i_n hop_1_n_q) hop_2_i_q)
2997  (=> (and hop_1_i_n hop_1_n_p) hop_2_i_p)
2998  (=> (and hop_1_i_q hop_1_q_a) hop_2_i_a)
2999  (=> (and hop_1_i_q hop_1_q_c) hop_2_i_c)
3000  (=> (and hop_1_i_q hop_1_q_b) hop_2_i_b)
3001  (=> (and hop_1_i_q hop_1_q_e) hop_2_i_e)
3002  (=> (and hop_1_i_q hop_1_q_d) hop_2_i_d)
3003  (=> (and hop_1_i_q hop_1_q_g) hop_2_i_g)
3004  (=> (and hop_1_i_q hop_1_q_f) hop_2_i_f)
3005  (=> (and hop_1_i_q hop_1_q_h) hop_2_i_h)
3006  (=> (and hop_1_i_q hop_1_q_k) hop_2_i_k)
3007  (=> (and hop_1_i_q hop_1_q_j) hop_2_i_j)
3008  (=> (and hop_1_i_q hop_1_q_m) hop_2_i_m)
3009  (=> (and hop_1_i_q hop_1_q_l) hop_2_i_l)
3010  (=> (and hop_1_i_q hop_1_q_o) hop_2_i_o)
3011  (=> (and hop_1_i_q hop_1_q_n) hop_2_i_n)
3012  (=> (and hop_1_i_q hop_1_q_p) hop_2_i_p)
3013  (=> (and hop_1_i_p hop_1_p_a) hop_2_i_a)
3014  (=> (and hop_1_i_p hop_1_p_c) hop_2_i_c)
3015  (=> (and hop_1_i_p hop_1_p_b) hop_2_i_b)
3016  (=> (and hop_1_i_p hop_1_p_e) hop_2_i_e)
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3017  (=> (and hop_1_i_p hop_1_p_d) hop_2_i_d)
3018  (=> (and hop_1_i_p hop_1_p_g) hop_2_i_g)
3019  (=> (and hop_1_i_p hop_1_p_f) hop_2_i_f)
3020  (=> (and hop_1_i_p hop_1_p_h) hop_2_i_h)
3021  (=> (and hop_1_i_p hop_1_p_k) hop_2_i_k)
3022  (=> (and hop_1_i_p hop_1_p_j) hop_2_i_j)
3023  (=> (and hop_1_i_p hop_1_p_m) hop_2_i_m)
3024  (=> (and hop_1_i_p hop_1_p_l) hop_2_i_l)
3025  (=> (and hop_1_i_p hop_1_p_o) hop_2_i_o)
3026  (=> (and hop_1_i_p hop_1_p_n) hop_2_i_n)
3027  (=> (and hop_1_i_p hop_1_p_q) hop_2_i_q)
3028  (=> (and hop_1_h_a hop_1_a_c) hop_2_h_c)
3029  (=> (and hop_1_h_a hop_1_a_b) hop_2_h_b)
3030  (=> (and hop_1_h_a hop_1_a_e) hop_2_h_e)
3031  (=> (and hop_1_h_a hop_1_a_d) hop_2_h_d)
3032  (=> (and hop_1_h_a hop_1_a_g) hop_2_h_g)
3033  (=> (and hop_1_h_a hop_1_a_f) hop_2_h_f)
3034  (=> (and hop_1_h_a hop_1_a_i) hop_2_h_i)
3035  (=> (and hop_1_h_a hop_1_a_k) hop_2_h_k)
3036  (=> (and hop_1_h_a hop_1_a_j) hop_2_h_j)
3037  (=> (and hop_1_h_a hop_1_a_m) hop_2_h_m)
3038  (=> (and hop_1_h_a hop_1_a_l) hop_2_h_l)
3039  (=> (and hop_1_h_a hop_1_a_o) hop_2_h_o)
3040  (=> (and hop_1_h_a hop_1_a_n) hop_2_h_n)
3041  (=> (and hop_1_h_a hop_1_a_q) hop_2_h_q)
3042  (=> (and hop_1_h_a hop_1_a_p) hop_2_h_p)
3043  (=> (and hop_1_h_c hop_1_c_a) hop_2_h_a)
3044  (=> (and hop_1_h_c hop_1_c_b) hop_2_h_b)
3045  (=> (and hop_1_h_c hop_1_c_e) hop_2_h_e)
3046  (=> (and hop_1_h_c hop_1_c_d) hop_2_h_d)
3047  (=> (and hop_1_h_c hop_1_c_g) hop_2_h_g)
3048  (=> (and hop_1_h_c hop_1_c_f) hop_2_h_f)
3049  (=> (and hop_1_h_c hop_1_c_i) hop_2_h_i)
3050  (=> (and hop_1_h_c hop_1_c_k) hop_2_h_k)
3051  (=> (and hop_1_h_c hop_1_c_j) hop_2_h_j)
3052  (=> (and hop_1_h_c hop_1_c_m) hop_2_h_m)
3053  (=> (and hop_1_h_c hop_1_c_l) hop_2_h_l)
3054  (=> (and hop_1_h_c hop_1_c_o) hop_2_h_o)
3055  (=> (and hop_1_h_c hop_1_c_n) hop_2_h_n)
3056  (=> (and hop_1_h_c hop_1_c_q) hop_2_h_q)
3057  (=> (and hop_1_h_c hop_1_c_p) hop_2_h_p)
3058  (=> (and hop_1_h_b hop_1_b_a) hop_2_h_a)
3059  (=> (and hop_1_h_b hop_1_b_c) hop_2_h_c)
3060  (=> (and hop_1_h_b hop_1_b_e) hop_2_h_e)
3061  (=> (and hop_1_h_b hop_1_b_d) hop_2_h_d)
3062  (=> (and hop_1_h_b hop_1_b_g) hop_2_h_g)
3063  (=> (and hop_1_h_b hop_1_b_f) hop_2_h_f)
3064  (=> (and hop_1_h_b hop_1_b_i) hop_2_h_i)
3065  (=> (and hop_1_h_b hop_1_b_k) hop_2_h_k)
3066  (=> (and hop_1_h_b hop_1_b_j) hop_2_h_j)
3067  (=> (and hop_1_h_b hop_1_b_m) hop_2_h_m)
3068  (=> (and hop_1_h_b hop_1_b_l) hop_2_h_l)
3069  (=> (and hop_1_h_b hop_1_b_o) hop_2_h_o)
3070  (=> (and hop_1_h_b hop_1_b_n) hop_2_h_n)
3071  (=> (and hop_1_h_b hop_1_b_q) hop_2_h_q)
3072  (=> (and hop_1_h_b hop_1_b_p) hop_2_h_p)
3073  (=> (and hop_1_h_e hop_1_e_a) hop_2_h_a)
3074  (=> (and hop_1_h_e hop_1_e_c) hop_2_h_c)
3075  (=> (and hop_1_h_e hop_1_e_b) hop_2_h_b)
3076  (=> (and hop_1_h_e hop_1_e_d) hop_2_h_d)
3077  (=> (and hop_1_h_e hop_1_e_g) hop_2_h_g)
3078  (=> (and hop_1_h_e hop_1_e_f) hop_2_h_f)
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```
3079  (=> (and hop_1_h_e hop_1_e_i) hop_2_h_i)
3080  (=> (and hop_1_h_e hop_1_e_k) hop_2_h_k)
3081  (=> (and hop_1_h_e hop_1_e_j) hop_2_h_j)
3082  (=> (and hop_1_h_e hop_1_e_m) hop_2_h_m)
3083  (=> (and hop_1_h_e hop_1_e_l) hop_2_h_l)
3084  (=> (and hop_1_h_e hop_1_e_o) hop_2_h_o)
3085  (=> (and hop_1_h_e hop_1_e_n) hop_2_h_n)
3086  (=> (and hop_1_h_e hop_1_e_q) hop_2_h_q)
3087  (=> (and hop_1_h_e hop_1_e_p) hop_2_h_p)
3088  (=> (and hop_1_h_d hop_1_d_a) hop_2_h_a)
3089  (=> (and hop_1_h_d hop_1_d_c) hop_2_h_c)
3090  (=> (and hop_1_h_d hop_1_d_b) hop_2_h_b)
3091  (=> (and hop_1_h_d hop_1_d_e) hop_2_h_e)
3092  (=> (and hop_1_h_d hop_1_d_g) hop_2_h_g)
3093  (=> (and hop_1_h_d hop_1_d_f) hop_2_h_f)
3094  (=> (and hop_1_h_d hop_1_d_i) hop_2_h_i)
3095  (=> (and hop_1_h_d hop_1_d_k) hop_2_h_k)
3096  (=> (and hop_1_h_d hop_1_d_j) hop_2_h_j)
3097  (=> (and hop_1_h_d hop_1_d_m) hop_2_h_m)
3098  (=> (and hop_1_h_d hop_1_d_l) hop_2_h_l)
3099  (=> (and hop_1_h_d hop_1_d_o) hop_2_h_o)
3100  (=> (and hop_1_h_d hop_1_d_n) hop_2_h_n)
3101  (=> (and hop_1_h_d hop_1_d_q) hop_2_h_q)
3102  (=> (and hop_1_h_d hop_1_d_p) hop_2_h_p)
3103  (=> (and hop_1_h_g hop_1_g_a) hop_2_h_a)
3104  (=> (and hop_1_h_g hop_1_g_c) hop_2_h_c)
3105  (=> (and hop_1_h_g hop_1_g_b) hop_2_h_b)
3106  (=> (and hop_1_h_g hop_1_g_e) hop_2_h_e)
3107  (=> (and hop_1_h_g hop_1_g_d) hop_2_h_d)
3108  (=> (and hop_1_h_g hop_1_g_f) hop_2_h_f)
3109  (=> (and hop_1_h_g hop_1_g_i) hop_2_h_i)
3110  (=> (and hop_1_h_g hop_1_g_k) hop_2_h_k)
3111  (=> (and hop_1_h_g hop_1_g_j) hop_2_h_j)
3112  (=> (and hop_1_h_g hop_1_g_m) hop_2_h_m)
3113  (=> (and hop_1_h_g hop_1_g_l) hop_2_h_l)
3114  (=> (and hop_1_h_g hop_1_g_o) hop_2_h_o)
3115  (=> (and hop_1_h_g hop_1_g_n) hop_2_h_n)
3116  (=> (and hop_1_h_g hop_1_g_q) hop_2_h_q)
3117  (=> (and hop_1_h_g hop_1_g_p) hop_2_h_p)
3118  (=> (and hop_1_h_f hop_1_f_a) hop_2_h_a)
3119  (=> (and hop_1_h_f hop_1_f_c) hop_2_h_c)
3120  (=> (and hop_1_h_f hop_1_f_b) hop_2_h_b)
3121  (=> (and hop_1_h_f hop_1_f_e) hop_2_h_e)
3122  (=> (and hop_1_h_f hop_1_f_d) hop_2_h_d)
3123  (=> (and hop_1_h_f hop_1_f_g) hop_2_h_g)
3124  (=> (and hop_1_h_f hop_1_f_i) hop_2_h_i)
3125  (=> (and hop_1_h_f hop_1_f_k) hop_2_h_k)
3126  (=> (and hop_1_h_f hop_1_f_j) hop_2_h_j)
3127  (=> (and hop_1_h_f hop_1_f_m) hop_2_h_m)
3128  (=> (and hop_1_h_f hop_1_f_l) hop_2_h_l)
3129  (=> (and hop_1_h_f hop_1_f_o) hop_2_h_o)
3130  (=> (and hop_1_h_f hop_1_f_n) hop_2_h_n)
3131  (=> (and hop_1_h_f hop_1_f_q) hop_2_h_q)
3132  (=> (and hop_1_h_f hop_1_f_p) hop_2_h_p)
3133  (=> (and hop_1_h_i hop_1_i_a) hop_2_h_a)
3134  (=> (and hop_1_h_i hop_1_i_c) hop_2_h_c)
3135  (=> (and hop_1_h_i hop_1_i_b) hop_2_h_b)
3136  (=> (and hop_1_h_i hop_1_i_e) hop_2_h_e)
3137  (=> (and hop_1_h_i hop_1_i_d) hop_2_h_d)
3138  (=> (and hop_1_h_i hop_1_i_g) hop_2_h_g)
3139  (=> (and hop_1_h_i hop_1_i_f) hop_2_h_f)
3140  (=> (and hop_1_h_i hop_1_i_k) hop_2_h_k)
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3141  (=> (and hop_1_h_i hop_1_i_j) hop_2_h_j)
3142  (=> (and hop_1_h_i hop_1_i_m) hop_2_h_m)
3143  (=> (and hop_1_h_i hop_1_i_l) hop_2_h_l)
3144  (=> (and hop_1_h_i hop_1_i_o) hop_2_h_o)
3145  (=> (and hop_1_h_i hop_1_i_n) hop_2_h_n)
3146  (=> (and hop_1_h_i hop_1_i_q) hop_2_h_q)
3147  (=> (and hop_1_h_i hop_1_i_p) hop_2_h_p)
3148  (=> (and hop_1_h_k hop_1_k_a) hop_2_h_a)
3149  (=> (and hop_1_h_k hop_1_k_c) hop_2_h_c)
3150  (=> (and hop_1_h_k hop_1_k_b) hop_2_h_b)
3151  (=> (and hop_1_h_k hop_1_k_e) hop_2_h_e)
3152  (=> (and hop_1_h_k hop_1_k_d) hop_2_h_d)
3153  (=> (and hop_1_h_k hop_1_k_g) hop_2_h_g)
3154  (=> (and hop_1_h_k hop_1_k_f) hop_2_h_f)
3155  (=> (and hop_1_h_k hop_1_k_i) hop_2_h_i)
3156  (=> (and hop_1_h_k hop_1_k_j) hop_2_h_j)
3157  (=> (and hop_1_h_k hop_1_k_m) hop_2_h_m)
3158  (=> (and hop_1_h_k hop_1_k_l) hop_2_h_l)
3159  (=> (and hop_1_h_k hop_1_k_o) hop_2_h_o)
3160  (=> (and hop_1_h_k hop_1_k_n) hop_2_h_n)
3161  (=> (and hop_1_h_k hop_1_k_q) hop_2_h_q)
3162  (=> (and hop_1_h_k hop_1_k_p) hop_2_h_p)
3163  (=> (and hop_1_h_j hop_1_j_a) hop_2_h_a)
3164  (=> (and hop_1_h_j hop_1_j_c) hop_2_h_c)
3165  (=> (and hop_1_h_j hop_1_j_b) hop_2_h_b)
3166  (=> (and hop_1_h_j hop_1_j_e) hop_2_h_e)
3167  (=> (and hop_1_h_j hop_1_j_d) hop_2_h_d)
3168  (=> (and hop_1_h_j hop_1_j_g) hop_2_h_g)
3169  (=> (and hop_1_h_j hop_1_j_f) hop_2_h_f)
3170  (=> (and hop_1_h_j hop_1_j_i) hop_2_h_i)
3171  (=> (and hop_1_h_j hop_1_j_k) hop_2_h_k)
3172  (=> (and hop_1_h_j hop_1_j_m) hop_2_h_m)
3173  (=> (and hop_1_h_j hop_1_j_l) hop_2_h_l)
3174  (=> (and hop_1_h_j hop_1_j_o) hop_2_h_o)
3175  (=> (and hop_1_h_j hop_1_j_n) hop_2_h_n)
3176  (=> (and hop_1_h_j hop_1_j_q) hop_2_h_q)
3177  (=> (and hop_1_h_j hop_1_j_p) hop_2_h_p)
3178  (=> (and hop_1_h_m hop_1_m_a) hop_2_h_a)
3179  (=> (and hop_1_h_m hop_1_m_c) hop_2_h_c)
3180  (=> (and hop_1_h_m hop_1_m_b) hop_2_h_b)
3181  (=> (and hop_1_h_m hop_1_m_e) hop_2_h_e)
3182  (=> (and hop_1_h_m hop_1_m_d) hop_2_h_d)
3183  (=> (and hop_1_h_m hop_1_m_g) hop_2_h_g)
3184  (=> (and hop_1_h_m hop_1_m_f) hop_2_h_f)
3185  (=> (and hop_1_h_m hop_1_m_i) hop_2_h_i)
3186  (=> (and hop_1_h_m hop_1_m_k) hop_2_h_k)
3187  (=> (and hop_1_h_m hop_1_m_j) hop_2_h_j)
3188  (=> (and hop_1_h_m hop_1_m_l) hop_2_h_l)
3189  (=> (and hop_1_h_m hop_1_m_o) hop_2_h_o)
3190  (=> (and hop_1_h_m hop_1_m_n) hop_2_h_n)
3191  (=> (and hop_1_h_m hop_1_m_q) hop_2_h_q)
3192  (=> (and hop_1_h_m hop_1_m_p) hop_2_h_p)
3193  (=> (and hop_1_h_l hop_1_l_a) hop_2_h_a)
3194  (=> (and hop_1_h_l hop_1_l_c) hop_2_h_c)
3195  (=> (and hop_1_h_l hop_1_l_b) hop_2_h_b)
3196  (=> (and hop_1_h_l hop_1_l_e) hop_2_h_e)
3197  (=> (and hop_1_h_l hop_1_l_d) hop_2_h_d)
3198  (=> (and hop_1_h_l hop_1_l_g) hop_2_h_g)
3199  (=> (and hop_1_h_l hop_1_l_f) hop_2_h_f)
3200  (=> (and hop_1_h_l hop_1_l_i) hop_2_h_i)
3201  (=> (and hop_1_h_l hop_1_l_k) hop_2_h_k)
3202  (=> (and hop_1_h_l hop_1_l_j) hop_2_h_j)
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3203  (=> (and hop_1_h_l hop_1_l_m) hop_2_h_m)
3204  (=> (and hop_1_h_l hop_1_l_o) hop_2_h_o)
3205  (=> (and hop_1_h_l hop_1_l_n) hop_2_h_n)
3206  (=> (and hop_1_h_l hop_1_l_q) hop_2_h_q)
3207  (=> (and hop_1_h_l hop_1_l_p) hop_2_h_p)
3208  (=> (and hop_1_h_o hop_1_o_a) hop_2_h_a)
3209  (=> (and hop_1_h_o hop_1_o_c) hop_2_h_c)
3210  (=> (and hop_1_h_o hop_1_o_b) hop_2_h_b)
3211  (=> (and hop_1_h_o hop_1_o_e) hop_2_h_e)
3212  (=> (and hop_1_h_o hop_1_o_d) hop_2_h_d)
3213  (=> (and hop_1_h_o hop_1_o_g) hop_2_h_g)
3214  (=> (and hop_1_h_o hop_1_o_f) hop_2_h_f)
3215  (=> (and hop_1_h_o hop_1_o_i) hop_2_h_i)
3216  (=> (and hop_1_h_o hop_1_o_k) hop_2_h_k)
3217  (=> (and hop_1_h_o hop_1_o_j) hop_2_h_j)
3218  (=> (and hop_1_h_o hop_1_o_m) hop_2_h_m)
3219  (=> (and hop_1_h_o hop_1_o_l) hop_2_h_l)
3220  (=> (and hop_1_h_o hop_1_o_n) hop_2_h_n)
3221  (=> (and hop_1_h_o hop_1_o_q) hop_2_h_q)
3222  (=> (and hop_1_h_o hop_1_o_p) hop_2_h_p)
3223  (=> (and hop_1_h_n hop_1_n_a) hop_2_h_a)
3224  (=> (and hop_1_h_n hop_1_n_c) hop_2_h_c)
3225  (=> (and hop_1_h_n hop_1_n_b) hop_2_h_b)
3226  (=> (and hop_1_h_n hop_1_n_e) hop_2_h_e)
3227  (=> (and hop_1_h_n hop_1_n_d) hop_2_h_d)
3228  (=> (and hop_1_h_n hop_1_n_g) hop_2_h_g)
3229  (=> (and hop_1_h_n hop_1_n_f) hop_2_h_f)
3230  (=> (and hop_1_h_n hop_1_n_i) hop_2_h_i)
3231  (=> (and hop_1_h_n hop_1_n_k) hop_2_h_k)
3232  (=> (and hop_1_h_n hop_1_n_j) hop_2_h_j)
3233  (=> (and hop_1_h_n hop_1_n_m) hop_2_h_m)
3234  (=> (and hop_1_h_n hop_1_n_l) hop_2_h_l)
3235  (=> (and hop_1_h_n hop_1_n_o) hop_2_h_o)
3236  (=> (and hop_1_h_n hop_1_n_q) hop_2_h_q)
3237  (=> (and hop_1_h_n hop_1_n_p) hop_2_h_p)
3238  (=> (and hop_1_h_q hop_1_q_a) hop_2_h_a)
3239  (=> (and hop_1_h_q hop_1_q_c) hop_2_h_c)
3240  (=> (and hop_1_h_q hop_1_q_b) hop_2_h_b)
3241  (=> (and hop_1_h_q hop_1_q_e) hop_2_h_e)
3242  (=> (and hop_1_h_q hop_1_q_d) hop_2_h_d)
3243  (=> (and hop_1_h_q hop_1_q_g) hop_2_h_g)
3244  (=> (and hop_1_h_q hop_1_q_f) hop_2_h_f)
3245  (=> (and hop_1_h_q hop_1_q_i) hop_2_h_i)
3246  (=> (and hop_1_h_q hop_1_q_k) hop_2_h_k)
3247  (=> (and hop_1_h_q hop_1_q_j) hop_2_h_j)
3248  (=> (and hop_1_h_q hop_1_q_m) hop_2_h_m)
3249  (=> (and hop_1_h_q hop_1_q_l) hop_2_h_l)
3250  (=> (and hop_1_h_q hop_1_q_o) hop_2_h_o)
3251  (=> (and hop_1_h_q hop_1_q_n) hop_2_h_n)
3252  (=> (and hop_1_h_q hop_1_q_p) hop_2_h_p)
3253  (=> (and hop_1_h_p hop_1_p_a) hop_2_h_a)
3254  (=> (and hop_1_h_p hop_1_p_c) hop_2_h_c)
3255  (=> (and hop_1_h_p hop_1_p_b) hop_2_h_b)
3256  (=> (and hop_1_h_p hop_1_p_e) hop_2_h_e)
3257  (=> (and hop_1_h_p hop_1_p_d) hop_2_h_d)
3258  (=> (and hop_1_h_p hop_1_p_g) hop_2_h_g)
3259  (=> (and hop_1_h_p hop_1_p_f) hop_2_h_f)
3260  (=> (and hop_1_h_p hop_1_p_i) hop_2_h_i)
3261  (=> (and hop_1_h_p hop_1_p_k) hop_2_h_k)
3262  (=> (and hop_1_h_p hop_1_p_j) hop_2_h_j)
3263  (=> (and hop_1_h_p hop_1_p_m) hop_2_h_m)
3264  (=> (and hop_1_h_p hop_1_p_l) hop_2_h_l)
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3265  (=> (and hop_1_h_p hop_1_p_o) hop_2_h_o)
3266  (=> (and hop_1_h_p hop_1_p_n) hop_2_h_n)
3267  (=> (and hop_1_h_p hop_1_p_q) hop_2_h_q)
3268  (=> (and hop_1_k_a hop_1_a_c) hop_2_k_c)
3269  (=> (and hop_1_k_a hop_1_a_b) hop_2_k_b)
3270  (=> (and hop_1_k_a hop_1_a_e) hop_2_k_e)
3271  (=> (and hop_1_k_a hop_1_a_d) hop_2_k_d)
3272  (=> (and hop_1_k_a hop_1_a_g) hop_2_k_g)
3273  (=> (and hop_1_k_a hop_1_a_f) hop_2_k_f)
3274  (=> (and hop_1_k_a hop_1_a_i) hop_2_k_i)
3275  (=> (and hop_1_k_a hop_1_a_h) hop_2_k_h)
3276  (=> (and hop_1_k_a hop_1_a_j) hop_2_k_j)
3277  (=> (and hop_1_k_a hop_1_a_m) hop_2_k_m)
3278  (=> (and hop_1_k_a hop_1_a_l) hop_2_k_l)
3279  (=> (and hop_1_k_a hop_1_a_o) hop_2_k_o)
3280  (=> (and hop_1_k_a hop_1_a_n) hop_2_k_n)
3281  (=> (and hop_1_k_a hop_1_a_q) hop_2_k_q)
3282  (=> (and hop_1_k_a hop_1_a_p) hop_2_k_p)
3283  (=> (and hop_1_k_c hop_1_c_a) hop_2_k_a)
3284  (=> (and hop_1_k_c hop_1_c_b) hop_2_k_b)
3285  (=> (and hop_1_k_c hop_1_c_e) hop_2_k_e)
3286  (=> (and hop_1_k_c hop_1_c_d) hop_2_k_d)
3287  (=> (and hop_1_k_c hop_1_c_g) hop_2_k_g)
3288  (=> (and hop_1_k_c hop_1_c_f) hop_2_k_f)
3289  (=> (and hop_1_k_c hop_1_c_i) hop_2_k_i)
3290  (=> (and hop_1_k_c hop_1_c_h) hop_2_k_h)
3291  (=> (and hop_1_k_c hop_1_c_j) hop_2_k_j)
3292  (=> (and hop_1_k_c hop_1_c_m) hop_2_k_m)
3293  (=> (and hop_1_k_c hop_1_c_l) hop_2_k_l)
3294  (=> (and hop_1_k_c hop_1_c_o) hop_2_k_o)
3295  (=> (and hop_1_k_c hop_1_c_n) hop_2_k_n)
3296  (=> (and hop_1_k_c hop_1_c_q) hop_2_k_q)
3297  (=> (and hop_1_k_c hop_1_c_p) hop_2_k_p)
3298  (=> (and hop_1_k_b hop_1_b_a) hop_2_k_a)
3299  (=> (and hop_1_k_b hop_1_b_c) hop_2_k_c)
3300  (=> (and hop_1_k_b hop_1_b_e) hop_2_k_e)
3301  (=> (and hop_1_k_b hop_1_b_d) hop_2_k_d)
3302  (=> (and hop_1_k_b hop_1_b_g) hop_2_k_g)
3303  (=> (and hop_1_k_b hop_1_b_f) hop_2_k_f)
3304  (=> (and hop_1_k_b hop_1_b_i) hop_2_k_i)
3305  (=> (and hop_1_k_b hop_1_b_h) hop_2_k_h)
3306  (=> (and hop_1_k_b hop_1_b_j) hop_2_k_j)
3307  (=> (and hop_1_k_b hop_1_b_m) hop_2_k_m)
3308  (=> (and hop_1_k_b hop_1_b_l) hop_2_k_l)
3309  (=> (and hop_1_k_b hop_1_b_o) hop_2_k_o)
3310  (=> (and hop_1_k_b hop_1_b_n) hop_2_k_n)
3311  (=> (and hop_1_k_b hop_1_b_q) hop_2_k_q)
3312  (=> (and hop_1_k_b hop_1_b_p) hop_2_k_p)
3313  (=> (and hop_1_k_e hop_1_e_a) hop_2_k_a)
3314  (=> (and hop_1_k_e hop_1_e_c) hop_2_k_c)
3315  (=> (and hop_1_k_e hop_1_e_b) hop_2_k_b)
3316  (=> (and hop_1_k_e hop_1_e_d) hop_2_k_d)
3317  (=> (and hop_1_k_e hop_1_e_g) hop_2_k_g)
3318  (=> (and hop_1_k_e hop_1_e_f) hop_2_k_f)
3319  (=> (and hop_1_k_e hop_1_e_i) hop_2_k_i)
3320  (=> (and hop_1_k_e hop_1_e_h) hop_2_k_h)
3321  (=> (and hop_1_k_e hop_1_e_j) hop_2_k_j)
3322  (=> (and hop_1_k_e hop_1_e_m) hop_2_k_m)
3323  (=> (and hop_1_k_e hop_1_e_l) hop_2_k_l)
3324  (=> (and hop_1_k_e hop_1_e_o) hop_2_k_o)
3325  (=> (and hop_1_k_e hop_1_e_n) hop_2_k_n)
3326  (=> (and hop_1_k_e hop_1_e_q) hop_2_k_q)
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3327   (=> (and hop_1_k_e hop_1_e_p) hop_2_k_p)
3328   (=> (and hop_1_k_d hop_1_d_a) hop_2_k_a)
3329   (=> (and hop_1_k_d hop_1_d_c) hop_2_k_c)
3330   (=> (and hop_1_k_d hop_1_d_b) hop_2_k_b)
3331   (=> (and hop_1_k_d hop_1_d_e) hop_2_k_e)
3332   (=> (and hop_1_k_d hop_1_d_g) hop_2_k_g)
3333   (=> (and hop_1_k_d hop_1_d_f) hop_2_k_f)
3334   (=> (and hop_1_k_d hop_1_d_i) hop_2_k_i)
3335   (=> (and hop_1_k_d hop_1_d_h) hop_2_k_h)
3336   (=> (and hop_1_k_d hop_1_d_j) hop_2_k_j)
3337   (=> (and hop_1_k_d hop_1_d_m) hop_2_k_m)
3338   (=> (and hop_1_k_d hop_1_d_l) hop_2_k_l)
3339   (=> (and hop_1_k_d hop_1_d_o) hop_2_k_o)
3340   (=> (and hop_1_k_d hop_1_d_n) hop_2_k_n)
3341   (=> (and hop_1_k_d hop_1_d_q) hop_2_k_q)
3342   (=> (and hop_1_k_d hop_1_d_p) hop_2_k_p)
3343   (=> (and hop_1_k_g hop_1_g_a) hop_2_k_a)
3344   (=> (and hop_1_k_g hop_1_g_c) hop_2_k_c)
3345   (=> (and hop_1_k_g hop_1_g_b) hop_2_k_b)
3346   (=> (and hop_1_k_g hop_1_g_e) hop_2_k_e)
3347   (=> (and hop_1_k_g hop_1_g_d) hop_2_k_d)
3348   (=> (and hop_1_k_g hop_1_g_f) hop_2_k_f)
3349   (=> (and hop_1_k_g hop_1_g_i) hop_2_k_i)
3350   (=> (and hop_1_k_g hop_1_g_h) hop_2_k_h)
3351   (=> (and hop_1_k_g hop_1_g_j) hop_2_k_j)
3352   (=> (and hop_1_k_g hop_1_g_m) hop_2_k_m)
3353   (=> (and hop_1_k_g hop_1_g_l) hop_2_k_l)
3354   (=> (and hop_1_k_g hop_1_g_o) hop_2_k_o)
3355   (=> (and hop_1_k_g hop_1_g_n) hop_2_k_n)
3356   (=> (and hop_1_k_g hop_1_g_q) hop_2_k_q)
3357   (=> (and hop_1_k_g hop_1_g_p) hop_2_k_p)
3358   (=> (and hop_1_k_f hop_1_f_a) hop_2_k_a)
3359   (=> (and hop_1_k_f hop_1_f_c) hop_2_k_c)
3360   (=> (and hop_1_k_f hop_1_f_b) hop_2_k_b)
3361   (=> (and hop_1_k_f hop_1_f_e) hop_2_k_e)
3362   (=> (and hop_1_k_f hop_1_f_d) hop_2_k_d)
3363   (=> (and hop_1_k_f hop_1_f_g) hop_2_k_g)
3364   (=> (and hop_1_k_f hop_1_f_i) hop_2_k_i)
3365   (=> (and hop_1_k_f hop_1_f_h) hop_2_k_h)
3366   (=> (and hop_1_k_f hop_1_f_j) hop_2_k_j)
3367   (=> (and hop_1_k_f hop_1_f_m) hop_2_k_m)
3368   (=> (and hop_1_k_f hop_1_f_l) hop_2_k_l)
3369   (=> (and hop_1_k_f hop_1_f_o) hop_2_k_o)
3370   (=> (and hop_1_k_f hop_1_f_n) hop_2_k_n)
3371   (=> (and hop_1_k_f hop_1_f_q) hop_2_k_q)
3372   (=> (and hop_1_k_f hop_1_f_p) hop_2_k_p)
3373   (=> (and hop_1_k_i hop_1_i_a) hop_2_k_a)
3374   (=> (and hop_1_k_i hop_1_i_c) hop_2_k_c)
3375   (=> (and hop_1_k_i hop_1_i_b) hop_2_k_b)
3376   (=> (and hop_1_k_i hop_1_i_e) hop_2_k_e)
3377   (=> (and hop_1_k_i hop_1_i_d) hop_2_k_d)
3378   (=> (and hop_1_k_i hop_1_i_g) hop_2_k_g)
3379   (=> (and hop_1_k_i hop_1_i_f) hop_2_k_f)
3380   (=> (and hop_1_k_i hop_1_i_h) hop_2_k_h)
3381   (=> (and hop_1_k_i hop_1_i_j) hop_2_k_j)
3382   (=> (and hop_1_k_i hop_1_i_m) hop_2_k_m)
3383   (=> (and hop_1_k_i hop_1_i_l) hop_2_k_l)
3384   (=> (and hop_1_k_i hop_1_i_o) hop_2_k_o)
3385   (=> (and hop_1_k_i hop_1_i_n) hop_2_k_n)
3386   (=> (and hop_1_k_i hop_1_i_q) hop_2_k_q)
3387   (=> (and hop_1_k_i hop_1_i_p) hop_2_k_p)
3388   (=> (and hop_1_k_h hop_1_h_a) hop_2_k_a)
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3389  (=> (and hop_1_k_h hop_1_h_c) hop_2_k_c)
3390  (=> (and hop_1_k_h hop_1_h_b) hop_2_k_b)
3391  (=> (and hop_1_k_h hop_1_h_e) hop_2_k_e)
3392  (=> (and hop_1_k_h hop_1_h_d) hop_2_k_d)
3393  (=> (and hop_1_k_h hop_1_h_g) hop_2_k_g)
3394  (=> (and hop_1_k_h hop_1_h_f) hop_2_k_f)
3395  (=> (and hop_1_k_h hop_1_h_i) hop_2_k_i)
3396  (=> (and hop_1_k_h hop_1_h_j) hop_2_k_j)
3397  (=> (and hop_1_k_h hop_1_h_m) hop_2_k_m)
3398  (=> (and hop_1_k_h hop_1_h_l) hop_2_k_l)
3399  (=> (and hop_1_k_h hop_1_h_o) hop_2_k_o)
3400  (=> (and hop_1_k_h hop_1_h_n) hop_2_k_n)
3401  (=> (and hop_1_k_h hop_1_h_q) hop_2_k_q)
3402  (=> (and hop_1_k_h hop_1_h_p) hop_2_k_p)
3403  (=> (and hop_1_k_j hop_1_j_a) hop_2_k_a)
3404  (=> (and hop_1_k_j hop_1_j_c) hop_2_k_c)
3405  (=> (and hop_1_k_j hop_1_j_b) hop_2_k_b)
3406  (=> (and hop_1_k_j hop_1_j_e) hop_2_k_e)
3407  (=> (and hop_1_k_j hop_1_j_d) hop_2_k_d)
3408  (=> (and hop_1_k_j hop_1_j_g) hop_2_k_g)
3409  (=> (and hop_1_k_j hop_1_j_f) hop_2_k_f)
3410  (=> (and hop_1_k_j hop_1_j_i) hop_2_k_i)
3411  (=> (and hop_1_k_j hop_1_j_h) hop_2_k_h)
3412  (=> (and hop_1_k_j hop_1_j_m) hop_2_k_m)
3413  (=> (and hop_1_k_j hop_1_j_l) hop_2_k_l)
3414  (=> (and hop_1_k_j hop_1_j_o) hop_2_k_o)
3415  (=> (and hop_1_k_j hop_1_j_n) hop_2_k_n)
3416  (=> (and hop_1_k_j hop_1_j_q) hop_2_k_q)
3417  (=> (and hop_1_k_j hop_1_j_p) hop_2_k_p)
3418  (=> (and hop_1_k_m hop_1_m_a) hop_2_k_a)
3419  (=> (and hop_1_k_m hop_1_m_c) hop_2_k_c)
3420  (=> (and hop_1_k_m hop_1_m_b) hop_2_k_b)
3421  (=> (and hop_1_k_m hop_1_m_e) hop_2_k_e)
3422  (=> (and hop_1_k_m hop_1_m_d) hop_2_k_d)
3423  (=> (and hop_1_k_m hop_1_m_g) hop_2_k_g)
3424  (=> (and hop_1_k_m hop_1_m_f) hop_2_k_f)
3425  (=> (and hop_1_k_m hop_1_m_i) hop_2_k_i)
3426  (=> (and hop_1_k_m hop_1_m_h) hop_2_k_h)
3427  (=> (and hop_1_k_m hop_1_m_j) hop_2_k_j)
3428  (=> (and hop_1_k_m hop_1_m_l) hop_2_k_l)
3429  (=> (and hop_1_k_m hop_1_m_o) hop_2_k_o)
3430  (=> (and hop_1_k_m hop_1_m_n) hop_2_k_n)
3431  (=> (and hop_1_k_m hop_1_m_q) hop_2_k_q)
3432  (=> (and hop_1_k_m hop_1_m_p) hop_2_k_p)
3433  (=> (and hop_1_k_l hop_1_l_a) hop_2_k_a)
3434  (=> (and hop_1_k_l hop_1_l_c) hop_2_k_c)
3435  (=> (and hop_1_k_l hop_1_l_b) hop_2_k_b)
3436  (=> (and hop_1_k_l hop_1_l_e) hop_2_k_e)
3437  (=> (and hop_1_k_l hop_1_l_d) hop_2_k_d)
3438  (=> (and hop_1_k_l hop_1_l_g) hop_2_k_g)
3439  (=> (and hop_1_k_l hop_1_l_f) hop_2_k_f)
3440  (=> (and hop_1_k_l hop_1_l_i) hop_2_k_i)
3441  (=> (and hop_1_k_l hop_1_l_h) hop_2_k_h)
3442  (=> (and hop_1_k_l hop_1_l_j) hop_2_k_j)
3443  (=> (and hop_1_k_l hop_1_l_m) hop_2_k_m)
3444  (=> (and hop_1_k_l hop_1_l_o) hop_2_k_o)
3445  (=> (and hop_1_k_l hop_1_l_n) hop_2_k_n)
3446  (=> (and hop_1_k_l hop_1_l_q) hop_2_k_q)
3447  (=> (and hop_1_k_l hop_1_l_p) hop_2_k_p)
3448  (=> (and hop_1_k_o hop_1_o_a) hop_2_k_a)
3449  (=> (and hop_1_k_o hop_1_o_c) hop_2_k_c)
3450  (=> (and hop_1_k_o hop_1_o_b) hop_2_k_b)
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3451  (=> (and hop_1_k_o hop_1_o_e) hop_2_k_e)
3452  (=> (and hop_1_k_o hop_1_o_d) hop_2_k_d)
3453  (=> (and hop_1_k_o hop_1_o_g) hop_2_k_g)
3454  (=> (and hop_1_k_o hop_1_o_f) hop_2_k_f)
3455  (=> (and hop_1_k_o hop_1_o_i) hop_2_k_i)
3456  (=> (and hop_1_k_o hop_1_o_h) hop_2_k_h)
3457  (=> (and hop_1_k_o hop_1_o_j) hop_2_k_j)
3458  (=> (and hop_1_k_o hop_1_o_m) hop_2_k_m)
3459  (=> (and hop_1_k_o hop_1_o_l) hop_2_k_l)
3460  (=> (and hop_1_k_o hop_1_o_n) hop_2_k_n)
3461  (=> (and hop_1_k_o hop_1_o_q) hop_2_k_q)
3462  (=> (and hop_1_k_o hop_1_o_p) hop_2_k_p)
3463  (=> (and hop_1_k_n hop_1_n_a) hop_2_k_a)
3464  (=> (and hop_1_k_n hop_1_n_c) hop_2_k_c)
3465  (=> (and hop_1_k_n hop_1_n_b) hop_2_k_b)
3466  (=> (and hop_1_k_n hop_1_n_e) hop_2_k_e)
3467  (=> (and hop_1_k_n hop_1_n_d) hop_2_k_d)
3468  (=> (and hop_1_k_n hop_1_n_g) hop_2_k_g)
3469  (=> (and hop_1_k_n hop_1_n_f) hop_2_k_f)
3470  (=> (and hop_1_k_n hop_1_n_i) hop_2_k_i)
3471  (=> (and hop_1_k_n hop_1_n_h) hop_2_k_h)
3472  (=> (and hop_1_k_n hop_1_n_j) hop_2_k_j)
3473  (=> (and hop_1_k_n hop_1_n_m) hop_2_k_m)
3474  (=> (and hop_1_k_n hop_1_n_l) hop_2_k_l)
3475  (=> (and hop_1_k_n hop_1_n_o) hop_2_k_o)
3476  (=> (and hop_1_k_n hop_1_n_q) hop_2_k_q)
3477  (=> (and hop_1_k_n hop_1_n_p) hop_2_k_p)
3478  (=> (and hop_1_k_q hop_1_q_a) hop_2_k_a)
3479  (=> (and hop_1_k_q hop_1_q_c) hop_2_k_c)
3480  (=> (and hop_1_k_q hop_1_q_b) hop_2_k_b)
3481  (=> (and hop_1_k_q hop_1_q_e) hop_2_k_e)
3482  (=> (and hop_1_k_q hop_1_q_d) hop_2_k_d)
3483  (=> (and hop_1_k_q hop_1_q_g) hop_2_k_g)
3484  (=> (and hop_1_k_q hop_1_q_f) hop_2_k_f)
3485  (=> (and hop_1_k_q hop_1_q_i) hop_2_k_i)
3486  (=> (and hop_1_k_q hop_1_q_h) hop_2_k_h)
3487  (=> (and hop_1_k_q hop_1_q_j) hop_2_k_j)
3488  (=> (and hop_1_k_q hop_1_q_m) hop_2_k_m)
3489  (=> (and hop_1_k_q hop_1_q_l) hop_2_k_l)
3490  (=> (and hop_1_k_q hop_1_q_o) hop_2_k_o)
3491  (=> (and hop_1_k_q hop_1_q_n) hop_2_k_n)
3492  (=> (and hop_1_k_q hop_1_q_p) hop_2_k_p)
3493  (=> (and hop_1_k_p hop_1_p_a) hop_2_k_a)
3494  (=> (and hop_1_k_p hop_1_p_c) hop_2_k_c)
3495  (=> (and hop_1_k_p hop_1_p_b) hop_2_k_b)
3496  (=> (and hop_1_k_p hop_1_p_e) hop_2_k_e)
3497  (=> (and hop_1_k_p hop_1_p_d) hop_2_k_d)
3498  (=> (and hop_1_k_p hop_1_p_g) hop_2_k_g)
3499  (=> (and hop_1_k_p hop_1_p_f) hop_2_k_f)
3500  (=> (and hop_1_k_p hop_1_p_i) hop_2_k_i)
3501  (=> (and hop_1_k_p hop_1_p_h) hop_2_k_h)
3502  (=> (and hop_1_k_p hop_1_p_j) hop_2_k_j)
3503  (=> (and hop_1_k_p hop_1_p_m) hop_2_k_m)
3504  (=> (and hop_1_k_p hop_1_p_l) hop_2_k_l)
3505  (=> (and hop_1_k_p hop_1_p_o) hop_2_k_o)
3506  (=> (and hop_1_k_p hop_1_p_n) hop_2_k_n)
3507  (=> (and hop_1_k_p hop_1_p_q) hop_2_k_q)
3508  (=> (and hop_1_j_a hop_1_a_c) hop_2_j_c)
3509  (=> (and hop_1_j_a hop_1_a_b) hop_2_j_b)
3510  (=> (and hop_1_j_a hop_1_a_e) hop_2_j_e)
3511  (=> (and hop_1_j_a hop_1_a_d) hop_2_j_d)
3512  (=> (and hop_1_j_a hop_1_a_g) hop_2_j_g)
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3513   (=> (and hop_1_j_a hop_1_a_f) hop_2_j_f)
3514   (=> (and hop_1_j_a hop_1_a_i) hop_2_j_i)
3515   (=> (and hop_1_j_a hop_1_a_h) hop_2_j_h)
3516   (=> (and hop_1_j_a hop_1_a_k) hop_2_j_k)
3517   (=> (and hop_1_j_a hop_1_a_m) hop_2_j_m)
3518   (=> (and hop_1_j_a hop_1_a_l) hop_2_j_l)
3519   (=> (and hop_1_j_a hop_1_a_o) hop_2_j_o)
3520   (=> (and hop_1_j_a hop_1_a_n) hop_2_j_n)
3521   (=> (and hop_1_j_a hop_1_a_q) hop_2_j_q)
3522   (=> (and hop_1_j_a hop_1_a_p) hop_2_j_p)
3523   (=> (and hop_1_j_c hop_1_c_a) hop_2_j_a)
3524   (=> (and hop_1_j_c hop_1_c_b) hop_2_j_b)
3525   (=> (and hop_1_j_c hop_1_c_e) hop_2_j_e)
3526   (=> (and hop_1_j_c hop_1_c_d) hop_2_j_d)
3527   (=> (and hop_1_j_c hop_1_c_g) hop_2_j_g)
3528   (=> (and hop_1_j_c hop_1_c_f) hop_2_j_f)
3529   (=> (and hop_1_j_c hop_1_c_i) hop_2_j_i)
3530   (=> (and hop_1_j_c hop_1_c_h) hop_2_j_h)
3531   (=> (and hop_1_j_c hop_1_c_k) hop_2_j_k)
3532   (=> (and hop_1_j_c hop_1_c_m) hop_2_j_m)
3533   (=> (and hop_1_j_c hop_1_c_l) hop_2_j_l)
3534   (=> (and hop_1_j_c hop_1_c_o) hop_2_j_o)
3535   (=> (and hop_1_j_c hop_1_c_n) hop_2_j_n)
3536   (=> (and hop_1_j_c hop_1_c_q) hop_2_j_q)
3537   (=> (and hop_1_j_c hop_1_c_p) hop_2_j_p)
3538   (=> (and hop_1_j_b hop_1_b_a) hop_2_j_a)
3539   (=> (and hop_1_j_b hop_1_b_c) hop_2_j_c)
3540   (=> (and hop_1_j_b hop_1_b_e) hop_2_j_e)
3541   (=> (and hop_1_j_b hop_1_b_d) hop_2_j_d)
3542   (=> (and hop_1_j_b hop_1_b_g) hop_2_j_g)
3543   (=> (and hop_1_j_b hop_1_b_f) hop_2_j_f)
3544   (=> (and hop_1_j_b hop_1_b_i) hop_2_j_i)
3545   (=> (and hop_1_j_b hop_1_b_h) hop_2_j_h)
3546   (=> (and hop_1_j_b hop_1_b_k) hop_2_j_k)
3547   (=> (and hop_1_j_b hop_1_b_m) hop_2_j_m)
3548   (=> (and hop_1_j_b hop_1_b_l) hop_2_j_l)
3549   (=> (and hop_1_j_b hop_1_b_o) hop_2_j_o)
3550   (=> (and hop_1_j_b hop_1_b_n) hop_2_j_n)
3551   (=> (and hop_1_j_b hop_1_b_q) hop_2_j_q)
3552   (=> (and hop_1_j_b hop_1_b_p) hop_2_j_p)
3553   (=> (and hop_1_j_e hop_1_e_a) hop_2_j_a)
3554   (=> (and hop_1_j_e hop_1_e_c) hop_2_j_c)
3555   (=> (and hop_1_j_e hop_1_e_b) hop_2_j_b)
3556   (=> (and hop_1_j_e hop_1_e_d) hop_2_j_d)
3557   (=> (and hop_1_j_e hop_1_e_g) hop_2_j_g)
3558   (=> (and hop_1_j_e hop_1_e_f) hop_2_j_f)
3559   (=> (and hop_1_j_e hop_1_e_i) hop_2_j_i)
3560   (=> (and hop_1_j_e hop_1_e_h) hop_2_j_h)
3561   (=> (and hop_1_j_e hop_1_e_k) hop_2_j_k)
3562   (=> (and hop_1_j_e hop_1_e_m) hop_2_j_m)
3563   (=> (and hop_1_j_e hop_1_e_l) hop_2_j_l)
3564   (=> (and hop_1_j_e hop_1_e_o) hop_2_j_o)
3565   (=> (and hop_1_j_e hop_1_e_n) hop_2_j_n)
3566   (=> (and hop_1_j_e hop_1_e_q) hop_2_j_q)
3567   (=> (and hop_1_j_e hop_1_e_p) hop_2_j_p)
3568   (=> (and hop_1_j_d hop_1_d_a) hop_2_j_a)
3569   (=> (and hop_1_j_d hop_1_d_c) hop_2_j_c)
3570   (=> (and hop_1_j_d hop_1_d_b) hop_2_j_b)
3571   (=> (and hop_1_j_d hop_1_d_e) hop_2_j_e)
3572   (=> (and hop_1_j_d hop_1_d_g) hop_2_j_g)
3573   (=> (and hop_1_j_d hop_1_d_f) hop_2_j_f)
3574   (=> (and hop_1_j_d hop_1_d_i) hop_2_j_i)
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3575  (=> (and hop_1_j_d hop_1_d_h) hop_2_j_h)
3576  (=> (and hop_1_j_d hop_1_d_k) hop_2_j_k)
3577  (=> (and hop_1_j_d hop_1_d_m) hop_2_j_m)
3578  (=> (and hop_1_j_d hop_1_d_l) hop_2_j_l)
3579  (=> (and hop_1_j_d hop_1_d_o) hop_2_j_o)
3580  (=> (and hop_1_j_d hop_1_d_n) hop_2_j_n)
3581  (=> (and hop_1_j_d hop_1_d_q) hop_2_j_q)
3582  (=> (and hop_1_j_d hop_1_d_p) hop_2_j_p)
3583  (=> (and hop_1_j_g hop_1_g_a) hop_2_j_a)
3584  (=> (and hop_1_j_g hop_1_g_c) hop_2_j_c)
3585  (=> (and hop_1_j_g hop_1_g_b) hop_2_j_b)
3586  (=> (and hop_1_j_g hop_1_g_e) hop_2_j_e)
3587  (=> (and hop_1_j_g hop_1_g_d) hop_2_j_d)
3588  (=> (and hop_1_j_g hop_1_g_f) hop_2_j_f)
3589  (=> (and hop_1_j_g hop_1_g_i) hop_2_j_i)
3590  (=> (and hop_1_j_g hop_1_g_h) hop_2_j_h)
3591  (=> (and hop_1_j_g hop_1_g_k) hop_2_j_k)
3592  (=> (and hop_1_j_g hop_1_g_m) hop_2_j_m)
3593  (=> (and hop_1_j_g hop_1_g_l) hop_2_j_l)
3594  (=> (and hop_1_j_g hop_1_g_o) hop_2_j_o)
3595  (=> (and hop_1_j_g hop_1_g_n) hop_2_j_n)
3596  (=> (and hop_1_j_g hop_1_g_q) hop_2_j_q)
3597  (=> (and hop_1_j_g hop_1_g_p) hop_2_j_p)
3598  (=> (and hop_1_j_f hop_1_f_a) hop_2_j_a)
3599  (=> (and hop_1_j_f hop_1_f_c) hop_2_j_c)
3600  (=> (and hop_1_j_f hop_1_f_b) hop_2_j_b)
3601  (=> (and hop_1_j_f hop_1_f_e) hop_2_j_e)
3602  (=> (and hop_1_j_f hop_1_f_d) hop_2_j_d)
3603  (=> (and hop_1_j_f hop_1_f_g) hop_2_j_g)
3604  (=> (and hop_1_j_f hop_1_f_i) hop_2_j_i)
3605  (=> (and hop_1_j_f hop_1_f_h) hop_2_j_h)
3606  (=> (and hop_1_j_f hop_1_f_k) hop_2_j_k)
3607  (=> (and hop_1_j_f hop_1_f_m) hop_2_j_m)
3608  (=> (and hop_1_j_f hop_1_f_l) hop_2_j_l)
3609  (=> (and hop_1_j_f hop_1_f_o) hop_2_j_o)
3610  (=> (and hop_1_j_f hop_1_f_n) hop_2_j_n)
3611  (=> (and hop_1_j_f hop_1_f_q) hop_2_j_q)
3612  (=> (and hop_1_j_f hop_1_f_p) hop_2_j_p)
3613  (=> (and hop_1_j_i hop_1_i_a) hop_2_j_a)
3614  (=> (and hop_1_j_i hop_1_i_c) hop_2_j_c)
3615  (=> (and hop_1_j_i hop_1_i_b) hop_2_j_b)
3616  (=> (and hop_1_j_i hop_1_i_e) hop_2_j_e)
3617  (=> (and hop_1_j_i hop_1_i_d) hop_2_j_d)
3618  (=> (and hop_1_j_i hop_1_i_g) hop_2_j_g)
3619  (=> (and hop_1_j_i hop_1_i_f) hop_2_j_f)
3620  (=> (and hop_1_j_i hop_1_i_h) hop_2_j_h)
3621  (=> (and hop_1_j_i hop_1_i_k) hop_2_j_k)
3622  (=> (and hop_1_j_i hop_1_i_m) hop_2_j_m)
3623  (=> (and hop_1_j_i hop_1_i_l) hop_2_j_l)
3624  (=> (and hop_1_j_i hop_1_i_o) hop_2_j_o)
3625  (=> (and hop_1_j_i hop_1_i_n) hop_2_j_n)
3626  (=> (and hop_1_j_i hop_1_i_q) hop_2_j_q)
3627  (=> (and hop_1_j_i hop_1_i_p) hop_2_j_p)
3628  (=> (and hop_1_j_h hop_1_h_a) hop_2_j_a)
3629  (=> (and hop_1_j_h hop_1_h_c) hop_2_j_c)
3630  (=> (and hop_1_j_h hop_1_h_b) hop_2_j_b)
3631  (=> (and hop_1_j_h hop_1_h_e) hop_2_j_e)
3632  (=> (and hop_1_j_h hop_1_h_d) hop_2_j_d)
3633  (=> (and hop_1_j_h hop_1_h_g) hop_2_j_g)
3634  (=> (and hop_1_j_h hop_1_h_f) hop_2_j_f)
3635  (=> (and hop_1_j_h hop_1_h_i) hop_2_j_i)
3636  (=> (and hop_1_j_h hop_1_h_k) hop_2_j_k)
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3637   (=> (and hop_1_j_h hop_1_h_m) hop_2_j_m)
3638   (=> (and hop_1_j_h hop_1_h_l) hop_2_j_l)
3639   (=> (and hop_1_j_h hop_1_h_o) hop_2_j_o)
3640   (=> (and hop_1_j_h hop_1_h_n) hop_2_j_n)
3641   (=> (and hop_1_j_h hop_1_h_q) hop_2_j_q)
3642   (=> (and hop_1_j_h hop_1_h_p) hop_2_j_p)
3643   (=> (and hop_1_j_k hop_1_k_a) hop_2_j_a)
3644   (=> (and hop_1_j_k hop_1_k_c) hop_2_j_c)
3645   (=> (and hop_1_j_k hop_1_k_b) hop_2_j_b)
3646   (=> (and hop_1_j_k hop_1_k_e) hop_2_j_e)
3647   (=> (and hop_1_j_k hop_1_k_d) hop_2_j_d)
3648   (=> (and hop_1_j_k hop_1_k_g) hop_2_j_g)
3649   (=> (and hop_1_j_k hop_1_k_f) hop_2_j_f)
3650   (=> (and hop_1_j_k hop_1_k_i) hop_2_j_i)
3651   (=> (and hop_1_j_k hop_1_k_h) hop_2_j_h)
3652   (=> (and hop_1_j_k hop_1_k_m) hop_2_j_m)
3653   (=> (and hop_1_j_k hop_1_k_l) hop_2_j_l)
3654   (=> (and hop_1_j_k hop_1_k_o) hop_2_j_o)
3655   (=> (and hop_1_j_k hop_1_k_n) hop_2_j_n)
3656   (=> (and hop_1_j_k hop_1_k_q) hop_2_j_q)
3657   (=> (and hop_1_j_k hop_1_k_p) hop_2_j_p)
3658   (=> (and hop_1_j_m hop_1_m_a) hop_2_j_a)
3659   (=> (and hop_1_j_m hop_1_m_c) hop_2_j_c)
3660   (=> (and hop_1_j_m hop_1_m_b) hop_2_j_b)
3661   (=> (and hop_1_j_m hop_1_m_e) hop_2_j_e)
3662   (=> (and hop_1_j_m hop_1_m_d) hop_2_j_d)
3663   (=> (and hop_1_j_m hop_1_m_g) hop_2_j_g)
3664   (=> (and hop_1_j_m hop_1_m_f) hop_2_j_f)
3665   (=> (and hop_1_j_m hop_1_m_i) hop_2_j_i)
3666   (=> (and hop_1_j_m hop_1_m_h) hop_2_j_h)
3667   (=> (and hop_1_j_m hop_1_m_k) hop_2_j_k)
3668   (=> (and hop_1_j_m hop_1_m_l) hop_2_j_l)
3669   (=> (and hop_1_j_m hop_1_m_o) hop_2_j_o)
3670   (=> (and hop_1_j_m hop_1_m_n) hop_2_j_n)
3671   (=> (and hop_1_j_m hop_1_m_q) hop_2_j_q)
3672   (=> (and hop_1_j_m hop_1_m_p) hop_2_j_p)
3673   (=> (and hop_1_j_l hop_1_l_a) hop_2_j_a)
3674   (=> (and hop_1_j_l hop_1_l_c) hop_2_j_c)
3675   (=> (and hop_1_j_l hop_1_l_b) hop_2_j_b)
3676   (=> (and hop_1_j_l hop_1_l_e) hop_2_j_e)
3677   (=> (and hop_1_j_l hop_1_l_d) hop_2_j_d)
3678   (=> (and hop_1_j_l hop_1_l_g) hop_2_j_g)
3679   (=> (and hop_1_j_l hop_1_l_f) hop_2_j_f)
3680   (=> (and hop_1_j_l hop_1_l_i) hop_2_j_i)
3681   (=> (and hop_1_j_l hop_1_l_h) hop_2_j_h)
3682   (=> (and hop_1_j_l hop_1_l_k) hop_2_j_k)
3683   (=> (and hop_1_j_l hop_1_l_m) hop_2_j_m)
3684   (=> (and hop_1_j_l hop_1_l_o) hop_2_j_o)
3685   (=> (and hop_1_j_l hop_1_l_n) hop_2_j_n)
3686   (=> (and hop_1_j_l hop_1_l_q) hop_2_j_q)
3687   (=> (and hop_1_j_l hop_1_l_p) hop_2_j_p)
3688   (=> (and hop_1_j_o hop_1_o_a) hop_2_j_a)
3689   (=> (and hop_1_j_o hop_1_o_c) hop_2_j_c)
3690   (=> (and hop_1_j_o hop_1_o_b) hop_2_j_b)
3691   (=> (and hop_1_j_o hop_1_o_e) hop_2_j_e)
3692   (=> (and hop_1_j_o hop_1_o_d) hop_2_j_d)
3693   (=> (and hop_1_j_o hop_1_o_g) hop_2_j_g)
3694   (=> (and hop_1_j_o hop_1_o_f) hop_2_j_f)
3695   (=> (and hop_1_j_o hop_1_o_i) hop_2_j_i)
3696   (=> (and hop_1_j_o hop_1_o_h) hop_2_j_h)
3697   (=> (and hop_1_j_o hop_1_o_k) hop_2_j_k)
3698   (=> (and hop_1_j_o hop_1_o_m) hop_2_j_m)
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3699  (=> (and hop_1_j_o hop_1_o_l) hop_2_j_l)
3700  (=> (and hop_1_j_o hop_1_o_n) hop_2_j_n)
3701  (=> (and hop_1_j_o hop_1_o_q) hop_2_j_q)
3702  (=> (and hop_1_j_o hop_1_o_p) hop_2_j_p)
3703  (=> (and hop_1_j_n hop_1_n_a) hop_2_j_a)
3704  (=> (and hop_1_j_n hop_1_n_c) hop_2_j_c)
3705  (=> (and hop_1_j_n hop_1_n_b) hop_2_j_b)
3706  (=> (and hop_1_j_n hop_1_n_e) hop_2_j_e)
3707  (=> (and hop_1_j_n hop_1_n_d) hop_2_j_d)
3708  (=> (and hop_1_j_n hop_1_n_g) hop_2_j_g)
3709  (=> (and hop_1_j_n hop_1_n_f) hop_2_j_f)
3710  (=> (and hop_1_j_n hop_1_n_i) hop_2_j_i)
3711  (=> (and hop_1_j_n hop_1_n_h) hop_2_j_h)
3712  (=> (and hop_1_j_n hop_1_n_k) hop_2_j_k)
3713  (=> (and hop_1_j_n hop_1_n_m) hop_2_j_m)
3714  (=> (and hop_1_j_n hop_1_n_l) hop_2_j_l)
3715  (=> (and hop_1_j_n hop_1_n_o) hop_2_j_o)
3716  (=> (and hop_1_j_n hop_1_n_q) hop_2_j_q)
3717  (=> (and hop_1_j_n hop_1_n_p) hop_2_j_p)
3718  (=> (and hop_1_j_q hop_1_q_a) hop_2_j_a)
3719  (=> (and hop_1_j_q hop_1_q_c) hop_2_j_c)
3720  (=> (and hop_1_j_q hop_1_q_b) hop_2_j_b)
3721  (=> (and hop_1_j_q hop_1_q_e) hop_2_j_e)
3722  (=> (and hop_1_j_q hop_1_q_d) hop_2_j_d)
3723  (=> (and hop_1_j_q hop_1_q_g) hop_2_j_g)
3724  (=> (and hop_1_j_q hop_1_q_f) hop_2_j_f)
3725  (=> (and hop_1_j_q hop_1_q_i) hop_2_j_i)
3726  (=> (and hop_1_j_q hop_1_q_h) hop_2_j_h)
3727  (=> (and hop_1_j_q hop_1_q_k) hop_2_j_k)
3728  (=> (and hop_1_j_q hop_1_q_m) hop_2_j_m)
3729  (=> (and hop_1_j_q hop_1_q_l) hop_2_j_l)
3730  (=> (and hop_1_j_q hop_1_q_o) hop_2_j_o)
3731  (=> (and hop_1_j_q hop_1_q_n) hop_2_j_n)
3732  (=> (and hop_1_j_q hop_1_q_p) hop_2_j_p)
3733  (=> (and hop_1_j_p hop_1_p_a) hop_2_j_a)
3734  (=> (and hop_1_j_p hop_1_p_c) hop_2_j_c)
3735  (=> (and hop_1_j_p hop_1_p_b) hop_2_j_b)
3736  (=> (and hop_1_j_p hop_1_p_e) hop_2_j_e)
3737  (=> (and hop_1_j_p hop_1_p_d) hop_2_j_d)
3738  (=> (and hop_1_j_p hop_1_p_g) hop_2_j_g)
3739  (=> (and hop_1_j_p hop_1_p_f) hop_2_j_f)
3740  (=> (and hop_1_j_p hop_1_p_i) hop_2_j_i)
3741  (=> (and hop_1_j_p hop_1_p_h) hop_2_j_h)
3742  (=> (and hop_1_j_p hop_1_p_k) hop_2_j_k)
3743  (=> (and hop_1_j_p hop_1_p_m) hop_2_j_m)
3744  (=> (and hop_1_j_p hop_1_p_l) hop_2_j_l)
3745  (=> (and hop_1_j_p hop_1_p_o) hop_2_j_o)
3746  (=> (and hop_1_j_p hop_1_p_n) hop_2_j_n)
3747  (=> (and hop_1_j_p hop_1_p_q) hop_2_j_q)
3748  (=> (and hop_1_m_a hop_1_a_c) hop_2_m_c)
3749  (=> (and hop_1_m_a hop_1_a_b) hop_2_m_b)
3750  (=> (and hop_1_m_a hop_1_a_e) hop_2_m_e)
3751  (=> (and hop_1_m_a hop_1_a_d) hop_2_m_d)
3752  (=> (and hop_1_m_a hop_1_a_g) hop_2_m_g)
3753  (=> (and hop_1_m_a hop_1_a_f) hop_2_m_f)
3754  (=> (and hop_1_m_a hop_1_a_i) hop_2_m_i)
3755  (=> (and hop_1_m_a hop_1_a_h) hop_2_m_h)
3756  (=> (and hop_1_m_a hop_1_a_k) hop_2_m_k)
3757  (=> (and hop_1_m_a hop_1_a_j) hop_2_m_j)
3758  (=> (and hop_1_m_a hop_1_a_l) hop_2_m_l)
3759  (=> (and hop_1_m_a hop_1_a_o) hop_2_m_o)
3760  (=> (and hop_1_m_a hop_1_a_n) hop_2_m_n)
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3761  (=> (and hop_1_m_a hop_1_a_q) hop_2_m_q)
3762  (=> (and hop_1_m_a hop_1_a_p) hop_2_m_p)
3763  (=> (and hop_1_m_c hop_1_c_a) hop_2_m_a)
3764  (=> (and hop_1_m_c hop_1_c_b) hop_2_m_b)
3765  (=> (and hop_1_m_c hop_1_c_e) hop_2_m_e)
3766  (=> (and hop_1_m_c hop_1_c_d) hop_2_m_d)
3767  (=> (and hop_1_m_c hop_1_c_g) hop_2_m_g)
3768  (=> (and hop_1_m_c hop_1_c_f) hop_2_m_f)
3769  (=> (and hop_1_m_c hop_1_c_i) hop_2_m_i)
3770  (=> (and hop_1_m_c hop_1_c_h) hop_2_m_h)
3771  (=> (and hop_1_m_c hop_1_c_k) hop_2_m_k)
3772  (=> (and hop_1_m_c hop_1_c_j) hop_2_m_j)
3773  (=> (and hop_1_m_c hop_1_c_l) hop_2_m_l)
3774  (=> (and hop_1_m_c hop_1_c_o) hop_2_m_o)
3775  (=> (and hop_1_m_c hop_1_c_n) hop_2_m_n)
3776  (=> (and hop_1_m_c hop_1_c_q) hop_2_m_q)
3777  (=> (and hop_1_m_c hop_1_c_p) hop_2_m_p)
3778  (=> (and hop_1_m_b hop_1_b_a) hop_2_m_a)
3779  (=> (and hop_1_m_b hop_1_b_c) hop_2_m_c)
3780  (=> (and hop_1_m_b hop_1_b_e) hop_2_m_e)
3781  (=> (and hop_1_m_b hop_1_b_d) hop_2_m_d)
3782  (=> (and hop_1_m_b hop_1_b_g) hop_2_m_g)
3783  (=> (and hop_1_m_b hop_1_b_f) hop_2_m_f)
3784  (=> (and hop_1_m_b hop_1_b_i) hop_2_m_i)
3785  (=> (and hop_1_m_b hop_1_b_h) hop_2_m_h)
3786  (=> (and hop_1_m_b hop_1_b_k) hop_2_m_k)
3787  (=> (and hop_1_m_b hop_1_b_j) hop_2_m_j)
3788  (=> (and hop_1_m_b hop_1_b_l) hop_2_m_l)
3789  (=> (and hop_1_m_b hop_1_b_o) hop_2_m_o)
3790  (=> (and hop_1_m_b hop_1_b_n) hop_2_m_n)
3791  (=> (and hop_1_m_b hop_1_b_q) hop_2_m_q)
3792  (=> (and hop_1_m_b hop_1_b_p) hop_2_m_p)
3793  (=> (and hop_1_m_e hop_1_e_a) hop_2_m_a)
3794  (=> (and hop_1_m_e hop_1_e_c) hop_2_m_c)
3795  (=> (and hop_1_m_e hop_1_e_b) hop_2_m_b)
3796  (=> (and hop_1_m_e hop_1_e_d) hop_2_m_d)
3797  (=> (and hop_1_m_e hop_1_e_g) hop_2_m_g)
3798  (=> (and hop_1_m_e hop_1_e_f) hop_2_m_f)
3799  (=> (and hop_1_m_e hop_1_e_i) hop_2_m_i)
3800  (=> (and hop_1_m_e hop_1_e_h) hop_2_m_h)
3801  (=> (and hop_1_m_e hop_1_e_k) hop_2_m_k)
3802  (=> (and hop_1_m_e hop_1_e_j) hop_2_m_j)
3803  (=> (and hop_1_m_e hop_1_e_l) hop_2_m_l)
3804  (=> (and hop_1_m_e hop_1_e_o) hop_2_m_o)
3805  (=> (and hop_1_m_e hop_1_e_n) hop_2_m_n)
3806  (=> (and hop_1_m_e hop_1_e_q) hop_2_m_q)
3807  (=> (and hop_1_m_e hop_1_e_p) hop_2_m_p)
3808  (=> (and hop_1_m_d hop_1_d_a) hop_2_m_a)
3809  (=> (and hop_1_m_d hop_1_d_c) hop_2_m_c)
3810  (=> (and hop_1_m_d hop_1_d_b) hop_2_m_b)
3811  (=> (and hop_1_m_d hop_1_d_e) hop_2_m_e)
3812  (=> (and hop_1_m_d hop_1_d_g) hop_2_m_g)
3813  (=> (and hop_1_m_d hop_1_d_f) hop_2_m_f)
3814  (=> (and hop_1_m_d hop_1_d_i) hop_2_m_i)
3815  (=> (and hop_1_m_d hop_1_d_h) hop_2_m_h)
3816  (=> (and hop_1_m_d hop_1_d_k) hop_2_m_k)
3817  (=> (and hop_1_m_d hop_1_d_j) hop_2_m_j)
3818  (=> (and hop_1_m_d hop_1_d_l) hop_2_m_l)
3819  (=> (and hop_1_m_d hop_1_d_o) hop_2_m_o)
3820  (=> (and hop_1_m_d hop_1_d_n) hop_2_m_n)
3821  (=> (and hop_1_m_d hop_1_d_q) hop_2_m_q)
3822  (=> (and hop_1_m_d hop_1_d_p) hop_2_m_p)
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3823   (=> (and hop_1_m_g hop_1_g_a) hop_2_m_a)
3824   (=> (and hop_1_m_g hop_1_g_c) hop_2_m_c)
3825   (=> (and hop_1_m_g hop_1_g_b) hop_2_m_b)
3826   (=> (and hop_1_m_g hop_1_g_e) hop_2_m_e)
3827   (=> (and hop_1_m_g hop_1_g_d) hop_2_m_d)
3828   (=> (and hop_1_m_g hop_1_g_f) hop_2_m_f)
3829   (=> (and hop_1_m_g hop_1_g_i) hop_2_m_i)
3830   (=> (and hop_1_m_g hop_1_g_h) hop_2_m_h)
3831   (=> (and hop_1_m_g hop_1_g_k) hop_2_m_k)
3832   (=> (and hop_1_m_g hop_1_g_j) hop_2_m_j)
3833   (=> (and hop_1_m_g hop_1_g_l) hop_2_m_l)
3834   (=> (and hop_1_m_g hop_1_g_o) hop_2_m_o)
3835   (=> (and hop_1_m_g hop_1_g_n) hop_2_m_n)
3836   (=> (and hop_1_m_g hop_1_g_q) hop_2_m_q)
3837   (=> (and hop_1_m_g hop_1_g_p) hop_2_m_p)
3838   (=> (and hop_1_m_f hop_1_f_a) hop_2_m_a)
3839   (=> (and hop_1_m_f hop_1_f_c) hop_2_m_c)
3840   (=> (and hop_1_m_f hop_1_f_b) hop_2_m_b)
3841   (=> (and hop_1_m_f hop_1_f_e) hop_2_m_e)
3842   (=> (and hop_1_m_f hop_1_f_d) hop_2_m_d)
3843   (=> (and hop_1_m_f hop_1_f_g) hop_2_m_g)
3844   (=> (and hop_1_m_f hop_1_f_i) hop_2_m_i)
3845   (=> (and hop_1_m_f hop_1_f_h) hop_2_m_h)
3846   (=> (and hop_1_m_f hop_1_f_k) hop_2_m_k)
3847   (=> (and hop_1_m_f hop_1_f_j) hop_2_m_j)
3848   (=> (and hop_1_m_f hop_1_f_l) hop_2_m_l)
3849   (=> (and hop_1_m_f hop_1_f_o) hop_2_m_o)
3850   (=> (and hop_1_m_f hop_1_f_n) hop_2_m_n)
3851   (=> (and hop_1_m_f hop_1_f_q) hop_2_m_q)
3852   (=> (and hop_1_m_f hop_1_f_p) hop_2_m_p)
3853   (=> (and hop_1_m_i hop_1_i_a) hop_2_m_a)
3854   (=> (and hop_1_m_i hop_1_i_c) hop_2_m_c)
3855   (=> (and hop_1_m_i hop_1_i_b) hop_2_m_b)
3856   (=> (and hop_1_m_i hop_1_i_e) hop_2_m_e)
3857   (=> (and hop_1_m_i hop_1_i_d) hop_2_m_d)
3858   (=> (and hop_1_m_i hop_1_i_g) hop_2_m_g)
3859   (=> (and hop_1_m_i hop_1_i_f) hop_2_m_f)
3860   (=> (and hop_1_m_i hop_1_i_h) hop_2_m_h)
3861   (=> (and hop_1_m_i hop_1_i_k) hop_2_m_k)
3862   (=> (and hop_1_m_i hop_1_i_j) hop_2_m_j)
3863   (=> (and hop_1_m_i hop_1_i_l) hop_2_m_l)
3864   (=> (and hop_1_m_i hop_1_i_o) hop_2_m_o)
3865   (=> (and hop_1_m_i hop_1_i_n) hop_2_m_n)
3866   (=> (and hop_1_m_i hop_1_i_q) hop_2_m_q)
3867   (=> (and hop_1_m_i hop_1_i_p) hop_2_m_p)
3868   (=> (and hop_1_m_h hop_1_h_a) hop_2_m_a)
3869   (=> (and hop_1_m_h hop_1_h_c) hop_2_m_c)
3870   (=> (and hop_1_m_h hop_1_h_b) hop_2_m_b)
3871   (=> (and hop_1_m_h hop_1_h_e) hop_2_m_e)
3872   (=> (and hop_1_m_h hop_1_h_d) hop_2_m_d)
3873   (=> (and hop_1_m_h hop_1_h_g) hop_2_m_g)
3874   (=> (and hop_1_m_h hop_1_h_f) hop_2_m_f)
3875   (=> (and hop_1_m_h hop_1_h_i) hop_2_m_i)
3876   (=> (and hop_1_m_h hop_1_h_k) hop_2_m_k)
3877   (=> (and hop_1_m_h hop_1_h_j) hop_2_m_j)
3878   (=> (and hop_1_m_h hop_1_h_l) hop_2_m_l)
3879   (=> (and hop_1_m_h hop_1_h_o) hop_2_m_o)
3880   (=> (and hop_1_m_h hop_1_h_n) hop_2_m_n)
3881   (=> (and hop_1_m_h hop_1_h_q) hop_2_m_q)
3882   (=> (and hop_1_m_h hop_1_h_p) hop_2_m_p)
3883   (=> (and hop_1_m_k hop_1_k_a) hop_2_m_a)
3884   (=> (and hop_1_m_k hop_1_k_c) hop_2_m_c)
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3885  (=> (and hop_1_m_k hop_1_k_b) hop_2_m_b)
3886  (=> (and hop_1_m_k hop_1_k_e) hop_2_m_e)
3887  (=> (and hop_1_m_k hop_1_k_d) hop_2_m_d)
3888  (=> (and hop_1_m_k hop_1_k_g) hop_2_m_g)
3889  (=> (and hop_1_m_k hop_1_k_f) hop_2_m_f)
3890  (=> (and hop_1_m_k hop_1_k_i) hop_2_m_i)
3891  (=> (and hop_1_m_k hop_1_k_h) hop_2_m_h)
3892  (=> (and hop_1_m_k hop_1_k_j) hop_2_m_j)
3893  (=> (and hop_1_m_k hop_1_k_l) hop_2_m_l)
3894  (=> (and hop_1_m_k hop_1_k_o) hop_2_m_o)
3895  (=> (and hop_1_m_k hop_1_k_n) hop_2_m_n)
3896  (=> (and hop_1_m_k hop_1_k_q) hop_2_m_q)
3897  (=> (and hop_1_m_k hop_1_k_p) hop_2_m_p)
3898  (=> (and hop_1_m_j hop_1_j_a) hop_2_m_a)
3899  (=> (and hop_1_m_j hop_1_j_c) hop_2_m_c)
3900  (=> (and hop_1_m_j hop_1_j_b) hop_2_m_b)
3901  (=> (and hop_1_m_j hop_1_j_e) hop_2_m_e)
3902  (=> (and hop_1_m_j hop_1_j_d) hop_2_m_d)
3903  (=> (and hop_1_m_j hop_1_j_g) hop_2_m_g)
3904  (=> (and hop_1_m_j hop_1_j_f) hop_2_m_f)
3905  (=> (and hop_1_m_j hop_1_j_i) hop_2_m_i)
3906  (=> (and hop_1_m_j hop_1_j_h) hop_2_m_h)
3907  (=> (and hop_1_m_j hop_1_j_k) hop_2_m_k)
3908  (=> (and hop_1_m_j hop_1_j_l) hop_2_m_l)
3909  (=> (and hop_1_m_j hop_1_j_o) hop_2_m_o)
3910  (=> (and hop_1_m_j hop_1_j_n) hop_2_m_n)
3911  (=> (and hop_1_m_j hop_1_j_q) hop_2_m_q)
3912  (=> (and hop_1_m_j hop_1_j_p) hop_2_m_p)
3913  (=> (and hop_1_m_l hop_1_l_a) hop_2_m_a)
3914  (=> (and hop_1_m_l hop_1_l_c) hop_2_m_c)
3915  (=> (and hop_1_m_l hop_1_l_b) hop_2_m_b)
3916  (=> (and hop_1_m_l hop_1_l_e) hop_2_m_e)
3917  (=> (and hop_1_m_l hop_1_l_d) hop_2_m_d)
3918  (=> (and hop_1_m_l hop_1_l_g) hop_2_m_g)
3919  (=> (and hop_1_m_l hop_1_l_f) hop_2_m_f)
3920  (=> (and hop_1_m_l hop_1_l_i) hop_2_m_i)
3921  (=> (and hop_1_m_l hop_1_l_h) hop_2_m_h)
3922  (=> (and hop_1_m_l hop_1_l_k) hop_2_m_k)
3923  (=> (and hop_1_m_l hop_1_l_j) hop_2_m_j)
3924  (=> (and hop_1_m_l hop_1_l_o) hop_2_m_o)
3925  (=> (and hop_1_m_l hop_1_l_n) hop_2_m_n)
3926  (=> (and hop_1_m_l hop_1_l_q) hop_2_m_q)
3927  (=> (and hop_1_m_l hop_1_l_p) hop_2_m_p)
3928  (=> (and hop_1_m_o hop_1_o_a) hop_2_m_a)
3929  (=> (and hop_1_m_o hop_1_o_c) hop_2_m_c)
3930  (=> (and hop_1_m_o hop_1_o_b) hop_2_m_b)
3931  (=> (and hop_1_m_o hop_1_o_e) hop_2_m_e)
3932  (=> (and hop_1_m_o hop_1_o_d) hop_2_m_d)
3933  (=> (and hop_1_m_o hop_1_o_g) hop_2_m_g)
3934  (=> (and hop_1_m_o hop_1_o_f) hop_2_m_f)
3935  (=> (and hop_1_m_o hop_1_o_i) hop_2_m_i)
3936  (=> (and hop_1_m_o hop_1_o_h) hop_2_m_h)
3937  (=> (and hop_1_m_o hop_1_o_k) hop_2_m_k)
3938  (=> (and hop_1_m_o hop_1_o_j) hop_2_m_j)
3939  (=> (and hop_1_m_o hop_1_o_l) hop_2_m_l)
3940  (=> (and hop_1_m_o hop_1_o_n) hop_2_m_n)
3941  (=> (and hop_1_m_o hop_1_o_q) hop_2_m_q)
3942  (=> (and hop_1_m_o hop_1_o_p) hop_2_m_p)
3943  (=> (and hop_1_m_n hop_1_n_a) hop_2_m_a)
3944  (=> (and hop_1_m_n hop_1_n_c) hop_2_m_c)
3945  (=> (and hop_1_m_n hop_1_n_b) hop_2_m_b)
3946  (=> (and hop_1_m_n hop_1_n_e) hop_2_m_e)
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3947  (=> (and hop_1_m_n hop_1_n_d) hop_2_m_d)
3948  (=> (and hop_1_m_n hop_1_n_g) hop_2_m_g)
3949  (=> (and hop_1_m_n hop_1_n_f) hop_2_m_f)
3950  (=> (and hop_1_m_n hop_1_n_i) hop_2_m_i)
3951  (=> (and hop_1_m_n hop_1_n_h) hop_2_m_h)
3952  (=> (and hop_1_m_n hop_1_n_k) hop_2_m_k)
3953  (=> (and hop_1_m_n hop_1_n_j) hop_2_m_j)
3954  (=> (and hop_1_m_n hop_1_n_l) hop_2_m_l)
3955  (=> (and hop_1_m_n hop_1_n_o) hop_2_m_o)
3956  (=> (and hop_1_m_n hop_1_n_q) hop_2_m_q)
3957  (=> (and hop_1_m_n hop_1_n_p) hop_2_m_p)
3958  (=> (and hop_1_m_q hop_1_q_a) hop_2_m_a)
3959  (=> (and hop_1_m_q hop_1_q_c) hop_2_m_c)
3960  (=> (and hop_1_m_q hop_1_q_b) hop_2_m_b)
3961  (=> (and hop_1_m_q hop_1_q_e) hop_2_m_e)
3962  (=> (and hop_1_m_q hop_1_q_d) hop_2_m_d)
3963  (=> (and hop_1_m_q hop_1_q_g) hop_2_m_g)
3964  (=> (and hop_1_m_q hop_1_q_f) hop_2_m_f)
3965  (=> (and hop_1_m_q hop_1_q_i) hop_2_m_i)
3966  (=> (and hop_1_m_q hop_1_q_h) hop_2_m_h)
3967  (=> (and hop_1_m_q hop_1_q_k) hop_2_m_k)
3968  (=> (and hop_1_m_q hop_1_q_j) hop_2_m_j)
3969  (=> (and hop_1_m_q hop_1_q_l) hop_2_m_l)
3970  (=> (and hop_1_m_q hop_1_q_o) hop_2_m_o)
3971  (=> (and hop_1_m_q hop_1_q_n) hop_2_m_n)
3972  (=> (and hop_1_m_q hop_1_q_p) hop_2_m_p)
3973  (=> (and hop_1_m_p hop_1_p_a) hop_2_m_a)
3974  (=> (and hop_1_m_p hop_1_p_c) hop_2_m_c)
3975  (=> (and hop_1_m_p hop_1_p_b) hop_2_m_b)
3976  (=> (and hop_1_m_p hop_1_p_e) hop_2_m_e)
3977  (=> (and hop_1_m_p hop_1_p_d) hop_2_m_d)
3978  (=> (and hop_1_m_p hop_1_p_g) hop_2_m_g)
3979  (=> (and hop_1_m_p hop_1_p_f) hop_2_m_f)
3980  (=> (and hop_1_m_p hop_1_p_i) hop_2_m_i)
3981  (=> (and hop_1_m_p hop_1_p_h) hop_2_m_h)
3982  (=> (and hop_1_m_p hop_1_p_k) hop_2_m_k)
3983  (=> (and hop_1_m_p hop_1_p_j) hop_2_m_j)
3984  (=> (and hop_1_m_p hop_1_p_l) hop_2_m_l)
3985  (=> (and hop_1_m_p hop_1_p_o) hop_2_m_o)
3986  (=> (and hop_1_m_p hop_1_p_n) hop_2_m_n)
3987  (=> (and hop_1_m_p hop_1_p_q) hop_2_m_q)
3988  (=> (and hop_1_l_a hop_1_a_c) hop_2_l_c)
3989  (=> (and hop_1_l_a hop_1_a_b) hop_2_l_b)
3990  (=> (and hop_1_l_a hop_1_a_e) hop_2_l_e)
3991  (=> (and hop_1_l_a hop_1_a_d) hop_2_l_d)
3992  (=> (and hop_1_l_a hop_1_a_g) hop_2_l_g)
3993  (=> (and hop_1_l_a hop_1_a_f) hop_2_l_f)
3994  (=> (and hop_1_l_a hop_1_a_i) hop_2_l_i)
3995  (=> (and hop_1_l_a hop_1_a_h) hop_2_l_h)
3996  (=> (and hop_1_l_a hop_1_a_k) hop_2_l_k)
3997  (=> (and hop_1_l_a hop_1_a_j) hop_2_l_j)
3998  (=> (and hop_1_l_a hop_1_a_m) hop_2_l_m)
3999  (=> (and hop_1_l_a hop_1_a_o) hop_2_l_o)
4000  (=> (and hop_1_l_a hop_1_a_n) hop_2_l_n)
4001  (=> (and hop_1_l_a hop_1_a_q) hop_2_l_q)
4002  (=> (and hop_1_l_a hop_1_a_p) hop_2_l_p)
4003  (=> (and hop_1_l_c hop_1_c_a) hop_2_l_a)
4004  (=> (and hop_1_l_c hop_1_c_b) hop_2_l_b)
4005  (=> (and hop_1_l_c hop_1_c_e) hop_2_l_e)
4006  (=> (and hop_1_l_c hop_1_c_d) hop_2_l_d)
4007  (=> (and hop_1_l_c hop_1_c_g) hop_2_l_g)
4008  (=> (and hop_1_l_c hop_1_c_f) hop_2_l_f)
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4009  (=> (and hop_1_l_c hop_1_c_i) hop_2_l_i)
4010  (=> (and hop_1_l_c hop_1_c_h) hop_2_l_h)
4011  (=> (and hop_1_l_c hop_1_c_k) hop_2_l_k)
4012  (=> (and hop_1_l_c hop_1_c_j) hop_2_l_j)
4013  (=> (and hop_1_l_c hop_1_c_m) hop_2_l_m)
4014  (=> (and hop_1_l_c hop_1_c_o) hop_2_l_o)
4015  (=> (and hop_1_l_c hop_1_c_n) hop_2_l_n)
4016  (=> (and hop_1_l_c hop_1_c_q) hop_2_l_q)
4017  (=> (and hop_1_l_c hop_1_c_p) hop_2_l_p)
4018  (=> (and hop_1_l_b hop_1_b_a) hop_2_l_a)
4019  (=> (and hop_1_l_b hop_1_b_c) hop_2_l_c)
4020  (=> (and hop_1_l_b hop_1_b_e) hop_2_l_e)
4021  (=> (and hop_1_l_b hop_1_b_d) hop_2_l_d)
4022  (=> (and hop_1_l_b hop_1_b_g) hop_2_l_g)
4023  (=> (and hop_1_l_b hop_1_b_f) hop_2_l_f)
4024  (=> (and hop_1_l_b hop_1_b_i) hop_2_l_i)
4025  (=> (and hop_1_l_b hop_1_b_h) hop_2_l_h)
4026  (=> (and hop_1_l_b hop_1_b_k) hop_2_l_k)
4027  (=> (and hop_1_l_b hop_1_b_j) hop_2_l_j)
4028  (=> (and hop_1_l_b hop_1_b_m) hop_2_l_m)
4029  (=> (and hop_1_l_b hop_1_b_o) hop_2_l_o)
4030  (=> (and hop_1_l_b hop_1_b_n) hop_2_l_n)
4031  (=> (and hop_1_l_b hop_1_b_q) hop_2_l_q)
4032  (=> (and hop_1_l_b hop_1_b_p) hop_2_l_p)
4033  (=> (and hop_1_l_e hop_1_e_a) hop_2_l_a)
4034  (=> (and hop_1_l_e hop_1_e_c) hop_2_l_c)
4035  (=> (and hop_1_l_e hop_1_e_b) hop_2_l_b)
4036  (=> (and hop_1_l_e hop_1_e_d) hop_2_l_d)
4037  (=> (and hop_1_l_e hop_1_e_g) hop_2_l_g)
4038  (=> (and hop_1_l_e hop_1_e_f) hop_2_l_f)
4039  (=> (and hop_1_l_e hop_1_e_i) hop_2_l_i)
4040  (=> (and hop_1_l_e hop_1_e_h) hop_2_l_h)
4041  (=> (and hop_1_l_e hop_1_e_k) hop_2_l_k)
4042  (=> (and hop_1_l_e hop_1_e_j) hop_2_l_j)
4043  (=> (and hop_1_l_e hop_1_e_m) hop_2_l_m)
4044  (=> (and hop_1_l_e hop_1_e_o) hop_2_l_o)
4045  (=> (and hop_1_l_e hop_1_e_n) hop_2_l_n)
4046  (=> (and hop_1_l_e hop_1_e_q) hop_2_l_q)
4047  (=> (and hop_1_l_e hop_1_e_p) hop_2_l_p)
4048  (=> (and hop_1_l_d hop_1_d_a) hop_2_l_a)
4049  (=> (and hop_1_l_d hop_1_d_c) hop_2_l_c)
4050  (=> (and hop_1_l_d hop_1_d_b) hop_2_l_b)
4051  (=> (and hop_1_l_d hop_1_d_e) hop_2_l_e)
4052  (=> (and hop_1_l_d hop_1_d_g) hop_2_l_g)
4053  (=> (and hop_1_l_d hop_1_d_f) hop_2_l_f)
4054  (=> (and hop_1_l_d hop_1_d_i) hop_2_l_i)
4055  (=> (and hop_1_l_d hop_1_d_h) hop_2_l_h)
4056  (=> (and hop_1_l_d hop_1_d_k) hop_2_l_k)
4057  (=> (and hop_1_l_d hop_1_d_j) hop_2_l_j)
4058  (=> (and hop_1_l_d hop_1_d_m) hop_2_l_m)
4059  (=> (and hop_1_l_d hop_1_d_o) hop_2_l_o)
4060  (=> (and hop_1_l_d hop_1_d_n) hop_2_l_n)
4061  (=> (and hop_1_l_d hop_1_d_q) hop_2_l_q)
4062  (=> (and hop_1_l_d hop_1_d_p) hop_2_l_p)
4063  (=> (and hop_1_l_g hop_1_g_a) hop_2_l_a)
4064  (=> (and hop_1_l_g hop_1_g_c) hop_2_l_c)
4065  (=> (and hop_1_l_g hop_1_g_b) hop_2_l_b)
4066  (=> (and hop_1_l_g hop_1_g_e) hop_2_l_e)
4067  (=> (and hop_1_l_g hop_1_g_d) hop_2_l_d)
4068  (=> (and hop_1_l_g hop_1_g_f) hop_2_l_f)
4069  (=> (and hop_1_l_g hop_1_g_i) hop_2_l_i)
4070  (=> (and hop_1_l_g hop_1_g_h) hop_2_l_h)
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4071  (=> (and hop_1_l_g hop_1_g_k) hop_2_l_k)
4072  (=> (and hop_1_l_g hop_1_g_j) hop_2_l_j)
4073  (=> (and hop_1_l_g hop_1_g_m) hop_2_l_m)
4074  (=> (and hop_1_l_g hop_1_g_o) hop_2_l_o)
4075  (=> (and hop_1_l_g hop_1_g_n) hop_2_l_n)
4076  (=> (and hop_1_l_g hop_1_g_q) hop_2_l_q)
4077  (=> (and hop_1_l_g hop_1_g_p) hop_2_l_p)
4078  (=> (and hop_1_l_f hop_1_f_a) hop_2_l_a)
4079  (=> (and hop_1_l_f hop_1_f_c) hop_2_l_c)
4080  (=> (and hop_1_l_f hop_1_f_b) hop_2_l_b)
4081  (=> (and hop_1_l_f hop_1_f_e) hop_2_l_e)
4082  (=> (and hop_1_l_f hop_1_f_d) hop_2_l_d)
4083  (=> (and hop_1_l_f hop_1_f_g) hop_2_l_g)
4084  (=> (and hop_1_l_f hop_1_f_i) hop_2_l_i)
4085  (=> (and hop_1_l_f hop_1_f_h) hop_2_l_h)
4086  (=> (and hop_1_l_f hop_1_f_k) hop_2_l_k)
4087  (=> (and hop_1_l_f hop_1_f_j) hop_2_l_j)
4088  (=> (and hop_1_l_f hop_1_f_m) hop_2_l_m)
4089  (=> (and hop_1_l_f hop_1_f_o) hop_2_l_o)
4090  (=> (and hop_1_l_f hop_1_f_n) hop_2_l_n)
4091  (=> (and hop_1_l_f hop_1_f_q) hop_2_l_q)
4092  (=> (and hop_1_l_f hop_1_f_p) hop_2_l_p)
4093  (=> (and hop_1_l_i hop_1_i_a) hop_2_l_a)
4094  (=> (and hop_1_l_i hop_1_i_c) hop_2_l_c)
4095  (=> (and hop_1_l_i hop_1_i_b) hop_2_l_b)
4096  (=> (and hop_1_l_i hop_1_i_e) hop_2_l_e)
4097  (=> (and hop_1_l_i hop_1_i_d) hop_2_l_d)
4098  (=> (and hop_1_l_i hop_1_i_g) hop_2_l_g)
4099  (=> (and hop_1_l_i hop_1_i_f) hop_2_l_f)
4100  (=> (and hop_1_l_i hop_1_i_h) hop_2_l_h)
4101  (=> (and hop_1_l_i hop_1_i_k) hop_2_l_k)
4102  (=> (and hop_1_l_i hop_1_i_j) hop_2_l_j)
4103  (=> (and hop_1_l_i hop_1_i_m) hop_2_l_m)
4104  (=> (and hop_1_l_i hop_1_i_o) hop_2_l_o)
4105  (=> (and hop_1_l_i hop_1_i_n) hop_2_l_n)
4106  (=> (and hop_1_l_i hop_1_i_q) hop_2_l_q)
4107  (=> (and hop_1_l_i hop_1_i_p) hop_2_l_p)
4108  (=> (and hop_1_l_h hop_1_h_a) hop_2_l_a)
4109  (=> (and hop_1_l_h hop_1_h_c) hop_2_l_c)
4110  (=> (and hop_1_l_h hop_1_h_b) hop_2_l_b)
4111  (=> (and hop_1_l_h hop_1_h_e) hop_2_l_e)
4112  (=> (and hop_1_l_h hop_1_h_d) hop_2_l_d)
4113  (=> (and hop_1_l_h hop_1_h_g) hop_2_l_g)
4114  (=> (and hop_1_l_h hop_1_h_f) hop_2_l_f)
4115  (=> (and hop_1_l_h hop_1_h_i) hop_2_l_i)
4116  (=> (and hop_1_l_h hop_1_h_k) hop_2_l_k)
4117  (=> (and hop_1_l_h hop_1_h_j) hop_2_l_j)
4118  (=> (and hop_1_l_h hop_1_h_m) hop_2_l_m)
4119  (=> (and hop_1_l_h hop_1_h_o) hop_2_l_o)
4120  (=> (and hop_1_l_h hop_1_h_n) hop_2_l_n)
4121  (=> (and hop_1_l_h hop_1_h_q) hop_2_l_q)
4122  (=> (and hop_1_l_h hop_1_h_p) hop_2_l_p)
4123  (=> (and hop_1_l_k hop_1_k_a) hop_2_l_a)
4124  (=> (and hop_1_l_k hop_1_k_c) hop_2_l_c)
4125  (=> (and hop_1_l_k hop_1_k_b) hop_2_l_b)
4126  (=> (and hop_1_l_k hop_1_k_e) hop_2_l_e)
4127  (=> (and hop_1_l_k hop_1_k_d) hop_2_l_d)
4128  (=> (and hop_1_l_k hop_1_k_g) hop_2_l_g)
4129  (=> (and hop_1_l_k hop_1_k_f) hop_2_l_f)
4130  (=> (and hop_1_l_k hop_1_k_i) hop_2_l_i)
4131  (=> (and hop_1_l_k hop_1_k_h) hop_2_l_h)
4132  (=> (and hop_1_l_k hop_1_k_j) hop_2_l_j)
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4133  (=> (and hop_1_l_k hop_1_k_m) hop_2_l_m)
4134  (=> (and hop_1_l_k hop_1_k_o) hop_2_l_o)
4135  (=> (and hop_1_l_k hop_1_k_n) hop_2_l_n)
4136  (=> (and hop_1_l_k hop_1_k_q) hop_2_l_q)
4137  (=> (and hop_1_l_k hop_1_k_p) hop_2_l_p)
4138  (=> (and hop_1_l_j hop_1_j_a) hop_2_l_a)
4139  (=> (and hop_1_l_j hop_1_j_c) hop_2_l_c)
4140  (=> (and hop_1_l_j hop_1_j_b) hop_2_l_b)
4141  (=> (and hop_1_l_j hop_1_j_e) hop_2_l_e)
4142  (=> (and hop_1_l_j hop_1_j_d) hop_2_l_d)
4143  (=> (and hop_1_l_j hop_1_j_g) hop_2_l_g)
4144  (=> (and hop_1_l_j hop_1_j_f) hop_2_l_f)
4145  (=> (and hop_1_l_j hop_1_j_i) hop_2_l_i)
4146  (=> (and hop_1_l_j hop_1_j_h) hop_2_l_h)
4147  (=> (and hop_1_l_j hop_1_j_k) hop_2_l_k)
4148  (=> (and hop_1_l_j hop_1_j_m) hop_2_l_m)
4149  (=> (and hop_1_l_j hop_1_j_o) hop_2_l_o)
4150  (=> (and hop_1_l_j hop_1_j_n) hop_2_l_n)
4151  (=> (and hop_1_l_j hop_1_j_q) hop_2_l_q)
4152  (=> (and hop_1_l_j hop_1_j_p) hop_2_l_p)
4153  (=> (and hop_1_l_m hop_1_m_a) hop_2_l_a)
4154  (=> (and hop_1_l_m hop_1_m_c) hop_2_l_c)
4155  (=> (and hop_1_l_m hop_1_m_b) hop_2_l_b)
4156  (=> (and hop_1_l_m hop_1_m_e) hop_2_l_e)
4157  (=> (and hop_1_l_m hop_1_m_d) hop_2_l_d)
4158  (=> (and hop_1_l_m hop_1_m_g) hop_2_l_g)
4159  (=> (and hop_1_l_m hop_1_m_f) hop_2_l_f)
4160  (=> (and hop_1_l_m hop_1_m_i) hop_2_l_i)
4161  (=> (and hop_1_l_m hop_1_m_h) hop_2_l_h)
4162  (=> (and hop_1_l_m hop_1_m_k) hop_2_l_k)
4163  (=> (and hop_1_l_m hop_1_m_j) hop_2_l_j)
4164  (=> (and hop_1_l_m hop_1_m_o) hop_2_l_o)
4165  (=> (and hop_1_l_m hop_1_m_n) hop_2_l_n)
4166  (=> (and hop_1_l_m hop_1_m_q) hop_2_l_q)
4167  (=> (and hop_1_l_m hop_1_m_p) hop_2_l_p)
4168  (=> (and hop_1_l_o hop_1_o_a) hop_2_l_a)
4169  (=> (and hop_1_l_o hop_1_o_c) hop_2_l_c)
4170  (=> (and hop_1_l_o hop_1_o_b) hop_2_l_b)
4171  (=> (and hop_1_l_o hop_1_o_e) hop_2_l_e)
4172  (=> (and hop_1_l_o hop_1_o_d) hop_2_l_d)
4173  (=> (and hop_1_l_o hop_1_o_g) hop_2_l_g)
4174  (=> (and hop_1_l_o hop_1_o_f) hop_2_l_f)
4175  (=> (and hop_1_l_o hop_1_o_i) hop_2_l_i)
4176  (=> (and hop_1_l_o hop_1_o_h) hop_2_l_h)
4177  (=> (and hop_1_l_o hop_1_o_k) hop_2_l_k)
4178  (=> (and hop_1_l_o hop_1_o_j) hop_2_l_j)
4179  (=> (and hop_1_l_o hop_1_o_m) hop_2_l_m)
4180  (=> (and hop_1_l_o hop_1_o_n) hop_2_l_n)
4181  (=> (and hop_1_l_o hop_1_o_q) hop_2_l_q)
4182  (=> (and hop_1_l_o hop_1_o_p) hop_2_l_p)
4183  (=> (and hop_1_l_n hop_1_n_a) hop_2_l_a)
4184  (=> (and hop_1_l_n hop_1_n_c) hop_2_l_c)
4185  (=> (and hop_1_l_n hop_1_n_b) hop_2_l_b)
4186  (=> (and hop_1_l_n hop_1_n_e) hop_2_l_e)
4187  (=> (and hop_1_l_n hop_1_n_d) hop_2_l_d)
4188  (=> (and hop_1_l_n hop_1_n_g) hop_2_l_g)
4189  (=> (and hop_1_l_n hop_1_n_f) hop_2_l_f)
4190  (=> (and hop_1_l_n hop_1_n_i) hop_2_l_i)
4191  (=> (and hop_1_l_n hop_1_n_h) hop_2_l_h)
4192  (=> (and hop_1_l_n hop_1_n_k) hop_2_l_k)
4193  (=> (and hop_1_l_n hop_1_n_j) hop_2_l_j)
4194  (=> (and hop_1_l_n hop_1_n_m) hop_2_l_m)
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4195  (=> (and hop_1_l_n hop_1_n_o) hop_2_l_o)
4196  (=> (and hop_1_l_n hop_1_n_q) hop_2_l_q)
4197  (=> (and hop_1_l_n hop_1_n_p) hop_2_l_p)
4198  (=> (and hop_1_l_q hop_1_q_a) hop_2_l_a)
4199  (=> (and hop_1_l_q hop_1_q_c) hop_2_l_c)
4200  (=> (and hop_1_l_q hop_1_q_b) hop_2_l_b)
4201  (=> (and hop_1_l_q hop_1_q_e) hop_2_l_e)
4202  (=> (and hop_1_l_q hop_1_q_d) hop_2_l_d)
4203  (=> (and hop_1_l_q hop_1_q_g) hop_2_l_g)
4204  (=> (and hop_1_l_q hop_1_q_f) hop_2_l_f)
4205  (=> (and hop_1_l_q hop_1_q_i) hop_2_l_i)
4206  (=> (and hop_1_l_q hop_1_q_h) hop_2_l_h)
4207  (=> (and hop_1_l_q hop_1_q_k) hop_2_l_k)
4208  (=> (and hop_1_l_q hop_1_q_j) hop_2_l_j)
4209  (=> (and hop_1_l_q hop_1_q_m) hop_2_l_m)
4210  (=> (and hop_1_l_q hop_1_q_o) hop_2_l_o)
4211  (=> (and hop_1_l_q hop_1_q_n) hop_2_l_n)
4212  (=> (and hop_1_l_q hop_1_q_p) hop_2_l_p)
4213  (=> (and hop_1_l_p hop_1_p_a) hop_2_l_a)
4214  (=> (and hop_1_l_p hop_1_p_c) hop_2_l_c)
4215  (=> (and hop_1_l_p hop_1_p_b) hop_2_l_b)
4216  (=> (and hop_1_l_p hop_1_p_e) hop_2_l_e)
4217  (=> (and hop_1_l_p hop_1_p_d) hop_2_l_d)
4218  (=> (and hop_1_l_p hop_1_p_g) hop_2_l_g)
4219  (=> (and hop_1_l_p hop_1_p_f) hop_2_l_f)
4220  (=> (and hop_1_l_p hop_1_p_i) hop_2_l_i)
4221  (=> (and hop_1_l_p hop_1_p_h) hop_2_l_h)
4222  (=> (and hop_1_l_p hop_1_p_k) hop_2_l_k)
4223  (=> (and hop_1_l_p hop_1_p_j) hop_2_l_j)
4224  (=> (and hop_1_l_p hop_1_p_m) hop_2_l_m)
4225  (=> (and hop_1_l_p hop_1_p_o) hop_2_l_o)
4226  (=> (and hop_1_l_p hop_1_p_n) hop_2_l_n)
4227  (=> (and hop_1_l_p hop_1_p_q) hop_2_l_q)
4228  (=> (and hop_1_o_a hop_1_a_c) hop_2_o_c)
4229  (=> (and hop_1_o_a hop_1_a_b) hop_2_o_b)
4230  (=> (and hop_1_o_a hop_1_a_e) hop_2_o_e)
4231  (=> (and hop_1_o_a hop_1_a_d) hop_2_o_d)
4232  (=> (and hop_1_o_a hop_1_a_g) hop_2_o_g)
4233  (=> (and hop_1_o_a hop_1_a_f) hop_2_o_f)
4234  (=> (and hop_1_o_a hop_1_a_i) hop_2_o_i)
4235  (=> (and hop_1_o_a hop_1_a_h) hop_2_o_h)
4236  (=> (and hop_1_o_a hop_1_a_k) hop_2_o_k)
4237  (=> (and hop_1_o_a hop_1_a_j) hop_2_o_j)
4238  (=> (and hop_1_o_a hop_1_a_m) hop_2_o_m)
4239  (=> (and hop_1_o_a hop_1_a_l) hop_2_o_l)
4240  (=> (and hop_1_o_a hop_1_a_n) hop_2_o_n)
4241  (=> (and hop_1_o_a hop_1_a_q) hop_2_o_q)
4242  (=> (and hop_1_o_a hop_1_a_p) hop_2_o_p)
4243  (=> (and hop_1_o_c hop_1_c_a) hop_2_o_a)
4244  (=> (and hop_1_o_c hop_1_c_b) hop_2_o_b)
4245  (=> (and hop_1_o_c hop_1_c_e) hop_2_o_e)
4246  (=> (and hop_1_o_c hop_1_c_d) hop_2_o_d)
4247  (=> (and hop_1_o_c hop_1_c_g) hop_2_o_g)
4248  (=> (and hop_1_o_c hop_1_c_f) hop_2_o_f)
4249  (=> (and hop_1_o_c hop_1_c_i) hop_2_o_i)
4250  (=> (and hop_1_o_c hop_1_c_h) hop_2_o_h)
4251  (=> (and hop_1_o_c hop_1_c_k) hop_2_o_k)
4252  (=> (and hop_1_o_c hop_1_c_j) hop_2_o_j)
4253  (=> (and hop_1_o_c hop_1_c_m) hop_2_o_m)
4254  (=> (and hop_1_o_c hop_1_c_l) hop_2_o_l)
4255  (=> (and hop_1_o_c hop_1_c_n) hop_2_o_n)
4256  (=> (and hop_1_o_c hop_1_c_q) hop_2_o_q)
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4257  (=> (and hop_1_o_c hop_1_c_p) hop_2_o_p)
4258  (=> (and hop_1_o_b hop_1_b_a) hop_2_o_a)
4259  (=> (and hop_1_o_b hop_1_b_c) hop_2_o_c)
4260  (=> (and hop_1_o_b hop_1_b_e) hop_2_o_e)
4261  (=> (and hop_1_o_b hop_1_b_d) hop_2_o_d)
4262  (=> (and hop_1_o_b hop_1_b_g) hop_2_o_g)
4263  (=> (and hop_1_o_b hop_1_b_f) hop_2_o_f)
4264  (=> (and hop_1_o_b hop_1_b_i) hop_2_o_i)
4265  (=> (and hop_1_o_b hop_1_b_h) hop_2_o_h)
4266  (=> (and hop_1_o_b hop_1_b_k) hop_2_o_k)
4267  (=> (and hop_1_o_b hop_1_b_j) hop_2_o_j)
4268  (=> (and hop_1_o_b hop_1_b_m) hop_2_o_m)
4269  (=> (and hop_1_o_b hop_1_b_l) hop_2_o_l)
4270  (=> (and hop_1_o_b hop_1_b_n) hop_2_o_n)
4271  (=> (and hop_1_o_b hop_1_b_q) hop_2_o_q)
4272  (=> (and hop_1_o_b hop_1_b_p) hop_2_o_p)
4273  (=> (and hop_1_o_e hop_1_e_a) hop_2_o_a)
4274  (=> (and hop_1_o_e hop_1_e_c) hop_2_o_c)
4275  (=> (and hop_1_o_e hop_1_e_b) hop_2_o_b)
4276  (=> (and hop_1_o_e hop_1_e_d) hop_2_o_d)
4277  (=> (and hop_1_o_e hop_1_e_g) hop_2_o_g)
4278  (=> (and hop_1_o_e hop_1_e_f) hop_2_o_f)
4279  (=> (and hop_1_o_e hop_1_e_i) hop_2_o_i)
4280  (=> (and hop_1_o_e hop_1_e_h) hop_2_o_h)
4281  (=> (and hop_1_o_e hop_1_e_k) hop_2_o_k)
4282  (=> (and hop_1_o_e hop_1_e_j) hop_2_o_j)
4283  (=> (and hop_1_o_e hop_1_e_m) hop_2_o_m)
4284  (=> (and hop_1_o_e hop_1_e_l) hop_2_o_l)
4285  (=> (and hop_1_o_e hop_1_e_n) hop_2_o_n)
4286  (=> (and hop_1_o_e hop_1_e_q) hop_2_o_q)
4287  (=> (and hop_1_o_e hop_1_e_p) hop_2_o_p)
4288  (=> (and hop_1_o_d hop_1_d_a) hop_2_o_a)
4289  (=> (and hop_1_o_d hop_1_d_c) hop_2_o_c)
4290  (=> (and hop_1_o_d hop_1_d_b) hop_2_o_b)
4291  (=> (and hop_1_o_d hop_1_d_e) hop_2_o_e)
4292  (=> (and hop_1_o_d hop_1_d_g) hop_2_o_g)
4293  (=> (and hop_1_o_d hop_1_d_f) hop_2_o_f)
4294  (=> (and hop_1_o_d hop_1_d_i) hop_2_o_i)
4295  (=> (and hop_1_o_d hop_1_d_h) hop_2_o_h)
4296  (=> (and hop_1_o_d hop_1_d_k) hop_2_o_k)
4297  (=> (and hop_1_o_d hop_1_d_j) hop_2_o_j)
4298  (=> (and hop_1_o_d hop_1_d_m) hop_2_o_m)
4299  (=> (and hop_1_o_d hop_1_d_l) hop_2_o_l)
4300  (=> (and hop_1_o_d hop_1_d_n) hop_2_o_n)
4301  (=> (and hop_1_o_d hop_1_d_q) hop_2_o_q)
4302  (=> (and hop_1_o_d hop_1_d_p) hop_2_o_p)
4303  (=> (and hop_1_o_g hop_1_g_a) hop_2_o_a)
4304  (=> (and hop_1_o_g hop_1_g_c) hop_2_o_c)
4305  (=> (and hop_1_o_g hop_1_g_b) hop_2_o_b)
4306  (=> (and hop_1_o_g hop_1_g_e) hop_2_o_e)
4307  (=> (and hop_1_o_g hop_1_g_d) hop_2_o_d)
4308  (=> (and hop_1_o_g hop_1_g_f) hop_2_o_f)
4309  (=> (and hop_1_o_g hop_1_g_i) hop_2_o_i)
4310  (=> (and hop_1_o_g hop_1_g_h) hop_2_o_h)
4311  (=> (and hop_1_o_g hop_1_g_k) hop_2_o_k)
4312  (=> (and hop_1_o_g hop_1_g_j) hop_2_o_j)
4313  (=> (and hop_1_o_g hop_1_g_m) hop_2_o_m)
4314  (=> (and hop_1_o_g hop_1_g_l) hop_2_o_l)
4315  (=> (and hop_1_o_g hop_1_g_n) hop_2_o_n)
4316  (=> (and hop_1_o_g hop_1_g_q) hop_2_o_q)
4317  (=> (and hop_1_o_g hop_1_g_p) hop_2_o_p)
4318  (=> (and hop_1_o_f hop_1_f_a) hop_2_o_a)
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```
4319  (=> (and hop_1_o_f hop_1_f_c) hop_2_o_c)
4320  (=> (and hop_1_o_f hop_1_f_b) hop_2_o_b)
4321  (=> (and hop_1_o_f hop_1_f_e) hop_2_o_e)
4322  (=> (and hop_1_o_f hop_1_f_d) hop_2_o_d)
4323  (=> (and hop_1_o_f hop_1_f_g) hop_2_o_g)
4324  (=> (and hop_1_o_f hop_1_f_i) hop_2_o_i)
4325  (=> (and hop_1_o_f hop_1_f_h) hop_2_o_h)
4326  (=> (and hop_1_o_f hop_1_f_k) hop_2_o_k)
4327  (=> (and hop_1_o_f hop_1_f_j) hop_2_o_j)
4328  (=> (and hop_1_o_f hop_1_f_m) hop_2_o_m)
4329  (=> (and hop_1_o_f hop_1_f_l) hop_2_o_l)
4330  (=> (and hop_1_o_f hop_1_f_n) hop_2_o_n)
4331  (=> (and hop_1_o_f hop_1_f_q) hop_2_o_q)
4332  (=> (and hop_1_o_f hop_1_f_p) hop_2_o_p)
4333  (=> (and hop_1_o_i hop_1_i_a) hop_2_o_a)
4334  (=> (and hop_1_o_i hop_1_i_c) hop_2_o_c)
4335  (=> (and hop_1_o_i hop_1_i_b) hop_2_o_b)
4336  (=> (and hop_1_o_i hop_1_i_e) hop_2_o_e)
4337  (=> (and hop_1_o_i hop_1_i_d) hop_2_o_d)
4338  (=> (and hop_1_o_i hop_1_i_g) hop_2_o_g)
4339  (=> (and hop_1_o_i hop_1_i_f) hop_2_o_f)
4340  (=> (and hop_1_o_i hop_1_i_h) hop_2_o_h)
4341  (=> (and hop_1_o_i hop_1_i_k) hop_2_o_k)
4342  (=> (and hop_1_o_i hop_1_i_j) hop_2_o_j)
4343  (=> (and hop_1_o_i hop_1_i_m) hop_2_o_m)
4344  (=> (and hop_1_o_i hop_1_i_l) hop_2_o_l)
4345  (=> (and hop_1_o_i hop_1_i_n) hop_2_o_n)
4346  (=> (and hop_1_o_i hop_1_i_q) hop_2_o_q)
4347  (=> (and hop_1_o_i hop_1_i_p) hop_2_o_p)
4348  (=> (and hop_1_o_h hop_1_h_a) hop_2_o_a)
4349  (=> (and hop_1_o_h hop_1_h_c) hop_2_o_c)
4350  (=> (and hop_1_o_h hop_1_h_b) hop_2_o_b)
4351  (=> (and hop_1_o_h hop_1_h_e) hop_2_o_e)
4352  (=> (and hop_1_o_h hop_1_h_d) hop_2_o_d)
4353  (=> (and hop_1_o_h hop_1_h_g) hop_2_o_g)
4354  (=> (and hop_1_o_h hop_1_h_f) hop_2_o_f)
4355  (=> (and hop_1_o_h hop_1_h_i) hop_2_o_i)
4356  (=> (and hop_1_o_h hop_1_h_k) hop_2_o_k)
4357  (=> (and hop_1_o_h hop_1_h_j) hop_2_o_j)
4358  (=> (and hop_1_o_h hop_1_h_m) hop_2_o_m)
4359  (=> (and hop_1_o_h hop_1_h_l) hop_2_o_l)
4360  (=> (and hop_1_o_h hop_1_h_n) hop_2_o_n)
4361  (=> (and hop_1_o_h hop_1_h_q) hop_2_o_q)
4362  (=> (and hop_1_o_h hop_1_h_p) hop_2_o_p)
4363  (=> (and hop_1_o_k hop_1_k_a) hop_2_o_a)
4364  (=> (and hop_1_o_k hop_1_k_c) hop_2_o_c)
4365  (=> (and hop_1_o_k hop_1_k_b) hop_2_o_b)
4366  (=> (and hop_1_o_k hop_1_k_e) hop_2_o_e)
4367  (=> (and hop_1_o_k hop_1_k_d) hop_2_o_d)
4368  (=> (and hop_1_o_k hop_1_k_g) hop_2_o_g)
4369  (=> (and hop_1_o_k hop_1_k_f) hop_2_o_f)
4370  (=> (and hop_1_o_k hop_1_k_i) hop_2_o_i)
4371  (=> (and hop_1_o_k hop_1_k_h) hop_2_o_h)
4372  (=> (and hop_1_o_k hop_1_k_j) hop_2_o_j)
4373  (=> (and hop_1_o_k hop_1_k_m) hop_2_o_m)
4374  (=> (and hop_1_o_k hop_1_k_l) hop_2_o_l)
4375  (=> (and hop_1_o_k hop_1_k_n) hop_2_o_n)
4376  (=> (and hop_1_o_k hop_1_k_q) hop_2_o_q)
4377  (=> (and hop_1_o_k hop_1_k_p) hop_2_o_p)
4378  (=> (and hop_1_o_j hop_1_j_a) hop_2_o_a)
4379  (=> (and hop_1_o_j hop_1_j_c) hop_2_o_c)
4380  (=> (and hop_1_o_j hop_1_j_b) hop_2_o_b)
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4381  (=> (and hop_1_o_j hop_1_j_e) hop_2_o_e)
4382  (=> (and hop_1_o_j hop_1_j_d) hop_2_o_d)
4383  (=> (and hop_1_o_j hop_1_j_g) hop_2_o_g)
4384  (=> (and hop_1_o_j hop_1_j_f) hop_2_o_f)
4385  (=> (and hop_1_o_j hop_1_j_i) hop_2_o_i)
4386  (=> (and hop_1_o_j hop_1_j_h) hop_2_o_h)
4387  (=> (and hop_1_o_j hop_1_j_k) hop_2_o_k)
4388  (=> (and hop_1_o_j hop_1_j_m) hop_2_o_m)
4389  (=> (and hop_1_o_j hop_1_j_l) hop_2_o_l)
4390  (=> (and hop_1_o_j hop_1_j_n) hop_2_o_n)
4391  (=> (and hop_1_o_j hop_1_j_q) hop_2_o_q)
4392  (=> (and hop_1_o_j hop_1_j_p) hop_2_o_p)
4393  (=> (and hop_1_o_m hop_1_m_a) hop_2_o_a)
4394  (=> (and hop_1_o_m hop_1_m_c) hop_2_o_c)
4395  (=> (and hop_1_o_m hop_1_m_b) hop_2_o_b)
4396  (=> (and hop_1_o_m hop_1_m_e) hop_2_o_e)
4397  (=> (and hop_1_o_m hop_1_m_d) hop_2_o_d)
4398  (=> (and hop_1_o_m hop_1_m_g) hop_2_o_g)
4399  (=> (and hop_1_o_m hop_1_m_f) hop_2_o_f)
4400  (=> (and hop_1_o_m hop_1_m_i) hop_2_o_i)
4401  (=> (and hop_1_o_m hop_1_m_h) hop_2_o_h)
4402  (=> (and hop_1_o_m hop_1_m_k) hop_2_o_k)
4403  (=> (and hop_1_o_m hop_1_m_j) hop_2_o_j)
4404  (=> (and hop_1_o_m hop_1_m_l) hop_2_o_l)
4405  (=> (and hop_1_o_m hop_1_m_n) hop_2_o_n)
4406  (=> (and hop_1_o_m hop_1_m_q) hop_2_o_q)
4407  (=> (and hop_1_o_m hop_1_m_p) hop_2_o_p)
4408  (=> (and hop_1_o_l hop_1_l_a) hop_2_o_a)
4409  (=> (and hop_1_o_l hop_1_l_c) hop_2_o_c)
4410  (=> (and hop_1_o_l hop_1_l_b) hop_2_o_b)
4411  (=> (and hop_1_o_l hop_1_l_e) hop_2_o_e)
4412  (=> (and hop_1_o_l hop_1_l_d) hop_2_o_d)
4413  (=> (and hop_1_o_l hop_1_l_g) hop_2_o_g)
4414  (=> (and hop_1_o_l hop_1_l_f) hop_2_o_f)
4415  (=> (and hop_1_o_l hop_1_l_i) hop_2_o_i)
4416  (=> (and hop_1_o_l hop_1_l_h) hop_2_o_h)
4417  (=> (and hop_1_o_l hop_1_l_k) hop_2_o_k)
4418  (=> (and hop_1_o_l hop_1_l_j) hop_2_o_j)
4419  (=> (and hop_1_o_l hop_1_l_m) hop_2_o_m)
4420  (=> (and hop_1_o_l hop_1_l_n) hop_2_o_n)
4421  (=> (and hop_1_o_l hop_1_l_q) hop_2_o_q)
4422  (=> (and hop_1_o_l hop_1_l_p) hop_2_o_p)
4423  (=> (and hop_1_o_n hop_1_n_a) hop_2_o_a)
4424  (=> (and hop_1_o_n hop_1_n_c) hop_2_o_c)
4425  (=> (and hop_1_o_n hop_1_n_b) hop_2_o_b)
4426  (=> (and hop_1_o_n hop_1_n_e) hop_2_o_e)
4427  (=> (and hop_1_o_n hop_1_n_d) hop_2_o_d)
4428  (=> (and hop_1_o_n hop_1_n_g) hop_2_o_g)
4429  (=> (and hop_1_o_n hop_1_n_f) hop_2_o_f)
4430  (=> (and hop_1_o_n hop_1_n_i) hop_2_o_i)
4431  (=> (and hop_1_o_n hop_1_n_h) hop_2_o_h)
4432  (=> (and hop_1_o_n hop_1_n_k) hop_2_o_k)
4433  (=> (and hop_1_o_n hop_1_n_j) hop_2_o_j)
4434  (=> (and hop_1_o_n hop_1_n_m) hop_2_o_m)
4435  (=> (and hop_1_o_n hop_1_n_l) hop_2_o_l)
4436  (=> (and hop_1_o_n hop_1_n_q) hop_2_o_q)
4437  (=> (and hop_1_o_n hop_1_n_p) hop_2_o_p)
4438  (=> (and hop_1_o_q hop_1_q_a) hop_2_o_a)
4439  (=> (and hop_1_o_q hop_1_q_c) hop_2_o_c)
4440  (=> (and hop_1_o_q hop_1_q_b) hop_2_o_b)
4441  (=> (and hop_1_o_q hop_1_q_e) hop_2_o_e)
4442  (=> (and hop_1_o_q hop_1_q_d) hop_2_o_d)
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4443   (=> (and hop_1_o_q hop_1_q_g) hop_2_o_g)
4444   (=> (and hop_1_o_q hop_1_q_f) hop_2_o_f)
4445   (=> (and hop_1_o_q hop_1_q_i) hop_2_o_i)
4446   (=> (and hop_1_o_q hop_1_q_h) hop_2_o_h)
4447   (=> (and hop_1_o_q hop_1_q_k) hop_2_o_k)
4448   (=> (and hop_1_o_q hop_1_q_j) hop_2_o_j)
4449   (=> (and hop_1_o_q hop_1_q_m) hop_2_o_m)
4450   (=> (and hop_1_o_q hop_1_q_l) hop_2_o_l)
4451   (=> (and hop_1_o_q hop_1_q_n) hop_2_o_n)
4452   (=> (and hop_1_o_q hop_1_q_p) hop_2_o_p)
4453   (=> (and hop_1_o_p hop_1_p_a) hop_2_o_a)
4454   (=> (and hop_1_o_p hop_1_p_c) hop_2_o_c)
4455   (=> (and hop_1_o_p hop_1_p_b) hop_2_o_b)
4456   (=> (and hop_1_o_p hop_1_p_e) hop_2_o_e)
4457   (=> (and hop_1_o_p hop_1_p_d) hop_2_o_d)
4458   (=> (and hop_1_o_p hop_1_p_g) hop_2_o_g)
4459   (=> (and hop_1_o_p hop_1_p_f) hop_2_o_f)
4460   (=> (and hop_1_o_p hop_1_p_i) hop_2_o_i)
4461   (=> (and hop_1_o_p hop_1_p_h) hop_2_o_h)
4462   (=> (and hop_1_o_p hop_1_p_k) hop_2_o_k)
4463   (=> (and hop_1_o_p hop_1_p_j) hop_2_o_j)
4464   (=> (and hop_1_o_p hop_1_p_m) hop_2_o_m)
4465   (=> (and hop_1_o_p hop_1_p_l) hop_2_o_l)
4466   (=> (and hop_1_o_p hop_1_p_n) hop_2_o_n)
4467   (=> (and hop_1_o_p hop_1_p_q) hop_2_o_q)
4468   (=> (and hop_1_n_a hop_1_a_c) hop_2_n_c)
4469   (=> (and hop_1_n_a hop_1_a_b) hop_2_n_b)
4470   (=> (and hop_1_n_a hop_1_a_e) hop_2_n_e)
4471   (=> (and hop_1_n_a hop_1_a_d) hop_2_n_d)
4472   (=> (and hop_1_n_a hop_1_a_g) hop_2_n_g)
4473   (=> (and hop_1_n_a hop_1_a_f) hop_2_n_f)
4474   (=> (and hop_1_n_a hop_1_a_i) hop_2_n_i)
4475   (=> (and hop_1_n_a hop_1_a_h) hop_2_n_h)
4476   (=> (and hop_1_n_a hop_1_a_k) hop_2_n_k)
4477   (=> (and hop_1_n_a hop_1_a_j) hop_2_n_j)
4478   (=> (and hop_1_n_a hop_1_a_m) hop_2_n_m)
4479   (=> (and hop_1_n_a hop_1_a_l) hop_2_n_l)
4480   (=> (and hop_1_n_a hop_1_a_o) hop_2_n_o)
4481   (=> (and hop_1_n_a hop_1_a_q) hop_2_n_q)
4482   (=> (and hop_1_n_a hop_1_a_p) hop_2_n_p)
4483   (=> (and hop_1_n_c hop_1_c_a) hop_2_n_a)
4484   (=> (and hop_1_n_c hop_1_c_b) hop_2_n_b)
4485   (=> (and hop_1_n_c hop_1_c_e) hop_2_n_e)
4486   (=> (and hop_1_n_c hop_1_c_d) hop_2_n_d)
4487   (=> (and hop_1_n_c hop_1_c_g) hop_2_n_g)
4488   (=> (and hop_1_n_c hop_1_c_f) hop_2_n_f)
4489   (=> (and hop_1_n_c hop_1_c_i) hop_2_n_i)
4490   (=> (and hop_1_n_c hop_1_c_h) hop_2_n_h)
4491   (=> (and hop_1_n_c hop_1_c_k) hop_2_n_k)
4492   (=> (and hop_1_n_c hop_1_c_j) hop_2_n_j)
4493   (=> (and hop_1_n_c hop_1_c_m) hop_2_n_m)
4494   (=> (and hop_1_n_c hop_1_c_l) hop_2_n_l)
4495   (=> (and hop_1_n_c hop_1_c_o) hop_2_n_o)
4496   (=> (and hop_1_n_c hop_1_c_q) hop_2_n_q)
4497   (=> (and hop_1_n_c hop_1_c_p) hop_2_n_p)
4498   (=> (and hop_1_n_b hop_1_b_a) hop_2_n_a)
4499   (=> (and hop_1_n_b hop_1_b_c) hop_2_n_c)
4500   (=> (and hop_1_n_b hop_1_b_e) hop_2_n_e)
4501   (=> (and hop_1_n_b hop_1_b_d) hop_2_n_d)
4502   (=> (and hop_1_n_b hop_1_b_g) hop_2_n_g)
4503   (=> (and hop_1_n_b hop_1_b_f) hop_2_n_f)
4504   (=> (and hop_1_n_b hop_1_b_i) hop_2_n_i)
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4505  (=> (and hop_1_n_b hop_1_b_h) hop_2_n_h)
4506  (=> (and hop_1_n_b hop_1_b_k) hop_2_n_k)
4507  (=> (and hop_1_n_b hop_1_b_j) hop_2_n_j)
4508  (=> (and hop_1_n_b hop_1_b_m) hop_2_n_m)
4509  (=> (and hop_1_n_b hop_1_b_l) hop_2_n_l)
4510  (=> (and hop_1_n_b hop_1_b_o) hop_2_n_o)
4511  (=> (and hop_1_n_b hop_1_b_q) hop_2_n_q)
4512  (=> (and hop_1_n_b hop_1_b_p) hop_2_n_p)
4513  (=> (and hop_1_n_e hop_1_e_a) hop_2_n_a)
4514  (=> (and hop_1_n_e hop_1_e_c) hop_2_n_c)
4515  (=> (and hop_1_n_e hop_1_e_b) hop_2_n_b)
4516  (=> (and hop_1_n_e hop_1_e_d) hop_2_n_d)
4517  (=> (and hop_1_n_e hop_1_e_g) hop_2_n_g)
4518  (=> (and hop_1_n_e hop_1_e_f) hop_2_n_f)
4519  (=> (and hop_1_n_e hop_1_e_i) hop_2_n_i)
4520  (=> (and hop_1_n_e hop_1_e_h) hop_2_n_h)
4521  (=> (and hop_1_n_e hop_1_e_k) hop_2_n_k)
4522  (=> (and hop_1_n_e hop_1_e_j) hop_2_n_j)
4523  (=> (and hop_1_n_e hop_1_e_m) hop_2_n_m)
4524  (=> (and hop_1_n_e hop_1_e_l) hop_2_n_l)
4525  (=> (and hop_1_n_e hop_1_e_o) hop_2_n_o)
4526  (=> (and hop_1_n_e hop_1_e_q) hop_2_n_q)
4527  (=> (and hop_1_n_e hop_1_e_p) hop_2_n_p)
4528  (=> (and hop_1_n_d hop_1_d_a) hop_2_n_a)
4529  (=> (and hop_1_n_d hop_1_d_c) hop_2_n_c)
4530  (=> (and hop_1_n_d hop_1_d_b) hop_2_n_b)
4531  (=> (and hop_1_n_d hop_1_d_e) hop_2_n_e)
4532  (=> (and hop_1_n_d hop_1_d_g) hop_2_n_g)
4533  (=> (and hop_1_n_d hop_1_d_f) hop_2_n_f)
4534  (=> (and hop_1_n_d hop_1_d_i) hop_2_n_i)
4535  (=> (and hop_1_n_d hop_1_d_h) hop_2_n_h)
4536  (=> (and hop_1_n_d hop_1_d_k) hop_2_n_k)
4537  (=> (and hop_1_n_d hop_1_d_j) hop_2_n_j)
4538  (=> (and hop_1_n_d hop_1_d_m) hop_2_n_m)
4539  (=> (and hop_1_n_d hop_1_d_l) hop_2_n_l)
4540  (=> (and hop_1_n_d hop_1_d_o) hop_2_n_o)
4541  (=> (and hop_1_n_d hop_1_d_q) hop_2_n_q)
4542  (=> (and hop_1_n_d hop_1_d_p) hop_2_n_p)
4543  (=> (and hop_1_n_g hop_1_g_a) hop_2_n_a)
4544  (=> (and hop_1_n_g hop_1_g_c) hop_2_n_c)
4545  (=> (and hop_1_n_g hop_1_g_b) hop_2_n_b)
4546  (=> (and hop_1_n_g hop_1_g_e) hop_2_n_e)
4547  (=> (and hop_1_n_g hop_1_g_d) hop_2_n_d)
4548  (=> (and hop_1_n_g hop_1_g_f) hop_2_n_f)
4549  (=> (and hop_1_n_g hop_1_g_i) hop_2_n_i)
4550  (=> (and hop_1_n_g hop_1_g_h) hop_2_n_h)
4551  (=> (and hop_1_n_g hop_1_g_k) hop_2_n_k)
4552  (=> (and hop_1_n_g hop_1_g_j) hop_2_n_j)
4553  (=> (and hop_1_n_g hop_1_g_m) hop_2_n_m)
4554  (=> (and hop_1_n_g hop_1_g_l) hop_2_n_l)
4555  (=> (and hop_1_n_g hop_1_g_o) hop_2_n_o)
4556  (=> (and hop_1_n_g hop_1_g_q) hop_2_n_q)
4557  (=> (and hop_1_n_g hop_1_g_p) hop_2_n_p)
4558  (=> (and hop_1_n_f hop_1_f_a) hop_2_n_a)
4559  (=> (and hop_1_n_f hop_1_f_c) hop_2_n_c)
4560  (=> (and hop_1_n_f hop_1_f_b) hop_2_n_b)
4561  (=> (and hop_1_n_f hop_1_f_e) hop_2_n_e)
4562  (=> (and hop_1_n_f hop_1_f_d) hop_2_n_d)
4563  (=> (and hop_1_n_f hop_1_f_g) hop_2_n_g)
4564  (=> (and hop_1_n_f hop_1_f_i) hop_2_n_i)
4565  (=> (and hop_1_n_f hop_1_f_h) hop_2_n_h)
4566  (=> (and hop_1_n_f hop_1_f_k) hop_2_n_k)
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```
4567  (=> (and hop_1_n_f hop_1_f_j) hop_2_n_j)
4568  (=> (and hop_1_n_f hop_1_f_m) hop_2_n_m)
4569  (=> (and hop_1_n_f hop_1_f_l) hop_2_n_l)
4570  (=> (and hop_1_n_f hop_1_f_o) hop_2_n_o)
4571  (=> (and hop_1_n_f hop_1_f_q) hop_2_n_q)
4572  (=> (and hop_1_n_f hop_1_f_p) hop_2_n_p)
4573  (=> (and hop_1_n_i hop_1_i_a) hop_2_n_a)
4574  (=> (and hop_1_n_i hop_1_i_c) hop_2_n_c)
4575  (=> (and hop_1_n_i hop_1_i_b) hop_2_n_b)
4576  (=> (and hop_1_n_i hop_1_i_e) hop_2_n_e)
4577  (=> (and hop_1_n_i hop_1_i_d) hop_2_n_d)
4578  (=> (and hop_1_n_i hop_1_i_g) hop_2_n_g)
4579  (=> (and hop_1_n_i hop_1_i_f) hop_2_n_f)
4580  (=> (and hop_1_n_i hop_1_i_h) hop_2_n_h)
4581  (=> (and hop_1_n_i hop_1_i_k) hop_2_n_k)
4582  (=> (and hop_1_n_i hop_1_i_j) hop_2_n_j)
4583  (=> (and hop_1_n_i hop_1_i_m) hop_2_n_m)
4584  (=> (and hop_1_n_i hop_1_i_l) hop_2_n_l)
4585  (=> (and hop_1_n_i hop_1_i_o) hop_2_n_o)
4586  (=> (and hop_1_n_i hop_1_i_q) hop_2_n_q)
4587  (=> (and hop_1_n_i hop_1_i_p) hop_2_n_p)
4588  (=> (and hop_1_n_h hop_1_h_a) hop_2_n_a)
4589  (=> (and hop_1_n_h hop_1_h_c) hop_2_n_c)
4590  (=> (and hop_1_n_h hop_1_h_b) hop_2_n_b)
4591  (=> (and hop_1_n_h hop_1_h_e) hop_2_n_e)
4592  (=> (and hop_1_n_h hop_1_h_d) hop_2_n_d)
4593  (=> (and hop_1_n_h hop_1_h_g) hop_2_n_g)
4594  (=> (and hop_1_n_h hop_1_h_f) hop_2_n_f)
4595  (=> (and hop_1_n_h hop_1_h_i) hop_2_n_i)
4596  (=> (and hop_1_n_h hop_1_h_k) hop_2_n_k)
4597  (=> (and hop_1_n_h hop_1_h_j) hop_2_n_j)
4598  (=> (and hop_1_n_h hop_1_h_m) hop_2_n_m)
4599  (=> (and hop_1_n_h hop_1_h_l) hop_2_n_l)
4600  (=> (and hop_1_n_h hop_1_h_o) hop_2_n_o)
4601  (=> (and hop_1_n_h hop_1_h_q) hop_2_n_q)
4602  (=> (and hop_1_n_h hop_1_h_p) hop_2_n_p)
4603  (=> (and hop_1_n_k hop_1_k_a) hop_2_n_a)
4604  (=> (and hop_1_n_k hop_1_k_c) hop_2_n_c)
4605  (=> (and hop_1_n_k hop_1_k_b) hop_2_n_b)
4606  (=> (and hop_1_n_k hop_1_k_e) hop_2_n_e)
4607  (=> (and hop_1_n_k hop_1_k_d) hop_2_n_d)
4608  (=> (and hop_1_n_k hop_1_k_g) hop_2_n_g)
4609  (=> (and hop_1_n_k hop_1_k_f) hop_2_n_f)
4610  (=> (and hop_1_n_k hop_1_k_i) hop_2_n_i)
4611  (=> (and hop_1_n_k hop_1_k_h) hop_2_n_h)
4612  (=> (and hop_1_n_k hop_1_k_j) hop_2_n_j)
4613  (=> (and hop_1_n_k hop_1_k_m) hop_2_n_m)
4614  (=> (and hop_1_n_k hop_1_k_l) hop_2_n_l)
4615  (=> (and hop_1_n_k hop_1_k_o) hop_2_n_o)
4616  (=> (and hop_1_n_k hop_1_k_q) hop_2_n_q)
4617  (=> (and hop_1_n_k hop_1_k_p) hop_2_n_p)
4618  (=> (and hop_1_n_j hop_1_j_a) hop_2_n_a)
4619  (=> (and hop_1_n_j hop_1_j_c) hop_2_n_c)
4620  (=> (and hop_1_n_j hop_1_j_b) hop_2_n_b)
4621  (=> (and hop_1_n_j hop_1_j_e) hop_2_n_e)
4622  (=> (and hop_1_n_j hop_1_j_d) hop_2_n_d)
4623  (=> (and hop_1_n_j hop_1_j_g) hop_2_n_g)
4624  (=> (and hop_1_n_j hop_1_j_f) hop_2_n_f)
4625  (=> (and hop_1_n_j hop_1_j_i) hop_2_n_i)
4626  (=> (and hop_1_n_j hop_1_j_h) hop_2_n_h)
4627  (=> (and hop_1_n_j hop_1_j_k) hop_2_n_k)
4628  (=> (and hop_1_n_j hop_1_j_m) hop_2_n_m)
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4629  (=> (and hop_1_n_j hop_1_j_l) hop_2_n_l)
4630  (=> (and hop_1_n_j hop_1_j_o) hop_2_n_o)
4631  (=> (and hop_1_n_j hop_1_j_q) hop_2_n_q)
4632  (=> (and hop_1_n_j hop_1_j_p) hop_2_n_p)
4633  (=> (and hop_1_n_m hop_1_m_a) hop_2_n_a)
4634  (=> (and hop_1_n_m hop_1_m_c) hop_2_n_c)
4635  (=> (and hop_1_n_m hop_1_m_b) hop_2_n_b)
4636  (=> (and hop_1_n_m hop_1_m_e) hop_2_n_e)
4637  (=> (and hop_1_n_m hop_1_m_d) hop_2_n_d)
4638  (=> (and hop_1_n_m hop_1_m_g) hop_2_n_g)
4639  (=> (and hop_1_n_m hop_1_m_f) hop_2_n_f)
4640  (=> (and hop_1_n_m hop_1_m_i) hop_2_n_i)
4641  (=> (and hop_1_n_m hop_1_m_h) hop_2_n_h)
4642  (=> (and hop_1_n_m hop_1_m_k) hop_2_n_k)
4643  (=> (and hop_1_n_m hop_1_m_j) hop_2_n_j)
4644  (=> (and hop_1_n_m hop_1_m_l) hop_2_n_l)
4645  (=> (and hop_1_n_m hop_1_m_o) hop_2_n_o)
4646  (=> (and hop_1_n_m hop_1_m_q) hop_2_n_q)
4647  (=> (and hop_1_n_m hop_1_m_p) hop_2_n_p)
4648  (=> (and hop_1_n_l hop_1_l_a) hop_2_n_a)
4649  (=> (and hop_1_n_l hop_1_l_c) hop_2_n_c)
4650  (=> (and hop_1_n_l hop_1_l_b) hop_2_n_b)
4651  (=> (and hop_1_n_l hop_1_l_e) hop_2_n_e)
4652  (=> (and hop_1_n_l hop_1_l_d) hop_2_n_d)
4653  (=> (and hop_1_n_l hop_1_l_g) hop_2_n_g)
4654  (=> (and hop_1_n_l hop_1_l_f) hop_2_n_f)
4655  (=> (and hop_1_n_l hop_1_l_i) hop_2_n_i)
4656  (=> (and hop_1_n_l hop_1_l_h) hop_2_n_h)
4657  (=> (and hop_1_n_l hop_1_l_k) hop_2_n_k)
4658  (=> (and hop_1_n_l hop_1_l_j) hop_2_n_j)
4659  (=> (and hop_1_n_l hop_1_l_m) hop_2_n_m)
4660  (=> (and hop_1_n_l hop_1_l_o) hop_2_n_o)
4661  (=> (and hop_1_n_l hop_1_l_q) hop_2_n_q)
4662  (=> (and hop_1_n_l hop_1_l_p) hop_2_n_p)
4663  (=> (and hop_1_n_o hop_1_o_a) hop_2_n_a)
4664  (=> (and hop_1_n_o hop_1_o_c) hop_2_n_c)
4665  (=> (and hop_1_n_o hop_1_o_b) hop_2_n_b)
4666  (=> (and hop_1_n_o hop_1_o_e) hop_2_n_e)
4667  (=> (and hop_1_n_o hop_1_o_d) hop_2_n_d)
4668  (=> (and hop_1_n_o hop_1_o_g) hop_2_n_g)
4669  (=> (and hop_1_n_o hop_1_o_f) hop_2_n_f)
4670  (=> (and hop_1_n_o hop_1_o_i) hop_2_n_i)
4671  (=> (and hop_1_n_o hop_1_o_h) hop_2_n_h)
4672  (=> (and hop_1_n_o hop_1_o_k) hop_2_n_k)
4673  (=> (and hop_1_n_o hop_1_o_j) hop_2_n_j)
4674  (=> (and hop_1_n_o hop_1_o_m) hop_2_n_m)
4675  (=> (and hop_1_n_o hop_1_o_l) hop_2_n_l)
4676  (=> (and hop_1_n_o hop_1_o_q) hop_2_n_q)
4677  (=> (and hop_1_n_o hop_1_o_p) hop_2_n_p)
4678  (=> (and hop_1_n_q hop_1_q_a) hop_2_n_a)
4679  (=> (and hop_1_n_q hop_1_q_c) hop_2_n_c)
4680  (=> (and hop_1_n_q hop_1_q_b) hop_2_n_b)
4681  (=> (and hop_1_n_q hop_1_q_e) hop_2_n_e)
4682  (=> (and hop_1_n_q hop_1_q_d) hop_2_n_d)
4683  (=> (and hop_1_n_q hop_1_q_g) hop_2_n_g)
4684  (=> (and hop_1_n_q hop_1_q_f) hop_2_n_f)
4685  (=> (and hop_1_n_q hop_1_q_i) hop_2_n_i)
4686  (=> (and hop_1_n_q hop_1_q_h) hop_2_n_h)
4687  (=> (and hop_1_n_q hop_1_q_k) hop_2_n_k)
4688  (=> (and hop_1_n_q hop_1_q_j) hop_2_n_j)
4689  (=> (and hop_1_n_q hop_1_q_m) hop_2_n_m)
4690  (=> (and hop_1_n_q hop_1_q_l) hop_2_n_l)
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4691  (=> (and hop_1_n_q hop_1_q_o) hop_2_n_o)
4692  (=> (and hop_1_n_q hop_1_q_p) hop_2_n_p)
4693  (=> (and hop_1_n_p hop_1_p_a) hop_2_n_a)
4694  (=> (and hop_1_n_p hop_1_p_c) hop_2_n_c)
4695  (=> (and hop_1_n_p hop_1_p_b) hop_2_n_b)
4696  (=> (and hop_1_n_p hop_1_p_e) hop_2_n_e)
4697  (=> (and hop_1_n_p hop_1_p_d) hop_2_n_d)
4698  (=> (and hop_1_n_p hop_1_p_g) hop_2_n_g)
4699  (=> (and hop_1_n_p hop_1_p_f) hop_2_n_f)
4700  (=> (and hop_1_n_p hop_1_p_i) hop_2_n_i)
4701  (=> (and hop_1_n_p hop_1_p_h) hop_2_n_h)
4702  (=> (and hop_1_n_p hop_1_p_k) hop_2_n_k)
4703  (=> (and hop_1_n_p hop_1_p_j) hop_2_n_j)
4704  (=> (and hop_1_n_p hop_1_p_m) hop_2_n_m)
4705  (=> (and hop_1_n_p hop_1_p_l) hop_2_n_l)
4706  (=> (and hop_1_n_p hop_1_p_o) hop_2_n_o)
4707  (=> (and hop_1_n_p hop_1_p_q) hop_2_n_q)
4708  (=> (and hop_1_q_a hop_1_a_c) hop_2_q_c)
4709  (=> (and hop_1_q_a hop_1_a_b) hop_2_q_b)
4710  (=> (and hop_1_q_a hop_1_a_e) hop_2_q_e)
4711  (=> (and hop_1_q_a hop_1_a_d) hop_2_q_d)
4712  (=> (and hop_1_q_a hop_1_a_g) hop_2_q_g)
4713  (=> (and hop_1_q_a hop_1_a_f) hop_2_q_f)
4714  (=> (and hop_1_q_a hop_1_a_i) hop_2_q_i)
4715  (=> (and hop_1_q_a hop_1_a_h) hop_2_q_h)
4716  (=> (and hop_1_q_a hop_1_a_k) hop_2_q_k)
4717  (=> (and hop_1_q_a hop_1_a_j) hop_2_q_j)
4718  (=> (and hop_1_q_a hop_1_a_m) hop_2_q_m)
4719  (=> (and hop_1_q_a hop_1_a_l) hop_2_q_l)
4720  (=> (and hop_1_q_a hop_1_a_o) hop_2_q_o)
4721  (=> (and hop_1_q_a hop_1_a_n) hop_2_q_n)
4722  (=> (and hop_1_q_a hop_1_a_p) hop_2_q_p)
4723  (=> (and hop_1_q_c hop_1_c_a) hop_2_q_a)
4724  (=> (and hop_1_q_c hop_1_c_b) hop_2_q_b)
4725  (=> (and hop_1_q_c hop_1_c_e) hop_2_q_e)
4726  (=> (and hop_1_q_c hop_1_c_d) hop_2_q_d)
4727  (=> (and hop_1_q_c hop_1_c_g) hop_2_q_g)
4728  (=> (and hop_1_q_c hop_1_c_f) hop_2_q_f)
4729  (=> (and hop_1_q_c hop_1_c_i) hop_2_q_i)
4730  (=> (and hop_1_q_c hop_1_c_h) hop_2_q_h)
4731  (=> (and hop_1_q_c hop_1_c_k) hop_2_q_k)
4732  (=> (and hop_1_q_c hop_1_c_j) hop_2_q_j)
4733  (=> (and hop_1_q_c hop_1_c_m) hop_2_q_m)
4734  (=> (and hop_1_q_c hop_1_c_l) hop_2_q_l)
4735  (=> (and hop_1_q_c hop_1_c_o) hop_2_q_o)
4736  (=> (and hop_1_q_c hop_1_c_n) hop_2_q_n)
4737  (=> (and hop_1_q_c hop_1_c_p) hop_2_q_p)
4738  (=> (and hop_1_q_b hop_1_b_a) hop_2_q_a)
4739  (=> (and hop_1_q_b hop_1_b_c) hop_2_q_c)
4740  (=> (and hop_1_q_b hop_1_b_e) hop_2_q_e)
4741  (=> (and hop_1_q_b hop_1_b_d) hop_2_q_d)
4742  (=> (and hop_1_q_b hop_1_b_g) hop_2_q_g)
4743  (=> (and hop_1_q_b hop_1_b_f) hop_2_q_f)
4744  (=> (and hop_1_q_b hop_1_b_i) hop_2_q_i)
4745  (=> (and hop_1_q_b hop_1_b_h) hop_2_q_h)
4746  (=> (and hop_1_q_b hop_1_b_k) hop_2_q_k)
4747  (=> (and hop_1_q_b hop_1_b_j) hop_2_q_j)
4748  (=> (and hop_1_q_b hop_1_b_m) hop_2_q_m)
4749  (=> (and hop_1_q_b hop_1_b_l) hop_2_q_l)
4750  (=> (and hop_1_q_b hop_1_b_o) hop_2_q_o)
4751  (=> (and hop_1_q_b hop_1_b_n) hop_2_q_n)
4752  (=> (and hop_1_q_b hop_1_b_p) hop_2_q_p)
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4753  (=> (and hop_1_q_e hop_1_e_a) hop_2_q_a)
4754  (=> (and hop_1_q_e hop_1_e_c) hop_2_q_c)
4755  (=> (and hop_1_q_e hop_1_e_b) hop_2_q_b)
4756  (=> (and hop_1_q_e hop_1_e_d) hop_2_q_d)
4757  (=> (and hop_1_q_e hop_1_e_g) hop_2_q_g)
4758  (=> (and hop_1_q_e hop_1_e_f) hop_2_q_f)
4759  (=> (and hop_1_q_e hop_1_e_i) hop_2_q_i)
4760  (=> (and hop_1_q_e hop_1_e_h) hop_2_q_h)
4761  (=> (and hop_1_q_e hop_1_e_k) hop_2_q_k)
4762  (=> (and hop_1_q_e hop_1_e_j) hop_2_q_j)
4763  (=> (and hop_1_q_e hop_1_e_m) hop_2_q_m)
4764  (=> (and hop_1_q_e hop_1_e_l) hop_2_q_l)
4765  (=> (and hop_1_q_e hop_1_e_o) hop_2_q_o)
4766  (=> (and hop_1_q_e hop_1_e_n) hop_2_q_n)
4767  (=> (and hop_1_q_e hop_1_e_p) hop_2_q_p)
4768  (=> (and hop_1_q_d hop_1_d_a) hop_2_q_a)
4769  (=> (and hop_1_q_d hop_1_d_c) hop_2_q_c)
4770  (=> (and hop_1_q_d hop_1_d_b) hop_2_q_b)
4771  (=> (and hop_1_q_d hop_1_d_e) hop_2_q_e)
4772  (=> (and hop_1_q_d hop_1_d_g) hop_2_q_g)
4773  (=> (and hop_1_q_d hop_1_d_f) hop_2_q_f)
4774  (=> (and hop_1_q_d hop_1_d_i) hop_2_q_i)
4775  (=> (and hop_1_q_d hop_1_d_h) hop_2_q_h)
4776  (=> (and hop_1_q_d hop_1_d_k) hop_2_q_k)
4777  (=> (and hop_1_q_d hop_1_d_j) hop_2_q_j)
4778  (=> (and hop_1_q_d hop_1_d_m) hop_2_q_m)
4779  (=> (and hop_1_q_d hop_1_d_l) hop_2_q_l)
4780  (=> (and hop_1_q_d hop_1_d_o) hop_2_q_o)
4781  (=> (and hop_1_q_d hop_1_d_n) hop_2_q_n)
4782  (=> (and hop_1_q_d hop_1_d_p) hop_2_q_p)
4783  (=> (and hop_1_q_g hop_1_g_a) hop_2_q_a)
4784  (=> (and hop_1_q_g hop_1_g_c) hop_2_q_c)
4785  (=> (and hop_1_q_g hop_1_g_b) hop_2_q_b)
4786  (=> (and hop_1_q_g hop_1_g_e) hop_2_q_e)
4787  (=> (and hop_1_q_g hop_1_g_d) hop_2_q_d)
4788  (=> (and hop_1_q_g hop_1_g_f) hop_2_q_f)
4789  (=> (and hop_1_q_g hop_1_g_i) hop_2_q_i)
4790  (=> (and hop_1_q_g hop_1_g_h) hop_2_q_h)
4791  (=> (and hop_1_q_g hop_1_g_k) hop_2_q_k)
4792  (=> (and hop_1_q_g hop_1_g_j) hop_2_q_j)
4793  (=> (and hop_1_q_g hop_1_g_m) hop_2_q_m)
4794  (=> (and hop_1_q_g hop_1_g_l) hop_2_q_l)
4795  (=> (and hop_1_q_g hop_1_g_o) hop_2_q_o)
4796  (=> (and hop_1_q_g hop_1_g_n) hop_2_q_n)
4797  (=> (and hop_1_q_g hop_1_g_p) hop_2_q_p)
4798  (=> (and hop_1_q_f hop_1_f_a) hop_2_q_a)
4799  (=> (and hop_1_q_f hop_1_f_c) hop_2_q_c)
4800  (=> (and hop_1_q_f hop_1_f_b) hop_2_q_b)
4801  (=> (and hop_1_q_f hop_1_f_e) hop_2_q_e)
4802  (=> (and hop_1_q_f hop_1_f_d) hop_2_q_d)
4803  (=> (and hop_1_q_f hop_1_f_g) hop_2_q_g)
4804  (=> (and hop_1_q_f hop_1_f_i) hop_2_q_i)
4805  (=> (and hop_1_q_f hop_1_f_h) hop_2_q_h)
4806  (=> (and hop_1_q_f hop_1_f_k) hop_2_q_k)
4807  (=> (and hop_1_q_f hop_1_f_j) hop_2_q_j)
4808  (=> (and hop_1_q_f hop_1_f_m) hop_2_q_m)
4809  (=> (and hop_1_q_f hop_1_f_l) hop_2_q_l)
4810  (=> (and hop_1_q_f hop_1_f_o) hop_2_q_o)
4811  (=> (and hop_1_q_f hop_1_f_n) hop_2_q_n)
4812  (=> (and hop_1_q_f hop_1_f_p) hop_2_q_p)
4813  (=> (and hop_1_q_i hop_1_i_a) hop_2_q_a)
4814  (=> (and hop_1_q_i hop_1_i_c) hop_2_q_c)
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4815  (=> (and hop_1_q_i hop_1_i_b) hop_2_q_b)
4816  (=> (and hop_1_q_i hop_1_i_e) hop_2_q_e)
4817  (=> (and hop_1_q_i hop_1_i_d) hop_2_q_d)
4818  (=> (and hop_1_q_i hop_1_i_g) hop_2_q_g)
4819  (=> (and hop_1_q_i hop_1_i_f) hop_2_q_f)
4820  (=> (and hop_1_q_i hop_1_i_h) hop_2_q_h)
4821  (=> (and hop_1_q_i hop_1_i_k) hop_2_q_k)
4822  (=> (and hop_1_q_i hop_1_i_j) hop_2_q_j)
4823  (=> (and hop_1_q_i hop_1_i_m) hop_2_q_m)
4824  (=> (and hop_1_q_i hop_1_i_l) hop_2_q_l)
4825  (=> (and hop_1_q_i hop_1_i_o) hop_2_q_o)
4826  (=> (and hop_1_q_i hop_1_i_n) hop_2_q_n)
4827  (=> (and hop_1_q_i hop_1_i_p) hop_2_q_p)
4828  (=> (and hop_1_q_h hop_1_h_a) hop_2_q_a)
4829  (=> (and hop_1_q_h hop_1_h_c) hop_2_q_c)
4830  (=> (and hop_1_q_h hop_1_h_b) hop_2_q_b)
4831  (=> (and hop_1_q_h hop_1_h_e) hop_2_q_e)
4832  (=> (and hop_1_q_h hop_1_h_d) hop_2_q_d)
4833  (=> (and hop_1_q_h hop_1_h_g) hop_2_q_g)
4834  (=> (and hop_1_q_h hop_1_h_f) hop_2_q_f)
4835  (=> (and hop_1_q_h hop_1_h_i) hop_2_q_i)
4836  (=> (and hop_1_q_h hop_1_h_k) hop_2_q_k)
4837  (=> (and hop_1_q_h hop_1_h_j) hop_2_q_j)
4838  (=> (and hop_1_q_h hop_1_h_m) hop_2_q_m)
4839  (=> (and hop_1_q_h hop_1_h_l) hop_2_q_l)
4840  (=> (and hop_1_q_h hop_1_h_o) hop_2_q_o)
4841  (=> (and hop_1_q_h hop_1_h_n) hop_2_q_n)
4842  (=> (and hop_1_q_h hop_1_h_p) hop_2_q_p)
4843  (=> (and hop_1_q_k hop_1_k_a) hop_2_q_a)
4844  (=> (and hop_1_q_k hop_1_k_c) hop_2_q_c)
4845  (=> (and hop_1_q_k hop_1_k_b) hop_2_q_b)
4846  (=> (and hop_1_q_k hop_1_k_e) hop_2_q_e)
4847  (=> (and hop_1_q_k hop_1_k_d) hop_2_q_d)
4848  (=> (and hop_1_q_k hop_1_k_g) hop_2_q_g)
4849  (=> (and hop_1_q_k hop_1_k_f) hop_2_q_f)
4850  (=> (and hop_1_q_k hop_1_k_i) hop_2_q_i)
4851  (=> (and hop_1_q_k hop_1_k_h) hop_2_q_h)
4852  (=> (and hop_1_q_k hop_1_k_j) hop_2_q_j)
4853  (=> (and hop_1_q_k hop_1_k_m) hop_2_q_m)
4854  (=> (and hop_1_q_k hop_1_k_l) hop_2_q_l)
4855  (=> (and hop_1_q_k hop_1_k_o) hop_2_q_o)
4856  (=> (and hop_1_q_k hop_1_k_n) hop_2_q_n)
4857  (=> (and hop_1_q_k hop_1_k_p) hop_2_q_p)
4858  (=> (and hop_1_q_j hop_1_j_a) hop_2_q_a)
4859  (=> (and hop_1_q_j hop_1_j_c) hop_2_q_c)
4860  (=> (and hop_1_q_j hop_1_j_b) hop_2_q_b)
4861  (=> (and hop_1_q_j hop_1_j_e) hop_2_q_e)
4862  (=> (and hop_1_q_j hop_1_j_d) hop_2_q_d)
4863  (=> (and hop_1_q_j hop_1_j_g) hop_2_q_g)
4864  (=> (and hop_1_q_j hop_1_j_f) hop_2_q_f)
4865  (=> (and hop_1_q_j hop_1_j_i) hop_2_q_i)
4866  (=> (and hop_1_q_j hop_1_j_h) hop_2_q_h)
4867  (=> (and hop_1_q_j hop_1_j_k) hop_2_q_k)
4868  (=> (and hop_1_q_j hop_1_j_m) hop_2_q_m)
4869  (=> (and hop_1_q_j hop_1_j_l) hop_2_q_l)
4870  (=> (and hop_1_q_j hop_1_j_o) hop_2_q_o)
4871  (=> (and hop_1_q_j hop_1_j_n) hop_2_q_n)
4872  (=> (and hop_1_q_j hop_1_j_p) hop_2_q_p)
4873  (=> (and hop_1_q_m hop_1_m_a) hop_2_q_a)
4874  (=> (and hop_1_q_m hop_1_m_c) hop_2_q_c)
4875  (=> (and hop_1_q_m hop_1_m_b) hop_2_q_b)
4876  (=> (and hop_1_q_m hop_1_m_e) hop_2_q_e)
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4877  (=> (and hop_1_q_m hop_1_m_d) hop_2_q_d)
4878  (=> (and hop_1_q_m hop_1_m_g) hop_2_q_g)
4879  (=> (and hop_1_q_m hop_1_m_f) hop_2_q_f)
4880  (=> (and hop_1_q_m hop_1_m_i) hop_2_q_i)
4881  (=> (and hop_1_q_m hop_1_m_h) hop_2_q_h)
4882  (=> (and hop_1_q_m hop_1_m_k) hop_2_q_k)
4883  (=> (and hop_1_q_m hop_1_m_j) hop_2_q_j)
4884  (=> (and hop_1_q_m hop_1_m_l) hop_2_q_l)
4885  (=> (and hop_1_q_m hop_1_m_o) hop_2_q_o)
4886  (=> (and hop_1_q_m hop_1_m_n) hop_2_q_n)
4887  (=> (and hop_1_q_m hop_1_m_p) hop_2_q_p)
4888  (=> (and hop_1_q_l hop_1_l_a) hop_2_q_a)
4889  (=> (and hop_1_q_l hop_1_l_c) hop_2_q_c)
4890  (=> (and hop_1_q_l hop_1_l_b) hop_2_q_b)
4891  (=> (and hop_1_q_l hop_1_l_e) hop_2_q_e)
4892  (=> (and hop_1_q_l hop_1_l_d) hop_2_q_d)
4893  (=> (and hop_1_q_l hop_1_l_g) hop_2_q_g)
4894  (=> (and hop_1_q_l hop_1_l_f) hop_2_q_f)
4895  (=> (and hop_1_q_l hop_1_l_i) hop_2_q_i)
4896  (=> (and hop_1_q_l hop_1_l_h) hop_2_q_h)
4897  (=> (and hop_1_q_l hop_1_l_k) hop_2_q_k)
4898  (=> (and hop_1_q_l hop_1_l_j) hop_2_q_j)
4899  (=> (and hop_1_q_l hop_1_l_m) hop_2_q_m)
4900  (=> (and hop_1_q_l hop_1_l_o) hop_2_q_o)
4901  (=> (and hop_1_q_l hop_1_l_n) hop_2_q_n)
4902  (=> (and hop_1_q_l hop_1_l_p) hop_2_q_p)
4903  (=> (and hop_1_q_o hop_1_o_a) hop_2_q_a)
4904  (=> (and hop_1_q_o hop_1_o_c) hop_2_q_c)
4905  (=> (and hop_1_q_o hop_1_o_b) hop_2_q_b)
4906  (=> (and hop_1_q_o hop_1_o_e) hop_2_q_e)
4907  (=> (and hop_1_q_o hop_1_o_d) hop_2_q_d)
4908  (=> (and hop_1_q_o hop_1_o_g) hop_2_q_g)
4909  (=> (and hop_1_q_o hop_1_o_f) hop_2_q_f)
4910  (=> (and hop_1_q_o hop_1_o_i) hop_2_q_i)
4911  (=> (and hop_1_q_o hop_1_o_h) hop_2_q_h)
4912  (=> (and hop_1_q_o hop_1_o_k) hop_2_q_k)
4913  (=> (and hop_1_q_o hop_1_o_j) hop_2_q_j)
4914  (=> (and hop_1_q_o hop_1_o_m) hop_2_q_m)
4915  (=> (and hop_1_q_o hop_1_o_l) hop_2_q_l)
4916  (=> (and hop_1_q_o hop_1_o_n) hop_2_q_n)
4917  (=> (and hop_1_q_o hop_1_o_p) hop_2_q_p)
4918  (=> (and hop_1_q_n hop_1_n_a) hop_2_q_a)
4919  (=> (and hop_1_q_n hop_1_n_c) hop_2_q_c)
4920  (=> (and hop_1_q_n hop_1_n_b) hop_2_q_b)
4921  (=> (and hop_1_q_n hop_1_n_e) hop_2_q_e)
4922  (=> (and hop_1_q_n hop_1_n_d) hop_2_q_d)
4923  (=> (and hop_1_q_n hop_1_n_g) hop_2_q_g)
4924  (=> (and hop_1_q_n hop_1_n_f) hop_2_q_f)
4925  (=> (and hop_1_q_n hop_1_n_i) hop_2_q_i)
4926  (=> (and hop_1_q_n hop_1_n_h) hop_2_q_h)
4927  (=> (and hop_1_q_n hop_1_n_k) hop_2_q_k)
4928  (=> (and hop_1_q_n hop_1_n_j) hop_2_q_j)
4929  (=> (and hop_1_q_n hop_1_n_m) hop_2_q_m)
4930  (=> (and hop_1_q_n hop_1_n_l) hop_2_q_l)
4931  (=> (and hop_1_q_n hop_1_n_o) hop_2_q_o)
4932  (=> (and hop_1_q_n hop_1_n_p) hop_2_q_p)
4933  (=> (and hop_1_q_p hop_1_p_a) hop_2_q_a)
4934  (=> (and hop_1_q_p hop_1_p_c) hop_2_q_c)
4935  (=> (and hop_1_q_p hop_1_p_b) hop_2_q_b)
4936  (=> (and hop_1_q_p hop_1_p_e) hop_2_q_e)
4937  (=> (and hop_1_q_p hop_1_p_d) hop_2_q_d)
4938  (=> (and hop_1_q_p hop_1_p_g) hop_2_q_g)
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4939  (=> (and hop_1_q_p hop_1_p_f) hop_2_q_f)
4940  (=> (and hop_1_q_p hop_1_p_i) hop_2_q_i)
4941  (=> (and hop_1_q_p hop_1_p_h) hop_2_q_h)
4942  (=> (and hop_1_q_p hop_1_p_k) hop_2_q_k)
4943  (=> (and hop_1_q_p hop_1_p_j) hop_2_q_j)
4944  (=> (and hop_1_q_p hop_1_p_m) hop_2_q_m)
4945  (=> (and hop_1_q_p hop_1_p_l) hop_2_q_l)
4946  (=> (and hop_1_q_p hop_1_p_o) hop_2_q_o)
4947  (=> (and hop_1_q_p hop_1_p_n) hop_2_q_n)
4948  (=> (and hop_1_p_a hop_1_a_c) hop_2_p_c)
4949  (=> (and hop_1_p_a hop_1_a_b) hop_2_p_b)
4950  (=> (and hop_1_p_a hop_1_a_e) hop_2_p_e)
4951  (=> (and hop_1_p_a hop_1_a_d) hop_2_p_d)
4952  (=> (and hop_1_p_a hop_1_a_g) hop_2_p_g)
4953  (=> (and hop_1_p_a hop_1_a_f) hop_2_p_f)
4954  (=> (and hop_1_p_a hop_1_a_i) hop_2_p_i)
4955  (=> (and hop_1_p_a hop_1_a_h) hop_2_p_h)
4956  (=> (and hop_1_p_a hop_1_a_k) hop_2_p_k)
4957  (=> (and hop_1_p_a hop_1_a_j) hop_2_p_j)
4958  (=> (and hop_1_p_a hop_1_a_m) hop_2_p_m)
4959  (=> (and hop_1_p_a hop_1_a_l) hop_2_p_l)
4960  (=> (and hop_1_p_a hop_1_a_o) hop_2_p_o)
4961  (=> (and hop_1_p_a hop_1_a_n) hop_2_p_n)
4962  (=> (and hop_1_p_a hop_1_a_q) hop_2_p_q)
4963  (=> (and hop_1_p_c hop_1_c_a) hop_2_p_a)
4964  (=> (and hop_1_p_c hop_1_c_b) hop_2_p_b)
4965  (=> (and hop_1_p_c hop_1_c_e) hop_2_p_e)
4966  (=> (and hop_1_p_c hop_1_c_d) hop_2_p_d)
4967  (=> (and hop_1_p_c hop_1_c_g) hop_2_p_g)
4968  (=> (and hop_1_p_c hop_1_c_f) hop_2_p_f)
4969  (=> (and hop_1_p_c hop_1_c_i) hop_2_p_i)
4970  (=> (and hop_1_p_c hop_1_c_h) hop_2_p_h)
4971  (=> (and hop_1_p_c hop_1_c_k) hop_2_p_k)
4972  (=> (and hop_1_p_c hop_1_c_j) hop_2_p_j)
4973  (=> (and hop_1_p_c hop_1_c_m) hop_2_p_m)
4974  (=> (and hop_1_p_c hop_1_c_l) hop_2_p_l)
4975  (=> (and hop_1_p_c hop_1_c_o) hop_2_p_o)
4976  (=> (and hop_1_p_c hop_1_c_n) hop_2_p_n)
4977  (=> (and hop_1_p_c hop_1_c_q) hop_2_p_q)
4978  (=> (and hop_1_p_b hop_1_b_a) hop_2_p_a)
4979  (=> (and hop_1_p_b hop_1_b_c) hop_2_p_c)
4980  (=> (and hop_1_p_b hop_1_b_e) hop_2_p_e)
4981  (=> (and hop_1_p_b hop_1_b_d) hop_2_p_d)
4982  (=> (and hop_1_p_b hop_1_b_g) hop_2_p_g)
4983  (=> (and hop_1_p_b hop_1_b_f) hop_2_p_f)
4984  (=> (and hop_1_p_b hop_1_b_i) hop_2_p_i)
4985  (=> (and hop_1_p_b hop_1_b_h) hop_2_p_h)
4986  (=> (and hop_1_p_b hop_1_b_k) hop_2_p_k)
4987  (=> (and hop_1_p_b hop_1_b_j) hop_2_p_j)
4988  (=> (and hop_1_p_b hop_1_b_m) hop_2_p_m)
4989  (=> (and hop_1_p_b hop_1_b_l) hop_2_p_l)
4990  (=> (and hop_1_p_b hop_1_b_o) hop_2_p_o)
4991  (=> (and hop_1_p_b hop_1_b_n) hop_2_p_n)
4992  (=> (and hop_1_p_b hop_1_b_q) hop_2_p_q)
4993  (=> (and hop_1_p_e hop_1_e_a) hop_2_p_a)
4994  (=> (and hop_1_p_e hop_1_e_c) hop_2_p_c)
4995  (=> (and hop_1_p_e hop_1_e_b) hop_2_p_b)
4996  (=> (and hop_1_p_e hop_1_e_d) hop_2_p_d)
4997  (=> (and hop_1_p_e hop_1_e_g) hop_2_p_g)
4998  (=> (and hop_1_p_e hop_1_e_f) hop_2_p_f)
4999  (=> (and hop_1_p_e hop_1_e_i) hop_2_p_i)
5000  (=> (and hop_1_p_e hop_1_e_h) hop_2_p_h)
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```
5001    (=> (and hop_1_p_e hop_1_e_k) hop_2_p_k)
5002    (=> (and hop_1_p_e hop_1_e_j) hop_2_p_j)
5003    (=> (and hop_1_p_e hop_1_e_m) hop_2_p_m)
5004    (=> (and hop_1_p_e hop_1_e_l) hop_2_p_l)
5005    (=> (and hop_1_p_e hop_1_e_o) hop_2_p_o)
5006    (=> (and hop_1_p_e hop_1_e_n) hop_2_p_n)
5007    (=> (and hop_1_p_e hop_1_e_q) hop_2_p_q)
5008    (=> (and hop_1_p_d hop_1_d_a) hop_2_p_a)
5009    (=> (and hop_1_p_d hop_1_d_c) hop_2_p_c)
5010    (=> (and hop_1_p_d hop_1_d_b) hop_2_p_b)
5011    (=> (and hop_1_p_d hop_1_d_e) hop_2_p_e)
5012    (=> (and hop_1_p_d hop_1_d_g) hop_2_p_g)
5013    (=> (and hop_1_p_d hop_1_d_f) hop_2_p_f)
5014    (=> (and hop_1_p_d hop_1_d_i) hop_2_p_i)
5015    (=> (and hop_1_p_d hop_1_d_h) hop_2_p_h)
5016    (=> (and hop_1_p_d hop_1_d_k) hop_2_p_k)
5017    (=> (and hop_1_p_d hop_1_d_j) hop_2_p_j)
5018    (=> (and hop_1_p_d hop_1_d_m) hop_2_p_m)
5019    (=> (and hop_1_p_d hop_1_d_l) hop_2_p_l)
5020    (=> (and hop_1_p_d hop_1_d_o) hop_2_p_o)
5021    (=> (and hop_1_p_d hop_1_d_n) hop_2_p_n)
5022    (=> (and hop_1_p_d hop_1_d_q) hop_2_p_q)
5023    (=> (and hop_1_p_g hop_1_g_a) hop_2_p_a)
5024    (=> (and hop_1_p_g hop_1_g_c) hop_2_p_c)
5025    (=> (and hop_1_p_g hop_1_g_b) hop_2_p_b)
5026    (=> (and hop_1_p_g hop_1_g_e) hop_2_p_e)
5027    (=> (and hop_1_p_g hop_1_g_d) hop_2_p_d)
5028    (=> (and hop_1_p_g hop_1_g_f) hop_2_p_f)
5029    (=> (and hop_1_p_g hop_1_g_i) hop_2_p_i)
5030    (=> (and hop_1_p_g hop_1_g_h) hop_2_p_h)
5031    (=> (and hop_1_p_g hop_1_g_k) hop_2_p_k)
5032    (=> (and hop_1_p_g hop_1_g_j) hop_2_p_j)
5033    (=> (and hop_1_p_g hop_1_g_m) hop_2_p_m)
5034    (=> (and hop_1_p_g hop_1_g_l) hop_2_p_l)
5035    (=> (and hop_1_p_g hop_1_g_o) hop_2_p_o)
5036    (=> (and hop_1_p_g hop_1_g_n) hop_2_p_n)
5037    (=> (and hop_1_p_g hop_1_g_q) hop_2_p_q)
5038    (=> (and hop_1_p_f hop_1_f_a) hop_2_p_a)
5039    (=> (and hop_1_p_f hop_1_f_c) hop_2_p_c)
5040    (=> (and hop_1_p_f hop_1_f_b) hop_2_p_b)
5041    (=> (and hop_1_p_f hop_1_f_e) hop_2_p_e)
5042    (=> (and hop_1_p_f hop_1_f_d) hop_2_p_d)
5043    (=> (and hop_1_p_f hop_1_f_g) hop_2_p_g)
5044    (=> (and hop_1_p_f hop_1_f_i) hop_2_p_i)
5045    (=> (and hop_1_p_f hop_1_f_h) hop_2_p_h)
5046    (=> (and hop_1_p_f hop_1_f_k) hop_2_p_k)
5047    (=> (and hop_1_p_f hop_1_f_j) hop_2_p_j)
5048    (=> (and hop_1_p_f hop_1_f_m) hop_2_p_m)
5049    (=> (and hop_1_p_f hop_1_f_l) hop_2_p_l)
5050    (=> (and hop_1_p_f hop_1_f_o) hop_2_p_o)
5051    (=> (and hop_1_p_f hop_1_f_n) hop_2_p_n)
5052    (=> (and hop_1_p_f hop_1_f_q) hop_2_p_q)
5053    (=> (and hop_1_p_i hop_1_i_a) hop_2_p_a)
5054    (=> (and hop_1_p_i hop_1_i_c) hop_2_p_c)
5055    (=> (and hop_1_p_i hop_1_i_b) hop_2_p_b)
5056    (=> (and hop_1_p_i hop_1_i_e) hop_2_p_e)
5057    (=> (and hop_1_p_i hop_1_i_d) hop_2_p_d)
5058    (=> (and hop_1_p_i hop_1_i_g) hop_2_p_g)
5059    (=> (and hop_1_p_i hop_1_i_f) hop_2_p_f)
5060    (=> (and hop_1_p_i hop_1_i_h) hop_2_p_h)
5061    (=> (and hop_1_p_i hop_1_i_k) hop_2_p_k)
5062    (=> (and hop_1_p_i hop_1_i_j) hop_2_p_j)
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```
5063    (=> (and hop_1_p_i hop_1_i_m) hop_2_p_m)
5064    (=> (and hop_1_p_i hop_1_i_l) hop_2_p_l)
5065    (=> (and hop_1_p_i hop_1_i_o) hop_2_p_o)
5066    (=> (and hop_1_p_i hop_1_i_n) hop_2_p_n)
5067    (=> (and hop_1_p_i hop_1_i_q) hop_2_p_q)
5068    (=> (and hop_1_p_h hop_1_h_a) hop_2_p_a)
5069    (=> (and hop_1_p_h hop_1_h_c) hop_2_p_c)
5070    (=> (and hop_1_p_h hop_1_h_b) hop_2_p_b)
5071    (=> (and hop_1_p_h hop_1_h_e) hop_2_p_e)
5072    (=> (and hop_1_p_h hop_1_h_d) hop_2_p_d)
5073    (=> (and hop_1_p_h hop_1_h_g) hop_2_p_g)
5074    (=> (and hop_1_p_h hop_1_h_f) hop_2_p_f)
5075    (=> (and hop_1_p_h hop_1_h_i) hop_2_p_i)
5076    (=> (and hop_1_p_h hop_1_h_k) hop_2_p_k)
5077    (=> (and hop_1_p_h hop_1_h_j) hop_2_p_j)
5078    (=> (and hop_1_p_h hop_1_h_m) hop_2_p_m)
5079    (=> (and hop_1_p_h hop_1_h_l) hop_2_p_l)
5080    (=> (and hop_1_p_h hop_1_h_o) hop_2_p_o)
5081    (=> (and hop_1_p_h hop_1_h_n) hop_2_p_n)
5082    (=> (and hop_1_p_h hop_1_h_q) hop_2_p_q)
5083    (=> (and hop_1_p_k hop_1_k_a) hop_2_p_a)
5084    (=> (and hop_1_p_k hop_1_k_c) hop_2_p_c)
5085    (=> (and hop_1_p_k hop_1_k_b) hop_2_p_b)
5086    (=> (and hop_1_p_k hop_1_k_e) hop_2_p_e)
5087    (=> (and hop_1_p_k hop_1_k_d) hop_2_p_d)
5088    (=> (and hop_1_p_k hop_1_k_g) hop_2_p_g)
5089    (=> (and hop_1_p_k hop_1_k_f) hop_2_p_f)
5090    (=> (and hop_1_p_k hop_1_k_i) hop_2_p_i)
5091    (=> (and hop_1_p_k hop_1_k_h) hop_2_p_h)
5092    (=> (and hop_1_p_k hop_1_k_j) hop_2_p_j)
5093    (=> (and hop_1_p_k hop_1_k_m) hop_2_p_m)
5094    (=> (and hop_1_p_k hop_1_k_l) hop_2_p_l)
5095    (=> (and hop_1_p_k hop_1_k_o) hop_2_p_o)
5096    (=> (and hop_1_p_k hop_1_k_n) hop_2_p_n)
5097    (=> (and hop_1_p_k hop_1_k_q) hop_2_p_q)
5098    (=> (and hop_1_p_j hop_1_j_a) hop_2_p_a)
5099    (=> (and hop_1_p_j hop_1_j_c) hop_2_p_c)
5100    (=> (and hop_1_p_j hop_1_j_b) hop_2_p_b)
5101    (=> (and hop_1_p_j hop_1_j_e) hop_2_p_e)
5102    (=> (and hop_1_p_j hop_1_j_d) hop_2_p_d)
5103    (=> (and hop_1_p_j hop_1_j_g) hop_2_p_g)
5104    (=> (and hop_1_p_j hop_1_j_f) hop_2_p_f)
5105    (=> (and hop_1_p_j hop_1_j_i) hop_2_p_i)
5106    (=> (and hop_1_p_j hop_1_j_h) hop_2_p_h)
5107    (=> (and hop_1_p_j hop_1_j_k) hop_2_p_k)
5108    (=> (and hop_1_p_j hop_1_j_m) hop_2_p_m)
5109    (=> (and hop_1_p_j hop_1_j_l) hop_2_p_l)
5110    (=> (and hop_1_p_j hop_1_j_o) hop_2_p_o)
5111    (=> (and hop_1_p_j hop_1_j_n) hop_2_p_n)
5112    (=> (and hop_1_p_j hop_1_j_q) hop_2_p_q)
5113    (=> (and hop_1_p_m hop_1_m_a) hop_2_p_a)
5114    (=> (and hop_1_p_m hop_1_m_c) hop_2_p_c)
5115    (=> (and hop_1_p_m hop_1_m_b) hop_2_p_b)
5116    (=> (and hop_1_p_m hop_1_m_e) hop_2_p_e)
5117    (=> (and hop_1_p_m hop_1_m_d) hop_2_p_d)
5118    (=> (and hop_1_p_m hop_1_m_g) hop_2_p_g)
5119    (=> (and hop_1_p_m hop_1_m_f) hop_2_p_f)
5120    (=> (and hop_1_p_m hop_1_m_i) hop_2_p_i)
5121    (=> (and hop_1_p_m hop_1_m_h) hop_2_p_h)
5122    (=> (and hop_1_p_m hop_1_m_k) hop_2_p_k)
5123    (=> (and hop_1_p_m hop_1_m_j) hop_2_p_j)
5124    (=> (and hop_1_p_m hop_1_m_l) hop_2_p_l)
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5125  (=> (and hop_1_p_m hop_1_m_o) hop_2_p_o)
5126  (=> (and hop_1_p_m hop_1_m_n) hop_2_p_n)
5127  (=> (and hop_1_p_m hop_1_m_q) hop_2_p_q)
5128  (=> (and hop_1_p_l hop_1_l_a) hop_2_p_a)
5129  (=> (and hop_1_p_l hop_1_l_c) hop_2_p_c)
5130  (=> (and hop_1_p_l hop_1_l_b) hop_2_p_b)
5131  (=> (and hop_1_p_l hop_1_l_e) hop_2_p_e)
5132  (=> (and hop_1_p_l hop_1_l_d) hop_2_p_d)
5133  (=> (and hop_1_p_l hop_1_l_g) hop_2_p_g)
5134  (=> (and hop_1_p_l hop_1_l_f) hop_2_p_f)
5135  (=> (and hop_1_p_l hop_1_l_i) hop_2_p_i)
5136  (=> (and hop_1_p_l hop_1_l_h) hop_2_p_h)
5137  (=> (and hop_1_p_l hop_1_l_k) hop_2_p_k)
5138  (=> (and hop_1_p_l hop_1_l_j) hop_2_p_j)
5139  (=> (and hop_1_p_l hop_1_l_m) hop_2_p_m)
5140  (=> (and hop_1_p_l hop_1_l_o) hop_2_p_o)
5141  (=> (and hop_1_p_l hop_1_l_n) hop_2_p_n)
5142  (=> (and hop_1_p_l hop_1_l_q) hop_2_p_q)
5143  (=> (and hop_1_p_o hop_1_o_a) hop_2_p_a)
5144  (=> (and hop_1_p_o hop_1_o_c) hop_2_p_c)
5145  (=> (and hop_1_p_o hop_1_o_b) hop_2_p_b)
5146  (=> (and hop_1_p_o hop_1_o_e) hop_2_p_e)
5147  (=> (and hop_1_p_o hop_1_o_d) hop_2_p_d)
5148  (=> (and hop_1_p_o hop_1_o_g) hop_2_p_g)
5149  (=> (and hop_1_p_o hop_1_o_f) hop_2_p_f)
5150  (=> (and hop_1_p_o hop_1_o_i) hop_2_p_i)
5151  (=> (and hop_1_p_o hop_1_o_h) hop_2_p_h)
5152  (=> (and hop_1_p_o hop_1_o_k) hop_2_p_k)
5153  (=> (and hop_1_p_o hop_1_o_j) hop_2_p_j)
5154  (=> (and hop_1_p_o hop_1_o_m) hop_2_p_m)
5155  (=> (and hop_1_p_o hop_1_o_l) hop_2_p_l)
5156  (=> (and hop_1_p_o hop_1_o_n) hop_2_p_n)
5157  (=> (and hop_1_p_o hop_1_o_q) hop_2_p_q)
5158  (=> (and hop_1_p_n hop_1_n_a) hop_2_p_a)
5159  (=> (and hop_1_p_n hop_1_n_c) hop_2_p_c)
5160  (=> (and hop_1_p_n hop_1_n_b) hop_2_p_b)
5161  (=> (and hop_1_p_n hop_1_n_e) hop_2_p_e)
5162  (=> (and hop_1_p_n hop_1_n_d) hop_2_p_d)
5163  (=> (and hop_1_p_n hop_1_n_g) hop_2_p_g)
5164  (=> (and hop_1_p_n hop_1_n_f) hop_2_p_f)
5165  (=> (and hop_1_p_n hop_1_n_i) hop_2_p_i)
5166  (=> (and hop_1_p_n hop_1_n_h) hop_2_p_h)
5167  (=> (and hop_1_p_n hop_1_n_k) hop_2_p_k)
5168  (=> (and hop_1_p_n hop_1_n_j) hop_2_p_j)
5169  (=> (and hop_1_p_n hop_1_n_m) hop_2_p_m)
5170  (=> (and hop_1_p_n hop_1_n_l) hop_2_p_l)
5171  (=> (and hop_1_p_n hop_1_n_o) hop_2_p_o)
5172  (=> (and hop_1_p_n hop_1_n_q) hop_2_p_q)
5173  (=> (and hop_1_p_q hop_1_q_a) hop_2_p_a)
5174  (=> (and hop_1_p_q hop_1_q_c) hop_2_p_c)
5175  (=> (and hop_1_p_q hop_1_q_b) hop_2_p_b)
5176  (=> (and hop_1_p_q hop_1_q_e) hop_2_p_e)
5177  (=> (and hop_1_p_q hop_1_q_d) hop_2_p_d)
5178  (=> (and hop_1_p_q hop_1_q_g) hop_2_p_g)
5179  (=> (and hop_1_p_q hop_1_q_f) hop_2_p_f)
5180  (=> (and hop_1_p_q hop_1_q_i) hop_2_p_i)
5181  (=> (and hop_1_p_q hop_1_q_h) hop_2_p_h)
5182  (=> (and hop_1_p_q hop_1_q_k) hop_2_p_k)
5183  (=> (and hop_1_p_q hop_1_q_j) hop_2_p_j)
5184  (=> (and hop_1_p_q hop_1_q_m) hop_2_p_m)
5185  (=> (and hop_1_p_q hop_1_q_l) hop_2_p_l)
5186  (=> (and hop_1_p_q hop_1_q_o) hop_2_p_o)
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5187  (=> (and hop_1_p_q hop_1_q_n) hop_2_p_n)
5188  (=> hop_2_a_c (not (= chan_a chan_c)))
5189  (=> hop_2_a_b (not (= chan_a chan_b)))
5190  (=> hop_2_a_e (not (= chan_a chan_e)))
5191  (=> hop_2_a_d (not (= chan_a chan_d)))
5192  (=> hop_2_a_g (not (= chan_a chan_g)))
5193  (=> hop_2_a_f (not (= chan_a chan_f)))
5194  (=> hop_2_a_i (not (= chan_a chan_i)))
5195  (=> hop_2_a_h (not (= chan_a chan_h)))
5196  (=> hop_2_a_k (not (= chan_a chan_k)))
5197  (=> hop_2_a_j (not (= chan_a chan_j)))
5198  (=> hop_2_a_m (not (= chan_a chan_m)))
5199  (=> hop_2_a_l (not (= chan_a chan_l)))
5200  (=> hop_2_a_o (not (= chan_a chan_o)))
5201  (=> hop_2_a_n (not (= chan_a chan_n)))
5202  (=> hop_2_a_q (not (= chan_a chan_q)))
5203  (=> hop_2_a_p (not (= chan_a chan_p)))
5204  (=> hop_2_c_a (not (= chan_c chan_a)))
5205  (=> hop_2_c_b (not (= chan_c chan_b)))
5206  (=> hop_2_c_e (not (= chan_c chan_e)))
5207  (=> hop_2_c_d (not (= chan_c chan_d)))
5208  (=> hop_2_c_g (not (= chan_c chan_g)))
5209  (=> hop_2_c_f (not (= chan_c chan_f)))
5210  (=> hop_2_c_i (not (= chan_c chan_i)))
5211  (=> hop_2_c_h (not (= chan_c chan_h)))
5212  (=> hop_2_c_k (not (= chan_c chan_k)))
5213  (=> hop_2_c_j (not (= chan_c chan_j)))
5214  (=> hop_2_c_m (not (= chan_c chan_m)))
5215  (=> hop_2_c_l (not (= chan_c chan_l)))
5216  (=> hop_2_c_o (not (= chan_c chan_o)))
5217  (=> hop_2_c_n (not (= chan_c chan_n)))
5218  (=> hop_2_c_q (not (= chan_c chan_q)))
5219  (=> hop_2_c_p (not (= chan_c chan_p)))
5220  (=> hop_2_b_a (not (= chan_b chan_a)))
5221  (=> hop_2_b_c (not (= chan_b chan_c)))
5222  (=> hop_2_b_e (not (= chan_b chan_e)))
5223  (=> hop_2_b_d (not (= chan_b chan_d)))
5224  (=> hop_2_b_g (not (= chan_b chan_g)))
5225  (=> hop_2_b_f (not (= chan_b chan_f)))
5226  (=> hop_2_b_i (not (= chan_b chan_i)))
5227  (=> hop_2_b_h (not (= chan_b chan_h)))
5228  (=> hop_2_b_k (not (= chan_b chan_k)))
5229  (=> hop_2_b_j (not (= chan_b chan_j)))
5230  (=> hop_2_b_m (not (= chan_b chan_m)))
5231  (=> hop_2_b_l (not (= chan_b chan_l)))
5232  (=> hop_2_b_o (not (= chan_b chan_o)))
5233  (=> hop_2_b_n (not (= chan_b chan_n)))
5234  (=> hop_2_b_q (not (= chan_b chan_q)))
5235  (=> hop_2_b_p (not (= chan_b chan_p)))
5236  (=> hop_2_e_a (not (= chan_e chan_a)))
5237  (=> hop_2_e_c (not (= chan_e chan_c)))
5238  (=> hop_2_e_b (not (= chan_e chan_b)))
5239  (=> hop_2_e_d (not (= chan_e chan_d)))
5240  (=> hop_2_e_g (not (= chan_e chan_g)))
5241  (=> hop_2_e_f (not (= chan_e chan_f)))
5242  (=> hop_2_e_i (not (= chan_e chan_i)))
5243  (=> hop_2_e_h (not (= chan_e chan_h)))
5244  (=> hop_2_e_k (not (= chan_e chan_k)))
5245  (=> hop_2_e_j (not (= chan_e chan_j)))
5246  (=> hop_2_e_m (not (= chan_e chan_m)))
5247  (=> hop_2_e_l (not (= chan_e chan_l)))
5248  (=> hop_2_e_o (not (= chan_e chan_o)))
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5249  (=> hop_2_e_n (not (= chan_e chan_n)))
5250  (=> hop_2_e_q (not (= chan_e chan_q)))
5251  (=> hop_2_e_p (not (= chan_e chan_p)))
5252  (=> hop_2_d_a (not (= chan_d chan_a)))
5253  (=> hop_2_d_c (not (= chan_d chan_c)))
5254  (=> hop_2_d_b (not (= chan_d chan_b)))
5255  (=> hop_2_d_e (not (= chan_d chan_e)))
5256  (=> hop_2_d_g (not (= chan_d chan_g)))
5257  (=> hop_2_d_f (not (= chan_d chan_f)))
5258  (=> hop_2_d_i (not (= chan_d chan_i)))
5259  (=> hop_2_d_h (not (= chan_d chan_h)))
5260  (=> hop_2_d_k (not (= chan_d chan_k)))
5261  (=> hop_2_d_j (not (= chan_d chan_j)))
5262  (=> hop_2_d_m (not (= chan_d chan_m)))
5263  (=> hop_2_d_l (not (= chan_d chan_l)))
5264  (=> hop_2_d_o (not (= chan_d chan_o)))
5265  (=> hop_2_d_n (not (= chan_d chan_n)))
5266  (=> hop_2_d_q (not (= chan_d chan_q)))
5267  (=> hop_2_d_p (not (= chan_d chan_p)))
5268  (=> hop_2_g_a (not (= chan_g chan_a)))
5269  (=> hop_2_g_c (not (= chan_g chan_c)))
5270  (=> hop_2_g_b (not (= chan_g chan_b)))
5271  (=> hop_2_g_e (not (= chan_g chan_e)))
5272  (=> hop_2_g_d (not (= chan_g chan_d)))
5273  (=> hop_2_g_f (not (= chan_g chan_f)))
5274  (=> hop_2_g_i (not (= chan_g chan_i)))
5275  (=> hop_2_g_h (not (= chan_g chan_h)))
5276  (=> hop_2_g_k (not (= chan_g chan_k)))
5277  (=> hop_2_g_j (not (= chan_g chan_j)))
5278  (=> hop_2_g_m (not (= chan_g chan_m)))
5279  (=> hop_2_g_l (not (= chan_g chan_l)))
5280  (=> hop_2_g_o (not (= chan_g chan_o)))
5281  (=> hop_2_g_n (not (= chan_g chan_n)))
5282  (=> hop_2_g_q (not (= chan_g chan_q)))
5283  (=> hop_2_g_p (not (= chan_g chan_p)))
5284  (=> hop_2_f_a (not (= chan_f chan_a)))
5285  (=> hop_2_f_c (not (= chan_f chan_c)))
5286  (=> hop_2_f_b (not (= chan_f chan_b)))
5287  (=> hop_2_f_e (not (= chan_f chan_e)))
5288  (=> hop_2_f_d (not (= chan_f chan_d)))
5289  (=> hop_2_f_g (not (= chan_f chan_g)))
5290  (=> hop_2_f_i (not (= chan_f chan_i)))
5291  (=> hop_2_f_h (not (= chan_f chan_h)))
5292  (=> hop_2_f_k (not (= chan_f chan_k)))
5293  (=> hop_2_f_j (not (= chan_f chan_j)))
5294  (=> hop_2_f_m (not (= chan_f chan_m)))
5295  (=> hop_2_f_l (not (= chan_f chan_l)))
5296  (=> hop_2_f_o (not (= chan_f chan_o)))
5297  (=> hop_2_f_n (not (= chan_f chan_n)))
5298  (=> hop_2_f_q (not (= chan_f chan_q)))
5299  (=> hop_2_f_p (not (= chan_f chan_p)))
5300  (=> hop_2_i_a (not (= chan_i chan_a)))
5301  (=> hop_2_i_c (not (= chan_i chan_c)))
5302  (=> hop_2_i_b (not (= chan_i chan_b)))
5303  (=> hop_2_i_e (not (= chan_i chan_e)))
5304  (=> hop_2_i_d (not (= chan_i chan_d)))
5305  (=> hop_2_i_g (not (= chan_i chan_g)))
5306  (=> hop_2_i_f (not (= chan_i chan_f)))
5307  (=> hop_2_i_h (not (= chan_i chan_h)))
5308  (=> hop_2_i_k (not (= chan_i chan_k)))
5309  (=> hop_2_i_j (not (= chan_i chan_j)))
5310  (=> hop_2_i_m (not (= chan_i chan_m)))
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5311  (=> hop_2_i_l (not (= chan_i chan_l)))
5312  (=> hop_2_i_o (not (= chan_i chan_o)))
5313  (=> hop_2_i_n (not (= chan_i chan_n)))
5314  (=> hop_2_i_q (not (= chan_i chan_q)))
5315  (=> hop_2_i_p (not (= chan_i chan_p)))
5316  (=> hop_2_h_a (not (= chan_h chan_a)))
5317  (=> hop_2_h_c (not (= chan_h chan_c)))
5318  (=> hop_2_h_b (not (= chan_h chan_b)))
5319  (=> hop_2_h_e (not (= chan_h chan_e)))
5320  (=> hop_2_h_d (not (= chan_h chan_d)))
5321  (=> hop_2_h_g (not (= chan_h chan_g)))
5322  (=> hop_2_h_f (not (= chan_h chan_f)))
5323  (=> hop_2_h_i (not (= chan_h chan_i)))
5324  (=> hop_2_h_k (not (= chan_h chan_k)))
5325  (=> hop_2_h_j (not (= chan_h chan_j)))
5326  (=> hop_2_h_m (not (= chan_h chan_m)))
5327  (=> hop_2_h_l (not (= chan_h chan_l)))
5328  (=> hop_2_h_o (not (= chan_h chan_o)))
5329  (=> hop_2_h_n (not (= chan_h chan_n)))
5330  (=> hop_2_h_q (not (= chan_h chan_q)))
5331  (=> hop_2_h_p (not (= chan_h chan_p)))
5332  (=> hop_2_k_a (not (= chan_k chan_a)))
5333  (=> hop_2_k_c (not (= chan_k chan_c)))
5334  (=> hop_2_k_b (not (= chan_k chan_b)))
5335  (=> hop_2_k_e (not (= chan_k chan_e)))
5336  (=> hop_2_k_d (not (= chan_k chan_d)))
5337  (=> hop_2_k_g (not (= chan_k chan_g)))
5338  (=> hop_2_k_f (not (= chan_k chan_f)))
5339  (=> hop_2_k_i (not (= chan_k chan_i)))
5340  (=> hop_2_k_h (not (= chan_k chan_h)))
5341  (=> hop_2_k_j (not (= chan_k chan_j)))
5342  (=> hop_2_k_m (not (= chan_k chan_m)))
5343  (=> hop_2_k_l (not (= chan_k chan_l)))
5344  (=> hop_2_k_o (not (= chan_k chan_o)))
5345  (=> hop_2_k_n (not (= chan_k chan_n)))
5346  (=> hop_2_k_q (not (= chan_k chan_q)))
5347  (=> hop_2_k_p (not (= chan_k chan_p)))
5348  (=> hop_2_j_a (not (= chan_j chan_a)))
5349  (=> hop_2_j_c (not (= chan_j chan_c)))
5350  (=> hop_2_j_b (not (= chan_j chan_b)))
5351  (=> hop_2_j_e (not (= chan_j chan_e)))
5352  (=> hop_2_j_d (not (= chan_j chan_d)))
5353  (=> hop_2_j_g (not (= chan_j chan_g)))
5354  (=> hop_2_j_f (not (= chan_j chan_f)))
5355  (=> hop_2_j_i (not (= chan_j chan_i)))
5356  (=> hop_2_j_h (not (= chan_j chan_h)))
5357  (=> hop_2_j_k (not (= chan_j chan_k)))
5358  (=> hop_2_j_m (not (= chan_j chan_m)))
5359  (=> hop_2_j_l (not (= chan_j chan_l)))
5360  (=> hop_2_j_o (not (= chan_j chan_o)))
5361  (=> hop_2_j_n (not (= chan_j chan_n)))
5362  (=> hop_2_j_q (not (= chan_j chan_q)))
5363  (=> hop_2_j_p (not (= chan_j chan_p)))
5364  (=> hop_2_m_a (not (= chan_m chan_a)))
5365  (=> hop_2_m_c (not (= chan_m chan_c)))
5366  (=> hop_2_m_b (not (= chan_m chan_b)))
5367  (=> hop_2_m_e (not (= chan_m chan_e)))
5368  (=> hop_2_m_d (not (= chan_m chan_d)))
5369  (=> hop_2_m_g (not (= chan_m chan_g)))
5370  (=> hop_2_m_f (not (= chan_m chan_f)))
5371  (=> hop_2_m_i (not (= chan_m chan_i)))
5372  (=> hop_2_m_h (not (= chan_m chan_h)))
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5373    (=> hop_2_m_k (not (= chan_m chan_k)))
5374    (=> hop_2_m_j (not (= chan_m chan_j)))
5375    (=> hop_2_m_l (not (= chan_m chan_l)))
5376    (=> hop_2_m_o (not (= chan_m chan_o)))
5377    (=> hop_2_m_n (not (= chan_m chan_n)))
5378    (=> hop_2_m_q (not (= chan_m chan_q)))
5379    (=> hop_2_m_p (not (= chan_m chan_p)))
5380    (=> hop_2_l_a (not (= chan_l chan_a)))
5381    (=> hop_2_l_c (not (= chan_l chan_c)))
5382    (=> hop_2_l_b (not (= chan_l chan_b)))
5383    (=> hop_2_l_e (not (= chan_l chan_e)))
5384    (=> hop_2_l_d (not (= chan_l chan_d)))
5385    (=> hop_2_l_g (not (= chan_l chan_g)))
5386    (=> hop_2_l_f (not (= chan_l chan_f)))
5387    (=> hop_2_l_i (not (= chan_l chan_i)))
5388    (=> hop_2_l_h (not (= chan_l chan_h)))
5389    (=> hop_2_l_k (not (= chan_l chan_k)))
5390    (=> hop_2_l_j (not (= chan_l chan_j)))
5391    (=> hop_2_l_m (not (= chan_l chan_m)))
5392    (=> hop_2_l_o (not (= chan_l chan_o)))
5393    (=> hop_2_l_n (not (= chan_l chan_n)))
5394    (=> hop_2_l_q (not (= chan_l chan_q)))
5395    (=> hop_2_l_p (not (= chan_l chan_p)))
5396    (=> hop_2_o_a (not (= chan_o chan_a)))
5397    (=> hop_2_o_c (not (= chan_o chan_c)))
5398    (=> hop_2_o_b (not (= chan_o chan_b)))
5399    (=> hop_2_o_e (not (= chan_o chan_e)))
5400    (=> hop_2_o_d (not (= chan_o chan_d)))
5401    (=> hop_2_o_g (not (= chan_o chan_g)))
5402    (=> hop_2_o_f (not (= chan_o chan_f)))
5403    (=> hop_2_o_i (not (= chan_o chan_i)))
5404    (=> hop_2_o_h (not (= chan_o chan_h)))
5405    (=> hop_2_o_k (not (= chan_o chan_k)))
5406    (=> hop_2_o_j (not (= chan_o chan_j)))
5407    (=> hop_2_o_m (not (= chan_o chan_m)))
5408    (=> hop_2_o_l (not (= chan_o chan_l)))
5409    (=> hop_2_o_n (not (= chan_o chan_n)))
5410    (=> hop_2_o_q (not (= chan_o chan_q)))
5411    (=> hop_2_o_p (not (= chan_o chan_p)))
5412    (=> hop_2_n_a (not (= chan_n chan_a)))
5413    (=> hop_2_n_c (not (= chan_n chan_c)))
5414    (=> hop_2_n_b (not (= chan_n chan_b)))
5415    (=> hop_2_n_e (not (= chan_n chan_e)))
5416    (=> hop_2_n_d (not (= chan_n chan_d)))
5417    (=> hop_2_n_g (not (= chan_n chan_g)))
5418    (=> hop_2_n_f (not (= chan_n chan_f)))
5419    (=> hop_2_n_i (not (= chan_n chan_i)))
5420    (=> hop_2_n_h (not (= chan_n chan_h)))
5421    (=> hop_2_n_k (not (= chan_n chan_k)))
5422    (=> hop_2_n_j (not (= chan_n chan_j)))
5423    (=> hop_2_n_m (not (= chan_n chan_m)))
5424    (=> hop_2_n_l (not (= chan_n chan_l)))
5425    (=> hop_2_n_o (not (= chan_n chan_o)))
5426    (=> hop_2_n_q (not (= chan_n chan_q)))
5427    (=> hop_2_n_p (not (= chan_n chan_p)))
5428    (=> hop_2_q_a (not (= chan_q chan_a)))
5429    (=> hop_2_q_c (not (= chan_q chan_c)))
5430    (=> hop_2_q_b (not (= chan_q chan_b)))
5431    (=> hop_2_q_e (not (= chan_q chan_e)))
5432    (=> hop_2_q_d (not (= chan_q chan_d)))
5433    (=> hop_2_q_g (not (= chan_q chan_g)))
5434    (=> hop_2_q_f (not (= chan_q chan_f)))
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5435   (=> hop_2_q_i (not (= chan_q chan_i)))
5436   (=> hop_2_q_h (not (= chan_q chan_h)))
5437   (=> hop_2_q_k (not (= chan_q chan_k)))
5438   (=> hop_2_q_j (not (= chan_q chan_j)))
5439   (=> hop_2_q_m (not (= chan_q chan_m)))
5440   (=> hop_2_q_l (not (= chan_q chan_l)))
5441   (=> hop_2_q_o (not (= chan_q chan_o)))
5442   (=> hop_2_q_n (not (= chan_q chan_n)))
5443   (=> hop_2_q_p (not (= chan_q chan_p)))
5444   (=> hop_2_p_a (not (= chan_p chan_a)))
5445   (=> hop_2_p_c (not (= chan_p chan_c)))
5446   (=> hop_2_p_b (not (= chan_p chan_b)))
5447   (=> hop_2_p_e (not (= chan_p chan_e)))
5448   (=> hop_2_p_d (not (= chan_p chan_d)))
5449   (=> hop_2_p_g (not (= chan_p chan_g)))
5450   (=> hop_2_p_f (not (= chan_p chan_f)))
5451   (=> hop_2_p_i (not (= chan_p chan_i)))
5452   (=> hop_2_p_h (not (= chan_p chan_h)))
5453   (=> hop_2_p_k (not (= chan_p chan_k)))
5454   (=> hop_2_p_j (not (= chan_p chan_j)))
5455   (=> hop_2_p_m (not (= chan_p chan_m)))
5456   (=> hop_2_p_l (not (= chan_p chan_l)))
5457   (=> hop_2_p_o (not (= chan_p chan_o)))
5458   (=> hop_2_p_n (not (= chan_p chan_n)))
5459   (=> hop_2_p_q (not (= chan_p chan_q)))
5460   (>= chan_a 0)
5461   (<= chan_a 6)
5462   (>= chan_c 0)
5463   (<= chan_c 6)
5464   (>= chan_b 0)
5465   (<= chan_b 6)
5466   (>= chan_e 0)
5467   (<= chan_e 6)
5468   (>= chan_d 0)
5469   (<= chan_d 6)
5470   (>= chan_g 0)
5471   (<= chan_g 6)
5472   (>= chan_f 0)
5473   (<= chan_f 6)
5474   (>= chan_i 0)
5475   (<= chan_i 6)
5476   (>= chan_h 0)
5477   (<= chan_h 6)
5478   (>= chan_k 0)
5479   (<= chan_k 6)
5480   (>= chan_j 0)
5481   (<= chan_j 6)
5482   (>= chan_m 0)
5483   (<= chan_m 6)
5484   (>= chan_l 0)
5485   (<= chan_l 6)
5486   (>= chan_o 0)
5487   (<= chan_o 6)
5488   (>= chan_n 0)
5489   (<= chan_n 6)
5490   (>= chan_q 0)
5491   (<= chan_q 6)
5492   (>= chan_p 0)
5493   (<= chan_p 6)
5494   ))
5495   (check-sat)
5496   (get-model)
```

Appendix 31

The generated requirements for Question 4(b) with $chan\_x \leq 5$

```
 1   (declare-const chan_a Int)
 2   (declare-const chan_c Int)
 3   (declare-const chan_b Int)
 4   (declare-const chan_e Int)
 5   (declare-const chan_d Int)
 6   (declare-const chan_g Int)
 7   (declare-const chan_f Int)
 8   (declare-const chan_i Int)
 9   (declare-const chan_h Int)
10   (declare-const chan_k Int)
11   (declare-const chan_j Int)
12   (declare-const chan_m Int)
13   (declare-const chan_l Int)
14   (declare-const chan_o Int)
15   (declare-const chan_n Int)
16   (declare-const chan_q Int)
17   (declare-const chan_p Int)
18   (declare-const hop_1_a_c Bool)
19   (declare-const hop_2_a_c Bool)
20   (declare-const hop_1_a_b Bool)
21   (declare-const hop_2_a_b Bool)
22   (declare-const hop_1_a_e Bool)
23   (declare-const hop_2_a_e Bool)
24   (declare-const hop_1_a_d Bool)
25   (declare-const hop_2_a_d Bool)
26   (declare-const hop_1_a_g Bool)
27   (declare-const hop_2_a_g Bool)
28   (declare-const hop_1_a_f Bool)
29   (declare-const hop_2_a_f Bool)
30   (declare-const hop_1_a_i Bool)
31   (declare-const hop_2_a_i Bool)
32   (declare-const hop_1_a_h Bool)
33   (declare-const hop_2_a_h Bool)
34   (declare-const hop_1_a_k Bool)
35   (declare-const hop_2_a_k Bool)
36   (declare-const hop_1_a_j Bool)
37   (declare-const hop_2_a_j Bool)
38   (declare-const hop_1_a_m Bool)
39   (declare-const hop_2_a_m Bool)
40   (declare-const hop_1_a_l Bool)
```

```
41   (declare-const hop_2_a_l Bool)
42   (declare-const hop_1_a_o Bool)
43   (declare-const hop_2_a_o Bool)
44   (declare-const hop_1_a_n Bool)
45   (declare-const hop_2_a_n Bool)
46   (declare-const hop_1_a_q Bool)
47   (declare-const hop_2_a_q Bool)
48   (declare-const hop_1_a_p Bool)
49   (declare-const hop_2_a_p Bool)
50   (declare-const hop_1_c_a Bool)
51   (declare-const hop_2_c_a Bool)
52   (declare-const hop_1_c_b Bool)
53   (declare-const hop_2_c_b Bool)
54   (declare-const hop_1_c_e Bool)
55   (declare-const hop_2_c_e Bool)
56   (declare-const hop_1_c_d Bool)
57   (declare-const hop_2_c_d Bool)
58   (declare-const hop_1_c_g Bool)
59   (declare-const hop_2_c_g Bool)
60   (declare-const hop_1_c_f Bool)
61   (declare-const hop_2_c_f Bool)
62   (declare-const hop_1_c_i Bool)
63   (declare-const hop_2_c_i Bool)
64   (declare-const hop_1_c_h Bool)
65   (declare-const hop_2_c_h Bool)
66   (declare-const hop_1_c_k Bool)
67   (declare-const hop_2_c_k Bool)
68   (declare-const hop_1_c_j Bool)
69   (declare-const hop_2_c_j Bool)
70   (declare-const hop_1_c_m Bool)
71   (declare-const hop_2_c_m Bool)
72   (declare-const hop_1_c_l Bool)
73   (declare-const hop_2_c_l Bool)
74   (declare-const hop_1_c_o Bool)
75   (declare-const hop_2_c_o Bool)
76   (declare-const hop_1_c_n Bool)
77   (declare-const hop_2_c_n Bool)
78   (declare-const hop_1_c_q Bool)
79   (declare-const hop_2_c_q Bool)
80   (declare-const hop_1_c_p Bool)
81   (declare-const hop_2_c_p Bool)
82   (declare-const hop_1_b_a Bool)
83   (declare-const hop_2_b_a Bool)
84   (declare-const hop_1_b_c Bool)
85   (declare-const hop_2_b_c Bool)
86   (declare-const hop_1_b_e Bool)
87   (declare-const hop_2_b_e Bool)
88   (declare-const hop_1_b_d Bool)
89   (declare-const hop_2_b_d Bool)
90   (declare-const hop_1_b_g Bool)
91   (declare-const hop_2_b_g Bool)
92   (declare-const hop_1_b_f Bool)
93   (declare-const hop_2_b_f Bool)
94   (declare-const hop_1_b_i Bool)
95   (declare-const hop_2_b_i Bool)
96   (declare-const hop_1_b_h Bool)
97   (declare-const hop_2_b_h Bool)
98   (declare-const hop_1_b_k Bool)
99   (declare-const hop_2_b_k Bool)
100  (declare-const hop_1_b_j Bool)
101  (declare-const hop_2_b_j Bool)
102  (declare-const hop_1_b_m Bool)
```

```
103  (declare-const hop_2_b_m Bool)
104  (declare-const hop_1_b_l Bool)
105  (declare-const hop_2_b_l Bool)
106  (declare-const hop_1_b_o Bool)
107  (declare-const hop_2_b_o Bool)
108  (declare-const hop_1_b_n Bool)
109  (declare-const hop_2_b_n Bool)
110  (declare-const hop_1_b_q Bool)
111  (declare-const hop_2_b_q Bool)
112  (declare-const hop_1_b_p Bool)
113  (declare-const hop_2_b_p Bool)
114  (declare-const hop_1_e_a Bool)
115  (declare-const hop_2_e_a Bool)
116  (declare-const hop_1_e_c Bool)
117  (declare-const hop_2_e_c Bool)
118  (declare-const hop_1_e_b Bool)
119  (declare-const hop_2_e_b Bool)
120  (declare-const hop_1_e_d Bool)
121  (declare-const hop_2_e_d Bool)
122  (declare-const hop_1_e_g Bool)
123  (declare-const hop_2_e_g Bool)
124  (declare-const hop_1_e_f Bool)
125  (declare-const hop_2_e_f Bool)
126  (declare-const hop_1_e_i Bool)
127  (declare-const hop_2_e_i Bool)
128  (declare-const hop_1_e_h Bool)
129  (declare-const hop_2_e_h Bool)
130  (declare-const hop_1_e_k Bool)
131  (declare-const hop_2_e_k Bool)
132  (declare-const hop_1_e_j Bool)
133  (declare-const hop_2_e_j Bool)
134  (declare-const hop_1_e_m Bool)
135  (declare-const hop_2_e_m Bool)
136  (declare-const hop_1_e_l Bool)
137  (declare-const hop_2_e_l Bool)
138  (declare-const hop_1_e_o Bool)
139  (declare-const hop_2_e_o Bool)
140  (declare-const hop_1_e_n Bool)
141  (declare-const hop_2_e_n Bool)
142  (declare-const hop_1_e_q Bool)
143  (declare-const hop_2_e_q Bool)
144  (declare-const hop_1_e_p Bool)
145  (declare-const hop_2_e_p Bool)
146  (declare-const hop_1_d_a Bool)
147  (declare-const hop_2_d_a Bool)
148  (declare-const hop_1_d_c Bool)
149  (declare-const hop_2_d_c Bool)
150  (declare-const hop_1_d_b Bool)
151  (declare-const hop_2_d_b Bool)
152  (declare-const hop_1_d_e Bool)
153  (declare-const hop_2_d_e Bool)
154  (declare-const hop_1_d_g Bool)
155  (declare-const hop_2_d_g Bool)
156  (declare-const hop_1_d_f Bool)
157  (declare-const hop_2_d_f Bool)
158  (declare-const hop_1_d_i Bool)
159  (declare-const hop_2_d_i Bool)
160  (declare-const hop_1_d_h Bool)
161  (declare-const hop_2_d_h Bool)
162  (declare-const hop_1_d_k Bool)
163  (declare-const hop_2_d_k Bool)
164  (declare-const hop_1_d_j Bool)
```

```
165  (declare-const hop_2_d_j Bool)
166  (declare-const hop_1_d_m Bool)
167  (declare-const hop_2_d_m Bool)
168  (declare-const hop_1_d_l Bool)
169  (declare-const hop_2_d_l Bool)
170  (declare-const hop_1_d_o Bool)
171  (declare-const hop_2_d_o Bool)
172  (declare-const hop_1_d_n Bool)
173  (declare-const hop_2_d_n Bool)
174  (declare-const hop_1_d_q Bool)
175  (declare-const hop_2_d_q Bool)
176  (declare-const hop_1_d_p Bool)
177  (declare-const hop_2_d_p Bool)
178  (declare-const hop_1_g_a Bool)
179  (declare-const hop_2_g_a Bool)
180  (declare-const hop_1_g_c Bool)
181  (declare-const hop_2_g_c Bool)
182  (declare-const hop_1_g_b Bool)
183  (declare-const hop_2_g_b Bool)
184  (declare-const hop_1_g_e Bool)
185  (declare-const hop_2_g_e Bool)
186  (declare-const hop_1_g_d Bool)
187  (declare-const hop_2_g_d Bool)
188  (declare-const hop_1_g_f Bool)
189  (declare-const hop_2_g_f Bool)
190  (declare-const hop_1_g_i Bool)
191  (declare-const hop_2_g_i Bool)
192  (declare-const hop_1_g_h Bool)
193  (declare-const hop_2_g_h Bool)
194  (declare-const hop_1_g_k Bool)
195  (declare-const hop_2_g_k Bool)
196  (declare-const hop_1_g_j Bool)
197  (declare-const hop_2_g_j Bool)
198  (declare-const hop_1_g_m Bool)
199  (declare-const hop_2_g_m Bool)
200  (declare-const hop_1_g_l Bool)
201  (declare-const hop_2_g_l Bool)
202  (declare-const hop_1_g_o Bool)
203  (declare-const hop_2_g_o Bool)
204  (declare-const hop_1_g_n Bool)
205  (declare-const hop_2_g_n Bool)
206  (declare-const hop_1_g_q Bool)
207  (declare-const hop_2_g_q Bool)
208  (declare-const hop_1_g_p Bool)
209  (declare-const hop_2_g_p Bool)
210  (declare-const hop_1_f_a Bool)
211  (declare-const hop_2_f_a Bool)
212  (declare-const hop_1_f_c Bool)
213  (declare-const hop_2_f_c Bool)
214  (declare-const hop_1_f_b Bool)
215  (declare-const hop_2_f_b Bool)
216  (declare-const hop_1_f_e Bool)
217  (declare-const hop_2_f_e Bool)
218  (declare-const hop_1_f_d Bool)
219  (declare-const hop_2_f_d Bool)
220  (declare-const hop_1_f_g Bool)
221  (declare-const hop_2_f_g Bool)
222  (declare-const hop_1_f_i Bool)
223  (declare-const hop_2_f_i Bool)
224  (declare-const hop_1_f_h Bool)
225  (declare-const hop_2_f_h Bool)
226  (declare-const hop_1_f_k Bool)
```

```
227   (declare-const hop_2_f_k Bool)
228   (declare-const hop_1_f_j Bool)
229   (declare-const hop_2_f_j Bool)
230   (declare-const hop_1_f_m Bool)
231   (declare-const hop_2_f_m Bool)
232   (declare-const hop_1_f_l Bool)
233   (declare-const hop_2_f_l Bool)
234   (declare-const hop_1_f_o Bool)
235   (declare-const hop_2_f_o Bool)
236   (declare-const hop_1_f_n Bool)
237   (declare-const hop_2_f_n Bool)
238   (declare-const hop_1_f_q Bool)
239   (declare-const hop_2_f_q Bool)
240   (declare-const hop_1_f_p Bool)
241   (declare-const hop_2_f_p Bool)
242   (declare-const hop_1_i_a Bool)
243   (declare-const hop_2_i_a Bool)
244   (declare-const hop_1_i_c Bool)
245   (declare-const hop_2_i_c Bool)
246   (declare-const hop_1_i_b Bool)
247   (declare-const hop_2_i_b Bool)
248   (declare-const hop_1_i_e Bool)
249   (declare-const hop_2_i_e Bool)
250   (declare-const hop_1_i_d Bool)
251   (declare-const hop_2_i_d Bool)
252   (declare-const hop_1_i_g Bool)
253   (declare-const hop_2_i_g Bool)
254   (declare-const hop_1_i_f Bool)
255   (declare-const hop_2_i_f Bool)
256   (declare-const hop_1_i_h Bool)
257   (declare-const hop_2_i_h Bool)
258   (declare-const hop_1_i_k Bool)
259   (declare-const hop_2_i_k Bool)
260   (declare-const hop_1_i_j Bool)
261   (declare-const hop_2_i_j Bool)
262   (declare-const hop_1_i_m Bool)
263   (declare-const hop_2_i_m Bool)
264   (declare-const hop_1_i_l Bool)
265   (declare-const hop_2_i_l Bool)
266   (declare-const hop_1_i_o Bool)
267   (declare-const hop_2_i_o Bool)
268   (declare-const hop_1_i_n Bool)
269   (declare-const hop_2_i_n Bool)
270   (declare-const hop_1_i_q Bool)
271   (declare-const hop_2_i_q Bool)
272   (declare-const hop_1_i_p Bool)
273   (declare-const hop_2_i_p Bool)
274   (declare-const hop_1_h_a Bool)
275   (declare-const hop_2_h_a Bool)
276   (declare-const hop_1_h_c Bool)
277   (declare-const hop_2_h_c Bool)
278   (declare-const hop_1_h_b Bool)
279   (declare-const hop_2_h_b Bool)
280   (declare-const hop_1_h_e Bool)
281   (declare-const hop_2_h_e Bool)
282   (declare-const hop_1_h_d Bool)
283   (declare-const hop_2_h_d Bool)
284   (declare-const hop_1_h_g Bool)
285   (declare-const hop_2_h_g Bool)
286   (declare-const hop_1_h_f Bool)
287   (declare-const hop_2_h_f Bool)
288   (declare-const hop_1_h_i Bool)
```

```
289  (declare-const hop_2_h_i Bool)
290  (declare-const hop_1_h_k Bool)
291  (declare-const hop_2_h_k Bool)
292  (declare-const hop_1_h_j Bool)
293  (declare-const hop_2_h_j Bool)
294  (declare-const hop_1_h_m Bool)
295  (declare-const hop_2_h_m Bool)
296  (declare-const hop_1_h_l Bool)
297  (declare-const hop_2_h_l Bool)
298  (declare-const hop_1_h_o Bool)
299  (declare-const hop_2_h_o Bool)
300  (declare-const hop_1_h_n Bool)
301  (declare-const hop_2_h_n Bool)
302  (declare-const hop_1_h_q Bool)
303  (declare-const hop_2_h_q Bool)
304  (declare-const hop_1_h_p Bool)
305  (declare-const hop_2_h_p Bool)
306  (declare-const hop_1_k_a Bool)
307  (declare-const hop_2_k_a Bool)
308  (declare-const hop_1_k_c Bool)
309  (declare-const hop_2_k_c Bool)
310  (declare-const hop_1_k_b Bool)
311  (declare-const hop_2_k_b Bool)
312  (declare-const hop_1_k_e Bool)
313  (declare-const hop_2_k_e Bool)
314  (declare-const hop_1_k_d Bool)
315  (declare-const hop_2_k_d Bool)
316  (declare-const hop_1_k_g Bool)
317  (declare-const hop_2_k_g Bool)
318  (declare-const hop_1_k_f Bool)
319  (declare-const hop_2_k_f Bool)
320  (declare-const hop_1_k_i Bool)
321  (declare-const hop_2_k_i Bool)
322  (declare-const hop_1_k_h Bool)
323  (declare-const hop_2_k_h Bool)
324  (declare-const hop_1_k_j Bool)
325  (declare-const hop_2_k_j Bool)
326  (declare-const hop_1_k_m Bool)
327  (declare-const hop_2_k_m Bool)
328  (declare-const hop_1_k_l Bool)
329  (declare-const hop_2_k_l Bool)
330  (declare-const hop_1_k_o Bool)
331  (declare-const hop_2_k_o Bool)
332  (declare-const hop_1_k_n Bool)
333  (declare-const hop_2_k_n Bool)
334  (declare-const hop_1_k_q Bool)
335  (declare-const hop_2_k_q Bool)
336  (declare-const hop_1_k_p Bool)
337  (declare-const hop_2_k_p Bool)
338  (declare-const hop_1_j_a Bool)
339  (declare-const hop_2_j_a Bool)
340  (declare-const hop_1_j_c Bool)
341  (declare-const hop_2_j_c Bool)
342  (declare-const hop_1_j_b Bool)
343  (declare-const hop_2_j_b Bool)
344  (declare-const hop_1_j_e Bool)
345  (declare-const hop_2_j_e Bool)
346  (declare-const hop_1_j_d Bool)
347  (declare-const hop_2_j_d Bool)
348  (declare-const hop_1_j_g Bool)
349  (declare-const hop_2_j_g Bool)
350  (declare-const hop_1_j_f Bool)
```

```
351   (declare-const hop_2_j_f Bool)
352   (declare-const hop_1_j_i Bool)
353   (declare-const hop_2_j_i Bool)
354   (declare-const hop_1_j_h Bool)
355   (declare-const hop_2_j_h Bool)
356   (declare-const hop_1_j_k Bool)
357   (declare-const hop_2_j_k Bool)
358   (declare-const hop_1_j_m Bool)
359   (declare-const hop_2_j_m Bool)
360   (declare-const hop_1_j_l Bool)
361   (declare-const hop_2_j_l Bool)
362   (declare-const hop_1_j_o Bool)
363   (declare-const hop_2_j_o Bool)
364   (declare-const hop_1_j_n Bool)
365   (declare-const hop_2_j_n Bool)
366   (declare-const hop_1_j_q Bool)
367   (declare-const hop_2_j_q Bool)
368   (declare-const hop_1_j_p Bool)
369   (declare-const hop_2_j_p Bool)
370   (declare-const hop_1_m_a Bool)
371   (declare-const hop_2_m_a Bool)
372   (declare-const hop_1_m_c Bool)
373   (declare-const hop_2_m_c Bool)
374   (declare-const hop_1_m_b Bool)
375   (declare-const hop_2_m_b Bool)
376   (declare-const hop_1_m_e Bool)
377   (declare-const hop_2_m_e Bool)
378   (declare-const hop_1_m_d Bool)
379   (declare-const hop_2_m_d Bool)
380   (declare-const hop_1_m_g Bool)
381   (declare-const hop_2_m_g Bool)
382   (declare-const hop_1_m_f Bool)
383   (declare-const hop_2_m_f Bool)
384   (declare-const hop_1_m_i Bool)
385   (declare-const hop_2_m_i Bool)
386   (declare-const hop_1_m_h Bool)
387   (declare-const hop_2_m_h Bool)
388   (declare-const hop_1_m_k Bool)
389   (declare-const hop_2_m_k Bool)
390   (declare-const hop_1_m_j Bool)
391   (declare-const hop_2_m_j Bool)
392   (declare-const hop_1_m_l Bool)
393   (declare-const hop_2_m_l Bool)
394   (declare-const hop_1_m_o Bool)
395   (declare-const hop_2_m_o Bool)
396   (declare-const hop_1_m_n Bool)
397   (declare-const hop_2_m_n Bool)
398   (declare-const hop_1_m_q Bool)
399   (declare-const hop_2_m_q Bool)
400   (declare-const hop_1_m_p Bool)
401   (declare-const hop_2_m_p Bool)
402   (declare-const hop_1_l_a Bool)
403   (declare-const hop_2_l_a Bool)
404   (declare-const hop_1_l_c Bool)
405   (declare-const hop_2_l_c Bool)
406   (declare-const hop_1_l_b Bool)
407   (declare-const hop_2_l_b Bool)
408   (declare-const hop_1_l_e Bool)
409   (declare-const hop_2_l_e Bool)
410   (declare-const hop_1_l_d Bool)
411   (declare-const hop_2_l_d Bool)
412   (declare-const hop_1_l_g Bool)
```

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```
413    (declare-const hop_2_l_g Bool)
414    (declare-const hop_1_l_f Bool)
415    (declare-const hop_2_l_f Bool)
416    (declare-const hop_1_l_i Bool)
417    (declare-const hop_2_l_i Bool)
418    (declare-const hop_1_l_h Bool)
419    (declare-const hop_2_l_h Bool)
420    (declare-const hop_1_l_k Bool)
421    (declare-const hop_2_l_k Bool)
422    (declare-const hop_1_l_j Bool)
423    (declare-const hop_2_l_j Bool)
424    (declare-const hop_1_l_m Bool)
425    (declare-const hop_2_l_m Bool)
426    (declare-const hop_1_l_o Bool)
427    (declare-const hop_2_l_o Bool)
428    (declare-const hop_1_l_n Bool)
429    (declare-const hop_2_l_n Bool)
430    (declare-const hop_1_l_q Bool)
431    (declare-const hop_2_l_q Bool)
432    (declare-const hop_1_l_p Bool)
433    (declare-const hop_2_l_p Bool)
434    (declare-const hop_1_o_a Bool)
435    (declare-const hop_2_o_a Bool)
436    (declare-const hop_1_o_c Bool)
437    (declare-const hop_2_o_c Bool)
438    (declare-const hop_1_o_b Bool)
439    (declare-const hop_2_o_b Bool)
440    (declare-const hop_1_o_e Bool)
441    (declare-const hop_2_o_e Bool)
442    (declare-const hop_1_o_d Bool)
443    (declare-const hop_2_o_d Bool)
444    (declare-const hop_1_o_g Bool)
445    (declare-const hop_2_o_g Bool)
446    (declare-const hop_1_o_f Bool)
447    (declare-const hop_2_o_f Bool)
448    (declare-const hop_1_o_i Bool)
449    (declare-const hop_2_o_i Bool)
450    (declare-const hop_1_o_h Bool)
451    (declare-const hop_2_o_h Bool)
452    (declare-const hop_1_o_k Bool)
453    (declare-const hop_2_o_k Bool)
454    (declare-const hop_1_o_j Bool)
455    (declare-const hop_2_o_j Bool)
456    (declare-const hop_1_o_m Bool)
457    (declare-const hop_2_o_m Bool)
458    (declare-const hop_1_o_l Bool)
459    (declare-const hop_2_o_l Bool)
460    (declare-const hop_1_o_n Bool)
461    (declare-const hop_2_o_n Bool)
462    (declare-const hop_1_o_q Bool)
463    (declare-const hop_2_o_q Bool)
464    (declare-const hop_1_o_p Bool)
465    (declare-const hop_2_o_p Bool)
466    (declare-const hop_1_n_a Bool)
467    (declare-const hop_2_n_a Bool)
468    (declare-const hop_1_n_c Bool)
469    (declare-const hop_2_n_c Bool)
470    (declare-const hop_1_n_b Bool)
471    (declare-const hop_2_n_b Bool)
472    (declare-const hop_1_n_e Bool)
473    (declare-const hop_2_n_e Bool)
474    (declare-const hop_1_n_d Bool)
```

```
475  (declare-const hop_2_n_d Bool)
476  (declare-const hop_1_n_g Bool)
477  (declare-const hop_2_n_g Bool)
478  (declare-const hop_1_n_f Bool)
479  (declare-const hop_2_n_f Bool)
480  (declare-const hop_1_n_i Bool)
481  (declare-const hop_2_n_i Bool)
482  (declare-const hop_1_n_h Bool)
483  (declare-const hop_2_n_h Bool)
484  (declare-const hop_1_n_k Bool)
485  (declare-const hop_2_n_k Bool)
486  (declare-const hop_1_n_j Bool)
487  (declare-const hop_2_n_j Bool)
488  (declare-const hop_1_n_m Bool)
489  (declare-const hop_2_n_m Bool)
490  (declare-const hop_1_n_l Bool)
491  (declare-const hop_2_n_l Bool)
492  (declare-const hop_1_n_o Bool)
493  (declare-const hop_2_n_o Bool)
494  (declare-const hop_1_n_q Bool)
495  (declare-const hop_2_n_q Bool)
496  (declare-const hop_1_n_p Bool)
497  (declare-const hop_2_n_p Bool)
498  (declare-const hop_1_q_a Bool)
499  (declare-const hop_2_q_a Bool)
500  (declare-const hop_1_q_c Bool)
501  (declare-const hop_2_q_c Bool)
502  (declare-const hop_1_q_b Bool)
503  (declare-const hop_2_q_b Bool)
504  (declare-const hop_1_q_e Bool)
505  (declare-const hop_2_q_e Bool)
506  (declare-const hop_1_q_d Bool)
507  (declare-const hop_2_q_d Bool)
508  (declare-const hop_1_q_g Bool)
509  (declare-const hop_2_q_g Bool)
510  (declare-const hop_1_q_f Bool)
511  (declare-const hop_2_q_f Bool)
512  (declare-const hop_1_q_i Bool)
513  (declare-const hop_2_q_i Bool)
514  (declare-const hop_1_q_h Bool)
515  (declare-const hop_2_q_h Bool)
516  (declare-const hop_1_q_k Bool)
517  (declare-const hop_2_q_k Bool)
518  (declare-const hop_1_q_j Bool)
519  (declare-const hop_2_q_j Bool)
520  (declare-const hop_1_q_m Bool)
521  (declare-const hop_2_q_m Bool)
522  (declare-const hop_1_q_l Bool)
523  (declare-const hop_2_q_l Bool)
524  (declare-const hop_1_q_o Bool)
525  (declare-const hop_2_q_o Bool)
526  (declare-const hop_1_q_n Bool)
527  (declare-const hop_2_q_n Bool)
528  (declare-const hop_1_q_p Bool)
529  (declare-const hop_2_q_p Bool)
530  (declare-const hop_1_p_a Bool)
531  (declare-const hop_2_p_a Bool)
532  (declare-const hop_1_p_c Bool)
533  (declare-const hop_2_p_c Bool)
534  (declare-const hop_1_p_b Bool)
535  (declare-const hop_2_p_b Bool)
536  (declare-const hop_1_p_e Bool)
```

```
537  (declare-const hop_2_p_e Bool)
538  (declare-const hop_1_p_d Bool)
539  (declare-const hop_2_p_d Bool)
540  (declare-const hop_1_p_g Bool)
541  (declare-const hop_2_p_g Bool)
542  (declare-const hop_1_p_f Bool)
543  (declare-const hop_2_p_f Bool)
544  (declare-const hop_1_p_i Bool)
545  (declare-const hop_2_p_i Bool)
546  (declare-const hop_1_p_h Bool)
547  (declare-const hop_2_p_h Bool)
548  (declare-const hop_1_p_k Bool)
549  (declare-const hop_2_p_k Bool)
550  (declare-const hop_1_p_j Bool)
551  (declare-const hop_2_p_j Bool)
552  (declare-const hop_1_p_m Bool)
553  (declare-const hop_2_p_m Bool)
554  (declare-const hop_1_p_l Bool)
555  (declare-const hop_2_p_l Bool)
556  (declare-const hop_1_p_o Bool)
557  (declare-const hop_2_p_o Bool)
558  (declare-const hop_1_p_n Bool)
559  (declare-const hop_2_p_n Bool)
560  (declare-const hop_1_p_q Bool)
561  (declare-const hop_2_p_q Bool)
562  (assert
563  (and
564  (not hop_1_a_c)
565  hop_1_a_b
566  (not hop_1_a_e)
567  hop_1_a_d
568  (not hop_1_a_g)
569  (not hop_1_a_f)
570  (not hop_1_a_i)
571  (not hop_1_a_h)
572  (not hop_1_a_k)
573  (not hop_1_a_j)
574  (not hop_1_a_m)
575  (not hop_1_a_l)
576  (not hop_1_a_o)
577  (not hop_1_a_n)
578  (not hop_1_a_q)
579  (not hop_1_a_p)
580  (not hop_1_c_a)
581  hop_1_c_b
582  (not hop_1_c_e)
583  (not hop_1_c_d)
584  (not hop_1_c_g)
585  (not hop_1_c_f)
586  (not hop_1_c_i)
587  (not hop_1_c_h)
588  (not hop_1_c_k)
589  (not hop_1_c_j)
590  (not hop_1_c_m)
591  (not hop_1_c_l)
592  (not hop_1_c_o)
593  (not hop_1_c_n)
594  (not hop_1_c_q)
595  (not hop_1_c_p)
596  hop_1_b_a
597  hop_1_b_c
598  (not hop_1_b_e)
```

```
599    hop_1_b_d
600    (not hop_1_b_g)
601    (not hop_1_b_f)
602    (not hop_1_b_i)
603    (not hop_1_b_h)
604    (not hop_1_b_k)
605    (not hop_1_b_j)
606    (not hop_1_b_m)
607    (not hop_1_b_l)
608    (not hop_1_b_o)
609    (not hop_1_b_n)
610    (not hop_1_b_q)
611    (not hop_1_b_p)
612    (not hop_1_e_a)
613    (not hop_1_e_c)
614    (not hop_1_e_b)
615    hop_1_e_d
616    hop_1_e_g
617    (not hop_1_e_f)
618    hop_1_e_i
619    hop_1_e_h
620    (not hop_1_e_k)
621    (not hop_1_e_j)
622    (not hop_1_e_m)
623    (not hop_1_e_l)
624    (not hop_1_e_o)
625    (not hop_1_e_n)
626    (not hop_1_e_q)
627    (not hop_1_e_p)
628    hop_1_d_a
629    (not hop_1_d_c)
630    hop_1_d_b
631    hop_1_d_e
632    (not hop_1_d_g)
633    hop_1_d_f
634    (not hop_1_d_i)
635    (not hop_1_d_h)
636    (not hop_1_d_k)
637    (not hop_1_d_j)
638    (not hop_1_d_m)
639    (not hop_1_d_l)
640    (not hop_1_d_o)
641    (not hop_1_d_n)
642    (not hop_1_d_q)
643    (not hop_1_d_p)
644    (not hop_1_g_a)
645    (not hop_1_g_c)
646    (not hop_1_g_b)
647    hop_1_g_e
648    (not hop_1_g_d)
649    (not hop_1_g_f)
650    (not hop_1_g_i)
651    hop_1_g_h
652    hop_1_g_k
653    (not hop_1_g_j)
654    (not hop_1_g_m)
655    (not hop_1_g_l)
656    (not hop_1_g_o)
657    (not hop_1_g_n)
658    (not hop_1_g_q)
659    (not hop_1_g_p)
660    (not hop_1_f_a)
```

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```
661  (not hop_1_f_c)
662  (not hop_1_f_b)
663  (not hop_1_f_e)
664  hop_1_f_d
665  (not hop_1_f_g)
666  hop_1_f_i
667  (not hop_1_f_h)
668  (not hop_1_f_k)
669  hop_1_f_j
670  (not hop_1_f_m)
671  (not hop_1_f_l)
672  (not hop_1_f_o)
673  (not hop_1_f_n)
674  (not hop_1_f_q)
675  (not hop_1_f_p)
676  (not hop_1_i_a)
677  (not hop_1_i_c)
678  (not hop_1_i_b)
679  hop_1_i_e
680  (not hop_1_i_d)
681  (not hop_1_i_g)
682  hop_1_i_f
683  hop_1_i_h
684  (not hop_1_i_k)
685  hop_1_i_j
686  (not hop_1_i_m)
687  hop_1_i_l
688  (not hop_1_i_o)
689  (not hop_1_i_n)
690  (not hop_1_i_q)
691  (not hop_1_i_p)
692  (not hop_1_h_a)
693  (not hop_1_h_c)
694  (not hop_1_h_b)
695  hop_1_h_e
696  (not hop_1_h_d)
697  hop_1_h_g
698  (not hop_1_h_f)
699  hop_1_h_i
700  hop_1_h_k
701  (not hop_1_h_j)
702  (not hop_1_h_m)
703  (not hop_1_h_l)
704  (not hop_1_h_o)
705  (not hop_1_h_n)
706  (not hop_1_h_q)
707  (not hop_1_h_p)
708  (not hop_1_k_a)
709  (not hop_1_k_c)
710  (not hop_1_k_b)
711  (not hop_1_k_e)
712  (not hop_1_k_d)
713  hop_1_k_g
714  (not hop_1_k_f)
715  (not hop_1_k_i)
716  hop_1_k_h
717  (not hop_1_k_j)
718  hop_1_k_m
719  hop_1_k_l
720  (not hop_1_k_o)
721  (not hop_1_k_n)
722  (not hop_1_k_q)
```

```
723   (not hop_1_k_p)
724   (not hop_1_j_a)
725   (not hop_1_j_c)
726   (not hop_1_j_b)
727   (not hop_1_j_e)
728   (not hop_1_j_d)
729   (not hop_1_j_g)
730   hop_1_j_f
731   hop_1_j_i
732   (not hop_1_j_h)
733   (not hop_1_j_k)
734   (not hop_1_j_m)
735   hop_1_j_l
736   (not hop_1_j_o)
737   hop_1_j_n
738   (not hop_1_j_q)
739   (not hop_1_j_p)
740   (not hop_1_m_a)
741   (not hop_1_m_c)
742   (not hop_1_m_b)
743   (not hop_1_m_e)
744   (not hop_1_m_d)
745   (not hop_1_m_g)
746   (not hop_1_m_f)
747   (not hop_1_m_i)
748   (not hop_1_m_h)
749   hop_1_m_k
750   (not hop_1_m_j)
751   hop_1_m_l
752   hop_1_m_o
753   (not hop_1_m_n)
754   (not hop_1_m_q)
755   hop_1_m_p
756   (not hop_1_l_a)
757   (not hop_1_l_c)
758   (not hop_1_l_b)
759   (not hop_1_l_e)
760   (not hop_1_l_d)
761   (not hop_1_l_g)
762   (not hop_1_l_f)
763   hop_1_l_i
764   (not hop_1_l_h)
765   hop_1_l_k
766   hop_1_l_j
767   hop_1_l_m
768   (not hop_1_l_o)
769   hop_1_l_n
770   (not hop_1_l_q)
771   hop_1_l_p
772   (not hop_1_o_a)
773   (not hop_1_o_c)
774   (not hop_1_o_b)
775   (not hop_1_o_e)
776   (not hop_1_o_d)
777   (not hop_1_o_g)
778   (not hop_1_o_f)
779   (not hop_1_o_i)
780   (not hop_1_o_h)
781   (not hop_1_o_k)
782   (not hop_1_o_j)
783   hop_1_o_m
784   (not hop_1_o_l)
```

```
785    (not hop_1_o_n)
786    (not hop_1_o_q)
787    hop_1_o_p
788    (not hop_1_n_a)
789    (not hop_1_n_c)
790    (not hop_1_n_b)
791    (not hop_1_n_e)
792    (not hop_1_n_d)
793    (not hop_1_n_g)
794    (not hop_1_n_f)
795    (not hop_1_n_i)
796    (not hop_1_n_h)
797    (not hop_1_n_k)
798    hop_1_n_j
799    (not hop_1_n_m)
800    hop_1_n_l
801    (not hop_1_n_o)
802    hop_1_n_q
803    hop_1_n_p
804    (not hop_1_q_a)
805    (not hop_1_q_c)
806    (not hop_1_q_b)
807    (not hop_1_q_e)
808    (not hop_1_q_d)
809    (not hop_1_q_g)
810    (not hop_1_q_f)
811    (not hop_1_q_i)
812    (not hop_1_q_h)
813    (not hop_1_q_k)
814    (not hop_1_q_j)
815    (not hop_1_q_m)
816    (not hop_1_q_l)
817    (not hop_1_q_o)
818    hop_1_q_n
819    hop_1_q_p
820    (not hop_1_p_a)
821    (not hop_1_p_c)
822    (not hop_1_p_b)
823    (not hop_1_p_e)
824    (not hop_1_p_d)
825    (not hop_1_p_g)
826    (not hop_1_p_f)
827    (not hop_1_p_i)
828    (not hop_1_p_h)
829    (not hop_1_p_k)
830    (not hop_1_p_j)
831    hop_1_p_m
832    hop_1_p_l
833    hop_1_p_o
834    hop_1_p_n
835    hop_1_p_q
836    (=> hop_1_a_c hop_2_a_c)
837    (=> hop_1_a_b hop_2_a_b)
838    (=> hop_1_a_e hop_2_a_e)
839    (=> hop_1_a_d hop_2_a_d)
840    (=> hop_1_a_g hop_2_a_g)
841    (=> hop_1_a_f hop_2_a_f)
842    (=> hop_1_a_i hop_2_a_i)
843    (=> hop_1_a_h hop_2_a_h)
844    (=> hop_1_a_k hop_2_a_k)
845    (=> hop_1_a_j hop_2_a_j)
846    (=> hop_1_a_m hop_2_a_m)
```

```
847    (=> hop_1_a_l hop_2_a_l)
848    (=> hop_1_a_o hop_2_a_o)
849    (=> hop_1_a_n hop_2_a_n)
850    (=> hop_1_a_q hop_2_a_q)
851    (=> hop_1_a_p hop_2_a_p)
852    (=> hop_1_c_a hop_2_c_a)
853    (=> hop_1_c_b hop_2_c_b)
854    (=> hop_1_c_e hop_2_c_e)
855    (=> hop_1_c_d hop_2_c_d)
856    (=> hop_1_c_g hop_2_c_g)
857    (=> hop_1_c_f hop_2_c_f)
858    (=> hop_1_c_i hop_2_c_i)
859    (=> hop_1_c_h hop_2_c_h)
860    (=> hop_1_c_k hop_2_c_k)
861    (=> hop_1_c_j hop_2_c_j)
862    (=> hop_1_c_m hop_2_c_m)
863    (=> hop_1_c_l hop_2_c_l)
864    (=> hop_1_c_o hop_2_c_o)
865    (=> hop_1_c_n hop_2_c_n)
866    (=> hop_1_c_q hop_2_c_q)
867    (=> hop_1_c_p hop_2_c_p)
868    (=> hop_1_b_a hop_2_b_a)
869    (=> hop_1_b_c hop_2_b_c)
870    (=> hop_1_b_e hop_2_b_e)
871    (=> hop_1_b_d hop_2_b_d)
872    (=> hop_1_b_g hop_2_b_g)
873    (=> hop_1_b_f hop_2_b_f)
874    (=> hop_1_b_i hop_2_b_i)
875    (=> hop_1_b_h hop_2_b_h)
876    (=> hop_1_b_k hop_2_b_k)
877    (=> hop_1_b_j hop_2_b_j)
878    (=> hop_1_b_m hop_2_b_m)
879    (=> hop_1_b_l hop_2_b_l)
880    (=> hop_1_b_o hop_2_b_o)
881    (=> hop_1_b_n hop_2_b_n)
882    (=> hop_1_b_q hop_2_b_q)
883    (=> hop_1_b_p hop_2_b_p)
884    (=> hop_1_e_a hop_2_e_a)
885    (=> hop_1_e_c hop_2_e_c)
886    (=> hop_1_e_b hop_2_e_b)
887    (=> hop_1_e_d hop_2_e_d)
888    (=> hop_1_e_g hop_2_e_g)
889    (=> hop_1_e_f hop_2_e_f)
890    (=> hop_1_e_i hop_2_e_i)
891    (=> hop_1_e_h hop_2_e_h)
892    (=> hop_1_e_k hop_2_e_k)
893    (=> hop_1_e_j hop_2_e_j)
894    (=> hop_1_e_m hop_2_e_m)
895    (=> hop_1_e_l hop_2_e_l)
896    (=> hop_1_e_o hop_2_e_o)
897    (=> hop_1_e_n hop_2_e_n)
898    (=> hop_1_e_q hop_2_e_q)
899    (=> hop_1_e_p hop_2_e_p)
900    (=> hop_1_d_a hop_2_d_a)
901    (=> hop_1_d_c hop_2_d_c)
902    (=> hop_1_d_b hop_2_d_b)
903    (=> hop_1_d_e hop_2_d_e)
904    (=> hop_1_d_g hop_2_d_g)
905    (=> hop_1_d_f hop_2_d_f)
906    (=> hop_1_d_i hop_2_d_i)
907    (=> hop_1_d_h hop_2_d_h)
908    (=> hop_1_d_k hop_2_d_k)
```

```
909    (=> hop_1_d_j hop_2_d_j)
910    (=> hop_1_d_m hop_2_d_m)
911    (=> hop_1_d_l hop_2_d_l)
912    (=> hop_1_d_o hop_2_d_o)
913    (=> hop_1_d_n hop_2_d_n)
914    (=> hop_1_d_q hop_2_d_q)
915    (=> hop_1_d_p hop_2_d_p)
916    (=> hop_1_g_a hop_2_g_a)
917    (=> hop_1_g_c hop_2_g_c)
918    (=> hop_1_g_b hop_2_g_b)
919    (=> hop_1_g_e hop_2_g_e)
920    (=> hop_1_g_d hop_2_g_d)
921    (=> hop_1_g_f hop_2_g_f)
922    (=> hop_1_g_i hop_2_g_i)
923    (=> hop_1_g_h hop_2_g_h)
924    (=> hop_1_g_k hop_2_g_k)
925    (=> hop_1_g_j hop_2_g_j)
926    (=> hop_1_g_m hop_2_g_m)
927    (=> hop_1_g_l hop_2_g_l)
928    (=> hop_1_g_o hop_2_g_o)
929    (=> hop_1_g_n hop_2_g_n)
930    (=> hop_1_g_q hop_2_g_q)
931    (=> hop_1_g_p hop_2_g_p)
932    (=> hop_1_f_a hop_2_f_a)
933    (=> hop_1_f_c hop_2_f_c)
934    (=> hop_1_f_b hop_2_f_b)
935    (=> hop_1_f_e hop_2_f_e)
936    (=> hop_1_f_d hop_2_f_d)
937    (=> hop_1_f_g hop_2_f_g)
938    (=> hop_1_f_i hop_2_f_i)
939    (=> hop_1_f_h hop_2_f_h)
940    (=> hop_1_f_k hop_2_f_k)
941    (=> hop_1_f_j hop_2_f_j)
942    (=> hop_1_f_m hop_2_f_m)
943    (=> hop_1_f_l hop_2_f_l)
944    (=> hop_1_f_o hop_2_f_o)
945    (=> hop_1_f_n hop_2_f_n)
946    (=> hop_1_f_q hop_2_f_q)
947    (=> hop_1_f_p hop_2_f_p)
948    (=> hop_1_i_a hop_2_i_a)
949    (=> hop_1_i_c hop_2_i_c)
950    (=> hop_1_i_b hop_2_i_b)
951    (=> hop_1_i_e hop_2_i_e)
952    (=> hop_1_i_d hop_2_i_d)
953    (=> hop_1_i_g hop_2_i_g)
954    (=> hop_1_i_f hop_2_i_f)
955    (=> hop_1_i_h hop_2_i_h)
956    (=> hop_1_i_k hop_2_i_k)
957    (=> hop_1_i_j hop_2_i_j)
958    (=> hop_1_i_m hop_2_i_m)
959    (=> hop_1_i_l hop_2_i_l)
960    (=> hop_1_i_o hop_2_i_o)
961    (=> hop_1_i_n hop_2_i_n)
962    (=> hop_1_i_q hop_2_i_q)
963    (=> hop_1_i_p hop_2_i_p)
964    (=> hop_1_h_a hop_2_h_a)
965    (=> hop_1_h_c hop_2_h_c)
966    (=> hop_1_h_b hop_2_h_b)
967    (=> hop_1_h_e hop_2_h_e)
968    (=> hop_1_h_d hop_2_h_d)
969    (=> hop_1_h_g hop_2_h_g)
970    (=> hop_1_h_f hop_2_h_f)
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971   (=> hop_1_h_i hop_2_h_i)
972   (=> hop_1_h_k hop_2_h_k)
973   (=> hop_1_h_j hop_2_h_j)
974   (=> hop_1_h_m hop_2_h_m)
975   (=> hop_1_h_l hop_2_h_l)
976   (=> hop_1_h_o hop_2_h_o)
977   (=> hop_1_h_n hop_2_h_n)
978   (=> hop_1_h_q hop_2_h_q)
979   (=> hop_1_h_p hop_2_h_p)
980   (=> hop_1_k_a hop_2_k_a)
981   (=> hop_1_k_c hop_2_k_c)
982   (=> hop_1_k_b hop_2_k_b)
983   (=> hop_1_k_e hop_2_k_e)
984   (=> hop_1_k_d hop_2_k_d)
985   (=> hop_1_k_g hop_2_k_g)
986   (=> hop_1_k_f hop_2_k_f)
987   (=> hop_1_k_i hop_2_k_i)
988   (=> hop_1_k_h hop_2_k_h)
989   (=> hop_1_k_j hop_2_k_j)
990   (=> hop_1_k_m hop_2_k_m)
991   (=> hop_1_k_l hop_2_k_l)
992   (=> hop_1_k_o hop_2_k_o)
993   (=> hop_1_k_n hop_2_k_n)
994   (=> hop_1_k_q hop_2_k_q)
995   (=> hop_1_k_p hop_2_k_p)
996   (=> hop_1_j_a hop_2_j_a)
997   (=> hop_1_j_c hop_2_j_c)
998   (=> hop_1_j_b hop_2_j_b)
999   (=> hop_1_j_e hop_2_j_e)
1000  (=> hop_1_j_d hop_2_j_d)
1001  (=> hop_1_j_g hop_2_j_g)
1002  (=> hop_1_j_f hop_2_j_f)
1003  (=> hop_1_j_i hop_2_j_i)
1004  (=> hop_1_j_h hop_2_j_h)
1005  (=> hop_1_j_k hop_2_j_k)
1006  (=> hop_1_j_m hop_2_j_m)
1007  (=> hop_1_j_l hop_2_j_l)
1008  (=> hop_1_j_o hop_2_j_o)
1009  (=> hop_1_j_n hop_2_j_n)
1010  (=> hop_1_j_q hop_2_j_q)
1011  (=> hop_1_j_p hop_2_j_p)
1012  (=> hop_1_m_a hop_2_m_a)
1013  (=> hop_1_m_c hop_2_m_c)
1014  (=> hop_1_m_b hop_2_m_b)
1015  (=> hop_1_m_e hop_2_m_e)
1016  (=> hop_1_m_d hop_2_m_d)
1017  (=> hop_1_m_g hop_2_m_g)
1018  (=> hop_1_m_f hop_2_m_f)
1019  (=> hop_1_m_i hop_2_m_i)
1020  (=> hop_1_m_h hop_2_m_h)
1021  (=> hop_1_m_k hop_2_m_k)
1022  (=> hop_1_m_j hop_2_m_j)
1023  (=> hop_1_m_l hop_2_m_l)
1024  (=> hop_1_m_o hop_2_m_o)
1025  (=> hop_1_m_n hop_2_m_n)
1026  (=> hop_1_m_q hop_2_m_q)
1027  (=> hop_1_m_p hop_2_m_p)
1028  (=> hop_1_l_a hop_2_l_a)
1029  (=> hop_1_l_c hop_2_l_c)
1030  (=> hop_1_l_b hop_2_l_b)
1031  (=> hop_1_l_e hop_2_l_e)
1032  (=> hop_1_l_d hop_2_l_d)
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1033    (=> hop_1_l_g hop_2_l_g)
1034    (=> hop_1_l_f hop_2_l_f)
1035    (=> hop_1_l_i hop_2_l_i)
1036    (=> hop_1_l_h hop_2_l_h)
1037    (=> hop_1_l_k hop_2_l_k)
1038    (=> hop_1_l_j hop_2_l_j)
1039    (=> hop_1_l_m hop_2_l_m)
1040    (=> hop_1_l_o hop_2_l_o)
1041    (=> hop_1_l_n hop_2_l_n)
1042    (=> hop_1_l_q hop_2_l_q)
1043    (=> hop_1_l_p hop_2_l_p)
1044    (=> hop_1_o_a hop_2_o_a)
1045    (=> hop_1_o_c hop_2_o_c)
1046    (=> hop_1_o_b hop_2_o_b)
1047    (=> hop_1_o_e hop_2_o_e)
1048    (=> hop_1_o_d hop_2_o_d)
1049    (=> hop_1_o_g hop_2_o_g)
1050    (=> hop_1_o_f hop_2_o_f)
1051    (=> hop_1_o_i hop_2_o_i)
1052    (=> hop_1_o_h hop_2_o_h)
1053    (=> hop_1_o_k hop_2_o_k)
1054    (=> hop_1_o_j hop_2_o_j)
1055    (=> hop_1_o_m hop_2_o_m)
1056    (=> hop_1_o_l hop_2_o_l)
1057    (=> hop_1_o_n hop_2_o_n)
1058    (=> hop_1_o_q hop_2_o_q)
1059    (=> hop_1_o_p hop_2_o_p)
1060    (=> hop_1_n_a hop_2_n_a)
1061    (=> hop_1_n_c hop_2_n_c)
1062    (=> hop_1_n_b hop_2_n_b)
1063    (=> hop_1_n_e hop_2_n_e)
1064    (=> hop_1_n_d hop_2_n_d)
1065    (=> hop_1_n_g hop_2_n_g)
1066    (=> hop_1_n_f hop_2_n_f)
1067    (=> hop_1_n_i hop_2_n_i)
1068    (=> hop_1_n_h hop_2_n_h)
1069    (=> hop_1_n_k hop_2_n_k)
1070    (=> hop_1_n_j hop_2_n_j)
1071    (=> hop_1_n_m hop_2_n_m)
1072    (=> hop_1_n_l hop_2_n_l)
1073    (=> hop_1_n_o hop_2_n_o)
1074    (=> hop_1_n_q hop_2_n_q)
1075    (=> hop_1_n_p hop_2_n_p)
1076    (=> hop_1_q_a hop_2_q_a)
1077    (=> hop_1_q_c hop_2_q_c)
1078    (=> hop_1_q_b hop_2_q_b)
1079    (=> hop_1_q_e hop_2_q_e)
1080    (=> hop_1_q_d hop_2_q_d)
1081    (=> hop_1_q_g hop_2_q_g)
1082    (=> hop_1_q_f hop_2_q_f)
1083    (=> hop_1_q_i hop_2_q_i)
1084    (=> hop_1_q_h hop_2_q_h)
1085    (=> hop_1_q_k hop_2_q_k)
1086    (=> hop_1_q_j hop_2_q_j)
1087    (=> hop_1_q_m hop_2_q_m)
1088    (=> hop_1_q_l hop_2_q_l)
1089    (=> hop_1_q_o hop_2_q_o)
1090    (=> hop_1_q_n hop_2_q_n)
1091    (=> hop_1_q_p hop_2_q_p)
1092    (=> hop_1_p_a hop_2_p_a)
1093    (=> hop_1_p_c hop_2_p_c)
1094    (=> hop_1_p_b hop_2_p_b)
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1095  (=> hop_1_p_e hop_2_p_e)
1096  (=> hop_1_p_d hop_2_p_d)
1097  (=> hop_1_p_g hop_2_p_g)
1098  (=> hop_1_p_f hop_2_p_f)
1099  (=> hop_1_p_i hop_2_p_i)
1100  (=> hop_1_p_h hop_2_p_h)
1101  (=> hop_1_p_k hop_2_p_k)
1102  (=> hop_1_p_j hop_2_p_j)
1103  (=> hop_1_p_m hop_2_p_m)
1104  (=> hop_1_p_l hop_2_p_l)
1105  (=> hop_1_p_o hop_2_p_o)
1106  (=> hop_1_p_n hop_2_p_n)
1107  (=> hop_1_p_q hop_2_p_q)
1108  (=> (and hop_1_a_c hop_1_c_b) hop_2_a_b)
1109  (=> (and hop_1_a_c hop_1_c_e) hop_2_a_e)
1110  (=> (and hop_1_a_c hop_1_c_d) hop_2_a_d)
1111  (=> (and hop_1_a_c hop_1_c_g) hop_2_a_g)
1112  (=> (and hop_1_a_c hop_1_c_f) hop_2_a_f)
1113  (=> (and hop_1_a_c hop_1_c_i) hop_2_a_i)
1114  (=> (and hop_1_a_c hop_1_c_h) hop_2_a_h)
1115  (=> (and hop_1_a_c hop_1_c_k) hop_2_a_k)
1116  (=> (and hop_1_a_c hop_1_c_j) hop_2_a_j)
1117  (=> (and hop_1_a_c hop_1_c_m) hop_2_a_m)
1118  (=> (and hop_1_a_c hop_1_c_l) hop_2_a_l)
1119  (=> (and hop_1_a_c hop_1_c_o) hop_2_a_o)
1120  (=> (and hop_1_a_c hop_1_c_n) hop_2_a_n)
1121  (=> (and hop_1_a_c hop_1_c_q) hop_2_a_q)
1122  (=> (and hop_1_a_c hop_1_c_p) hop_2_a_p)
1123  (=> (and hop_1_a_b hop_1_b_c) hop_2_a_c)
1124  (=> (and hop_1_a_b hop_1_b_e) hop_2_a_e)
1125  (=> (and hop_1_a_b hop_1_b_d) hop_2_a_d)
1126  (=> (and hop_1_a_b hop_1_b_g) hop_2_a_g)
1127  (=> (and hop_1_a_b hop_1_b_f) hop_2_a_f)
1128  (=> (and hop_1_a_b hop_1_b_i) hop_2_a_i)
1129  (=> (and hop_1_a_b hop_1_b_h) hop_2_a_h)
1130  (=> (and hop_1_a_b hop_1_b_k) hop_2_a_k)
1131  (=> (and hop_1_a_b hop_1_b_j) hop_2_a_j)
1132  (=> (and hop_1_a_b hop_1_b_m) hop_2_a_m)
1133  (=> (and hop_1_a_b hop_1_b_l) hop_2_a_l)
1134  (=> (and hop_1_a_b hop_1_b_o) hop_2_a_o)
1135  (=> (and hop_1_a_b hop_1_b_n) hop_2_a_n)
1136  (=> (and hop_1_a_b hop_1_b_q) hop_2_a_q)
1137  (=> (and hop_1_a_b hop_1_b_p) hop_2_a_p)
1138  (=> (and hop_1_a_e hop_1_e_c) hop_2_a_c)
1139  (=> (and hop_1_a_e hop_1_e_b) hop_2_a_b)
1140  (=> (and hop_1_a_e hop_1_e_d) hop_2_a_d)
1141  (=> (and hop_1_a_e hop_1_e_g) hop_2_a_g)
1142  (=> (and hop_1_a_e hop_1_e_f) hop_2_a_f)
1143  (=> (and hop_1_a_e hop_1_e_i) hop_2_a_i)
1144  (=> (and hop_1_a_e hop_1_e_h) hop_2_a_h)
1145  (=> (and hop_1_a_e hop_1_e_k) hop_2_a_k)
1146  (=> (and hop_1_a_e hop_1_e_j) hop_2_a_j)
1147  (=> (and hop_1_a_e hop_1_e_m) hop_2_a_m)
1148  (=> (and hop_1_a_e hop_1_e_l) hop_2_a_l)
1149  (=> (and hop_1_a_e hop_1_e_o) hop_2_a_o)
1150  (=> (and hop_1_a_e hop_1_e_n) hop_2_a_n)
1151  (=> (and hop_1_a_e hop_1_e_q) hop_2_a_q)
1152  (=> (and hop_1_a_e hop_1_e_p) hop_2_a_p)
1153  (=> (and hop_1_a_d hop_1_d_c) hop_2_a_c)
1154  (=> (and hop_1_a_d hop_1_d_b) hop_2_a_b)
1155  (=> (and hop_1_a_d hop_1_d_e) hop_2_a_e)
1156  (=> (and hop_1_a_d hop_1_d_g) hop_2_a_g)
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1157  (=> (and hop_1_a_d hop_1_d_f) hop_2_a_f)
1158  (=> (and hop_1_a_d hop_1_d_i) hop_2_a_i)
1159  (=> (and hop_1_a_d hop_1_d_h) hop_2_a_h)
1160  (=> (and hop_1_a_d hop_1_d_k) hop_2_a_k)
1161  (=> (and hop_1_a_d hop_1_d_j) hop_2_a_j)
1162  (=> (and hop_1_a_d hop_1_d_m) hop_2_a_m)
1163  (=> (and hop_1_a_d hop_1_d_l) hop_2_a_l)
1164  (=> (and hop_1_a_d hop_1_d_o) hop_2_a_o)
1165  (=> (and hop_1_a_d hop_1_d_n) hop_2_a_n)
1166  (=> (and hop_1_a_d hop_1_d_q) hop_2_a_q)
1167  (=> (and hop_1_a_d hop_1_d_p) hop_2_a_p)
1168  (=> (and hop_1_a_g hop_1_g_c) hop_2_a_c)
1169  (=> (and hop_1_a_g hop_1_g_b) hop_2_a_b)
1170  (=> (and hop_1_a_g hop_1_g_e) hop_2_a_e)
1171  (=> (and hop_1_a_g hop_1_g_d) hop_2_a_d)
1172  (=> (and hop_1_a_g hop_1_g_f) hop_2_a_f)
1173  (=> (and hop_1_a_g hop_1_g_i) hop_2_a_i)
1174  (=> (and hop_1_a_g hop_1_g_h) hop_2_a_h)
1175  (=> (and hop_1_a_g hop_1_g_k) hop_2_a_k)
1176  (=> (and hop_1_a_g hop_1_g_j) hop_2_a_j)
1177  (=> (and hop_1_a_g hop_1_g_m) hop_2_a_m)
1178  (=> (and hop_1_a_g hop_1_g_l) hop_2_a_l)
1179  (=> (and hop_1_a_g hop_1_g_o) hop_2_a_o)
1180  (=> (and hop_1_a_g hop_1_g_n) hop_2_a_n)
1181  (=> (and hop_1_a_g hop_1_g_q) hop_2_a_q)
1182  (=> (and hop_1_a_g hop_1_g_p) hop_2_a_p)
1183  (=> (and hop_1_a_f hop_1_f_c) hop_2_a_c)
1184  (=> (and hop_1_a_f hop_1_f_b) hop_2_a_b)
1185  (=> (and hop_1_a_f hop_1_f_e) hop_2_a_e)
1186  (=> (and hop_1_a_f hop_1_f_d) hop_2_a_d)
1187  (=> (and hop_1_a_f hop_1_f_g) hop_2_a_g)
1188  (=> (and hop_1_a_f hop_1_f_i) hop_2_a_i)
1189  (=> (and hop_1_a_f hop_1_f_h) hop_2_a_h)
1190  (=> (and hop_1_a_f hop_1_f_k) hop_2_a_k)
1191  (=> (and hop_1_a_f hop_1_f_j) hop_2_a_j)
1192  (=> (and hop_1_a_f hop_1_f_m) hop_2_a_m)
1193  (=> (and hop_1_a_f hop_1_f_l) hop_2_a_l)
1194  (=> (and hop_1_a_f hop_1_f_o) hop_2_a_o)
1195  (=> (and hop_1_a_f hop_1_f_n) hop_2_a_n)
1196  (=> (and hop_1_a_f hop_1_f_q) hop_2_a_q)
1197  (=> (and hop_1_a_f hop_1_f_p) hop_2_a_p)
1198  (=> (and hop_1_a_i hop_1_i_c) hop_2_a_c)
1199  (=> (and hop_1_a_i hop_1_i_b) hop_2_a_b)
1200  (=> (and hop_1_a_i hop_1_i_e) hop_2_a_e)
1201  (=> (and hop_1_a_i hop_1_i_d) hop_2_a_d)
1202  (=> (and hop_1_a_i hop_1_i_g) hop_2_a_g)
1203  (=> (and hop_1_a_i hop_1_i_f) hop_2_a_f)
1204  (=> (and hop_1_a_i hop_1_i_h) hop_2_a_h)
1205  (=> (and hop_1_a_i hop_1_i_k) hop_2_a_k)
1206  (=> (and hop_1_a_i hop_1_i_j) hop_2_a_j)
1207  (=> (and hop_1_a_i hop_1_i_m) hop_2_a_m)
1208  (=> (and hop_1_a_i hop_1_i_l) hop_2_a_l)
1209  (=> (and hop_1_a_i hop_1_i_o) hop_2_a_o)
1210  (=> (and hop_1_a_i hop_1_i_n) hop_2_a_n)
1211  (=> (and hop_1_a_i hop_1_i_q) hop_2_a_q)
1212  (=> (and hop_1_a_i hop_1_i_p) hop_2_a_p)
1213  (=> (and hop_1_a_h hop_1_h_c) hop_2_a_c)
1214  (=> (and hop_1_a_h hop_1_h_b) hop_2_a_b)
1215  (=> (and hop_1_a_h hop_1_h_e) hop_2_a_e)
1216  (=> (and hop_1_a_h hop_1_h_d) hop_2_a_d)
1217  (=> (and hop_1_a_h hop_1_h_g) hop_2_a_g)
1218  (=> (and hop_1_a_h hop_1_h_f) hop_2_a_f)
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```
1219  (=> (and hop_1_a_h hop_1_h_i) hop_2_a_i)
1220  (=> (and hop_1_a_h hop_1_h_k) hop_2_a_k)
1221  (=> (and hop_1_a_h hop_1_h_j) hop_2_a_j)
1222  (=> (and hop_1_a_h hop_1_h_m) hop_2_a_m)
1223  (=> (and hop_1_a_h hop_1_h_l) hop_2_a_l)
1224  (=> (and hop_1_a_h hop_1_h_o) hop_2_a_o)
1225  (=> (and hop_1_a_h hop_1_h_n) hop_2_a_n)
1226  (=> (and hop_1_a_h hop_1_h_q) hop_2_a_q)
1227  (=> (and hop_1_a_h hop_1_h_p) hop_2_a_p)
1228  (=> (and hop_1_a_k hop_1_k_c) hop_2_a_c)
1229  (=> (and hop_1_a_k hop_1_k_b) hop_2_a_b)
1230  (=> (and hop_1_a_k hop_1_k_e) hop_2_a_e)
1231  (=> (and hop_1_a_k hop_1_k_d) hop_2_a_d)
1232  (=> (and hop_1_a_k hop_1_k_g) hop_2_a_g)
1233  (=> (and hop_1_a_k hop_1_k_f) hop_2_a_f)
1234  (=> (and hop_1_a_k hop_1_k_i) hop_2_a_i)
1235  (=> (and hop_1_a_k hop_1_k_h) hop_2_a_h)
1236  (=> (and hop_1_a_k hop_1_k_j) hop_2_a_j)
1237  (=> (and hop_1_a_k hop_1_k_m) hop_2_a_m)
1238  (=> (and hop_1_a_k hop_1_k_l) hop_2_a_l)
1239  (=> (and hop_1_a_k hop_1_k_o) hop_2_a_o)
1240  (=> (and hop_1_a_k hop_1_k_n) hop_2_a_n)
1241  (=> (and hop_1_a_k hop_1_k_q) hop_2_a_q)
1242  (=> (and hop_1_a_k hop_1_k_p) hop_2_a_p)
1243  (=> (and hop_1_a_j hop_1_j_c) hop_2_a_c)
1244  (=> (and hop_1_a_j hop_1_j_b) hop_2_a_b)
1245  (=> (and hop_1_a_j hop_1_j_e) hop_2_a_e)
1246  (=> (and hop_1_a_j hop_1_j_d) hop_2_a_d)
1247  (=> (and hop_1_a_j hop_1_j_g) hop_2_a_g)
1248  (=> (and hop_1_a_j hop_1_j_f) hop_2_a_f)
1249  (=> (and hop_1_a_j hop_1_j_i) hop_2_a_i)
1250  (=> (and hop_1_a_j hop_1_j_h) hop_2_a_h)
1251  (=> (and hop_1_a_j hop_1_j_k) hop_2_a_k)
1252  (=> (and hop_1_a_j hop_1_j_m) hop_2_a_m)
1253  (=> (and hop_1_a_j hop_1_j_l) hop_2_a_l)
1254  (=> (and hop_1_a_j hop_1_j_o) hop_2_a_o)
1255  (=> (and hop_1_a_j hop_1_j_n) hop_2_a_n)
1256  (=> (and hop_1_a_j hop_1_j_q) hop_2_a_q)
1257  (=> (and hop_1_a_j hop_1_j_p) hop_2_a_p)
1258  (=> (and hop_1_a_m hop_1_m_c) hop_2_a_c)
1259  (=> (and hop_1_a_m hop_1_m_b) hop_2_a_b)
1260  (=> (and hop_1_a_m hop_1_m_e) hop_2_a_e)
1261  (=> (and hop_1_a_m hop_1_m_d) hop_2_a_d)
1262  (=> (and hop_1_a_m hop_1_m_g) hop_2_a_g)
1263  (=> (and hop_1_a_m hop_1_m_f) hop_2_a_f)
1264  (=> (and hop_1_a_m hop_1_m_i) hop_2_a_i)
1265  (=> (and hop_1_a_m hop_1_m_h) hop_2_a_h)
1266  (=> (and hop_1_a_m hop_1_m_k) hop_2_a_k)
1267  (=> (and hop_1_a_m hop_1_m_j) hop_2_a_j)
1268  (=> (and hop_1_a_m hop_1_m_l) hop_2_a_l)
1269  (=> (and hop_1_a_m hop_1_m_o) hop_2_a_o)
1270  (=> (and hop_1_a_m hop_1_m_n) hop_2_a_n)
1271  (=> (and hop_1_a_m hop_1_m_q) hop_2_a_q)
1272  (=> (and hop_1_a_m hop_1_m_p) hop_2_a_p)
1273  (=> (and hop_1_a_l hop_1_l_c) hop_2_a_c)
1274  (=> (and hop_1_a_l hop_1_l_b) hop_2_a_b)
1275  (=> (and hop_1_a_l hop_1_l_e) hop_2_a_e)
1276  (=> (and hop_1_a_l hop_1_l_d) hop_2_a_d)
1277  (=> (and hop_1_a_l hop_1_l_g) hop_2_a_g)
1278  (=> (and hop_1_a_l hop_1_l_f) hop_2_a_f)
1279  (=> (and hop_1_a_l hop_1_l_i) hop_2_a_i)
1280  (=> (and hop_1_a_l hop_1_l_h) hop_2_a_h)
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1281  (=> (and hop_1_a_l hop_1_l_k) hop_2_a_k)
1282  (=> (and hop_1_a_l hop_1_l_j) hop_2_a_j)
1283  (=> (and hop_1_a_l hop_1_l_m) hop_2_a_m)
1284  (=> (and hop_1_a_l hop_1_l_o) hop_2_a_o)
1285  (=> (and hop_1_a_l hop_1_l_n) hop_2_a_n)
1286  (=> (and hop_1_a_l hop_1_l_q) hop_2_a_q)
1287  (=> (and hop_1_a_l hop_1_l_p) hop_2_a_p)
1288  (=> (and hop_1_a_o hop_1_o_c) hop_2_a_c)
1289  (=> (and hop_1_a_o hop_1_o_b) hop_2_a_b)
1290  (=> (and hop_1_a_o hop_1_o_e) hop_2_a_e)
1291  (=> (and hop_1_a_o hop_1_o_d) hop_2_a_d)
1292  (=> (and hop_1_a_o hop_1_o_g) hop_2_a_g)
1293  (=> (and hop_1_a_o hop_1_o_f) hop_2_a_f)
1294  (=> (and hop_1_a_o hop_1_o_i) hop_2_a_i)
1295  (=> (and hop_1_a_o hop_1_o_h) hop_2_a_h)
1296  (=> (and hop_1_a_o hop_1_o_k) hop_2_a_k)
1297  (=> (and hop_1_a_o hop_1_o_j) hop_2_a_j)
1298  (=> (and hop_1_a_o hop_1_o_m) hop_2_a_m)
1299  (=> (and hop_1_a_o hop_1_o_l) hop_2_a_l)
1300  (=> (and hop_1_a_o hop_1_o_n) hop_2_a_n)
1301  (=> (and hop_1_a_o hop_1_o_q) hop_2_a_q)
1302  (=> (and hop_1_a_o hop_1_o_p) hop_2_a_p)
1303  (=> (and hop_1_a_n hop_1_n_c) hop_2_a_c)
1304  (=> (and hop_1_a_n hop_1_n_b) hop_2_a_b)
1305  (=> (and hop_1_a_n hop_1_n_e) hop_2_a_e)
1306  (=> (and hop_1_a_n hop_1_n_d) hop_2_a_d)
1307  (=> (and hop_1_a_n hop_1_n_g) hop_2_a_g)
1308  (=> (and hop_1_a_n hop_1_n_f) hop_2_a_f)
1309  (=> (and hop_1_a_n hop_1_n_i) hop_2_a_i)
1310  (=> (and hop_1_a_n hop_1_n_h) hop_2_a_h)
1311  (=> (and hop_1_a_n hop_1_n_k) hop_2_a_k)
1312  (=> (and hop_1_a_n hop_1_n_j) hop_2_a_j)
1313  (=> (and hop_1_a_n hop_1_n_m) hop_2_a_m)
1314  (=> (and hop_1_a_n hop_1_n_l) hop_2_a_l)
1315  (=> (and hop_1_a_n hop_1_n_o) hop_2_a_o)
1316  (=> (and hop_1_a_n hop_1_n_q) hop_2_a_q)
1317  (=> (and hop_1_a_n hop_1_n_p) hop_2_a_p)
1318  (=> (and hop_1_a_q hop_1_q_c) hop_2_a_c)
1319  (=> (and hop_1_a_q hop_1_q_b) hop_2_a_b)
1320  (=> (and hop_1_a_q hop_1_q_e) hop_2_a_e)
1321  (=> (and hop_1_a_q hop_1_q_d) hop_2_a_d)
1322  (=> (and hop_1_a_q hop_1_q_g) hop_2_a_g)
1323  (=> (and hop_1_a_q hop_1_q_f) hop_2_a_f)
1324  (=> (and hop_1_a_q hop_1_q_i) hop_2_a_i)
1325  (=> (and hop_1_a_q hop_1_q_h) hop_2_a_h)
1326  (=> (and hop_1_a_q hop_1_q_k) hop_2_a_k)
1327  (=> (and hop_1_a_q hop_1_q_j) hop_2_a_j)
1328  (=> (and hop_1_a_q hop_1_q_m) hop_2_a_m)
1329  (=> (and hop_1_a_q hop_1_q_l) hop_2_a_l)
1330  (=> (and hop_1_a_q hop_1_q_o) hop_2_a_o)
1331  (=> (and hop_1_a_q hop_1_q_n) hop_2_a_n)
1332  (=> (and hop_1_a_q hop_1_q_p) hop_2_a_p)
1333  (=> (and hop_1_a_p hop_1_p_c) hop_2_a_c)
1334  (=> (and hop_1_a_p hop_1_p_b) hop_2_a_b)
1335  (=> (and hop_1_a_p hop_1_p_e) hop_2_a_e)
1336  (=> (and hop_1_a_p hop_1_p_d) hop_2_a_d)
1337  (=> (and hop_1_a_p hop_1_p_g) hop_2_a_g)
1338  (=> (and hop_1_a_p hop_1_p_f) hop_2_a_f)
1339  (=> (and hop_1_a_p hop_1_p_i) hop_2_a_i)
1340  (=> (and hop_1_a_p hop_1_p_h) hop_2_a_h)
1341  (=> (and hop_1_a_p hop_1_p_k) hop_2_a_k)
1342  (=> (and hop_1_a_p hop_1_p_j) hop_2_a_j)
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1343  (=> (and hop_1_a_p hop_1_p_m) hop_2_a_m)
1344  (=> (and hop_1_a_p hop_1_p_l) hop_2_a_l)
1345  (=> (and hop_1_a_p hop_1_p_o) hop_2_a_o)
1346  (=> (and hop_1_a_p hop_1_p_n) hop_2_a_n)
1347  (=> (and hop_1_a_p hop_1_p_q) hop_2_a_q)
1348  (=> (and hop_1_c_a hop_1_a_b) hop_2_c_b)
1349  (=> (and hop_1_c_a hop_1_a_e) hop_2_c_e)
1350  (=> (and hop_1_c_a hop_1_a_d) hop_2_c_d)
1351  (=> (and hop_1_c_a hop_1_a_g) hop_2_c_g)
1352  (=> (and hop_1_c_a hop_1_a_f) hop_2_c_f)
1353  (=> (and hop_1_c_a hop_1_a_i) hop_2_c_i)
1354  (=> (and hop_1_c_a hop_1_a_h) hop_2_c_h)
1355  (=> (and hop_1_c_a hop_1_a_k) hop_2_c_k)
1356  (=> (and hop_1_c_a hop_1_a_j) hop_2_c_j)
1357  (=> (and hop_1_c_a hop_1_a_m) hop_2_c_m)
1358  (=> (and hop_1_c_a hop_1_a_l) hop_2_c_l)
1359  (=> (and hop_1_c_a hop_1_a_o) hop_2_c_o)
1360  (=> (and hop_1_c_a hop_1_a_n) hop_2_c_n)
1361  (=> (and hop_1_c_a hop_1_a_q) hop_2_c_q)
1362  (=> (and hop_1_c_a hop_1_a_p) hop_2_c_p)
1363  (=> (and hop_1_c_b hop_1_b_a) hop_2_c_a)
1364  (=> (and hop_1_c_b hop_1_b_e) hop_2_c_e)
1365  (=> (and hop_1_c_b hop_1_b_d) hop_2_c_d)
1366  (=> (and hop_1_c_b hop_1_b_g) hop_2_c_g)
1367  (=> (and hop_1_c_b hop_1_b_f) hop_2_c_f)
1368  (=> (and hop_1_c_b hop_1_b_i) hop_2_c_i)
1369  (=> (and hop_1_c_b hop_1_b_h) hop_2_c_h)
1370  (=> (and hop_1_c_b hop_1_b_k) hop_2_c_k)
1371  (=> (and hop_1_c_b hop_1_b_j) hop_2_c_j)
1372  (=> (and hop_1_c_b hop_1_b_m) hop_2_c_m)
1373  (=> (and hop_1_c_b hop_1_b_l) hop_2_c_l)
1374  (=> (and hop_1_c_b hop_1_b_o) hop_2_c_o)
1375  (=> (and hop_1_c_b hop_1_b_n) hop_2_c_n)
1376  (=> (and hop_1_c_b hop_1_b_q) hop_2_c_q)
1377  (=> (and hop_1_c_b hop_1_b_p) hop_2_c_p)
1378  (=> (and hop_1_c_e hop_1_e_a) hop_2_c_a)
1379  (=> (and hop_1_c_e hop_1_e_b) hop_2_c_b)
1380  (=> (and hop_1_c_e hop_1_e_d) hop_2_c_d)
1381  (=> (and hop_1_c_e hop_1_e_g) hop_2_c_g)
1382  (=> (and hop_1_c_e hop_1_e_f) hop_2_c_f)
1383  (=> (and hop_1_c_e hop_1_e_i) hop_2_c_i)
1384  (=> (and hop_1_c_e hop_1_e_h) hop_2_c_h)
1385  (=> (and hop_1_c_e hop_1_e_k) hop_2_c_k)
1386  (=> (and hop_1_c_e hop_1_e_j) hop_2_c_j)
1387  (=> (and hop_1_c_e hop_1_e_m) hop_2_c_m)
1388  (=> (and hop_1_c_e hop_1_e_l) hop_2_c_l)
1389  (=> (and hop_1_c_e hop_1_e_o) hop_2_c_o)
1390  (=> (and hop_1_c_e hop_1_e_n) hop_2_c_n)
1391  (=> (and hop_1_c_e hop_1_e_q) hop_2_c_q)
1392  (=> (and hop_1_c_e hop_1_e_p) hop_2_c_p)
1393  (=> (and hop_1_c_d hop_1_d_a) hop_2_c_a)
1394  (=> (and hop_1_c_d hop_1_d_b) hop_2_c_b)
1395  (=> (and hop_1_c_d hop_1_d_e) hop_2_c_e)
1396  (=> (and hop_1_c_d hop_1_d_g) hop_2_c_g)
1397  (=> (and hop_1_c_d hop_1_d_f) hop_2_c_f)
1398  (=> (and hop_1_c_d hop_1_d_i) hop_2_c_i)
1399  (=> (and hop_1_c_d hop_1_d_h) hop_2_c_h)
1400  (=> (and hop_1_c_d hop_1_d_k) hop_2_c_k)
1401  (=> (and hop_1_c_d hop_1_d_j) hop_2_c_j)
1402  (=> (and hop_1_c_d hop_1_d_m) hop_2_c_m)
1403  (=> (and hop_1_c_d hop_1_d_l) hop_2_c_l)
1404  (=> (and hop_1_c_d hop_1_d_o) hop_2_c_o)
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1405  (=> (and hop_1_c_d hop_1_d_n) hop_2_c_n)
1406  (=> (and hop_1_c_d hop_1_d_q) hop_2_c_q)
1407  (=> (and hop_1_c_d hop_1_d_p) hop_2_c_p)
1408  (=> (and hop_1_c_g hop_1_g_a) hop_2_c_a)
1409  (=> (and hop_1_c_g hop_1_g_b) hop_2_c_b)
1410  (=> (and hop_1_c_g hop_1_g_e) hop_2_c_e)
1411  (=> (and hop_1_c_g hop_1_g_d) hop_2_c_d)
1412  (=> (and hop_1_c_g hop_1_g_f) hop_2_c_f)
1413  (=> (and hop_1_c_g hop_1_g_i) hop_2_c_i)
1414  (=> (and hop_1_c_g hop_1_g_h) hop_2_c_h)
1415  (=> (and hop_1_c_g hop_1_g_k) hop_2_c_k)
1416  (=> (and hop_1_c_g hop_1_g_j) hop_2_c_j)
1417  (=> (and hop_1_c_g hop_1_g_m) hop_2_c_m)
1418  (=> (and hop_1_c_g hop_1_g_l) hop_2_c_l)
1419  (=> (and hop_1_c_g hop_1_g_o) hop_2_c_o)
1420  (=> (and hop_1_c_g hop_1_g_n) hop_2_c_n)
1421  (=> (and hop_1_c_g hop_1_g_q) hop_2_c_q)
1422  (=> (and hop_1_c_g hop_1_g_p) hop_2_c_p)
1423  (=> (and hop_1_c_f hop_1_f_a) hop_2_c_a)
1424  (=> (and hop_1_c_f hop_1_f_b) hop_2_c_b)
1425  (=> (and hop_1_c_f hop_1_f_e) hop_2_c_e)
1426  (=> (and hop_1_c_f hop_1_f_d) hop_2_c_d)
1427  (=> (and hop_1_c_f hop_1_f_g) hop_2_c_g)
1428  (=> (and hop_1_c_f hop_1_f_i) hop_2_c_i)
1429  (=> (and hop_1_c_f hop_1_f_h) hop_2_c_h)
1430  (=> (and hop_1_c_f hop_1_f_k) hop_2_c_k)
1431  (=> (and hop_1_c_f hop_1_f_j) hop_2_c_j)
1432  (=> (and hop_1_c_f hop_1_f_m) hop_2_c_m)
1433  (=> (and hop_1_c_f hop_1_f_l) hop_2_c_l)
1434  (=> (and hop_1_c_f hop_1_f_o) hop_2_c_o)
1435  (=> (and hop_1_c_f hop_1_f_n) hop_2_c_n)
1436  (=> (and hop_1_c_f hop_1_f_q) hop_2_c_q)
1437  (=> (and hop_1_c_f hop_1_f_p) hop_2_c_p)
1438  (=> (and hop_1_c_i hop_1_i_a) hop_2_c_a)
1439  (=> (and hop_1_c_i hop_1_i_b) hop_2_c_b)
1440  (=> (and hop_1_c_i hop_1_i_e) hop_2_c_e)
1441  (=> (and hop_1_c_i hop_1_i_d) hop_2_c_d)
1442  (=> (and hop_1_c_i hop_1_i_g) hop_2_c_g)
1443  (=> (and hop_1_c_i hop_1_i_f) hop_2_c_f)
1444  (=> (and hop_1_c_i hop_1_i_h) hop_2_c_h)
1445  (=> (and hop_1_c_i hop_1_i_k) hop_2_c_k)
1446  (=> (and hop_1_c_i hop_1_i_j) hop_2_c_j)
1447  (=> (and hop_1_c_i hop_1_i_m) hop_2_c_m)
1448  (=> (and hop_1_c_i hop_1_i_l) hop_2_c_l)
1449  (=> (and hop_1_c_i hop_1_i_o) hop_2_c_o)
1450  (=> (and hop_1_c_i hop_1_i_n) hop_2_c_n)
1451  (=> (and hop_1_c_i hop_1_i_q) hop_2_c_q)
1452  (=> (and hop_1_c_i hop_1_i_p) hop_2_c_p)
1453  (=> (and hop_1_c_h hop_1_h_a) hop_2_c_a)
1454  (=> (and hop_1_c_h hop_1_h_b) hop_2_c_b)
1455  (=> (and hop_1_c_h hop_1_h_e) hop_2_c_e)
1456  (=> (and hop_1_c_h hop_1_h_d) hop_2_c_d)
1457  (=> (and hop_1_c_h hop_1_h_g) hop_2_c_g)
1458  (=> (and hop_1_c_h hop_1_h_f) hop_2_c_f)
1459  (=> (and hop_1_c_h hop_1_h_i) hop_2_c_i)
1460  (=> (and hop_1_c_h hop_1_h_k) hop_2_c_k)
1461  (=> (and hop_1_c_h hop_1_h_j) hop_2_c_j)
1462  (=> (and hop_1_c_h hop_1_h_m) hop_2_c_m)
1463  (=> (and hop_1_c_h hop_1_h_l) hop_2_c_l)
1464  (=> (and hop_1_c_h hop_1_h_o) hop_2_c_o)
1465  (=> (and hop_1_c_h hop_1_h_n) hop_2_c_n)
1466  (=> (and hop_1_c_h hop_1_h_q) hop_2_c_q)
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1467  (=> (and hop_1_c_h hop_1_h_p) hop_2_c_p)
1468  (=> (and hop_1_c_k hop_1_k_a) hop_2_c_a)
1469  (=> (and hop_1_c_k hop_1_k_b) hop_2_c_b)
1470  (=> (and hop_1_c_k hop_1_k_e) hop_2_c_e)
1471  (=> (and hop_1_c_k hop_1_k_d) hop_2_c_d)
1472  (=> (and hop_1_c_k hop_1_k_g) hop_2_c_g)
1473  (=> (and hop_1_c_k hop_1_k_f) hop_2_c_f)
1474  (=> (and hop_1_c_k hop_1_k_i) hop_2_c_i)
1475  (=> (and hop_1_c_k hop_1_k_h) hop_2_c_h)
1476  (=> (and hop_1_c_k hop_1_k_j) hop_2_c_j)
1477  (=> (and hop_1_c_k hop_1_k_m) hop_2_c_m)
1478  (=> (and hop_1_c_k hop_1_k_l) hop_2_c_l)
1479  (=> (and hop_1_c_k hop_1_k_o) hop_2_c_o)
1480  (=> (and hop_1_c_k hop_1_k_n) hop_2_c_n)
1481  (=> (and hop_1_c_k hop_1_k_q) hop_2_c_q)
1482  (=> (and hop_1_c_k hop_1_k_p) hop_2_c_p)
1483  (=> (and hop_1_c_j hop_1_j_a) hop_2_c_a)
1484  (=> (and hop_1_c_j hop_1_j_b) hop_2_c_b)
1485  (=> (and hop_1_c_j hop_1_j_e) hop_2_c_e)
1486  (=> (and hop_1_c_j hop_1_j_d) hop_2_c_d)
1487  (=> (and hop_1_c_j hop_1_j_g) hop_2_c_g)
1488  (=> (and hop_1_c_j hop_1_j_f) hop_2_c_f)
1489  (=> (and hop_1_c_j hop_1_j_i) hop_2_c_i)
1490  (=> (and hop_1_c_j hop_1_j_h) hop_2_c_h)
1491  (=> (and hop_1_c_j hop_1_j_k) hop_2_c_k)
1492  (=> (and hop_1_c_j hop_1_j_m) hop_2_c_m)
1493  (=> (and hop_1_c_j hop_1_j_l) hop_2_c_l)
1494  (=> (and hop_1_c_j hop_1_j_o) hop_2_c_o)
1495  (=> (and hop_1_c_j hop_1_j_n) hop_2_c_n)
1496  (=> (and hop_1_c_j hop_1_j_q) hop_2_c_q)
1497  (=> (and hop_1_c_j hop_1_j_p) hop_2_c_p)
1498  (=> (and hop_1_c_m hop_1_m_a) hop_2_c_a)
1499  (=> (and hop_1_c_m hop_1_m_b) hop_2_c_b)
1500  (=> (and hop_1_c_m hop_1_m_e) hop_2_c_e)
1501  (=> (and hop_1_c_m hop_1_m_d) hop_2_c_d)
1502  (=> (and hop_1_c_m hop_1_m_g) hop_2_c_g)
1503  (=> (and hop_1_c_m hop_1_m_f) hop_2_c_f)
1504  (=> (and hop_1_c_m hop_1_m_i) hop_2_c_i)
1505  (=> (and hop_1_c_m hop_1_m_h) hop_2_c_h)
1506  (=> (and hop_1_c_m hop_1_m_k) hop_2_c_k)
1507  (=> (and hop_1_c_m hop_1_m_j) hop_2_c_j)
1508  (=> (and hop_1_c_m hop_1_m_l) hop_2_c_l)
1509  (=> (and hop_1_c_m hop_1_m_o) hop_2_c_o)
1510  (=> (and hop_1_c_m hop_1_m_n) hop_2_c_n)
1511  (=> (and hop_1_c_m hop_1_m_q) hop_2_c_q)
1512  (=> (and hop_1_c_m hop_1_m_p) hop_2_c_p)
1513  (=> (and hop_1_c_l hop_1_l_a) hop_2_c_a)
1514  (=> (and hop_1_c_l hop_1_l_b) hop_2_c_b)
1515  (=> (and hop_1_c_l hop_1_l_e) hop_2_c_e)
1516  (=> (and hop_1_c_l hop_1_l_d) hop_2_c_d)
1517  (=> (and hop_1_c_l hop_1_l_g) hop_2_c_g)
1518  (=> (and hop_1_c_l hop_1_l_f) hop_2_c_f)
1519  (=> (and hop_1_c_l hop_1_l_i) hop_2_c_i)
1520  (=> (and hop_1_c_l hop_1_l_h) hop_2_c_h)
1521  (=> (and hop_1_c_l hop_1_l_k) hop_2_c_k)
1522  (=> (and hop_1_c_l hop_1_l_j) hop_2_c_j)
1523  (=> (and hop_1_c_l hop_1_l_m) hop_2_c_m)
1524  (=> (and hop_1_c_l hop_1_l_o) hop_2_c_o)
1525  (=> (and hop_1_c_l hop_1_l_n) hop_2_c_n)
1526  (=> (and hop_1_c_l hop_1_l_q) hop_2_c_q)
1527  (=> (and hop_1_c_l hop_1_l_p) hop_2_c_p)
1528  (=> (and hop_1_c_o hop_1_o_a) hop_2_c_a)
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1529   (=> (and hop_1_c_o hop_1_o_b) hop_2_c_b)
1530   (=> (and hop_1_c_o hop_1_o_e) hop_2_c_e)
1531   (=> (and hop_1_c_o hop_1_o_d) hop_2_c_d)
1532   (=> (and hop_1_c_o hop_1_o_g) hop_2_c_g)
1533   (=> (and hop_1_c_o hop_1_o_f) hop_2_c_f)
1534   (=> (and hop_1_c_o hop_1_o_i) hop_2_c_i)
1535   (=> (and hop_1_c_o hop_1_o_h) hop_2_c_h)
1536   (=> (and hop_1_c_o hop_1_o_k) hop_2_c_k)
1537   (=> (and hop_1_c_o hop_1_o_j) hop_2_c_j)
1538   (=> (and hop_1_c_o hop_1_o_m) hop_2_c_m)
1539   (=> (and hop_1_c_o hop_1_o_l) hop_2_c_l)
1540   (=> (and hop_1_c_o hop_1_o_n) hop_2_c_n)
1541   (=> (and hop_1_c_o hop_1_o_q) hop_2_c_q)
1542   (=> (and hop_1_c_o hop_1_o_p) hop_2_c_p)
1543   (=> (and hop_1_c_n hop_1_n_a) hop_2_c_a)
1544   (=> (and hop_1_c_n hop_1_n_b) hop_2_c_b)
1545   (=> (and hop_1_c_n hop_1_n_e) hop_2_c_e)
1546   (=> (and hop_1_c_n hop_1_n_d) hop_2_c_d)
1547   (=> (and hop_1_c_n hop_1_n_g) hop_2_c_g)
1548   (=> (and hop_1_c_n hop_1_n_f) hop_2_c_f)
1549   (=> (and hop_1_c_n hop_1_n_i) hop_2_c_i)
1550   (=> (and hop_1_c_n hop_1_n_h) hop_2_c_h)
1551   (=> (and hop_1_c_n hop_1_n_k) hop_2_c_k)
1552   (=> (and hop_1_c_n hop_1_n_j) hop_2_c_j)
1553   (=> (and hop_1_c_n hop_1_n_m) hop_2_c_m)
1554   (=> (and hop_1_c_n hop_1_n_l) hop_2_c_l)
1555   (=> (and hop_1_c_n hop_1_n_o) hop_2_c_o)
1556   (=> (and hop_1_c_n hop_1_n_q) hop_2_c_q)
1557   (=> (and hop_1_c_n hop_1_n_p) hop_2_c_p)
1558   (=> (and hop_1_c_q hop_1_q_a) hop_2_c_a)
1559   (=> (and hop_1_c_q hop_1_q_b) hop_2_c_b)
1560   (=> (and hop_1_c_q hop_1_q_e) hop_2_c_e)
1561   (=> (and hop_1_c_q hop_1_q_d) hop_2_c_d)
1562   (=> (and hop_1_c_q hop_1_q_g) hop_2_c_g)
1563   (=> (and hop_1_c_q hop_1_q_f) hop_2_c_f)
1564   (=> (and hop_1_c_q hop_1_q_i) hop_2_c_i)
1565   (=> (and hop_1_c_q hop_1_q_h) hop_2_c_h)
1566   (=> (and hop_1_c_q hop_1_q_k) hop_2_c_k)
1567   (=> (and hop_1_c_q hop_1_q_j) hop_2_c_j)
1568   (=> (and hop_1_c_q hop_1_q_m) hop_2_c_m)
1569   (=> (and hop_1_c_q hop_1_q_l) hop_2_c_l)
1570   (=> (and hop_1_c_q hop_1_q_o) hop_2_c_o)
1571   (=> (and hop_1_c_q hop_1_q_n) hop_2_c_n)
1572   (=> (and hop_1_c_q hop_1_q_p) hop_2_c_p)
1573   (=> (and hop_1_c_p hop_1_p_a) hop_2_c_a)
1574   (=> (and hop_1_c_p hop_1_p_b) hop_2_c_b)
1575   (=> (and hop_1_c_p hop_1_p_e) hop_2_c_e)
1576   (=> (and hop_1_c_p hop_1_p_d) hop_2_c_d)
1577   (=> (and hop_1_c_p hop_1_p_g) hop_2_c_g)
1578   (=> (and hop_1_c_p hop_1_p_f) hop_2_c_f)
1579   (=> (and hop_1_c_p hop_1_p_i) hop_2_c_i)
1580   (=> (and hop_1_c_p hop_1_p_h) hop_2_c_h)
1581   (=> (and hop_1_c_p hop_1_p_k) hop_2_c_k)
1582   (=> (and hop_1_c_p hop_1_p_j) hop_2_c_j)
1583   (=> (and hop_1_c_p hop_1_p_m) hop_2_c_m)
1584   (=> (and hop_1_c_p hop_1_p_l) hop_2_c_l)
1585   (=> (and hop_1_c_p hop_1_p_o) hop_2_c_o)
1586   (=> (and hop_1_c_p hop_1_p_n) hop_2_c_n)
1587   (=> (and hop_1_c_p hop_1_p_q) hop_2_c_q)
1588   (=> (and hop_1_b_a hop_1_a_c) hop_2_b_c)
1589   (=> (and hop_1_b_a hop_1_a_e) hop_2_b_e)
1590   (=> (and hop_1_b_a hop_1_a_d) hop_2_b_d)
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1591  (=> (and hop_1_b_a hop_1_a_g) hop_2_b_g)
1592  (=> (and hop_1_b_a hop_1_a_f) hop_2_b_f)
1593  (=> (and hop_1_b_a hop_1_a_i) hop_2_b_i)
1594  (=> (and hop_1_b_a hop_1_a_h) hop_2_b_h)
1595  (=> (and hop_1_b_a hop_1_a_k) hop_2_b_k)
1596  (=> (and hop_1_b_a hop_1_a_j) hop_2_b_j)
1597  (=> (and hop_1_b_a hop_1_a_m) hop_2_b_m)
1598  (=> (and hop_1_b_a hop_1_a_l) hop_2_b_l)
1599  (=> (and hop_1_b_a hop_1_a_o) hop_2_b_o)
1600  (=> (and hop_1_b_a hop_1_a_n) hop_2_b_n)
1601  (=> (and hop_1_b_a hop_1_a_q) hop_2_b_q)
1602  (=> (and hop_1_b_a hop_1_a_p) hop_2_b_p)
1603  (=> (and hop_1_b_c hop_1_c_a) hop_2_b_a)
1604  (=> (and hop_1_b_c hop_1_c_e) hop_2_b_e)
1605  (=> (and hop_1_b_c hop_1_c_d) hop_2_b_d)
1606  (=> (and hop_1_b_c hop_1_c_g) hop_2_b_g)
1607  (=> (and hop_1_b_c hop_1_c_f) hop_2_b_f)
1608  (=> (and hop_1_b_c hop_1_c_i) hop_2_b_i)
1609  (=> (and hop_1_b_c hop_1_c_h) hop_2_b_h)
1610  (=> (and hop_1_b_c hop_1_c_k) hop_2_b_k)
1611  (=> (and hop_1_b_c hop_1_c_j) hop_2_b_j)
1612  (=> (and hop_1_b_c hop_1_c_m) hop_2_b_m)
1613  (=> (and hop_1_b_c hop_1_c_l) hop_2_b_l)
1614  (=> (and hop_1_b_c hop_1_c_o) hop_2_b_o)
1615  (=> (and hop_1_b_c hop_1_c_n) hop_2_b_n)
1616  (=> (and hop_1_b_c hop_1_c_q) hop_2_b_q)
1617  (=> (and hop_1_b_c hop_1_c_p) hop_2_b_p)
1618  (=> (and hop_1_b_e hop_1_e_a) hop_2_b_a)
1619  (=> (and hop_1_b_e hop_1_e_c) hop_2_b_c)
1620  (=> (and hop_1_b_e hop_1_e_d) hop_2_b_d)
1621  (=> (and hop_1_b_e hop_1_e_g) hop_2_b_g)
1622  (=> (and hop_1_b_e hop_1_e_f) hop_2_b_f)
1623  (=> (and hop_1_b_e hop_1_e_i) hop_2_b_i)
1624  (=> (and hop_1_b_e hop_1_e_h) hop_2_b_h)
1625  (=> (and hop_1_b_e hop_1_e_k) hop_2_b_k)
1626  (=> (and hop_1_b_e hop_1_e_j) hop_2_b_j)
1627  (=> (and hop_1_b_e hop_1_e_m) hop_2_b_m)
1628  (=> (and hop_1_b_e hop_1_e_l) hop_2_b_l)
1629  (=> (and hop_1_b_e hop_1_e_o) hop_2_b_o)
1630  (=> (and hop_1_b_e hop_1_e_n) hop_2_b_n)
1631  (=> (and hop_1_b_e hop_1_e_q) hop_2_b_q)
1632  (=> (and hop_1_b_e hop_1_e_p) hop_2_b_p)
1633  (=> (and hop_1_b_d hop_1_d_a) hop_2_b_a)
1634  (=> (and hop_1_b_d hop_1_d_c) hop_2_b_c)
1635  (=> (and hop_1_b_d hop_1_d_e) hop_2_b_e)
1636  (=> (and hop_1_b_d hop_1_d_g) hop_2_b_g)
1637  (=> (and hop_1_b_d hop_1_d_f) hop_2_b_f)
1638  (=> (and hop_1_b_d hop_1_d_i) hop_2_b_i)
1639  (=> (and hop_1_b_d hop_1_d_h) hop_2_b_h)
1640  (=> (and hop_1_b_d hop_1_d_k) hop_2_b_k)
1641  (=> (and hop_1_b_d hop_1_d_j) hop_2_b_j)
1642  (=> (and hop_1_b_d hop_1_d_m) hop_2_b_m)
1643  (=> (and hop_1_b_d hop_1_d_l) hop_2_b_l)
1644  (=> (and hop_1_b_d hop_1_d_o) hop_2_b_o)
1645  (=> (and hop_1_b_d hop_1_d_n) hop_2_b_n)
1646  (=> (and hop_1_b_d hop_1_d_q) hop_2_b_q)
1647  (=> (and hop_1_b_d hop_1_d_p) hop_2_b_p)
1648  (=> (and hop_1_b_g hop_1_g_a) hop_2_b_a)
1649  (=> (and hop_1_b_g hop_1_g_c) hop_2_b_c)
1650  (=> (and hop_1_b_g hop_1_g_e) hop_2_b_e)
1651  (=> (and hop_1_b_g hop_1_g_d) hop_2_b_d)
1652  (=> (and hop_1_b_g hop_1_g_f) hop_2_b_f)
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1653  (=> (and hop_1_b_g hop_1_g_i) hop_2_b_i)
1654  (=> (and hop_1_b_g hop_1_g_h) hop_2_b_h)
1655  (=> (and hop_1_b_g hop_1_g_k) hop_2_b_k)
1656  (=> (and hop_1_b_g hop_1_g_j) hop_2_b_j)
1657  (=> (and hop_1_b_g hop_1_g_m) hop_2_b_m)
1658  (=> (and hop_1_b_g hop_1_g_l) hop_2_b_l)
1659  (=> (and hop_1_b_g hop_1_g_o) hop_2_b_o)
1660  (=> (and hop_1_b_g hop_1_g_n) hop_2_b_n)
1661  (=> (and hop_1_b_g hop_1_g_q) hop_2_b_q)
1662  (=> (and hop_1_b_g hop_1_g_p) hop_2_b_p)
1663  (=> (and hop_1_b_f hop_1_f_a) hop_2_b_a)
1664  (=> (and hop_1_b_f hop_1_f_c) hop_2_b_c)
1665  (=> (and hop_1_b_f hop_1_f_e) hop_2_b_e)
1666  (=> (and hop_1_b_f hop_1_f_d) hop_2_b_d)
1667  (=> (and hop_1_b_f hop_1_f_g) hop_2_b_g)
1668  (=> (and hop_1_b_f hop_1_f_i) hop_2_b_i)
1669  (=> (and hop_1_b_f hop_1_f_h) hop_2_b_h)
1670  (=> (and hop_1_b_f hop_1_f_k) hop_2_b_k)
1671  (=> (and hop_1_b_f hop_1_f_j) hop_2_b_j)
1672  (=> (and hop_1_b_f hop_1_f_m) hop_2_b_m)
1673  (=> (and hop_1_b_f hop_1_f_l) hop_2_b_l)
1674  (=> (and hop_1_b_f hop_1_f_o) hop_2_b_o)
1675  (=> (and hop_1_b_f hop_1_f_n) hop_2_b_n)
1676  (=> (and hop_1_b_f hop_1_f_q) hop_2_b_q)
1677  (=> (and hop_1_b_f hop_1_f_p) hop_2_b_p)
1678  (=> (and hop_1_b_i hop_1_i_a) hop_2_b_a)
1679  (=> (and hop_1_b_i hop_1_i_c) hop_2_b_c)
1680  (=> (and hop_1_b_i hop_1_i_e) hop_2_b_e)
1681  (=> (and hop_1_b_i hop_1_i_d) hop_2_b_d)
1682  (=> (and hop_1_b_i hop_1_i_g) hop_2_b_g)
1683  (=> (and hop_1_b_i hop_1_i_f) hop_2_b_f)
1684  (=> (and hop_1_b_i hop_1_i_h) hop_2_b_h)
1685  (=> (and hop_1_b_i hop_1_i_k) hop_2_b_k)
1686  (=> (and hop_1_b_i hop_1_i_j) hop_2_b_j)
1687  (=> (and hop_1_b_i hop_1_i_m) hop_2_b_m)
1688  (=> (and hop_1_b_i hop_1_i_l) hop_2_b_l)
1689  (=> (and hop_1_b_i hop_1_i_o) hop_2_b_o)
1690  (=> (and hop_1_b_i hop_1_i_n) hop_2_b_n)
1691  (=> (and hop_1_b_i hop_1_i_q) hop_2_b_q)
1692  (=> (and hop_1_b_i hop_1_i_p) hop_2_b_p)
1693  (=> (and hop_1_b_h hop_1_h_a) hop_2_b_a)
1694  (=> (and hop_1_b_h hop_1_h_c) hop_2_b_c)
1695  (=> (and hop_1_b_h hop_1_h_e) hop_2_b_e)
1696  (=> (and hop_1_b_h hop_1_h_d) hop_2_b_d)
1697  (=> (and hop_1_b_h hop_1_h_g) hop_2_b_g)
1698  (=> (and hop_1_b_h hop_1_h_f) hop_2_b_f)
1699  (=> (and hop_1_b_h hop_1_h_i) hop_2_b_i)
1700  (=> (and hop_1_b_h hop_1_h_k) hop_2_b_k)
1701  (=> (and hop_1_b_h hop_1_h_j) hop_2_b_j)
1702  (=> (and hop_1_b_h hop_1_h_m) hop_2_b_m)
1703  (=> (and hop_1_b_h hop_1_h_l) hop_2_b_l)
1704  (=> (and hop_1_b_h hop_1_h_o) hop_2_b_o)
1705  (=> (and hop_1_b_h hop_1_h_n) hop_2_b_n)
1706  (=> (and hop_1_b_h hop_1_h_q) hop_2_b_q)
1707  (=> (and hop_1_b_h hop_1_h_p) hop_2_b_p)
1708  (=> (and hop_1_b_k hop_1_k_a) hop_2_b_a)
1709  (=> (and hop_1_b_k hop_1_k_c) hop_2_b_c)
1710  (=> (and hop_1_b_k hop_1_k_e) hop_2_b_e)
1711  (=> (and hop_1_b_k hop_1_k_d) hop_2_b_d)
1712  (=> (and hop_1_b_k hop_1_k_g) hop_2_b_g)
1713  (=> (and hop_1_b_k hop_1_k_f) hop_2_b_f)
1714  (=> (and hop_1_b_k hop_1_k_i) hop_2_b_i)
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1715   (=> (and hop_1_b_k hop_1_k_h) hop_2_b_h)
1716   (=> (and hop_1_b_k hop_1_k_j) hop_2_b_j)
1717   (=> (and hop_1_b_k hop_1_k_m) hop_2_b_m)
1718   (=> (and hop_1_b_k hop_1_k_l) hop_2_b_l)
1719   (=> (and hop_1_b_k hop_1_k_o) hop_2_b_o)
1720   (=> (and hop_1_b_k hop_1_k_n) hop_2_b_n)
1721   (=> (and hop_1_b_k hop_1_k_q) hop_2_b_q)
1722   (=> (and hop_1_b_k hop_1_k_p) hop_2_b_p)
1723   (=> (and hop_1_b_j hop_1_j_a) hop_2_b_a)
1724   (=> (and hop_1_b_j hop_1_j_c) hop_2_b_c)
1725   (=> (and hop_1_b_j hop_1_j_e) hop_2_b_e)
1726   (=> (and hop_1_b_j hop_1_j_d) hop_2_b_d)
1727   (=> (and hop_1_b_j hop_1_j_g) hop_2_b_g)
1728   (=> (and hop_1_b_j hop_1_j_f) hop_2_b_f)
1729   (=> (and hop_1_b_j hop_1_j_i) hop_2_b_i)
1730   (=> (and hop_1_b_j hop_1_j_h) hop_2_b_h)
1731   (=> (and hop_1_b_j hop_1_j_k) hop_2_b_k)
1732   (=> (and hop_1_b_j hop_1_j_m) hop_2_b_m)
1733   (=> (and hop_1_b_j hop_1_j_l) hop_2_b_l)
1734   (=> (and hop_1_b_j hop_1_j_o) hop_2_b_o)
1735   (=> (and hop_1_b_j hop_1_j_n) hop_2_b_n)
1736   (=> (and hop_1_b_j hop_1_j_q) hop_2_b_q)
1737   (=> (and hop_1_b_j hop_1_j_p) hop_2_b_p)
1738   (=> (and hop_1_b_m hop_1_m_a) hop_2_b_a)
1739   (=> (and hop_1_b_m hop_1_m_c) hop_2_b_c)
1740   (=> (and hop_1_b_m hop_1_m_e) hop_2_b_e)
1741   (=> (and hop_1_b_m hop_1_m_d) hop_2_b_d)
1742   (=> (and hop_1_b_m hop_1_m_g) hop_2_b_g)
1743   (=> (and hop_1_b_m hop_1_m_f) hop_2_b_f)
1744   (=> (and hop_1_b_m hop_1_m_i) hop_2_b_i)
1745   (=> (and hop_1_b_m hop_1_m_h) hop_2_b_h)
1746   (=> (and hop_1_b_m hop_1_m_k) hop_2_b_k)
1747   (=> (and hop_1_b_m hop_1_m_j) hop_2_b_j)
1748   (=> (and hop_1_b_m hop_1_m_l) hop_2_b_l)
1749   (=> (and hop_1_b_m hop_1_m_o) hop_2_b_o)
1750   (=> (and hop_1_b_m hop_1_m_n) hop_2_b_n)
1751   (=> (and hop_1_b_m hop_1_m_q) hop_2_b_q)
1752   (=> (and hop_1_b_m hop_1_m_p) hop_2_b_p)
1753   (=> (and hop_1_b_l hop_1_l_a) hop_2_b_a)
1754   (=> (and hop_1_b_l hop_1_l_c) hop_2_b_c)
1755   (=> (and hop_1_b_l hop_1_l_e) hop_2_b_e)
1756   (=> (and hop_1_b_l hop_1_l_d) hop_2_b_d)
1757   (=> (and hop_1_b_l hop_1_l_g) hop_2_b_g)
1758   (=> (and hop_1_b_l hop_1_l_f) hop_2_b_f)
1759   (=> (and hop_1_b_l hop_1_l_i) hop_2_b_i)
1760   (=> (and hop_1_b_l hop_1_l_h) hop_2_b_h)
1761   (=> (and hop_1_b_l hop_1_l_k) hop_2_b_k)
1762   (=> (and hop_1_b_l hop_1_l_j) hop_2_b_j)
1763   (=> (and hop_1_b_l hop_1_l_m) hop_2_b_m)
1764   (=> (and hop_1_b_l hop_1_l_o) hop_2_b_o)
1765   (=> (and hop_1_b_l hop_1_l_n) hop_2_b_n)
1766   (=> (and hop_1_b_l hop_1_l_q) hop_2_b_q)
1767   (=> (and hop_1_b_l hop_1_l_p) hop_2_b_p)
1768   (=> (and hop_1_b_o hop_1_o_a) hop_2_b_a)
1769   (=> (and hop_1_b_o hop_1_o_c) hop_2_b_c)
1770   (=> (and hop_1_b_o hop_1_o_e) hop_2_b_e)
1771   (=> (and hop_1_b_o hop_1_o_d) hop_2_b_d)
1772   (=> (and hop_1_b_o hop_1_o_g) hop_2_b_g)
1773   (=> (and hop_1_b_o hop_1_o_f) hop_2_b_f)
1774   (=> (and hop_1_b_o hop_1_o_i) hop_2_b_i)
1775   (=> (and hop_1_b_o hop_1_o_h) hop_2_b_h)
1776   (=> (and hop_1_b_o hop_1_o_k) hop_2_b_k)
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1777  (=> (and hop_1_b_o hop_1_o_j) hop_2_b_j)
1778  (=> (and hop_1_b_o hop_1_o_m) hop_2_b_m)
1779  (=> (and hop_1_b_o hop_1_o_l) hop_2_b_l)
1780  (=> (and hop_1_b_o hop_1_o_n) hop_2_b_n)
1781  (=> (and hop_1_b_o hop_1_o_q) hop_2_b_q)
1782  (=> (and hop_1_b_o hop_1_o_p) hop_2_b_p)
1783  (=> (and hop_1_b_n hop_1_n_a) hop_2_b_a)
1784  (=> (and hop_1_b_n hop_1_n_c) hop_2_b_c)
1785  (=> (and hop_1_b_n hop_1_n_e) hop_2_b_e)
1786  (=> (and hop_1_b_n hop_1_n_d) hop_2_b_d)
1787  (=> (and hop_1_b_n hop_1_n_g) hop_2_b_g)
1788  (=> (and hop_1_b_n hop_1_n_f) hop_2_b_f)
1789  (=> (and hop_1_b_n hop_1_n_i) hop_2_b_i)
1790  (=> (and hop_1_b_n hop_1_n_h) hop_2_b_h)
1791  (=> (and hop_1_b_n hop_1_n_k) hop_2_b_k)
1792  (=> (and hop_1_b_n hop_1_n_j) hop_2_b_j)
1793  (=> (and hop_1_b_n hop_1_n_m) hop_2_b_m)
1794  (=> (and hop_1_b_n hop_1_n_l) hop_2_b_l)
1795  (=> (and hop_1_b_n hop_1_n_o) hop_2_b_o)
1796  (=> (and hop_1_b_n hop_1_n_q) hop_2_b_q)
1797  (=> (and hop_1_b_n hop_1_n_p) hop_2_b_p)
1798  (=> (and hop_1_b_q hop_1_q_a) hop_2_b_a)
1799  (=> (and hop_1_b_q hop_1_q_c) hop_2_b_c)
1800  (=> (and hop_1_b_q hop_1_q_e) hop_2_b_e)
1801  (=> (and hop_1_b_q hop_1_q_d) hop_2_b_d)
1802  (=> (and hop_1_b_q hop_1_q_g) hop_2_b_g)
1803  (=> (and hop_1_b_q hop_1_q_f) hop_2_b_f)
1804  (=> (and hop_1_b_q hop_1_q_i) hop_2_b_i)
1805  (=> (and hop_1_b_q hop_1_q_h) hop_2_b_h)
1806  (=> (and hop_1_b_q hop_1_q_k) hop_2_b_k)
1807  (=> (and hop_1_b_q hop_1_q_j) hop_2_b_j)
1808  (=> (and hop_1_b_q hop_1_q_m) hop_2_b_m)
1809  (=> (and hop_1_b_q hop_1_q_l) hop_2_b_l)
1810  (=> (and hop_1_b_q hop_1_q_o) hop_2_b_o)
1811  (=> (and hop_1_b_q hop_1_q_n) hop_2_b_n)
1812  (=> (and hop_1_b_q hop_1_q_p) hop_2_b_p)
1813  (=> (and hop_1_b_p hop_1_p_a) hop_2_b_a)
1814  (=> (and hop_1_b_p hop_1_p_c) hop_2_b_c)
1815  (=> (and hop_1_b_p hop_1_p_e) hop_2_b_e)
1816  (=> (and hop_1_b_p hop_1_p_d) hop_2_b_d)
1817  (=> (and hop_1_b_p hop_1_p_g) hop_2_b_g)
1818  (=> (and hop_1_b_p hop_1_p_f) hop_2_b_f)
1819  (=> (and hop_1_b_p hop_1_p_i) hop_2_b_i)
1820  (=> (and hop_1_b_p hop_1_p_h) hop_2_b_h)
1821  (=> (and hop_1_b_p hop_1_p_k) hop_2_b_k)
1822  (=> (and hop_1_b_p hop_1_p_j) hop_2_b_j)
1823  (=> (and hop_1_b_p hop_1_p_m) hop_2_b_m)
1824  (=> (and hop_1_b_p hop_1_p_l) hop_2_b_l)
1825  (=> (and hop_1_b_p hop_1_p_o) hop_2_b_o)
1826  (=> (and hop_1_b_p hop_1_p_n) hop_2_b_n)
1827  (=> (and hop_1_b_p hop_1_p_q) hop_2_b_q)
1828  (=> (and hop_1_e_a hop_1_a_c) hop_2_e_c)
1829  (=> (and hop_1_e_a hop_1_a_b) hop_2_e_b)
1830  (=> (and hop_1_e_a hop_1_a_d) hop_2_e_d)
1831  (=> (and hop_1_e_a hop_1_a_g) hop_2_e_g)
1832  (=> (and hop_1_e_a hop_1_a_f) hop_2_e_f)
1833  (=> (and hop_1_e_a hop_1_a_i) hop_2_e_i)
1834  (=> (and hop_1_e_a hop_1_a_h) hop_2_e_h)
1835  (=> (and hop_1_e_a hop_1_a_k) hop_2_e_k)
1836  (=> (and hop_1_e_a hop_1_a_j) hop_2_e_j)
1837  (=> (and hop_1_e_a hop_1_a_m) hop_2_e_m)
1838  (=> (and hop_1_e_a hop_1_a_l) hop_2_e_l)
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1839  (=> (and hop_1_e_a hop_1_a_o) hop_2_e_o)
1840  (=> (and hop_1_e_a hop_1_a_n) hop_2_e_n)
1841  (=> (and hop_1_e_a hop_1_a_q) hop_2_e_q)
1842  (=> (and hop_1_e_a hop_1_a_p) hop_2_e_p)
1843  (=> (and hop_1_e_c hop_1_c_a) hop_2_e_a)
1844  (=> (and hop_1_e_c hop_1_c_b) hop_2_e_b)
1845  (=> (and hop_1_e_c hop_1_c_d) hop_2_e_d)
1846  (=> (and hop_1_e_c hop_1_c_g) hop_2_e_g)
1847  (=> (and hop_1_e_c hop_1_c_f) hop_2_e_f)
1848  (=> (and hop_1_e_c hop_1_c_i) hop_2_e_i)
1849  (=> (and hop_1_e_c hop_1_c_h) hop_2_e_h)
1850  (=> (and hop_1_e_c hop_1_c_k) hop_2_e_k)
1851  (=> (and hop_1_e_c hop_1_c_j) hop_2_e_j)
1852  (=> (and hop_1_e_c hop_1_c_m) hop_2_e_m)
1853  (=> (and hop_1_e_c hop_1_c_l) hop_2_e_l)
1854  (=> (and hop_1_e_c hop_1_c_o) hop_2_e_o)
1855  (=> (and hop_1_e_c hop_1_c_n) hop_2_e_n)
1856  (=> (and hop_1_e_c hop_1_c_q) hop_2_e_q)
1857  (=> (and hop_1_e_c hop_1_c_p) hop_2_e_p)
1858  (=> (and hop_1_e_b hop_1_b_a) hop_2_e_a)
1859  (=> (and hop_1_e_b hop_1_b_c) hop_2_e_c)
1860  (=> (and hop_1_e_b hop_1_b_d) hop_2_e_d)
1861  (=> (and hop_1_e_b hop_1_b_g) hop_2_e_g)
1862  (=> (and hop_1_e_b hop_1_b_f) hop_2_e_f)
1863  (=> (and hop_1_e_b hop_1_b_i) hop_2_e_i)
1864  (=> (and hop_1_e_b hop_1_b_h) hop_2_e_h)
1865  (=> (and hop_1_e_b hop_1_b_k) hop_2_e_k)
1866  (=> (and hop_1_e_b hop_1_b_j) hop_2_e_j)
1867  (=> (and hop_1_e_b hop_1_b_m) hop_2_e_m)
1868  (=> (and hop_1_e_b hop_1_b_l) hop_2_e_l)
1869  (=> (and hop_1_e_b hop_1_b_o) hop_2_e_o)
1870  (=> (and hop_1_e_b hop_1_b_n) hop_2_e_n)
1871  (=> (and hop_1_e_b hop_1_b_q) hop_2_e_q)
1872  (=> (and hop_1_e_b hop_1_b_p) hop_2_e_p)
1873  (=> (and hop_1_e_d hop_1_d_a) hop_2_e_a)
1874  (=> (and hop_1_e_d hop_1_d_c) hop_2_e_c)
1875  (=> (and hop_1_e_d hop_1_d_b) hop_2_e_b)
1876  (=> (and hop_1_e_d hop_1_d_g) hop_2_e_g)
1877  (=> (and hop_1_e_d hop_1_d_f) hop_2_e_f)
1878  (=> (and hop_1_e_d hop_1_d_i) hop_2_e_i)
1879  (=> (and hop_1_e_d hop_1_d_h) hop_2_e_h)
1880  (=> (and hop_1_e_d hop_1_d_k) hop_2_e_k)
1881  (=> (and hop_1_e_d hop_1_d_j) hop_2_e_j)
1882  (=> (and hop_1_e_d hop_1_d_m) hop_2_e_m)
1883  (=> (and hop_1_e_d hop_1_d_l) hop_2_e_l)
1884  (=> (and hop_1_e_d hop_1_d_o) hop_2_e_o)
1885  (=> (and hop_1_e_d hop_1_d_n) hop_2_e_n)
1886  (=> (and hop_1_e_d hop_1_d_q) hop_2_e_q)
1887  (=> (and hop_1_e_d hop_1_d_p) hop_2_e_p)
1888  (=> (and hop_1_e_g hop_1_g_a) hop_2_e_a)
1889  (=> (and hop_1_e_g hop_1_g_c) hop_2_e_c)
1890  (=> (and hop_1_e_g hop_1_g_b) hop_2_e_b)
1891  (=> (and hop_1_e_g hop_1_g_d) hop_2_e_d)
1892  (=> (and hop_1_e_g hop_1_g_f) hop_2_e_f)
1893  (=> (and hop_1_e_g hop_1_g_i) hop_2_e_i)
1894  (=> (and hop_1_e_g hop_1_g_h) hop_2_e_h)
1895  (=> (and hop_1_e_g hop_1_g_k) hop_2_e_k)
1896  (=> (and hop_1_e_g hop_1_g_j) hop_2_e_j)
1897  (=> (and hop_1_e_g hop_1_g_m) hop_2_e_m)
1898  (=> (and hop_1_e_g hop_1_g_l) hop_2_e_l)
1899  (=> (and hop_1_e_g hop_1_g_o) hop_2_e_o)
1900  (=> (and hop_1_e_g hop_1_g_n) hop_2_e_n)
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1901  (=> (and hop_1_e_g hop_1_g_q) hop_2_e_q)
1902  (=> (and hop_1_e_g hop_1_g_p) hop_2_e_p)
1903  (=> (and hop_1_e_f hop_1_f_a) hop_2_e_a)
1904  (=> (and hop_1_e_f hop_1_f_c) hop_2_e_c)
1905  (=> (and hop_1_e_f hop_1_f_b) hop_2_e_b)
1906  (=> (and hop_1_e_f hop_1_f_d) hop_2_e_d)
1907  (=> (and hop_1_e_f hop_1_f_g) hop_2_e_g)
1908  (=> (and hop_1_e_f hop_1_f_i) hop_2_e_i)
1909  (=> (and hop_1_e_f hop_1_f_h) hop_2_e_h)
1910  (=> (and hop_1_e_f hop_1_f_k) hop_2_e_k)
1911  (=> (and hop_1_e_f hop_1_f_j) hop_2_e_j)
1912  (=> (and hop_1_e_f hop_1_f_m) hop_2_e_m)
1913  (=> (and hop_1_e_f hop_1_f_l) hop_2_e_l)
1914  (=> (and hop_1_e_f hop_1_f_o) hop_2_e_o)
1915  (=> (and hop_1_e_f hop_1_f_n) hop_2_e_n)
1916  (=> (and hop_1_e_f hop_1_f_q) hop_2_e_q)
1917  (=> (and hop_1_e_f hop_1_f_p) hop_2_e_p)
1918  (=> (and hop_1_e_i hop_1_i_a) hop_2_e_a)
1919  (=> (and hop_1_e_i hop_1_i_c) hop_2_e_c)
1920  (=> (and hop_1_e_i hop_1_i_b) hop_2_e_b)
1921  (=> (and hop_1_e_i hop_1_i_d) hop_2_e_d)
1922  (=> (and hop_1_e_i hop_1_i_g) hop_2_e_g)
1923  (=> (and hop_1_e_i hop_1_i_f) hop_2_e_f)
1924  (=> (and hop_1_e_i hop_1_i_h) hop_2_e_h)
1925  (=> (and hop_1_e_i hop_1_i_k) hop_2_e_k)
1926  (=> (and hop_1_e_i hop_1_i_j) hop_2_e_j)
1927  (=> (and hop_1_e_i hop_1_i_m) hop_2_e_m)
1928  (=> (and hop_1_e_i hop_1_i_l) hop_2_e_l)
1929  (=> (and hop_1_e_i hop_1_i_o) hop_2_e_o)
1930  (=> (and hop_1_e_i hop_1_i_n) hop_2_e_n)
1931  (=> (and hop_1_e_i hop_1_i_q) hop_2_e_q)
1932  (=> (and hop_1_e_i hop_1_i_p) hop_2_e_p)
1933  (=> (and hop_1_e_h hop_1_h_a) hop_2_e_a)
1934  (=> (and hop_1_e_h hop_1_h_c) hop_2_e_c)
1935  (=> (and hop_1_e_h hop_1_h_b) hop_2_e_b)
1936  (=> (and hop_1_e_h hop_1_h_d) hop_2_e_d)
1937  (=> (and hop_1_e_h hop_1_h_g) hop_2_e_g)
1938  (=> (and hop_1_e_h hop_1_h_f) hop_2_e_f)
1939  (=> (and hop_1_e_h hop_1_h_i) hop_2_e_i)
1940  (=> (and hop_1_e_h hop_1_h_k) hop_2_e_k)
1941  (=> (and hop_1_e_h hop_1_h_j) hop_2_e_j)
1942  (=> (and hop_1_e_h hop_1_h_m) hop_2_e_m)
1943  (=> (and hop_1_e_h hop_1_h_l) hop_2_e_l)
1944  (=> (and hop_1_e_h hop_1_h_o) hop_2_e_o)
1945  (=> (and hop_1_e_h hop_1_h_n) hop_2_e_n)
1946  (=> (and hop_1_e_h hop_1_h_q) hop_2_e_q)
1947  (=> (and hop_1_e_h hop_1_h_p) hop_2_e_p)
1948  (=> (and hop_1_e_k hop_1_k_a) hop_2_e_a)
1949  (=> (and hop_1_e_k hop_1_k_c) hop_2_e_c)
1950  (=> (and hop_1_e_k hop_1_k_b) hop_2_e_b)
1951  (=> (and hop_1_e_k hop_1_k_d) hop_2_e_d)
1952  (=> (and hop_1_e_k hop_1_k_g) hop_2_e_g)
1953  (=> (and hop_1_e_k hop_1_k_f) hop_2_e_f)
1954  (=> (and hop_1_e_k hop_1_k_i) hop_2_e_i)
1955  (=> (and hop_1_e_k hop_1_k_h) hop_2_e_h)
1956  (=> (and hop_1_e_k hop_1_k_j) hop_2_e_j)
1957  (=> (and hop_1_e_k hop_1_k_m) hop_2_e_m)
1958  (=> (and hop_1_e_k hop_1_k_l) hop_2_e_l)
1959  (=> (and hop_1_e_k hop_1_k_o) hop_2_e_o)
1960  (=> (and hop_1_e_k hop_1_k_n) hop_2_e_n)
1961  (=> (and hop_1_e_k hop_1_k_q) hop_2_e_q)
1962  (=> (and hop_1_e_k hop_1_k_p) hop_2_e_p)
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1963   (=> (and hop_1_e_j hop_1_j_a) hop_2_e_a)
1964   (=> (and hop_1_e_j hop_1_j_c) hop_2_e_c)
1965   (=> (and hop_1_e_j hop_1_j_b) hop_2_e_b)
1966   (=> (and hop_1_e_j hop_1_j_d) hop_2_e_d)
1967   (=> (and hop_1_e_j hop_1_j_g) hop_2_e_g)
1968   (=> (and hop_1_e_j hop_1_j_f) hop_2_e_f)
1969   (=> (and hop_1_e_j hop_1_j_i) hop_2_e_i)
1970   (=> (and hop_1_e_j hop_1_j_h) hop_2_e_h)
1971   (=> (and hop_1_e_j hop_1_j_k) hop_2_e_k)
1972   (=> (and hop_1_e_j hop_1_j_m) hop_2_e_m)
1973   (=> (and hop_1_e_j hop_1_j_l) hop_2_e_l)
1974   (=> (and hop_1_e_j hop_1_j_o) hop_2_e_o)
1975   (=> (and hop_1_e_j hop_1_j_n) hop_2_e_n)
1976   (=> (and hop_1_e_j hop_1_j_q) hop_2_e_q)
1977   (=> (and hop_1_e_j hop_1_j_p) hop_2_e_p)
1978   (=> (and hop_1_e_m hop_1_m_a) hop_2_e_a)
1979   (=> (and hop_1_e_m hop_1_m_c) hop_2_e_c)
1980   (=> (and hop_1_e_m hop_1_m_b) hop_2_e_b)
1981   (=> (and hop_1_e_m hop_1_m_d) hop_2_e_d)
1982   (=> (and hop_1_e_m hop_1_m_g) hop_2_e_g)
1983   (=> (and hop_1_e_m hop_1_m_f) hop_2_e_f)
1984   (=> (and hop_1_e_m hop_1_m_i) hop_2_e_i)
1985   (=> (and hop_1_e_m hop_1_m_h) hop_2_e_h)
1986   (=> (and hop_1_e_m hop_1_m_k) hop_2_e_k)
1987   (=> (and hop_1_e_m hop_1_m_j) hop_2_e_j)
1988   (=> (and hop_1_e_m hop_1_m_l) hop_2_e_l)
1989   (=> (and hop_1_e_m hop_1_m_o) hop_2_e_o)
1990   (=> (and hop_1_e_m hop_1_m_n) hop_2_e_n)
1991   (=> (and hop_1_e_m hop_1_m_q) hop_2_e_q)
1992   (=> (and hop_1_e_m hop_1_m_p) hop_2_e_p)
1993   (=> (and hop_1_e_l hop_1_l_a) hop_2_e_a)
1994   (=> (and hop_1_e_l hop_1_l_c) hop_2_e_c)
1995   (=> (and hop_1_e_l hop_1_l_b) hop_2_e_b)
1996   (=> (and hop_1_e_l hop_1_l_d) hop_2_e_d)
1997   (=> (and hop_1_e_l hop_1_l_g) hop_2_e_g)
1998   (=> (and hop_1_e_l hop_1_l_f) hop_2_e_f)
1999   (=> (and hop_1_e_l hop_1_l_i) hop_2_e_i)
2000   (=> (and hop_1_e_l hop_1_l_h) hop_2_e_h)
2001   (=> (and hop_1_e_l hop_1_l_k) hop_2_e_k)
2002   (=> (and hop_1_e_l hop_1_l_j) hop_2_e_j)
2003   (=> (and hop_1_e_l hop_1_l_m) hop_2_e_m)
2004   (=> (and hop_1_e_l hop_1_l_o) hop_2_e_o)
2005   (=> (and hop_1_e_l hop_1_l_n) hop_2_e_n)
2006   (=> (and hop_1_e_l hop_1_l_q) hop_2_e_q)
2007   (=> (and hop_1_e_l hop_1_l_p) hop_2_e_p)
2008   (=> (and hop_1_e_o hop_1_o_a) hop_2_e_a)
2009   (=> (and hop_1_e_o hop_1_o_c) hop_2_e_c)
2010   (=> (and hop_1_e_o hop_1_o_b) hop_2_e_b)
2011   (=> (and hop_1_e_o hop_1_o_d) hop_2_e_d)
2012   (=> (and hop_1_e_o hop_1_o_g) hop_2_e_g)
2013   (=> (and hop_1_e_o hop_1_o_f) hop_2_e_f)
2014   (=> (and hop_1_e_o hop_1_o_i) hop_2_e_i)
2015   (=> (and hop_1_e_o hop_1_o_h) hop_2_e_h)
2016   (=> (and hop_1_e_o hop_1_o_k) hop_2_e_k)
2017   (=> (and hop_1_e_o hop_1_o_j) hop_2_e_j)
2018   (=> (and hop_1_e_o hop_1_o_m) hop_2_e_m)
2019   (=> (and hop_1_e_o hop_1_o_l) hop_2_e_l)
2020   (=> (and hop_1_e_o hop_1_o_n) hop_2_e_n)
2021   (=> (and hop_1_e_o hop_1_o_q) hop_2_e_q)
2022   (=> (and hop_1_e_o hop_1_o_p) hop_2_e_p)
2023   (=> (and hop_1_e_n hop_1_n_a) hop_2_e_a)
2024   (=> (and hop_1_e_n hop_1_n_c) hop_2_e_c)
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2025  (=> (and hop_1_e_n hop_1_n_b) hop_2_e_b)
2026  (=> (and hop_1_e_n hop_1_n_d) hop_2_e_d)
2027  (=> (and hop_1_e_n hop_1_n_g) hop_2_e_g)
2028  (=> (and hop_1_e_n hop_1_n_f) hop_2_e_f)
2029  (=> (and hop_1_e_n hop_1_n_i) hop_2_e_i)
2030  (=> (and hop_1_e_n hop_1_n_h) hop_2_e_h)
2031  (=> (and hop_1_e_n hop_1_n_k) hop_2_e_k)
2032  (=> (and hop_1_e_n hop_1_n_j) hop_2_e_j)
2033  (=> (and hop_1_e_n hop_1_n_m) hop_2_e_m)
2034  (=> (and hop_1_e_n hop_1_n_l) hop_2_e_l)
2035  (=> (and hop_1_e_n hop_1_n_o) hop_2_e_o)
2036  (=> (and hop_1_e_n hop_1_n_q) hop_2_e_q)
2037  (=> (and hop_1_e_n hop_1_n_p) hop_2_e_p)
2038  (=> (and hop_1_e_q hop_1_q_a) hop_2_e_a)
2039  (=> (and hop_1_e_q hop_1_q_c) hop_2_e_c)
2040  (=> (and hop_1_e_q hop_1_q_b) hop_2_e_b)
2041  (=> (and hop_1_e_q hop_1_q_d) hop_2_e_d)
2042  (=> (and hop_1_e_q hop_1_q_g) hop_2_e_g)
2043  (=> (and hop_1_e_q hop_1_q_f) hop_2_e_f)
2044  (=> (and hop_1_e_q hop_1_q_i) hop_2_e_i)
2045  (=> (and hop_1_e_q hop_1_q_h) hop_2_e_h)
2046  (=> (and hop_1_e_q hop_1_q_k) hop_2_e_k)
2047  (=> (and hop_1_e_q hop_1_q_j) hop_2_e_j)
2048  (=> (and hop_1_e_q hop_1_q_m) hop_2_e_m)
2049  (=> (and hop_1_e_q hop_1_q_l) hop_2_e_l)
2050  (=> (and hop_1_e_q hop_1_q_o) hop_2_e_o)
2051  (=> (and hop_1_e_q hop_1_q_n) hop_2_e_n)
2052  (=> (and hop_1_e_q hop_1_q_p) hop_2_e_p)
2053  (=> (and hop_1_e_p hop_1_p_a) hop_2_e_a)
2054  (=> (and hop_1_e_p hop_1_p_c) hop_2_e_c)
2055  (=> (and hop_1_e_p hop_1_p_b) hop_2_e_b)
2056  (=> (and hop_1_e_p hop_1_p_d) hop_2_e_d)
2057  (=> (and hop_1_e_p hop_1_p_g) hop_2_e_g)
2058  (=> (and hop_1_e_p hop_1_p_f) hop_2_e_f)
2059  (=> (and hop_1_e_p hop_1_p_i) hop_2_e_i)
2060  (=> (and hop_1_e_p hop_1_p_h) hop_2_e_h)
2061  (=> (and hop_1_e_p hop_1_p_k) hop_2_e_k)
2062  (=> (and hop_1_e_p hop_1_p_j) hop_2_e_j)
2063  (=> (and hop_1_e_p hop_1_p_m) hop_2_e_m)
2064  (=> (and hop_1_e_p hop_1_p_l) hop_2_e_l)
2065  (=> (and hop_1_e_p hop_1_p_o) hop_2_e_o)
2066  (=> (and hop_1_e_p hop_1_p_n) hop_2_e_n)
2067  (=> (and hop_1_e_p hop_1_p_q) hop_2_e_q)
2068  (=> (and hop_1_d_a hop_1_a_c) hop_2_d_c)
2069  (=> (and hop_1_d_a hop_1_a_b) hop_2_d_b)
2070  (=> (and hop_1_d_a hop_1_a_e) hop_2_d_e)
2071  (=> (and hop_1_d_a hop_1_a_g) hop_2_d_g)
2072  (=> (and hop_1_d_a hop_1_a_f) hop_2_d_f)
2073  (=> (and hop_1_d_a hop_1_a_i) hop_2_d_i)
2074  (=> (and hop_1_d_a hop_1_a_h) hop_2_d_h)
2075  (=> (and hop_1_d_a hop_1_a_k) hop_2_d_k)
2076  (=> (and hop_1_d_a hop_1_a_j) hop_2_d_j)
2077  (=> (and hop_1_d_a hop_1_a_m) hop_2_d_m)
2078  (=> (and hop_1_d_a hop_1_a_l) hop_2_d_l)
2079  (=> (and hop_1_d_a hop_1_a_o) hop_2_d_o)
2080  (=> (and hop_1_d_a hop_1_a_n) hop_2_d_n)
2081  (=> (and hop_1_d_a hop_1_a_q) hop_2_d_q)
2082  (=> (and hop_1_d_a hop_1_a_p) hop_2_d_p)
2083  (=> (and hop_1_d_c hop_1_c_a) hop_2_d_a)
2084  (=> (and hop_1_d_c hop_1_c_b) hop_2_d_b)
2085  (=> (and hop_1_d_c hop_1_c_e) hop_2_d_e)
2086  (=> (and hop_1_d_c hop_1_c_g) hop_2_d_g)
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2087  (=> (and hop_1_d_c hop_1_c_f) hop_2_d_f)
2088  (=> (and hop_1_d_c hop_1_c_i) hop_2_d_i)
2089  (=> (and hop_1_d_c hop_1_c_h) hop_2_d_h)
2090  (=> (and hop_1_d_c hop_1_c_k) hop_2_d_k)
2091  (=> (and hop_1_d_c hop_1_c_j) hop_2_d_j)
2092  (=> (and hop_1_d_c hop_1_c_m) hop_2_d_m)
2093  (=> (and hop_1_d_c hop_1_c_l) hop_2_d_l)
2094  (=> (and hop_1_d_c hop_1_c_o) hop_2_d_o)
2095  (=> (and hop_1_d_c hop_1_c_n) hop_2_d_n)
2096  (=> (and hop_1_d_c hop_1_c_q) hop_2_d_q)
2097  (=> (and hop_1_d_c hop_1_c_p) hop_2_d_p)
2098  (=> (and hop_1_d_b hop_1_b_a) hop_2_d_a)
2099  (=> (and hop_1_d_b hop_1_b_c) hop_2_d_c)
2100  (=> (and hop_1_d_b hop_1_b_e) hop_2_d_e)
2101  (=> (and hop_1_d_b hop_1_b_g) hop_2_d_g)
2102  (=> (and hop_1_d_b hop_1_b_f) hop_2_d_f)
2103  (=> (and hop_1_d_b hop_1_b_i) hop_2_d_i)
2104  (=> (and hop_1_d_b hop_1_b_h) hop_2_d_h)
2105  (=> (and hop_1_d_b hop_1_b_k) hop_2_d_k)
2106  (=> (and hop_1_d_b hop_1_b_j) hop_2_d_j)
2107  (=> (and hop_1_d_b hop_1_b_m) hop_2_d_m)
2108  (=> (and hop_1_d_b hop_1_b_l) hop_2_d_l)
2109  (=> (and hop_1_d_b hop_1_b_o) hop_2_d_o)
2110  (=> (and hop_1_d_b hop_1_b_n) hop_2_d_n)
2111  (=> (and hop_1_d_b hop_1_b_q) hop_2_d_q)
2112  (=> (and hop_1_d_b hop_1_b_p) hop_2_d_p)
2113  (=> (and hop_1_d_e hop_1_e_a) hop_2_d_a)
2114  (=> (and hop_1_d_e hop_1_e_c) hop_2_d_c)
2115  (=> (and hop_1_d_e hop_1_e_b) hop_2_d_b)
2116  (=> (and hop_1_d_e hop_1_e_g) hop_2_d_g)
2117  (=> (and hop_1_d_e hop_1_e_f) hop_2_d_f)
2118  (=> (and hop_1_d_e hop_1_e_i) hop_2_d_i)
2119  (=> (and hop_1_d_e hop_1_e_h) hop_2_d_h)
2120  (=> (and hop_1_d_e hop_1_e_k) hop_2_d_k)
2121  (=> (and hop_1_d_e hop_1_e_j) hop_2_d_j)
2122  (=> (and hop_1_d_e hop_1_e_m) hop_2_d_m)
2123  (=> (and hop_1_d_e hop_1_e_l) hop_2_d_l)
2124  (=> (and hop_1_d_e hop_1_e_o) hop_2_d_o)
2125  (=> (and hop_1_d_e hop_1_e_n) hop_2_d_n)
2126  (=> (and hop_1_d_e hop_1_e_q) hop_2_d_q)
2127  (=> (and hop_1_d_e hop_1_e_p) hop_2_d_p)
2128  (=> (and hop_1_d_g hop_1_g_a) hop_2_d_a)
2129  (=> (and hop_1_d_g hop_1_g_c) hop_2_d_c)
2130  (=> (and hop_1_d_g hop_1_g_b) hop_2_d_b)
2131  (=> (and hop_1_d_g hop_1_g_e) hop_2_d_e)
2132  (=> (and hop_1_d_g hop_1_g_f) hop_2_d_f)
2133  (=> (and hop_1_d_g hop_1_g_i) hop_2_d_i)
2134  (=> (and hop_1_d_g hop_1_g_h) hop_2_d_h)
2135  (=> (and hop_1_d_g hop_1_g_k) hop_2_d_k)
2136  (=> (and hop_1_d_g hop_1_g_j) hop_2_d_j)
2137  (=> (and hop_1_d_g hop_1_g_m) hop_2_d_m)
2138  (=> (and hop_1_d_g hop_1_g_l) hop_2_d_l)
2139  (=> (and hop_1_d_g hop_1_g_o) hop_2_d_o)
2140  (=> (and hop_1_d_g hop_1_g_n) hop_2_d_n)
2141  (=> (and hop_1_d_g hop_1_g_q) hop_2_d_q)
2142  (=> (and hop_1_d_g hop_1_g_p) hop_2_d_p)
2143  (=> (and hop_1_d_f hop_1_f_a) hop_2_d_a)
2144  (=> (and hop_1_d_f hop_1_f_c) hop_2_d_c)
2145  (=> (and hop_1_d_f hop_1_f_b) hop_2_d_b)
2146  (=> (and hop_1_d_f hop_1_f_e) hop_2_d_e)
2147  (=> (and hop_1_d_f hop_1_f_g) hop_2_d_g)
2148  (=> (and hop_1_d_f hop_1_f_i) hop_2_d_i)
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2149  (=> (and hop_1_d_f hop_1_f_h) hop_2_d_h)
2150  (=> (and hop_1_d_f hop_1_f_k) hop_2_d_k)
2151  (=> (and hop_1_d_f hop_1_f_j) hop_2_d_j)
2152  (=> (and hop_1_d_f hop_1_f_m) hop_2_d_m)
2153  (=> (and hop_1_d_f hop_1_f_l) hop_2_d_l)
2154  (=> (and hop_1_d_f hop_1_f_o) hop_2_d_o)
2155  (=> (and hop_1_d_f hop_1_f_n) hop_2_d_n)
2156  (=> (and hop_1_d_f hop_1_f_q) hop_2_d_q)
2157  (=> (and hop_1_d_f hop_1_f_p) hop_2_d_p)
2158  (=> (and hop_1_d_i hop_1_i_a) hop_2_d_a)
2159  (=> (and hop_1_d_i hop_1_i_c) hop_2_d_c)
2160  (=> (and hop_1_d_i hop_1_i_b) hop_2_d_b)
2161  (=> (and hop_1_d_i hop_1_i_e) hop_2_d_e)
2162  (=> (and hop_1_d_i hop_1_i_g) hop_2_d_g)
2163  (=> (and hop_1_d_i hop_1_i_f) hop_2_d_f)
2164  (=> (and hop_1_d_i hop_1_i_h) hop_2_d_h)
2165  (=> (and hop_1_d_i hop_1_i_k) hop_2_d_k)
2166  (=> (and hop_1_d_i hop_1_i_j) hop_2_d_j)
2167  (=> (and hop_1_d_i hop_1_i_m) hop_2_d_m)
2168  (=> (and hop_1_d_i hop_1_i_l) hop_2_d_l)
2169  (=> (and hop_1_d_i hop_1_i_o) hop_2_d_o)
2170  (=> (and hop_1_d_i hop_1_i_n) hop_2_d_n)
2171  (=> (and hop_1_d_i hop_1_i_q) hop_2_d_q)
2172  (=> (and hop_1_d_i hop_1_i_p) hop_2_d_p)
2173  (=> (and hop_1_d_h hop_1_h_a) hop_2_d_a)
2174  (=> (and hop_1_d_h hop_1_h_c) hop_2_d_c)
2175  (=> (and hop_1_d_h hop_1_h_b) hop_2_d_b)
2176  (=> (and hop_1_d_h hop_1_h_e) hop_2_d_e)
2177  (=> (and hop_1_d_h hop_1_h_g) hop_2_d_g)
2178  (=> (and hop_1_d_h hop_1_h_f) hop_2_d_f)
2179  (=> (and hop_1_d_h hop_1_h_i) hop_2_d_i)
2180  (=> (and hop_1_d_h hop_1_h_k) hop_2_d_k)
2181  (=> (and hop_1_d_h hop_1_h_j) hop_2_d_j)
2182  (=> (and hop_1_d_h hop_1_h_m) hop_2_d_m)
2183  (=> (and hop_1_d_h hop_1_h_l) hop_2_d_l)
2184  (=> (and hop_1_d_h hop_1_h_o) hop_2_d_o)
2185  (=> (and hop_1_d_h hop_1_h_n) hop_2_d_n)
2186  (=> (and hop_1_d_h hop_1_h_q) hop_2_d_q)
2187  (=> (and hop_1_d_h hop_1_h_p) hop_2_d_p)
2188  (=> (and hop_1_d_k hop_1_k_a) hop_2_d_a)
2189  (=> (and hop_1_d_k hop_1_k_c) hop_2_d_c)
2190  (=> (and hop_1_d_k hop_1_k_b) hop_2_d_b)
2191  (=> (and hop_1_d_k hop_1_k_e) hop_2_d_e)
2192  (=> (and hop_1_d_k hop_1_k_g) hop_2_d_g)
2193  (=> (and hop_1_d_k hop_1_k_f) hop_2_d_f)
2194  (=> (and hop_1_d_k hop_1_k_i) hop_2_d_i)
2195  (=> (and hop_1_d_k hop_1_k_h) hop_2_d_h)
2196  (=> (and hop_1_d_k hop_1_k_j) hop_2_d_j)
2197  (=> (and hop_1_d_k hop_1_k_m) hop_2_d_m)
2198  (=> (and hop_1_d_k hop_1_k_l) hop_2_d_l)
2199  (=> (and hop_1_d_k hop_1_k_o) hop_2_d_o)
2200  (=> (and hop_1_d_k hop_1_k_n) hop_2_d_n)
2201  (=> (and hop_1_d_k hop_1_k_q) hop_2_d_q)
2202  (=> (and hop_1_d_k hop_1_k_p) hop_2_d_p)
2203  (=> (and hop_1_d_j hop_1_j_a) hop_2_d_a)
2204  (=> (and hop_1_d_j hop_1_j_c) hop_2_d_c)
2205  (=> (and hop_1_d_j hop_1_j_b) hop_2_d_b)
2206  (=> (and hop_1_d_j hop_1_j_e) hop_2_d_e)
2207  (=> (and hop_1_d_j hop_1_j_g) hop_2_d_g)
2208  (=> (and hop_1_d_j hop_1_j_f) hop_2_d_f)
2209  (=> (and hop_1_d_j hop_1_j_i) hop_2_d_i)
2210  (=> (and hop_1_d_j hop_1_j_h) hop_2_d_h)
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2211   (=> (and hop_1_d_j hop_1_j_k) hop_2_d_k)
2212   (=> (and hop_1_d_j hop_1_j_m) hop_2_d_m)
2213   (=> (and hop_1_d_j hop_1_j_l) hop_2_d_l)
2214   (=> (and hop_1_d_j hop_1_j_o) hop_2_d_o)
2215   (=> (and hop_1_d_j hop_1_j_n) hop_2_d_n)
2216   (=> (and hop_1_d_j hop_1_j_q) hop_2_d_q)
2217   (=> (and hop_1_d_j hop_1_j_p) hop_2_d_p)
2218   (=> (and hop_1_d_m hop_1_m_a) hop_2_d_a)
2219   (=> (and hop_1_d_m hop_1_m_c) hop_2_d_c)
2220   (=> (and hop_1_d_m hop_1_m_b) hop_2_d_b)
2221   (=> (and hop_1_d_m hop_1_m_e) hop_2_d_e)
2222   (=> (and hop_1_d_m hop_1_m_g) hop_2_d_g)
2223   (=> (and hop_1_d_m hop_1_m_f) hop_2_d_f)
2224   (=> (and hop_1_d_m hop_1_m_i) hop_2_d_i)
2225   (=> (and hop_1_d_m hop_1_m_h) hop_2_d_h)
2226   (=> (and hop_1_d_m hop_1_m_k) hop_2_d_k)
2227   (=> (and hop_1_d_m hop_1_m_j) hop_2_d_j)
2228   (=> (and hop_1_d_m hop_1_m_l) hop_2_d_l)
2229   (=> (and hop_1_d_m hop_1_m_o) hop_2_d_o)
2230   (=> (and hop_1_d_m hop_1_m_n) hop_2_d_n)
2231   (=> (and hop_1_d_m hop_1_m_q) hop_2_d_q)
2232   (=> (and hop_1_d_m hop_1_m_p) hop_2_d_p)
2233   (=> (and hop_1_d_l hop_1_l_a) hop_2_d_a)
2234   (=> (and hop_1_d_l hop_1_l_c) hop_2_d_c)
2235   (=> (and hop_1_d_l hop_1_l_b) hop_2_d_b)
2236   (=> (and hop_1_d_l hop_1_l_e) hop_2_d_e)
2237   (=> (and hop_1_d_l hop_1_l_g) hop_2_d_g)
2238   (=> (and hop_1_d_l hop_1_l_f) hop_2_d_f)
2239   (=> (and hop_1_d_l hop_1_l_i) hop_2_d_i)
2240   (=> (and hop_1_d_l hop_1_l_h) hop_2_d_h)
2241   (=> (and hop_1_d_l hop_1_l_k) hop_2_d_k)
2242   (=> (and hop_1_d_l hop_1_l_j) hop_2_d_j)
2243   (=> (and hop_1_d_l hop_1_l_m) hop_2_d_m)
2244   (=> (and hop_1_d_l hop_1_l_o) hop_2_d_o)
2245   (=> (and hop_1_d_l hop_1_l_n) hop_2_d_n)
2246   (=> (and hop_1_d_l hop_1_l_q) hop_2_d_q)
2247   (=> (and hop_1_d_l hop_1_l_p) hop_2_d_p)
2248   (=> (and hop_1_d_o hop_1_o_a) hop_2_d_a)
2249   (=> (and hop_1_d_o hop_1_o_c) hop_2_d_c)
2250   (=> (and hop_1_d_o hop_1_o_b) hop_2_d_b)
2251   (=> (and hop_1_d_o hop_1_o_e) hop_2_d_e)
2252   (=> (and hop_1_d_o hop_1_o_g) hop_2_d_g)
2253   (=> (and hop_1_d_o hop_1_o_f) hop_2_d_f)
2254   (=> (and hop_1_d_o hop_1_o_i) hop_2_d_i)
2255   (=> (and hop_1_d_o hop_1_o_h) hop_2_d_h)
2256   (=> (and hop_1_d_o hop_1_o_k) hop_2_d_k)
2257   (=> (and hop_1_d_o hop_1_o_j) hop_2_d_j)
2258   (=> (and hop_1_d_o hop_1_o_m) hop_2_d_m)
2259   (=> (and hop_1_d_o hop_1_o_l) hop_2_d_l)
2260   (=> (and hop_1_d_o hop_1_o_n) hop_2_d_n)
2261   (=> (and hop_1_d_o hop_1_o_q) hop_2_d_q)
2262   (=> (and hop_1_d_o hop_1_o_p) hop_2_d_p)
2263   (=> (and hop_1_d_n hop_1_n_a) hop_2_d_a)
2264   (=> (and hop_1_d_n hop_1_n_c) hop_2_d_c)
2265   (=> (and hop_1_d_n hop_1_n_b) hop_2_d_b)
2266   (=> (and hop_1_d_n hop_1_n_e) hop_2_d_e)
2267   (=> (and hop_1_d_n hop_1_n_g) hop_2_d_g)
2268   (=> (and hop_1_d_n hop_1_n_f) hop_2_d_f)
2269   (=> (and hop_1_d_n hop_1_n_i) hop_2_d_i)
2270   (=> (and hop_1_d_n hop_1_n_h) hop_2_d_h)
2271   (=> (and hop_1_d_n hop_1_n_k) hop_2_d_k)
2272   (=> (and hop_1_d_n hop_1_n_j) hop_2_d_j)
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2273   (=> (and hop_1_d_n hop_1_n_m) hop_2_d_m)
2274   (=> (and hop_1_d_n hop_1_n_l) hop_2_d_l)
2275   (=> (and hop_1_d_n hop_1_n_o) hop_2_d_o)
2276   (=> (and hop_1_d_n hop_1_n_q) hop_2_d_q)
2277   (=> (and hop_1_d_n hop_1_n_p) hop_2_d_p)
2278   (=> (and hop_1_d_q hop_1_q_a) hop_2_d_a)
2279   (=> (and hop_1_d_q hop_1_q_c) hop_2_d_c)
2280   (=> (and hop_1_d_q hop_1_q_b) hop_2_d_b)
2281   (=> (and hop_1_d_q hop_1_q_e) hop_2_d_e)
2282   (=> (and hop_1_d_q hop_1_q_g) hop_2_d_g)
2283   (=> (and hop_1_d_q hop_1_q_f) hop_2_d_f)
2284   (=> (and hop_1_d_q hop_1_q_i) hop_2_d_i)
2285   (=> (and hop_1_d_q hop_1_q_h) hop_2_d_h)
2286   (=> (and hop_1_d_q hop_1_q_k) hop_2_d_k)
2287   (=> (and hop_1_d_q hop_1_q_j) hop_2_d_j)
2288   (=> (and hop_1_d_q hop_1_q_m) hop_2_d_m)
2289   (=> (and hop_1_d_q hop_1_q_l) hop_2_d_l)
2290   (=> (and hop_1_d_q hop_1_q_o) hop_2_d_o)
2291   (=> (and hop_1_d_q hop_1_q_n) hop_2_d_n)
2292   (=> (and hop_1_d_q hop_1_q_p) hop_2_d_p)
2293   (=> (and hop_1_d_p hop_1_p_a) hop_2_d_a)
2294   (=> (and hop_1_d_p hop_1_p_c) hop_2_d_c)
2295   (=> (and hop_1_d_p hop_1_p_b) hop_2_d_b)
2296   (=> (and hop_1_d_p hop_1_p_e) hop_2_d_e)
2297   (=> (and hop_1_d_p hop_1_p_g) hop_2_d_g)
2298   (=> (and hop_1_d_p hop_1_p_f) hop_2_d_f)
2299   (=> (and hop_1_d_p hop_1_p_i) hop_2_d_i)
2300   (=> (and hop_1_d_p hop_1_p_h) hop_2_d_h)
2301   (=> (and hop_1_d_p hop_1_p_k) hop_2_d_k)
2302   (=> (and hop_1_d_p hop_1_p_j) hop_2_d_j)
2303   (=> (and hop_1_d_p hop_1_p_m) hop_2_d_m)
2304   (=> (and hop_1_d_p hop_1_p_l) hop_2_d_l)
2305   (=> (and hop_1_d_p hop_1_p_o) hop_2_d_o)
2306   (=> (and hop_1_d_p hop_1_p_n) hop_2_d_n)
2307   (=> (and hop_1_d_p hop_1_p_q) hop_2_d_q)
2308   (=> (and hop_1_g_a hop_1_a_c) hop_2_g_c)
2309   (=> (and hop_1_g_a hop_1_a_b) hop_2_g_b)
2310   (=> (and hop_1_g_a hop_1_a_e) hop_2_g_e)
2311   (=> (and hop_1_g_a hop_1_a_d) hop_2_g_d)
2312   (=> (and hop_1_g_a hop_1_a_f) hop_2_g_f)
2313   (=> (and hop_1_g_a hop_1_a_i) hop_2_g_i)
2314   (=> (and hop_1_g_a hop_1_a_h) hop_2_g_h)
2315   (=> (and hop_1_g_a hop_1_a_k) hop_2_g_k)
2316   (=> (and hop_1_g_a hop_1_a_j) hop_2_g_j)
2317   (=> (and hop_1_g_a hop_1_a_m) hop_2_g_m)
2318   (=> (and hop_1_g_a hop_1_a_l) hop_2_g_l)
2319   (=> (and hop_1_g_a hop_1_a_o) hop_2_g_o)
2320   (=> (and hop_1_g_a hop_1_a_n) hop_2_g_n)
2321   (=> (and hop_1_g_a hop_1_a_q) hop_2_g_q)
2322   (=> (and hop_1_g_a hop_1_a_p) hop_2_g_p)
2323   (=> (and hop_1_g_c hop_1_c_a) hop_2_g_a)
2324   (=> (and hop_1_g_c hop_1_c_b) hop_2_g_b)
2325   (=> (and hop_1_g_c hop_1_c_e) hop_2_g_e)
2326   (=> (and hop_1_g_c hop_1_c_d) hop_2_g_d)
2327   (=> (and hop_1_g_c hop_1_c_f) hop_2_g_f)
2328   (=> (and hop_1_g_c hop_1_c_i) hop_2_g_i)
2329   (=> (and hop_1_g_c hop_1_c_h) hop_2_g_h)
2330   (=> (and hop_1_g_c hop_1_c_k) hop_2_g_k)
2331   (=> (and hop_1_g_c hop_1_c_j) hop_2_g_j)
2332   (=> (and hop_1_g_c hop_1_c_m) hop_2_g_m)
2333   (=> (and hop_1_g_c hop_1_c_l) hop_2_g_l)
2334   (=> (and hop_1_g_c hop_1_c_o) hop_2_g_o)
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2335    (=> (and hop_1_g_c hop_1_c_n) hop_2_g_n)
2336    (=> (and hop_1_g_c hop_1_c_q) hop_2_g_q)
2337    (=> (and hop_1_g_c hop_1_c_p) hop_2_g_p)
2338    (=> (and hop_1_g_b hop_1_b_a) hop_2_g_a)
2339    (=> (and hop_1_g_b hop_1_b_c) hop_2_g_c)
2340    (=> (and hop_1_g_b hop_1_b_e) hop_2_g_e)
2341    (=> (and hop_1_g_b hop_1_b_d) hop_2_g_d)
2342    (=> (and hop_1_g_b hop_1_b_f) hop_2_g_f)
2343    (=> (and hop_1_g_b hop_1_b_i) hop_2_g_i)
2344    (=> (and hop_1_g_b hop_1_b_h) hop_2_g_h)
2345    (=> (and hop_1_g_b hop_1_b_k) hop_2_g_k)
2346    (=> (and hop_1_g_b hop_1_b_j) hop_2_g_j)
2347    (=> (and hop_1_g_b hop_1_b_m) hop_2_g_m)
2348    (=> (and hop_1_g_b hop_1_b_l) hop_2_g_l)
2349    (=> (and hop_1_g_b hop_1_b_o) hop_2_g_o)
2350    (=> (and hop_1_g_b hop_1_b_n) hop_2_g_n)
2351    (=> (and hop_1_g_b hop_1_b_q) hop_2_g_q)
2352    (=> (and hop_1_g_b hop_1_b_p) hop_2_g_p)
2353    (=> (and hop_1_g_e hop_1_e_a) hop_2_g_a)
2354    (=> (and hop_1_g_e hop_1_e_c) hop_2_g_c)
2355    (=> (and hop_1_g_e hop_1_e_b) hop_2_g_b)
2356    (=> (and hop_1_g_e hop_1_e_d) hop_2_g_d)
2357    (=> (and hop_1_g_e hop_1_e_f) hop_2_g_f)
2358    (=> (and hop_1_g_e hop_1_e_i) hop_2_g_i)
2359    (=> (and hop_1_g_e hop_1_e_h) hop_2_g_h)
2360    (=> (and hop_1_g_e hop_1_e_k) hop_2_g_k)
2361    (=> (and hop_1_g_e hop_1_e_j) hop_2_g_j)
2362    (=> (and hop_1_g_e hop_1_e_m) hop_2_g_m)
2363    (=> (and hop_1_g_e hop_1_e_l) hop_2_g_l)
2364    (=> (and hop_1_g_e hop_1_e_o) hop_2_g_o)
2365    (=> (and hop_1_g_e hop_1_e_n) hop_2_g_n)
2366    (=> (and hop_1_g_e hop_1_e_q) hop_2_g_q)
2367    (=> (and hop_1_g_e hop_1_e_p) hop_2_g_p)
2368    (=> (and hop_1_g_d hop_1_d_a) hop_2_g_a)
2369    (=> (and hop_1_g_d hop_1_d_c) hop_2_g_c)
2370    (=> (and hop_1_g_d hop_1_d_b) hop_2_g_b)
2371    (=> (and hop_1_g_d hop_1_d_e) hop_2_g_e)
2372    (=> (and hop_1_g_d hop_1_d_f) hop_2_g_f)
2373    (=> (and hop_1_g_d hop_1_d_i) hop_2_g_i)
2374    (=> (and hop_1_g_d hop_1_d_h) hop_2_g_h)
2375    (=> (and hop_1_g_d hop_1_d_k) hop_2_g_k)
2376    (=> (and hop_1_g_d hop_1_d_j) hop_2_g_j)
2377    (=> (and hop_1_g_d hop_1_d_m) hop_2_g_m)
2378    (=> (and hop_1_g_d hop_1_d_l) hop_2_g_l)
2379    (=> (and hop_1_g_d hop_1_d_o) hop_2_g_o)
2380    (=> (and hop_1_g_d hop_1_d_n) hop_2_g_n)
2381    (=> (and hop_1_g_d hop_1_d_q) hop_2_g_q)
2382    (=> (and hop_1_g_d hop_1_d_p) hop_2_g_p)
2383    (=> (and hop_1_g_f hop_1_f_a) hop_2_g_a)
2384    (=> (and hop_1_g_f hop_1_f_c) hop_2_g_c)
2385    (=> (and hop_1_g_f hop_1_f_b) hop_2_g_b)
2386    (=> (and hop_1_g_f hop_1_f_e) hop_2_g_e)
2387    (=> (and hop_1_g_f hop_1_f_d) hop_2_g_d)
2388    (=> (and hop_1_g_f hop_1_f_i) hop_2_g_i)
2389    (=> (and hop_1_g_f hop_1_f_h) hop_2_g_h)
2390    (=> (and hop_1_g_f hop_1_f_k) hop_2_g_k)
2391    (=> (and hop_1_g_f hop_1_f_j) hop_2_g_j)
2392    (=> (and hop_1_g_f hop_1_f_m) hop_2_g_m)
2393    (=> (and hop_1_g_f hop_1_f_l) hop_2_g_l)
2394    (=> (and hop_1_g_f hop_1_f_o) hop_2_g_o)
2395    (=> (and hop_1_g_f hop_1_f_n) hop_2_g_n)
2396    (=> (and hop_1_g_f hop_1_f_q) hop_2_g_q)
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2397  (=> (and hop_1_g_f hop_1_f_p) hop_2_g_p)
2398  (=> (and hop_1_g_i hop_1_i_a) hop_2_g_a)
2399  (=> (and hop_1_g_i hop_1_i_c) hop_2_g_c)
2400  (=> (and hop_1_g_i hop_1_i_b) hop_2_g_b)
2401  (=> (and hop_1_g_i hop_1_i_e) hop_2_g_e)
2402  (=> (and hop_1_g_i hop_1_i_d) hop_2_g_d)
2403  (=> (and hop_1_g_i hop_1_i_f) hop_2_g_f)
2404  (=> (and hop_1_g_i hop_1_i_h) hop_2_g_h)
2405  (=> (and hop_1_g_i hop_1_i_k) hop_2_g_k)
2406  (=> (and hop_1_g_i hop_1_i_j) hop_2_g_j)
2407  (=> (and hop_1_g_i hop_1_i_m) hop_2_g_m)
2408  (=> (and hop_1_g_i hop_1_i_l) hop_2_g_l)
2409  (=> (and hop_1_g_i hop_1_i_o) hop_2_g_o)
2410  (=> (and hop_1_g_i hop_1_i_n) hop_2_g_n)
2411  (=> (and hop_1_g_i hop_1_i_q) hop_2_g_q)
2412  (=> (and hop_1_g_i hop_1_i_p) hop_2_g_p)
2413  (=> (and hop_1_g_h hop_1_h_a) hop_2_g_a)
2414  (=> (and hop_1_g_h hop_1_h_c) hop_2_g_c)
2415  (=> (and hop_1_g_h hop_1_h_b) hop_2_g_b)
2416  (=> (and hop_1_g_h hop_1_h_e) hop_2_g_e)
2417  (=> (and hop_1_g_h hop_1_h_d) hop_2_g_d)
2418  (=> (and hop_1_g_h hop_1_h_f) hop_2_g_f)
2419  (=> (and hop_1_g_h hop_1_h_i) hop_2_g_i)
2420  (=> (and hop_1_g_h hop_1_h_k) hop_2_g_k)
2421  (=> (and hop_1_g_h hop_1_h_j) hop_2_g_j)
2422  (=> (and hop_1_g_h hop_1_h_m) hop_2_g_m)
2423  (=> (and hop_1_g_h hop_1_h_l) hop_2_g_l)
2424  (=> (and hop_1_g_h hop_1_h_o) hop_2_g_o)
2425  (=> (and hop_1_g_h hop_1_h_n) hop_2_g_n)
2426  (=> (and hop_1_g_h hop_1_h_q) hop_2_g_q)
2427  (=> (and hop_1_g_h hop_1_h_p) hop_2_g_p)
2428  (=> (and hop_1_g_k hop_1_k_a) hop_2_g_a)
2429  (=> (and hop_1_g_k hop_1_k_c) hop_2_g_c)
2430  (=> (and hop_1_g_k hop_1_k_b) hop_2_g_b)
2431  (=> (and hop_1_g_k hop_1_k_e) hop_2_g_e)
2432  (=> (and hop_1_g_k hop_1_k_d) hop_2_g_d)
2433  (=> (and hop_1_g_k hop_1_k_f) hop_2_g_f)
2434  (=> (and hop_1_g_k hop_1_k_i) hop_2_g_i)
2435  (=> (and hop_1_g_k hop_1_k_h) hop_2_g_h)
2436  (=> (and hop_1_g_k hop_1_k_j) hop_2_g_j)
2437  (=> (and hop_1_g_k hop_1_k_m) hop_2_g_m)
2438  (=> (and hop_1_g_k hop_1_k_l) hop_2_g_l)
2439  (=> (and hop_1_g_k hop_1_k_o) hop_2_g_o)
2440  (=> (and hop_1_g_k hop_1_k_n) hop_2_g_n)
2441  (=> (and hop_1_g_k hop_1_k_q) hop_2_g_q)
2442  (=> (and hop_1_g_k hop_1_k_p) hop_2_g_p)
2443  (=> (and hop_1_g_j hop_1_j_a) hop_2_g_a)
2444  (=> (and hop_1_g_j hop_1_j_c) hop_2_g_c)
2445  (=> (and hop_1_g_j hop_1_j_b) hop_2_g_b)
2446  (=> (and hop_1_g_j hop_1_j_e) hop_2_g_e)
2447  (=> (and hop_1_g_j hop_1_j_d) hop_2_g_d)
2448  (=> (and hop_1_g_j hop_1_j_f) hop_2_g_f)
2449  (=> (and hop_1_g_j hop_1_j_i) hop_2_g_i)
2450  (=> (and hop_1_g_j hop_1_j_h) hop_2_g_h)
2451  (=> (and hop_1_g_j hop_1_j_k) hop_2_g_k)
2452  (=> (and hop_1_g_j hop_1_j_m) hop_2_g_m)
2453  (=> (and hop_1_g_j hop_1_j_l) hop_2_g_l)
2454  (=> (and hop_1_g_j hop_1_j_o) hop_2_g_o)
2455  (=> (and hop_1_g_j hop_1_j_n) hop_2_g_n)
2456  (=> (and hop_1_g_j hop_1_j_q) hop_2_g_q)
2457  (=> (and hop_1_g_j hop_1_j_p) hop_2_g_p)
2458  (=> (and hop_1_g_m hop_1_m_a) hop_2_g_a)
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2459    (=> (and hop_1_g_m hop_1_m_c) hop_2_g_c)
2460    (=> (and hop_1_g_m hop_1_m_b) hop_2_g_b)
2461    (=> (and hop_1_g_m hop_1_m_e) hop_2_g_e)
2462    (=> (and hop_1_g_m hop_1_m_d) hop_2_g_d)
2463    (=> (and hop_1_g_m hop_1_m_f) hop_2_g_f)
2464    (=> (and hop_1_g_m hop_1_m_i) hop_2_g_i)
2465    (=> (and hop_1_g_m hop_1_m_h) hop_2_g_h)
2466    (=> (and hop_1_g_m hop_1_m_k) hop_2_g_k)
2467    (=> (and hop_1_g_m hop_1_m_j) hop_2_g_j)
2468    (=> (and hop_1_g_m hop_1_m_l) hop_2_g_l)
2469    (=> (and hop_1_g_m hop_1_m_o) hop_2_g_o)
2470    (=> (and hop_1_g_m hop_1_m_n) hop_2_g_n)
2471    (=> (and hop_1_g_m hop_1_m_q) hop_2_g_q)
2472    (=> (and hop_1_g_m hop_1_m_p) hop_2_g_p)
2473    (=> (and hop_1_g_l hop_1_l_a) hop_2_g_a)
2474    (=> (and hop_1_g_l hop_1_l_c) hop_2_g_c)
2475    (=> (and hop_1_g_l hop_1_l_b) hop_2_g_b)
2476    (=> (and hop_1_g_l hop_1_l_e) hop_2_g_e)
2477    (=> (and hop_1_g_l hop_1_l_d) hop_2_g_d)
2478    (=> (and hop_1_g_l hop_1_l_f) hop_2_g_f)
2479    (=> (and hop_1_g_l hop_1_l_i) hop_2_g_i)
2480    (=> (and hop_1_g_l hop_1_l_h) hop_2_g_h)
2481    (=> (and hop_1_g_l hop_1_l_k) hop_2_g_k)
2482    (=> (and hop_1_g_l hop_1_l_j) hop_2_g_j)
2483    (=> (and hop_1_g_l hop_1_l_m) hop_2_g_m)
2484    (=> (and hop_1_g_l hop_1_l_o) hop_2_g_o)
2485    (=> (and hop_1_g_l hop_1_l_n) hop_2_g_n)
2486    (=> (and hop_1_g_l hop_1_l_q) hop_2_g_q)
2487    (=> (and hop_1_g_l hop_1_l_p) hop_2_g_p)
2488    (=> (and hop_1_g_o hop_1_o_a) hop_2_g_a)
2489    (=> (and hop_1_g_o hop_1_o_c) hop_2_g_c)
2490    (=> (and hop_1_g_o hop_1_o_b) hop_2_g_b)
2491    (=> (and hop_1_g_o hop_1_o_e) hop_2_g_e)
2492    (=> (and hop_1_g_o hop_1_o_d) hop_2_g_d)
2493    (=> (and hop_1_g_o hop_1_o_f) hop_2_g_f)
2494    (=> (and hop_1_g_o hop_1_o_i) hop_2_g_i)
2495    (=> (and hop_1_g_o hop_1_o_h) hop_2_g_h)
2496    (=> (and hop_1_g_o hop_1_o_k) hop_2_g_k)
2497    (=> (and hop_1_g_o hop_1_o_j) hop_2_g_j)
2498    (=> (and hop_1_g_o hop_1_o_m) hop_2_g_m)
2499    (=> (and hop_1_g_o hop_1_o_l) hop_2_g_l)
2500    (=> (and hop_1_g_o hop_1_o_n) hop_2_g_n)
2501    (=> (and hop_1_g_o hop_1_o_q) hop_2_g_q)
2502    (=> (and hop_1_g_o hop_1_o_p) hop_2_g_p)
2503    (=> (and hop_1_g_n hop_1_n_a) hop_2_g_a)
2504    (=> (and hop_1_g_n hop_1_n_c) hop_2_g_c)
2505    (=> (and hop_1_g_n hop_1_n_b) hop_2_g_b)
2506    (=> (and hop_1_g_n hop_1_n_e) hop_2_g_e)
2507    (=> (and hop_1_g_n hop_1_n_d) hop_2_g_d)
2508    (=> (and hop_1_g_n hop_1_n_f) hop_2_g_f)
2509    (=> (and hop_1_g_n hop_1_n_i) hop_2_g_i)
2510    (=> (and hop_1_g_n hop_1_n_h) hop_2_g_h)
2511    (=> (and hop_1_g_n hop_1_n_k) hop_2_g_k)
2512    (=> (and hop_1_g_n hop_1_n_j) hop_2_g_j)
2513    (=> (and hop_1_g_n hop_1_n_m) hop_2_g_m)
2514    (=> (and hop_1_g_n hop_1_n_l) hop_2_g_l)
2515    (=> (and hop_1_g_n hop_1_n_o) hop_2_g_o)
2516    (=> (and hop_1_g_n hop_1_n_q) hop_2_g_q)
2517    (=> (and hop_1_g_n hop_1_n_p) hop_2_g_p)
2518    (=> (and hop_1_g_q hop_1_q_a) hop_2_g_a)
2519    (=> (and hop_1_g_q hop_1_q_c) hop_2_g_c)
2520    (=> (and hop_1_g_q hop_1_q_b) hop_2_g_b)
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2521   (=> (and hop_1_g_q hop_1_q_e) hop_2_g_e)
2522   (=> (and hop_1_g_q hop_1_q_d) hop_2_g_d)
2523   (=> (and hop_1_g_q hop_1_q_f) hop_2_g_f)
2524   (=> (and hop_1_g_q hop_1_q_i) hop_2_g_i)
2525   (=> (and hop_1_g_q hop_1_q_h) hop_2_g_h)
2526   (=> (and hop_1_g_q hop_1_q_k) hop_2_g_k)
2527   (=> (and hop_1_g_q hop_1_q_j) hop_2_g_j)
2528   (=> (and hop_1_g_q hop_1_q_m) hop_2_g_m)
2529   (=> (and hop_1_g_q hop_1_q_l) hop_2_g_l)
2530   (=> (and hop_1_g_q hop_1_q_o) hop_2_g_o)
2531   (=> (and hop_1_g_q hop_1_q_n) hop_2_g_n)
2532   (=> (and hop_1_g_q hop_1_q_p) hop_2_g_p)
2533   (=> (and hop_1_g_p hop_1_p_a) hop_2_g_a)
2534   (=> (and hop_1_g_p hop_1_p_c) hop_2_g_c)
2535   (=> (and hop_1_g_p hop_1_p_b) hop_2_g_b)
2536   (=> (and hop_1_g_p hop_1_p_e) hop_2_g_e)
2537   (=> (and hop_1_g_p hop_1_p_d) hop_2_g_d)
2538   (=> (and hop_1_g_p hop_1_p_f) hop_2_g_f)
2539   (=> (and hop_1_g_p hop_1_p_i) hop_2_g_i)
2540   (=> (and hop_1_g_p hop_1_p_h) hop_2_g_h)
2541   (=> (and hop_1_g_p hop_1_p_k) hop_2_g_k)
2542   (=> (and hop_1_g_p hop_1_p_j) hop_2_g_j)
2543   (=> (and hop_1_g_p hop_1_p_m) hop_2_g_m)
2544   (=> (and hop_1_g_p hop_1_p_l) hop_2_g_l)
2545   (=> (and hop_1_g_p hop_1_p_o) hop_2_g_o)
2546   (=> (and hop_1_g_p hop_1_p_n) hop_2_g_n)
2547   (=> (and hop_1_g_p hop_1_p_q) hop_2_g_q)
2548   (=> (and hop_1_f_a hop_1_a_c) hop_2_f_c)
2549   (=> (and hop_1_f_a hop_1_a_b) hop_2_f_b)
2550   (=> (and hop_1_f_a hop_1_a_e) hop_2_f_e)
2551   (=> (and hop_1_f_a hop_1_a_d) hop_2_f_d)
2552   (=> (and hop_1_f_a hop_1_a_g) hop_2_f_g)
2553   (=> (and hop_1_f_a hop_1_a_i) hop_2_f_i)
2554   (=> (and hop_1_f_a hop_1_a_h) hop_2_f_h)
2555   (=> (and hop_1_f_a hop_1_a_k) hop_2_f_k)
2556   (=> (and hop_1_f_a hop_1_a_j) hop_2_f_j)
2557   (=> (and hop_1_f_a hop_1_a_m) hop_2_f_m)
2558   (=> (and hop_1_f_a hop_1_a_l) hop_2_f_l)
2559   (=> (and hop_1_f_a hop_1_a_o) hop_2_f_o)
2560   (=> (and hop_1_f_a hop_1_a_n) hop_2_f_n)
2561   (=> (and hop_1_f_a hop_1_a_q) hop_2_f_q)
2562   (=> (and hop_1_f_a hop_1_a_p) hop_2_f_p)
2563   (=> (and hop_1_f_c hop_1_c_a) hop_2_f_a)
2564   (=> (and hop_1_f_c hop_1_c_b) hop_2_f_b)
2565   (=> (and hop_1_f_c hop_1_c_e) hop_2_f_e)
2566   (=> (and hop_1_f_c hop_1_c_d) hop_2_f_d)
2567   (=> (and hop_1_f_c hop_1_c_g) hop_2_f_g)
2568   (=> (and hop_1_f_c hop_1_c_i) hop_2_f_i)
2569   (=> (and hop_1_f_c hop_1_c_h) hop_2_f_h)
2570   (=> (and hop_1_f_c hop_1_c_k) hop_2_f_k)
2571   (=> (and hop_1_f_c hop_1_c_j) hop_2_f_j)
2572   (=> (and hop_1_f_c hop_1_c_m) hop_2_f_m)
2573   (=> (and hop_1_f_c hop_1_c_l) hop_2_f_l)
2574   (=> (and hop_1_f_c hop_1_c_o) hop_2_f_o)
2575   (=> (and hop_1_f_c hop_1_c_n) hop_2_f_n)
2576   (=> (and hop_1_f_c hop_1_c_q) hop_2_f_q)
2577   (=> (and hop_1_f_c hop_1_c_p) hop_2_f_p)
2578   (=> (and hop_1_f_b hop_1_b_a) hop_2_f_a)
2579   (=> (and hop_1_f_b hop_1_b_c) hop_2_f_c)
2580   (=> (and hop_1_f_b hop_1_b_e) hop_2_f_e)
2581   (=> (and hop_1_f_b hop_1_b_d) hop_2_f_d)
2582   (=> (and hop_1_f_b hop_1_b_g) hop_2_f_g)
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2583  (=> (and hop_1_f_b hop_1_b_i) hop_2_f_i)
2584  (=> (and hop_1_f_b hop_1_b_h) hop_2_f_h)
2585  (=> (and hop_1_f_b hop_1_b_k) hop_2_f_k)
2586  (=> (and hop_1_f_b hop_1_b_j) hop_2_f_j)
2587  (=> (and hop_1_f_b hop_1_b_m) hop_2_f_m)
2588  (=> (and hop_1_f_b hop_1_b_l) hop_2_f_l)
2589  (=> (and hop_1_f_b hop_1_b_o) hop_2_f_o)
2590  (=> (and hop_1_f_b hop_1_b_n) hop_2_f_n)
2591  (=> (and hop_1_f_b hop_1_b_q) hop_2_f_q)
2592  (=> (and hop_1_f_b hop_1_b_p) hop_2_f_p)
2593  (=> (and hop_1_f_e hop_1_e_a) hop_2_f_a)
2594  (=> (and hop_1_f_e hop_1_e_c) hop_2_f_c)
2595  (=> (and hop_1_f_e hop_1_e_b) hop_2_f_b)
2596  (=> (and hop_1_f_e hop_1_e_d) hop_2_f_d)
2597  (=> (and hop_1_f_e hop_1_e_g) hop_2_f_g)
2598  (=> (and hop_1_f_e hop_1_e_i) hop_2_f_i)
2599  (=> (and hop_1_f_e hop_1_e_h) hop_2_f_h)
2600  (=> (and hop_1_f_e hop_1_e_k) hop_2_f_k)
2601  (=> (and hop_1_f_e hop_1_e_j) hop_2_f_j)
2602  (=> (and hop_1_f_e hop_1_e_m) hop_2_f_m)
2603  (=> (and hop_1_f_e hop_1_e_l) hop_2_f_l)
2604  (=> (and hop_1_f_e hop_1_e_o) hop_2_f_o)
2605  (=> (and hop_1_f_e hop_1_e_n) hop_2_f_n)
2606  (=> (and hop_1_f_e hop_1_e_q) hop_2_f_q)
2607  (=> (and hop_1_f_e hop_1_e_p) hop_2_f_p)
2608  (=> (and hop_1_f_d hop_1_d_a) hop_2_f_a)
2609  (=> (and hop_1_f_d hop_1_d_c) hop_2_f_c)
2610  (=> (and hop_1_f_d hop_1_d_b) hop_2_f_b)
2611  (=> (and hop_1_f_d hop_1_d_e) hop_2_f_e)
2612  (=> (and hop_1_f_d hop_1_d_g) hop_2_f_g)
2613  (=> (and hop_1_f_d hop_1_d_i) hop_2_f_i)
2614  (=> (and hop_1_f_d hop_1_d_h) hop_2_f_h)
2615  (=> (and hop_1_f_d hop_1_d_k) hop_2_f_k)
2616  (=> (and hop_1_f_d hop_1_d_j) hop_2_f_j)
2617  (=> (and hop_1_f_d hop_1_d_m) hop_2_f_m)
2618  (=> (and hop_1_f_d hop_1_d_l) hop_2_f_l)
2619  (=> (and hop_1_f_d hop_1_d_o) hop_2_f_o)
2620  (=> (and hop_1_f_d hop_1_d_n) hop_2_f_n)
2621  (=> (and hop_1_f_d hop_1_d_q) hop_2_f_q)
2622  (=> (and hop_1_f_d hop_1_d_p) hop_2_f_p)
2623  (=> (and hop_1_f_g hop_1_g_a) hop_2_f_a)
2624  (=> (and hop_1_f_g hop_1_g_c) hop_2_f_c)
2625  (=> (and hop_1_f_g hop_1_g_b) hop_2_f_b)
2626  (=> (and hop_1_f_g hop_1_g_e) hop_2_f_e)
2627  (=> (and hop_1_f_g hop_1_g_d) hop_2_f_d)
2628  (=> (and hop_1_f_g hop_1_g_i) hop_2_f_i)
2629  (=> (and hop_1_f_g hop_1_g_h) hop_2_f_h)
2630  (=> (and hop_1_f_g hop_1_g_k) hop_2_f_k)
2631  (=> (and hop_1_f_g hop_1_g_j) hop_2_f_j)
2632  (=> (and hop_1_f_g hop_1_g_m) hop_2_f_m)
2633  (=> (and hop_1_f_g hop_1_g_l) hop_2_f_l)
2634  (=> (and hop_1_f_g hop_1_g_o) hop_2_f_o)
2635  (=> (and hop_1_f_g hop_1_g_n) hop_2_f_n)
2636  (=> (and hop_1_f_g hop_1_g_q) hop_2_f_q)
2637  (=> (and hop_1_f_g hop_1_g_p) hop_2_f_p)
2638  (=> (and hop_1_f_i hop_1_i_a) hop_2_f_a)
2639  (=> (and hop_1_f_i hop_1_i_c) hop_2_f_c)
2640  (=> (and hop_1_f_i hop_1_i_b) hop_2_f_b)
2641  (=> (and hop_1_f_i hop_1_i_e) hop_2_f_e)
2642  (=> (and hop_1_f_i hop_1_i_d) hop_2_f_d)
2643  (=> (and hop_1_f_i hop_1_i_g) hop_2_f_g)
2644  (=> (and hop_1_f_i hop_1_i_h) hop_2_f_h)
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2645  (=> (and hop_1_f_i hop_1_i_k) hop_2_f_k)
2646  (=> (and hop_1_f_i hop_1_i_j) hop_2_f_j)
2647  (=> (and hop_1_f_i hop_1_i_m) hop_2_f_m)
2648  (=> (and hop_1_f_i hop_1_i_l) hop_2_f_l)
2649  (=> (and hop_1_f_i hop_1_i_o) hop_2_f_o)
2650  (=> (and hop_1_f_i hop_1_i_n) hop_2_f_n)
2651  (=> (and hop_1_f_i hop_1_i_q) hop_2_f_q)
2652  (=> (and hop_1_f_i hop_1_i_p) hop_2_f_p)
2653  (=> (and hop_1_f_h hop_1_h_a) hop_2_f_a)
2654  (=> (and hop_1_f_h hop_1_h_c) hop_2_f_c)
2655  (=> (and hop_1_f_h hop_1_h_b) hop_2_f_b)
2656  (=> (and hop_1_f_h hop_1_h_e) hop_2_f_e)
2657  (=> (and hop_1_f_h hop_1_h_d) hop_2_f_d)
2658  (=> (and hop_1_f_h hop_1_h_g) hop_2_f_g)
2659  (=> (and hop_1_f_h hop_1_h_i) hop_2_f_i)
2660  (=> (and hop_1_f_h hop_1_h_k) hop_2_f_k)
2661  (=> (and hop_1_f_h hop_1_h_j) hop_2_f_j)
2662  (=> (and hop_1_f_h hop_1_h_m) hop_2_f_m)
2663  (=> (and hop_1_f_h hop_1_h_l) hop_2_f_l)
2664  (=> (and hop_1_f_h hop_1_h_o) hop_2_f_o)
2665  (=> (and hop_1_f_h hop_1_h_n) hop_2_f_n)
2666  (=> (and hop_1_f_h hop_1_h_q) hop_2_f_q)
2667  (=> (and hop_1_f_h hop_1_h_p) hop_2_f_p)
2668  (=> (and hop_1_f_k hop_1_k_a) hop_2_f_a)
2669  (=> (and hop_1_f_k hop_1_k_c) hop_2_f_c)
2670  (=> (and hop_1_f_k hop_1_k_b) hop_2_f_b)
2671  (=> (and hop_1_f_k hop_1_k_e) hop_2_f_e)
2672  (=> (and hop_1_f_k hop_1_k_d) hop_2_f_d)
2673  (=> (and hop_1_f_k hop_1_k_g) hop_2_f_g)
2674  (=> (and hop_1_f_k hop_1_k_i) hop_2_f_i)
2675  (=> (and hop_1_f_k hop_1_k_h) hop_2_f_h)
2676  (=> (and hop_1_f_k hop_1_k_j) hop_2_f_j)
2677  (=> (and hop_1_f_k hop_1_k_m) hop_2_f_m)
2678  (=> (and hop_1_f_k hop_1_k_l) hop_2_f_l)
2679  (=> (and hop_1_f_k hop_1_k_o) hop_2_f_o)
2680  (=> (and hop_1_f_k hop_1_k_n) hop_2_f_n)
2681  (=> (and hop_1_f_k hop_1_k_q) hop_2_f_q)
2682  (=> (and hop_1_f_k hop_1_k_p) hop_2_f_p)
2683  (=> (and hop_1_f_j hop_1_j_a) hop_2_f_a)
2684  (=> (and hop_1_f_j hop_1_j_c) hop_2_f_c)
2685  (=> (and hop_1_f_j hop_1_j_b) hop_2_f_b)
2686  (=> (and hop_1_f_j hop_1_j_e) hop_2_f_e)
2687  (=> (and hop_1_f_j hop_1_j_d) hop_2_f_d)
2688  (=> (and hop_1_f_j hop_1_j_g) hop_2_f_g)
2689  (=> (and hop_1_f_j hop_1_j_i) hop_2_f_i)
2690  (=> (and hop_1_f_j hop_1_j_h) hop_2_f_h)
2691  (=> (and hop_1_f_j hop_1_j_k) hop_2_f_k)
2692  (=> (and hop_1_f_j hop_1_j_m) hop_2_f_m)
2693  (=> (and hop_1_f_j hop_1_j_l) hop_2_f_l)
2694  (=> (and hop_1_f_j hop_1_j_o) hop_2_f_o)
2695  (=> (and hop_1_f_j hop_1_j_n) hop_2_f_n)
2696  (=> (and hop_1_f_j hop_1_j_q) hop_2_f_q)
2697  (=> (and hop_1_f_j hop_1_j_p) hop_2_f_p)
2698  (=> (and hop_1_f_m hop_1_m_a) hop_2_f_a)
2699  (=> (and hop_1_f_m hop_1_m_c) hop_2_f_c)
2700  (=> (and hop_1_f_m hop_1_m_b) hop_2_f_b)
2701  (=> (and hop_1_f_m hop_1_m_e) hop_2_f_e)
2702  (=> (and hop_1_f_m hop_1_m_d) hop_2_f_d)
2703  (=> (and hop_1_f_m hop_1_m_g) hop_2_f_g)
2704  (=> (and hop_1_f_m hop_1_m_i) hop_2_f_i)
2705  (=> (and hop_1_f_m hop_1_m_h) hop_2_f_h)
2706  (=> (and hop_1_f_m hop_1_m_k) hop_2_f_k)
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2707   (=> (and hop_1_f_m hop_1_m_j) hop_2_f_j)
2708   (=> (and hop_1_f_m hop_1_m_l) hop_2_f_l)
2709   (=> (and hop_1_f_m hop_1_m_o) hop_2_f_o)
2710   (=> (and hop_1_f_m hop_1_m_n) hop_2_f_n)
2711   (=> (and hop_1_f_m hop_1_m_q) hop_2_f_q)
2712   (=> (and hop_1_f_m hop_1_m_p) hop_2_f_p)
2713   (=> (and hop_1_f_l hop_1_l_a) hop_2_f_a)
2714   (=> (and hop_1_f_l hop_1_l_c) hop_2_f_c)
2715   (=> (and hop_1_f_l hop_1_l_b) hop_2_f_b)
2716   (=> (and hop_1_f_l hop_1_l_e) hop_2_f_e)
2717   (=> (and hop_1_f_l hop_1_l_d) hop_2_f_d)
2718   (=> (and hop_1_f_l hop_1_l_g) hop_2_f_g)
2719   (=> (and hop_1_f_l hop_1_l_i) hop_2_f_i)
2720   (=> (and hop_1_f_l hop_1_l_h) hop_2_f_h)
2721   (=> (and hop_1_f_l hop_1_l_k) hop_2_f_k)
2722   (=> (and hop_1_f_l hop_1_l_j) hop_2_f_j)
2723   (=> (and hop_1_f_l hop_1_l_m) hop_2_f_m)
2724   (=> (and hop_1_f_l hop_1_l_o) hop_2_f_o)
2725   (=> (and hop_1_f_l hop_1_l_n) hop_2_f_n)
2726   (=> (and hop_1_f_l hop_1_l_q) hop_2_f_q)
2727   (=> (and hop_1_f_l hop_1_l_p) hop_2_f_p)
2728   (=> (and hop_1_f_o hop_1_o_a) hop_2_f_a)
2729   (=> (and hop_1_f_o hop_1_o_c) hop_2_f_c)
2730   (=> (and hop_1_f_o hop_1_o_b) hop_2_f_b)
2731   (=> (and hop_1_f_o hop_1_o_e) hop_2_f_e)
2732   (=> (and hop_1_f_o hop_1_o_d) hop_2_f_d)
2733   (=> (and hop_1_f_o hop_1_o_g) hop_2_f_g)
2734   (=> (and hop_1_f_o hop_1_o_i) hop_2_f_i)
2735   (=> (and hop_1_f_o hop_1_o_h) hop_2_f_h)
2736   (=> (and hop_1_f_o hop_1_o_k) hop_2_f_k)
2737   (=> (and hop_1_f_o hop_1_o_j) hop_2_f_j)
2738   (=> (and hop_1_f_o hop_1_o_m) hop_2_f_m)
2739   (=> (and hop_1_f_o hop_1_o_l) hop_2_f_l)
2740   (=> (and hop_1_f_o hop_1_o_n) hop_2_f_n)
2741   (=> (and hop_1_f_o hop_1_o_q) hop_2_f_q)
2742   (=> (and hop_1_f_o hop_1_o_p) hop_2_f_p)
2743   (=> (and hop_1_f_n hop_1_n_a) hop_2_f_a)
2744   (=> (and hop_1_f_n hop_1_n_c) hop_2_f_c)
2745   (=> (and hop_1_f_n hop_1_n_b) hop_2_f_b)
2746   (=> (and hop_1_f_n hop_1_n_e) hop_2_f_e)
2747   (=> (and hop_1_f_n hop_1_n_d) hop_2_f_d)
2748   (=> (and hop_1_f_n hop_1_n_g) hop_2_f_g)
2749   (=> (and hop_1_f_n hop_1_n_i) hop_2_f_i)
2750   (=> (and hop_1_f_n hop_1_n_h) hop_2_f_h)
2751   (=> (and hop_1_f_n hop_1_n_k) hop_2_f_k)
2752   (=> (and hop_1_f_n hop_1_n_j) hop_2_f_j)
2753   (=> (and hop_1_f_n hop_1_n_m) hop_2_f_m)
2754   (=> (and hop_1_f_n hop_1_n_l) hop_2_f_l)
2755   (=> (and hop_1_f_n hop_1_n_o) hop_2_f_o)
2756   (=> (and hop_1_f_n hop_1_n_q) hop_2_f_q)
2757   (=> (and hop_1_f_n hop_1_n_p) hop_2_f_p)
2758   (=> (and hop_1_f_q hop_1_q_a) hop_2_f_a)
2759   (=> (and hop_1_f_q hop_1_q_c) hop_2_f_c)
2760   (=> (and hop_1_f_q hop_1_q_b) hop_2_f_b)
2761   (=> (and hop_1_f_q hop_1_q_e) hop_2_f_e)
2762   (=> (and hop_1_f_q hop_1_q_d) hop_2_f_d)
2763   (=> (and hop_1_f_q hop_1_q_g) hop_2_f_g)
2764   (=> (and hop_1_f_q hop_1_q_i) hop_2_f_i)
2765   (=> (and hop_1_f_q hop_1_q_h) hop_2_f_h)
2766   (=> (and hop_1_f_q hop_1_q_k) hop_2_f_k)
2767   (=> (and hop_1_f_q hop_1_q_j) hop_2_f_j)
2768   (=> (and hop_1_f_q hop_1_q_m) hop_2_f_m)
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2769  (=> (and hop_1_f_q hop_1_q_l) hop_2_f_l)
2770  (=> (and hop_1_f_q hop_1_q_o) hop_2_f_o)
2771  (=> (and hop_1_f_q hop_1_q_n) hop_2_f_n)
2772  (=> (and hop_1_f_q hop_1_q_p) hop_2_f_p)
2773  (=> (and hop_1_f_p hop_1_p_a) hop_2_f_a)
2774  (=> (and hop_1_f_p hop_1_p_c) hop_2_f_c)
2775  (=> (and hop_1_f_p hop_1_p_b) hop_2_f_b)
2776  (=> (and hop_1_f_p hop_1_p_e) hop_2_f_e)
2777  (=> (and hop_1_f_p hop_1_p_d) hop_2_f_d)
2778  (=> (and hop_1_f_p hop_1_p_g) hop_2_f_g)
2779  (=> (and hop_1_f_p hop_1_p_i) hop_2_f_i)
2780  (=> (and hop_1_f_p hop_1_p_h) hop_2_f_h)
2781  (=> (and hop_1_f_p hop_1_p_k) hop_2_f_k)
2782  (=> (and hop_1_f_p hop_1_p_j) hop_2_f_j)
2783  (=> (and hop_1_f_p hop_1_p_m) hop_2_f_m)
2784  (=> (and hop_1_f_p hop_1_p_l) hop_2_f_l)
2785  (=> (and hop_1_f_p hop_1_p_o) hop_2_f_o)
2786  (=> (and hop_1_f_p hop_1_p_n) hop_2_f_n)
2787  (=> (and hop_1_f_p hop_1_p_q) hop_2_f_q)
2788  (=> (and hop_1_i_a hop_1_a_c) hop_2_i_c)
2789  (=> (and hop_1_i_a hop_1_a_b) hop_2_i_b)
2790  (=> (and hop_1_i_a hop_1_a_e) hop_2_i_e)
2791  (=> (and hop_1_i_a hop_1_a_d) hop_2_i_d)
2792  (=> (and hop_1_i_a hop_1_a_g) hop_2_i_g)
2793  (=> (and hop_1_i_a hop_1_a_f) hop_2_i_f)
2794  (=> (and hop_1_i_a hop_1_a_h) hop_2_i_h)
2795  (=> (and hop_1_i_a hop_1_a_k) hop_2_i_k)
2796  (=> (and hop_1_i_a hop_1_a_j) hop_2_i_j)
2797  (=> (and hop_1_i_a hop_1_a_m) hop_2_i_m)
2798  (=> (and hop_1_i_a hop_1_a_l) hop_2_i_l)
2799  (=> (and hop_1_i_a hop_1_a_o) hop_2_i_o)
2800  (=> (and hop_1_i_a hop_1_a_n) hop_2_i_n)
2801  (=> (and hop_1_i_a hop_1_a_q) hop_2_i_q)
2802  (=> (and hop_1_i_a hop_1_a_p) hop_2_i_p)
2803  (=> (and hop_1_i_c hop_1_c_a) hop_2_i_a)
2804  (=> (and hop_1_i_c hop_1_c_b) hop_2_i_b)
2805  (=> (and hop_1_i_c hop_1_c_e) hop_2_i_e)
2806  (=> (and hop_1_i_c hop_1_c_d) hop_2_i_d)
2807  (=> (and hop_1_i_c hop_1_c_g) hop_2_i_g)
2808  (=> (and hop_1_i_c hop_1_c_f) hop_2_i_f)
2809  (=> (and hop_1_i_c hop_1_c_h) hop_2_i_h)
2810  (=> (and hop_1_i_c hop_1_c_k) hop_2_i_k)
2811  (=> (and hop_1_i_c hop_1_c_j) hop_2_i_j)
2812  (=> (and hop_1_i_c hop_1_c_m) hop_2_i_m)
2813  (=> (and hop_1_i_c hop_1_c_l) hop_2_i_l)
2814  (=> (and hop_1_i_c hop_1_c_o) hop_2_i_o)
2815  (=> (and hop_1_i_c hop_1_c_n) hop_2_i_n)
2816  (=> (and hop_1_i_c hop_1_c_q) hop_2_i_q)
2817  (=> (and hop_1_i_c hop_1_c_p) hop_2_i_p)
2818  (=> (and hop_1_i_b hop_1_b_a) hop_2_i_a)
2819  (=> (and hop_1_i_b hop_1_b_c) hop_2_i_c)
2820  (=> (and hop_1_i_b hop_1_b_e) hop_2_i_e)
2821  (=> (and hop_1_i_b hop_1_b_d) hop_2_i_d)
2822  (=> (and hop_1_i_b hop_1_b_g) hop_2_i_g)
2823  (=> (and hop_1_i_b hop_1_b_f) hop_2_i_f)
2824  (=> (and hop_1_i_b hop_1_b_h) hop_2_i_h)
2825  (=> (and hop_1_i_b hop_1_b_k) hop_2_i_k)
2826  (=> (and hop_1_i_b hop_1_b_j) hop_2_i_j)
2827  (=> (and hop_1_i_b hop_1_b_m) hop_2_i_m)
2828  (=> (and hop_1_i_b hop_1_b_l) hop_2_i_l)
2829  (=> (and hop_1_i_b hop_1_b_o) hop_2_i_o)
2830  (=> (and hop_1_i_b hop_1_b_n) hop_2_i_n)
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2831  (=> (and hop_1_i_b hop_1_b_q) hop_2_i_q)
2832  (=> (and hop_1_i_b hop_1_b_p) hop_2_i_p)
2833  (=> (and hop_1_i_e hop_1_e_a) hop_2_i_a)
2834  (=> (and hop_1_i_e hop_1_e_c) hop_2_i_c)
2835  (=> (and hop_1_i_e hop_1_e_b) hop_2_i_b)
2836  (=> (and hop_1_i_e hop_1_e_d) hop_2_i_d)
2837  (=> (and hop_1_i_e hop_1_e_g) hop_2_i_g)
2838  (=> (and hop_1_i_e hop_1_e_f) hop_2_i_f)
2839  (=> (and hop_1_i_e hop_1_e_h) hop_2_i_h)
2840  (=> (and hop_1_i_e hop_1_e_k) hop_2_i_k)
2841  (=> (and hop_1_i_e hop_1_e_j) hop_2_i_j)
2842  (=> (and hop_1_i_e hop_1_e_m) hop_2_i_m)
2843  (=> (and hop_1_i_e hop_1_e_l) hop_2_i_l)
2844  (=> (and hop_1_i_e hop_1_e_o) hop_2_i_o)
2845  (=> (and hop_1_i_e hop_1_e_n) hop_2_i_n)
2846  (=> (and hop_1_i_e hop_1_e_q) hop_2_i_q)
2847  (=> (and hop_1_i_e hop_1_e_p) hop_2_i_p)
2848  (=> (and hop_1_i_d hop_1_d_a) hop_2_i_a)
2849  (=> (and hop_1_i_d hop_1_d_c) hop_2_i_c)
2850  (=> (and hop_1_i_d hop_1_d_b) hop_2_i_b)
2851  (=> (and hop_1_i_d hop_1_d_e) hop_2_i_e)
2852  (=> (and hop_1_i_d hop_1_d_g) hop_2_i_g)
2853  (=> (and hop_1_i_d hop_1_d_f) hop_2_i_f)
2854  (=> (and hop_1_i_d hop_1_d_h) hop_2_i_h)
2855  (=> (and hop_1_i_d hop_1_d_k) hop_2_i_k)
2856  (=> (and hop_1_i_d hop_1_d_j) hop_2_i_j)
2857  (=> (and hop_1_i_d hop_1_d_m) hop_2_i_m)
2858  (=> (and hop_1_i_d hop_1_d_l) hop_2_i_l)
2859  (=> (and hop_1_i_d hop_1_d_o) hop_2_i_o)
2860  (=> (and hop_1_i_d hop_1_d_n) hop_2_i_n)
2861  (=> (and hop_1_i_d hop_1_d_q) hop_2_i_q)
2862  (=> (and hop_1_i_d hop_1_d_p) hop_2_i_p)
2863  (=> (and hop_1_i_g hop_1_g_a) hop_2_i_a)
2864  (=> (and hop_1_i_g hop_1_g_c) hop_2_i_c)
2865  (=> (and hop_1_i_g hop_1_g_b) hop_2_i_b)
2866  (=> (and hop_1_i_g hop_1_g_e) hop_2_i_e)
2867  (=> (and hop_1_i_g hop_1_g_d) hop_2_i_d)
2868  (=> (and hop_1_i_g hop_1_g_f) hop_2_i_f)
2869  (=> (and hop_1_i_g hop_1_g_h) hop_2_i_h)
2870  (=> (and hop_1_i_g hop_1_g_k) hop_2_i_k)
2871  (=> (and hop_1_i_g hop_1_g_j) hop_2_i_j)
2872  (=> (and hop_1_i_g hop_1_g_m) hop_2_i_m)
2873  (=> (and hop_1_i_g hop_1_g_l) hop_2_i_l)
2874  (=> (and hop_1_i_g hop_1_g_o) hop_2_i_o)
2875  (=> (and hop_1_i_g hop_1_g_n) hop_2_i_n)
2876  (=> (and hop_1_i_g hop_1_g_q) hop_2_i_q)
2877  (=> (and hop_1_i_g hop_1_g_p) hop_2_i_p)
2878  (=> (and hop_1_i_f hop_1_f_a) hop_2_i_a)
2879  (=> (and hop_1_i_f hop_1_f_c) hop_2_i_c)
2880  (=> (and hop_1_i_f hop_1_f_b) hop_2_i_b)
2881  (=> (and hop_1_i_f hop_1_f_e) hop_2_i_e)
2882  (=> (and hop_1_i_f hop_1_f_d) hop_2_i_d)
2883  (=> (and hop_1_i_f hop_1_f_g) hop_2_i_g)
2884  (=> (and hop_1_i_f hop_1_f_h) hop_2_i_h)
2885  (=> (and hop_1_i_f hop_1_f_k) hop_2_i_k)
2886  (=> (and hop_1_i_f hop_1_f_j) hop_2_i_j)
2887  (=> (and hop_1_i_f hop_1_f_m) hop_2_i_m)
2888  (=> (and hop_1_i_f hop_1_f_l) hop_2_i_l)
2889  (=> (and hop_1_i_f hop_1_f_o) hop_2_i_o)
2890  (=> (and hop_1_i_f hop_1_f_n) hop_2_i_n)
2891  (=> (and hop_1_i_f hop_1_f_q) hop_2_i_q)
2892  (=> (and hop_1_i_f hop_1_f_p) hop_2_i_p)
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2893  (=> (and hop_1_i_h hop_1_h_a) hop_2_i_a)
2894  (=> (and hop_1_i_h hop_1_h_c) hop_2_i_c)
2895  (=> (and hop_1_i_h hop_1_h_b) hop_2_i_b)
2896  (=> (and hop_1_i_h hop_1_h_e) hop_2_i_e)
2897  (=> (and hop_1_i_h hop_1_h_d) hop_2_i_d)
2898  (=> (and hop_1_i_h hop_1_h_g) hop_2_i_g)
2899  (=> (and hop_1_i_h hop_1_h_f) hop_2_i_f)
2900  (=> (and hop_1_i_h hop_1_h_k) hop_2_i_k)
2901  (=> (and hop_1_i_h hop_1_h_j) hop_2_i_j)
2902  (=> (and hop_1_i_h hop_1_h_m) hop_2_i_m)
2903  (=> (and hop_1_i_h hop_1_h_l) hop_2_i_l)
2904  (=> (and hop_1_i_h hop_1_h_o) hop_2_i_o)
2905  (=> (and hop_1_i_h hop_1_h_n) hop_2_i_n)
2906  (=> (and hop_1_i_h hop_1_h_q) hop_2_i_q)
2907  (=> (and hop_1_i_h hop_1_h_p) hop_2_i_p)
2908  (=> (and hop_1_i_k hop_1_k_a) hop_2_i_a)
2909  (=> (and hop_1_i_k hop_1_k_c) hop_2_i_c)
2910  (=> (and hop_1_i_k hop_1_k_b) hop_2_i_b)
2911  (=> (and hop_1_i_k hop_1_k_e) hop_2_i_e)
2912  (=> (and hop_1_i_k hop_1_k_d) hop_2_i_d)
2913  (=> (and hop_1_i_k hop_1_k_g) hop_2_i_g)
2914  (=> (and hop_1_i_k hop_1_k_f) hop_2_i_f)
2915  (=> (and hop_1_i_k hop_1_k_h) hop_2_i_h)
2916  (=> (and hop_1_i_k hop_1_k_j) hop_2_i_j)
2917  (=> (and hop_1_i_k hop_1_k_m) hop_2_i_m)
2918  (=> (and hop_1_i_k hop_1_k_l) hop_2_i_l)
2919  (=> (and hop_1_i_k hop_1_k_o) hop_2_i_o)
2920  (=> (and hop_1_i_k hop_1_k_n) hop_2_i_n)
2921  (=> (and hop_1_i_k hop_1_k_q) hop_2_i_q)
2922  (=> (and hop_1_i_k hop_1_k_p) hop_2_i_p)
2923  (=> (and hop_1_i_j hop_1_j_a) hop_2_i_a)
2924  (=> (and hop_1_i_j hop_1_j_c) hop_2_i_c)
2925  (=> (and hop_1_i_j hop_1_j_b) hop_2_i_b)
2926  (=> (and hop_1_i_j hop_1_j_e) hop_2_i_e)
2927  (=> (and hop_1_i_j hop_1_j_d) hop_2_i_d)
2928  (=> (and hop_1_i_j hop_1_j_g) hop_2_i_g)
2929  (=> (and hop_1_i_j hop_1_j_f) hop_2_i_f)
2930  (=> (and hop_1_i_j hop_1_j_h) hop_2_i_h)
2931  (=> (and hop_1_i_j hop_1_j_k) hop_2_i_k)
2932  (=> (and hop_1_i_j hop_1_j_m) hop_2_i_m)
2933  (=> (and hop_1_i_j hop_1_j_l) hop_2_i_l)
2934  (=> (and hop_1_i_j hop_1_j_o) hop_2_i_o)
2935  (=> (and hop_1_i_j hop_1_j_n) hop_2_i_n)
2936  (=> (and hop_1_i_j hop_1_j_q) hop_2_i_q)
2937  (=> (and hop_1_i_j hop_1_j_p) hop_2_i_p)
2938  (=> (and hop_1_i_m hop_1_m_a) hop_2_i_a)
2939  (=> (and hop_1_i_m hop_1_m_c) hop_2_i_c)
2940  (=> (and hop_1_i_m hop_1_m_b) hop_2_i_b)
2941  (=> (and hop_1_i_m hop_1_m_e) hop_2_i_e)
2942  (=> (and hop_1_i_m hop_1_m_d) hop_2_i_d)
2943  (=> (and hop_1_i_m hop_1_m_g) hop_2_i_g)
2944  (=> (and hop_1_i_m hop_1_m_f) hop_2_i_f)
2945  (=> (and hop_1_i_m hop_1_m_h) hop_2_i_h)
2946  (=> (and hop_1_i_m hop_1_m_k) hop_2_i_k)
2947  (=> (and hop_1_i_m hop_1_m_j) hop_2_i_j)
2948  (=> (and hop_1_i_m hop_1_m_l) hop_2_i_l)
2949  (=> (and hop_1_i_m hop_1_m_o) hop_2_i_o)
2950  (=> (and hop_1_i_m hop_1_m_n) hop_2_i_n)
2951  (=> (and hop_1_i_m hop_1_m_q) hop_2_i_q)
2952  (=> (and hop_1_i_m hop_1_m_p) hop_2_i_p)
2953  (=> (and hop_1_i_l hop_1_l_a) hop_2_i_a)
2954  (=> (and hop_1_i_l hop_1_l_c) hop_2_i_c)
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2955  (=> (and hop_1_i_l hop_1_l_b) hop_2_i_b)
2956  (=> (and hop_1_i_l hop_1_l_e) hop_2_i_e)
2957  (=> (and hop_1_i_l hop_1_l_d) hop_2_i_d)
2958  (=> (and hop_1_i_l hop_1_l_g) hop_2_i_g)
2959  (=> (and hop_1_i_l hop_1_l_f) hop_2_i_f)
2960  (=> (and hop_1_i_l hop_1_l_h) hop_2_i_h)
2961  (=> (and hop_1_i_l hop_1_l_k) hop_2_i_k)
2962  (=> (and hop_1_i_l hop_1_l_j) hop_2_i_j)
2963  (=> (and hop_1_i_l hop_1_l_m) hop_2_i_m)
2964  (=> (and hop_1_i_l hop_1_l_o) hop_2_i_o)
2965  (=> (and hop_1_i_l hop_1_l_n) hop_2_i_n)
2966  (=> (and hop_1_i_l hop_1_l_q) hop_2_i_q)
2967  (=> (and hop_1_i_l hop_1_l_p) hop_2_i_p)
2968  (=> (and hop_1_i_o hop_1_o_a) hop_2_i_a)
2969  (=> (and hop_1_i_o hop_1_o_c) hop_2_i_c)
2970  (=> (and hop_1_i_o hop_1_o_b) hop_2_i_b)
2971  (=> (and hop_1_i_o hop_1_o_e) hop_2_i_e)
2972  (=> (and hop_1_i_o hop_1_o_d) hop_2_i_d)
2973  (=> (and hop_1_i_o hop_1_o_g) hop_2_i_g)
2974  (=> (and hop_1_i_o hop_1_o_f) hop_2_i_f)
2975  (=> (and hop_1_i_o hop_1_o_h) hop_2_i_h)
2976  (=> (and hop_1_i_o hop_1_o_k) hop_2_i_k)
2977  (=> (and hop_1_i_o hop_1_o_j) hop_2_i_j)
2978  (=> (and hop_1_i_o hop_1_o_m) hop_2_i_m)
2979  (=> (and hop_1_i_o hop_1_o_l) hop_2_i_l)
2980  (=> (and hop_1_i_o hop_1_o_n) hop_2_i_n)
2981  (=> (and hop_1_i_o hop_1_o_q) hop_2_i_q)
2982  (=> (and hop_1_i_o hop_1_o_p) hop_2_i_p)
2983  (=> (and hop_1_i_n hop_1_n_a) hop_2_i_a)
2984  (=> (and hop_1_i_n hop_1_n_c) hop_2_i_c)
2985  (=> (and hop_1_i_n hop_1_n_b) hop_2_i_b)
2986  (=> (and hop_1_i_n hop_1_n_e) hop_2_i_e)
2987  (=> (and hop_1_i_n hop_1_n_d) hop_2_i_d)
2988  (=> (and hop_1_i_n hop_1_n_g) hop_2_i_g)
2989  (=> (and hop_1_i_n hop_1_n_f) hop_2_i_f)
2990  (=> (and hop_1_i_n hop_1_n_h) hop_2_i_h)
2991  (=> (and hop_1_i_n hop_1_n_k) hop_2_i_k)
2992  (=> (and hop_1_i_n hop_1_n_j) hop_2_i_j)
2993  (=> (and hop_1_i_n hop_1_n_m) hop_2_i_m)
2994  (=> (and hop_1_i_n hop_1_n_l) hop_2_i_l)
2995  (=> (and hop_1_i_n hop_1_n_o) hop_2_i_o)
2996  (=> (and hop_1_i_n hop_1_n_q) hop_2_i_q)
2997  (=> (and hop_1_i_n hop_1_n_p) hop_2_i_p)
2998  (=> (and hop_1_i_q hop_1_q_a) hop_2_i_a)
2999  (=> (and hop_1_i_q hop_1_q_c) hop_2_i_c)
3000  (=> (and hop_1_i_q hop_1_q_b) hop_2_i_b)
3001  (=> (and hop_1_i_q hop_1_q_e) hop_2_i_e)
3002  (=> (and hop_1_i_q hop_1_q_d) hop_2_i_d)
3003  (=> (and hop_1_i_q hop_1_q_g) hop_2_i_g)
3004  (=> (and hop_1_i_q hop_1_q_f) hop_2_i_f)
3005  (=> (and hop_1_i_q hop_1_q_h) hop_2_i_h)
3006  (=> (and hop_1_i_q hop_1_q_k) hop_2_i_k)
3007  (=> (and hop_1_i_q hop_1_q_j) hop_2_i_j)
3008  (=> (and hop_1_i_q hop_1_q_m) hop_2_i_m)
3009  (=> (and hop_1_i_q hop_1_q_l) hop_2_i_l)
3010  (=> (and hop_1_i_q hop_1_q_o) hop_2_i_o)
3011  (=> (and hop_1_i_q hop_1_q_n) hop_2_i_n)
3012  (=> (and hop_1_i_q hop_1_q_p) hop_2_i_p)
3013  (=> (and hop_1_i_p hop_1_p_a) hop_2_i_a)
3014  (=> (and hop_1_i_p hop_1_p_c) hop_2_i_c)
3015  (=> (and hop_1_i_p hop_1_p_b) hop_2_i_b)
3016  (=> (and hop_1_i_p hop_1_p_e) hop_2_i_e)
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```
3017  (=> (and hop_1_i_p hop_1_p_d) hop_2_i_d)
3018  (=> (and hop_1_i_p hop_1_p_g) hop_2_i_g)
3019  (=> (and hop_1_i_p hop_1_p_f) hop_2_i_f)
3020  (=> (and hop_1_i_p hop_1_p_h) hop_2_i_h)
3021  (=> (and hop_1_i_p hop_1_p_k) hop_2_i_k)
3022  (=> (and hop_1_i_p hop_1_p_j) hop_2_i_j)
3023  (=> (and hop_1_i_p hop_1_p_m) hop_2_i_m)
3024  (=> (and hop_1_i_p hop_1_p_l) hop_2_i_l)
3025  (=> (and hop_1_i_p hop_1_p_o) hop_2_i_o)
3026  (=> (and hop_1_i_p hop_1_p_n) hop_2_i_n)
3027  (=> (and hop_1_i_p hop_1_p_q) hop_2_i_q)
3028  (=> (and hop_1_h_a hop_1_a_c) hop_2_h_c)
3029  (=> (and hop_1_h_a hop_1_a_b) hop_2_h_b)
3030  (=> (and hop_1_h_a hop_1_a_e) hop_2_h_e)
3031  (=> (and hop_1_h_a hop_1_a_d) hop_2_h_d)
3032  (=> (and hop_1_h_a hop_1_a_g) hop_2_h_g)
3033  (=> (and hop_1_h_a hop_1_a_f) hop_2_h_f)
3034  (=> (and hop_1_h_a hop_1_a_i) hop_2_h_i)
3035  (=> (and hop_1_h_a hop_1_a_k) hop_2_h_k)
3036  (=> (and hop_1_h_a hop_1_a_j) hop_2_h_j)
3037  (=> (and hop_1_h_a hop_1_a_m) hop_2_h_m)
3038  (=> (and hop_1_h_a hop_1_a_l) hop_2_h_l)
3039  (=> (and hop_1_h_a hop_1_a_o) hop_2_h_o)
3040  (=> (and hop_1_h_a hop_1_a_n) hop_2_h_n)
3041  (=> (and hop_1_h_a hop_1_a_q) hop_2_h_q)
3042  (=> (and hop_1_h_a hop_1_a_p) hop_2_h_p)
3043  (=> (and hop_1_h_c hop_1_c_a) hop_2_h_a)
3044  (=> (and hop_1_h_c hop_1_c_b) hop_2_h_b)
3045  (=> (and hop_1_h_c hop_1_c_e) hop_2_h_e)
3046  (=> (and hop_1_h_c hop_1_c_d) hop_2_h_d)
3047  (=> (and hop_1_h_c hop_1_c_g) hop_2_h_g)
3048  (=> (and hop_1_h_c hop_1_c_f) hop_2_h_f)
3049  (=> (and hop_1_h_c hop_1_c_i) hop_2_h_i)
3050  (=> (and hop_1_h_c hop_1_c_k) hop_2_h_k)
3051  (=> (and hop_1_h_c hop_1_c_j) hop_2_h_j)
3052  (=> (and hop_1_h_c hop_1_c_m) hop_2_h_m)
3053  (=> (and hop_1_h_c hop_1_c_l) hop_2_h_l)
3054  (=> (and hop_1_h_c hop_1_c_o) hop_2_h_o)
3055  (=> (and hop_1_h_c hop_1_c_n) hop_2_h_n)
3056  (=> (and hop_1_h_c hop_1_c_q) hop_2_h_q)
3057  (=> (and hop_1_h_c hop_1_c_p) hop_2_h_p)
3058  (=> (and hop_1_h_b hop_1_b_a) hop_2_h_a)
3059  (=> (and hop_1_h_b hop_1_b_c) hop_2_h_c)
3060  (=> (and hop_1_h_b hop_1_b_e) hop_2_h_e)
3061  (=> (and hop_1_h_b hop_1_b_d) hop_2_h_d)
3062  (=> (and hop_1_h_b hop_1_b_g) hop_2_h_g)
3063  (=> (and hop_1_h_b hop_1_b_f) hop_2_h_f)
3064  (=> (and hop_1_h_b hop_1_b_i) hop_2_h_i)
3065  (=> (and hop_1_h_b hop_1_b_k) hop_2_h_k)
3066  (=> (and hop_1_h_b hop_1_b_j) hop_2_h_j)
3067  (=> (and hop_1_h_b hop_1_b_m) hop_2_h_m)
3068  (=> (and hop_1_h_b hop_1_b_l) hop_2_h_l)
3069  (=> (and hop_1_h_b hop_1_b_o) hop_2_h_o)
3070  (=> (and hop_1_h_b hop_1_b_n) hop_2_h_n)
3071  (=> (and hop_1_h_b hop_1_b_q) hop_2_h_q)
3072  (=> (and hop_1_h_b hop_1_b_p) hop_2_h_p)
3073  (=> (and hop_1_h_e hop_1_e_a) hop_2_h_a)
3074  (=> (and hop_1_h_e hop_1_e_c) hop_2_h_c)
3075  (=> (and hop_1_h_e hop_1_e_b) hop_2_h_b)
3076  (=> (and hop_1_h_e hop_1_e_d) hop_2_h_d)
3077  (=> (and hop_1_h_e hop_1_e_g) hop_2_h_g)
3078  (=> (and hop_1_h_e hop_1_e_f) hop_2_h_f)
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3079   (=> (and hop_1_h_e hop_1_e_i) hop_2_h_i)
3080   (=> (and hop_1_h_e hop_1_e_k) hop_2_h_k)
3081   (=> (and hop_1_h_e hop_1_e_j) hop_2_h_j)
3082   (=> (and hop_1_h_e hop_1_e_m) hop_2_h_m)
3083   (=> (and hop_1_h_e hop_1_e_l) hop_2_h_l)
3084   (=> (and hop_1_h_e hop_1_e_o) hop_2_h_o)
3085   (=> (and hop_1_h_e hop_1_e_n) hop_2_h_n)
3086   (=> (and hop_1_h_e hop_1_e_q) hop_2_h_q)
3087   (=> (and hop_1_h_e hop_1_e_p) hop_2_h_p)
3088   (=> (and hop_1_h_d hop_1_d_a) hop_2_h_a)
3089   (=> (and hop_1_h_d hop_1_d_c) hop_2_h_c)
3090   (=> (and hop_1_h_d hop_1_d_b) hop_2_h_b)
3091   (=> (and hop_1_h_d hop_1_d_e) hop_2_h_e)
3092   (=> (and hop_1_h_d hop_1_d_g) hop_2_h_g)
3093   (=> (and hop_1_h_d hop_1_d_f) hop_2_h_f)
3094   (=> (and hop_1_h_d hop_1_d_i) hop_2_h_i)
3095   (=> (and hop_1_h_d hop_1_d_k) hop_2_h_k)
3096   (=> (and hop_1_h_d hop_1_d_j) hop_2_h_j)
3097   (=> (and hop_1_h_d hop_1_d_m) hop_2_h_m)
3098   (=> (and hop_1_h_d hop_1_d_l) hop_2_h_l)
3099   (=> (and hop_1_h_d hop_1_d_o) hop_2_h_o)
3100   (=> (and hop_1_h_d hop_1_d_n) hop_2_h_n)
3101   (=> (and hop_1_h_d hop_1_d_q) hop_2_h_q)
3102   (=> (and hop_1_h_d hop_1_d_p) hop_2_h_p)
3103   (=> (and hop_1_h_g hop_1_g_a) hop_2_h_a)
3104   (=> (and hop_1_h_g hop_1_g_c) hop_2_h_c)
3105   (=> (and hop_1_h_g hop_1_g_b) hop_2_h_b)
3106   (=> (and hop_1_h_g hop_1_g_e) hop_2_h_e)
3107   (=> (and hop_1_h_g hop_1_g_d) hop_2_h_d)
3108   (=> (and hop_1_h_g hop_1_g_f) hop_2_h_f)
3109   (=> (and hop_1_h_g hop_1_g_i) hop_2_h_i)
3110   (=> (and hop_1_h_g hop_1_g_k) hop_2_h_k)
3111   (=> (and hop_1_h_g hop_1_g_j) hop_2_h_j)
3112   (=> (and hop_1_h_g hop_1_g_m) hop_2_h_m)
3113   (=> (and hop_1_h_g hop_1_g_l) hop_2_h_l)
3114   (=> (and hop_1_h_g hop_1_g_o) hop_2_h_o)
3115   (=> (and hop_1_h_g hop_1_g_n) hop_2_h_n)
3116   (=> (and hop_1_h_g hop_1_g_q) hop_2_h_q)
3117   (=> (and hop_1_h_g hop_1_g_p) hop_2_h_p)
3118   (=> (and hop_1_h_f hop_1_f_a) hop_2_h_a)
3119   (=> (and hop_1_h_f hop_1_f_c) hop_2_h_c)
3120   (=> (and hop_1_h_f hop_1_f_b) hop_2_h_b)
3121   (=> (and hop_1_h_f hop_1_f_e) hop_2_h_e)
3122   (=> (and hop_1_h_f hop_1_f_d) hop_2_h_d)
3123   (=> (and hop_1_h_f hop_1_f_g) hop_2_h_g)
3124   (=> (and hop_1_h_f hop_1_f_i) hop_2_h_i)
3125   (=> (and hop_1_h_f hop_1_f_k) hop_2_h_k)
3126   (=> (and hop_1_h_f hop_1_f_j) hop_2_h_j)
3127   (=> (and hop_1_h_f hop_1_f_m) hop_2_h_m)
3128   (=> (and hop_1_h_f hop_1_f_l) hop_2_h_l)
3129   (=> (and hop_1_h_f hop_1_f_o) hop_2_h_o)
3130   (=> (and hop_1_h_f hop_1_f_n) hop_2_h_n)
3131   (=> (and hop_1_h_f hop_1_f_q) hop_2_h_q)
3132   (=> (and hop_1_h_f hop_1_f_p) hop_2_h_p)
3133   (=> (and hop_1_h_i hop_1_i_a) hop_2_h_a)
3134   (=> (and hop_1_h_i hop_1_i_c) hop_2_h_c)
3135   (=> (and hop_1_h_i hop_1_i_b) hop_2_h_b)
3136   (=> (and hop_1_h_i hop_1_i_e) hop_2_h_e)
3137   (=> (and hop_1_h_i hop_1_i_d) hop_2_h_d)
3138   (=> (and hop_1_h_i hop_1_i_g) hop_2_h_g)
3139   (=> (and hop_1_h_i hop_1_i_f) hop_2_h_f)
3140   (=> (and hop_1_h_i hop_1_i_k) hop_2_h_k)
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3141  (=> (and hop_1_h_i hop_1_i_j) hop_2_h_j)
3142  (=> (and hop_1_h_i hop_1_i_m) hop_2_h_m)
3143  (=> (and hop_1_h_i hop_1_i_l) hop_2_h_l)
3144  (=> (and hop_1_h_i hop_1_i_o) hop_2_h_o)
3145  (=> (and hop_1_h_i hop_1_i_n) hop_2_h_n)
3146  (=> (and hop_1_h_i hop_1_i_q) hop_2_h_q)
3147  (=> (and hop_1_h_i hop_1_i_p) hop_2_h_p)
3148  (=> (and hop_1_h_k hop_1_k_a) hop_2_h_a)
3149  (=> (and hop_1_h_k hop_1_k_c) hop_2_h_c)
3150  (=> (and hop_1_h_k hop_1_k_b) hop_2_h_b)
3151  (=> (and hop_1_h_k hop_1_k_e) hop_2_h_e)
3152  (=> (and hop_1_h_k hop_1_k_d) hop_2_h_d)
3153  (=> (and hop_1_h_k hop_1_k_g) hop_2_h_g)
3154  (=> (and hop_1_h_k hop_1_k_f) hop_2_h_f)
3155  (=> (and hop_1_h_k hop_1_k_i) hop_2_h_i)
3156  (=> (and hop_1_h_k hop_1_k_j) hop_2_h_j)
3157  (=> (and hop_1_h_k hop_1_k_m) hop_2_h_m)
3158  (=> (and hop_1_h_k hop_1_k_l) hop_2_h_l)
3159  (=> (and hop_1_h_k hop_1_k_o) hop_2_h_o)
3160  (=> (and hop_1_h_k hop_1_k_n) hop_2_h_n)
3161  (=> (and hop_1_h_k hop_1_k_q) hop_2_h_q)
3162  (=> (and hop_1_h_k hop_1_k_p) hop_2_h_p)
3163  (=> (and hop_1_h_j hop_1_j_a) hop_2_h_a)
3164  (=> (and hop_1_h_j hop_1_j_c) hop_2_h_c)
3165  (=> (and hop_1_h_j hop_1_j_b) hop_2_h_b)
3166  (=> (and hop_1_h_j hop_1_j_e) hop_2_h_e)
3167  (=> (and hop_1_h_j hop_1_j_d) hop_2_h_d)
3168  (=> (and hop_1_h_j hop_1_j_g) hop_2_h_g)
3169  (=> (and hop_1_h_j hop_1_j_f) hop_2_h_f)
3170  (=> (and hop_1_h_j hop_1_j_i) hop_2_h_i)
3171  (=> (and hop_1_h_j hop_1_j_k) hop_2_h_k)
3172  (=> (and hop_1_h_j hop_1_j_m) hop_2_h_m)
3173  (=> (and hop_1_h_j hop_1_j_l) hop_2_h_l)
3174  (=> (and hop_1_h_j hop_1_j_o) hop_2_h_o)
3175  (=> (and hop_1_h_j hop_1_j_n) hop_2_h_n)
3176  (=> (and hop_1_h_j hop_1_j_q) hop_2_h_q)
3177  (=> (and hop_1_h_j hop_1_j_p) hop_2_h_p)
3178  (=> (and hop_1_h_m hop_1_m_a) hop_2_h_a)
3179  (=> (and hop_1_h_m hop_1_m_c) hop_2_h_c)
3180  (=> (and hop_1_h_m hop_1_m_b) hop_2_h_b)
3181  (=> (and hop_1_h_m hop_1_m_e) hop_2_h_e)
3182  (=> (and hop_1_h_m hop_1_m_d) hop_2_h_d)
3183  (=> (and hop_1_h_m hop_1_m_g) hop_2_h_g)
3184  (=> (and hop_1_h_m hop_1_m_f) hop_2_h_f)
3185  (=> (and hop_1_h_m hop_1_m_i) hop_2_h_i)
3186  (=> (and hop_1_h_m hop_1_m_k) hop_2_h_k)
3187  (=> (and hop_1_h_m hop_1_m_j) hop_2_h_j)
3188  (=> (and hop_1_h_m hop_1_m_l) hop_2_h_l)
3189  (=> (and hop_1_h_m hop_1_m_o) hop_2_h_o)
3190  (=> (and hop_1_h_m hop_1_m_n) hop_2_h_n)
3191  (=> (and hop_1_h_m hop_1_m_q) hop_2_h_q)
3192  (=> (and hop_1_h_m hop_1_m_p) hop_2_h_p)
3193  (=> (and hop_1_h_l hop_1_l_a) hop_2_h_a)
3194  (=> (and hop_1_h_l hop_1_l_c) hop_2_h_c)
3195  (=> (and hop_1_h_l hop_1_l_b) hop_2_h_b)
3196  (=> (and hop_1_h_l hop_1_l_e) hop_2_h_e)
3197  (=> (and hop_1_h_l hop_1_l_d) hop_2_h_d)
3198  (=> (and hop_1_h_l hop_1_l_g) hop_2_h_g)
3199  (=> (and hop_1_h_l hop_1_l_f) hop_2_h_f)
3200  (=> (and hop_1_h_l hop_1_l_i) hop_2_h_i)
3201  (=> (and hop_1_h_l hop_1_l_k) hop_2_h_k)
3202  (=> (and hop_1_h_l hop_1_l_j) hop_2_h_j)
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3203   (=> (and hop_1_h_l hop_1_l_m) hop_2_h_m)
3204   (=> (and hop_1_h_l hop_1_l_o) hop_2_h_o)
3205   (=> (and hop_1_h_l hop_1_l_n) hop_2_h_n)
3206   (=> (and hop_1_h_l hop_1_l_q) hop_2_h_q)
3207   (=> (and hop_1_h_l hop_1_l_p) hop_2_h_p)
3208   (=> (and hop_1_h_o hop_1_o_a) hop_2_h_a)
3209   (=> (and hop_1_h_o hop_1_o_c) hop_2_h_c)
3210   (=> (and hop_1_h_o hop_1_o_b) hop_2_h_b)
3211   (=> (and hop_1_h_o hop_1_o_e) hop_2_h_e)
3212   (=> (and hop_1_h_o hop_1_o_d) hop_2_h_d)
3213   (=> (and hop_1_h_o hop_1_o_g) hop_2_h_g)
3214   (=> (and hop_1_h_o hop_1_o_f) hop_2_h_f)
3215   (=> (and hop_1_h_o hop_1_o_i) hop_2_h_i)
3216   (=> (and hop_1_h_o hop_1_o_k) hop_2_h_k)
3217   (=> (and hop_1_h_o hop_1_o_j) hop_2_h_j)
3218   (=> (and hop_1_h_o hop_1_o_m) hop_2_h_m)
3219   (=> (and hop_1_h_o hop_1_o_l) hop_2_h_l)
3220   (=> (and hop_1_h_o hop_1_o_n) hop_2_h_n)
3221   (=> (and hop_1_h_o hop_1_o_q) hop_2_h_q)
3222   (=> (and hop_1_h_o hop_1_o_p) hop_2_h_p)
3223   (=> (and hop_1_h_n hop_1_n_a) hop_2_h_a)
3224   (=> (and hop_1_h_n hop_1_n_c) hop_2_h_c)
3225   (=> (and hop_1_h_n hop_1_n_b) hop_2_h_b)
3226   (=> (and hop_1_h_n hop_1_n_e) hop_2_h_e)
3227   (=> (and hop_1_h_n hop_1_n_d) hop_2_h_d)
3228   (=> (and hop_1_h_n hop_1_n_g) hop_2_h_g)
3229   (=> (and hop_1_h_n hop_1_n_f) hop_2_h_f)
3230   (=> (and hop_1_h_n hop_1_n_i) hop_2_h_i)
3231   (=> (and hop_1_h_n hop_1_n_k) hop_2_h_k)
3232   (=> (and hop_1_h_n hop_1_n_j) hop_2_h_j)
3233   (=> (and hop_1_h_n hop_1_n_m) hop_2_h_m)
3234   (=> (and hop_1_h_n hop_1_n_l) hop_2_h_l)
3235   (=> (and hop_1_h_n hop_1_n_o) hop_2_h_o)
3236   (=> (and hop_1_h_n hop_1_n_q) hop_2_h_q)
3237   (=> (and hop_1_h_n hop_1_n_p) hop_2_h_p)
3238   (=> (and hop_1_h_q hop_1_q_a) hop_2_h_a)
3239   (=> (and hop_1_h_q hop_1_q_c) hop_2_h_c)
3240   (=> (and hop_1_h_q hop_1_q_b) hop_2_h_b)
3241   (=> (and hop_1_h_q hop_1_q_e) hop_2_h_e)
3242   (=> (and hop_1_h_q hop_1_q_d) hop_2_h_d)
3243   (=> (and hop_1_h_q hop_1_q_g) hop_2_h_g)
3244   (=> (and hop_1_h_q hop_1_q_f) hop_2_h_f)
3245   (=> (and hop_1_h_q hop_1_q_i) hop_2_h_i)
3246   (=> (and hop_1_h_q hop_1_q_k) hop_2_h_k)
3247   (=> (and hop_1_h_q hop_1_q_j) hop_2_h_j)
3248   (=> (and hop_1_h_q hop_1_q_m) hop_2_h_m)
3249   (=> (and hop_1_h_q hop_1_q_l) hop_2_h_l)
3250   (=> (and hop_1_h_q hop_1_q_o) hop_2_h_o)
3251   (=> (and hop_1_h_q hop_1_q_n) hop_2_h_n)
3252   (=> (and hop_1_h_q hop_1_q_p) hop_2_h_p)
3253   (=> (and hop_1_h_p hop_1_p_a) hop_2_h_a)
3254   (=> (and hop_1_h_p hop_1_p_c) hop_2_h_c)
3255   (=> (and hop_1_h_p hop_1_p_b) hop_2_h_b)
3256   (=> (and hop_1_h_p hop_1_p_e) hop_2_h_e)
3257   (=> (and hop_1_h_p hop_1_p_d) hop_2_h_d)
3258   (=> (and hop_1_h_p hop_1_p_g) hop_2_h_g)
3259   (=> (and hop_1_h_p hop_1_p_f) hop_2_h_f)
3260   (=> (and hop_1_h_p hop_1_p_i) hop_2_h_i)
3261   (=> (and hop_1_h_p hop_1_p_k) hop_2_h_k)
3262   (=> (and hop_1_h_p hop_1_p_j) hop_2_h_j)
3263   (=> (and hop_1_h_p hop_1_p_m) hop_2_h_m)
3264   (=> (and hop_1_h_p hop_1_p_l) hop_2_h_l)
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3265  (=> (and hop_1_h_p hop_1_p_o) hop_2_h_o)
3266  (=> (and hop_1_h_p hop_1_p_n) hop_2_h_n)
3267  (=> (and hop_1_h_p hop_1_p_q) hop_2_h_q)
3268  (=> (and hop_1_k_a hop_1_a_c) hop_2_k_c)
3269  (=> (and hop_1_k_a hop_1_a_b) hop_2_k_b)
3270  (=> (and hop_1_k_a hop_1_a_e) hop_2_k_e)
3271  (=> (and hop_1_k_a hop_1_a_d) hop_2_k_d)
3272  (=> (and hop_1_k_a hop_1_a_g) hop_2_k_g)
3273  (=> (and hop_1_k_a hop_1_a_f) hop_2_k_f)
3274  (=> (and hop_1_k_a hop_1_a_i) hop_2_k_i)
3275  (=> (and hop_1_k_a hop_1_a_h) hop_2_k_h)
3276  (=> (and hop_1_k_a hop_1_a_j) hop_2_k_j)
3277  (=> (and hop_1_k_a hop_1_a_m) hop_2_k_m)
3278  (=> (and hop_1_k_a hop_1_a_l) hop_2_k_l)
3279  (=> (and hop_1_k_a hop_1_a_o) hop_2_k_o)
3280  (=> (and hop_1_k_a hop_1_a_n) hop_2_k_n)
3281  (=> (and hop_1_k_a hop_1_a_q) hop_2_k_q)
3282  (=> (and hop_1_k_a hop_1_a_p) hop_2_k_p)
3283  (=> (and hop_1_k_c hop_1_c_a) hop_2_k_a)
3284  (=> (and hop_1_k_c hop_1_c_b) hop_2_k_b)
3285  (=> (and hop_1_k_c hop_1_c_e) hop_2_k_e)
3286  (=> (and hop_1_k_c hop_1_c_d) hop_2_k_d)
3287  (=> (and hop_1_k_c hop_1_c_g) hop_2_k_g)
3288  (=> (and hop_1_k_c hop_1_c_f) hop_2_k_f)
3289  (=> (and hop_1_k_c hop_1_c_i) hop_2_k_i)
3290  (=> (and hop_1_k_c hop_1_c_h) hop_2_k_h)
3291  (=> (and hop_1_k_c hop_1_c_j) hop_2_k_j)
3292  (=> (and hop_1_k_c hop_1_c_m) hop_2_k_m)
3293  (=> (and hop_1_k_c hop_1_c_l) hop_2_k_l)
3294  (=> (and hop_1_k_c hop_1_c_o) hop_2_k_o)
3295  (=> (and hop_1_k_c hop_1_c_n) hop_2_k_n)
3296  (=> (and hop_1_k_c hop_1_c_q) hop_2_k_q)
3297  (=> (and hop_1_k_c hop_1_c_p) hop_2_k_p)
3298  (=> (and hop_1_k_b hop_1_b_a) hop_2_k_a)
3299  (=> (and hop_1_k_b hop_1_b_c) hop_2_k_c)
3300  (=> (and hop_1_k_b hop_1_b_e) hop_2_k_e)
3301  (=> (and hop_1_k_b hop_1_b_d) hop_2_k_d)
3302  (=> (and hop_1_k_b hop_1_b_g) hop_2_k_g)
3303  (=> (and hop_1_k_b hop_1_b_f) hop_2_k_f)
3304  (=> (and hop_1_k_b hop_1_b_i) hop_2_k_i)
3305  (=> (and hop_1_k_b hop_1_b_h) hop_2_k_h)
3306  (=> (and hop_1_k_b hop_1_b_j) hop_2_k_j)
3307  (=> (and hop_1_k_b hop_1_b_m) hop_2_k_m)
3308  (=> (and hop_1_k_b hop_1_b_l) hop_2_k_l)
3309  (=> (and hop_1_k_b hop_1_b_o) hop_2_k_o)
3310  (=> (and hop_1_k_b hop_1_b_n) hop_2_k_n)
3311  (=> (and hop_1_k_b hop_1_b_q) hop_2_k_q)
3312  (=> (and hop_1_k_b hop_1_b_p) hop_2_k_p)
3313  (=> (and hop_1_k_e hop_1_e_a) hop_2_k_a)
3314  (=> (and hop_1_k_e hop_1_e_c) hop_2_k_c)
3315  (=> (and hop_1_k_e hop_1_e_b) hop_2_k_b)
3316  (=> (and hop_1_k_e hop_1_e_d) hop_2_k_d)
3317  (=> (and hop_1_k_e hop_1_e_g) hop_2_k_g)
3318  (=> (and hop_1_k_e hop_1_e_f) hop_2_k_f)
3319  (=> (and hop_1_k_e hop_1_e_i) hop_2_k_i)
3320  (=> (and hop_1_k_e hop_1_e_h) hop_2_k_h)
3321  (=> (and hop_1_k_e hop_1_e_j) hop_2_k_j)
3322  (=> (and hop_1_k_e hop_1_e_m) hop_2_k_m)
3323  (=> (and hop_1_k_e hop_1_e_l) hop_2_k_l)
3324  (=> (and hop_1_k_e hop_1_e_o) hop_2_k_o)
3325  (=> (and hop_1_k_e hop_1_e_n) hop_2_k_n)
3326  (=> (and hop_1_k_e hop_1_e_q) hop_2_k_q)
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3327  (=> (and hop_1_k_e hop_1_e_p) hop_2_k_p)
3328  (=> (and hop_1_k_d hop_1_d_a) hop_2_k_a)
3329  (=> (and hop_1_k_d hop_1_d_c) hop_2_k_c)
3330  (=> (and hop_1_k_d hop_1_d_b) hop_2_k_b)
3331  (=> (and hop_1_k_d hop_1_d_e) hop_2_k_e)
3332  (=> (and hop_1_k_d hop_1_d_g) hop_2_k_g)
3333  (=> (and hop_1_k_d hop_1_d_f) hop_2_k_f)
3334  (=> (and hop_1_k_d hop_1_d_i) hop_2_k_i)
3335  (=> (and hop_1_k_d hop_1_d_h) hop_2_k_h)
3336  (=> (and hop_1_k_d hop_1_d_j) hop_2_k_j)
3337  (=> (and hop_1_k_d hop_1_d_m) hop_2_k_m)
3338  (=> (and hop_1_k_d hop_1_d_l) hop_2_k_l)
3339  (=> (and hop_1_k_d hop_1_d_o) hop_2_k_o)
3340  (=> (and hop_1_k_d hop_1_d_n) hop_2_k_n)
3341  (=> (and hop_1_k_d hop_1_d_q) hop_2_k_q)
3342  (=> (and hop_1_k_d hop_1_d_p) hop_2_k_p)
3343  (=> (and hop_1_k_g hop_1_g_a) hop_2_k_a)
3344  (=> (and hop_1_k_g hop_1_g_c) hop_2_k_c)
3345  (=> (and hop_1_k_g hop_1_g_b) hop_2_k_b)
3346  (=> (and hop_1_k_g hop_1_g_e) hop_2_k_e)
3347  (=> (and hop_1_k_g hop_1_g_d) hop_2_k_d)
3348  (=> (and hop_1_k_g hop_1_g_f) hop_2_k_f)
3349  (=> (and hop_1_k_g hop_1_g_i) hop_2_k_i)
3350  (=> (and hop_1_k_g hop_1_g_h) hop_2_k_h)
3351  (=> (and hop_1_k_g hop_1_g_j) hop_2_k_j)
3352  (=> (and hop_1_k_g hop_1_g_m) hop_2_k_m)
3353  (=> (and hop_1_k_g hop_1_g_l) hop_2_k_l)
3354  (=> (and hop_1_k_g hop_1_g_o) hop_2_k_o)
3355  (=> (and hop_1_k_g hop_1_g_n) hop_2_k_n)
3356  (=> (and hop_1_k_g hop_1_g_q) hop_2_k_q)
3357  (=> (and hop_1_k_g hop_1_g_p) hop_2_k_p)
3358  (=> (and hop_1_k_f hop_1_f_a) hop_2_k_a)
3359  (=> (and hop_1_k_f hop_1_f_c) hop_2_k_c)
3360  (=> (and hop_1_k_f hop_1_f_b) hop_2_k_b)
3361  (=> (and hop_1_k_f hop_1_f_e) hop_2_k_e)
3362  (=> (and hop_1_k_f hop_1_f_d) hop_2_k_d)
3363  (=> (and hop_1_k_f hop_1_f_g) hop_2_k_g)
3364  (=> (and hop_1_k_f hop_1_f_i) hop_2_k_i)
3365  (=> (and hop_1_k_f hop_1_f_h) hop_2_k_h)
3366  (=> (and hop_1_k_f hop_1_f_j) hop_2_k_j)
3367  (=> (and hop_1_k_f hop_1_f_m) hop_2_k_m)
3368  (=> (and hop_1_k_f hop_1_f_l) hop_2_k_l)
3369  (=> (and hop_1_k_f hop_1_f_o) hop_2_k_o)
3370  (=> (and hop_1_k_f hop_1_f_n) hop_2_k_n)
3371  (=> (and hop_1_k_f hop_1_f_q) hop_2_k_q)
3372  (=> (and hop_1_k_f hop_1_f_p) hop_2_k_p)
3373  (=> (and hop_1_k_i hop_1_i_a) hop_2_k_a)
3374  (=> (and hop_1_k_i hop_1_i_c) hop_2_k_c)
3375  (=> (and hop_1_k_i hop_1_i_b) hop_2_k_b)
3376  (=> (and hop_1_k_i hop_1_i_e) hop_2_k_e)
3377  (=> (and hop_1_k_i hop_1_i_d) hop_2_k_d)
3378  (=> (and hop_1_k_i hop_1_i_g) hop_2_k_g)
3379  (=> (and hop_1_k_i hop_1_i_f) hop_2_k_f)
3380  (=> (and hop_1_k_i hop_1_i_h) hop_2_k_h)
3381  (=> (and hop_1_k_i hop_1_i_j) hop_2_k_j)
3382  (=> (and hop_1_k_i hop_1_i_m) hop_2_k_m)
3383  (=> (and hop_1_k_i hop_1_i_l) hop_2_k_l)
3384  (=> (and hop_1_k_i hop_1_i_o) hop_2_k_o)
3385  (=> (and hop_1_k_i hop_1_i_n) hop_2_k_n)
3386  (=> (and hop_1_k_i hop_1_i_q) hop_2_k_q)
3387  (=> (and hop_1_k_i hop_1_i_p) hop_2_k_p)
3388  (=> (and hop_1_k_h hop_1_h_a) hop_2_k_a)
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3389  (=> (and hop_1_k_h hop_1_h_c) hop_2_k_c)
3390  (=> (and hop_1_k_h hop_1_h_b) hop_2_k_b)
3391  (=> (and hop_1_k_h hop_1_h_e) hop_2_k_e)
3392  (=> (and hop_1_k_h hop_1_h_d) hop_2_k_d)
3393  (=> (and hop_1_k_h hop_1_h_g) hop_2_k_g)
3394  (=> (and hop_1_k_h hop_1_h_f) hop_2_k_f)
3395  (=> (and hop_1_k_h hop_1_h_i) hop_2_k_i)
3396  (=> (and hop_1_k_h hop_1_h_j) hop_2_k_j)
3397  (=> (and hop_1_k_h hop_1_h_m) hop_2_k_m)
3398  (=> (and hop_1_k_h hop_1_h_l) hop_2_k_l)
3399  (=> (and hop_1_k_h hop_1_h_o) hop_2_k_o)
3400  (=> (and hop_1_k_h hop_1_h_n) hop_2_k_n)
3401  (=> (and hop_1_k_h hop_1_h_q) hop_2_k_q)
3402  (=> (and hop_1_k_h hop_1_h_p) hop_2_k_p)
3403  (=> (and hop_1_k_j hop_1_j_a) hop_2_k_a)
3404  (=> (and hop_1_k_j hop_1_j_c) hop_2_k_c)
3405  (=> (and hop_1_k_j hop_1_j_b) hop_2_k_b)
3406  (=> (and hop_1_k_j hop_1_j_e) hop_2_k_e)
3407  (=> (and hop_1_k_j hop_1_j_d) hop_2_k_d)
3408  (=> (and hop_1_k_j hop_1_j_g) hop_2_k_g)
3409  (=> (and hop_1_k_j hop_1_j_f) hop_2_k_f)
3410  (=> (and hop_1_k_j hop_1_j_i) hop_2_k_i)
3411  (=> (and hop_1_k_j hop_1_j_h) hop_2_k_h)
3412  (=> (and hop_1_k_j hop_1_j_m) hop_2_k_m)
3413  (=> (and hop_1_k_j hop_1_j_l) hop_2_k_l)
3414  (=> (and hop_1_k_j hop_1_j_o) hop_2_k_o)
3415  (=> (and hop_1_k_j hop_1_j_n) hop_2_k_n)
3416  (=> (and hop_1_k_j hop_1_j_q) hop_2_k_q)
3417  (=> (and hop_1_k_j hop_1_j_p) hop_2_k_p)
3418  (=> (and hop_1_k_m hop_1_m_a) hop_2_k_a)
3419  (=> (and hop_1_k_m hop_1_m_c) hop_2_k_c)
3420  (=> (and hop_1_k_m hop_1_m_b) hop_2_k_b)
3421  (=> (and hop_1_k_m hop_1_m_e) hop_2_k_e)
3422  (=> (and hop_1_k_m hop_1_m_d) hop_2_k_d)
3423  (=> (and hop_1_k_m hop_1_m_g) hop_2_k_g)
3424  (=> (and hop_1_k_m hop_1_m_f) hop_2_k_f)
3425  (=> (and hop_1_k_m hop_1_m_i) hop_2_k_i)
3426  (=> (and hop_1_k_m hop_1_m_h) hop_2_k_h)
3427  (=> (and hop_1_k_m hop_1_m_j) hop_2_k_j)
3428  (=> (and hop_1_k_m hop_1_m_l) hop_2_k_l)
3429  (=> (and hop_1_k_m hop_1_m_o) hop_2_k_o)
3430  (=> (and hop_1_k_m hop_1_m_n) hop_2_k_n)
3431  (=> (and hop_1_k_m hop_1_m_q) hop_2_k_q)
3432  (=> (and hop_1_k_m hop_1_m_p) hop_2_k_p)
3433  (=> (and hop_1_k_l hop_1_l_a) hop_2_k_a)
3434  (=> (and hop_1_k_l hop_1_l_c) hop_2_k_c)
3435  (=> (and hop_1_k_l hop_1_l_b) hop_2_k_b)
3436  (=> (and hop_1_k_l hop_1_l_e) hop_2_k_e)
3437  (=> (and hop_1_k_l hop_1_l_d) hop_2_k_d)
3438  (=> (and hop_1_k_l hop_1_l_g) hop_2_k_g)
3439  (=> (and hop_1_k_l hop_1_l_f) hop_2_k_f)
3440  (=> (and hop_1_k_l hop_1_l_i) hop_2_k_i)
3441  (=> (and hop_1_k_l hop_1_l_h) hop_2_k_h)
3442  (=> (and hop_1_k_l hop_1_l_j) hop_2_k_j)
3443  (=> (and hop_1_k_l hop_1_l_m) hop_2_k_m)
3444  (=> (and hop_1_k_l hop_1_l_o) hop_2_k_o)
3445  (=> (and hop_1_k_l hop_1_l_n) hop_2_k_n)
3446  (=> (and hop_1_k_l hop_1_l_q) hop_2_k_q)
3447  (=> (and hop_1_k_l hop_1_l_p) hop_2_k_p)
3448  (=> (and hop_1_k_o hop_1_o_a) hop_2_k_a)
3449  (=> (and hop_1_k_o hop_1_o_c) hop_2_k_c)
3450  (=> (and hop_1_k_o hop_1_o_b) hop_2_k_b)
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3451  (=> (and hop_1_k_o hop_1_o_e) hop_2_k_e)
3452  (=> (and hop_1_k_o hop_1_o_d) hop_2_k_d)
3453  (=> (and hop_1_k_o hop_1_o_g) hop_2_k_g)
3454  (=> (and hop_1_k_o hop_1_o_f) hop_2_k_f)
3455  (=> (and hop_1_k_o hop_1_o_i) hop_2_k_i)
3456  (=> (and hop_1_k_o hop_1_o_h) hop_2_k_h)
3457  (=> (and hop_1_k_o hop_1_o_j) hop_2_k_j)
3458  (=> (and hop_1_k_o hop_1_o_m) hop_2_k_m)
3459  (=> (and hop_1_k_o hop_1_o_l) hop_2_k_l)
3460  (=> (and hop_1_k_o hop_1_o_n) hop_2_k_n)
3461  (=> (and hop_1_k_o hop_1_o_q) hop_2_k_q)
3462  (=> (and hop_1_k_o hop_1_o_p) hop_2_k_p)
3463  (=> (and hop_1_k_n hop_1_n_a) hop_2_k_a)
3464  (=> (and hop_1_k_n hop_1_n_c) hop_2_k_c)
3465  (=> (and hop_1_k_n hop_1_n_b) hop_2_k_b)
3466  (=> (and hop_1_k_n hop_1_n_e) hop_2_k_e)
3467  (=> (and hop_1_k_n hop_1_n_d) hop_2_k_d)
3468  (=> (and hop_1_k_n hop_1_n_g) hop_2_k_g)
3469  (=> (and hop_1_k_n hop_1_n_f) hop_2_k_f)
3470  (=> (and hop_1_k_n hop_1_n_i) hop_2_k_i)
3471  (=> (and hop_1_k_n hop_1_n_h) hop_2_k_h)
3472  (=> (and hop_1_k_n hop_1_n_j) hop_2_k_j)
3473  (=> (and hop_1_k_n hop_1_n_m) hop_2_k_m)
3474  (=> (and hop_1_k_n hop_1_n_l) hop_2_k_l)
3475  (=> (and hop_1_k_n hop_1_n_o) hop_2_k_o)
3476  (=> (and hop_1_k_n hop_1_n_q) hop_2_k_q)
3477  (=> (and hop_1_k_n hop_1_n_p) hop_2_k_p)
3478  (=> (and hop_1_k_q hop_1_q_a) hop_2_k_a)
3479  (=> (and hop_1_k_q hop_1_q_c) hop_2_k_c)
3480  (=> (and hop_1_k_q hop_1_q_b) hop_2_k_b)
3481  (=> (and hop_1_k_q hop_1_q_e) hop_2_k_e)
3482  (=> (and hop_1_k_q hop_1_q_d) hop_2_k_d)
3483  (=> (and hop_1_k_q hop_1_q_g) hop_2_k_g)
3484  (=> (and hop_1_k_q hop_1_q_f) hop_2_k_f)
3485  (=> (and hop_1_k_q hop_1_q_i) hop_2_k_i)
3486  (=> (and hop_1_k_q hop_1_q_h) hop_2_k_h)
3487  (=> (and hop_1_k_q hop_1_q_j) hop_2_k_j)
3488  (=> (and hop_1_k_q hop_1_q_m) hop_2_k_m)
3489  (=> (and hop_1_k_q hop_1_q_l) hop_2_k_l)
3490  (=> (and hop_1_k_q hop_1_q_o) hop_2_k_o)
3491  (=> (and hop_1_k_q hop_1_q_n) hop_2_k_n)
3492  (=> (and hop_1_k_q hop_1_q_p) hop_2_k_p)
3493  (=> (and hop_1_k_p hop_1_p_a) hop_2_k_a)
3494  (=> (and hop_1_k_p hop_1_p_c) hop_2_k_c)
3495  (=> (and hop_1_k_p hop_1_p_b) hop_2_k_b)
3496  (=> (and hop_1_k_p hop_1_p_e) hop_2_k_e)
3497  (=> (and hop_1_k_p hop_1_p_d) hop_2_k_d)
3498  (=> (and hop_1_k_p hop_1_p_g) hop_2_k_g)
3499  (=> (and hop_1_k_p hop_1_p_f) hop_2_k_f)
3500  (=> (and hop_1_k_p hop_1_p_i) hop_2_k_i)
3501  (=> (and hop_1_k_p hop_1_p_h) hop_2_k_h)
3502  (=> (and hop_1_k_p hop_1_p_j) hop_2_k_j)
3503  (=> (and hop_1_k_p hop_1_p_m) hop_2_k_m)
3504  (=> (and hop_1_k_p hop_1_p_l) hop_2_k_l)
3505  (=> (and hop_1_k_p hop_1_p_o) hop_2_k_o)
3506  (=> (and hop_1_k_p hop_1_p_n) hop_2_k_n)
3507  (=> (and hop_1_k_p hop_1_p_q) hop_2_k_q)
3508  (=> (and hop_1_j_a hop_1_a_c) hop_2_j_c)
3509  (=> (and hop_1_j_a hop_1_a_b) hop_2_j_b)
3510  (=> (and hop_1_j_a hop_1_a_e) hop_2_j_e)
3511  (=> (and hop_1_j_a hop_1_a_d) hop_2_j_d)
3512  (=> (and hop_1_j_a hop_1_a_g) hop_2_j_g)
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3513  (=> (and hop_1_j_a hop_1_a_f) hop_2_j_f)
3514  (=> (and hop_1_j_a hop_1_a_i) hop_2_j_i)
3515  (=> (and hop_1_j_a hop_1_a_h) hop_2_j_h)
3516  (=> (and hop_1_j_a hop_1_a_k) hop_2_j_k)
3517  (=> (and hop_1_j_a hop_1_a_m) hop_2_j_m)
3518  (=> (and hop_1_j_a hop_1_a_l) hop_2_j_l)
3519  (=> (and hop_1_j_a hop_1_a_o) hop_2_j_o)
3520  (=> (and hop_1_j_a hop_1_a_n) hop_2_j_n)
3521  (=> (and hop_1_j_a hop_1_a_q) hop_2_j_q)
3522  (=> (and hop_1_j_a hop_1_a_p) hop_2_j_p)
3523  (=> (and hop_1_j_c hop_1_c_a) hop_2_j_a)
3524  (=> (and hop_1_j_c hop_1_c_b) hop_2_j_b)
3525  (=> (and hop_1_j_c hop_1_c_e) hop_2_j_e)
3526  (=> (and hop_1_j_c hop_1_c_d) hop_2_j_d)
3527  (=> (and hop_1_j_c hop_1_c_g) hop_2_j_g)
3528  (=> (and hop_1_j_c hop_1_c_f) hop_2_j_f)
3529  (=> (and hop_1_j_c hop_1_c_i) hop_2_j_i)
3530  (=> (and hop_1_j_c hop_1_c_h) hop_2_j_h)
3531  (=> (and hop_1_j_c hop_1_c_k) hop_2_j_k)
3532  (=> (and hop_1_j_c hop_1_c_m) hop_2_j_m)
3533  (=> (and hop_1_j_c hop_1_c_l) hop_2_j_l)
3534  (=> (and hop_1_j_c hop_1_c_o) hop_2_j_o)
3535  (=> (and hop_1_j_c hop_1_c_n) hop_2_j_n)
3536  (=> (and hop_1_j_c hop_1_c_q) hop_2_j_q)
3537  (=> (and hop_1_j_c hop_1_c_p) hop_2_j_p)
3538  (=> (and hop_1_j_b hop_1_b_a) hop_2_j_a)
3539  (=> (and hop_1_j_b hop_1_b_c) hop_2_j_c)
3540  (=> (and hop_1_j_b hop_1_b_e) hop_2_j_e)
3541  (=> (and hop_1_j_b hop_1_b_d) hop_2_j_d)
3542  (=> (and hop_1_j_b hop_1_b_g) hop_2_j_g)
3543  (=> (and hop_1_j_b hop_1_b_f) hop_2_j_f)
3544  (=> (and hop_1_j_b hop_1_b_i) hop_2_j_i)
3545  (=> (and hop_1_j_b hop_1_b_h) hop_2_j_h)
3546  (=> (and hop_1_j_b hop_1_b_k) hop_2_j_k)
3547  (=> (and hop_1_j_b hop_1_b_m) hop_2_j_m)
3548  (=> (and hop_1_j_b hop_1_b_l) hop_2_j_l)
3549  (=> (and hop_1_j_b hop_1_b_o) hop_2_j_o)
3550  (=> (and hop_1_j_b hop_1_b_n) hop_2_j_n)
3551  (=> (and hop_1_j_b hop_1_b_q) hop_2_j_q)
3552  (=> (and hop_1_j_b hop_1_b_p) hop_2_j_p)
3553  (=> (and hop_1_j_e hop_1_e_a) hop_2_j_a)
3554  (=> (and hop_1_j_e hop_1_e_c) hop_2_j_c)
3555  (=> (and hop_1_j_e hop_1_e_b) hop_2_j_b)
3556  (=> (and hop_1_j_e hop_1_e_d) hop_2_j_d)
3557  (=> (and hop_1_j_e hop_1_e_g) hop_2_j_g)
3558  (=> (and hop_1_j_e hop_1_e_f) hop_2_j_f)
3559  (=> (and hop_1_j_e hop_1_e_i) hop_2_j_i)
3560  (=> (and hop_1_j_e hop_1_e_h) hop_2_j_h)
3561  (=> (and hop_1_j_e hop_1_e_k) hop_2_j_k)
3562  (=> (and hop_1_j_e hop_1_e_m) hop_2_j_m)
3563  (=> (and hop_1_j_e hop_1_e_l) hop_2_j_l)
3564  (=> (and hop_1_j_e hop_1_e_o) hop_2_j_o)
3565  (=> (and hop_1_j_e hop_1_e_n) hop_2_j_n)
3566  (=> (and hop_1_j_e hop_1_e_q) hop_2_j_q)
3567  (=> (and hop_1_j_e hop_1_e_p) hop_2_j_p)
3568  (=> (and hop_1_j_d hop_1_d_a) hop_2_j_a)
3569  (=> (and hop_1_j_d hop_1_d_c) hop_2_j_c)
3570  (=> (and hop_1_j_d hop_1_d_b) hop_2_j_b)
3571  (=> (and hop_1_j_d hop_1_d_e) hop_2_j_e)
3572  (=> (and hop_1_j_d hop_1_d_g) hop_2_j_g)
3573  (=> (and hop_1_j_d hop_1_d_f) hop_2_j_f)
3574  (=> (and hop_1_j_d hop_1_d_i) hop_2_j_i)
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3575  (=> (and hop_1_j_d hop_1_d_h) hop_2_j_h)
3576  (=> (and hop_1_j_d hop_1_d_k) hop_2_j_k)
3577  (=> (and hop_1_j_d hop_1_d_m) hop_2_j_m)
3578  (=> (and hop_1_j_d hop_1_d_l) hop_2_j_l)
3579  (=> (and hop_1_j_d hop_1_d_o) hop_2_j_o)
3580  (=> (and hop_1_j_d hop_1_d_n) hop_2_j_n)
3581  (=> (and hop_1_j_d hop_1_d_q) hop_2_j_q)
3582  (=> (and hop_1_j_d hop_1_d_p) hop_2_j_p)
3583  (=> (and hop_1_j_g hop_1_g_a) hop_2_j_a)
3584  (=> (and hop_1_j_g hop_1_g_c) hop_2_j_c)
3585  (=> (and hop_1_j_g hop_1_g_b) hop_2_j_b)
3586  (=> (and hop_1_j_g hop_1_g_e) hop_2_j_e)
3587  (=> (and hop_1_j_g hop_1_g_d) hop_2_j_d)
3588  (=> (and hop_1_j_g hop_1_g_f) hop_2_j_f)
3589  (=> (and hop_1_j_g hop_1_g_i) hop_2_j_i)
3590  (=> (and hop_1_j_g hop_1_g_h) hop_2_j_h)
3591  (=> (and hop_1_j_g hop_1_g_k) hop_2_j_k)
3592  (=> (and hop_1_j_g hop_1_g_m) hop_2_j_m)
3593  (=> (and hop_1_j_g hop_1_g_l) hop_2_j_l)
3594  (=> (and hop_1_j_g hop_1_g_o) hop_2_j_o)
3595  (=> (and hop_1_j_g hop_1_g_n) hop_2_j_n)
3596  (=> (and hop_1_j_g hop_1_g_q) hop_2_j_q)
3597  (=> (and hop_1_j_g hop_1_g_p) hop_2_j_p)
3598  (=> (and hop_1_j_f hop_1_f_a) hop_2_j_a)
3599  (=> (and hop_1_j_f hop_1_f_c) hop_2_j_c)
3600  (=> (and hop_1_j_f hop_1_f_b) hop_2_j_b)
3601  (=> (and hop_1_j_f hop_1_f_e) hop_2_j_e)
3602  (=> (and hop_1_j_f hop_1_f_d) hop_2_j_d)
3603  (=> (and hop_1_j_f hop_1_f_g) hop_2_j_g)
3604  (=> (and hop_1_j_f hop_1_f_i) hop_2_j_i)
3605  (=> (and hop_1_j_f hop_1_f_h) hop_2_j_h)
3606  (=> (and hop_1_j_f hop_1_f_k) hop_2_j_k)
3607  (=> (and hop_1_j_f hop_1_f_m) hop_2_j_m)
3608  (=> (and hop_1_j_f hop_1_f_l) hop_2_j_l)
3609  (=> (and hop_1_j_f hop_1_f_o) hop_2_j_o)
3610  (=> (and hop_1_j_f hop_1_f_n) hop_2_j_n)
3611  (=> (and hop_1_j_f hop_1_f_q) hop_2_j_q)
3612  (=> (and hop_1_j_f hop_1_f_p) hop_2_j_p)
3613  (=> (and hop_1_j_i hop_1_i_a) hop_2_j_a)
3614  (=> (and hop_1_j_i hop_1_i_c) hop_2_j_c)
3615  (=> (and hop_1_j_i hop_1_i_b) hop_2_j_b)
3616  (=> (and hop_1_j_i hop_1_i_e) hop_2_j_e)
3617  (=> (and hop_1_j_i hop_1_i_d) hop_2_j_d)
3618  (=> (and hop_1_j_i hop_1_i_g) hop_2_j_g)
3619  (=> (and hop_1_j_i hop_1_i_f) hop_2_j_f)
3620  (=> (and hop_1_j_i hop_1_i_h) hop_2_j_h)
3621  (=> (and hop_1_j_i hop_1_i_k) hop_2_j_k)
3622  (=> (and hop_1_j_i hop_1_i_m) hop_2_j_m)
3623  (=> (and hop_1_j_i hop_1_i_l) hop_2_j_l)
3624  (=> (and hop_1_j_i hop_1_i_o) hop_2_j_o)
3625  (=> (and hop_1_j_i hop_1_i_n) hop_2_j_n)
3626  (=> (and hop_1_j_i hop_1_i_q) hop_2_j_q)
3627  (=> (and hop_1_j_i hop_1_i_p) hop_2_j_p)
3628  (=> (and hop_1_j_h hop_1_h_a) hop_2_j_a)
3629  (=> (and hop_1_j_h hop_1_h_c) hop_2_j_c)
3630  (=> (and hop_1_j_h hop_1_h_b) hop_2_j_b)
3631  (=> (and hop_1_j_h hop_1_h_e) hop_2_j_e)
3632  (=> (and hop_1_j_h hop_1_h_d) hop_2_j_d)
3633  (=> (and hop_1_j_h hop_1_h_g) hop_2_j_g)
3634  (=> (and hop_1_j_h hop_1_h_f) hop_2_j_f)
3635  (=> (and hop_1_j_h hop_1_h_i) hop_2_j_i)
3636  (=> (and hop_1_j_h hop_1_h_k) hop_2_j_k)
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3637  (=> (and hop_1_j_h hop_1_h_m) hop_2_j_m)
3638  (=> (and hop_1_j_h hop_1_h_l) hop_2_j_l)
3639  (=> (and hop_1_j_h hop_1_h_o) hop_2_j_o)
3640  (=> (and hop_1_j_h hop_1_h_n) hop_2_j_n)
3641  (=> (and hop_1_j_h hop_1_h_q) hop_2_j_q)
3642  (=> (and hop_1_j_h hop_1_h_p) hop_2_j_p)
3643  (=> (and hop_1_j_k hop_1_k_a) hop_2_j_a)
3644  (=> (and hop_1_j_k hop_1_k_c) hop_2_j_c)
3645  (=> (and hop_1_j_k hop_1_k_b) hop_2_j_b)
3646  (=> (and hop_1_j_k hop_1_k_e) hop_2_j_e)
3647  (=> (and hop_1_j_k hop_1_k_d) hop_2_j_d)
3648  (=> (and hop_1_j_k hop_1_k_g) hop_2_j_g)
3649  (=> (and hop_1_j_k hop_1_k_f) hop_2_j_f)
3650  (=> (and hop_1_j_k hop_1_k_i) hop_2_j_i)
3651  (=> (and hop_1_j_k hop_1_k_h) hop_2_j_h)
3652  (=> (and hop_1_j_k hop_1_k_m) hop_2_j_m)
3653  (=> (and hop_1_j_k hop_1_k_l) hop_2_j_l)
3654  (=> (and hop_1_j_k hop_1_k_o) hop_2_j_o)
3655  (=> (and hop_1_j_k hop_1_k_n) hop_2_j_n)
3656  (=> (and hop_1_j_k hop_1_k_q) hop_2_j_q)
3657  (=> (and hop_1_j_k hop_1_k_p) hop_2_j_p)
3658  (=> (and hop_1_j_m hop_1_m_a) hop_2_j_a)
3659  (=> (and hop_1_j_m hop_1_m_c) hop_2_j_c)
3660  (=> (and hop_1_j_m hop_1_m_b) hop_2_j_b)
3661  (=> (and hop_1_j_m hop_1_m_e) hop_2_j_e)
3662  (=> (and hop_1_j_m hop_1_m_d) hop_2_j_d)
3663  (=> (and hop_1_j_m hop_1_m_g) hop_2_j_g)
3664  (=> (and hop_1_j_m hop_1_m_f) hop_2_j_f)
3665  (=> (and hop_1_j_m hop_1_m_i) hop_2_j_i)
3666  (=> (and hop_1_j_m hop_1_m_h) hop_2_j_h)
3667  (=> (and hop_1_j_m hop_1_m_k) hop_2_j_k)
3668  (=> (and hop_1_j_m hop_1_m_l) hop_2_j_l)
3669  (=> (and hop_1_j_m hop_1_m_o) hop_2_j_o)
3670  (=> (and hop_1_j_m hop_1_m_n) hop_2_j_n)
3671  (=> (and hop_1_j_m hop_1_m_q) hop_2_j_q)
3672  (=> (and hop_1_j_m hop_1_m_p) hop_2_j_p)
3673  (=> (and hop_1_j_l hop_1_l_a) hop_2_j_a)
3674  (=> (and hop_1_j_l hop_1_l_c) hop_2_j_c)
3675  (=> (and hop_1_j_l hop_1_l_b) hop_2_j_b)
3676  (=> (and hop_1_j_l hop_1_l_e) hop_2_j_e)
3677  (=> (and hop_1_j_l hop_1_l_d) hop_2_j_d)
3678  (=> (and hop_1_j_l hop_1_l_g) hop_2_j_g)
3679  (=> (and hop_1_j_l hop_1_l_f) hop_2_j_f)
3680  (=> (and hop_1_j_l hop_1_l_i) hop_2_j_i)
3681  (=> (and hop_1_j_l hop_1_l_h) hop_2_j_h)
3682  (=> (and hop_1_j_l hop_1_l_k) hop_2_j_k)
3683  (=> (and hop_1_j_l hop_1_l_m) hop_2_j_m)
3684  (=> (and hop_1_j_l hop_1_l_o) hop_2_j_o)
3685  (=> (and hop_1_j_l hop_1_l_n) hop_2_j_n)
3686  (=> (and hop_1_j_l hop_1_l_q) hop_2_j_q)
3687  (=> (and hop_1_j_l hop_1_l_p) hop_2_j_p)
3688  (=> (and hop_1_j_o hop_1_o_a) hop_2_j_a)
3689  (=> (and hop_1_j_o hop_1_o_c) hop_2_j_c)
3690  (=> (and hop_1_j_o hop_1_o_b) hop_2_j_b)
3691  (=> (and hop_1_j_o hop_1_o_e) hop_2_j_e)
3692  (=> (and hop_1_j_o hop_1_o_d) hop_2_j_d)
3693  (=> (and hop_1_j_o hop_1_o_g) hop_2_j_g)
3694  (=> (and hop_1_j_o hop_1_o_f) hop_2_j_f)
3695  (=> (and hop_1_j_o hop_1_o_i) hop_2_j_i)
3696  (=> (and hop_1_j_o hop_1_o_h) hop_2_j_h)
3697  (=> (and hop_1_j_o hop_1_o_k) hop_2_j_k)
3698  (=> (and hop_1_j_o hop_1_o_m) hop_2_j_m)
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3699  (=> (and hop_1_j_o hop_1_o_l) hop_2_j_l)
3700  (=> (and hop_1_j_o hop_1_o_n) hop_2_j_n)
3701  (=> (and hop_1_j_o hop_1_o_q) hop_2_j_q)
3702  (=> (and hop_1_j_o hop_1_o_p) hop_2_j_p)
3703  (=> (and hop_1_j_n hop_1_n_a) hop_2_j_a)
3704  (=> (and hop_1_j_n hop_1_n_c) hop_2_j_c)
3705  (=> (and hop_1_j_n hop_1_n_b) hop_2_j_b)
3706  (=> (and hop_1_j_n hop_1_n_e) hop_2_j_e)
3707  (=> (and hop_1_j_n hop_1_n_d) hop_2_j_d)
3708  (=> (and hop_1_j_n hop_1_n_g) hop_2_j_g)
3709  (=> (and hop_1_j_n hop_1_n_f) hop_2_j_f)
3710  (=> (and hop_1_j_n hop_1_n_i) hop_2_j_i)
3711  (=> (and hop_1_j_n hop_1_n_h) hop_2_j_h)
3712  (=> (and hop_1_j_n hop_1_n_k) hop_2_j_k)
3713  (=> (and hop_1_j_n hop_1_n_m) hop_2_j_m)
3714  (=> (and hop_1_j_n hop_1_n_l) hop_2_j_l)
3715  (=> (and hop_1_j_n hop_1_n_o) hop_2_j_o)
3716  (=> (and hop_1_j_n hop_1_n_q) hop_2_j_q)
3717  (=> (and hop_1_j_n hop_1_n_p) hop_2_j_p)
3718  (=> (and hop_1_j_q hop_1_q_a) hop_2_j_a)
3719  (=> (and hop_1_j_q hop_1_q_c) hop_2_j_c)
3720  (=> (and hop_1_j_q hop_1_q_b) hop_2_j_b)
3721  (=> (and hop_1_j_q hop_1_q_e) hop_2_j_e)
3722  (=> (and hop_1_j_q hop_1_q_d) hop_2_j_d)
3723  (=> (and hop_1_j_q hop_1_q_g) hop_2_j_g)
3724  (=> (and hop_1_j_q hop_1_q_f) hop_2_j_f)
3725  (=> (and hop_1_j_q hop_1_q_i) hop_2_j_i)
3726  (=> (and hop_1_j_q hop_1_q_h) hop_2_j_h)
3727  (=> (and hop_1_j_q hop_1_q_k) hop_2_j_k)
3728  (=> (and hop_1_j_q hop_1_q_m) hop_2_j_m)
3729  (=> (and hop_1_j_q hop_1_q_l) hop_2_j_l)
3730  (=> (and hop_1_j_q hop_1_q_o) hop_2_j_o)
3731  (=> (and hop_1_j_q hop_1_q_n) hop_2_j_n)
3732  (=> (and hop_1_j_q hop_1_q_p) hop_2_j_p)
3733  (=> (and hop_1_j_p hop_1_p_a) hop_2_j_a)
3734  (=> (and hop_1_j_p hop_1_p_c) hop_2_j_c)
3735  (=> (and hop_1_j_p hop_1_p_b) hop_2_j_b)
3736  (=> (and hop_1_j_p hop_1_p_e) hop_2_j_e)
3737  (=> (and hop_1_j_p hop_1_p_d) hop_2_j_d)
3738  (=> (and hop_1_j_p hop_1_p_g) hop_2_j_g)
3739  (=> (and hop_1_j_p hop_1_p_f) hop_2_j_f)
3740  (=> (and hop_1_j_p hop_1_p_i) hop_2_j_i)
3741  (=> (and hop_1_j_p hop_1_p_h) hop_2_j_h)
3742  (=> (and hop_1_j_p hop_1_p_k) hop_2_j_k)
3743  (=> (and hop_1_j_p hop_1_p_m) hop_2_j_m)
3744  (=> (and hop_1_j_p hop_1_p_l) hop_2_j_l)
3745  (=> (and hop_1_j_p hop_1_p_o) hop_2_j_o)
3746  (=> (and hop_1_j_p hop_1_p_n) hop_2_j_n)
3747  (=> (and hop_1_j_p hop_1_p_q) hop_2_j_q)
3748  (=> (and hop_1_m_a hop_1_a_c) hop_2_m_c)
3749  (=> (and hop_1_m_a hop_1_a_b) hop_2_m_b)
3750  (=> (and hop_1_m_a hop_1_a_e) hop_2_m_e)
3751  (=> (and hop_1_m_a hop_1_a_d) hop_2_m_d)
3752  (=> (and hop_1_m_a hop_1_a_g) hop_2_m_g)
3753  (=> (and hop_1_m_a hop_1_a_f) hop_2_m_f)
3754  (=> (and hop_1_m_a hop_1_a_i) hop_2_m_i)
3755  (=> (and hop_1_m_a hop_1_a_h) hop_2_m_h)
3756  (=> (and hop_1_m_a hop_1_a_k) hop_2_m_k)
3757  (=> (and hop_1_m_a hop_1_a_j) hop_2_m_j)
3758  (=> (and hop_1_m_a hop_1_a_l) hop_2_m_l)
3759  (=> (and hop_1_m_a hop_1_a_o) hop_2_m_o)
3760  (=> (and hop_1_m_a hop_1_a_n) hop_2_m_n)
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3761  (=> (and hop_1_m_a hop_1_a_q) hop_2_m_q)
3762  (=> (and hop_1_m_a hop_1_a_p) hop_2_m_p)
3763  (=> (and hop_1_m_c hop_1_c_a) hop_2_m_a)
3764  (=> (and hop_1_m_c hop_1_c_b) hop_2_m_b)
3765  (=> (and hop_1_m_c hop_1_c_e) hop_2_m_e)
3766  (=> (and hop_1_m_c hop_1_c_d) hop_2_m_d)
3767  (=> (and hop_1_m_c hop_1_c_g) hop_2_m_g)
3768  (=> (and hop_1_m_c hop_1_c_f) hop_2_m_f)
3769  (=> (and hop_1_m_c hop_1_c_i) hop_2_m_i)
3770  (=> (and hop_1_m_c hop_1_c_h) hop_2_m_h)
3771  (=> (and hop_1_m_c hop_1_c_k) hop_2_m_k)
3772  (=> (and hop_1_m_c hop_1_c_j) hop_2_m_j)
3773  (=> (and hop_1_m_c hop_1_c_l) hop_2_m_l)
3774  (=> (and hop_1_m_c hop_1_c_o) hop_2_m_o)
3775  (=> (and hop_1_m_c hop_1_c_n) hop_2_m_n)
3776  (=> (and hop_1_m_c hop_1_c_q) hop_2_m_q)
3777  (=> (and hop_1_m_c hop_1_c_p) hop_2_m_p)
3778  (=> (and hop_1_m_b hop_1_b_a) hop_2_m_a)
3779  (=> (and hop_1_m_b hop_1_b_c) hop_2_m_c)
3780  (=> (and hop_1_m_b hop_1_b_e) hop_2_m_e)
3781  (=> (and hop_1_m_b hop_1_b_d) hop_2_m_d)
3782  (=> (and hop_1_m_b hop_1_b_g) hop_2_m_g)
3783  (=> (and hop_1_m_b hop_1_b_f) hop_2_m_f)
3784  (=> (and hop_1_m_b hop_1_b_i) hop_2_m_i)
3785  (=> (and hop_1_m_b hop_1_b_h) hop_2_m_h)
3786  (=> (and hop_1_m_b hop_1_b_k) hop_2_m_k)
3787  (=> (and hop_1_m_b hop_1_b_j) hop_2_m_j)
3788  (=> (and hop_1_m_b hop_1_b_l) hop_2_m_l)
3789  (=> (and hop_1_m_b hop_1_b_o) hop_2_m_o)
3790  (=> (and hop_1_m_b hop_1_b_n) hop_2_m_n)
3791  (=> (and hop_1_m_b hop_1_b_q) hop_2_m_q)
3792  (=> (and hop_1_m_b hop_1_b_p) hop_2_m_p)
3793  (=> (and hop_1_m_e hop_1_e_a) hop_2_m_a)
3794  (=> (and hop_1_m_e hop_1_e_c) hop_2_m_c)
3795  (=> (and hop_1_m_e hop_1_e_b) hop_2_m_b)
3796  (=> (and hop_1_m_e hop_1_e_d) hop_2_m_d)
3797  (=> (and hop_1_m_e hop_1_e_g) hop_2_m_g)
3798  (=> (and hop_1_m_e hop_1_e_f) hop_2_m_f)
3799  (=> (and hop_1_m_e hop_1_e_i) hop_2_m_i)
3800  (=> (and hop_1_m_e hop_1_e_h) hop_2_m_h)
3801  (=> (and hop_1_m_e hop_1_e_k) hop_2_m_k)
3802  (=> (and hop_1_m_e hop_1_e_j) hop_2_m_j)
3803  (=> (and hop_1_m_e hop_1_e_l) hop_2_m_l)
3804  (=> (and hop_1_m_e hop_1_e_o) hop_2_m_o)
3805  (=> (and hop_1_m_e hop_1_e_n) hop_2_m_n)
3806  (=> (and hop_1_m_e hop_1_e_q) hop_2_m_q)
3807  (=> (and hop_1_m_e hop_1_e_p) hop_2_m_p)
3808  (=> (and hop_1_m_d hop_1_d_a) hop_2_m_a)
3809  (=> (and hop_1_m_d hop_1_d_c) hop_2_m_c)
3810  (=> (and hop_1_m_d hop_1_d_b) hop_2_m_b)
3811  (=> (and hop_1_m_d hop_1_d_e) hop_2_m_e)
3812  (=> (and hop_1_m_d hop_1_d_g) hop_2_m_g)
3813  (=> (and hop_1_m_d hop_1_d_f) hop_2_m_f)
3814  (=> (and hop_1_m_d hop_1_d_i) hop_2_m_i)
3815  (=> (and hop_1_m_d hop_1_d_h) hop_2_m_h)
3816  (=> (and hop_1_m_d hop_1_d_k) hop_2_m_k)
3817  (=> (and hop_1_m_d hop_1_d_j) hop_2_m_j)
3818  (=> (and hop_1_m_d hop_1_d_l) hop_2_m_l)
3819  (=> (and hop_1_m_d hop_1_d_o) hop_2_m_o)
3820  (=> (and hop_1_m_d hop_1_d_n) hop_2_m_n)
3821  (=> (and hop_1_m_d hop_1_d_q) hop_2_m_q)
3822  (=> (and hop_1_m_d hop_1_d_p) hop_2_m_p)
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3823  (=> (and hop_1_m_g hop_1_g_a) hop_2_m_a)
3824  (=> (and hop_1_m_g hop_1_g_c) hop_2_m_c)
3825  (=> (and hop_1_m_g hop_1_g_b) hop_2_m_b)
3826  (=> (and hop_1_m_g hop_1_g_e) hop_2_m_e)
3827  (=> (and hop_1_m_g hop_1_g_d) hop_2_m_d)
3828  (=> (and hop_1_m_g hop_1_g_f) hop_2_m_f)
3829  (=> (and hop_1_m_g hop_1_g_i) hop_2_m_i)
3830  (=> (and hop_1_m_g hop_1_g_h) hop_2_m_h)
3831  (=> (and hop_1_m_g hop_1_g_k) hop_2_m_k)
3832  (=> (and hop_1_m_g hop_1_g_j) hop_2_m_j)
3833  (=> (and hop_1_m_g hop_1_g_l) hop_2_m_l)
3834  (=> (and hop_1_m_g hop_1_g_o) hop_2_m_o)
3835  (=> (and hop_1_m_g hop_1_g_n) hop_2_m_n)
3836  (=> (and hop_1_m_g hop_1_g_q) hop_2_m_q)
3837  (=> (and hop_1_m_g hop_1_g_p) hop_2_m_p)
3838  (=> (and hop_1_m_f hop_1_f_a) hop_2_m_a)
3839  (=> (and hop_1_m_f hop_1_f_c) hop_2_m_c)
3840  (=> (and hop_1_m_f hop_1_f_b) hop_2_m_b)
3841  (=> (and hop_1_m_f hop_1_f_e) hop_2_m_e)
3842  (=> (and hop_1_m_f hop_1_f_d) hop_2_m_d)
3843  (=> (and hop_1_m_f hop_1_f_g) hop_2_m_g)
3844  (=> (and hop_1_m_f hop_1_f_i) hop_2_m_i)
3845  (=> (and hop_1_m_f hop_1_f_h) hop_2_m_h)
3846  (=> (and hop_1_m_f hop_1_f_k) hop_2_m_k)
3847  (=> (and hop_1_m_f hop_1_f_j) hop_2_m_j)
3848  (=> (and hop_1_m_f hop_1_f_l) hop_2_m_l)
3849  (=> (and hop_1_m_f hop_1_f_o) hop_2_m_o)
3850  (=> (and hop_1_m_f hop_1_f_n) hop_2_m_n)
3851  (=> (and hop_1_m_f hop_1_f_q) hop_2_m_q)
3852  (=> (and hop_1_m_f hop_1_f_p) hop_2_m_p)
3853  (=> (and hop_1_m_i hop_1_i_a) hop_2_m_a)
3854  (=> (and hop_1_m_i hop_1_i_c) hop_2_m_c)
3855  (=> (and hop_1_m_i hop_1_i_b) hop_2_m_b)
3856  (=> (and hop_1_m_i hop_1_i_e) hop_2_m_e)
3857  (=> (and hop_1_m_i hop_1_i_d) hop_2_m_d)
3858  (=> (and hop_1_m_i hop_1_i_g) hop_2_m_g)
3859  (=> (and hop_1_m_i hop_1_i_f) hop_2_m_f)
3860  (=> (and hop_1_m_i hop_1_i_h) hop_2_m_h)
3861  (=> (and hop_1_m_i hop_1_i_k) hop_2_m_k)
3862  (=> (and hop_1_m_i hop_1_i_j) hop_2_m_j)
3863  (=> (and hop_1_m_i hop_1_i_l) hop_2_m_l)
3864  (=> (and hop_1_m_i hop_1_i_o) hop_2_m_o)
3865  (=> (and hop_1_m_i hop_1_i_n) hop_2_m_n)
3866  (=> (and hop_1_m_i hop_1_i_q) hop_2_m_q)
3867  (=> (and hop_1_m_i hop_1_i_p) hop_2_m_p)
3868  (=> (and hop_1_m_h hop_1_h_a) hop_2_m_a)
3869  (=> (and hop_1_m_h hop_1_h_c) hop_2_m_c)
3870  (=> (and hop_1_m_h hop_1_h_b) hop_2_m_b)
3871  (=> (and hop_1_m_h hop_1_h_e) hop_2_m_e)
3872  (=> (and hop_1_m_h hop_1_h_d) hop_2_m_d)
3873  (=> (and hop_1_m_h hop_1_h_g) hop_2_m_g)
3874  (=> (and hop_1_m_h hop_1_h_f) hop_2_m_f)
3875  (=> (and hop_1_m_h hop_1_h_i) hop_2_m_i)
3876  (=> (and hop_1_m_h hop_1_h_k) hop_2_m_k)
3877  (=> (and hop_1_m_h hop_1_h_j) hop_2_m_j)
3878  (=> (and hop_1_m_h hop_1_h_l) hop_2_m_l)
3879  (=> (and hop_1_m_h hop_1_h_o) hop_2_m_o)
3880  (=> (and hop_1_m_h hop_1_h_n) hop_2_m_n)
3881  (=> (and hop_1_m_h hop_1_h_q) hop_2_m_q)
3882  (=> (and hop_1_m_h hop_1_h_p) hop_2_m_p)
3883  (=> (and hop_1_m_k hop_1_k_a) hop_2_m_a)
3884  (=> (and hop_1_m_k hop_1_k_c) hop_2_m_c)
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3885  (=> (and hop_1_m_k hop_1_k_b) hop_2_m_b)
3886  (=> (and hop_1_m_k hop_1_k_e) hop_2_m_e)
3887  (=> (and hop_1_m_k hop_1_k_d) hop_2_m_d)
3888  (=> (and hop_1_m_k hop_1_k_g) hop_2_m_g)
3889  (=> (and hop_1_m_k hop_1_k_f) hop_2_m_f)
3890  (=> (and hop_1_m_k hop_1_k_i) hop_2_m_i)
3891  (=> (and hop_1_m_k hop_1_k_h) hop_2_m_h)
3892  (=> (and hop_1_m_k hop_1_k_j) hop_2_m_j)
3893  (=> (and hop_1_m_k hop_1_k_l) hop_2_m_l)
3894  (=> (and hop_1_m_k hop_1_k_o) hop_2_m_o)
3895  (=> (and hop_1_m_k hop_1_k_n) hop_2_m_n)
3896  (=> (and hop_1_m_k hop_1_k_q) hop_2_m_q)
3897  (=> (and hop_1_m_k hop_1_k_p) hop_2_m_p)
3898  (=> (and hop_1_m_j hop_1_j_a) hop_2_m_a)
3899  (=> (and hop_1_m_j hop_1_j_c) hop_2_m_c)
3900  (=> (and hop_1_m_j hop_1_j_b) hop_2_m_b)
3901  (=> (and hop_1_m_j hop_1_j_e) hop_2_m_e)
3902  (=> (and hop_1_m_j hop_1_j_d) hop_2_m_d)
3903  (=> (and hop_1_m_j hop_1_j_g) hop_2_m_g)
3904  (=> (and hop_1_m_j hop_1_j_f) hop_2_m_f)
3905  (=> (and hop_1_m_j hop_1_j_i) hop_2_m_i)
3906  (=> (and hop_1_m_j hop_1_j_h) hop_2_m_h)
3907  (=> (and hop_1_m_j hop_1_j_k) hop_2_m_k)
3908  (=> (and hop_1_m_j hop_1_j_l) hop_2_m_l)
3909  (=> (and hop_1_m_j hop_1_j_o) hop_2_m_o)
3910  (=> (and hop_1_m_j hop_1_j_n) hop_2_m_n)
3911  (=> (and hop_1_m_j hop_1_j_q) hop_2_m_q)
3912  (=> (and hop_1_m_j hop_1_j_p) hop_2_m_p)
3913  (=> (and hop_1_m_l hop_1_l_a) hop_2_m_a)
3914  (=> (and hop_1_m_l hop_1_l_c) hop_2_m_c)
3915  (=> (and hop_1_m_l hop_1_l_b) hop_2_m_b)
3916  (=> (and hop_1_m_l hop_1_l_e) hop_2_m_e)
3917  (=> (and hop_1_m_l hop_1_l_d) hop_2_m_d)
3918  (=> (and hop_1_m_l hop_1_l_g) hop_2_m_g)
3919  (=> (and hop_1_m_l hop_1_l_f) hop_2_m_f)
3920  (=> (and hop_1_m_l hop_1_l_i) hop_2_m_i)
3921  (=> (and hop_1_m_l hop_1_l_h) hop_2_m_h)
3922  (=> (and hop_1_m_l hop_1_l_k) hop_2_m_k)
3923  (=> (and hop_1_m_l hop_1_l_j) hop_2_m_j)
3924  (=> (and hop_1_m_l hop_1_l_o) hop_2_m_o)
3925  (=> (and hop_1_m_l hop_1_l_n) hop_2_m_n)
3926  (=> (and hop_1_m_l hop_1_l_q) hop_2_m_q)
3927  (=> (and hop_1_m_l hop_1_l_p) hop_2_m_p)
3928  (=> (and hop_1_m_o hop_1_o_a) hop_2_m_a)
3929  (=> (and hop_1_m_o hop_1_o_c) hop_2_m_c)
3930  (=> (and hop_1_m_o hop_1_o_b) hop_2_m_b)
3931  (=> (and hop_1_m_o hop_1_o_e) hop_2_m_e)
3932  (=> (and hop_1_m_o hop_1_o_d) hop_2_m_d)
3933  (=> (and hop_1_m_o hop_1_o_g) hop_2_m_g)
3934  (=> (and hop_1_m_o hop_1_o_f) hop_2_m_f)
3935  (=> (and hop_1_m_o hop_1_o_i) hop_2_m_i)
3936  (=> (and hop_1_m_o hop_1_o_h) hop_2_m_h)
3937  (=> (and hop_1_m_o hop_1_o_k) hop_2_m_k)
3938  (=> (and hop_1_m_o hop_1_o_j) hop_2_m_j)
3939  (=> (and hop_1_m_o hop_1_o_l) hop_2_m_l)
3940  (=> (and hop_1_m_o hop_1_o_n) hop_2_m_n)
3941  (=> (and hop_1_m_o hop_1_o_q) hop_2_m_q)
3942  (=> (and hop_1_m_o hop_1_o_p) hop_2_m_p)
3943  (=> (and hop_1_m_n hop_1_n_a) hop_2_m_a)
3944  (=> (and hop_1_m_n hop_1_n_c) hop_2_m_c)
3945  (=> (and hop_1_m_n hop_1_n_b) hop_2_m_b)
3946  (=> (and hop_1_m_n hop_1_n_e) hop_2_m_e)
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3947  (=> (and hop_1_m_n hop_1_n_d) hop_2_m_d)
3948  (=> (and hop_1_m_n hop_1_n_g) hop_2_m_g)
3949  (=> (and hop_1_m_n hop_1_n_f) hop_2_m_f)
3950  (=> (and hop_1_m_n hop_1_n_i) hop_2_m_i)
3951  (=> (and hop_1_m_n hop_1_n_h) hop_2_m_h)
3952  (=> (and hop_1_m_n hop_1_n_k) hop_2_m_k)
3953  (=> (and hop_1_m_n hop_1_n_j) hop_2_m_j)
3954  (=> (and hop_1_m_n hop_1_n_l) hop_2_m_l)
3955  (=> (and hop_1_m_n hop_1_n_o) hop_2_m_o)
3956  (=> (and hop_1_m_n hop_1_n_q) hop_2_m_q)
3957  (=> (and hop_1_m_n hop_1_n_p) hop_2_m_p)
3958  (=> (and hop_1_m_q hop_1_q_a) hop_2_m_a)
3959  (=> (and hop_1_m_q hop_1_q_c) hop_2_m_c)
3960  (=> (and hop_1_m_q hop_1_q_b) hop_2_m_b)
3961  (=> (and hop_1_m_q hop_1_q_e) hop_2_m_e)
3962  (=> (and hop_1_m_q hop_1_q_d) hop_2_m_d)
3963  (=> (and hop_1_m_q hop_1_q_g) hop_2_m_g)
3964  (=> (and hop_1_m_q hop_1_q_f) hop_2_m_f)
3965  (=> (and hop_1_m_q hop_1_q_i) hop_2_m_i)
3966  (=> (and hop_1_m_q hop_1_q_h) hop_2_m_h)
3967  (=> (and hop_1_m_q hop_1_q_k) hop_2_m_k)
3968  (=> (and hop_1_m_q hop_1_q_j) hop_2_m_j)
3969  (=> (and hop_1_m_q hop_1_q_l) hop_2_m_l)
3970  (=> (and hop_1_m_q hop_1_q_o) hop_2_m_o)
3971  (=> (and hop_1_m_q hop_1_q_n) hop_2_m_n)
3972  (=> (and hop_1_m_q hop_1_q_p) hop_2_m_p)
3973  (=> (and hop_1_m_p hop_1_p_a) hop_2_m_a)
3974  (=> (and hop_1_m_p hop_1_p_c) hop_2_m_c)
3975  (=> (and hop_1_m_p hop_1_p_b) hop_2_m_b)
3976  (=> (and hop_1_m_p hop_1_p_e) hop_2_m_e)
3977  (=> (and hop_1_m_p hop_1_p_d) hop_2_m_d)
3978  (=> (and hop_1_m_p hop_1_p_g) hop_2_m_g)
3979  (=> (and hop_1_m_p hop_1_p_f) hop_2_m_f)
3980  (=> (and hop_1_m_p hop_1_p_i) hop_2_m_i)
3981  (=> (and hop_1_m_p hop_1_p_h) hop_2_m_h)
3982  (=> (and hop_1_m_p hop_1_p_k) hop_2_m_k)
3983  (=> (and hop_1_m_p hop_1_p_j) hop_2_m_j)
3984  (=> (and hop_1_m_p hop_1_p_l) hop_2_m_l)
3985  (=> (and hop_1_m_p hop_1_p_o) hop_2_m_o)
3986  (=> (and hop_1_m_p hop_1_p_n) hop_2_m_n)
3987  (=> (and hop_1_m_p hop_1_p_q) hop_2_m_q)
3988  (=> (and hop_1_l_a hop_1_a_c) hop_2_l_c)
3989  (=> (and hop_1_l_a hop_1_a_b) hop_2_l_b)
3990  (=> (and hop_1_l_a hop_1_a_e) hop_2_l_e)
3991  (=> (and hop_1_l_a hop_1_a_d) hop_2_l_d)
3992  (=> (and hop_1_l_a hop_1_a_g) hop_2_l_g)
3993  (=> (and hop_1_l_a hop_1_a_f) hop_2_l_f)
3994  (=> (and hop_1_l_a hop_1_a_i) hop_2_l_i)
3995  (=> (and hop_1_l_a hop_1_a_h) hop_2_l_h)
3996  (=> (and hop_1_l_a hop_1_a_k) hop_2_l_k)
3997  (=> (and hop_1_l_a hop_1_a_j) hop_2_l_j)
3998  (=> (and hop_1_l_a hop_1_a_m) hop_2_l_m)
3999  (=> (and hop_1_l_a hop_1_a_o) hop_2_l_o)
4000  (=> (and hop_1_l_a hop_1_a_n) hop_2_l_n)
4001  (=> (and hop_1_l_a hop_1_a_q) hop_2_l_q)
4002  (=> (and hop_1_l_a hop_1_a_p) hop_2_l_p)
4003  (=> (and hop_1_l_c hop_1_c_a) hop_2_l_a)
4004  (=> (and hop_1_l_c hop_1_c_b) hop_2_l_b)
4005  (=> (and hop_1_l_c hop_1_c_e) hop_2_l_e)
4006  (=> (and hop_1_l_c hop_1_c_d) hop_2_l_d)
4007  (=> (and hop_1_l_c hop_1_c_g) hop_2_l_g)
4008  (=> (and hop_1_l_c hop_1_c_f) hop_2_l_f)
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4009  (=> (and hop_1_l_c hop_1_c_i) hop_2_l_i)
4010  (=> (and hop_1_l_c hop_1_c_h) hop_2_l_h)
4011  (=> (and hop_1_l_c hop_1_c_k) hop_2_l_k)
4012  (=> (and hop_1_l_c hop_1_c_j) hop_2_l_j)
4013  (=> (and hop_1_l_c hop_1_c_m) hop_2_l_m)
4014  (=> (and hop_1_l_c hop_1_c_o) hop_2_l_o)
4015  (=> (and hop_1_l_c hop_1_c_n) hop_2_l_n)
4016  (=> (and hop_1_l_c hop_1_c_q) hop_2_l_q)
4017  (=> (and hop_1_l_c hop_1_c_p) hop_2_l_p)
4018  (=> (and hop_1_l_b hop_1_b_a) hop_2_l_a)
4019  (=> (and hop_1_l_b hop_1_b_c) hop_2_l_c)
4020  (=> (and hop_1_l_b hop_1_b_e) hop_2_l_e)
4021  (=> (and hop_1_l_b hop_1_b_d) hop_2_l_d)
4022  (=> (and hop_1_l_b hop_1_b_g) hop_2_l_g)
4023  (=> (and hop_1_l_b hop_1_b_f) hop_2_l_f)
4024  (=> (and hop_1_l_b hop_1_b_i) hop_2_l_i)
4025  (=> (and hop_1_l_b hop_1_b_h) hop_2_l_h)
4026  (=> (and hop_1_l_b hop_1_b_k) hop_2_l_k)
4027  (=> (and hop_1_l_b hop_1_b_j) hop_2_l_j)
4028  (=> (and hop_1_l_b hop_1_b_m) hop_2_l_m)
4029  (=> (and hop_1_l_b hop_1_b_o) hop_2_l_o)
4030  (=> (and hop_1_l_b hop_1_b_n) hop_2_l_n)
4031  (=> (and hop_1_l_b hop_1_b_q) hop_2_l_q)
4032  (=> (and hop_1_l_b hop_1_b_p) hop_2_l_p)
4033  (=> (and hop_1_l_e hop_1_e_a) hop_2_l_a)
4034  (=> (and hop_1_l_e hop_1_e_c) hop_2_l_c)
4035  (=> (and hop_1_l_e hop_1_e_b) hop_2_l_b)
4036  (=> (and hop_1_l_e hop_1_e_d) hop_2_l_d)
4037  (=> (and hop_1_l_e hop_1_e_g) hop_2_l_g)
4038  (=> (and hop_1_l_e hop_1_e_f) hop_2_l_f)
4039  (=> (and hop_1_l_e hop_1_e_i) hop_2_l_i)
4040  (=> (and hop_1_l_e hop_1_e_h) hop_2_l_h)
4041  (=> (and hop_1_l_e hop_1_e_k) hop_2_l_k)
4042  (=> (and hop_1_l_e hop_1_e_j) hop_2_l_j)
4043  (=> (and hop_1_l_e hop_1_e_m) hop_2_l_m)
4044  (=> (and hop_1_l_e hop_1_e_o) hop_2_l_o)
4045  (=> (and hop_1_l_e hop_1_e_n) hop_2_l_n)
4046  (=> (and hop_1_l_e hop_1_e_q) hop_2_l_q)
4047  (=> (and hop_1_l_e hop_1_e_p) hop_2_l_p)
4048  (=> (and hop_1_l_d hop_1_d_a) hop_2_l_a)
4049  (=> (and hop_1_l_d hop_1_d_c) hop_2_l_c)
4050  (=> (and hop_1_l_d hop_1_d_b) hop_2_l_b)
4051  (=> (and hop_1_l_d hop_1_d_e) hop_2_l_e)
4052  (=> (and hop_1_l_d hop_1_d_g) hop_2_l_g)
4053  (=> (and hop_1_l_d hop_1_d_f) hop_2_l_f)
4054  (=> (and hop_1_l_d hop_1_d_i) hop_2_l_i)
4055  (=> (and hop_1_l_d hop_1_d_h) hop_2_l_h)
4056  (=> (and hop_1_l_d hop_1_d_k) hop_2_l_k)
4057  (=> (and hop_1_l_d hop_1_d_j) hop_2_l_j)
4058  (=> (and hop_1_l_d hop_1_d_m) hop_2_l_m)
4059  (=> (and hop_1_l_d hop_1_d_o) hop_2_l_o)
4060  (=> (and hop_1_l_d hop_1_d_n) hop_2_l_n)
4061  (=> (and hop_1_l_d hop_1_d_q) hop_2_l_q)
4062  (=> (and hop_1_l_d hop_1_d_p) hop_2_l_p)
4063  (=> (and hop_1_l_g hop_1_g_a) hop_2_l_a)
4064  (=> (and hop_1_l_g hop_1_g_c) hop_2_l_c)
4065  (=> (and hop_1_l_g hop_1_g_b) hop_2_l_b)
4066  (=> (and hop_1_l_g hop_1_g_e) hop_2_l_e)
4067  (=> (and hop_1_l_g hop_1_g_d) hop_2_l_d)
4068  (=> (and hop_1_l_g hop_1_g_f) hop_2_l_f)
4069  (=> (and hop_1_l_g hop_1_g_i) hop_2_l_i)
4070  (=> (and hop_1_l_g hop_1_g_h) hop_2_l_h)
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4071  (=> (and hop_1_l_g hop_1_g_k) hop_2_l_k)
4072  (=> (and hop_1_l_g hop_1_g_j) hop_2_l_j)
4073  (=> (and hop_1_l_g hop_1_g_m) hop_2_l_m)
4074  (=> (and hop_1_l_g hop_1_g_o) hop_2_l_o)
4075  (=> (and hop_1_l_g hop_1_g_n) hop_2_l_n)
4076  (=> (and hop_1_l_g hop_1_g_q) hop_2_l_q)
4077  (=> (and hop_1_l_g hop_1_g_p) hop_2_l_p)
4078  (=> (and hop_1_l_f hop_1_f_a) hop_2_l_a)
4079  (=> (and hop_1_l_f hop_1_f_c) hop_2_l_c)
4080  (=> (and hop_1_l_f hop_1_f_b) hop_2_l_b)
4081  (=> (and hop_1_l_f hop_1_f_e) hop_2_l_e)
4082  (=> (and hop_1_l_f hop_1_f_d) hop_2_l_d)
4083  (=> (and hop_1_l_f hop_1_f_g) hop_2_l_g)
4084  (=> (and hop_1_l_f hop_1_f_i) hop_2_l_i)
4085  (=> (and hop_1_l_f hop_1_f_h) hop_2_l_h)
4086  (=> (and hop_1_l_f hop_1_f_k) hop_2_l_k)
4087  (=> (and hop_1_l_f hop_1_f_j) hop_2_l_j)
4088  (=> (and hop_1_l_f hop_1_f_m) hop_2_l_m)
4089  (=> (and hop_1_l_f hop_1_f_o) hop_2_l_o)
4090  (=> (and hop_1_l_f hop_1_f_n) hop_2_l_n)
4091  (=> (and hop_1_l_f hop_1_f_q) hop_2_l_q)
4092  (=> (and hop_1_l_f hop_1_f_p) hop_2_l_p)
4093  (=> (and hop_1_l_i hop_1_i_a) hop_2_l_a)
4094  (=> (and hop_1_l_i hop_1_i_c) hop_2_l_c)
4095  (=> (and hop_1_l_i hop_1_i_b) hop_2_l_b)
4096  (=> (and hop_1_l_i hop_1_i_e) hop_2_l_e)
4097  (=> (and hop_1_l_i hop_1_i_d) hop_2_l_d)
4098  (=> (and hop_1_l_i hop_1_i_g) hop_2_l_g)
4099  (=> (and hop_1_l_i hop_1_i_f) hop_2_l_f)
4100  (=> (and hop_1_l_i hop_1_i_h) hop_2_l_h)
4101  (=> (and hop_1_l_i hop_1_i_k) hop_2_l_k)
4102  (=> (and hop_1_l_i hop_1_i_j) hop_2_l_j)
4103  (=> (and hop_1_l_i hop_1_i_m) hop_2_l_m)
4104  (=> (and hop_1_l_i hop_1_i_o) hop_2_l_o)
4105  (=> (and hop_1_l_i hop_1_i_n) hop_2_l_n)
4106  (=> (and hop_1_l_i hop_1_i_q) hop_2_l_q)
4107  (=> (and hop_1_l_i hop_1_i_p) hop_2_l_p)
4108  (=> (and hop_1_l_h hop_1_h_a) hop_2_l_a)
4109  (=> (and hop_1_l_h hop_1_h_c) hop_2_l_c)
4110  (=> (and hop_1_l_h hop_1_h_b) hop_2_l_b)
4111  (=> (and hop_1_l_h hop_1_h_e) hop_2_l_e)
4112  (=> (and hop_1_l_h hop_1_h_d) hop_2_l_d)
4113  (=> (and hop_1_l_h hop_1_h_g) hop_2_l_g)
4114  (=> (and hop_1_l_h hop_1_h_f) hop_2_l_f)
4115  (=> (and hop_1_l_h hop_1_h_i) hop_2_l_i)
4116  (=> (and hop_1_l_h hop_1_h_k) hop_2_l_k)
4117  (=> (and hop_1_l_h hop_1_h_j) hop_2_l_j)
4118  (=> (and hop_1_l_h hop_1_h_m) hop_2_l_m)
4119  (=> (and hop_1_l_h hop_1_h_o) hop_2_l_o)
4120  (=> (and hop_1_l_h hop_1_h_n) hop_2_l_n)
4121  (=> (and hop_1_l_h hop_1_h_q) hop_2_l_q)
4122  (=> (and hop_1_l_h hop_1_h_p) hop_2_l_p)
4123  (=> (and hop_1_l_k hop_1_k_a) hop_2_l_a)
4124  (=> (and hop_1_l_k hop_1_k_c) hop_2_l_c)
4125  (=> (and hop_1_l_k hop_1_k_b) hop_2_l_b)
4126  (=> (and hop_1_l_k hop_1_k_e) hop_2_l_e)
4127  (=> (and hop_1_l_k hop_1_k_d) hop_2_l_d)
4128  (=> (and hop_1_l_k hop_1_k_g) hop_2_l_g)
4129  (=> (and hop_1_l_k hop_1_k_f) hop_2_l_f)
4130  (=> (and hop_1_l_k hop_1_k_i) hop_2_l_i)
4131  (=> (and hop_1_l_k hop_1_k_h) hop_2_l_h)
4132  (=> (and hop_1_l_k hop_1_k_j) hop_2_l_j)
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4133  (=> (and hop_1_l_k hop_1_k_m) hop_2_l_m)
4134  (=> (and hop_1_l_k hop_1_k_o) hop_2_l_o)
4135  (=> (and hop_1_l_k hop_1_k_n) hop_2_l_n)
4136  (=> (and hop_1_l_k hop_1_k_q) hop_2_l_q)
4137  (=> (and hop_1_l_k hop_1_k_p) hop_2_l_p)
4138  (=> (and hop_1_l_j hop_1_j_a) hop_2_l_a)
4139  (=> (and hop_1_l_j hop_1_j_c) hop_2_l_c)
4140  (=> (and hop_1_l_j hop_1_j_b) hop_2_l_b)
4141  (=> (and hop_1_l_j hop_1_j_e) hop_2_l_e)
4142  (=> (and hop_1_l_j hop_1_j_d) hop_2_l_d)
4143  (=> (and hop_1_l_j hop_1_j_g) hop_2_l_g)
4144  (=> (and hop_1_l_j hop_1_j_f) hop_2_l_f)
4145  (=> (and hop_1_l_j hop_1_j_i) hop_2_l_i)
4146  (=> (and hop_1_l_j hop_1_j_h) hop_2_l_h)
4147  (=> (and hop_1_l_j hop_1_j_k) hop_2_l_k)
4148  (=> (and hop_1_l_j hop_1_j_m) hop_2_l_m)
4149  (=> (and hop_1_l_j hop_1_j_o) hop_2_l_o)
4150  (=> (and hop_1_l_j hop_1_j_n) hop_2_l_n)
4151  (=> (and hop_1_l_j hop_1_j_q) hop_2_l_q)
4152  (=> (and hop_1_l_j hop_1_j_p) hop_2_l_p)
4153  (=> (and hop_1_l_m hop_1_m_a) hop_2_l_a)
4154  (=> (and hop_1_l_m hop_1_m_c) hop_2_l_c)
4155  (=> (and hop_1_l_m hop_1_m_b) hop_2_l_b)
4156  (=> (and hop_1_l_m hop_1_m_e) hop_2_l_e)
4157  (=> (and hop_1_l_m hop_1_m_d) hop_2_l_d)
4158  (=> (and hop_1_l_m hop_1_m_g) hop_2_l_g)
4159  (=> (and hop_1_l_m hop_1_m_f) hop_2_l_f)
4160  (=> (and hop_1_l_m hop_1_m_i) hop_2_l_i)
4161  (=> (and hop_1_l_m hop_1_m_h) hop_2_l_h)
4162  (=> (and hop_1_l_m hop_1_m_k) hop_2_l_k)
4163  (=> (and hop_1_l_m hop_1_m_j) hop_2_l_j)
4164  (=> (and hop_1_l_m hop_1_m_o) hop_2_l_o)
4165  (=> (and hop_1_l_m hop_1_m_n) hop_2_l_n)
4166  (=> (and hop_1_l_m hop_1_m_q) hop_2_l_q)
4167  (=> (and hop_1_l_m hop_1_m_p) hop_2_l_p)
4168  (=> (and hop_1_l_o hop_1_o_a) hop_2_l_a)
4169  (=> (and hop_1_l_o hop_1_o_c) hop_2_l_c)
4170  (=> (and hop_1_l_o hop_1_o_b) hop_2_l_b)
4171  (=> (and hop_1_l_o hop_1_o_e) hop_2_l_e)
4172  (=> (and hop_1_l_o hop_1_o_d) hop_2_l_d)
4173  (=> (and hop_1_l_o hop_1_o_g) hop_2_l_g)
4174  (=> (and hop_1_l_o hop_1_o_f) hop_2_l_f)
4175  (=> (and hop_1_l_o hop_1_o_i) hop_2_l_i)
4176  (=> (and hop_1_l_o hop_1_o_h) hop_2_l_h)
4177  (=> (and hop_1_l_o hop_1_o_k) hop_2_l_k)
4178  (=> (and hop_1_l_o hop_1_o_j) hop_2_l_j)
4179  (=> (and hop_1_l_o hop_1_o_m) hop_2_l_m)
4180  (=> (and hop_1_l_o hop_1_o_n) hop_2_l_n)
4181  (=> (and hop_1_l_o hop_1_o_q) hop_2_l_q)
4182  (=> (and hop_1_l_o hop_1_o_p) hop_2_l_p)
4183  (=> (and hop_1_l_n hop_1_n_a) hop_2_l_a)
4184  (=> (and hop_1_l_n hop_1_n_c) hop_2_l_c)
4185  (=> (and hop_1_l_n hop_1_n_b) hop_2_l_b)
4186  (=> (and hop_1_l_n hop_1_n_e) hop_2_l_e)
4187  (=> (and hop_1_l_n hop_1_n_d) hop_2_l_d)
4188  (=> (and hop_1_l_n hop_1_n_g) hop_2_l_g)
4189  (=> (and hop_1_l_n hop_1_n_f) hop_2_l_f)
4190  (=> (and hop_1_l_n hop_1_n_i) hop_2_l_i)
4191  (=> (and hop_1_l_n hop_1_n_h) hop_2_l_h)
4192  (=> (and hop_1_l_n hop_1_n_k) hop_2_l_k)
4193  (=> (and hop_1_l_n hop_1_n_j) hop_2_l_j)
4194  (=> (and hop_1_l_n hop_1_n_m) hop_2_l_m)
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4195  (=> (and hop_1_l_n hop_1_n_o) hop_2_l_o)
4196  (=> (and hop_1_l_n hop_1_n_q) hop_2_l_q)
4197  (=> (and hop_1_l_n hop_1_n_p) hop_2_l_p)
4198  (=> (and hop_1_l_q hop_1_q_a) hop_2_l_a)
4199  (=> (and hop_1_l_q hop_1_q_c) hop_2_l_c)
4200  (=> (and hop_1_l_q hop_1_q_b) hop_2_l_b)
4201  (=> (and hop_1_l_q hop_1_q_e) hop_2_l_e)
4202  (=> (and hop_1_l_q hop_1_q_d) hop_2_l_d)
4203  (=> (and hop_1_l_q hop_1_q_g) hop_2_l_g)
4204  (=> (and hop_1_l_q hop_1_q_f) hop_2_l_f)
4205  (=> (and hop_1_l_q hop_1_q_i) hop_2_l_i)
4206  (=> (and hop_1_l_q hop_1_q_h) hop_2_l_h)
4207  (=> (and hop_1_l_q hop_1_q_k) hop_2_l_k)
4208  (=> (and hop_1_l_q hop_1_q_j) hop_2_l_j)
4209  (=> (and hop_1_l_q hop_1_q_m) hop_2_l_m)
4210  (=> (and hop_1_l_q hop_1_q_o) hop_2_l_o)
4211  (=> (and hop_1_l_q hop_1_q_n) hop_2_l_n)
4212  (=> (and hop_1_l_q hop_1_q_p) hop_2_l_p)
4213  (=> (and hop_1_l_p hop_1_p_a) hop_2_l_a)
4214  (=> (and hop_1_l_p hop_1_p_c) hop_2_l_c)
4215  (=> (and hop_1_l_p hop_1_p_b) hop_2_l_b)
4216  (=> (and hop_1_l_p hop_1_p_e) hop_2_l_e)
4217  (=> (and hop_1_l_p hop_1_p_d) hop_2_l_d)
4218  (=> (and hop_1_l_p hop_1_p_g) hop_2_l_g)
4219  (=> (and hop_1_l_p hop_1_p_f) hop_2_l_f)
4220  (=> (and hop_1_l_p hop_1_p_i) hop_2_l_i)
4221  (=> (and hop_1_l_p hop_1_p_h) hop_2_l_h)
4222  (=> (and hop_1_l_p hop_1_p_k) hop_2_l_k)
4223  (=> (and hop_1_l_p hop_1_p_j) hop_2_l_j)
4224  (=> (and hop_1_l_p hop_1_p_m) hop_2_l_m)
4225  (=> (and hop_1_l_p hop_1_p_o) hop_2_l_o)
4226  (=> (and hop_1_l_p hop_1_p_n) hop_2_l_n)
4227  (=> (and hop_1_l_p hop_1_p_q) hop_2_l_q)
4228  (=> (and hop_1_o_a hop_1_a_c) hop_2_o_c)
4229  (=> (and hop_1_o_a hop_1_a_b) hop_2_o_b)
4230  (=> (and hop_1_o_a hop_1_a_e) hop_2_o_e)
4231  (=> (and hop_1_o_a hop_1_a_d) hop_2_o_d)
4232  (=> (and hop_1_o_a hop_1_a_g) hop_2_o_g)
4233  (=> (and hop_1_o_a hop_1_a_f) hop_2_o_f)
4234  (=> (and hop_1_o_a hop_1_a_i) hop_2_o_i)
4235  (=> (and hop_1_o_a hop_1_a_h) hop_2_o_h)
4236  (=> (and hop_1_o_a hop_1_a_k) hop_2_o_k)
4237  (=> (and hop_1_o_a hop_1_a_j) hop_2_o_j)
4238  (=> (and hop_1_o_a hop_1_a_m) hop_2_o_m)
4239  (=> (and hop_1_o_a hop_1_a_l) hop_2_o_l)
4240  (=> (and hop_1_o_a hop_1_a_n) hop_2_o_n)
4241  (=> (and hop_1_o_a hop_1_a_q) hop_2_o_q)
4242  (=> (and hop_1_o_a hop_1_a_p) hop_2_o_p)
4243  (=> (and hop_1_o_c hop_1_c_a) hop_2_o_a)
4244  (=> (and hop_1_o_c hop_1_c_b) hop_2_o_b)
4245  (=> (and hop_1_o_c hop_1_c_e) hop_2_o_e)
4246  (=> (and hop_1_o_c hop_1_c_d) hop_2_o_d)
4247  (=> (and hop_1_o_c hop_1_c_g) hop_2_o_g)
4248  (=> (and hop_1_o_c hop_1_c_f) hop_2_o_f)
4249  (=> (and hop_1_o_c hop_1_c_i) hop_2_o_i)
4250  (=> (and hop_1_o_c hop_1_c_h) hop_2_o_h)
4251  (=> (and hop_1_o_c hop_1_c_k) hop_2_o_k)
4252  (=> (and hop_1_o_c hop_1_c_j) hop_2_o_j)
4253  (=> (and hop_1_o_c hop_1_c_m) hop_2_o_m)
4254  (=> (and hop_1_o_c hop_1_c_l) hop_2_o_l)
4255  (=> (and hop_1_o_c hop_1_c_n) hop_2_o_n)
4256  (=> (and hop_1_o_c hop_1_c_q) hop_2_o_q)
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4257  (=> (and hop_1_o_c hop_1_c_p) hop_2_o_p)
4258  (=> (and hop_1_o_b hop_1_b_a) hop_2_o_a)
4259  (=> (and hop_1_o_b hop_1_b_c) hop_2_o_c)
4260  (=> (and hop_1_o_b hop_1_b_e) hop_2_o_e)
4261  (=> (and hop_1_o_b hop_1_b_d) hop_2_o_d)
4262  (=> (and hop_1_o_b hop_1_b_g) hop_2_o_g)
4263  (=> (and hop_1_o_b hop_1_b_f) hop_2_o_f)
4264  (=> (and hop_1_o_b hop_1_b_i) hop_2_o_i)
4265  (=> (and hop_1_o_b hop_1_b_h) hop_2_o_h)
4266  (=> (and hop_1_o_b hop_1_b_k) hop_2_o_k)
4267  (=> (and hop_1_o_b hop_1_b_j) hop_2_o_j)
4268  (=> (and hop_1_o_b hop_1_b_m) hop_2_o_m)
4269  (=> (and hop_1_o_b hop_1_b_l) hop_2_o_l)
4270  (=> (and hop_1_o_b hop_1_b_n) hop_2_o_n)
4271  (=> (and hop_1_o_b hop_1_b_q) hop_2_o_q)
4272  (=> (and hop_1_o_b hop_1_b_p) hop_2_o_p)
4273  (=> (and hop_1_o_e hop_1_e_a) hop_2_o_a)
4274  (=> (and hop_1_o_e hop_1_e_c) hop_2_o_c)
4275  (=> (and hop_1_o_e hop_1_e_b) hop_2_o_b)
4276  (=> (and hop_1_o_e hop_1_e_d) hop_2_o_d)
4277  (=> (and hop_1_o_e hop_1_e_g) hop_2_o_g)
4278  (=> (and hop_1_o_e hop_1_e_f) hop_2_o_f)
4279  (=> (and hop_1_o_e hop_1_e_i) hop_2_o_i)
4280  (=> (and hop_1_o_e hop_1_e_h) hop_2_o_h)
4281  (=> (and hop_1_o_e hop_1_e_k) hop_2_o_k)
4282  (=> (and hop_1_o_e hop_1_e_j) hop_2_o_j)
4283  (=> (and hop_1_o_e hop_1_e_m) hop_2_o_m)
4284  (=> (and hop_1_o_e hop_1_e_l) hop_2_o_l)
4285  (=> (and hop_1_o_e hop_1_e_n) hop_2_o_n)
4286  (=> (and hop_1_o_e hop_1_e_q) hop_2_o_q)
4287  (=> (and hop_1_o_e hop_1_e_p) hop_2_o_p)
4288  (=> (and hop_1_o_d hop_1_d_a) hop_2_o_a)
4289  (=> (and hop_1_o_d hop_1_d_c) hop_2_o_c)
4290  (=> (and hop_1_o_d hop_1_d_b) hop_2_o_b)
4291  (=> (and hop_1_o_d hop_1_d_e) hop_2_o_e)
4292  (=> (and hop_1_o_d hop_1_d_g) hop_2_o_g)
4293  (=> (and hop_1_o_d hop_1_d_f) hop_2_o_f)
4294  (=> (and hop_1_o_d hop_1_d_i) hop_2_o_i)
4295  (=> (and hop_1_o_d hop_1_d_h) hop_2_o_h)
4296  (=> (and hop_1_o_d hop_1_d_k) hop_2_o_k)
4297  (=> (and hop_1_o_d hop_1_d_j) hop_2_o_j)
4298  (=> (and hop_1_o_d hop_1_d_m) hop_2_o_m)
4299  (=> (and hop_1_o_d hop_1_d_l) hop_2_o_l)
4300  (=> (and hop_1_o_d hop_1_d_n) hop_2_o_n)
4301  (=> (and hop_1_o_d hop_1_d_q) hop_2_o_q)
4302  (=> (and hop_1_o_d hop_1_d_p) hop_2_o_p)
4303  (=> (and hop_1_o_g hop_1_g_a) hop_2_o_a)
4304  (=> (and hop_1_o_g hop_1_g_c) hop_2_o_c)
4305  (=> (and hop_1_o_g hop_1_g_b) hop_2_o_b)
4306  (=> (and hop_1_o_g hop_1_g_e) hop_2_o_e)
4307  (=> (and hop_1_o_g hop_1_g_d) hop_2_o_d)
4308  (=> (and hop_1_o_g hop_1_g_f) hop_2_o_f)
4309  (=> (and hop_1_o_g hop_1_g_i) hop_2_o_i)
4310  (=> (and hop_1_o_g hop_1_g_h) hop_2_o_h)
4311  (=> (and hop_1_o_g hop_1_g_k) hop_2_o_k)
4312  (=> (and hop_1_o_g hop_1_g_j) hop_2_o_j)
4313  (=> (and hop_1_o_g hop_1_g_m) hop_2_o_m)
4314  (=> (and hop_1_o_g hop_1_g_l) hop_2_o_l)
4315  (=> (and hop_1_o_g hop_1_g_n) hop_2_o_n)
4316  (=> (and hop_1_o_g hop_1_g_q) hop_2_o_q)
4317  (=> (and hop_1_o_g hop_1_g_p) hop_2_o_p)
4318  (=> (and hop_1_o_f hop_1_f_a) hop_2_o_a)
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4319   (=> (and hop_1_o_f hop_1_f_c) hop_2_o_c)
4320   (=> (and hop_1_o_f hop_1_f_b) hop_2_o_b)
4321   (=> (and hop_1_o_f hop_1_f_e) hop_2_o_e)
4322   (=> (and hop_1_o_f hop_1_f_d) hop_2_o_d)
4323   (=> (and hop_1_o_f hop_1_f_g) hop_2_o_g)
4324   (=> (and hop_1_o_f hop_1_f_i) hop_2_o_i)
4325   (=> (and hop_1_o_f hop_1_f_h) hop_2_o_h)
4326   (=> (and hop_1_o_f hop_1_f_k) hop_2_o_k)
4327   (=> (and hop_1_o_f hop_1_f_j) hop_2_o_j)
4328   (=> (and hop_1_o_f hop_1_f_m) hop_2_o_m)
4329   (=> (and hop_1_o_f hop_1_f_l) hop_2_o_l)
4330   (=> (and hop_1_o_f hop_1_f_n) hop_2_o_n)
4331   (=> (and hop_1_o_f hop_1_f_q) hop_2_o_q)
4332   (=> (and hop_1_o_f hop_1_f_p) hop_2_o_p)
4333   (=> (and hop_1_o_i hop_1_i_a) hop_2_o_a)
4334   (=> (and hop_1_o_i hop_1_i_c) hop_2_o_c)
4335   (=> (and hop_1_o_i hop_1_i_b) hop_2_o_b)
4336   (=> (and hop_1_o_i hop_1_i_e) hop_2_o_e)
4337   (=> (and hop_1_o_i hop_1_i_d) hop_2_o_d)
4338   (=> (and hop_1_o_i hop_1_i_g) hop_2_o_g)
4339   (=> (and hop_1_o_i hop_1_i_f) hop_2_o_f)
4340   (=> (and hop_1_o_i hop_1_i_h) hop_2_o_h)
4341   (=> (and hop_1_o_i hop_1_i_k) hop_2_o_k)
4342   (=> (and hop_1_o_i hop_1_i_j) hop_2_o_j)
4343   (=> (and hop_1_o_i hop_1_i_m) hop_2_o_m)
4344   (=> (and hop_1_o_i hop_1_i_l) hop_2_o_l)
4345   (=> (and hop_1_o_i hop_1_i_n) hop_2_o_n)
4346   (=> (and hop_1_o_i hop_1_i_q) hop_2_o_q)
4347   (=> (and hop_1_o_i hop_1_i_p) hop_2_o_p)
4348   (=> (and hop_1_o_h hop_1_h_a) hop_2_o_a)
4349   (=> (and hop_1_o_h hop_1_h_c) hop_2_o_c)
4350   (=> (and hop_1_o_h hop_1_h_b) hop_2_o_b)
4351   (=> (and hop_1_o_h hop_1_h_e) hop_2_o_e)
4352   (=> (and hop_1_o_h hop_1_h_d) hop_2_o_d)
4353   (=> (and hop_1_o_h hop_1_h_g) hop_2_o_g)
4354   (=> (and hop_1_o_h hop_1_h_f) hop_2_o_f)
4355   (=> (and hop_1_o_h hop_1_h_i) hop_2_o_i)
4356   (=> (and hop_1_o_h hop_1_h_k) hop_2_o_k)
4357   (=> (and hop_1_o_h hop_1_h_j) hop_2_o_j)
4358   (=> (and hop_1_o_h hop_1_h_m) hop_2_o_m)
4359   (=> (and hop_1_o_h hop_1_h_l) hop_2_o_l)
4360   (=> (and hop_1_o_h hop_1_h_n) hop_2_o_n)
4361   (=> (and hop_1_o_h hop_1_h_q) hop_2_o_q)
4362   (=> (and hop_1_o_h hop_1_h_p) hop_2_o_p)
4363   (=> (and hop_1_o_k hop_1_k_a) hop_2_o_a)
4364   (=> (and hop_1_o_k hop_1_k_c) hop_2_o_c)
4365   (=> (and hop_1_o_k hop_1_k_b) hop_2_o_b)
4366   (=> (and hop_1_o_k hop_1_k_e) hop_2_o_e)
4367   (=> (and hop_1_o_k hop_1_k_d) hop_2_o_d)
4368   (=> (and hop_1_o_k hop_1_k_g) hop_2_o_g)
4369   (=> (and hop_1_o_k hop_1_k_f) hop_2_o_f)
4370   (=> (and hop_1_o_k hop_1_k_i) hop_2_o_i)
4371   (=> (and hop_1_o_k hop_1_k_h) hop_2_o_h)
4372   (=> (and hop_1_o_k hop_1_k_j) hop_2_o_j)
4373   (=> (and hop_1_o_k hop_1_k_m) hop_2_o_m)
4374   (=> (and hop_1_o_k hop_1_k_l) hop_2_o_l)
4375   (=> (and hop_1_o_k hop_1_k_n) hop_2_o_n)
4376   (=> (and hop_1_o_k hop_1_k_q) hop_2_o_q)
4377   (=> (and hop_1_o_k hop_1_k_p) hop_2_o_p)
4378   (=> (and hop_1_o_j hop_1_j_a) hop_2_o_a)
4379   (=> (and hop_1_o_j hop_1_j_c) hop_2_o_c)
4380   (=> (and hop_1_o_j hop_1_j_b) hop_2_o_b)
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4381  (=> (and hop_1_o_j hop_1_j_e) hop_2_o_e)
4382  (=> (and hop_1_o_j hop_1_j_d) hop_2_o_d)
4383  (=> (and hop_1_o_j hop_1_j_g) hop_2_o_g)
4384  (=> (and hop_1_o_j hop_1_j_f) hop_2_o_f)
4385  (=> (and hop_1_o_j hop_1_j_i) hop_2_o_i)
4386  (=> (and hop_1_o_j hop_1_j_h) hop_2_o_h)
4387  (=> (and hop_1_o_j hop_1_j_k) hop_2_o_k)
4388  (=> (and hop_1_o_j hop_1_j_m) hop_2_o_m)
4389  (=> (and hop_1_o_j hop_1_j_l) hop_2_o_l)
4390  (=> (and hop_1_o_j hop_1_j_n) hop_2_o_n)
4391  (=> (and hop_1_o_j hop_1_j_q) hop_2_o_q)
4392  (=> (and hop_1_o_j hop_1_j_p) hop_2_o_p)
4393  (=> (and hop_1_o_m hop_1_m_a) hop_2_o_a)
4394  (=> (and hop_1_o_m hop_1_m_c) hop_2_o_c)
4395  (=> (and hop_1_o_m hop_1_m_b) hop_2_o_b)
4396  (=> (and hop_1_o_m hop_1_m_e) hop_2_o_e)
4397  (=> (and hop_1_o_m hop_1_m_d) hop_2_o_d)
4398  (=> (and hop_1_o_m hop_1_m_g) hop_2_o_g)
4399  (=> (and hop_1_o_m hop_1_m_f) hop_2_o_f)
4400  (=> (and hop_1_o_m hop_1_m_i) hop_2_o_i)
4401  (=> (and hop_1_o_m hop_1_m_h) hop_2_o_h)
4402  (=> (and hop_1_o_m hop_1_m_k) hop_2_o_k)
4403  (=> (and hop_1_o_m hop_1_m_j) hop_2_o_j)
4404  (=> (and hop_1_o_m hop_1_m_l) hop_2_o_l)
4405  (=> (and hop_1_o_m hop_1_m_n) hop_2_o_n)
4406  (=> (and hop_1_o_m hop_1_m_q) hop_2_o_q)
4407  (=> (and hop_1_o_m hop_1_m_p) hop_2_o_p)
4408  (=> (and hop_1_o_l hop_1_l_a) hop_2_o_a)
4409  (=> (and hop_1_o_l hop_1_l_c) hop_2_o_c)
4410  (=> (and hop_1_o_l hop_1_l_b) hop_2_o_b)
4411  (=> (and hop_1_o_l hop_1_l_e) hop_2_o_e)
4412  (=> (and hop_1_o_l hop_1_l_d) hop_2_o_d)
4413  (=> (and hop_1_o_l hop_1_l_g) hop_2_o_g)
4414  (=> (and hop_1_o_l hop_1_l_f) hop_2_o_f)
4415  (=> (and hop_1_o_l hop_1_l_i) hop_2_o_i)
4416  (=> (and hop_1_o_l hop_1_l_h) hop_2_o_h)
4417  (=> (and hop_1_o_l hop_1_l_k) hop_2_o_k)
4418  (=> (and hop_1_o_l hop_1_l_j) hop_2_o_j)
4419  (=> (and hop_1_o_l hop_1_l_m) hop_2_o_m)
4420  (=> (and hop_1_o_l hop_1_l_n) hop_2_o_n)
4421  (=> (and hop_1_o_l hop_1_l_q) hop_2_o_q)
4422  (=> (and hop_1_o_l hop_1_l_p) hop_2_o_p)
4423  (=> (and hop_1_o_n hop_1_n_a) hop_2_o_a)
4424  (=> (and hop_1_o_n hop_1_n_c) hop_2_o_c)
4425  (=> (and hop_1_o_n hop_1_n_b) hop_2_o_b)
4426  (=> (and hop_1_o_n hop_1_n_e) hop_2_o_e)
4427  (=> (and hop_1_o_n hop_1_n_d) hop_2_o_d)
4428  (=> (and hop_1_o_n hop_1_n_g) hop_2_o_g)
4429  (=> (and hop_1_o_n hop_1_n_f) hop_2_o_f)
4430  (=> (and hop_1_o_n hop_1_n_i) hop_2_o_i)
4431  (=> (and hop_1_o_n hop_1_n_h) hop_2_o_h)
4432  (=> (and hop_1_o_n hop_1_n_k) hop_2_o_k)
4433  (=> (and hop_1_o_n hop_1_n_j) hop_2_o_j)
4434  (=> (and hop_1_o_n hop_1_n_m) hop_2_o_m)
4435  (=> (and hop_1_o_n hop_1_n_l) hop_2_o_l)
4436  (=> (and hop_1_o_n hop_1_n_q) hop_2_o_q)
4437  (=> (and hop_1_o_n hop_1_n_p) hop_2_o_p)
4438  (=> (and hop_1_o_q hop_1_q_a) hop_2_o_a)
4439  (=> (and hop_1_o_q hop_1_q_c) hop_2_o_c)
4440  (=> (and hop_1_o_q hop_1_q_b) hop_2_o_b)
4441  (=> (and hop_1_o_q hop_1_q_e) hop_2_o_e)
4442  (=> (and hop_1_o_q hop_1_q_d) hop_2_o_d)
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4443  (=> (and hop_1_o_q hop_1_q_g) hop_2_o_g)
4444  (=> (and hop_1_o_q hop_1_q_f) hop_2_o_f)
4445  (=> (and hop_1_o_q hop_1_q_i) hop_2_o_i)
4446  (=> (and hop_1_o_q hop_1_q_h) hop_2_o_h)
4447  (=> (and hop_1_o_q hop_1_q_k) hop_2_o_k)
4448  (=> (and hop_1_o_q hop_1_q_j) hop_2_o_j)
4449  (=> (and hop_1_o_q hop_1_q_m) hop_2_o_m)
4450  (=> (and hop_1_o_q hop_1_q_l) hop_2_o_l)
4451  (=> (and hop_1_o_q hop_1_q_n) hop_2_o_n)
4452  (=> (and hop_1_o_q hop_1_q_p) hop_2_o_p)
4453  (=> (and hop_1_o_p hop_1_p_a) hop_2_o_a)
4454  (=> (and hop_1_o_p hop_1_p_c) hop_2_o_c)
4455  (=> (and hop_1_o_p hop_1_p_b) hop_2_o_b)
4456  (=> (and hop_1_o_p hop_1_p_e) hop_2_o_e)
4457  (=> (and hop_1_o_p hop_1_p_d) hop_2_o_d)
4458  (=> (and hop_1_o_p hop_1_p_g) hop_2_o_g)
4459  (=> (and hop_1_o_p hop_1_p_f) hop_2_o_f)
4460  (=> (and hop_1_o_p hop_1_p_i) hop_2_o_i)
4461  (=> (and hop_1_o_p hop_1_p_h) hop_2_o_h)
4462  (=> (and hop_1_o_p hop_1_p_k) hop_2_o_k)
4463  (=> (and hop_1_o_p hop_1_p_j) hop_2_o_j)
4464  (=> (and hop_1_o_p hop_1_p_m) hop_2_o_m)
4465  (=> (and hop_1_o_p hop_1_p_l) hop_2_o_l)
4466  (=> (and hop_1_o_p hop_1_p_n) hop_2_o_n)
4467  (=> (and hop_1_o_p hop_1_p_q) hop_2_o_q)
4468  (=> (and hop_1_n_a hop_1_a_c) hop_2_n_c)
4469  (=> (and hop_1_n_a hop_1_a_b) hop_2_n_b)
4470  (=> (and hop_1_n_a hop_1_a_e) hop_2_n_e)
4471  (=> (and hop_1_n_a hop_1_a_d) hop_2_n_d)
4472  (=> (and hop_1_n_a hop_1_a_g) hop_2_n_g)
4473  (=> (and hop_1_n_a hop_1_a_f) hop_2_n_f)
4474  (=> (and hop_1_n_a hop_1_a_i) hop_2_n_i)
4475  (=> (and hop_1_n_a hop_1_a_h) hop_2_n_h)
4476  (=> (and hop_1_n_a hop_1_a_k) hop_2_n_k)
4477  (=> (and hop_1_n_a hop_1_a_j) hop_2_n_j)
4478  (=> (and hop_1_n_a hop_1_a_m) hop_2_n_m)
4479  (=> (and hop_1_n_a hop_1_a_l) hop_2_n_l)
4480  (=> (and hop_1_n_a hop_1_a_o) hop_2_n_o)
4481  (=> (and hop_1_n_a hop_1_a_q) hop_2_n_q)
4482  (=> (and hop_1_n_a hop_1_a_p) hop_2_n_p)
4483  (=> (and hop_1_n_c hop_1_c_a) hop_2_n_a)
4484  (=> (and hop_1_n_c hop_1_c_b) hop_2_n_b)
4485  (=> (and hop_1_n_c hop_1_c_e) hop_2_n_e)
4486  (=> (and hop_1_n_c hop_1_c_d) hop_2_n_d)
4487  (=> (and hop_1_n_c hop_1_c_g) hop_2_n_g)
4488  (=> (and hop_1_n_c hop_1_c_f) hop_2_n_f)
4489  (=> (and hop_1_n_c hop_1_c_i) hop_2_n_i)
4490  (=> (and hop_1_n_c hop_1_c_h) hop_2_n_h)
4491  (=> (and hop_1_n_c hop_1_c_k) hop_2_n_k)
4492  (=> (and hop_1_n_c hop_1_c_j) hop_2_n_j)
4493  (=> (and hop_1_n_c hop_1_c_m) hop_2_n_m)
4494  (=> (and hop_1_n_c hop_1_c_l) hop_2_n_l)
4495  (=> (and hop_1_n_c hop_1_c_o) hop_2_n_o)
4496  (=> (and hop_1_n_c hop_1_c_q) hop_2_n_q)
4497  (=> (and hop_1_n_c hop_1_c_p) hop_2_n_p)
4498  (=> (and hop_1_n_b hop_1_b_a) hop_2_n_a)
4499  (=> (and hop_1_n_b hop_1_b_c) hop_2_n_c)
4500  (=> (and hop_1_n_b hop_1_b_e) hop_2_n_e)
4501  (=> (and hop_1_n_b hop_1_b_d) hop_2_n_d)
4502  (=> (and hop_1_n_b hop_1_b_g) hop_2_n_g)
4503  (=> (and hop_1_n_b hop_1_b_f) hop_2_n_f)
4504  (=> (and hop_1_n_b hop_1_b_i) hop_2_n_i)
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4505   (=> (and hop_1_n_b hop_1_b_h) hop_2_n_h)
4506   (=> (and hop_1_n_b hop_1_b_k) hop_2_n_k)
4507   (=> (and hop_1_n_b hop_1_b_j) hop_2_n_j)
4508   (=> (and hop_1_n_b hop_1_b_m) hop_2_n_m)
4509   (=> (and hop_1_n_b hop_1_b_l) hop_2_n_l)
4510   (=> (and hop_1_n_b hop_1_b_o) hop_2_n_o)
4511   (=> (and hop_1_n_b hop_1_b_q) hop_2_n_q)
4512   (=> (and hop_1_n_b hop_1_b_p) hop_2_n_p)
4513   (=> (and hop_1_n_e hop_1_e_a) hop_2_n_a)
4514   (=> (and hop_1_n_e hop_1_e_c) hop_2_n_c)
4515   (=> (and hop_1_n_e hop_1_e_b) hop_2_n_b)
4516   (=> (and hop_1_n_e hop_1_e_d) hop_2_n_d)
4517   (=> (and hop_1_n_e hop_1_e_g) hop_2_n_g)
4518   (=> (and hop_1_n_e hop_1_e_f) hop_2_n_f)
4519   (=> (and hop_1_n_e hop_1_e_i) hop_2_n_i)
4520   (=> (and hop_1_n_e hop_1_e_h) hop_2_n_h)
4521   (=> (and hop_1_n_e hop_1_e_k) hop_2_n_k)
4522   (=> (and hop_1_n_e hop_1_e_j) hop_2_n_j)
4523   (=> (and hop_1_n_e hop_1_e_m) hop_2_n_m)
4524   (=> (and hop_1_n_e hop_1_e_l) hop_2_n_l)
4525   (=> (and hop_1_n_e hop_1_e_o) hop_2_n_o)
4526   (=> (and hop_1_n_e hop_1_e_q) hop_2_n_q)
4527   (=> (and hop_1_n_e hop_1_e_p) hop_2_n_p)
4528   (=> (and hop_1_n_d hop_1_d_a) hop_2_n_a)
4529   (=> (and hop_1_n_d hop_1_d_c) hop_2_n_c)
4530   (=> (and hop_1_n_d hop_1_d_b) hop_2_n_b)
4531   (=> (and hop_1_n_d hop_1_d_e) hop_2_n_e)
4532   (=> (and hop_1_n_d hop_1_d_g) hop_2_n_g)
4533   (=> (and hop_1_n_d hop_1_d_f) hop_2_n_f)
4534   (=> (and hop_1_n_d hop_1_d_i) hop_2_n_i)
4535   (=> (and hop_1_n_d hop_1_d_h) hop_2_n_h)
4536   (=> (and hop_1_n_d hop_1_d_k) hop_2_n_k)
4537   (=> (and hop_1_n_d hop_1_d_j) hop_2_n_j)
4538   (=> (and hop_1_n_d hop_1_d_m) hop_2_n_m)
4539   (=> (and hop_1_n_d hop_1_d_l) hop_2_n_l)
4540   (=> (and hop_1_n_d hop_1_d_o) hop_2_n_o)
4541   (=> (and hop_1_n_d hop_1_d_q) hop_2_n_q)
4542   (=> (and hop_1_n_d hop_1_d_p) hop_2_n_p)
4543   (=> (and hop_1_n_g hop_1_g_a) hop_2_n_a)
4544   (=> (and hop_1_n_g hop_1_g_c) hop_2_n_c)
4545   (=> (and hop_1_n_g hop_1_g_b) hop_2_n_b)
4546   (=> (and hop_1_n_g hop_1_g_e) hop_2_n_e)
4547   (=> (and hop_1_n_g hop_1_g_d) hop_2_n_d)
4548   (=> (and hop_1_n_g hop_1_g_f) hop_2_n_f)
4549   (=> (and hop_1_n_g hop_1_g_i) hop_2_n_i)
4550   (=> (and hop_1_n_g hop_1_g_h) hop_2_n_h)
4551   (=> (and hop_1_n_g hop_1_g_k) hop_2_n_k)
4552   (=> (and hop_1_n_g hop_1_g_j) hop_2_n_j)
4553   (=> (and hop_1_n_g hop_1_g_m) hop_2_n_m)
4554   (=> (and hop_1_n_g hop_1_g_l) hop_2_n_l)
4555   (=> (and hop_1_n_g hop_1_g_o) hop_2_n_o)
4556   (=> (and hop_1_n_g hop_1_g_q) hop_2_n_q)
4557   (=> (and hop_1_n_g hop_1_g_p) hop_2_n_p)
4558   (=> (and hop_1_n_f hop_1_f_a) hop_2_n_a)
4559   (=> (and hop_1_n_f hop_1_f_c) hop_2_n_c)
4560   (=> (and hop_1_n_f hop_1_f_b) hop_2_n_b)
4561   (=> (and hop_1_n_f hop_1_f_e) hop_2_n_e)
4562   (=> (and hop_1_n_f hop_1_f_d) hop_2_n_d)
4563   (=> (and hop_1_n_f hop_1_f_g) hop_2_n_g)
4564   (=> (and hop_1_n_f hop_1_f_i) hop_2_n_i)
4565   (=> (and hop_1_n_f hop_1_f_h) hop_2_n_h)
4566   (=> (and hop_1_n_f hop_1_f_k) hop_2_n_k)
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4567  (=> (and hop_1_n_f hop_1_f_j) hop_2_n_j)
4568  (=> (and hop_1_n_f hop_1_f_m) hop_2_n_m)
4569  (=> (and hop_1_n_f hop_1_f_l) hop_2_n_l)
4570  (=> (and hop_1_n_f hop_1_f_o) hop_2_n_o)
4571  (=> (and hop_1_n_f hop_1_f_q) hop_2_n_q)
4572  (=> (and hop_1_n_f hop_1_f_p) hop_2_n_p)
4573  (=> (and hop_1_n_i hop_1_i_a) hop_2_n_a)
4574  (=> (and hop_1_n_i hop_1_i_c) hop_2_n_c)
4575  (=> (and hop_1_n_i hop_1_i_b) hop_2_n_b)
4576  (=> (and hop_1_n_i hop_1_i_e) hop_2_n_e)
4577  (=> (and hop_1_n_i hop_1_i_d) hop_2_n_d)
4578  (=> (and hop_1_n_i hop_1_i_g) hop_2_n_g)
4579  (=> (and hop_1_n_i hop_1_i_f) hop_2_n_f)
4580  (=> (and hop_1_n_i hop_1_i_h) hop_2_n_h)
4581  (=> (and hop_1_n_i hop_1_i_k) hop_2_n_k)
4582  (=> (and hop_1_n_i hop_1_i_j) hop_2_n_j)
4583  (=> (and hop_1_n_i hop_1_i_m) hop_2_n_m)
4584  (=> (and hop_1_n_i hop_1_i_l) hop_2_n_l)
4585  (=> (and hop_1_n_i hop_1_i_o) hop_2_n_o)
4586  (=> (and hop_1_n_i hop_1_i_q) hop_2_n_q)
4587  (=> (and hop_1_n_i hop_1_i_p) hop_2_n_p)
4588  (=> (and hop_1_n_h hop_1_h_a) hop_2_n_a)
4589  (=> (and hop_1_n_h hop_1_h_c) hop_2_n_c)
4590  (=> (and hop_1_n_h hop_1_h_b) hop_2_n_b)
4591  (=> (and hop_1_n_h hop_1_h_e) hop_2_n_e)
4592  (=> (and hop_1_n_h hop_1_h_d) hop_2_n_d)
4593  (=> (and hop_1_n_h hop_1_h_g) hop_2_n_g)
4594  (=> (and hop_1_n_h hop_1_h_f) hop_2_n_f)
4595  (=> (and hop_1_n_h hop_1_h_i) hop_2_n_i)
4596  (=> (and hop_1_n_h hop_1_h_k) hop_2_n_k)
4597  (=> (and hop_1_n_h hop_1_h_j) hop_2_n_j)
4598  (=> (and hop_1_n_h hop_1_h_m) hop_2_n_m)
4599  (=> (and hop_1_n_h hop_1_h_l) hop_2_n_l)
4600  (=> (and hop_1_n_h hop_1_h_o) hop_2_n_o)
4601  (=> (and hop_1_n_h hop_1_h_q) hop_2_n_q)
4602  (=> (and hop_1_n_h hop_1_h_p) hop_2_n_p)
4603  (=> (and hop_1_n_k hop_1_k_a) hop_2_n_a)
4604  (=> (and hop_1_n_k hop_1_k_c) hop_2_n_c)
4605  (=> (and hop_1_n_k hop_1_k_b) hop_2_n_b)
4606  (=> (and hop_1_n_k hop_1_k_e) hop_2_n_e)
4607  (=> (and hop_1_n_k hop_1_k_d) hop_2_n_d)
4608  (=> (and hop_1_n_k hop_1_k_g) hop_2_n_g)
4609  (=> (and hop_1_n_k hop_1_k_f) hop_2_n_f)
4610  (=> (and hop_1_n_k hop_1_k_i) hop_2_n_i)
4611  (=> (and hop_1_n_k hop_1_k_h) hop_2_n_h)
4612  (=> (and hop_1_n_k hop_1_k_j) hop_2_n_j)
4613  (=> (and hop_1_n_k hop_1_k_m) hop_2_n_m)
4614  (=> (and hop_1_n_k hop_1_k_l) hop_2_n_l)
4615  (=> (and hop_1_n_k hop_1_k_o) hop_2_n_o)
4616  (=> (and hop_1_n_k hop_1_k_q) hop_2_n_q)
4617  (=> (and hop_1_n_k hop_1_k_p) hop_2_n_p)
4618  (=> (and hop_1_n_j hop_1_j_a) hop_2_n_a)
4619  (=> (and hop_1_n_j hop_1_j_c) hop_2_n_c)
4620  (=> (and hop_1_n_j hop_1_j_b) hop_2_n_b)
4621  (=> (and hop_1_n_j hop_1_j_e) hop_2_n_e)
4622  (=> (and hop_1_n_j hop_1_j_d) hop_2_n_d)
4623  (=> (and hop_1_n_j hop_1_j_g) hop_2_n_g)
4624  (=> (and hop_1_n_j hop_1_j_f) hop_2_n_f)
4625  (=> (and hop_1_n_j hop_1_j_i) hop_2_n_i)
4626  (=> (and hop_1_n_j hop_1_j_h) hop_2_n_h)
4627  (=> (and hop_1_n_j hop_1_j_k) hop_2_n_k)
4628  (=> (and hop_1_n_j hop_1_j_m) hop_2_n_m)
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4629  (=> (and hop_1_n_j hop_1_j_l) hop_2_n_l)
4630  (=> (and hop_1_n_j hop_1_j_o) hop_2_n_o)
4631  (=> (and hop_1_n_j hop_1_j_q) hop_2_n_q)
4632  (=> (and hop_1_n_j hop_1_j_p) hop_2_n_p)
4633  (=> (and hop_1_n_m hop_1_m_a) hop_2_n_a)
4634  (=> (and hop_1_n_m hop_1_m_c) hop_2_n_c)
4635  (=> (and hop_1_n_m hop_1_m_b) hop_2_n_b)
4636  (=> (and hop_1_n_m hop_1_m_e) hop_2_n_e)
4637  (=> (and hop_1_n_m hop_1_m_d) hop_2_n_d)
4638  (=> (and hop_1_n_m hop_1_m_g) hop_2_n_g)
4639  (=> (and hop_1_n_m hop_1_m_f) hop_2_n_f)
4640  (=> (and hop_1_n_m hop_1_m_i) hop_2_n_i)
4641  (=> (and hop_1_n_m hop_1_m_h) hop_2_n_h)
4642  (=> (and hop_1_n_m hop_1_m_k) hop_2_n_k)
4643  (=> (and hop_1_n_m hop_1_m_j) hop_2_n_j)
4644  (=> (and hop_1_n_m hop_1_m_l) hop_2_n_l)
4645  (=> (and hop_1_n_m hop_1_m_o) hop_2_n_o)
4646  (=> (and hop_1_n_m hop_1_m_q) hop_2_n_q)
4647  (=> (and hop_1_n_m hop_1_m_p) hop_2_n_p)
4648  (=> (and hop_1_n_l hop_1_l_a) hop_2_n_a)
4649  (=> (and hop_1_n_l hop_1_l_c) hop_2_n_c)
4650  (=> (and hop_1_n_l hop_1_l_b) hop_2_n_b)
4651  (=> (and hop_1_n_l hop_1_l_e) hop_2_n_e)
4652  (=> (and hop_1_n_l hop_1_l_d) hop_2_n_d)
4653  (=> (and hop_1_n_l hop_1_l_g) hop_2_n_g)
4654  (=> (and hop_1_n_l hop_1_l_f) hop_2_n_f)
4655  (=> (and hop_1_n_l hop_1_l_i) hop_2_n_i)
4656  (=> (and hop_1_n_l hop_1_l_h) hop_2_n_h)
4657  (=> (and hop_1_n_l hop_1_l_k) hop_2_n_k)
4658  (=> (and hop_1_n_l hop_1_l_j) hop_2_n_j)
4659  (=> (and hop_1_n_l hop_1_l_m) hop_2_n_m)
4660  (=> (and hop_1_n_l hop_1_l_o) hop_2_n_o)
4661  (=> (and hop_1_n_l hop_1_l_q) hop_2_n_q)
4662  (=> (and hop_1_n_l hop_1_l_p) hop_2_n_p)
4663  (=> (and hop_1_n_o hop_1_o_a) hop_2_n_a)
4664  (=> (and hop_1_n_o hop_1_o_c) hop_2_n_c)
4665  (=> (and hop_1_n_o hop_1_o_b) hop_2_n_b)
4666  (=> (and hop_1_n_o hop_1_o_e) hop_2_n_e)
4667  (=> (and hop_1_n_o hop_1_o_d) hop_2_n_d)
4668  (=> (and hop_1_n_o hop_1_o_g) hop_2_n_g)
4669  (=> (and hop_1_n_o hop_1_o_f) hop_2_n_f)
4670  (=> (and hop_1_n_o hop_1_o_i) hop_2_n_i)
4671  (=> (and hop_1_n_o hop_1_o_h) hop_2_n_h)
4672  (=> (and hop_1_n_o hop_1_o_k) hop_2_n_k)
4673  (=> (and hop_1_n_o hop_1_o_j) hop_2_n_j)
4674  (=> (and hop_1_n_o hop_1_o_m) hop_2_n_m)
4675  (=> (and hop_1_n_o hop_1_o_l) hop_2_n_l)
4676  (=> (and hop_1_n_o hop_1_o_q) hop_2_n_q)
4677  (=> (and hop_1_n_o hop_1_o_p) hop_2_n_p)
4678  (=> (and hop_1_n_q hop_1_q_a) hop_2_n_a)
4679  (=> (and hop_1_n_q hop_1_q_c) hop_2_n_c)
4680  (=> (and hop_1_n_q hop_1_q_b) hop_2_n_b)
4681  (=> (and hop_1_n_q hop_1_q_e) hop_2_n_e)
4682  (=> (and hop_1_n_q hop_1_q_d) hop_2_n_d)
4683  (=> (and hop_1_n_q hop_1_q_g) hop_2_n_g)
4684  (=> (and hop_1_n_q hop_1_q_f) hop_2_n_f)
4685  (=> (and hop_1_n_q hop_1_q_i) hop_2_n_i)
4686  (=> (and hop_1_n_q hop_1_q_h) hop_2_n_h)
4687  (=> (and hop_1_n_q hop_1_q_k) hop_2_n_k)
4688  (=> (and hop_1_n_q hop_1_q_j) hop_2_n_j)
4689  (=> (and hop_1_n_q hop_1_q_m) hop_2_n_m)
4690  (=> (and hop_1_n_q hop_1_q_l) hop_2_n_l)
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4691   (=> (and hop_1_n_q hop_1_q_o) hop_2_n_o)
4692   (=> (and hop_1_n_q hop_1_q_p) hop_2_n_p)
4693   (=> (and hop_1_n_p hop_1_p_a) hop_2_n_a)
4694   (=> (and hop_1_n_p hop_1_p_c) hop_2_n_c)
4695   (=> (and hop_1_n_p hop_1_p_b) hop_2_n_b)
4696   (=> (and hop_1_n_p hop_1_p_e) hop_2_n_e)
4697   (=> (and hop_1_n_p hop_1_p_d) hop_2_n_d)
4698   (=> (and hop_1_n_p hop_1_p_g) hop_2_n_g)
4699   (=> (and hop_1_n_p hop_1_p_f) hop_2_n_f)
4700   (=> (and hop_1_n_p hop_1_p_i) hop_2_n_i)
4701   (=> (and hop_1_n_p hop_1_p_h) hop_2_n_h)
4702   (=> (and hop_1_n_p hop_1_p_k) hop_2_n_k)
4703   (=> (and hop_1_n_p hop_1_p_j) hop_2_n_j)
4704   (=> (and hop_1_n_p hop_1_p_m) hop_2_n_m)
4705   (=> (and hop_1_n_p hop_1_p_l) hop_2_n_l)
4706   (=> (and hop_1_n_p hop_1_p_o) hop_2_n_o)
4707   (=> (and hop_1_n_p hop_1_p_q) hop_2_n_q)
4708   (=> (and hop_1_q_a hop_1_a_c) hop_2_q_c)
4709   (=> (and hop_1_q_a hop_1_a_b) hop_2_q_b)
4710   (=> (and hop_1_q_a hop_1_a_e) hop_2_q_e)
4711   (=> (and hop_1_q_a hop_1_a_d) hop_2_q_d)
4712   (=> (and hop_1_q_a hop_1_a_g) hop_2_q_g)
4713   (=> (and hop_1_q_a hop_1_a_f) hop_2_q_f)
4714   (=> (and hop_1_q_a hop_1_a_i) hop_2_q_i)
4715   (=> (and hop_1_q_a hop_1_a_h) hop_2_q_h)
4716   (=> (and hop_1_q_a hop_1_a_k) hop_2_q_k)
4717   (=> (and hop_1_q_a hop_1_a_j) hop_2_q_j)
4718   (=> (and hop_1_q_a hop_1_a_m) hop_2_q_m)
4719   (=> (and hop_1_q_a hop_1_a_l) hop_2_q_l)
4720   (=> (and hop_1_q_a hop_1_a_o) hop_2_q_o)
4721   (=> (and hop_1_q_a hop_1_a_n) hop_2_q_n)
4722   (=> (and hop_1_q_a hop_1_a_p) hop_2_q_p)
4723   (=> (and hop_1_q_c hop_1_c_a) hop_2_q_a)
4724   (=> (and hop_1_q_c hop_1_c_b) hop_2_q_b)
4725   (=> (and hop_1_q_c hop_1_c_e) hop_2_q_e)
4726   (=> (and hop_1_q_c hop_1_c_d) hop_2_q_d)
4727   (=> (and hop_1_q_c hop_1_c_g) hop_2_q_g)
4728   (=> (and hop_1_q_c hop_1_c_f) hop_2_q_f)
4729   (=> (and hop_1_q_c hop_1_c_i) hop_2_q_i)
4730   (=> (and hop_1_q_c hop_1_c_h) hop_2_q_h)
4731   (=> (and hop_1_q_c hop_1_c_k) hop_2_q_k)
4732   (=> (and hop_1_q_c hop_1_c_j) hop_2_q_j)
4733   (=> (and hop_1_q_c hop_1_c_m) hop_2_q_m)
4734   (=> (and hop_1_q_c hop_1_c_l) hop_2_q_l)
4735   (=> (and hop_1_q_c hop_1_c_o) hop_2_q_o)
4736   (=> (and hop_1_q_c hop_1_c_n) hop_2_q_n)
4737   (=> (and hop_1_q_c hop_1_c_p) hop_2_q_p)
4738   (=> (and hop_1_q_b hop_1_b_a) hop_2_q_a)
4739   (=> (and hop_1_q_b hop_1_b_c) hop_2_q_c)
4740   (=> (and hop_1_q_b hop_1_b_e) hop_2_q_e)
4741   (=> (and hop_1_q_b hop_1_b_d) hop_2_q_d)
4742   (=> (and hop_1_q_b hop_1_b_g) hop_2_q_g)
4743   (=> (and hop_1_q_b hop_1_b_f) hop_2_q_f)
4744   (=> (and hop_1_q_b hop_1_b_i) hop_2_q_i)
4745   (=> (and hop_1_q_b hop_1_b_h) hop_2_q_h)
4746   (=> (and hop_1_q_b hop_1_b_k) hop_2_q_k)
4747   (=> (and hop_1_q_b hop_1_b_j) hop_2_q_j)
4748   (=> (and hop_1_q_b hop_1_b_m) hop_2_q_m)
4749   (=> (and hop_1_q_b hop_1_b_l) hop_2_q_l)
4750   (=> (and hop_1_q_b hop_1_b_o) hop_2_q_o)
4751   (=> (and hop_1_q_b hop_1_b_n) hop_2_q_n)
4752   (=> (and hop_1_q_b hop_1_b_p) hop_2_q_p)
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4753   (=> (and hop_1_q_e hop_1_e_a) hop_2_q_a)
4754   (=> (and hop_1_q_e hop_1_e_c) hop_2_q_c)
4755   (=> (and hop_1_q_e hop_1_e_b) hop_2_q_b)
4756   (=> (and hop_1_q_e hop_1_e_d) hop_2_q_d)
4757   (=> (and hop_1_q_e hop_1_e_g) hop_2_q_g)
4758   (=> (and hop_1_q_e hop_1_e_f) hop_2_q_f)
4759   (=> (and hop_1_q_e hop_1_e_i) hop_2_q_i)
4760   (=> (and hop_1_q_e hop_1_e_h) hop_2_q_h)
4761   (=> (and hop_1_q_e hop_1_e_k) hop_2_q_k)
4762   (=> (and hop_1_q_e hop_1_e_j) hop_2_q_j)
4763   (=> (and hop_1_q_e hop_1_e_m) hop_2_q_m)
4764   (=> (and hop_1_q_e hop_1_e_l) hop_2_q_l)
4765   (=> (and hop_1_q_e hop_1_e_o) hop_2_q_o)
4766   (=> (and hop_1_q_e hop_1_e_n) hop_2_q_n)
4767   (=> (and hop_1_q_e hop_1_e_p) hop_2_q_p)
4768   (=> (and hop_1_q_d hop_1_d_a) hop_2_q_a)
4769   (=> (and hop_1_q_d hop_1_d_c) hop_2_q_c)
4770   (=> (and hop_1_q_d hop_1_d_b) hop_2_q_b)
4771   (=> (and hop_1_q_d hop_1_d_e) hop_2_q_e)
4772   (=> (and hop_1_q_d hop_1_d_g) hop_2_q_g)
4773   (=> (and hop_1_q_d hop_1_d_f) hop_2_q_f)
4774   (=> (and hop_1_q_d hop_1_d_i) hop_2_q_i)
4775   (=> (and hop_1_q_d hop_1_d_h) hop_2_q_h)
4776   (=> (and hop_1_q_d hop_1_d_k) hop_2_q_k)
4777   (=> (and hop_1_q_d hop_1_d_j) hop_2_q_j)
4778   (=> (and hop_1_q_d hop_1_d_m) hop_2_q_m)
4779   (=> (and hop_1_q_d hop_1_d_l) hop_2_q_l)
4780   (=> (and hop_1_q_d hop_1_d_o) hop_2_q_o)
4781   (=> (and hop_1_q_d hop_1_d_n) hop_2_q_n)
4782   (=> (and hop_1_q_d hop_1_d_p) hop_2_q_p)
4783   (=> (and hop_1_q_g hop_1_g_a) hop_2_q_a)
4784   (=> (and hop_1_q_g hop_1_g_c) hop_2_q_c)
4785   (=> (and hop_1_q_g hop_1_g_b) hop_2_q_b)
4786   (=> (and hop_1_q_g hop_1_g_e) hop_2_q_e)
4787   (=> (and hop_1_q_g hop_1_g_d) hop_2_q_d)
4788   (=> (and hop_1_q_g hop_1_g_f) hop_2_q_f)
4789   (=> (and hop_1_q_g hop_1_g_i) hop_2_q_i)
4790   (=> (and hop_1_q_g hop_1_g_h) hop_2_q_h)
4791   (=> (and hop_1_q_g hop_1_g_k) hop_2_q_k)
4792   (=> (and hop_1_q_g hop_1_g_j) hop_2_q_j)
4793   (=> (and hop_1_q_g hop_1_g_m) hop_2_q_m)
4794   (=> (and hop_1_q_g hop_1_g_l) hop_2_q_l)
4795   (=> (and hop_1_q_g hop_1_g_o) hop_2_q_o)
4796   (=> (and hop_1_q_g hop_1_g_n) hop_2_q_n)
4797   (=> (and hop_1_q_g hop_1_g_p) hop_2_q_p)
4798   (=> (and hop_1_q_f hop_1_f_a) hop_2_q_a)
4799   (=> (and hop_1_q_f hop_1_f_c) hop_2_q_c)
4800   (=> (and hop_1_q_f hop_1_f_b) hop_2_q_b)
4801   (=> (and hop_1_q_f hop_1_f_e) hop_2_q_e)
4802   (=> (and hop_1_q_f hop_1_f_d) hop_2_q_d)
4803   (=> (and hop_1_q_f hop_1_f_g) hop_2_q_g)
4804   (=> (and hop_1_q_f hop_1_f_i) hop_2_q_i)
4805   (=> (and hop_1_q_f hop_1_f_h) hop_2_q_h)
4806   (=> (and hop_1_q_f hop_1_f_k) hop_2_q_k)
4807   (=> (and hop_1_q_f hop_1_f_j) hop_2_q_j)
4808   (=> (and hop_1_q_f hop_1_f_m) hop_2_q_m)
4809   (=> (and hop_1_q_f hop_1_f_l) hop_2_q_l)
4810   (=> (and hop_1_q_f hop_1_f_o) hop_2_q_o)
4811   (=> (and hop_1_q_f hop_1_f_n) hop_2_q_n)
4812   (=> (and hop_1_q_f hop_1_f_p) hop_2_q_p)
4813   (=> (and hop_1_q_i hop_1_i_a) hop_2_q_a)
4814   (=> (and hop_1_q_i hop_1_i_c) hop_2_q_c)
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4815  (=> (and hop_1_q_i hop_1_i_b) hop_2_q_b)
4816  (=> (and hop_1_q_i hop_1_i_e) hop_2_q_e)
4817  (=> (and hop_1_q_i hop_1_i_d) hop_2_q_d)
4818  (=> (and hop_1_q_i hop_1_i_g) hop_2_q_g)
4819  (=> (and hop_1_q_i hop_1_i_f) hop_2_q_f)
4820  (=> (and hop_1_q_i hop_1_i_h) hop_2_q_h)
4821  (=> (and hop_1_q_i hop_1_i_k) hop_2_q_k)
4822  (=> (and hop_1_q_i hop_1_i_j) hop_2_q_j)
4823  (=> (and hop_1_q_i hop_1_i_m) hop_2_q_m)
4824  (=> (and hop_1_q_i hop_1_i_l) hop_2_q_l)
4825  (=> (and hop_1_q_i hop_1_i_o) hop_2_q_o)
4826  (=> (and hop_1_q_i hop_1_i_n) hop_2_q_n)
4827  (=> (and hop_1_q_i hop_1_i_p) hop_2_q_p)
4828  (=> (and hop_1_q_h hop_1_h_a) hop_2_q_a)
4829  (=> (and hop_1_q_h hop_1_h_c) hop_2_q_c)
4830  (=> (and hop_1_q_h hop_1_h_b) hop_2_q_b)
4831  (=> (and hop_1_q_h hop_1_h_e) hop_2_q_e)
4832  (=> (and hop_1_q_h hop_1_h_d) hop_2_q_d)
4833  (=> (and hop_1_q_h hop_1_h_g) hop_2_q_g)
4834  (=> (and hop_1_q_h hop_1_h_f) hop_2_q_f)
4835  (=> (and hop_1_q_h hop_1_h_i) hop_2_q_i)
4836  (=> (and hop_1_q_h hop_1_h_k) hop_2_q_k)
4837  (=> (and hop_1_q_h hop_1_h_j) hop_2_q_j)
4838  (=> (and hop_1_q_h hop_1_h_m) hop_2_q_m)
4839  (=> (and hop_1_q_h hop_1_h_l) hop_2_q_l)
4840  (=> (and hop_1_q_h hop_1_h_o) hop_2_q_o)
4841  (=> (and hop_1_q_h hop_1_h_n) hop_2_q_n)
4842  (=> (and hop_1_q_h hop_1_h_p) hop_2_q_p)
4843  (=> (and hop_1_q_k hop_1_k_a) hop_2_q_a)
4844  (=> (and hop_1_q_k hop_1_k_c) hop_2_q_c)
4845  (=> (and hop_1_q_k hop_1_k_b) hop_2_q_b)
4846  (=> (and hop_1_q_k hop_1_k_e) hop_2_q_e)
4847  (=> (and hop_1_q_k hop_1_k_d) hop_2_q_d)
4848  (=> (and hop_1_q_k hop_1_k_g) hop_2_q_g)
4849  (=> (and hop_1_q_k hop_1_k_f) hop_2_q_f)
4850  (=> (and hop_1_q_k hop_1_k_i) hop_2_q_i)
4851  (=> (and hop_1_q_k hop_1_k_h) hop_2_q_h)
4852  (=> (and hop_1_q_k hop_1_k_j) hop_2_q_j)
4853  (=> (and hop_1_q_k hop_1_k_m) hop_2_q_m)
4854  (=> (and hop_1_q_k hop_1_k_l) hop_2_q_l)
4855  (=> (and hop_1_q_k hop_1_k_o) hop_2_q_o)
4856  (=> (and hop_1_q_k hop_1_k_n) hop_2_q_n)
4857  (=> (and hop_1_q_k hop_1_k_p) hop_2_q_p)
4858  (=> (and hop_1_q_j hop_1_j_a) hop_2_q_a)
4859  (=> (and hop_1_q_j hop_1_j_c) hop_2_q_c)
4860  (=> (and hop_1_q_j hop_1_j_b) hop_2_q_b)
4861  (=> (and hop_1_q_j hop_1_j_e) hop_2_q_e)
4862  (=> (and hop_1_q_j hop_1_j_d) hop_2_q_d)
4863  (=> (and hop_1_q_j hop_1_j_g) hop_2_q_g)
4864  (=> (and hop_1_q_j hop_1_j_f) hop_2_q_f)
4865  (=> (and hop_1_q_j hop_1_j_i) hop_2_q_i)
4866  (=> (and hop_1_q_j hop_1_j_h) hop_2_q_h)
4867  (=> (and hop_1_q_j hop_1_j_k) hop_2_q_k)
4868  (=> (and hop_1_q_j hop_1_j_m) hop_2_q_m)
4869  (=> (and hop_1_q_j hop_1_j_l) hop_2_q_l)
4870  (=> (and hop_1_q_j hop_1_j_o) hop_2_q_o)
4871  (=> (and hop_1_q_j hop_1_j_n) hop_2_q_n)
4872  (=> (and hop_1_q_j hop_1_j_p) hop_2_q_p)
4873  (=> (and hop_1_q_m hop_1_m_a) hop_2_q_a)
4874  (=> (and hop_1_q_m hop_1_m_c) hop_2_q_c)
4875  (=> (and hop_1_q_m hop_1_m_b) hop_2_q_b)
4876  (=> (and hop_1_q_m hop_1_m_e) hop_2_q_e)
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4877  (=> (and hop_1_q_m hop_1_m_d) hop_2_q_d)
4878  (=> (and hop_1_q_m hop_1_m_g) hop_2_q_g)
4879  (=> (and hop_1_q_m hop_1_m_f) hop_2_q_f)
4880  (=> (and hop_1_q_m hop_1_m_i) hop_2_q_i)
4881  (=> (and hop_1_q_m hop_1_m_h) hop_2_q_h)
4882  (=> (and hop_1_q_m hop_1_m_k) hop_2_q_k)
4883  (=> (and hop_1_q_m hop_1_m_j) hop_2_q_j)
4884  (=> (and hop_1_q_m hop_1_m_l) hop_2_q_l)
4885  (=> (and hop_1_q_m hop_1_m_o) hop_2_q_o)
4886  (=> (and hop_1_q_m hop_1_m_n) hop_2_q_n)
4887  (=> (and hop_1_q_m hop_1_m_p) hop_2_q_p)
4888  (=> (and hop_1_q_l hop_1_l_a) hop_2_q_a)
4889  (=> (and hop_1_q_l hop_1_l_c) hop_2_q_c)
4890  (=> (and hop_1_q_l hop_1_l_b) hop_2_q_b)
4891  (=> (and hop_1_q_l hop_1_l_e) hop_2_q_e)
4892  (=> (and hop_1_q_l hop_1_l_d) hop_2_q_d)
4893  (=> (and hop_1_q_l hop_1_l_g) hop_2_q_g)
4894  (=> (and hop_1_q_l hop_1_l_f) hop_2_q_f)
4895  (=> (and hop_1_q_l hop_1_l_i) hop_2_q_i)
4896  (=> (and hop_1_q_l hop_1_l_h) hop_2_q_h)
4897  (=> (and hop_1_q_l hop_1_l_k) hop_2_q_k)
4898  (=> (and hop_1_q_l hop_1_l_j) hop_2_q_j)
4899  (=> (and hop_1_q_l hop_1_l_m) hop_2_q_m)
4900  (=> (and hop_1_q_l hop_1_l_o) hop_2_q_o)
4901  (=> (and hop_1_q_l hop_1_l_n) hop_2_q_n)
4902  (=> (and hop_1_q_l hop_1_l_p) hop_2_q_p)
4903  (=> (and hop_1_q_o hop_1_o_a) hop_2_q_a)
4904  (=> (and hop_1_q_o hop_1_o_c) hop_2_q_c)
4905  (=> (and hop_1_q_o hop_1_o_b) hop_2_q_b)
4906  (=> (and hop_1_q_o hop_1_o_e) hop_2_q_e)
4907  (=> (and hop_1_q_o hop_1_o_d) hop_2_q_d)
4908  (=> (and hop_1_q_o hop_1_o_g) hop_2_q_g)
4909  (=> (and hop_1_q_o hop_1_o_f) hop_2_q_f)
4910  (=> (and hop_1_q_o hop_1_o_i) hop_2_q_i)
4911  (=> (and hop_1_q_o hop_1_o_h) hop_2_q_h)
4912  (=> (and hop_1_q_o hop_1_o_k) hop_2_q_k)
4913  (=> (and hop_1_q_o hop_1_o_j) hop_2_q_j)
4914  (=> (and hop_1_q_o hop_1_o_m) hop_2_q_m)
4915  (=> (and hop_1_q_o hop_1_o_l) hop_2_q_l)
4916  (=> (and hop_1_q_o hop_1_o_n) hop_2_q_n)
4917  (=> (and hop_1_q_o hop_1_o_p) hop_2_q_p)
4918  (=> (and hop_1_q_n hop_1_n_a) hop_2_q_a)
4919  (=> (and hop_1_q_n hop_1_n_c) hop_2_q_c)
4920  (=> (and hop_1_q_n hop_1_n_b) hop_2_q_b)
4921  (=> (and hop_1_q_n hop_1_n_e) hop_2_q_e)
4922  (=> (and hop_1_q_n hop_1_n_d) hop_2_q_d)
4923  (=> (and hop_1_q_n hop_1_n_g) hop_2_q_g)
4924  (=> (and hop_1_q_n hop_1_n_f) hop_2_q_f)
4925  (=> (and hop_1_q_n hop_1_n_i) hop_2_q_i)
4926  (=> (and hop_1_q_n hop_1_n_h) hop_2_q_h)
4927  (=> (and hop_1_q_n hop_1_n_k) hop_2_q_k)
4928  (=> (and hop_1_q_n hop_1_n_j) hop_2_q_j)
4929  (=> (and hop_1_q_n hop_1_n_m) hop_2_q_m)
4930  (=> (and hop_1_q_n hop_1_n_l) hop_2_q_l)
4931  (=> (and hop_1_q_n hop_1_n_o) hop_2_q_o)
4932  (=> (and hop_1_q_n hop_1_n_p) hop_2_q_p)
4933  (=> (and hop_1_q_p hop_1_p_a) hop_2_q_a)
4934  (=> (and hop_1_q_p hop_1_p_c) hop_2_q_c)
4935  (=> (and hop_1_q_p hop_1_p_b) hop_2_q_b)
4936  (=> (and hop_1_q_p hop_1_p_e) hop_2_q_e)
4937  (=> (and hop_1_q_p hop_1_p_d) hop_2_q_d)
4938  (=> (and hop_1_q_p hop_1_p_g) hop_2_q_g)
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4939  (=> (and hop_1_q_p hop_1_p_f) hop_2_q_f)
4940  (=> (and hop_1_q_p hop_1_p_i) hop_2_q_i)
4941  (=> (and hop_1_q_p hop_1_p_h) hop_2_q_h)
4942  (=> (and hop_1_q_p hop_1_p_k) hop_2_q_k)
4943  (=> (and hop_1_q_p hop_1_p_j) hop_2_q_j)
4944  (=> (and hop_1_q_p hop_1_p_m) hop_2_q_m)
4945  (=> (and hop_1_q_p hop_1_p_l) hop_2_q_l)
4946  (=> (and hop_1_q_p hop_1_p_o) hop_2_q_o)
4947  (=> (and hop_1_q_p hop_1_p_n) hop_2_q_n)
4948  (=> (and hop_1_p_a hop_1_a_c) hop_2_p_c)
4949  (=> (and hop_1_p_a hop_1_a_b) hop_2_p_b)
4950  (=> (and hop_1_p_a hop_1_a_e) hop_2_p_e)
4951  (=> (and hop_1_p_a hop_1_a_d) hop_2_p_d)
4952  (=> (and hop_1_p_a hop_1_a_g) hop_2_p_g)
4953  (=> (and hop_1_p_a hop_1_a_f) hop_2_p_f)
4954  (=> (and hop_1_p_a hop_1_a_i) hop_2_p_i)
4955  (=> (and hop_1_p_a hop_1_a_h) hop_2_p_h)
4956  (=> (and hop_1_p_a hop_1_a_k) hop_2_p_k)
4957  (=> (and hop_1_p_a hop_1_a_j) hop_2_p_j)
4958  (=> (and hop_1_p_a hop_1_a_m) hop_2_p_m)
4959  (=> (and hop_1_p_a hop_1_a_l) hop_2_p_l)
4960  (=> (and hop_1_p_a hop_1_a_o) hop_2_p_o)
4961  (=> (and hop_1_p_a hop_1_a_n) hop_2_p_n)
4962  (=> (and hop_1_p_a hop_1_a_q) hop_2_p_q)
4963  (=> (and hop_1_p_c hop_1_c_a) hop_2_p_a)
4964  (=> (and hop_1_p_c hop_1_c_b) hop_2_p_b)
4965  (=> (and hop_1_p_c hop_1_c_e) hop_2_p_e)
4966  (=> (and hop_1_p_c hop_1_c_d) hop_2_p_d)
4967  (=> (and hop_1_p_c hop_1_c_g) hop_2_p_g)
4968  (=> (and hop_1_p_c hop_1_c_f) hop_2_p_f)
4969  (=> (and hop_1_p_c hop_1_c_i) hop_2_p_i)
4970  (=> (and hop_1_p_c hop_1_c_h) hop_2_p_h)
4971  (=> (and hop_1_p_c hop_1_c_k) hop_2_p_k)
4972  (=> (and hop_1_p_c hop_1_c_j) hop_2_p_j)
4973  (=> (and hop_1_p_c hop_1_c_m) hop_2_p_m)
4974  (=> (and hop_1_p_c hop_1_c_l) hop_2_p_l)
4975  (=> (and hop_1_p_c hop_1_c_o) hop_2_p_o)
4976  (=> (and hop_1_p_c hop_1_c_n) hop_2_p_n)
4977  (=> (and hop_1_p_c hop_1_c_q) hop_2_p_q)
4978  (=> (and hop_1_p_b hop_1_b_a) hop_2_p_a)
4979  (=> (and hop_1_p_b hop_1_b_c) hop_2_p_c)
4980  (=> (and hop_1_p_b hop_1_b_e) hop_2_p_e)
4981  (=> (and hop_1_p_b hop_1_b_d) hop_2_p_d)
4982  (=> (and hop_1_p_b hop_1_b_g) hop_2_p_g)
4983  (=> (and hop_1_p_b hop_1_b_f) hop_2_p_f)
4984  (=> (and hop_1_p_b hop_1_b_i) hop_2_p_i)
4985  (=> (and hop_1_p_b hop_1_b_h) hop_2_p_h)
4986  (=> (and hop_1_p_b hop_1_b_k) hop_2_p_k)
4987  (=> (and hop_1_p_b hop_1_b_j) hop_2_p_j)
4988  (=> (and hop_1_p_b hop_1_b_m) hop_2_p_m)
4989  (=> (and hop_1_p_b hop_1_b_l) hop_2_p_l)
4990  (=> (and hop_1_p_b hop_1_b_o) hop_2_p_o)
4991  (=> (and hop_1_p_b hop_1_b_n) hop_2_p_n)
4992  (=> (and hop_1_p_b hop_1_b_q) hop_2_p_q)
4993  (=> (and hop_1_p_e hop_1_e_a) hop_2_p_a)
4994  (=> (and hop_1_p_e hop_1_e_c) hop_2_p_c)
4995  (=> (and hop_1_p_e hop_1_e_b) hop_2_p_b)
4996  (=> (and hop_1_p_e hop_1_e_d) hop_2_p_d)
4997  (=> (and hop_1_p_e hop_1_e_g) hop_2_p_g)
4998  (=> (and hop_1_p_e hop_1_e_f) hop_2_p_f)
4999  (=> (and hop_1_p_e hop_1_e_i) hop_2_p_i)
5000  (=> (and hop_1_p_e hop_1_e_h) hop_2_p_h)
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5001  (=> (and hop_1_p_e hop_1_e_k) hop_2_p_k)
5002  (=> (and hop_1_p_e hop_1_e_j) hop_2_p_j)
5003  (=> (and hop_1_p_e hop_1_e_m) hop_2_p_m)
5004  (=> (and hop_1_p_e hop_1_e_l) hop_2_p_l)
5005  (=> (and hop_1_p_e hop_1_e_o) hop_2_p_o)
5006  (=> (and hop_1_p_e hop_1_e_n) hop_2_p_n)
5007  (=> (and hop_1_p_e hop_1_e_q) hop_2_p_q)
5008  (=> (and hop_1_p_d hop_1_d_a) hop_2_p_a)
5009  (=> (and hop_1_p_d hop_1_d_c) hop_2_p_c)
5010  (=> (and hop_1_p_d hop_1_d_b) hop_2_p_b)
5011  (=> (and hop_1_p_d hop_1_d_e) hop_2_p_e)
5012  (=> (and hop_1_p_d hop_1_d_g) hop_2_p_g)
5013  (=> (and hop_1_p_d hop_1_d_f) hop_2_p_f)
5014  (=> (and hop_1_p_d hop_1_d_i) hop_2_p_i)
5015  (=> (and hop_1_p_d hop_1_d_h) hop_2_p_h)
5016  (=> (and hop_1_p_d hop_1_d_k) hop_2_p_k)
5017  (=> (and hop_1_p_d hop_1_d_j) hop_2_p_j)
5018  (=> (and hop_1_p_d hop_1_d_m) hop_2_p_m)
5019  (=> (and hop_1_p_d hop_1_d_l) hop_2_p_l)
5020  (=> (and hop_1_p_d hop_1_d_o) hop_2_p_o)
5021  (=> (and hop_1_p_d hop_1_d_n) hop_2_p_n)
5022  (=> (and hop_1_p_d hop_1_d_q) hop_2_p_q)
5023  (=> (and hop_1_p_g hop_1_g_a) hop_2_p_a)
5024  (=> (and hop_1_p_g hop_1_g_c) hop_2_p_c)
5025  (=> (and hop_1_p_g hop_1_g_b) hop_2_p_b)
5026  (=> (and hop_1_p_g hop_1_g_e) hop_2_p_e)
5027  (=> (and hop_1_p_g hop_1_g_d) hop_2_p_d)
5028  (=> (and hop_1_p_g hop_1_g_f) hop_2_p_f)
5029  (=> (and hop_1_p_g hop_1_g_i) hop_2_p_i)
5030  (=> (and hop_1_p_g hop_1_g_h) hop_2_p_h)
5031  (=> (and hop_1_p_g hop_1_g_k) hop_2_p_k)
5032  (=> (and hop_1_p_g hop_1_g_j) hop_2_p_j)
5033  (=> (and hop_1_p_g hop_1_g_m) hop_2_p_m)
5034  (=> (and hop_1_p_g hop_1_g_l) hop_2_p_l)
5035  (=> (and hop_1_p_g hop_1_g_o) hop_2_p_o)
5036  (=> (and hop_1_p_g hop_1_g_n) hop_2_p_n)
5037  (=> (and hop_1_p_g hop_1_g_q) hop_2_p_q)
5038  (=> (and hop_1_p_f hop_1_f_a) hop_2_p_a)
5039  (=> (and hop_1_p_f hop_1_f_c) hop_2_p_c)
5040  (=> (and hop_1_p_f hop_1_f_b) hop_2_p_b)
5041  (=> (and hop_1_p_f hop_1_f_e) hop_2_p_e)
5042  (=> (and hop_1_p_f hop_1_f_d) hop_2_p_d)
5043  (=> (and hop_1_p_f hop_1_f_g) hop_2_p_g)
5044  (=> (and hop_1_p_f hop_1_f_i) hop_2_p_i)
5045  (=> (and hop_1_p_f hop_1_f_h) hop_2_p_h)
5046  (=> (and hop_1_p_f hop_1_f_k) hop_2_p_k)
5047  (=> (and hop_1_p_f hop_1_f_j) hop_2_p_j)
5048  (=> (and hop_1_p_f hop_1_f_m) hop_2_p_m)
5049  (=> (and hop_1_p_f hop_1_f_l) hop_2_p_l)
5050  (=> (and hop_1_p_f hop_1_f_o) hop_2_p_o)
5051  (=> (and hop_1_p_f hop_1_f_n) hop_2_p_n)
5052  (=> (and hop_1_p_f hop_1_f_q) hop_2_p_q)
5053  (=> (and hop_1_p_i hop_1_i_a) hop_2_p_a)
5054  (=> (and hop_1_p_i hop_1_i_c) hop_2_p_c)
5055  (=> (and hop_1_p_i hop_1_i_b) hop_2_p_b)
5056  (=> (and hop_1_p_i hop_1_i_e) hop_2_p_e)
5057  (=> (and hop_1_p_i hop_1_i_d) hop_2_p_d)
5058  (=> (and hop_1_p_i hop_1_i_g) hop_2_p_g)
5059  (=> (and hop_1_p_i hop_1_i_f) hop_2_p_f)
5060  (=> (and hop_1_p_i hop_1_i_h) hop_2_p_h)
5061  (=> (and hop_1_p_i hop_1_i_k) hop_2_p_k)
5062  (=> (and hop_1_p_i hop_1_i_j) hop_2_p_j)
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5063    (=> (and hop_1_p_i hop_1_i_m) hop_2_p_m)
5064    (=> (and hop_1_p_i hop_1_i_l) hop_2_p_l)
5065    (=> (and hop_1_p_i hop_1_i_o) hop_2_p_o)
5066    (=> (and hop_1_p_i hop_1_i_n) hop_2_p_n)
5067    (=> (and hop_1_p_i hop_1_i_q) hop_2_p_q)
5068    (=> (and hop_1_p_h hop_1_h_a) hop_2_p_a)
5069    (=> (and hop_1_p_h hop_1_h_c) hop_2_p_c)
5070    (=> (and hop_1_p_h hop_1_h_b) hop_2_p_b)
5071    (=> (and hop_1_p_h hop_1_h_e) hop_2_p_e)
5072    (=> (and hop_1_p_h hop_1_h_d) hop_2_p_d)
5073    (=> (and hop_1_p_h hop_1_h_g) hop_2_p_g)
5074    (=> (and hop_1_p_h hop_1_h_f) hop_2_p_f)
5075    (=> (and hop_1_p_h hop_1_h_i) hop_2_p_i)
5076    (=> (and hop_1_p_h hop_1_h_k) hop_2_p_k)
5077    (=> (and hop_1_p_h hop_1_h_j) hop_2_p_j)
5078    (=> (and hop_1_p_h hop_1_h_m) hop_2_p_m)
5079    (=> (and hop_1_p_h hop_1_h_l) hop_2_p_l)
5080    (=> (and hop_1_p_h hop_1_h_o) hop_2_p_o)
5081    (=> (and hop_1_p_h hop_1_h_n) hop_2_p_n)
5082    (=> (and hop_1_p_h hop_1_h_q) hop_2_p_q)
5083    (=> (and hop_1_p_k hop_1_k_a) hop_2_p_a)
5084    (=> (and hop_1_p_k hop_1_k_c) hop_2_p_c)
5085    (=> (and hop_1_p_k hop_1_k_b) hop_2_p_b)
5086    (=> (and hop_1_p_k hop_1_k_e) hop_2_p_e)
5087    (=> (and hop_1_p_k hop_1_k_d) hop_2_p_d)
5088    (=> (and hop_1_p_k hop_1_k_g) hop_2_p_g)
5089    (=> (and hop_1_p_k hop_1_k_f) hop_2_p_f)
5090    (=> (and hop_1_p_k hop_1_k_i) hop_2_p_i)
5091    (=> (and hop_1_p_k hop_1_k_h) hop_2_p_h)
5092    (=> (and hop_1_p_k hop_1_k_j) hop_2_p_j)
5093    (=> (and hop_1_p_k hop_1_k_m) hop_2_p_m)
5094    (=> (and hop_1_p_k hop_1_k_l) hop_2_p_l)
5095    (=> (and hop_1_p_k hop_1_k_o) hop_2_p_o)
5096    (=> (and hop_1_p_k hop_1_k_n) hop_2_p_n)
5097    (=> (and hop_1_p_k hop_1_k_q) hop_2_p_q)
5098    (=> (and hop_1_p_j hop_1_j_a) hop_2_p_a)
5099    (=> (and hop_1_p_j hop_1_j_c) hop_2_p_c)
5100    (=> (and hop_1_p_j hop_1_j_b) hop_2_p_b)
5101    (=> (and hop_1_p_j hop_1_j_e) hop_2_p_e)
5102    (=> (and hop_1_p_j hop_1_j_d) hop_2_p_d)
5103    (=> (and hop_1_p_j hop_1_j_g) hop_2_p_g)
5104    (=> (and hop_1_p_j hop_1_j_f) hop_2_p_f)
5105    (=> (and hop_1_p_j hop_1_j_i) hop_2_p_i)
5106    (=> (and hop_1_p_j hop_1_j_h) hop_2_p_h)
5107    (=> (and hop_1_p_j hop_1_j_k) hop_2_p_k)
5108    (=> (and hop_1_p_j hop_1_j_m) hop_2_p_m)
5109    (=> (and hop_1_p_j hop_1_j_l) hop_2_p_l)
5110    (=> (and hop_1_p_j hop_1_j_o) hop_2_p_o)
5111    (=> (and hop_1_p_j hop_1_j_n) hop_2_p_n)
5112    (=> (and hop_1_p_j hop_1_j_q) hop_2_p_q)
5113    (=> (and hop_1_p_m hop_1_m_a) hop_2_p_a)
5114    (=> (and hop_1_p_m hop_1_m_c) hop_2_p_c)
5115    (=> (and hop_1_p_m hop_1_m_b) hop_2_p_b)
5116    (=> (and hop_1_p_m hop_1_m_e) hop_2_p_e)
5117    (=> (and hop_1_p_m hop_1_m_d) hop_2_p_d)
5118    (=> (and hop_1_p_m hop_1_m_g) hop_2_p_g)
5119    (=> (and hop_1_p_m hop_1_m_f) hop_2_p_f)
5120    (=> (and hop_1_p_m hop_1_m_i) hop_2_p_i)
5121    (=> (and hop_1_p_m hop_1_m_h) hop_2_p_h)
5122    (=> (and hop_1_p_m hop_1_m_k) hop_2_p_k)
5123    (=> (and hop_1_p_m hop_1_m_j) hop_2_p_j)
5124    (=> (and hop_1_p_m hop_1_m_l) hop_2_p_l)
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5125  (=> (and hop_1_p_m hop_1_m_o) hop_2_p_o)
5126  (=> (and hop_1_p_m hop_1_m_n) hop_2_p_n)
5127  (=> (and hop_1_p_m hop_1_m_q) hop_2_p_q)
5128  (=> (and hop_1_p_l hop_1_l_a) hop_2_p_a)
5129  (=> (and hop_1_p_l hop_1_l_c) hop_2_p_c)
5130  (=> (and hop_1_p_l hop_1_l_b) hop_2_p_b)
5131  (=> (and hop_1_p_l hop_1_l_e) hop_2_p_e)
5132  (=> (and hop_1_p_l hop_1_l_d) hop_2_p_d)
5133  (=> (and hop_1_p_l hop_1_l_g) hop_2_p_g)
5134  (=> (and hop_1_p_l hop_1_l_f) hop_2_p_f)
5135  (=> (and hop_1_p_l hop_1_l_i) hop_2_p_i)
5136  (=> (and hop_1_p_l hop_1_l_h) hop_2_p_h)
5137  (=> (and hop_1_p_l hop_1_l_k) hop_2_p_k)
5138  (=> (and hop_1_p_l hop_1_l_j) hop_2_p_j)
5139  (=> (and hop_1_p_l hop_1_l_m) hop_2_p_m)
5140  (=> (and hop_1_p_l hop_1_l_o) hop_2_p_o)
5141  (=> (and hop_1_p_l hop_1_l_n) hop_2_p_n)
5142  (=> (and hop_1_p_l hop_1_l_q) hop_2_p_q)
5143  (=> (and hop_1_p_o hop_1_o_a) hop_2_p_a)
5144  (=> (and hop_1_p_o hop_1_o_c) hop_2_p_c)
5145  (=> (and hop_1_p_o hop_1_o_b) hop_2_p_b)
5146  (=> (and hop_1_p_o hop_1_o_e) hop_2_p_e)
5147  (=> (and hop_1_p_o hop_1_o_d) hop_2_p_d)
5148  (=> (and hop_1_p_o hop_1_o_g) hop_2_p_g)
5149  (=> (and hop_1_p_o hop_1_o_f) hop_2_p_f)
5150  (=> (and hop_1_p_o hop_1_o_i) hop_2_p_i)
5151  (=> (and hop_1_p_o hop_1_o_h) hop_2_p_h)
5152  (=> (and hop_1_p_o hop_1_o_k) hop_2_p_k)
5153  (=> (and hop_1_p_o hop_1_o_j) hop_2_p_j)
5154  (=> (and hop_1_p_o hop_1_o_m) hop_2_p_m)
5155  (=> (and hop_1_p_o hop_1_o_l) hop_2_p_l)
5156  (=> (and hop_1_p_o hop_1_o_n) hop_2_p_n)
5157  (=> (and hop_1_p_o hop_1_o_q) hop_2_p_q)
5158  (=> (and hop_1_p_n hop_1_n_a) hop_2_p_a)
5159  (=> (and hop_1_p_n hop_1_n_c) hop_2_p_c)
5160  (=> (and hop_1_p_n hop_1_n_b) hop_2_p_b)
5161  (=> (and hop_1_p_n hop_1_n_e) hop_2_p_e)
5162  (=> (and hop_1_p_n hop_1_n_d) hop_2_p_d)
5163  (=> (and hop_1_p_n hop_1_n_g) hop_2_p_g)
5164  (=> (and hop_1_p_n hop_1_n_f) hop_2_p_f)
5165  (=> (and hop_1_p_n hop_1_n_i) hop_2_p_i)
5166  (=> (and hop_1_p_n hop_1_n_h) hop_2_p_h)
5167  (=> (and hop_1_p_n hop_1_n_k) hop_2_p_k)
5168  (=> (and hop_1_p_n hop_1_n_j) hop_2_p_j)
5169  (=> (and hop_1_p_n hop_1_n_m) hop_2_p_m)
5170  (=> (and hop_1_p_n hop_1_n_l) hop_2_p_l)
5171  (=> (and hop_1_p_n hop_1_n_o) hop_2_p_o)
5172  (=> (and hop_1_p_n hop_1_n_q) hop_2_p_q)
5173  (=> (and hop_1_p_q hop_1_q_a) hop_2_p_a)
5174  (=> (and hop_1_p_q hop_1_q_c) hop_2_p_c)
5175  (=> (and hop_1_p_q hop_1_q_b) hop_2_p_b)
5176  (=> (and hop_1_p_q hop_1_q_e) hop_2_p_e)
5177  (=> (and hop_1_p_q hop_1_q_d) hop_2_p_d)
5178  (=> (and hop_1_p_q hop_1_q_g) hop_2_p_g)
5179  (=> (and hop_1_p_q hop_1_q_f) hop_2_p_f)
5180  (=> (and hop_1_p_q hop_1_q_i) hop_2_p_i)
5181  (=> (and hop_1_p_q hop_1_q_h) hop_2_p_h)
5182  (=> (and hop_1_p_q hop_1_q_k) hop_2_p_k)
5183  (=> (and hop_1_p_q hop_1_q_j) hop_2_p_j)
5184  (=> (and hop_1_p_q hop_1_q_m) hop_2_p_m)
5185  (=> (and hop_1_p_q hop_1_q_l) hop_2_p_l)
5186  (=> (and hop_1_p_q hop_1_q_o) hop_2_p_o)
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5187  (=> (and hop_1_p_q hop_1_q_n) hop_2_p_n)
5188  (=> hop_2_a_c (not (= chan_a chan_c)))
5189  (=> hop_2_a_b (not (= chan_a chan_b)))
5190  (=> hop_2_a_e (not (= chan_a chan_e)))
5191  (=> hop_2_a_d (not (= chan_a chan_d)))
5192  (=> hop_2_a_g (not (= chan_a chan_g)))
5193  (=> hop_2_a_f (not (= chan_a chan_f)))
5194  (=> hop_2_a_i (not (= chan_a chan_i)))
5195  (=> hop_2_a_h (not (= chan_a chan_h)))
5196  (=> hop_2_a_k (not (= chan_a chan_k)))
5197  (=> hop_2_a_j (not (= chan_a chan_j)))
5198  (=> hop_2_a_m (not (= chan_a chan_m)))
5199  (=> hop_2_a_l (not (= chan_a chan_l)))
5200  (=> hop_2_a_o (not (= chan_a chan_o)))
5201  (=> hop_2_a_n (not (= chan_a chan_n)))
5202  (=> hop_2_a_q (not (= chan_a chan_q)))
5203  (=> hop_2_a_p (not (= chan_a chan_p)))
5204  (=> hop_2_c_a (not (= chan_c chan_a)))
5205  (=> hop_2_c_b (not (= chan_c chan_b)))
5206  (=> hop_2_c_e (not (= chan_c chan_e)))
5207  (=> hop_2_c_d (not (= chan_c chan_d)))
5208  (=> hop_2_c_g (not (= chan_c chan_g)))
5209  (=> hop_2_c_f (not (= chan_c chan_f)))
5210  (=> hop_2_c_i (not (= chan_c chan_i)))
5211  (=> hop_2_c_h (not (= chan_c chan_h)))
5212  (=> hop_2_c_k (not (= chan_c chan_k)))
5213  (=> hop_2_c_j (not (= chan_c chan_j)))
5214  (=> hop_2_c_m (not (= chan_c chan_m)))
5215  (=> hop_2_c_l (not (= chan_c chan_l)))
5216  (=> hop_2_c_o (not (= chan_c chan_o)))
5217  (=> hop_2_c_n (not (= chan_c chan_n)))
5218  (=> hop_2_c_q (not (= chan_c chan_q)))
5219  (=> hop_2_c_p (not (= chan_c chan_p)))
5220  (=> hop_2_b_a (not (= chan_b chan_a)))
5221  (=> hop_2_b_c (not (= chan_b chan_c)))
5222  (=> hop_2_b_e (not (= chan_b chan_e)))
5223  (=> hop_2_b_d (not (= chan_b chan_d)))
5224  (=> hop_2_b_g (not (= chan_b chan_g)))
5225  (=> hop_2_b_f (not (= chan_b chan_f)))
5226  (=> hop_2_b_i (not (= chan_b chan_i)))
5227  (=> hop_2_b_h (not (= chan_b chan_h)))
5228  (=> hop_2_b_k (not (= chan_b chan_k)))
5229  (=> hop_2_b_j (not (= chan_b chan_j)))
5230  (=> hop_2_b_m (not (= chan_b chan_m)))
5231  (=> hop_2_b_l (not (= chan_b chan_l)))
5232  (=> hop_2_b_o (not (= chan_b chan_o)))
5233  (=> hop_2_b_n (not (= chan_b chan_n)))
5234  (=> hop_2_b_q (not (= chan_b chan_q)))
5235  (=> hop_2_b_p (not (= chan_b chan_p)))
5236  (=> hop_2_e_a (not (= chan_e chan_a)))
5237  (=> hop_2_e_c (not (= chan_e chan_c)))
5238  (=> hop_2_e_b (not (= chan_e chan_b)))
5239  (=> hop_2_e_d (not (= chan_e chan_d)))
5240  (=> hop_2_e_g (not (= chan_e chan_g)))
5241  (=> hop_2_e_f (not (= chan_e chan_f)))
5242  (=> hop_2_e_i (not (= chan_e chan_i)))
5243  (=> hop_2_e_h (not (= chan_e chan_h)))
5244  (=> hop_2_e_k (not (= chan_e chan_k)))
5245  (=> hop_2_e_j (not (= chan_e chan_j)))
5246  (=> hop_2_e_m (not (= chan_e chan_m)))
5247  (=> hop_2_e_l (not (= chan_e chan_l)))
5248  (=> hop_2_e_o (not (= chan_e chan_o)))
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5249    (=> hop_2_e_n (not (= chan_e chan_n)))
5250    (=> hop_2_e_q (not (= chan_e chan_q)))
5251    (=> hop_2_e_p (not (= chan_e chan_p)))
5252    (=> hop_2_d_a (not (= chan_d chan_a)))
5253    (=> hop_2_d_c (not (= chan_d chan_c)))
5254    (=> hop_2_d_b (not (= chan_d chan_b)))
5255    (=> hop_2_d_e (not (= chan_d chan_e)))
5256    (=> hop_2_d_g (not (= chan_d chan_g)))
5257    (=> hop_2_d_f (not (= chan_d chan_f)))
5258    (=> hop_2_d_i (not (= chan_d chan_i)))
5259    (=> hop_2_d_h (not (= chan_d chan_h)))
5260    (=> hop_2_d_k (not (= chan_d chan_k)))
5261    (=> hop_2_d_j (not (= chan_d chan_j)))
5262    (=> hop_2_d_m (not (= chan_d chan_m)))
5263    (=> hop_2_d_l (not (= chan_d chan_l)))
5264    (=> hop_2_d_o (not (= chan_d chan_o)))
5265    (=> hop_2_d_n (not (= chan_d chan_n)))
5266    (=> hop_2_d_q (not (= chan_d chan_q)))
5267    (=> hop_2_d_p (not (= chan_d chan_p)))
5268    (=> hop_2_g_a (not (= chan_g chan_a)))
5269    (=> hop_2_g_c (not (= chan_g chan_c)))
5270    (=> hop_2_g_b (not (= chan_g chan_b)))
5271    (=> hop_2_g_e (not (= chan_g chan_e)))
5272    (=> hop_2_g_d (not (= chan_g chan_d)))
5273    (=> hop_2_g_f (not (= chan_g chan_f)))
5274    (=> hop_2_g_i (not (= chan_g chan_i)))
5275    (=> hop_2_g_h (not (= chan_g chan_h)))
5276    (=> hop_2_g_k (not (= chan_g chan_k)))
5277    (=> hop_2_g_j (not (= chan_g chan_j)))
5278    (=> hop_2_g_m (not (= chan_g chan_m)))
5279    (=> hop_2_g_l (not (= chan_g chan_l)))
5280    (=> hop_2_g_o (not (= chan_g chan_o)))
5281    (=> hop_2_g_n (not (= chan_g chan_n)))
5282    (=> hop_2_g_q (not (= chan_g chan_q)))
5283    (=> hop_2_g_p (not (= chan_g chan_p)))
5284    (=> hop_2_f_a (not (= chan_f chan_a)))
5285    (=> hop_2_f_c (not (= chan_f chan_c)))
5286    (=> hop_2_f_b (not (= chan_f chan_b)))
5287    (=> hop_2_f_e (not (= chan_f chan_e)))
5288    (=> hop_2_f_d (not (= chan_f chan_d)))
5289    (=> hop_2_f_g (not (= chan_f chan_g)))
5290    (=> hop_2_f_i (not (= chan_f chan_i)))
5291    (=> hop_2_f_h (not (= chan_f chan_h)))
5292    (=> hop_2_f_k (not (= chan_f chan_k)))
5293    (=> hop_2_f_j (not (= chan_f chan_j)))
5294    (=> hop_2_f_m (not (= chan_f chan_m)))
5295    (=> hop_2_f_l (not (= chan_f chan_l)))
5296    (=> hop_2_f_o (not (= chan_f chan_o)))
5297    (=> hop_2_f_n (not (= chan_f chan_n)))
5298    (=> hop_2_f_q (not (= chan_f chan_q)))
5299    (=> hop_2_f_p (not (= chan_f chan_p)))
5300    (=> hop_2_i_a (not (= chan_i chan_a)))
5301    (=> hop_2_i_c (not (= chan_i chan_c)))
5302    (=> hop_2_i_b (not (= chan_i chan_b)))
5303    (=> hop_2_i_e (not (= chan_i chan_e)))
5304    (=> hop_2_i_d (not (= chan_i chan_d)))
5305    (=> hop_2_i_g (not (= chan_i chan_g)))
5306    (=> hop_2_i_f (not (= chan_i chan_f)))
5307    (=> hop_2_i_h (not (= chan_i chan_h)))
5308    (=> hop_2_i_k (not (= chan_i chan_k)))
5309    (=> hop_2_i_j (not (= chan_i chan_j)))
5310    (=> hop_2_i_m (not (= chan_i chan_m)))
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5311   (=> hop_2_i_l (not (= chan_i chan_l)))
5312   (=> hop_2_i_o (not (= chan_i chan_o)))
5313   (=> hop_2_i_n (not (= chan_i chan_n)))
5314   (=> hop_2_i_q (not (= chan_i chan_q)))
5315   (=> hop_2_i_p (not (= chan_i chan_p)))
5316   (=> hop_2_h_a (not (= chan_h chan_a)))
5317   (=> hop_2_h_c (not (= chan_h chan_c)))
5318   (=> hop_2_h_b (not (= chan_h chan_b)))
5319   (=> hop_2_h_e (not (= chan_h chan_e)))
5320   (=> hop_2_h_d (not (= chan_h chan_d)))
5321   (=> hop_2_h_g (not (= chan_h chan_g)))
5322   (=> hop_2_h_f (not (= chan_h chan_f)))
5323   (=> hop_2_h_i (not (= chan_h chan_i)))
5324   (=> hop_2_h_k (not (= chan_h chan_k)))
5325   (=> hop_2_h_j (not (= chan_h chan_j)))
5326   (=> hop_2_h_m (not (= chan_h chan_m)))
5327   (=> hop_2_h_l (not (= chan_h chan_l)))
5328   (=> hop_2_h_o (not (= chan_h chan_o)))
5329   (=> hop_2_h_n (not (= chan_h chan_n)))
5330   (=> hop_2_h_q (not (= chan_h chan_q)))
5331   (=> hop_2_h_p (not (= chan_h chan_p)))
5332   (=> hop_2_k_a (not (= chan_k chan_a)))
5333   (=> hop_2_k_c (not (= chan_k chan_c)))
5334   (=> hop_2_k_b (not (= chan_k chan_b)))
5335   (=> hop_2_k_e (not (= chan_k chan_e)))
5336   (=> hop_2_k_d (not (= chan_k chan_d)))
5337   (=> hop_2_k_g (not (= chan_k chan_g)))
5338   (=> hop_2_k_f (not (= chan_k chan_f)))
5339   (=> hop_2_k_i (not (= chan_k chan_i)))
5340   (=> hop_2_k_h (not (= chan_k chan_h)))
5341   (=> hop_2_k_j (not (= chan_k chan_j)))
5342   (=> hop_2_k_m (not (= chan_k chan_m)))
5343   (=> hop_2_k_l (not (= chan_k chan_l)))
5344   (=> hop_2_k_o (not (= chan_k chan_o)))
5345   (=> hop_2_k_n (not (= chan_k chan_n)))
5346   (=> hop_2_k_q (not (= chan_k chan_q)))
5347   (=> hop_2_k_p (not (= chan_k chan_p)))
5348   (=> hop_2_j_a (not (= chan_j chan_a)))
5349   (=> hop_2_j_c (not (= chan_j chan_c)))
5350   (=> hop_2_j_b (not (= chan_j chan_b)))
5351   (=> hop_2_j_e (not (= chan_j chan_e)))
5352   (=> hop_2_j_d (not (= chan_j chan_d)))
5353   (=> hop_2_j_g (not (= chan_j chan_g)))
5354   (=> hop_2_j_f (not (= chan_j chan_f)))
5355   (=> hop_2_j_i (not (= chan_j chan_i)))
5356   (=> hop_2_j_h (not (= chan_j chan_h)))
5357   (=> hop_2_j_k (not (= chan_j chan_k)))
5358   (=> hop_2_j_m (not (= chan_j chan_m)))
5359   (=> hop_2_j_l (not (= chan_j chan_l)))
5360   (=> hop_2_j_o (not (= chan_j chan_o)))
5361   (=> hop_2_j_n (not (= chan_j chan_n)))
5362   (=> hop_2_j_q (not (= chan_j chan_q)))
5363   (=> hop_2_j_p (not (= chan_j chan_p)))
5364   (=> hop_2_m_a (not (= chan_m chan_a)))
5365   (=> hop_2_m_c (not (= chan_m chan_c)))
5366   (=> hop_2_m_b (not (= chan_m chan_b)))
5367   (=> hop_2_m_e (not (= chan_m chan_e)))
5368   (=> hop_2_m_d (not (= chan_m chan_d)))
5369   (=> hop_2_m_g (not (= chan_m chan_g)))
5370   (=> hop_2_m_f (not (= chan_m chan_f)))
5371   (=> hop_2_m_i (not (= chan_m chan_i)))
5372   (=> hop_2_m_h (not (= chan_m chan_h)))
```

```
5373   (=> hop_2_m_k (not (= chan_m chan_k)))
5374   (=> hop_2_m_j (not (= chan_m chan_j)))
5375   (=> hop_2_m_l (not (= chan_m chan_l)))
5376   (=> hop_2_m_o (not (= chan_m chan_o)))
5377   (=> hop_2_m_n (not (= chan_m chan_n)))
5378   (=> hop_2_m_q (not (= chan_m chan_q)))
5379   (=> hop_2_m_p (not (= chan_m chan_p)))
5380   (=> hop_2_l_a (not (= chan_l chan_a)))
5381   (=> hop_2_l_c (not (= chan_l chan_c)))
5382   (=> hop_2_l_b (not (= chan_l chan_b)))
5383   (=> hop_2_l_e (not (= chan_l chan_e)))
5384   (=> hop_2_l_d (not (= chan_l chan_d)))
5385   (=> hop_2_l_g (not (= chan_l chan_g)))
5386   (=> hop_2_l_f (not (= chan_l chan_f)))
5387   (=> hop_2_l_i (not (= chan_l chan_i)))
5388   (=> hop_2_l_h (not (= chan_l chan_h)))
5389   (=> hop_2_l_k (not (= chan_l chan_k)))
5390   (=> hop_2_l_j (not (= chan_l chan_j)))
5391   (=> hop_2_l_m (not (= chan_l chan_m)))
5392   (=> hop_2_l_o (not (= chan_l chan_o)))
5393   (=> hop_2_l_n (not (= chan_l chan_n)))
5394   (=> hop_2_l_q (not (= chan_l chan_q)))
5395   (=> hop_2_l_p (not (= chan_l chan_p)))
5396   (=> hop_2_o_a (not (= chan_o chan_a)))
5397   (=> hop_2_o_c (not (= chan_o chan_c)))
5398   (=> hop_2_o_b (not (= chan_o chan_b)))
5399   (=> hop_2_o_e (not (= chan_o chan_e)))
5400   (=> hop_2_o_d (not (= chan_o chan_d)))
5401   (=> hop_2_o_g (not (= chan_o chan_g)))
5402   (=> hop_2_o_f (not (= chan_o chan_f)))
5403   (=> hop_2_o_i (not (= chan_o chan_i)))
5404   (=> hop_2_o_h (not (= chan_o chan_h)))
5405   (=> hop_2_o_k (not (= chan_o chan_k)))
5406   (=> hop_2_o_j (not (= chan_o chan_j)))
5407   (=> hop_2_o_m (not (= chan_o chan_m)))
5408   (=> hop_2_o_l (not (= chan_o chan_l)))
5409   (=> hop_2_o_n (not (= chan_o chan_n)))
5410   (=> hop_2_o_q (not (= chan_o chan_q)))
5411   (=> hop_2_o_p (not (= chan_o chan_p)))
5412   (=> hop_2_n_a (not (= chan_n chan_a)))
5413   (=> hop_2_n_c (not (= chan_n chan_c)))
5414   (=> hop_2_n_b (not (= chan_n chan_b)))
5415   (=> hop_2_n_e (not (= chan_n chan_e)))
5416   (=> hop_2_n_d (not (= chan_n chan_d)))
5417   (=> hop_2_n_g (not (= chan_n chan_g)))
5418   (=> hop_2_n_f (not (= chan_n chan_f)))
5419   (=> hop_2_n_i (not (= chan_n chan_i)))
5420   (=> hop_2_n_h (not (= chan_n chan_h)))
5421   (=> hop_2_n_k (not (= chan_n chan_k)))
5422   (=> hop_2_n_j (not (= chan_n chan_j)))
5423   (=> hop_2_n_m (not (= chan_n chan_m)))
5424   (=> hop_2_n_l (not (= chan_n chan_l)))
5425   (=> hop_2_n_o (not (= chan_n chan_o)))
5426   (=> hop_2_n_q (not (= chan_n chan_q)))
5427   (=> hop_2_n_p (not (= chan_n chan_p)))
5428   (=> hop_2_q_a (not (= chan_q chan_a)))
5429   (=> hop_2_q_c (not (= chan_q chan_c)))
5430   (=> hop_2_q_b (not (= chan_q chan_b)))
5431   (=> hop_2_q_e (not (= chan_q chan_e)))
5432   (=> hop_2_q_d (not (= chan_q chan_d)))
5433   (=> hop_2_q_g (not (= chan_q chan_g)))
5434   (=> hop_2_q_f (not (= chan_q chan_f)))
```

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```
5435  (=> hop_2_q_i (not (= chan_q chan_i)))
5436  (=> hop_2_q_h (not (= chan_q chan_h)))
5437  (=> hop_2_q_k (not (= chan_q chan_k)))
5438  (=> hop_2_q_j (not (= chan_q chan_j)))
5439  (=> hop_2_q_m (not (= chan_q chan_m)))
5440  (=> hop_2_q_l (not (= chan_q chan_l)))
5441  (=> hop_2_q_o (not (= chan_q chan_o)))
5442  (=> hop_2_q_n (not (= chan_q chan_n)))
5443  (=> hop_2_q_p (not (= chan_q chan_p)))
5444  (=> hop_2_p_a (not (= chan_p chan_a)))
5445  (=> hop_2_p_c (not (= chan_p chan_c)))
5446  (=> hop_2_p_b (not (= chan_p chan_b)))
5447  (=> hop_2_p_e (not (= chan_p chan_e)))
5448  (=> hop_2_p_d (not (= chan_p chan_d)))
5449  (=> hop_2_p_g (not (= chan_p chan_g)))
5450  (=> hop_2_p_f (not (= chan_p chan_f)))
5451  (=> hop_2_p_i (not (= chan_p chan_i)))
5452  (=> hop_2_p_h (not (= chan_p chan_h)))
5453  (=> hop_2_p_k (not (= chan_p chan_k)))
5454  (=> hop_2_p_j (not (= chan_p chan_j)))
5455  (=> hop_2_p_m (not (= chan_p chan_m)))
5456  (=> hop_2_p_l (not (= chan_p chan_l)))
5457  (=> hop_2_p_o (not (= chan_p chan_o)))
5458  (=> hop_2_p_n (not (= chan_p chan_n)))
5459  (=> hop_2_p_q (not (= chan_p chan_q)))
5460  (>= chan_a 0)
5461  (<= chan_a 5)
5462  (>= chan_c 0)
5463  (<= chan_c 5)
5464  (>= chan_b 0)
5465  (<= chan_b 5)
5466  (>= chan_e 0)
5467  (<= chan_e 5)
5468  (>= chan_d 0)
5469  (<= chan_d 5)
5470  (>= chan_g 0)
5471  (<= chan_g 5)
5472  (>= chan_f 0)
5473  (<= chan_f 5)
5474  (>= chan_i 0)
5475  (<= chan_i 5)
5476  (>= chan_h 0)
5477  (<= chan_h 5)
5478  (>= chan_k 0)
5479  (<= chan_k 5)
5480  (>= chan_j 0)
5481  (<= chan_j 5)
5482  (>= chan_m 0)
5483  (<= chan_m 5)
5484  (>= chan_l 0)
5485  (<= chan_l 5)
5486  (>= chan_o 0)
5487  (<= chan_o 5)
5488  (>= chan_n 0)
5489  (<= chan_n 5)
5490  (>= chan_q 0)
5491  (<= chan_q 5)
5492  (>= chan_p 0)
5493  (<= chan_p 5)
5494  ))
5495  (check-sat)
5496  (get-model)
```

Appendix 32

The generated output for Question 4(b) with $chan\_x \le 6$

```
1  sat
2  (model
3    (define-fun chan_j () Int
4      5)
5    (define-fun chan_h () Int
6      3)
7    (define-fun chan_a () Int
8      1)
9    (define-fun chan_k () Int
10     4)
11   (define-fun chan_g () Int
12     5)
13   (define-fun chan_e () Int
14     6)
15   (define-fun chan_q () Int
16     4)
17   (define-fun chan_d () Int
18     2)
19   (define-fun chan_o () Int
20     5)
21   (define-fun chan_p () Int
22     3)
23   (define-fun chan_c () Int
24     4)
25   (define-fun chan_i () Int
26     0)
27   (define-fun chan_l () Int
28     1)
29   (define-fun chan_n () Int
30     6)
31   (define-fun chan_f () Int
32     4)
33   (define-fun chan_m () Int
34     2)
35   (define-fun chan_b () Int
36     0)
37   (define-fun hop_2_p_h () Bool
38     false)
39   (define-fun hop_2_p_f () Bool
40     true)
```

```
41     (define-fun hop_2_p_g () Bool
42       true)
43     (define-fun hop_2_p_d () Bool
44       true)
45     (define-fun hop_2_p_e () Bool
46       true)
47     (define-fun hop_2_p_b () Bool
48       true)
49     (define-fun hop_2_p_c () Bool
50       true)
51     (define-fun hop_2_p_a () Bool
52       true)
53     (define-fun hop_2_q_k () Bool
54       false)
55     (define-fun hop_2_q_h () Bool
56       true)
57     (define-fun hop_2_q_i () Bool
58       true)
59     (define-fun hop_2_q_f () Bool
60       false)
61     (define-fun hop_2_q_g () Bool
62       true)
63     (define-fun hop_2_q_d () Bool
64       true)
65     (define-fun hop_2_q_e () Bool
66       true)
67     (define-fun hop_2_q_b () Bool
68       true)
69     (define-fun hop_2_q_c () Bool
70       false)
71     (define-fun hop_2_q_a () Bool
72       true)
73     (define-fun hop_2_n_h () Bool
74       true)
75     (define-fun hop_2_n_g () Bool
76       true)
77     (define-fun hop_2_n_d () Bool
78       true)
79     (define-fun hop_2_n_e () Bool
80       false)
81     (define-fun hop_2_n_b () Bool
82       true)
83     (define-fun hop_2_n_c () Bool
84       true)
85     (define-fun hop_2_n_a () Bool
86       true)
87     (define-fun hop_2_o_j () Bool
88       false)
89     (define-fun hop_2_o_h () Bool
90       true)
91     (define-fun hop_2_o_i () Bool
92       true)
93     (define-fun hop_2_o_f () Bool
94       true)
95     (define-fun hop_2_o_g () Bool
96       false)
97     (define-fun hop_2_o_d () Bool
98       true)
99     (define-fun hop_2_o_e () Bool
100      true)
101    (define-fun hop_2_o_b () Bool
102      true)
```

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```
103    (define-fun hop_2_o_c () Bool
104      true)
105    (define-fun hop_2_o_a () Bool
106      true)
107    (define-fun hop_2_l_d () Bool
108      true)
109    (define-fun hop_2_l_b () Bool
110      true)
111    (define-fun hop_2_l_c () Bool
112      true)
113    (define-fun hop_2_l_a () Bool
114      false)
115    (define-fun hop_2_m_f () Bool
116      true)
117    (define-fun hop_2_m_d () Bool
118      false)
119    (define-fun hop_2_m_e () Bool
120      true)
121    (define-fun hop_2_m_b () Bool
122      true)
123    (define-fun hop_2_m_c () Bool
124      true)
125    (define-fun hop_2_m_a () Bool
126      true)
127    (define-fun hop_2_j_o () Bool
128      false)
129    (define-fun hop_2_j_g () Bool
130      false)
131    (define-fun hop_2_j_b () Bool
132      true)
133    (define-fun hop_2_j_c () Bool
134      true)
135    (define-fun hop_2_j_a () Bool
136      true)
137    (define-fun hop_2_k_q () Bool
138      false)
139    (define-fun hop_2_k_f () Bool
140      false)
141    (define-fun hop_2_k_d () Bool
142      true)
143    (define-fun hop_2_k_b () Bool
144      true)
145    (define-fun hop_2_k_c () Bool
146      false)
147    (define-fun hop_2_k_a () Bool
148      true)
149    (define-fun hop_2_h_p () Bool
150      false)
151    (define-fun hop_2_h_q () Bool
152      true)
153    (define-fun hop_2_h_n () Bool
154      true)
155    (define-fun hop_2_h_o () Bool
156      true)
157    (define-fun hop_2_h_b () Bool
158      true)
159    (define-fun hop_2_h_c () Bool
160      true)
161    (define-fun hop_2_h_a () Bool
162      true)
163    (define-fun hop_2_i_q () Bool
164      true)
```

```
165    (define-fun hop_2_i_o () Bool
166      true)
167    (define-fun hop_2_i_b () Bool
168      false)
169    (define-fun hop_2_i_c () Bool
170      true)
171    (define-fun hop_2_i_a () Bool
172      true)
173    (define-fun hop_2_f_p () Bool
174      true)
175    (define-fun hop_2_f_q () Bool
176      false)
177    (define-fun hop_2_f_o () Bool
178      true)
179    (define-fun hop_2_f_m () Bool
180      true)
181    (define-fun hop_2_f_k () Bool
182      false)
183    (define-fun hop_2_f_g () Bool
184      true)
185    (define-fun hop_2_f_c () Bool
186      false)
187    (define-fun hop_2_g_p () Bool
188      true)
189    (define-fun hop_2_g_q () Bool
190      true)
191    (define-fun hop_2_g_n () Bool
192      true)
193    (define-fun hop_2_g_o () Bool
194      false)
195    (define-fun hop_2_g_j () Bool
196      false)
197    (define-fun hop_2_g_f () Bool
198      true)
199    (define-fun hop_2_g_b () Bool
200      true)
201    (define-fun hop_2_g_c () Bool
202      true)
203    (define-fun hop_2_g_a () Bool
204      true)
205    (define-fun hop_2_d_p () Bool
206      true)
207    (define-fun hop_2_d_q () Bool
208      true)
209    (define-fun hop_2_d_n () Bool
210      true)
211    (define-fun hop_2_d_o () Bool
212      true)
213    (define-fun hop_2_d_l () Bool
214      true)
215    (define-fun hop_2_d_m () Bool
216      false)
217    (define-fun hop_2_d_k () Bool
218      true)
219    (define-fun hop_2_e_p () Bool
220      true)
221    (define-fun hop_2_e_q () Bool
222      true)
223    (define-fun hop_2_e_n () Bool
224      false)
225    (define-fun hop_2_e_o () Bool
226      true)
```

```
227    (define-fun hop_2_e_m () Bool
228      true)
229    (define-fun hop_2_e_c () Bool
230      true)
231    (define-fun hop_2_b_p () Bool
232      true)
233    (define-fun hop_2_b_q () Bool
234      true)
235    (define-fun hop_2_b_n () Bool
236      true)
237    (define-fun hop_2_b_o () Bool
238      true)
239    (define-fun hop_2_b_l () Bool
240      true)
241    (define-fun hop_2_b_m () Bool
242      true)
243    (define-fun hop_2_b_j () Bool
244      true)
245    (define-fun hop_2_b_k () Bool
246      true)
247    (define-fun hop_2_b_h () Bool
248      true)
249    (define-fun hop_2_b_i () Bool
250      false)
251    (define-fun hop_2_b_g () Bool
252      true)
253    (define-fun hop_2_c_p () Bool
254      true)
255    (define-fun hop_2_c_q () Bool
256      false)
257    (define-fun hop_2_c_n () Bool
258      true)
259    (define-fun hop_2_c_o () Bool
260      true)
261    (define-fun hop_2_c_l () Bool
262      true)
263    (define-fun hop_2_c_m () Bool
264      true)
265    (define-fun hop_2_c_j () Bool
266      true)
267    (define-fun hop_2_c_k () Bool
268      false)
269    (define-fun hop_2_c_h () Bool
270      true)
271    (define-fun hop_2_c_i () Bool
272      true)
273    (define-fun hop_2_c_f () Bool
274      false)
275    (define-fun hop_2_c_g () Bool
276      true)
277    (define-fun hop_2_c_e () Bool
278      true)
279    (define-fun hop_2_a_p () Bool
280      true)
281    (define-fun hop_2_a_q () Bool
282      true)
283    (define-fun hop_2_a_n () Bool
284      true)
285    (define-fun hop_2_a_o () Bool
286      true)
287    (define-fun hop_2_a_l () Bool
288      false)
```

```
289    (define-fun hop_2_a_m () Bool
290      true)
291    (define-fun hop_2_a_j () Bool
292      true)
293    (define-fun hop_2_a_k () Bool
294      true)
295    (define-fun hop_2_a_h () Bool
296      true)
297    (define-fun hop_2_a_i () Bool
298      true)
299    (define-fun hop_2_a_g () Bool
300      true)
301    (define-fun hop_2_p_j () Bool
302      true)
303    (define-fun hop_2_p_i () Bool
304      true)
305    (define-fun hop_2_p_k () Bool
306      true)
307    (define-fun hop_2_q_o () Bool
308      true)
309    (define-fun hop_2_q_m () Bool
310      true)
311    (define-fun hop_2_q_l () Bool
312      true)
313    (define-fun hop_2_q_j () Bool
314      true)
315    (define-fun hop_2_n_o () Bool
316      true)
317    (define-fun hop_2_n_m () Bool
318      true)
319    (define-fun hop_2_n_k () Bool
320      true)
321    (define-fun hop_2_n_i () Bool
322      true)
323    (define-fun hop_2_n_f () Bool
324      true)
325    (define-fun hop_2_o_q () Bool
326      true)
327    (define-fun hop_2_o_n () Bool
328      true)
329    (define-fun hop_2_o_l () Bool
330      true)
331    (define-fun hop_2_o_k () Bool
332      true)
333    (define-fun hop_2_l_q () Bool
334      true)
335    (define-fun hop_2_l_o () Bool
336      true)
337    (define-fun hop_2_l_g () Bool
338      true)
339    (define-fun hop_2_l_h () Bool
340      true)
341    (define-fun hop_2_l_f () Bool
342      true)
343    (define-fun hop_2_l_e () Bool
344      true)
345    (define-fun hop_2_m_q () Bool
346      true)
347    (define-fun hop_2_m_n () Bool
348      true)
349    (define-fun hop_2_m_j () Bool
350      true)
```

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```
351    (define-fun hop_2_m_i () Bool
352      true)
353    (define-fun hop_2_m_h () Bool
354      true)
355    (define-fun hop_2_m_g () Bool
356      true)
357    (define-fun hop_2_j_q () Bool
358      true)
359    (define-fun hop_2_j_p () Bool
360      true)
361    (define-fun hop_2_j_m () Bool
362      true)
363    (define-fun hop_2_j_k () Bool
364      true)
365    (define-fun hop_2_j_h () Bool
366      true)
367    (define-fun hop_2_j_e () Bool
368      true)
369    (define-fun hop_2_j_d () Bool
370      true)
371    (define-fun hop_2_k_n () Bool
372      true)
373    (define-fun hop_2_k_j () Bool
374      true)
375    (define-fun hop_2_k_p () Bool
376      true)
377    (define-fun hop_2_k_o () Bool
378      true)
379    (define-fun hop_2_k_i () Bool
380      true)
381    (define-fun hop_2_k_e () Bool
382      true)
383    (define-fun hop_2_h_m () Bool
384      true)
385    (define-fun hop_2_h_l () Bool
386      true)
387    (define-fun hop_2_h_j () Bool
388      true)
389    (define-fun hop_2_h_f () Bool
390      true)
391    (define-fun hop_2_h_d () Bool
392      true)
393    (define-fun hop_2_i_p () Bool
394      true)
395    (define-fun hop_2_i_m () Bool
396      true)
397    (define-fun hop_2_i_n () Bool
398      true)
399    (define-fun hop_2_i_k () Bool
400      true)
401    (define-fun hop_2_i_g () Bool
402      true)
403    (define-fun hop_2_i_d () Bool
404      true)
405    (define-fun hop_2_f_n () Bool
406      true)
407    (define-fun hop_2_f_l () Bool
408      true)
409    (define-fun hop_2_f_h () Bool
410      true)
411    (define-fun hop_2_f_e () Bool
412      true)
```

```
413    (define-fun hop_2_f_b () Bool
414      true)
415    (define-fun hop_2_f_a () Bool
416      true)
417    (define-fun hop_2_g_l () Bool
418      true)
419    (define-fun hop_2_g_m () Bool
420      true)
421    (define-fun hop_2_g_i () Bool
422      true)
423    (define-fun hop_2_g_d () Bool
424      true)
425    (define-fun hop_2_d_j () Bool
426      true)
427    (define-fun hop_2_d_h () Bool
428      true)
429    (define-fun hop_2_d_i () Bool
430      true)
431    (define-fun hop_2_d_g () Bool
432      true)
433    (define-fun hop_2_d_c () Bool
434      true)
435    (define-fun hop_2_e_l () Bool
436      true)
437    (define-fun hop_2_e_j () Bool
438      true)
439    (define-fun hop_2_e_k () Bool
440      true)
441    (define-fun hop_2_e_f () Bool
442      true)
443    (define-fun hop_2_e_b () Bool
444      true)
445    (define-fun hop_2_e_a () Bool
446      true)
447    (define-fun hop_2_b_f () Bool
448      true)
449    (define-fun hop_2_b_e () Bool
450      true)
451    (define-fun hop_2_c_d () Bool
452      true)
453    (define-fun hop_2_c_a () Bool
454      true)
455    (define-fun hop_2_a_f () Bool
456      true)
457    (define-fun hop_2_a_e () Bool
458      true)
459    (define-fun hop_2_a_c () Bool
460      true)
461    (define-fun hop_2_p_q () Bool
462      true)
463    (define-fun hop_2_p_n () Bool
464      true)
465    (define-fun hop_2_p_o () Bool
466      true)
467    (define-fun hop_2_p_l () Bool
468      true)
469    (define-fun hop_2_p_m () Bool
470      true)
471    (define-fun hop_2_q_p () Bool
472      true)
473    (define-fun hop_2_q_n () Bool
474      true)
```

```
475    (define-fun hop_2_n_p () Bool
476      true)
477    (define-fun hop_2_n_q () Bool
478      true)
479    (define-fun hop_2_n_l () Bool
480      true)
481    (define-fun hop_2_n_j () Bool
482      true)
483    (define-fun hop_2_o_p () Bool
484      true)
485    (define-fun hop_2_o_m () Bool
486      true)
487    (define-fun hop_2_l_p () Bool
488      true)
489    (define-fun hop_2_l_n () Bool
490      true)
491    (define-fun hop_2_l_m () Bool
492      true)
493    (define-fun hop_2_l_j () Bool
494      true)
495    (define-fun hop_2_l_k () Bool
496      true)
497    (define-fun hop_2_l_i () Bool
498      true)
499    (define-fun hop_2_m_p () Bool
500      true)
501    (define-fun hop_2_m_o () Bool
502      true)
503    (define-fun hop_2_m_l () Bool
504      true)
505    (define-fun hop_2_m_k () Bool
506      true)
507    (define-fun hop_2_j_n () Bool
508      true)
509    (define-fun hop_2_j_l () Bool
510      true)
511    (define-fun hop_2_j_i () Bool
512      true)
513    (define-fun hop_2_j_f () Bool
514      true)
515    (define-fun hop_2_k_l () Bool
516      true)
517    (define-fun hop_2_k_m () Bool
518      true)
519    (define-fun hop_2_k_h () Bool
520      true)
521    (define-fun hop_2_k_g () Bool
522      true)
523    (define-fun hop_2_h_k () Bool
524      true)
525    (define-fun hop_2_h_i () Bool
526      true)
527    (define-fun hop_2_h_g () Bool
528      true)
529    (define-fun hop_2_h_e () Bool
530      true)
531    (define-fun hop_2_i_l () Bool
532      true)
533    (define-fun hop_2_i_j () Bool
534      true)
535    (define-fun hop_2_i_h () Bool
536      true)
```

```
537    (define-fun hop_2_i_f () Bool
538      true)
539    (define-fun hop_2_i_e () Bool
540      true)
541    (define-fun hop_2_f_j () Bool
542      true)
543    (define-fun hop_2_f_i () Bool
544      true)
545    (define-fun hop_2_f_d () Bool
546      true)
547    (define-fun hop_2_g_k () Bool
548      true)
549    (define-fun hop_2_g_h () Bool
550      true)
551    (define-fun hop_2_g_e () Bool
552      true)
553    (define-fun hop_2_d_f () Bool
554      true)
555    (define-fun hop_2_d_e () Bool
556      true)
557    (define-fun hop_2_d_b () Bool
558      true)
559    (define-fun hop_2_d_a () Bool
560      true)
561    (define-fun hop_2_e_h () Bool
562      true)
563    (define-fun hop_2_e_i () Bool
564      true)
565    (define-fun hop_2_e_g () Bool
566      true)
567    (define-fun hop_2_e_d () Bool
568      true)
569    (define-fun hop_2_b_d () Bool
570      true)
571    (define-fun hop_2_b_c () Bool
572      true)
573    (define-fun hop_2_b_a () Bool
574      true)
575    (define-fun hop_2_c_b () Bool
576      true)
577    (define-fun hop_2_a_d () Bool
578      true)
579    (define-fun hop_2_a_b () Bool
580      true)
581    (define-fun hop_1_p_q () Bool
582      true)
583    (define-fun hop_1_p_n () Bool
584      true)
585    (define-fun hop_1_p_o () Bool
586      true)
587    (define-fun hop_1_p_l () Bool
588      true)
589    (define-fun hop_1_p_m () Bool
590      true)
591    (define-fun hop_1_p_j () Bool
592      false)
593    (define-fun hop_1_p_k () Bool
594      false)
595    (define-fun hop_1_p_h () Bool
596      false)
597    (define-fun hop_1_p_i () Bool
598      false)
```

```
599    (define-fun hop_1_p_f () Bool
600      false)
601    (define-fun hop_1_p_g () Bool
602      false)
603    (define-fun hop_1_p_d () Bool
604      false)
605    (define-fun hop_1_p_e () Bool
606      false)
607    (define-fun hop_1_p_b () Bool
608      false)
609    (define-fun hop_1_p_c () Bool
610      false)
611    (define-fun hop_1_p_a () Bool
612      false)
613    (define-fun hop_1_q_p () Bool
614      true)
615    (define-fun hop_1_q_n () Bool
616      true)
617    (define-fun hop_1_q_o () Bool
618      false)
619    (define-fun hop_1_q_l () Bool
620      false)
621    (define-fun hop_1_q_m () Bool
622      false)
623    (define-fun hop_1_q_j () Bool
624      false)
625    (define-fun hop_1_q_k () Bool
626      false)
627    (define-fun hop_1_q_h () Bool
628      false)
629    (define-fun hop_1_q_i () Bool
630      false)
631    (define-fun hop_1_q_f () Bool
632      false)
633    (define-fun hop_1_q_g () Bool
634      false)
635    (define-fun hop_1_q_d () Bool
636      false)
637    (define-fun hop_1_q_e () Bool
638      false)
639    (define-fun hop_1_q_b () Bool
640      false)
641    (define-fun hop_1_q_c () Bool
642      false)
643    (define-fun hop_1_q_a () Bool
644      false)
645    (define-fun hop_1_n_p () Bool
646      true)
647    (define-fun hop_1_n_q () Bool
648      true)
649    (define-fun hop_1_n_o () Bool
650      false)
651    (define-fun hop_1_n_l () Bool
652      true)
653    (define-fun hop_1_n_m () Bool
654      false)
655    (define-fun hop_1_n_j () Bool
656      true)
657    (define-fun hop_1_n_k () Bool
658      false)
659    (define-fun hop_1_n_h () Bool
660      false)
```

```
661    (define-fun hop_1_n_i () Bool
662      false)
663    (define-fun hop_1_n_f () Bool
664      false)
665    (define-fun hop_1_n_g () Bool
666      false)
667    (define-fun hop_1_n_d () Bool
668      false)
669    (define-fun hop_1_n_e () Bool
670      false)
671    (define-fun hop_1_n_b () Bool
672      false)
673    (define-fun hop_1_n_c () Bool
674      false)
675    (define-fun hop_1_n_a () Bool
676      false)
677    (define-fun hop_1_o_p () Bool
678      true)
679    (define-fun hop_1_o_q () Bool
680      false)
681    (define-fun hop_1_o_n () Bool
682      false)
683    (define-fun hop_1_o_l () Bool
684      false)
685    (define-fun hop_1_o_m () Bool
686      true)
687    (define-fun hop_1_o_j () Bool
688      false)
689    (define-fun hop_1_o_k () Bool
690      false)
691    (define-fun hop_1_o_h () Bool
692      false)
693    (define-fun hop_1_o_i () Bool
694      false)
695    (define-fun hop_1_o_f () Bool
696      false)
697    (define-fun hop_1_o_g () Bool
698      false)
699    (define-fun hop_1_o_d () Bool
700      false)
701    (define-fun hop_1_o_e () Bool
702      false)
703    (define-fun hop_1_o_b () Bool
704      false)
705    (define-fun hop_1_o_c () Bool
706      false)
707    (define-fun hop_1_o_a () Bool
708      false)
709    (define-fun hop_1_l_p () Bool
710      true)
711    (define-fun hop_1_l_q () Bool
712      false)
713    (define-fun hop_1_l_n () Bool
714      true)
715    (define-fun hop_1_l_o () Bool
716      false)
717    (define-fun hop_1_l_m () Bool
718      true)
719    (define-fun hop_1_l_j () Bool
720      true)
721    (define-fun hop_1_l_k () Bool
722      true)
```

```
723    (define-fun hop_1_l_h () Bool
724      false)
725    (define-fun hop_1_l_i () Bool
726      true)
727    (define-fun hop_1_l_f () Bool
728      false)
729    (define-fun hop_1_l_g () Bool
730      false)
731    (define-fun hop_1_l_d () Bool
732      false)
733    (define-fun hop_1_l_e () Bool
734      false)
735    (define-fun hop_1_l_b () Bool
736      false)
737    (define-fun hop_1_l_c () Bool
738      false)
739    (define-fun hop_1_l_a () Bool
740      false)
741    (define-fun hop_1_m_p () Bool
742      true)
743    (define-fun hop_1_m_q () Bool
744      false)
745    (define-fun hop_1_m_n () Bool
746      false)
747    (define-fun hop_1_m_o () Bool
748      true)
749    (define-fun hop_1_m_l () Bool
750      true)
751    (define-fun hop_1_m_j () Bool
752      false)
753    (define-fun hop_1_m_k () Bool
754      true)
755    (define-fun hop_1_m_h () Bool
756      false)
757    (define-fun hop_1_m_i () Bool
758      false)
759    (define-fun hop_1_m_f () Bool
760      false)
761    (define-fun hop_1_m_g () Bool
762      false)
763    (define-fun hop_1_m_d () Bool
764      false)
765    (define-fun hop_1_m_e () Bool
766      false)
767    (define-fun hop_1_m_b () Bool
768      false)
769    (define-fun hop_1_m_c () Bool
770      false)
771    (define-fun hop_1_m_a () Bool
772      false)
773    (define-fun hop_1_j_p () Bool
774      false)
775    (define-fun hop_1_j_q () Bool
776      false)
777    (define-fun hop_1_j_n () Bool
778      true)
779    (define-fun hop_1_j_o () Bool
780      false)
781    (define-fun hop_1_j_l () Bool
782      true)
783    (define-fun hop_1_j_m () Bool
784      false)
```

```
785    (define-fun hop_1_j_k () Bool
786      false)
787    (define-fun hop_1_j_h () Bool
788      false)
789    (define-fun hop_1_j_i () Bool
790      true)
791    (define-fun hop_1_j_f () Bool
792      true)
793    (define-fun hop_1_j_g () Bool
794      false)
795    (define-fun hop_1_j_d () Bool
796      false)
797    (define-fun hop_1_j_e () Bool
798      false)
799    (define-fun hop_1_j_b () Bool
800      false)
801    (define-fun hop_1_j_c () Bool
802      false)
803    (define-fun hop_1_j_a () Bool
804      false)
805    (define-fun hop_1_k_p () Bool
806      false)
807    (define-fun hop_1_k_q () Bool
808      false)
809    (define-fun hop_1_k_n () Bool
810      false)
811    (define-fun hop_1_k_o () Bool
812      false)
813    (define-fun hop_1_k_l () Bool
814      true)
815    (define-fun hop_1_k_m () Bool
816      true)
817    (define-fun hop_1_k_j () Bool
818      false)
819    (define-fun hop_1_k_h () Bool
820      true)
821    (define-fun hop_1_k_i () Bool
822      false)
823    (define-fun hop_1_k_f () Bool
824      false)
825    (define-fun hop_1_k_g () Bool
826      true)
827    (define-fun hop_1_k_d () Bool
828      false)
829    (define-fun hop_1_k_e () Bool
830      false)
831    (define-fun hop_1_k_b () Bool
832      false)
833    (define-fun hop_1_k_c () Bool
834      false)
835    (define-fun hop_1_k_a () Bool
836      false)
837    (define-fun hop_1_h_p () Bool
838      false)
839    (define-fun hop_1_h_q () Bool
840      false)
841    (define-fun hop_1_h_n () Bool
842      false)
843    (define-fun hop_1_h_o () Bool
844      false)
845    (define-fun hop_1_h_l () Bool
846      false)
```

```
847    (define-fun hop_1_h_m () Bool
848      false)
849    (define-fun hop_1_h_j () Bool
850      false)
851    (define-fun hop_1_h_k () Bool
852      true)
853    (define-fun hop_1_h_i () Bool
854      true)
855    (define-fun hop_1_h_f () Bool
856      false)
857    (define-fun hop_1_h_g () Bool
858      true)
859    (define-fun hop_1_h_d () Bool
860      false)
861    (define-fun hop_1_h_e () Bool
862      true)
863    (define-fun hop_1_h_b () Bool
864      false)
865    (define-fun hop_1_h_c () Bool
866      false)
867    (define-fun hop_1_h_a () Bool
868      false)
869    (define-fun hop_1_i_p () Bool
870      false)
871    (define-fun hop_1_i_q () Bool
872      false)
873    (define-fun hop_1_i_n () Bool
874      false)
875    (define-fun hop_1_i_o () Bool
876      false)
877    (define-fun hop_1_i_l () Bool
878      true)
879    (define-fun hop_1_i_m () Bool
880      false)
881    (define-fun hop_1_i_j () Bool
882      true)
883    (define-fun hop_1_i_k () Bool
884      false)
885    (define-fun hop_1_i_h () Bool
886      true)
887    (define-fun hop_1_i_f () Bool
888      true)
889    (define-fun hop_1_i_g () Bool
890      false)
891    (define-fun hop_1_i_d () Bool
892      false)
893    (define-fun hop_1_i_e () Bool
894      true)
895    (define-fun hop_1_i_b () Bool
896      false)
897    (define-fun hop_1_i_c () Bool
898      false)
899    (define-fun hop_1_i_a () Bool
900      false)
901    (define-fun hop_1_f_p () Bool
902      false)
903    (define-fun hop_1_f_q () Bool
904      false)
905    (define-fun hop_1_f_n () Bool
906      false)
907    (define-fun hop_1_f_o () Bool
908      false)
```

```
909    (define-fun hop_1_f_l () Bool
910      false)
911    (define-fun hop_1_f_m () Bool
912      false)
913    (define-fun hop_1_f_j () Bool
914      true)
915    (define-fun hop_1_f_k () Bool
916      false)
917    (define-fun hop_1_f_h () Bool
918      false)
919    (define-fun hop_1_f_i () Bool
920      true)
921    (define-fun hop_1_f_g () Bool
922      false)
923    (define-fun hop_1_f_d () Bool
924      true)
925    (define-fun hop_1_f_e () Bool
926      false)
927    (define-fun hop_1_f_b () Bool
928      false)
929    (define-fun hop_1_f_c () Bool
930      false)
931    (define-fun hop_1_f_a () Bool
932      false)
933    (define-fun hop_1_g_p () Bool
934      false)
935    (define-fun hop_1_g_q () Bool
936      false)
937    (define-fun hop_1_g_n () Bool
938      false)
939    (define-fun hop_1_g_o () Bool
940      false)
941    (define-fun hop_1_g_l () Bool
942      false)
943    (define-fun hop_1_g_m () Bool
944      false)
945    (define-fun hop_1_g_j () Bool
946      false)
947    (define-fun hop_1_g_k () Bool
948      true)
949    (define-fun hop_1_g_h () Bool
950      true)
951    (define-fun hop_1_g_i () Bool
952      false)
953    (define-fun hop_1_g_f () Bool
954      false)
955    (define-fun hop_1_g_d () Bool
956      false)
957    (define-fun hop_1_g_e () Bool
958      true)
959    (define-fun hop_1_g_b () Bool
960      false)
961    (define-fun hop_1_g_c () Bool
962      false)
963    (define-fun hop_1_g_a () Bool
964      false)
965    (define-fun hop_1_d_p () Bool
966      false)
967    (define-fun hop_1_d_q () Bool
968      false)
969    (define-fun hop_1_d_n () Bool
970      false)
```

```
971    (define-fun hop_1_d_o () Bool
972      false)
973    (define-fun hop_1_d_l () Bool
974      false)
975    (define-fun hop_1_d_m () Bool
976      false)
977    (define-fun hop_1_d_j () Bool
978      false)
979    (define-fun hop_1_d_k () Bool
980      false)
981    (define-fun hop_1_d_h () Bool
982      false)
983    (define-fun hop_1_d_i () Bool
984      false)
985    (define-fun hop_1_d_f () Bool
986      true)
987    (define-fun hop_1_d_g () Bool
988      false)
989    (define-fun hop_1_d_e () Bool
990      true)
991    (define-fun hop_1_d_b () Bool
992      true)
993    (define-fun hop_1_d_c () Bool
994      false)
995    (define-fun hop_1_d_a () Bool
996      true)
997    (define-fun hop_1_e_p () Bool
998      false)
999    (define-fun hop_1_e_q () Bool
1000     false)
1001   (define-fun hop_1_e_n () Bool
1002     false)
1003   (define-fun hop_1_e_o () Bool
1004     false)
1005   (define-fun hop_1_e_l () Bool
1006     false)
1007   (define-fun hop_1_e_m () Bool
1008     false)
1009   (define-fun hop_1_e_j () Bool
1010     false)
1011   (define-fun hop_1_e_k () Bool
1012     false)
1013   (define-fun hop_1_e_h () Bool
1014     true)
1015   (define-fun hop_1_e_i () Bool
1016     true)
1017   (define-fun hop_1_e_f () Bool
1018     false)
1019   (define-fun hop_1_e_g () Bool
1020     true)
1021   (define-fun hop_1_e_d () Bool
1022     true)
1023   (define-fun hop_1_e_b () Bool
1024     false)
1025   (define-fun hop_1_e_c () Bool
1026     false)
1027   (define-fun hop_1_e_a () Bool
1028     false)
1029   (define-fun hop_1_b_p () Bool
1030     false)
1031   (define-fun hop_1_b_q () Bool
1032     false)
```

```
1033    (define-fun hop_1_b_n () Bool
1034      false)
1035    (define-fun hop_1_b_o () Bool
1036      false)
1037    (define-fun hop_1_b_l () Bool
1038      false)
1039    (define-fun hop_1_b_m () Bool
1040      false)
1041    (define-fun hop_1_b_j () Bool
1042      false)
1043    (define-fun hop_1_b_k () Bool
1044      false)
1045    (define-fun hop_1_b_h () Bool
1046      false)
1047    (define-fun hop_1_b_i () Bool
1048      false)
1049    (define-fun hop_1_b_f () Bool
1050      false)
1051    (define-fun hop_1_b_g () Bool
1052      false)
1053    (define-fun hop_1_b_d () Bool
1054      true)
1055    (define-fun hop_1_b_e () Bool
1056      false)
1057    (define-fun hop_1_b_c () Bool
1058      true)
1059    (define-fun hop_1_b_a () Bool
1060      true)
1061    (define-fun hop_1_c_p () Bool
1062      false)
1063    (define-fun hop_1_c_q () Bool
1064      false)
1065    (define-fun hop_1_c_n () Bool
1066      false)
1067    (define-fun hop_1_c_o () Bool
1068      false)
1069    (define-fun hop_1_c_l () Bool
1070      false)
1071    (define-fun hop_1_c_m () Bool
1072      false)
1073    (define-fun hop_1_c_j () Bool
1074      false)
1075    (define-fun hop_1_c_k () Bool
1076      false)
1077    (define-fun hop_1_c_h () Bool
1078      false)
1079    (define-fun hop_1_c_i () Bool
1080      false)
1081    (define-fun hop_1_c_f () Bool
1082      false)
1083    (define-fun hop_1_c_g () Bool
1084      false)
1085    (define-fun hop_1_c_d () Bool
1086      false)
1087    (define-fun hop_1_c_e () Bool
1088      false)
1089    (define-fun hop_1_c_b () Bool
1090      true)
1091    (define-fun hop_1_c_a () Bool
1092      false)
1093    (define-fun hop_1_a_p () Bool
1094      false)
```

```
1095    (define-fun hop_1_a_q () Bool
1096      false)
1097    (define-fun hop_1_a_n () Bool
1098      false)
1099    (define-fun hop_1_a_o () Bool
1100      false)
1101    (define-fun hop_1_a_l () Bool
1102      false)
1103    (define-fun hop_1_a_m () Bool
1104      false)
1105    (define-fun hop_1_a_j () Bool
1106      false)
1107    (define-fun hop_1_a_k () Bool
1108      false)
1109    (define-fun hop_1_a_h () Bool
1110      false)
1111    (define-fun hop_1_a_i () Bool
1112      false)
1113    (define-fun hop_1_a_f () Bool
1114      false)
1115    (define-fun hop_1_a_g () Bool
1116      false)
1117    (define-fun hop_1_a_d () Bool
1118      true)
1119    (define-fun hop_1_a_e () Bool
1120      false)
1121    (define-fun hop_1_a_b () Bool
1122      true)
1123    (define-fun hop_1_a_c () Bool
1124      false)
1125  )
```

Appendix 33

The generated output for Question 4(b) with $chan\_x \leq 5$

```
1  unsat
2  (error "line 5496 column 10: model is not available")
```

Appendix 34

The generated requirements for Question 4(c)

```
1   (declare-const chan_a Int)
2   (declare-const chan_c Int)
3   (declare-const chan_b Int)
4   (declare-const chan_e Int)
5   (declare-const chan_d Int)
6   (declare-const chan_g Int)
7   (declare-const chan_f Int)
8   (declare-const chan_i Int)
9   (declare-const chan_h Int)
10  (declare-const chan_k Int)
11  (declare-const chan_j Int)
12  (declare-const chan_m Int)
13  (declare-const chan_l Int)
14  (declare-const chan_o Int)
15  (declare-const chan_n Int)
16  (declare-const chan_q Int)
17  (declare-const chan_p Int)
18  (declare-const hop_1_a_c Bool)
19  (declare-const hop_2_a_c Bool)
20  (declare-const hop_3_a_c Bool)
21  (declare-const hop_1_a_b Bool)
22  (declare-const hop_2_a_b Bool)
23  (declare-const hop_3_a_b Bool)
24  (declare-const hop_1_a_e Bool)
25  (declare-const hop_2_a_e Bool)
26  (declare-const hop_3_a_e Bool)
27  (declare-const hop_1_a_d Bool)
28  (declare-const hop_2_a_d Bool)
29  (declare-const hop_3_a_d Bool)
30  (declare-const hop_1_a_g Bool)
31  (declare-const hop_2_a_g Bool)
32  (declare-const hop_3_a_g Bool)
33  (declare-const hop_1_a_f Bool)
34  (declare-const hop_2_a_f Bool)
35  (declare-const hop_3_a_f Bool)
36  (declare-const hop_1_a_i Bool)
37  (declare-const hop_2_a_i Bool)
38  (declare-const hop_3_a_i Bool)
39  (declare-const hop_1_a_h Bool)
40  (declare-const hop_2_a_h Bool)
```

```
41    (declare-const hop_3_a_h Bool)
42    (declare-const hop_1_a_k Bool)
43    (declare-const hop_2_a_k Bool)
44    (declare-const hop_3_a_k Bool)
45    (declare-const hop_1_a_j Bool)
46    (declare-const hop_2_a_j Bool)
47    (declare-const hop_3_a_j Bool)
48    (declare-const hop_1_a_m Bool)
49    (declare-const hop_2_a_m Bool)
50    (declare-const hop_3_a_m Bool)
51    (declare-const hop_1_a_l Bool)
52    (declare-const hop_2_a_l Bool)
53    (declare-const hop_3_a_l Bool)
54    (declare-const hop_1_a_o Bool)
55    (declare-const hop_2_a_o Bool)
56    (declare-const hop_3_a_o Bool)
57    (declare-const hop_1_a_n Bool)
58    (declare-const hop_2_a_n Bool)
59    (declare-const hop_3_a_n Bool)
60    (declare-const hop_1_a_q Bool)
61    (declare-const hop_2_a_q Bool)
62    (declare-const hop_3_a_q Bool)
63    (declare-const hop_1_a_p Bool)
64    (declare-const hop_2_a_p Bool)
65    (declare-const hop_3_a_p Bool)
66    (declare-const hop_1_c_a Bool)
67    (declare-const hop_2_c_a Bool)
68    (declare-const hop_3_c_a Bool)
69    (declare-const hop_1_c_b Bool)
70    (declare-const hop_2_c_b Bool)
71    (declare-const hop_3_c_b Bool)
72    (declare-const hop_1_c_e Bool)
73    (declare-const hop_2_c_e Bool)
74    (declare-const hop_3_c_e Bool)
75    (declare-const hop_1_c_d Bool)
76    (declare-const hop_2_c_d Bool)
77    (declare-const hop_3_c_d Bool)
78    (declare-const hop_1_c_g Bool)
79    (declare-const hop_2_c_g Bool)
80    (declare-const hop_3_c_g Bool)
81    (declare-const hop_1_c_f Bool)
82    (declare-const hop_2_c_f Bool)
83    (declare-const hop_3_c_f Bool)
84    (declare-const hop_1_c_i Bool)
85    (declare-const hop_2_c_i Bool)
86    (declare-const hop_3_c_i Bool)
87    (declare-const hop_1_c_h Bool)
88    (declare-const hop_2_c_h Bool)
89    (declare-const hop_3_c_h Bool)
90    (declare-const hop_1_c_k Bool)
91    (declare-const hop_2_c_k Bool)
92    (declare-const hop_3_c_k Bool)
93    (declare-const hop_1_c_j Bool)
94    (declare-const hop_2_c_j Bool)
95    (declare-const hop_3_c_j Bool)
96    (declare-const hop_1_c_m Bool)
97    (declare-const hop_2_c_m Bool)
98    (declare-const hop_3_c_m Bool)
99    (declare-const hop_1_c_l Bool)
100   (declare-const hop_2_c_l Bool)
101   (declare-const hop_3_c_l Bool)
102   (declare-const hop_1_c_o Bool)
```

```
103  (declare-const hop_2_c_o Bool)
104  (declare-const hop_3_c_o Bool)
105  (declare-const hop_1_c_n Bool)
106  (declare-const hop_2_c_n Bool)
107  (declare-const hop_3_c_n Bool)
108  (declare-const hop_1_c_q Bool)
109  (declare-const hop_2_c_q Bool)
110  (declare-const hop_3_c_q Bool)
111  (declare-const hop_1_c_p Bool)
112  (declare-const hop_2_c_p Bool)
113  (declare-const hop_3_c_p Bool)
114  (declare-const hop_1_b_a Bool)
115  (declare-const hop_2_b_a Bool)
116  (declare-const hop_3_b_a Bool)
117  (declare-const hop_1_b_c Bool)
118  (declare-const hop_2_b_c Bool)
119  (declare-const hop_3_b_c Bool)
120  (declare-const hop_1_b_e Bool)
121  (declare-const hop_2_b_e Bool)
122  (declare-const hop_3_b_e Bool)
123  (declare-const hop_1_b_d Bool)
124  (declare-const hop_2_b_d Bool)
125  (declare-const hop_3_b_d Bool)
126  (declare-const hop_1_b_g Bool)
127  (declare-const hop_2_b_g Bool)
128  (declare-const hop_3_b_g Bool)
129  (declare-const hop_1_b_f Bool)
130  (declare-const hop_2_b_f Bool)
131  (declare-const hop_3_b_f Bool)
132  (declare-const hop_1_b_i Bool)
133  (declare-const hop_2_b_i Bool)
134  (declare-const hop_3_b_i Bool)
135  (declare-const hop_1_b_h Bool)
136  (declare-const hop_2_b_h Bool)
137  (declare-const hop_3_b_h Bool)
138  (declare-const hop_1_b_k Bool)
139  (declare-const hop_2_b_k Bool)
140  (declare-const hop_3_b_k Bool)
141  (declare-const hop_1_b_j Bool)
142  (declare-const hop_2_b_j Bool)
143  (declare-const hop_3_b_j Bool)
144  (declare-const hop_1_b_m Bool)
145  (declare-const hop_2_b_m Bool)
146  (declare-const hop_3_b_m Bool)
147  (declare-const hop_1_b_l Bool)
148  (declare-const hop_2_b_l Bool)
149  (declare-const hop_3_b_l Bool)
150  (declare-const hop_1_b_o Bool)
151  (declare-const hop_2_b_o Bool)
152  (declare-const hop_3_b_o Bool)
153  (declare-const hop_1_b_n Bool)
154  (declare-const hop_2_b_n Bool)
155  (declare-const hop_3_b_n Bool)
156  (declare-const hop_1_b_q Bool)
157  (declare-const hop_2_b_q Bool)
158  (declare-const hop_3_b_q Bool)
159  (declare-const hop_1_b_p Bool)
160  (declare-const hop_2_b_p Bool)
161  (declare-const hop_3_b_p Bool)
162  (declare-const hop_1_e_a Bool)
163  (declare-const hop_2_e_a Bool)
164  (declare-const hop_3_e_a Bool)
```

```
165    (declare-const hop_1_e_c Bool)
166    (declare-const hop_2_e_c Bool)
167    (declare-const hop_3_e_c Bool)
168    (declare-const hop_1_e_b Bool)
169    (declare-const hop_2_e_b Bool)
170    (declare-const hop_3_e_b Bool)
171    (declare-const hop_1_e_d Bool)
172    (declare-const hop_2_e_d Bool)
173    (declare-const hop_3_e_d Bool)
174    (declare-const hop_1_e_g Bool)
175    (declare-const hop_2_e_g Bool)
176    (declare-const hop_3_e_g Bool)
177    (declare-const hop_1_e_f Bool)
178    (declare-const hop_2_e_f Bool)
179    (declare-const hop_3_e_f Bool)
180    (declare-const hop_1_e_i Bool)
181    (declare-const hop_2_e_i Bool)
182    (declare-const hop_3_e_i Bool)
183    (declare-const hop_1_e_h Bool)
184    (declare-const hop_2_e_h Bool)
185    (declare-const hop_3_e_h Bool)
186    (declare-const hop_1_e_k Bool)
187    (declare-const hop_2_e_k Bool)
188    (declare-const hop_3_e_k Bool)
189    (declare-const hop_1_e_j Bool)
190    (declare-const hop_2_e_j Bool)
191    (declare-const hop_3_e_j Bool)
192    (declare-const hop_1_e_m Bool)
193    (declare-const hop_2_e_m Bool)
194    (declare-const hop_3_e_m Bool)
195    (declare-const hop_1_e_l Bool)
196    (declare-const hop_2_e_l Bool)
197    (declare-const hop_3_e_l Bool)
198    (declare-const hop_1_e_o Bool)
199    (declare-const hop_2_e_o Bool)
200    (declare-const hop_3_e_o Bool)
201    (declare-const hop_1_e_n Bool)
202    (declare-const hop_2_e_n Bool)
203    (declare-const hop_3_e_n Bool)
204    (declare-const hop_1_e_q Bool)
205    (declare-const hop_2_e_q Bool)
206    (declare-const hop_3_e_q Bool)
207    (declare-const hop_1_e_p Bool)
208    (declare-const hop_2_e_p Bool)
209    (declare-const hop_3_e_p Bool)
210    (declare-const hop_1_d_a Bool)
211    (declare-const hop_2_d_a Bool)
212    (declare-const hop_3_d_a Bool)
213    (declare-const hop_1_d_c Bool)
214    (declare-const hop_2_d_c Bool)
215    (declare-const hop_3_d_c Bool)
216    (declare-const hop_1_d_b Bool)
217    (declare-const hop_2_d_b Bool)
218    (declare-const hop_3_d_b Bool)
219    (declare-const hop_1_d_e Bool)
220    (declare-const hop_2_d_e Bool)
221    (declare-const hop_3_d_e Bool)
222    (declare-const hop_1_d_g Bool)
223    (declare-const hop_2_d_g Bool)
224    (declare-const hop_3_d_g Bool)
225    (declare-const hop_1_d_f Bool)
226    (declare-const hop_2_d_f Bool)
```

```
227   (declare-const hop_3_d_f Bool)
228   (declare-const hop_1_d_i Bool)
229   (declare-const hop_2_d_i Bool)
230   (declare-const hop_3_d_i Bool)
231   (declare-const hop_1_d_h Bool)
232   (declare-const hop_2_d_h Bool)
233   (declare-const hop_3_d_h Bool)
234   (declare-const hop_1_d_k Bool)
235   (declare-const hop_2_d_k Bool)
236   (declare-const hop_3_d_k Bool)
237   (declare-const hop_1_d_j Bool)
238   (declare-const hop_2_d_j Bool)
239   (declare-const hop_3_d_j Bool)
240   (declare-const hop_1_d_m Bool)
241   (declare-const hop_2_d_m Bool)
242   (declare-const hop_3_d_m Bool)
243   (declare-const hop_1_d_l Bool)
244   (declare-const hop_2_d_l Bool)
245   (declare-const hop_3_d_l Bool)
246   (declare-const hop_1_d_o Bool)
247   (declare-const hop_2_d_o Bool)
248   (declare-const hop_3_d_o Bool)
249   (declare-const hop_1_d_n Bool)
250   (declare-const hop_2_d_n Bool)
251   (declare-const hop_3_d_n Bool)
252   (declare-const hop_1_d_q Bool)
253   (declare-const hop_2_d_q Bool)
254   (declare-const hop_3_d_q Bool)
255   (declare-const hop_1_d_p Bool)
256   (declare-const hop_2_d_p Bool)
257   (declare-const hop_3_d_p Bool)
258   (declare-const hop_1_g_a Bool)
259   (declare-const hop_2_g_a Bool)
260   (declare-const hop_3_g_a Bool)
261   (declare-const hop_1_g_c Bool)
262   (declare-const hop_2_g_c Bool)
263   (declare-const hop_3_g_c Bool)
264   (declare-const hop_1_g_b Bool)
265   (declare-const hop_2_g_b Bool)
266   (declare-const hop_3_g_b Bool)
267   (declare-const hop_1_g_e Bool)
268   (declare-const hop_2_g_e Bool)
269   (declare-const hop_3_g_e Bool)
270   (declare-const hop_1_g_d Bool)
271   (declare-const hop_2_g_d Bool)
272   (declare-const hop_3_g_d Bool)
273   (declare-const hop_1_g_f Bool)
274   (declare-const hop_2_g_f Bool)
275   (declare-const hop_3_g_f Bool)
276   (declare-const hop_1_g_i Bool)
277   (declare-const hop_2_g_i Bool)
278   (declare-const hop_3_g_i Bool)
279   (declare-const hop_1_g_h Bool)
280   (declare-const hop_2_g_h Bool)
281   (declare-const hop_3_g_h Bool)
282   (declare-const hop_1_g_k Bool)
283   (declare-const hop_2_g_k Bool)
284   (declare-const hop_3_g_k Bool)
285   (declare-const hop_1_g_j Bool)
286   (declare-const hop_2_g_j Bool)
287   (declare-const hop_3_g_j Bool)
288   (declare-const hop_1_g_m Bool)
```

```
289    (declare-const hop_2_g_m Bool)
290    (declare-const hop_3_g_m Bool)
291    (declare-const hop_1_g_l Bool)
292    (declare-const hop_2_g_l Bool)
293    (declare-const hop_3_g_l Bool)
294    (declare-const hop_1_g_o Bool)
295    (declare-const hop_2_g_o Bool)
296    (declare-const hop_3_g_o Bool)
297    (declare-const hop_1_g_n Bool)
298    (declare-const hop_2_g_n Bool)
299    (declare-const hop_3_g_n Bool)
300    (declare-const hop_1_g_q Bool)
301    (declare-const hop_2_g_q Bool)
302    (declare-const hop_3_g_q Bool)
303    (declare-const hop_1_g_p Bool)
304    (declare-const hop_2_g_p Bool)
305    (declare-const hop_3_g_p Bool)
306    (declare-const hop_1_f_a Bool)
307    (declare-const hop_2_f_a Bool)
308    (declare-const hop_3_f_a Bool)
309    (declare-const hop_1_f_c Bool)
310    (declare-const hop_2_f_c Bool)
311    (declare-const hop_3_f_c Bool)
312    (declare-const hop_1_f_b Bool)
313    (declare-const hop_2_f_b Bool)
314    (declare-const hop_3_f_b Bool)
315    (declare-const hop_1_f_e Bool)
316    (declare-const hop_2_f_e Bool)
317    (declare-const hop_3_f_e Bool)
318    (declare-const hop_1_f_d Bool)
319    (declare-const hop_2_f_d Bool)
320    (declare-const hop_3_f_d Bool)
321    (declare-const hop_1_f_g Bool)
322    (declare-const hop_2_f_g Bool)
323    (declare-const hop_3_f_g Bool)
324    (declare-const hop_1_f_i Bool)
325    (declare-const hop_2_f_i Bool)
326    (declare-const hop_3_f_i Bool)
327    (declare-const hop_1_f_h Bool)
328    (declare-const hop_2_f_h Bool)
329    (declare-const hop_3_f_h Bool)
330    (declare-const hop_1_f_k Bool)
331    (declare-const hop_2_f_k Bool)
332    (declare-const hop_3_f_k Bool)
333    (declare-const hop_1_f_j Bool)
334    (declare-const hop_2_f_j Bool)
335    (declare-const hop_3_f_j Bool)
336    (declare-const hop_1_f_m Bool)
337    (declare-const hop_2_f_m Bool)
338    (declare-const hop_3_f_m Bool)
339    (declare-const hop_1_f_l Bool)
340    (declare-const hop_2_f_l Bool)
341    (declare-const hop_3_f_l Bool)
342    (declare-const hop_1_f_o Bool)
343    (declare-const hop_2_f_o Bool)
344    (declare-const hop_3_f_o Bool)
345    (declare-const hop_1_f_n Bool)
346    (declare-const hop_2_f_n Bool)
347    (declare-const hop_3_f_n Bool)
348    (declare-const hop_1_f_q Bool)
349    (declare-const hop_2_f_q Bool)
350    (declare-const hop_3_f_q Bool)
```

```
351  (declare-const hop_1_f_p Bool)
352  (declare-const hop_2_f_p Bool)
353  (declare-const hop_3_f_p Bool)
354  (declare-const hop_1_i_a Bool)
355  (declare-const hop_2_i_a Bool)
356  (declare-const hop_3_i_a Bool)
357  (declare-const hop_1_i_c Bool)
358  (declare-const hop_2_i_c Bool)
359  (declare-const hop_3_i_c Bool)
360  (declare-const hop_1_i_b Bool)
361  (declare-const hop_2_i_b Bool)
362  (declare-const hop_3_i_b Bool)
363  (declare-const hop_1_i_e Bool)
364  (declare-const hop_2_i_e Bool)
365  (declare-const hop_3_i_e Bool)
366  (declare-const hop_1_i_d Bool)
367  (declare-const hop_2_i_d Bool)
368  (declare-const hop_3_i_d Bool)
369  (declare-const hop_1_i_g Bool)
370  (declare-const hop_2_i_g Bool)
371  (declare-const hop_3_i_g Bool)
372  (declare-const hop_1_i_f Bool)
373  (declare-const hop_2_i_f Bool)
374  (declare-const hop_3_i_f Bool)
375  (declare-const hop_1_i_h Bool)
376  (declare-const hop_2_i_h Bool)
377  (declare-const hop_3_i_h Bool)
378  (declare-const hop_1_i_k Bool)
379  (declare-const hop_2_i_k Bool)
380  (declare-const hop_3_i_k Bool)
381  (declare-const hop_1_i_j Bool)
382  (declare-const hop_2_i_j Bool)
383  (declare-const hop_3_i_j Bool)
384  (declare-const hop_1_i_m Bool)
385  (declare-const hop_2_i_m Bool)
386  (declare-const hop_3_i_m Bool)
387  (declare-const hop_1_i_l Bool)
388  (declare-const hop_2_i_l Bool)
389  (declare-const hop_3_i_l Bool)
390  (declare-const hop_1_i_o Bool)
391  (declare-const hop_2_i_o Bool)
392  (declare-const hop_3_i_o Bool)
393  (declare-const hop_1_i_n Bool)
394  (declare-const hop_2_i_n Bool)
395  (declare-const hop_3_i_n Bool)
396  (declare-const hop_1_i_q Bool)
397  (declare-const hop_2_i_q Bool)
398  (declare-const hop_3_i_q Bool)
399  (declare-const hop_1_i_p Bool)
400  (declare-const hop_2_i_p Bool)
401  (declare-const hop_3_i_p Bool)
402  (declare-const hop_1_h_a Bool)
403  (declare-const hop_2_h_a Bool)
404  (declare-const hop_3_h_a Bool)
405  (declare-const hop_1_h_c Bool)
406  (declare-const hop_2_h_c Bool)
407  (declare-const hop_3_h_c Bool)
408  (declare-const hop_1_h_b Bool)
409  (declare-const hop_2_h_b Bool)
410  (declare-const hop_3_h_b Bool)
411  (declare-const hop_1_h_e Bool)
412  (declare-const hop_2_h_e Bool)
```

```
413   (declare-const hop_3_h_e Bool)
414   (declare-const hop_1_h_d Bool)
415   (declare-const hop_2_h_d Bool)
416   (declare-const hop_3_h_d Bool)
417   (declare-const hop_1_h_g Bool)
418   (declare-const hop_2_h_g Bool)
419   (declare-const hop_3_h_g Bool)
420   (declare-const hop_1_h_f Bool)
421   (declare-const hop_2_h_f Bool)
422   (declare-const hop_3_h_f Bool)
423   (declare-const hop_1_h_i Bool)
424   (declare-const hop_2_h_i Bool)
425   (declare-const hop_3_h_i Bool)
426   (declare-const hop_1_h_k Bool)
427   (declare-const hop_2_h_k Bool)
428   (declare-const hop_3_h_k Bool)
429   (declare-const hop_1_h_j Bool)
430   (declare-const hop_2_h_j Bool)
431   (declare-const hop_3_h_j Bool)
432   (declare-const hop_1_h_m Bool)
433   (declare-const hop_2_h_m Bool)
434   (declare-const hop_3_h_m Bool)
435   (declare-const hop_1_h_l Bool)
436   (declare-const hop_2_h_l Bool)
437   (declare-const hop_3_h_l Bool)
438   (declare-const hop_1_h_o Bool)
439   (declare-const hop_2_h_o Bool)
440   (declare-const hop_3_h_o Bool)
441   (declare-const hop_1_h_n Bool)
442   (declare-const hop_2_h_n Bool)
443   (declare-const hop_3_h_n Bool)
444   (declare-const hop_1_h_q Bool)
445   (declare-const hop_2_h_q Bool)
446   (declare-const hop_3_h_q Bool)
447   (declare-const hop_1_h_p Bool)
448   (declare-const hop_2_h_p Bool)
449   (declare-const hop_3_h_p Bool)
450   (declare-const hop_1_k_a Bool)
451   (declare-const hop_2_k_a Bool)
452   (declare-const hop_3_k_a Bool)
453   (declare-const hop_1_k_c Bool)
454   (declare-const hop_2_k_c Bool)
455   (declare-const hop_3_k_c Bool)
456   (declare-const hop_1_k_b Bool)
457   (declare-const hop_2_k_b Bool)
458   (declare-const hop_3_k_b Bool)
459   (declare-const hop_1_k_e Bool)
460   (declare-const hop_2_k_e Bool)
461   (declare-const hop_3_k_e Bool)
462   (declare-const hop_1_k_d Bool)
463   (declare-const hop_2_k_d Bool)
464   (declare-const hop_3_k_d Bool)
465   (declare-const hop_1_k_g Bool)
466   (declare-const hop_2_k_g Bool)
467   (declare-const hop_3_k_g Bool)
468   (declare-const hop_1_k_f Bool)
469   (declare-const hop_2_k_f Bool)
470   (declare-const hop_3_k_f Bool)
471   (declare-const hop_1_k_i Bool)
472   (declare-const hop_2_k_i Bool)
473   (declare-const hop_3_k_i Bool)
474   (declare-const hop_1_k_h Bool)
```

```
475  (declare-const hop_2_k_h Bool)
476  (declare-const hop_3_k_h Bool)
477  (declare-const hop_1_k_j Bool)
478  (declare-const hop_2_k_j Bool)
479  (declare-const hop_3_k_j Bool)
480  (declare-const hop_1_k_m Bool)
481  (declare-const hop_2_k_m Bool)
482  (declare-const hop_3_k_m Bool)
483  (declare-const hop_1_k_l Bool)
484  (declare-const hop_2_k_l Bool)
485  (declare-const hop_3_k_l Bool)
486  (declare-const hop_1_k_o Bool)
487  (declare-const hop_2_k_o Bool)
488  (declare-const hop_3_k_o Bool)
489  (declare-const hop_1_k_n Bool)
490  (declare-const hop_2_k_n Bool)
491  (declare-const hop_3_k_n Bool)
492  (declare-const hop_1_k_q Bool)
493  (declare-const hop_2_k_q Bool)
494  (declare-const hop_3_k_q Bool)
495  (declare-const hop_1_k_p Bool)
496  (declare-const hop_2_k_p Bool)
497  (declare-const hop_3_k_p Bool)
498  (declare-const hop_1_j_a Bool)
499  (declare-const hop_2_j_a Bool)
500  (declare-const hop_3_j_a Bool)
501  (declare-const hop_1_j_c Bool)
502  (declare-const hop_2_j_c Bool)
503  (declare-const hop_3_j_c Bool)
504  (declare-const hop_1_j_b Bool)
505  (declare-const hop_2_j_b Bool)
506  (declare-const hop_3_j_b Bool)
507  (declare-const hop_1_j_e Bool)
508  (declare-const hop_2_j_e Bool)
509  (declare-const hop_3_j_e Bool)
510  (declare-const hop_1_j_d Bool)
511  (declare-const hop_2_j_d Bool)
512  (declare-const hop_3_j_d Bool)
513  (declare-const hop_1_j_g Bool)
514  (declare-const hop_2_j_g Bool)
515  (declare-const hop_3_j_g Bool)
516  (declare-const hop_1_j_f Bool)
517  (declare-const hop_2_j_f Bool)
518  (declare-const hop_3_j_f Bool)
519  (declare-const hop_1_j_i Bool)
520  (declare-const hop_2_j_i Bool)
521  (declare-const hop_3_j_i Bool)
522  (declare-const hop_1_j_h Bool)
523  (declare-const hop_2_j_h Bool)
524  (declare-const hop_3_j_h Bool)
525  (declare-const hop_1_j_k Bool)
526  (declare-const hop_2_j_k Bool)
527  (declare-const hop_3_j_k Bool)
528  (declare-const hop_1_j_m Bool)
529  (declare-const hop_2_j_m Bool)
530  (declare-const hop_3_j_m Bool)
531  (declare-const hop_1_j_l Bool)
532  (declare-const hop_2_j_l Bool)
533  (declare-const hop_3_j_l Bool)
534  (declare-const hop_1_j_o Bool)
535  (declare-const hop_2_j_o Bool)
536  (declare-const hop_3_j_o Bool)
```

```
537    (declare-const hop_1_j_n Bool)
538    (declare-const hop_2_j_n Bool)
539    (declare-const hop_3_j_n Bool)
540    (declare-const hop_1_j_q Bool)
541    (declare-const hop_2_j_q Bool)
542    (declare-const hop_3_j_q Bool)
543    (declare-const hop_1_j_p Bool)
544    (declare-const hop_2_j_p Bool)
545    (declare-const hop_3_j_p Bool)
546    (declare-const hop_1_m_a Bool)
547    (declare-const hop_2_m_a Bool)
548    (declare-const hop_3_m_a Bool)
549    (declare-const hop_1_m_c Bool)
550    (declare-const hop_2_m_c Bool)
551    (declare-const hop_3_m_c Bool)
552    (declare-const hop_1_m_b Bool)
553    (declare-const hop_2_m_b Bool)
554    (declare-const hop_3_m_b Bool)
555    (declare-const hop_1_m_e Bool)
556    (declare-const hop_2_m_e Bool)
557    (declare-const hop_3_m_e Bool)
558    (declare-const hop_1_m_d Bool)
559    (declare-const hop_2_m_d Bool)
560    (declare-const hop_3_m_d Bool)
561    (declare-const hop_1_m_g Bool)
562    (declare-const hop_2_m_g Bool)
563    (declare-const hop_3_m_g Bool)
564    (declare-const hop_1_m_f Bool)
565    (declare-const hop_2_m_f Bool)
566    (declare-const hop_3_m_f Bool)
567    (declare-const hop_1_m_i Bool)
568    (declare-const hop_2_m_i Bool)
569    (declare-const hop_3_m_i Bool)
570    (declare-const hop_1_m_h Bool)
571    (declare-const hop_2_m_h Bool)
572    (declare-const hop_3_m_h Bool)
573    (declare-const hop_1_m_k Bool)
574    (declare-const hop_2_m_k Bool)
575    (declare-const hop_3_m_k Bool)
576    (declare-const hop_1_m_j Bool)
577    (declare-const hop_2_m_j Bool)
578    (declare-const hop_3_m_j Bool)
579    (declare-const hop_1_m_l Bool)
580    (declare-const hop_2_m_l Bool)
581    (declare-const hop_3_m_l Bool)
582    (declare-const hop_1_m_o Bool)
583    (declare-const hop_2_m_o Bool)
584    (declare-const hop_3_m_o Bool)
585    (declare-const hop_1_m_n Bool)
586    (declare-const hop_2_m_n Bool)
587    (declare-const hop_3_m_n Bool)
588    (declare-const hop_1_m_q Bool)
589    (declare-const hop_2_m_q Bool)
590    (declare-const hop_3_m_q Bool)
591    (declare-const hop_1_m_p Bool)
592    (declare-const hop_2_m_p Bool)
593    (declare-const hop_3_m_p Bool)
594    (declare-const hop_1_l_a Bool)
595    (declare-const hop_2_l_a Bool)
596    (declare-const hop_3_l_a Bool)
597    (declare-const hop_1_l_c Bool)
598    (declare-const hop_2_l_c Bool)
```

```
599    (declare-const hop_3_l_c Bool)
600    (declare-const hop_1_l_b Bool)
601    (declare-const hop_2_l_b Bool)
602    (declare-const hop_3_l_b Bool)
603    (declare-const hop_1_l_e Bool)
604    (declare-const hop_2_l_e Bool)
605    (declare-const hop_3_l_e Bool)
606    (declare-const hop_1_l_d Bool)
607    (declare-const hop_2_l_d Bool)
608    (declare-const hop_3_l_d Bool)
609    (declare-const hop_1_l_g Bool)
610    (declare-const hop_2_l_g Bool)
611    (declare-const hop_3_l_g Bool)
612    (declare-const hop_1_l_f Bool)
613    (declare-const hop_2_l_f Bool)
614    (declare-const hop_3_l_f Bool)
615    (declare-const hop_1_l_i Bool)
616    (declare-const hop_2_l_i Bool)
617    (declare-const hop_3_l_i Bool)
618    (declare-const hop_1_l_h Bool)
619    (declare-const hop_2_l_h Bool)
620    (declare-const hop_3_l_h Bool)
621    (declare-const hop_1_l_k Bool)
622    (declare-const hop_2_l_k Bool)
623    (declare-const hop_3_l_k Bool)
624    (declare-const hop_1_l_j Bool)
625    (declare-const hop_2_l_j Bool)
626    (declare-const hop_3_l_j Bool)
627    (declare-const hop_1_l_m Bool)
628    (declare-const hop_2_l_m Bool)
629    (declare-const hop_3_l_m Bool)
630    (declare-const hop_1_l_o Bool)
631    (declare-const hop_2_l_o Bool)
632    (declare-const hop_3_l_o Bool)
633    (declare-const hop_1_l_n Bool)
634    (declare-const hop_2_l_n Bool)
635    (declare-const hop_3_l_n Bool)
636    (declare-const hop_1_l_q Bool)
637    (declare-const hop_2_l_q Bool)
638    (declare-const hop_3_l_q Bool)
639    (declare-const hop_1_l_p Bool)
640    (declare-const hop_2_l_p Bool)
641    (declare-const hop_3_l_p Bool)
642    (declare-const hop_1_o_a Bool)
643    (declare-const hop_2_o_a Bool)
644    (declare-const hop_3_o_a Bool)
645    (declare-const hop_1_o_c Bool)
646    (declare-const hop_2_o_c Bool)
647    (declare-const hop_3_o_c Bool)
648    (declare-const hop_1_o_b Bool)
649    (declare-const hop_2_o_b Bool)
650    (declare-const hop_3_o_b Bool)
651    (declare-const hop_1_o_e Bool)
652    (declare-const hop_2_o_e Bool)
653    (declare-const hop_3_o_e Bool)
654    (declare-const hop_1_o_d Bool)
655    (declare-const hop_2_o_d Bool)
656    (declare-const hop_3_o_d Bool)
657    (declare-const hop_1_o_g Bool)
658    (declare-const hop_2_o_g Bool)
659    (declare-const hop_3_o_g Bool)
660    (declare-const hop_1_o_f Bool)
```

```
661  (declare-const hop_2_o_f Bool)
662  (declare-const hop_3_o_f Bool)
663  (declare-const hop_1_o_i Bool)
664  (declare-const hop_2_o_i Bool)
665  (declare-const hop_3_o_i Bool)
666  (declare-const hop_1_o_h Bool)
667  (declare-const hop_2_o_h Bool)
668  (declare-const hop_3_o_h Bool)
669  (declare-const hop_1_o_k Bool)
670  (declare-const hop_2_o_k Bool)
671  (declare-const hop_3_o_k Bool)
672  (declare-const hop_1_o_j Bool)
673  (declare-const hop_2_o_j Bool)
674  (declare-const hop_3_o_j Bool)
675  (declare-const hop_1_o_m Bool)
676  (declare-const hop_2_o_m Bool)
677  (declare-const hop_3_o_m Bool)
678  (declare-const hop_1_o_l Bool)
679  (declare-const hop_2_o_l Bool)
680  (declare-const hop_3_o_l Bool)
681  (declare-const hop_1_o_n Bool)
682  (declare-const hop_2_o_n Bool)
683  (declare-const hop_3_o_n Bool)
684  (declare-const hop_1_o_q Bool)
685  (declare-const hop_2_o_q Bool)
686  (declare-const hop_3_o_q Bool)
687  (declare-const hop_1_o_p Bool)
688  (declare-const hop_2_o_p Bool)
689  (declare-const hop_3_o_p Bool)
690  (declare-const hop_1_n_a Bool)
691  (declare-const hop_2_n_a Bool)
692  (declare-const hop_3_n_a Bool)
693  (declare-const hop_1_n_c Bool)
694  (declare-const hop_2_n_c Bool)
695  (declare-const hop_3_n_c Bool)
696  (declare-const hop_1_n_b Bool)
697  (declare-const hop_2_n_b Bool)
698  (declare-const hop_3_n_b Bool)
699  (declare-const hop_1_n_e Bool)
700  (declare-const hop_2_n_e Bool)
701  (declare-const hop_3_n_e Bool)
702  (declare-const hop_1_n_d Bool)
703  (declare-const hop_2_n_d Bool)
704  (declare-const hop_3_n_d Bool)
705  (declare-const hop_1_n_g Bool)
706  (declare-const hop_2_n_g Bool)
707  (declare-const hop_3_n_g Bool)
708  (declare-const hop_1_n_f Bool)
709  (declare-const hop_2_n_f Bool)
710  (declare-const hop_3_n_f Bool)
711  (declare-const hop_1_n_i Bool)
712  (declare-const hop_2_n_i Bool)
713  (declare-const hop_3_n_i Bool)
714  (declare-const hop_1_n_h Bool)
715  (declare-const hop_2_n_h Bool)
716  (declare-const hop_3_n_h Bool)
717  (declare-const hop_1_n_k Bool)
718  (declare-const hop_2_n_k Bool)
719  (declare-const hop_3_n_k Bool)
720  (declare-const hop_1_n_j Bool)
721  (declare-const hop_2_n_j Bool)
722  (declare-const hop_3_n_j Bool)
```

```
723  (declare-const hop_1_n_m Bool)
724  (declare-const hop_2_n_m Bool)
725  (declare-const hop_3_n_m Bool)
726  (declare-const hop_1_n_l Bool)
727  (declare-const hop_2_n_l Bool)
728  (declare-const hop_3_n_l Bool)
729  (declare-const hop_1_n_o Bool)
730  (declare-const hop_2_n_o Bool)
731  (declare-const hop_3_n_o Bool)
732  (declare-const hop_1_n_q Bool)
733  (declare-const hop_2_n_q Bool)
734  (declare-const hop_3_n_q Bool)
735  (declare-const hop_1_n_p Bool)
736  (declare-const hop_2_n_p Bool)
737  (declare-const hop_3_n_p Bool)
738  (declare-const hop_1_q_a Bool)
739  (declare-const hop_2_q_a Bool)
740  (declare-const hop_3_q_a Bool)
741  (declare-const hop_1_q_c Bool)
742  (declare-const hop_2_q_c Bool)
743  (declare-const hop_3_q_c Bool)
744  (declare-const hop_1_q_b Bool)
745  (declare-const hop_2_q_b Bool)
746  (declare-const hop_3_q_b Bool)
747  (declare-const hop_1_q_e Bool)
748  (declare-const hop_2_q_e Bool)
749  (declare-const hop_3_q_e Bool)
750  (declare-const hop_1_q_d Bool)
751  (declare-const hop_2_q_d Bool)
752  (declare-const hop_3_q_d Bool)
753  (declare-const hop_1_q_g Bool)
754  (declare-const hop_2_q_g Bool)
755  (declare-const hop_3_q_g Bool)
756  (declare-const hop_1_q_f Bool)
757  (declare-const hop_2_q_f Bool)
758  (declare-const hop_3_q_f Bool)
759  (declare-const hop_1_q_i Bool)
760  (declare-const hop_2_q_i Bool)
761  (declare-const hop_3_q_i Bool)
762  (declare-const hop_1_q_h Bool)
763  (declare-const hop_2_q_h Bool)
764  (declare-const hop_3_q_h Bool)
765  (declare-const hop_1_q_k Bool)
766  (declare-const hop_2_q_k Bool)
767  (declare-const hop_3_q_k Bool)
768  (declare-const hop_1_q_j Bool)
769  (declare-const hop_2_q_j Bool)
770  (declare-const hop_3_q_j Bool)
771  (declare-const hop_1_q_m Bool)
772  (declare-const hop_2_q_m Bool)
773  (declare-const hop_3_q_m Bool)
774  (declare-const hop_1_q_l Bool)
775  (declare-const hop_2_q_l Bool)
776  (declare-const hop_3_q_l Bool)
777  (declare-const hop_1_q_o Bool)
778  (declare-const hop_2_q_o Bool)
779  (declare-const hop_3_q_o Bool)
780  (declare-const hop_1_q_n Bool)
781  (declare-const hop_2_q_n Bool)
782  (declare-const hop_3_q_n Bool)
783  (declare-const hop_1_q_p Bool)
784  (declare-const hop_2_q_p Bool)
```

```
785  (declare-const hop_3_q_p Bool)
786  (declare-const hop_1_p_a Bool)
787  (declare-const hop_2_p_a Bool)
788  (declare-const hop_3_p_a Bool)
789  (declare-const hop_1_p_c Bool)
790  (declare-const hop_2_p_c Bool)
791  (declare-const hop_3_p_c Bool)
792  (declare-const hop_1_p_b Bool)
793  (declare-const hop_2_p_b Bool)
794  (declare-const hop_3_p_b Bool)
795  (declare-const hop_1_p_e Bool)
796  (declare-const hop_2_p_e Bool)
797  (declare-const hop_3_p_e Bool)
798  (declare-const hop_1_p_d Bool)
799  (declare-const hop_2_p_d Bool)
800  (declare-const hop_3_p_d Bool)
801  (declare-const hop_1_p_g Bool)
802  (declare-const hop_2_p_g Bool)
803  (declare-const hop_3_p_g Bool)
804  (declare-const hop_1_p_f Bool)
805  (declare-const hop_2_p_f Bool)
806  (declare-const hop_3_p_f Bool)
807  (declare-const hop_1_p_i Bool)
808  (declare-const hop_2_p_i Bool)
809  (declare-const hop_3_p_i Bool)
810  (declare-const hop_1_p_h Bool)
811  (declare-const hop_2_p_h Bool)
812  (declare-const hop_3_p_h Bool)
813  (declare-const hop_1_p_k Bool)
814  (declare-const hop_2_p_k Bool)
815  (declare-const hop_3_p_k Bool)
816  (declare-const hop_1_p_j Bool)
817  (declare-const hop_2_p_j Bool)
818  (declare-const hop_3_p_j Bool)
819  (declare-const hop_1_p_m Bool)
820  (declare-const hop_2_p_m Bool)
821  (declare-const hop_3_p_m Bool)
822  (declare-const hop_1_p_l Bool)
823  (declare-const hop_2_p_l Bool)
824  (declare-const hop_3_p_l Bool)
825  (declare-const hop_1_p_o Bool)
826  (declare-const hop_2_p_o Bool)
827  (declare-const hop_3_p_o Bool)
828  (declare-const hop_1_p_n Bool)
829  (declare-const hop_2_p_n Bool)
830  (declare-const hop_3_p_n Bool)
831  (declare-const hop_1_p_q Bool)
832  (declare-const hop_2_p_q Bool)
833  (declare-const hop_3_p_q Bool)
834  (assert
835  (and
836  (not hop_1_a_c)
837  hop_1_a_b
838  (not hop_1_a_e)
839  hop_1_a_d
840  (not hop_1_a_g)
841  (not hop_1_a_f)
842  (not hop_1_a_i)
843  (not hop_1_a_h)
844  (not hop_1_a_k)
845  (not hop_1_a_j)
846  (not hop_1_a_m)
```

```
847    (not hop_1_a_l)
848    (not hop_1_a_o)
849    (not hop_1_a_n)
850    (not hop_1_a_q)
851    (not hop_1_a_p)
852    (not hop_1_c_a)
853    hop_1_c_b
854    (not hop_1_c_e)
855    (not hop_1_c_d)
856    (not hop_1_c_g)
857    (not hop_1_c_f)
858    (not hop_1_c_i)
859    (not hop_1_c_h)
860    (not hop_1_c_k)
861    (not hop_1_c_j)
862    (not hop_1_c_m)
863    (not hop_1_c_l)
864    (not hop_1_c_o)
865    (not hop_1_c_n)
866    (not hop_1_c_q)
867    (not hop_1_c_p)
868    hop_1_b_a
869    hop_1_b_c
870    (not hop_1_b_e)
871    hop_1_b_d
872    (not hop_1_b_g)
873    (not hop_1_b_f)
874    (not hop_1_b_i)
875    (not hop_1_b_h)
876    (not hop_1_b_k)
877    (not hop_1_b_j)
878    (not hop_1_b_m)
879    (not hop_1_b_l)
880    (not hop_1_b_o)
881    (not hop_1_b_n)
882    (not hop_1_b_q)
883    (not hop_1_b_p)
884    (not hop_1_e_a)
885    (not hop_1_e_c)
886    (not hop_1_e_b)
887    hop_1_e_d
888    hop_1_e_g
889    (not hop_1_e_f)
890    hop_1_e_i
891    hop_1_e_h
892    (not hop_1_e_k)
893    (not hop_1_e_j)
894    (not hop_1_e_m)
895    (not hop_1_e_l)
896    (not hop_1_e_o)
897    (not hop_1_e_n)
898    (not hop_1_e_q)
899    (not hop_1_e_p)
900    hop_1_d_a
901    (not hop_1_d_c)
902    hop_1_d_b
903    hop_1_d_e
904    (not hop_1_d_g)
905    hop_1_d_f
906    (not hop_1_d_i)
907    (not hop_1_d_h)
908    (not hop_1_d_k)
```

```
909   (not hop_1_d_j)
910   (not hop_1_d_m)
911   (not hop_1_d_l)
912   (not hop_1_d_o)
913   (not hop_1_d_n)
914   (not hop_1_d_q)
915   (not hop_1_d_p)
916   (not hop_1_g_a)
917   (not hop_1_g_c)
918   (not hop_1_g_b)
919   hop_1_g_e
920   (not hop_1_g_d)
921   (not hop_1_g_f)
922   (not hop_1_g_i)
923   hop_1_g_h
924   hop_1_g_k
925   (not hop_1_g_j)
926   (not hop_1_g_m)
927   (not hop_1_g_l)
928   (not hop_1_g_o)
929   (not hop_1_g_n)
930   (not hop_1_g_q)
931   (not hop_1_g_p)
932   (not hop_1_f_a)
933   (not hop_1_f_c)
934   (not hop_1_f_b)
935   (not hop_1_f_e)
936   hop_1_f_d
937   (not hop_1_f_g)
938   hop_1_f_i
939   (not hop_1_f_h)
940   (not hop_1_f_k)
941   hop_1_f_j
942   (not hop_1_f_m)
943   (not hop_1_f_l)
944   (not hop_1_f_o)
945   (not hop_1_f_n)
946   (not hop_1_f_q)
947   (not hop_1_f_p)
948   (not hop_1_i_a)
949   (not hop_1_i_c)
950   (not hop_1_i_b)
951   hop_1_i_e
952   (not hop_1_i_d)
953   (not hop_1_i_g)
954   hop_1_i_f
955   hop_1_i_h
956   (not hop_1_i_k)
957   hop_1_i_j
958   (not hop_1_i_m)
959   hop_1_i_l
960   (not hop_1_i_o)
961   (not hop_1_i_n)
962   (not hop_1_i_q)
963   (not hop_1_i_p)
964   (not hop_1_h_a)
965   (not hop_1_h_c)
966   (not hop_1_h_b)
967   hop_1_h_e
968   (not hop_1_h_d)
969   hop_1_h_g
970   (not hop_1_h_f)
```

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971   hop_1_h_i
972   hop_1_h_k
973   (not hop_1_h_j)
974   (not hop_1_h_m)
975   (not hop_1_h_l)
976   (not hop_1_h_o)
977   (not hop_1_h_n)
978   (not hop_1_h_q)
979   (not hop_1_h_p)
980   (not hop_1_k_a)
981   (not hop_1_k_c)
982   (not hop_1_k_b)
983   (not hop_1_k_e)
984   (not hop_1_k_d)
985   hop_1_k_g
986   (not hop_1_k_f)
987   (not hop_1_k_i)
988   hop_1_k_h
989   (not hop_1_k_j)
990   hop_1_k_m
991   hop_1_k_l
992   (not hop_1_k_o)
993   (not hop_1_k_n)
994   (not hop_1_k_q)
995   (not hop_1_k_p)
996   (not hop_1_j_a)
997   (not hop_1_j_c)
998   (not hop_1_j_b)
999   (not hop_1_j_e)
1000  (not hop_1_j_d)
1001  (not hop_1_j_g)
1002  hop_1_j_f
1003  hop_1_j_i
1004  (not hop_1_j_h)
1005  (not hop_1_j_k)
1006  (not hop_1_j_m)
1007  hop_1_j_l
1008  (not hop_1_j_o)
1009  hop_1_j_n
1010  (not hop_1_j_q)
1011  (not hop_1_j_p)
1012  (not hop_1_m_a)
1013  (not hop_1_m_c)
1014  (not hop_1_m_b)
1015  (not hop_1_m_e)
1016  (not hop_1_m_d)
1017  (not hop_1_m_g)
1018  (not hop_1_m_f)
1019  (not hop_1_m_i)
1020  (not hop_1_m_h)
1021  hop_1_m_k
1022  (not hop_1_m_j)
1023  hop_1_m_l
1024  hop_1_m_o
1025  (not hop_1_m_n)
1026  (not hop_1_m_q)
1027  hop_1_m_p
1028  (not hop_1_l_a)
1029  (not hop_1_l_c)
1030  (not hop_1_l_b)
1031  (not hop_1_l_e)
1032  (not hop_1_l_d)
```

```
1033    (not hop_1_l_g)
1034    (not hop_1_l_f)
1035    hop_1_l_i
1036    (not hop_1_l_h)
1037    hop_1_l_k
1038    hop_1_l_j
1039    hop_1_l_m
1040    (not hop_1_l_o)
1041    hop_1_l_n
1042    (not hop_1_l_q)
1043    hop_1_l_p
1044    (not hop_1_o_a)
1045    (not hop_1_o_c)
1046    (not hop_1_o_b)
1047    (not hop_1_o_e)
1048    (not hop_1_o_d)
1049    (not hop_1_o_g)
1050    (not hop_1_o_f)
1051    (not hop_1_o_i)
1052    (not hop_1_o_h)
1053    (not hop_1_o_k)
1054    (not hop_1_o_j)
1055    hop_1_o_m
1056    (not hop_1_o_l)
1057    (not hop_1_o_n)
1058    (not hop_1_o_q)
1059    hop_1_o_p
1060    (not hop_1_n_a)
1061    (not hop_1_n_c)
1062    (not hop_1_n_b)
1063    (not hop_1_n_e)
1064    (not hop_1_n_d)
1065    (not hop_1_n_g)
1066    (not hop_1_n_f)
1067    (not hop_1_n_i)
1068    (not hop_1_n_h)
1069    (not hop_1_n_k)
1070    hop_1_n_j
1071    (not hop_1_n_m)
1072    hop_1_n_l
1073    (not hop_1_n_o)
1074    hop_1_n_q
1075    hop_1_n_p
1076    (not hop_1_q_a)
1077    (not hop_1_q_c)
1078    (not hop_1_q_b)
1079    (not hop_1_q_e)
1080    (not hop_1_q_d)
1081    (not hop_1_q_g)
1082    (not hop_1_q_f)
1083    (not hop_1_q_i)
1084    (not hop_1_q_h)
1085    (not hop_1_q_k)
1086    (not hop_1_q_j)
1087    (not hop_1_q_m)
1088    (not hop_1_q_l)
1089    (not hop_1_q_o)
1090    hop_1_q_n
1091    hop_1_q_p
1092    (not hop_1_p_a)
1093    (not hop_1_p_c)
1094    (not hop_1_p_b)
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```
1095    (not hop_1_p_e)
1096    (not hop_1_p_d)
1097    (not hop_1_p_g)
1098    (not hop_1_p_f)
1099    (not hop_1_p_i)
1100    (not hop_1_p_h)
1101    (not hop_1_p_k)
1102    (not hop_1_p_j)
1103    hop_1_p_m
1104    hop_1_p_l
1105    hop_1_p_o
1106    hop_1_p_n
1107    hop_1_p_q
1108    (=> hop_1_a_c hop_2_a_c)
1109    (=> hop_1_a_b hop_2_a_b)
1110    (=> hop_1_a_e hop_2_a_e)
1111    (=> hop_1_a_d hop_2_a_d)
1112    (=> hop_1_a_g hop_2_a_g)
1113    (=> hop_1_a_f hop_2_a_f)
1114    (=> hop_1_a_i hop_2_a_i)
1115    (=> hop_1_a_h hop_2_a_h)
1116    (=> hop_1_a_k hop_2_a_k)
1117    (=> hop_1_a_j hop_2_a_j)
1118    (=> hop_1_a_m hop_2_a_m)
1119    (=> hop_1_a_l hop_2_a_l)
1120    (=> hop_1_a_o hop_2_a_o)
1121    (=> hop_1_a_n hop_2_a_n)
1122    (=> hop_1_a_q hop_2_a_q)
1123    (=> hop_1_a_p hop_2_a_p)
1124    (=> hop_1_c_a hop_2_c_a)
1125    (=> hop_1_c_b hop_2_c_b)
1126    (=> hop_1_c_e hop_2_c_e)
1127    (=> hop_1_c_d hop_2_c_d)
1128    (=> hop_1_c_g hop_2_c_g)
1129    (=> hop_1_c_f hop_2_c_f)
1130    (=> hop_1_c_i hop_2_c_i)
1131    (=> hop_1_c_h hop_2_c_h)
1132    (=> hop_1_c_k hop_2_c_k)
1133    (=> hop_1_c_j hop_2_c_j)
1134    (=> hop_1_c_m hop_2_c_m)
1135    (=> hop_1_c_l hop_2_c_l)
1136    (=> hop_1_c_o hop_2_c_o)
1137    (=> hop_1_c_n hop_2_c_n)
1138    (=> hop_1_c_q hop_2_c_q)
1139    (=> hop_1_c_p hop_2_c_p)
1140    (=> hop_1_b_a hop_2_b_a)
1141    (=> hop_1_b_c hop_2_b_c)
1142    (=> hop_1_b_e hop_2_b_e)
1143    (=> hop_1_b_d hop_2_b_d)
1144    (=> hop_1_b_g hop_2_b_g)
1145    (=> hop_1_b_f hop_2_b_f)
1146    (=> hop_1_b_i hop_2_b_i)
1147    (=> hop_1_b_h hop_2_b_h)
1148    (=> hop_1_b_k hop_2_b_k)
1149    (=> hop_1_b_j hop_2_b_j)
1150    (=> hop_1_b_m hop_2_b_m)
1151    (=> hop_1_b_l hop_2_b_l)
1152    (=> hop_1_b_o hop_2_b_o)
1153    (=> hop_1_b_n hop_2_b_n)
1154    (=> hop_1_b_q hop_2_b_q)
1155    (=> hop_1_b_p hop_2_b_p)
1156    (=> hop_1_e_a hop_2_e_a)
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```
1157  (=> hop_1_e_c hop_2_e_c)
1158  (=> hop_1_e_b hop_2_e_b)
1159  (=> hop_1_e_d hop_2_e_d)
1160  (=> hop_1_e_g hop_2_e_g)
1161  (=> hop_1_e_f hop_2_e_f)
1162  (=> hop_1_e_i hop_2_e_i)
1163  (=> hop_1_e_h hop_2_e_h)
1164  (=> hop_1_e_k hop_2_e_k)
1165  (=> hop_1_e_j hop_2_e_j)
1166  (=> hop_1_e_m hop_2_e_m)
1167  (=> hop_1_e_l hop_2_e_l)
1168  (=> hop_1_e_o hop_2_e_o)
1169  (=> hop_1_e_n hop_2_e_n)
1170  (=> hop_1_e_q hop_2_e_q)
1171  (=> hop_1_e_p hop_2_e_p)
1172  (=> hop_1_d_a hop_2_d_a)
1173  (=> hop_1_d_c hop_2_d_c)
1174  (=> hop_1_d_b hop_2_d_b)
1175  (=> hop_1_d_e hop_2_d_e)
1176  (=> hop_1_d_g hop_2_d_g)
1177  (=> hop_1_d_f hop_2_d_f)
1178  (=> hop_1_d_i hop_2_d_i)
1179  (=> hop_1_d_h hop_2_d_h)
1180  (=> hop_1_d_k hop_2_d_k)
1181  (=> hop_1_d_j hop_2_d_j)
1182  (=> hop_1_d_m hop_2_d_m)
1183  (=> hop_1_d_l hop_2_d_l)
1184  (=> hop_1_d_o hop_2_d_o)
1185  (=> hop_1_d_n hop_2_d_n)
1186  (=> hop_1_d_q hop_2_d_q)
1187  (=> hop_1_d_p hop_2_d_p)
1188  (=> hop_1_g_a hop_2_g_a)
1189  (=> hop_1_g_c hop_2_g_c)
1190  (=> hop_1_g_b hop_2_g_b)
1191  (=> hop_1_g_e hop_2_g_e)
1192  (=> hop_1_g_d hop_2_g_d)
1193  (=> hop_1_g_f hop_2_g_f)
1194  (=> hop_1_g_i hop_2_g_i)
1195  (=> hop_1_g_h hop_2_g_h)
1196  (=> hop_1_g_k hop_2_g_k)
1197  (=> hop_1_g_j hop_2_g_j)
1198  (=> hop_1_g_m hop_2_g_m)
1199  (=> hop_1_g_l hop_2_g_l)
1200  (=> hop_1_g_o hop_2_g_o)
1201  (=> hop_1_g_n hop_2_g_n)
1202  (=> hop_1_g_q hop_2_g_q)
1203  (=> hop_1_g_p hop_2_g_p)
1204  (=> hop_1_f_a hop_2_f_a)
1205  (=> hop_1_f_c hop_2_f_c)
1206  (=> hop_1_f_b hop_2_f_b)
1207  (=> hop_1_f_e hop_2_f_e)
1208  (=> hop_1_f_d hop_2_f_d)
1209  (=> hop_1_f_g hop_2_f_g)
1210  (=> hop_1_f_i hop_2_f_i)
1211  (=> hop_1_f_h hop_2_f_h)
1212  (=> hop_1_f_k hop_2_f_k)
1213  (=> hop_1_f_j hop_2_f_j)
1214  (=> hop_1_f_m hop_2_f_m)
1215  (=> hop_1_f_l hop_2_f_l)
1216  (=> hop_1_f_o hop_2_f_o)
1217  (=> hop_1_f_n hop_2_f_n)
1218  (=> hop_1_f_q hop_2_f_q)
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```
1219   (=> hop_1_f_p hop_2_f_p)
1220   (=> hop_1_i_a hop_2_i_a)
1221   (=> hop_1_i_c hop_2_i_c)
1222   (=> hop_1_i_b hop_2_i_b)
1223   (=> hop_1_i_e hop_2_i_e)
1224   (=> hop_1_i_d hop_2_i_d)
1225   (=> hop_1_i_g hop_2_i_g)
1226   (=> hop_1_i_f hop_2_i_f)
1227   (=> hop_1_i_h hop_2_i_h)
1228   (=> hop_1_i_k hop_2_i_k)
1229   (=> hop_1_i_j hop_2_i_j)
1230   (=> hop_1_i_m hop_2_i_m)
1231   (=> hop_1_i_l hop_2_i_l)
1232   (=> hop_1_i_o hop_2_i_o)
1233   (=> hop_1_i_n hop_2_i_n)
1234   (=> hop_1_i_q hop_2_i_q)
1235   (=> hop_1_i_p hop_2_i_p)
1236   (=> hop_1_h_a hop_2_h_a)
1237   (=> hop_1_h_c hop_2_h_c)
1238   (=> hop_1_h_b hop_2_h_b)
1239   (=> hop_1_h_e hop_2_h_e)
1240   (=> hop_1_h_d hop_2_h_d)
1241   (=> hop_1_h_g hop_2_h_g)
1242   (=> hop_1_h_f hop_2_h_f)
1243   (=> hop_1_h_i hop_2_h_i)
1244   (=> hop_1_h_k hop_2_h_k)
1245   (=> hop_1_h_j hop_2_h_j)
1246   (=> hop_1_h_m hop_2_h_m)
1247   (=> hop_1_h_l hop_2_h_l)
1248   (=> hop_1_h_o hop_2_h_o)
1249   (=> hop_1_h_n hop_2_h_n)
1250   (=> hop_1_h_q hop_2_h_q)
1251   (=> hop_1_h_p hop_2_h_p)
1252   (=> hop_1_k_a hop_2_k_a)
1253   (=> hop_1_k_c hop_2_k_c)
1254   (=> hop_1_k_b hop_2_k_b)
1255   (=> hop_1_k_e hop_2_k_e)
1256   (=> hop_1_k_d hop_2_k_d)
1257   (=> hop_1_k_g hop_2_k_g)
1258   (=> hop_1_k_f hop_2_k_f)
1259   (=> hop_1_k_i hop_2_k_i)
1260   (=> hop_1_k_h hop_2_k_h)
1261   (=> hop_1_k_j hop_2_k_j)
1262   (=> hop_1_k_m hop_2_k_m)
1263   (=> hop_1_k_l hop_2_k_l)
1264   (=> hop_1_k_o hop_2_k_o)
1265   (=> hop_1_k_n hop_2_k_n)
1266   (=> hop_1_k_q hop_2_k_q)
1267   (=> hop_1_k_p hop_2_k_p)
1268   (=> hop_1_j_a hop_2_j_a)
1269   (=> hop_1_j_c hop_2_j_c)
1270   (=> hop_1_j_b hop_2_j_b)
1271   (=> hop_1_j_e hop_2_j_e)
1272   (=> hop_1_j_d hop_2_j_d)
1273   (=> hop_1_j_g hop_2_j_g)
1274   (=> hop_1_j_f hop_2_j_f)
1275   (=> hop_1_j_i hop_2_j_i)
1276   (=> hop_1_j_h hop_2_j_h)
1277   (=> hop_1_j_k hop_2_j_k)
1278   (=> hop_1_j_m hop_2_j_m)
1279   (=> hop_1_j_l hop_2_j_l)
1280   (=> hop_1_j_o hop_2_j_o)
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1281  (=> hop_1_j_n hop_2_j_n)
1282  (=> hop_1_j_q hop_2_j_q)
1283  (=> hop_1_j_p hop_2_j_p)
1284  (=> hop_1_m_a hop_2_m_a)
1285  (=> hop_1_m_c hop_2_m_c)
1286  (=> hop_1_m_b hop_2_m_b)
1287  (=> hop_1_m_e hop_2_m_e)
1288  (=> hop_1_m_d hop_2_m_d)
1289  (=> hop_1_m_g hop_2_m_g)
1290  (=> hop_1_m_f hop_2_m_f)
1291  (=> hop_1_m_i hop_2_m_i)
1292  (=> hop_1_m_h hop_2_m_h)
1293  (=> hop_1_m_k hop_2_m_k)
1294  (=> hop_1_m_j hop_2_m_j)
1295  (=> hop_1_m_l hop_2_m_l)
1296  (=> hop_1_m_o hop_2_m_o)
1297  (=> hop_1_m_n hop_2_m_n)
1298  (=> hop_1_m_q hop_2_m_q)
1299  (=> hop_1_m_p hop_2_m_p)
1300  (=> hop_1_l_a hop_2_l_a)
1301  (=> hop_1_l_c hop_2_l_c)
1302  (=> hop_1_l_b hop_2_l_b)
1303  (=> hop_1_l_e hop_2_l_e)
1304  (=> hop_1_l_d hop_2_l_d)
1305  (=> hop_1_l_g hop_2_l_g)
1306  (=> hop_1_l_f hop_2_l_f)
1307  (=> hop_1_l_i hop_2_l_i)
1308  (=> hop_1_l_h hop_2_l_h)
1309  (=> hop_1_l_k hop_2_l_k)
1310  (=> hop_1_l_j hop_2_l_j)
1311  (=> hop_1_l_m hop_2_l_m)
1312  (=> hop_1_l_o hop_2_l_o)
1313  (=> hop_1_l_n hop_2_l_n)
1314  (=> hop_1_l_q hop_2_l_q)
1315  (=> hop_1_l_p hop_2_l_p)
1316  (=> hop_1_o_a hop_2_o_a)
1317  (=> hop_1_o_c hop_2_o_c)
1318  (=> hop_1_o_b hop_2_o_b)
1319  (=> hop_1_o_e hop_2_o_e)
1320  (=> hop_1_o_d hop_2_o_d)
1321  (=> hop_1_o_g hop_2_o_g)
1322  (=> hop_1_o_f hop_2_o_f)
1323  (=> hop_1_o_i hop_2_o_i)
1324  (=> hop_1_o_h hop_2_o_h)
1325  (=> hop_1_o_k hop_2_o_k)
1326  (=> hop_1_o_j hop_2_o_j)
1327  (=> hop_1_o_m hop_2_o_m)
1328  (=> hop_1_o_l hop_2_o_l)
1329  (=> hop_1_o_n hop_2_o_n)
1330  (=> hop_1_o_q hop_2_o_q)
1331  (=> hop_1_o_p hop_2_o_p)
1332  (=> hop_1_n_a hop_2_n_a)
1333  (=> hop_1_n_c hop_2_n_c)
1334  (=> hop_1_n_b hop_2_n_b)
1335  (=> hop_1_n_e hop_2_n_e)
1336  (=> hop_1_n_d hop_2_n_d)
1337  (=> hop_1_n_g hop_2_n_g)
1338  (=> hop_1_n_f hop_2_n_f)
1339  (=> hop_1_n_i hop_2_n_i)
1340  (=> hop_1_n_h hop_2_n_h)
1341  (=> hop_1_n_k hop_2_n_k)
1342  (=> hop_1_n_j hop_2_n_j)
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```
1343   (=> hop_1_n_m hop_2_n_m)
1344   (=> hop_1_n_l hop_2_n_l)
1345   (=> hop_1_n_o hop_2_n_o)
1346   (=> hop_1_n_q hop_2_n_q)
1347   (=> hop_1_n_p hop_2_n_p)
1348   (=> hop_1_q_a hop_2_q_a)
1349   (=> hop_1_q_c hop_2_q_c)
1350   (=> hop_1_q_b hop_2_q_b)
1351   (=> hop_1_q_e hop_2_q_e)
1352   (=> hop_1_q_d hop_2_q_d)
1353   (=> hop_1_q_g hop_2_q_g)
1354   (=> hop_1_q_f hop_2_q_f)
1355   (=> hop_1_q_i hop_2_q_i)
1356   (=> hop_1_q_h hop_2_q_h)
1357   (=> hop_1_q_k hop_2_q_k)
1358   (=> hop_1_q_j hop_2_q_j)
1359   (=> hop_1_q_m hop_2_q_m)
1360   (=> hop_1_q_l hop_2_q_l)
1361   (=> hop_1_q_o hop_2_q_o)
1362   (=> hop_1_q_n hop_2_q_n)
1363   (=> hop_1_q_p hop_2_q_p)
1364   (=> hop_1_p_a hop_2_p_a)
1365   (=> hop_1_p_c hop_2_p_c)
1366   (=> hop_1_p_b hop_2_p_b)
1367   (=> hop_1_p_e hop_2_p_e)
1368   (=> hop_1_p_d hop_2_p_d)
1369   (=> hop_1_p_g hop_2_p_g)
1370   (=> hop_1_p_f hop_2_p_f)
1371   (=> hop_1_p_i hop_2_p_i)
1372   (=> hop_1_p_h hop_2_p_h)
1373   (=> hop_1_p_k hop_2_p_k)
1374   (=> hop_1_p_j hop_2_p_j)
1375   (=> hop_1_p_m hop_2_p_m)
1376   (=> hop_1_p_l hop_2_p_l)
1377   (=> hop_1_p_o hop_2_p_o)
1378   (=> hop_1_p_n hop_2_p_n)
1379   (=> hop_1_p_q hop_2_p_q)
1380   (=> (and hop_1_a_c hop_1_c_b) hop_2_a_b)
1381   (=> (and hop_1_a_c hop_1_c_e) hop_2_a_e)
1382   (=> (and hop_1_a_c hop_1_c_d) hop_2_a_d)
1383   (=> (and hop_1_a_c hop_1_c_g) hop_2_a_g)
1384   (=> (and hop_1_a_c hop_1_c_f) hop_2_a_f)
1385   (=> (and hop_1_a_c hop_1_c_i) hop_2_a_i)
1386   (=> (and hop_1_a_c hop_1_c_h) hop_2_a_h)
1387   (=> (and hop_1_a_c hop_1_c_k) hop_2_a_k)
1388   (=> (and hop_1_a_c hop_1_c_j) hop_2_a_j)
1389   (=> (and hop_1_a_c hop_1_c_m) hop_2_a_m)
1390   (=> (and hop_1_a_c hop_1_c_l) hop_2_a_l)
1391   (=> (and hop_1_a_c hop_1_c_o) hop_2_a_o)
1392   (=> (and hop_1_a_c hop_1_c_n) hop_2_a_n)
1393   (=> (and hop_1_a_c hop_1_c_q) hop_2_a_q)
1394   (=> (and hop_1_a_c hop_1_c_p) hop_2_a_p)
1395   (=> (and hop_1_a_b hop_1_b_c) hop_2_a_c)
1396   (=> (and hop_1_a_b hop_1_b_e) hop_2_a_e)
1397   (=> (and hop_1_a_b hop_1_b_d) hop_2_a_d)
1398   (=> (and hop_1_a_b hop_1_b_g) hop_2_a_g)
1399   (=> (and hop_1_a_b hop_1_b_f) hop_2_a_f)
1400   (=> (and hop_1_a_b hop_1_b_i) hop_2_a_i)
1401   (=> (and hop_1_a_b hop_1_b_h) hop_2_a_h)
1402   (=> (and hop_1_a_b hop_1_b_k) hop_2_a_k)
1403   (=> (and hop_1_a_b hop_1_b_j) hop_2_a_j)
1404   (=> (and hop_1_a_b hop_1_b_m) hop_2_a_m)
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1405  (=> (and hop_1_a_b hop_1_b_l) hop_2_a_l)
1406  (=> (and hop_1_a_b hop_1_b_o) hop_2_a_o)
1407  (=> (and hop_1_a_b hop_1_b_n) hop_2_a_n)
1408  (=> (and hop_1_a_b hop_1_b_q) hop_2_a_q)
1409  (=> (and hop_1_a_b hop_1_b_p) hop_2_a_p)
1410  (=> (and hop_1_a_e hop_1_e_c) hop_2_a_c)
1411  (=> (and hop_1_a_e hop_1_e_b) hop_2_a_b)
1412  (=> (and hop_1_a_e hop_1_e_d) hop_2_a_d)
1413  (=> (and hop_1_a_e hop_1_e_g) hop_2_a_g)
1414  (=> (and hop_1_a_e hop_1_e_f) hop_2_a_f)
1415  (=> (and hop_1_a_e hop_1_e_i) hop_2_a_i)
1416  (=> (and hop_1_a_e hop_1_e_h) hop_2_a_h)
1417  (=> (and hop_1_a_e hop_1_e_k) hop_2_a_k)
1418  (=> (and hop_1_a_e hop_1_e_j) hop_2_a_j)
1419  (=> (and hop_1_a_e hop_1_e_m) hop_2_a_m)
1420  (=> (and hop_1_a_e hop_1_e_l) hop_2_a_l)
1421  (=> (and hop_1_a_e hop_1_e_o) hop_2_a_o)
1422  (=> (and hop_1_a_e hop_1_e_n) hop_2_a_n)
1423  (=> (and hop_1_a_e hop_1_e_q) hop_2_a_q)
1424  (=> (and hop_1_a_e hop_1_e_p) hop_2_a_p)
1425  (=> (and hop_1_a_d hop_1_d_c) hop_2_a_c)
1426  (=> (and hop_1_a_d hop_1_d_b) hop_2_a_b)
1427  (=> (and hop_1_a_d hop_1_d_e) hop_2_a_e)
1428  (=> (and hop_1_a_d hop_1_d_g) hop_2_a_g)
1429  (=> (and hop_1_a_d hop_1_d_f) hop_2_a_f)
1430  (=> (and hop_1_a_d hop_1_d_i) hop_2_a_i)
1431  (=> (and hop_1_a_d hop_1_d_h) hop_2_a_h)
1432  (=> (and hop_1_a_d hop_1_d_k) hop_2_a_k)
1433  (=> (and hop_1_a_d hop_1_d_j) hop_2_a_j)
1434  (=> (and hop_1_a_d hop_1_d_m) hop_2_a_m)
1435  (=> (and hop_1_a_d hop_1_d_l) hop_2_a_l)
1436  (=> (and hop_1_a_d hop_1_d_o) hop_2_a_o)
1437  (=> (and hop_1_a_d hop_1_d_n) hop_2_a_n)
1438  (=> (and hop_1_a_d hop_1_d_q) hop_2_a_q)
1439  (=> (and hop_1_a_d hop_1_d_p) hop_2_a_p)
1440  (=> (and hop_1_a_g hop_1_g_c) hop_2_a_c)
1441  (=> (and hop_1_a_g hop_1_g_b) hop_2_a_b)
1442  (=> (and hop_1_a_g hop_1_g_e) hop_2_a_e)
1443  (=> (and hop_1_a_g hop_1_g_d) hop_2_a_d)
1444  (=> (and hop_1_a_g hop_1_g_f) hop_2_a_f)
1445  (=> (and hop_1_a_g hop_1_g_i) hop_2_a_i)
1446  (=> (and hop_1_a_g hop_1_g_h) hop_2_a_h)
1447  (=> (and hop_1_a_g hop_1_g_k) hop_2_a_k)
1448  (=> (and hop_1_a_g hop_1_g_j) hop_2_a_j)
1449  (=> (and hop_1_a_g hop_1_g_m) hop_2_a_m)
1450  (=> (and hop_1_a_g hop_1_g_l) hop_2_a_l)
1451  (=> (and hop_1_a_g hop_1_g_o) hop_2_a_o)
1452  (=> (and hop_1_a_g hop_1_g_n) hop_2_a_n)
1453  (=> (and hop_1_a_g hop_1_g_q) hop_2_a_q)
1454  (=> (and hop_1_a_g hop_1_g_p) hop_2_a_p)
1455  (=> (and hop_1_a_f hop_1_f_c) hop_2_a_c)
1456  (=> (and hop_1_a_f hop_1_f_b) hop_2_a_b)
1457  (=> (and hop_1_a_f hop_1_f_e) hop_2_a_e)
1458  (=> (and hop_1_a_f hop_1_f_d) hop_2_a_d)
1459  (=> (and hop_1_a_f hop_1_f_g) hop_2_a_g)
1460  (=> (and hop_1_a_f hop_1_f_i) hop_2_a_i)
1461  (=> (and hop_1_a_f hop_1_f_h) hop_2_a_h)
1462  (=> (and hop_1_a_f hop_1_f_k) hop_2_a_k)
1463  (=> (and hop_1_a_f hop_1_f_j) hop_2_a_j)
1464  (=> (and hop_1_a_f hop_1_f_m) hop_2_a_m)
1465  (=> (and hop_1_a_f hop_1_f_l) hop_2_a_l)
1466  (=> (and hop_1_a_f hop_1_f_o) hop_2_a_o)
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1467  (=> (and hop_1_a_f hop_1_f_n) hop_2_a_n)
1468  (=> (and hop_1_a_f hop_1_f_q) hop_2_a_q)
1469  (=> (and hop_1_a_f hop_1_f_p) hop_2_a_p)
1470  (=> (and hop_1_a_i hop_1_i_c) hop_2_a_c)
1471  (=> (and hop_1_a_i hop_1_i_b) hop_2_a_b)
1472  (=> (and hop_1_a_i hop_1_i_e) hop_2_a_e)
1473  (=> (and hop_1_a_i hop_1_i_d) hop_2_a_d)
1474  (=> (and hop_1_a_i hop_1_i_g) hop_2_a_g)
1475  (=> (and hop_1_a_i hop_1_i_f) hop_2_a_f)
1476  (=> (and hop_1_a_i hop_1_i_h) hop_2_a_h)
1477  (=> (and hop_1_a_i hop_1_i_k) hop_2_a_k)
1478  (=> (and hop_1_a_i hop_1_i_j) hop_2_a_j)
1479  (=> (and hop_1_a_i hop_1_i_m) hop_2_a_m)
1480  (=> (and hop_1_a_i hop_1_i_l) hop_2_a_l)
1481  (=> (and hop_1_a_i hop_1_i_o) hop_2_a_o)
1482  (=> (and hop_1_a_i hop_1_i_n) hop_2_a_n)
1483  (=> (and hop_1_a_i hop_1_i_q) hop_2_a_q)
1484  (=> (and hop_1_a_i hop_1_i_p) hop_2_a_p)
1485  (=> (and hop_1_a_h hop_1_h_c) hop_2_a_c)
1486  (=> (and hop_1_a_h hop_1_h_b) hop_2_a_b)
1487  (=> (and hop_1_a_h hop_1_h_e) hop_2_a_e)
1488  (=> (and hop_1_a_h hop_1_h_d) hop_2_a_d)
1489  (=> (and hop_1_a_h hop_1_h_g) hop_2_a_g)
1490  (=> (and hop_1_a_h hop_1_h_f) hop_2_a_f)
1491  (=> (and hop_1_a_h hop_1_h_i) hop_2_a_i)
1492  (=> (and hop_1_a_h hop_1_h_k) hop_2_a_k)
1493  (=> (and hop_1_a_h hop_1_h_j) hop_2_a_j)
1494  (=> (and hop_1_a_h hop_1_h_m) hop_2_a_m)
1495  (=> (and hop_1_a_h hop_1_h_l) hop_2_a_l)
1496  (=> (and hop_1_a_h hop_1_h_o) hop_2_a_o)
1497  (=> (and hop_1_a_h hop_1_h_n) hop_2_a_n)
1498  (=> (and hop_1_a_h hop_1_h_q) hop_2_a_q)
1499  (=> (and hop_1_a_h hop_1_h_p) hop_2_a_p)
1500  (=> (and hop_1_a_k hop_1_k_c) hop_2_a_c)
1501  (=> (and hop_1_a_k hop_1_k_b) hop_2_a_b)
1502  (=> (and hop_1_a_k hop_1_k_e) hop_2_a_e)
1503  (=> (and hop_1_a_k hop_1_k_d) hop_2_a_d)
1504  (=> (and hop_1_a_k hop_1_k_g) hop_2_a_g)
1505  (=> (and hop_1_a_k hop_1_k_f) hop_2_a_f)
1506  (=> (and hop_1_a_k hop_1_k_i) hop_2_a_i)
1507  (=> (and hop_1_a_k hop_1_k_h) hop_2_a_h)
1508  (=> (and hop_1_a_k hop_1_k_j) hop_2_a_j)
1509  (=> (and hop_1_a_k hop_1_k_m) hop_2_a_m)
1510  (=> (and hop_1_a_k hop_1_k_l) hop_2_a_l)
1511  (=> (and hop_1_a_k hop_1_k_o) hop_2_a_o)
1512  (=> (and hop_1_a_k hop_1_k_n) hop_2_a_n)
1513  (=> (and hop_1_a_k hop_1_k_q) hop_2_a_q)
1514  (=> (and hop_1_a_k hop_1_k_p) hop_2_a_p)
1515  (=> (and hop_1_a_j hop_1_j_c) hop_2_a_c)
1516  (=> (and hop_1_a_j hop_1_j_b) hop_2_a_b)
1517  (=> (and hop_1_a_j hop_1_j_e) hop_2_a_e)
1518  (=> (and hop_1_a_j hop_1_j_d) hop_2_a_d)
1519  (=> (and hop_1_a_j hop_1_j_g) hop_2_a_g)
1520  (=> (and hop_1_a_j hop_1_j_f) hop_2_a_f)
1521  (=> (and hop_1_a_j hop_1_j_i) hop_2_a_i)
1522  (=> (and hop_1_a_j hop_1_j_h) hop_2_a_h)
1523  (=> (and hop_1_a_j hop_1_j_k) hop_2_a_k)
1524  (=> (and hop_1_a_j hop_1_j_m) hop_2_a_m)
1525  (=> (and hop_1_a_j hop_1_j_l) hop_2_a_l)
1526  (=> (and hop_1_a_j hop_1_j_o) hop_2_a_o)
1527  (=> (and hop_1_a_j hop_1_j_n) hop_2_a_n)
1528  (=> (and hop_1_a_j hop_1_j_q) hop_2_a_q)
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1529  (=> (and hop_1_a_j hop_1_j_p) hop_2_a_p)
1530  (=> (and hop_1_a_m hop_1_m_c) hop_2_a_c)
1531  (=> (and hop_1_a_m hop_1_m_b) hop_2_a_b)
1532  (=> (and hop_1_a_m hop_1_m_e) hop_2_a_e)
1533  (=> (and hop_1_a_m hop_1_m_d) hop_2_a_d)
1534  (=> (and hop_1_a_m hop_1_m_g) hop_2_a_g)
1535  (=> (and hop_1_a_m hop_1_m_f) hop_2_a_f)
1536  (=> (and hop_1_a_m hop_1_m_i) hop_2_a_i)
1537  (=> (and hop_1_a_m hop_1_m_h) hop_2_a_h)
1538  (=> (and hop_1_a_m hop_1_m_k) hop_2_a_k)
1539  (=> (and hop_1_a_m hop_1_m_j) hop_2_a_j)
1540  (=> (and hop_1_a_m hop_1_m_l) hop_2_a_l)
1541  (=> (and hop_1_a_m hop_1_m_o) hop_2_a_o)
1542  (=> (and hop_1_a_m hop_1_m_n) hop_2_a_n)
1543  (=> (and hop_1_a_m hop_1_m_q) hop_2_a_q)
1544  (=> (and hop_1_a_m hop_1_m_p) hop_2_a_p)
1545  (=> (and hop_1_a_l hop_1_l_c) hop_2_a_c)
1546  (=> (and hop_1_a_l hop_1_l_b) hop_2_a_b)
1547  (=> (and hop_1_a_l hop_1_l_e) hop_2_a_e)
1548  (=> (and hop_1_a_l hop_1_l_d) hop_2_a_d)
1549  (=> (and hop_1_a_l hop_1_l_g) hop_2_a_g)
1550  (=> (and hop_1_a_l hop_1_l_f) hop_2_a_f)
1551  (=> (and hop_1_a_l hop_1_l_i) hop_2_a_i)
1552  (=> (and hop_1_a_l hop_1_l_h) hop_2_a_h)
1553  (=> (and hop_1_a_l hop_1_l_k) hop_2_a_k)
1554  (=> (and hop_1_a_l hop_1_l_j) hop_2_a_j)
1555  (=> (and hop_1_a_l hop_1_l_m) hop_2_a_m)
1556  (=> (and hop_1_a_l hop_1_l_o) hop_2_a_o)
1557  (=> (and hop_1_a_l hop_1_l_n) hop_2_a_n)
1558  (=> (and hop_1_a_l hop_1_l_q) hop_2_a_q)
1559  (=> (and hop_1_a_l hop_1_l_p) hop_2_a_p)
1560  (=> (and hop_1_a_o hop_1_o_c) hop_2_a_c)
1561  (=> (and hop_1_a_o hop_1_o_b) hop_2_a_b)
1562  (=> (and hop_1_a_o hop_1_o_e) hop_2_a_e)
1563  (=> (and hop_1_a_o hop_1_o_d) hop_2_a_d)
1564  (=> (and hop_1_a_o hop_1_o_g) hop_2_a_g)
1565  (=> (and hop_1_a_o hop_1_o_f) hop_2_a_f)
1566  (=> (and hop_1_a_o hop_1_o_i) hop_2_a_i)
1567  (=> (and hop_1_a_o hop_1_o_h) hop_2_a_h)
1568  (=> (and hop_1_a_o hop_1_o_k) hop_2_a_k)
1569  (=> (and hop_1_a_o hop_1_o_j) hop_2_a_j)
1570  (=> (and hop_1_a_o hop_1_o_m) hop_2_a_m)
1571  (=> (and hop_1_a_o hop_1_o_l) hop_2_a_l)
1572  (=> (and hop_1_a_o hop_1_o_n) hop_2_a_n)
1573  (=> (and hop_1_a_o hop_1_o_q) hop_2_a_q)
1574  (=> (and hop_1_a_o hop_1_o_p) hop_2_a_p)
1575  (=> (and hop_1_a_n hop_1_n_c) hop_2_a_c)
1576  (=> (and hop_1_a_n hop_1_n_b) hop_2_a_b)
1577  (=> (and hop_1_a_n hop_1_n_e) hop_2_a_e)
1578  (=> (and hop_1_a_n hop_1_n_d) hop_2_a_d)
1579  (=> (and hop_1_a_n hop_1_n_g) hop_2_a_g)
1580  (=> (and hop_1_a_n hop_1_n_f) hop_2_a_f)
1581  (=> (and hop_1_a_n hop_1_n_i) hop_2_a_i)
1582  (=> (and hop_1_a_n hop_1_n_h) hop_2_a_h)
1583  (=> (and hop_1_a_n hop_1_n_k) hop_2_a_k)
1584  (=> (and hop_1_a_n hop_1_n_j) hop_2_a_j)
1585  (=> (and hop_1_a_n hop_1_n_m) hop_2_a_m)
1586  (=> (and hop_1_a_n hop_1_n_l) hop_2_a_l)
1587  (=> (and hop_1_a_n hop_1_n_o) hop_2_a_o)
1588  (=> (and hop_1_a_n hop_1_n_q) hop_2_a_q)
1589  (=> (and hop_1_a_n hop_1_n_p) hop_2_a_p)
1590  (=> (and hop_1_a_q hop_1_q_c) hop_2_a_c)
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1591   (=> (and hop_1_a_q hop_1_q_b) hop_2_a_b)
1592   (=> (and hop_1_a_q hop_1_q_e) hop_2_a_e)
1593   (=> (and hop_1_a_q hop_1_q_d) hop_2_a_d)
1594   (=> (and hop_1_a_q hop_1_q_g) hop_2_a_g)
1595   (=> (and hop_1_a_q hop_1_q_f) hop_2_a_f)
1596   (=> (and hop_1_a_q hop_1_q_i) hop_2_a_i)
1597   (=> (and hop_1_a_q hop_1_q_h) hop_2_a_h)
1598   (=> (and hop_1_a_q hop_1_q_k) hop_2_a_k)
1599   (=> (and hop_1_a_q hop_1_q_j) hop_2_a_j)
1600   (=> (and hop_1_a_q hop_1_q_m) hop_2_a_m)
1601   (=> (and hop_1_a_q hop_1_q_l) hop_2_a_l)
1602   (=> (and hop_1_a_q hop_1_q_o) hop_2_a_o)
1603   (=> (and hop_1_a_q hop_1_q_n) hop_2_a_n)
1604   (=> (and hop_1_a_q hop_1_q_p) hop_2_a_p)
1605   (=> (and hop_1_a_p hop_1_p_c) hop_2_a_c)
1606   (=> (and hop_1_a_p hop_1_p_b) hop_2_a_b)
1607   (=> (and hop_1_a_p hop_1_p_e) hop_2_a_e)
1608   (=> (and hop_1_a_p hop_1_p_d) hop_2_a_d)
1609   (=> (and hop_1_a_p hop_1_p_g) hop_2_a_g)
1610   (=> (and hop_1_a_p hop_1_p_f) hop_2_a_f)
1611   (=> (and hop_1_a_p hop_1_p_i) hop_2_a_i)
1612   (=> (and hop_1_a_p hop_1_p_h) hop_2_a_h)
1613   (=> (and hop_1_a_p hop_1_p_k) hop_2_a_k)
1614   (=> (and hop_1_a_p hop_1_p_j) hop_2_a_j)
1615   (=> (and hop_1_a_p hop_1_p_m) hop_2_a_m)
1616   (=> (and hop_1_a_p hop_1_p_l) hop_2_a_l)
1617   (=> (and hop_1_a_p hop_1_p_o) hop_2_a_o)
1618   (=> (and hop_1_a_p hop_1_p_n) hop_2_a_n)
1619   (=> (and hop_1_a_p hop_1_p_q) hop_2_a_q)
1620   (=> (and hop_1_c_a hop_1_a_b) hop_2_c_b)
1621   (=> (and hop_1_c_a hop_1_a_e) hop_2_c_e)
1622   (=> (and hop_1_c_a hop_1_a_d) hop_2_c_d)
1623   (=> (and hop_1_c_a hop_1_a_g) hop_2_c_g)
1624   (=> (and hop_1_c_a hop_1_a_f) hop_2_c_f)
1625   (=> (and hop_1_c_a hop_1_a_i) hop_2_c_i)
1626   (=> (and hop_1_c_a hop_1_a_h) hop_2_c_h)
1627   (=> (and hop_1_c_a hop_1_a_k) hop_2_c_k)
1628   (=> (and hop_1_c_a hop_1_a_j) hop_2_c_j)
1629   (=> (and hop_1_c_a hop_1_a_m) hop_2_c_m)
1630   (=> (and hop_1_c_a hop_1_a_l) hop_2_c_l)
1631   (=> (and hop_1_c_a hop_1_a_o) hop_2_c_o)
1632   (=> (and hop_1_c_a hop_1_a_n) hop_2_c_n)
1633   (=> (and hop_1_c_a hop_1_a_q) hop_2_c_q)
1634   (=> (and hop_1_c_a hop_1_a_p) hop_2_c_p)
1635   (=> (and hop_1_c_b hop_1_b_a) hop_2_c_a)
1636   (=> (and hop_1_c_b hop_1_b_e) hop_2_c_e)
1637   (=> (and hop_1_c_b hop_1_b_d) hop_2_c_d)
1638   (=> (and hop_1_c_b hop_1_b_g) hop_2_c_g)
1639   (=> (and hop_1_c_b hop_1_b_f) hop_2_c_f)
1640   (=> (and hop_1_c_b hop_1_b_i) hop_2_c_i)
1641   (=> (and hop_1_c_b hop_1_b_h) hop_2_c_h)
1642   (=> (and hop_1_c_b hop_1_b_k) hop_2_c_k)
1643   (=> (and hop_1_c_b hop_1_b_j) hop_2_c_j)
1644   (=> (and hop_1_c_b hop_1_b_m) hop_2_c_m)
1645   (=> (and hop_1_c_b hop_1_b_l) hop_2_c_l)
1646   (=> (and hop_1_c_b hop_1_b_o) hop_2_c_o)
1647   (=> (and hop_1_c_b hop_1_b_n) hop_2_c_n)
1648   (=> (and hop_1_c_b hop_1_b_q) hop_2_c_q)
1649   (=> (and hop_1_c_b hop_1_b_p) hop_2_c_p)
1650   (=> (and hop_1_c_e hop_1_e_a) hop_2_c_a)
1651   (=> (and hop_1_c_e hop_1_e_b) hop_2_c_b)
1652   (=> (and hop_1_c_e hop_1_e_d) hop_2_c_d)
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1653  (=> (and hop_1_c_e hop_1_e_g) hop_2_c_g)
1654  (=> (and hop_1_c_e hop_1_e_f) hop_2_c_f)
1655  (=> (and hop_1_c_e hop_1_e_i) hop_2_c_i)
1656  (=> (and hop_1_c_e hop_1_e_h) hop_2_c_h)
1657  (=> (and hop_1_c_e hop_1_e_k) hop_2_c_k)
1658  (=> (and hop_1_c_e hop_1_e_j) hop_2_c_j)
1659  (=> (and hop_1_c_e hop_1_e_m) hop_2_c_m)
1660  (=> (and hop_1_c_e hop_1_e_l) hop_2_c_l)
1661  (=> (and hop_1_c_e hop_1_e_o) hop_2_c_o)
1662  (=> (and hop_1_c_e hop_1_e_n) hop_2_c_n)
1663  (=> (and hop_1_c_e hop_1_e_q) hop_2_c_q)
1664  (=> (and hop_1_c_e hop_1_e_p) hop_2_c_p)
1665  (=> (and hop_1_c_d hop_1_d_a) hop_2_c_a)
1666  (=> (and hop_1_c_d hop_1_d_b) hop_2_c_b)
1667  (=> (and hop_1_c_d hop_1_d_e) hop_2_c_e)
1668  (=> (and hop_1_c_d hop_1_d_g) hop_2_c_g)
1669  (=> (and hop_1_c_d hop_1_d_f) hop_2_c_f)
1670  (=> (and hop_1_c_d hop_1_d_i) hop_2_c_i)
1671  (=> (and hop_1_c_d hop_1_d_h) hop_2_c_h)
1672  (=> (and hop_1_c_d hop_1_d_k) hop_2_c_k)
1673  (=> (and hop_1_c_d hop_1_d_j) hop_2_c_j)
1674  (=> (and hop_1_c_d hop_1_d_m) hop_2_c_m)
1675  (=> (and hop_1_c_d hop_1_d_l) hop_2_c_l)
1676  (=> (and hop_1_c_d hop_1_d_o) hop_2_c_o)
1677  (=> (and hop_1_c_d hop_1_d_n) hop_2_c_n)
1678  (=> (and hop_1_c_d hop_1_d_q) hop_2_c_q)
1679  (=> (and hop_1_c_d hop_1_d_p) hop_2_c_p)
1680  (=> (and hop_1_c_g hop_1_g_a) hop_2_c_a)
1681  (=> (and hop_1_c_g hop_1_g_b) hop_2_c_b)
1682  (=> (and hop_1_c_g hop_1_g_e) hop_2_c_e)
1683  (=> (and hop_1_c_g hop_1_g_d) hop_2_c_d)
1684  (=> (and hop_1_c_g hop_1_g_f) hop_2_c_f)
1685  (=> (and hop_1_c_g hop_1_g_i) hop_2_c_i)
1686  (=> (and hop_1_c_g hop_1_g_h) hop_2_c_h)
1687  (=> (and hop_1_c_g hop_1_g_k) hop_2_c_k)
1688  (=> (and hop_1_c_g hop_1_g_j) hop_2_c_j)
1689  (=> (and hop_1_c_g hop_1_g_m) hop_2_c_m)
1690  (=> (and hop_1_c_g hop_1_g_l) hop_2_c_l)
1691  (=> (and hop_1_c_g hop_1_g_o) hop_2_c_o)
1692  (=> (and hop_1_c_g hop_1_g_n) hop_2_c_n)
1693  (=> (and hop_1_c_g hop_1_g_q) hop_2_c_q)
1694  (=> (and hop_1_c_g hop_1_g_p) hop_2_c_p)
1695  (=> (and hop_1_c_f hop_1_f_a) hop_2_c_a)
1696  (=> (and hop_1_c_f hop_1_f_b) hop_2_c_b)
1697  (=> (and hop_1_c_f hop_1_f_e) hop_2_c_e)
1698  (=> (and hop_1_c_f hop_1_f_d) hop_2_c_d)
1699  (=> (and hop_1_c_f hop_1_f_g) hop_2_c_g)
1700  (=> (and hop_1_c_f hop_1_f_i) hop_2_c_i)
1701  (=> (and hop_1_c_f hop_1_f_h) hop_2_c_h)
1702  (=> (and hop_1_c_f hop_1_f_k) hop_2_c_k)
1703  (=> (and hop_1_c_f hop_1_f_j) hop_2_c_j)
1704  (=> (and hop_1_c_f hop_1_f_m) hop_2_c_m)
1705  (=> (and hop_1_c_f hop_1_f_l) hop_2_c_l)
1706  (=> (and hop_1_c_f hop_1_f_o) hop_2_c_o)
1707  (=> (and hop_1_c_f hop_1_f_n) hop_2_c_n)
1708  (=> (and hop_1_c_f hop_1_f_q) hop_2_c_q)
1709  (=> (and hop_1_c_f hop_1_f_p) hop_2_c_p)
1710  (=> (and hop_1_c_i hop_1_i_a) hop_2_c_a)
1711  (=> (and hop_1_c_i hop_1_i_b) hop_2_c_b)
1712  (=> (and hop_1_c_i hop_1_i_e) hop_2_c_e)
1713  (=> (and hop_1_c_i hop_1_i_d) hop_2_c_d)
1714  (=> (and hop_1_c_i hop_1_i_g) hop_2_c_g)
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1715   (=> (and hop_1_c_i hop_1_i_f) hop_2_c_f)
1716   (=> (and hop_1_c_i hop_1_i_h) hop_2_c_h)
1717   (=> (and hop_1_c_i hop_1_i_k) hop_2_c_k)
1718   (=> (and hop_1_c_i hop_1_i_j) hop_2_c_j)
1719   (=> (and hop_1_c_i hop_1_i_m) hop_2_c_m)
1720   (=> (and hop_1_c_i hop_1_i_l) hop_2_c_l)
1721   (=> (and hop_1_c_i hop_1_i_o) hop_2_c_o)
1722   (=> (and hop_1_c_i hop_1_i_n) hop_2_c_n)
1723   (=> (and hop_1_c_i hop_1_i_q) hop_2_c_q)
1724   (=> (and hop_1_c_i hop_1_i_p) hop_2_c_p)
1725   (=> (and hop_1_c_h hop_1_h_a) hop_2_c_a)
1726   (=> (and hop_1_c_h hop_1_h_b) hop_2_c_b)
1727   (=> (and hop_1_c_h hop_1_h_e) hop_2_c_e)
1728   (=> (and hop_1_c_h hop_1_h_d) hop_2_c_d)
1729   (=> (and hop_1_c_h hop_1_h_g) hop_2_c_g)
1730   (=> (and hop_1_c_h hop_1_h_f) hop_2_c_f)
1731   (=> (and hop_1_c_h hop_1_h_i) hop_2_c_i)
1732   (=> (and hop_1_c_h hop_1_h_k) hop_2_c_k)
1733   (=> (and hop_1_c_h hop_1_h_j) hop_2_c_j)
1734   (=> (and hop_1_c_h hop_1_h_m) hop_2_c_m)
1735   (=> (and hop_1_c_h hop_1_h_l) hop_2_c_l)
1736   (=> (and hop_1_c_h hop_1_h_o) hop_2_c_o)
1737   (=> (and hop_1_c_h hop_1_h_n) hop_2_c_n)
1738   (=> (and hop_1_c_h hop_1_h_q) hop_2_c_q)
1739   (=> (and hop_1_c_h hop_1_h_p) hop_2_c_p)
1740   (=> (and hop_1_c_k hop_1_k_a) hop_2_c_a)
1741   (=> (and hop_1_c_k hop_1_k_b) hop_2_c_b)
1742   (=> (and hop_1_c_k hop_1_k_e) hop_2_c_e)
1743   (=> (and hop_1_c_k hop_1_k_d) hop_2_c_d)
1744   (=> (and hop_1_c_k hop_1_k_g) hop_2_c_g)
1745   (=> (and hop_1_c_k hop_1_k_f) hop_2_c_f)
1746   (=> (and hop_1_c_k hop_1_k_i) hop_2_c_i)
1747   (=> (and hop_1_c_k hop_1_k_h) hop_2_c_h)
1748   (=> (and hop_1_c_k hop_1_k_j) hop_2_c_j)
1749   (=> (and hop_1_c_k hop_1_k_m) hop_2_c_m)
1750   (=> (and hop_1_c_k hop_1_k_l) hop_2_c_l)
1751   (=> (and hop_1_c_k hop_1_k_o) hop_2_c_o)
1752   (=> (and hop_1_c_k hop_1_k_n) hop_2_c_n)
1753   (=> (and hop_1_c_k hop_1_k_q) hop_2_c_q)
1754   (=> (and hop_1_c_k hop_1_k_p) hop_2_c_p)
1755   (=> (and hop_1_c_j hop_1_j_a) hop_2_c_a)
1756   (=> (and hop_1_c_j hop_1_j_b) hop_2_c_b)
1757   (=> (and hop_1_c_j hop_1_j_e) hop_2_c_e)
1758   (=> (and hop_1_c_j hop_1_j_d) hop_2_c_d)
1759   (=> (and hop_1_c_j hop_1_j_g) hop_2_c_g)
1760   (=> (and hop_1_c_j hop_1_j_f) hop_2_c_f)
1761   (=> (and hop_1_c_j hop_1_j_i) hop_2_c_i)
1762   (=> (and hop_1_c_j hop_1_j_h) hop_2_c_h)
1763   (=> (and hop_1_c_j hop_1_j_k) hop_2_c_k)
1764   (=> (and hop_1_c_j hop_1_j_m) hop_2_c_m)
1765   (=> (and hop_1_c_j hop_1_j_l) hop_2_c_l)
1766   (=> (and hop_1_c_j hop_1_j_o) hop_2_c_o)
1767   (=> (and hop_1_c_j hop_1_j_n) hop_2_c_n)
1768   (=> (and hop_1_c_j hop_1_j_q) hop_2_c_q)
1769   (=> (and hop_1_c_j hop_1_j_p) hop_2_c_p)
1770   (=> (and hop_1_c_m hop_1_m_a) hop_2_c_a)
1771   (=> (and hop_1_c_m hop_1_m_b) hop_2_c_b)
1772   (=> (and hop_1_c_m hop_1_m_e) hop_2_c_e)
1773   (=> (and hop_1_c_m hop_1_m_d) hop_2_c_d)
1774   (=> (and hop_1_c_m hop_1_m_g) hop_2_c_g)
1775   (=> (and hop_1_c_m hop_1_m_f) hop_2_c_f)
1776   (=> (and hop_1_c_m hop_1_m_i) hop_2_c_i)
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1777  (=> (and hop_1_c_m hop_1_m_h) hop_2_c_h)
1778  (=> (and hop_1_c_m hop_1_m_k) hop_2_c_k)
1779  (=> (and hop_1_c_m hop_1_m_j) hop_2_c_j)
1780  (=> (and hop_1_c_m hop_1_m_l) hop_2_c_l)
1781  (=> (and hop_1_c_m hop_1_m_o) hop_2_c_o)
1782  (=> (and hop_1_c_m hop_1_m_n) hop_2_c_n)
1783  (=> (and hop_1_c_m hop_1_m_q) hop_2_c_q)
1784  (=> (and hop_1_c_m hop_1_m_p) hop_2_c_p)
1785  (=> (and hop_1_c_l hop_1_l_a) hop_2_c_a)
1786  (=> (and hop_1_c_l hop_1_l_b) hop_2_c_b)
1787  (=> (and hop_1_c_l hop_1_l_e) hop_2_c_e)
1788  (=> (and hop_1_c_l hop_1_l_d) hop_2_c_d)
1789  (=> (and hop_1_c_l hop_1_l_g) hop_2_c_g)
1790  (=> (and hop_1_c_l hop_1_l_f) hop_2_c_f)
1791  (=> (and hop_1_c_l hop_1_l_i) hop_2_c_i)
1792  (=> (and hop_1_c_l hop_1_l_h) hop_2_c_h)
1793  (=> (and hop_1_c_l hop_1_l_k) hop_2_c_k)
1794  (=> (and hop_1_c_l hop_1_l_j) hop_2_c_j)
1795  (=> (and hop_1_c_l hop_1_l_m) hop_2_c_m)
1796  (=> (and hop_1_c_l hop_1_l_o) hop_2_c_o)
1797  (=> (and hop_1_c_l hop_1_l_n) hop_2_c_n)
1798  (=> (and hop_1_c_l hop_1_l_q) hop_2_c_q)
1799  (=> (and hop_1_c_l hop_1_l_p) hop_2_c_p)
1800  (=> (and hop_1_c_o hop_1_o_a) hop_2_c_a)
1801  (=> (and hop_1_c_o hop_1_o_b) hop_2_c_b)
1802  (=> (and hop_1_c_o hop_1_o_e) hop_2_c_e)
1803  (=> (and hop_1_c_o hop_1_o_d) hop_2_c_d)
1804  (=> (and hop_1_c_o hop_1_o_g) hop_2_c_g)
1805  (=> (and hop_1_c_o hop_1_o_f) hop_2_c_f)
1806  (=> (and hop_1_c_o hop_1_o_i) hop_2_c_i)
1807  (=> (and hop_1_c_o hop_1_o_h) hop_2_c_h)
1808  (=> (and hop_1_c_o hop_1_o_k) hop_2_c_k)
1809  (=> (and hop_1_c_o hop_1_o_j) hop_2_c_j)
1810  (=> (and hop_1_c_o hop_1_o_m) hop_2_c_m)
1811  (=> (and hop_1_c_o hop_1_o_l) hop_2_c_l)
1812  (=> (and hop_1_c_o hop_1_o_n) hop_2_c_n)
1813  (=> (and hop_1_c_o hop_1_o_q) hop_2_c_q)
1814  (=> (and hop_1_c_o hop_1_o_p) hop_2_c_p)
1815  (=> (and hop_1_c_n hop_1_n_a) hop_2_c_a)
1816  (=> (and hop_1_c_n hop_1_n_b) hop_2_c_b)
1817  (=> (and hop_1_c_n hop_1_n_e) hop_2_c_e)
1818  (=> (and hop_1_c_n hop_1_n_d) hop_2_c_d)
1819  (=> (and hop_1_c_n hop_1_n_g) hop_2_c_g)
1820  (=> (and hop_1_c_n hop_1_n_f) hop_2_c_f)
1821  (=> (and hop_1_c_n hop_1_n_i) hop_2_c_i)
1822  (=> (and hop_1_c_n hop_1_n_h) hop_2_c_h)
1823  (=> (and hop_1_c_n hop_1_n_k) hop_2_c_k)
1824  (=> (and hop_1_c_n hop_1_n_j) hop_2_c_j)
1825  (=> (and hop_1_c_n hop_1_n_m) hop_2_c_m)
1826  (=> (and hop_1_c_n hop_1_n_l) hop_2_c_l)
1827  (=> (and hop_1_c_n hop_1_n_o) hop_2_c_o)
1828  (=> (and hop_1_c_n hop_1_n_q) hop_2_c_q)
1829  (=> (and hop_1_c_n hop_1_n_p) hop_2_c_p)
1830  (=> (and hop_1_c_q hop_1_q_a) hop_2_c_a)
1831  (=> (and hop_1_c_q hop_1_q_b) hop_2_c_b)
1832  (=> (and hop_1_c_q hop_1_q_e) hop_2_c_e)
1833  (=> (and hop_1_c_q hop_1_q_d) hop_2_c_d)
1834  (=> (and hop_1_c_q hop_1_q_g) hop_2_c_g)
1835  (=> (and hop_1_c_q hop_1_q_f) hop_2_c_f)
1836  (=> (and hop_1_c_q hop_1_q_i) hop_2_c_i)
1837  (=> (and hop_1_c_q hop_1_q_h) hop_2_c_h)
1838  (=> (and hop_1_c_q hop_1_q_k) hop_2_c_k)
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1839    (=> (and hop_1_c_q hop_1_q_j) hop_2_c_j)
1840    (=> (and hop_1_c_q hop_1_q_m) hop_2_c_m)
1841    (=> (and hop_1_c_q hop_1_q_l) hop_2_c_l)
1842    (=> (and hop_1_c_q hop_1_q_o) hop_2_c_o)
1843    (=> (and hop_1_c_q hop_1_q_n) hop_2_c_n)
1844    (=> (and hop_1_c_q hop_1_q_p) hop_2_c_p)
1845    (=> (and hop_1_c_p hop_1_p_a) hop_2_c_a)
1846    (=> (and hop_1_c_p hop_1_p_b) hop_2_c_b)
1847    (=> (and hop_1_c_p hop_1_p_e) hop_2_c_e)
1848    (=> (and hop_1_c_p hop_1_p_d) hop_2_c_d)
1849    (=> (and hop_1_c_p hop_1_p_g) hop_2_c_g)
1850    (=> (and hop_1_c_p hop_1_p_f) hop_2_c_f)
1851    (=> (and hop_1_c_p hop_1_p_i) hop_2_c_i)
1852    (=> (and hop_1_c_p hop_1_p_h) hop_2_c_h)
1853    (=> (and hop_1_c_p hop_1_p_k) hop_2_c_k)
1854    (=> (and hop_1_c_p hop_1_p_j) hop_2_c_j)
1855    (=> (and hop_1_c_p hop_1_p_m) hop_2_c_m)
1856    (=> (and hop_1_c_p hop_1_p_l) hop_2_c_l)
1857    (=> (and hop_1_c_p hop_1_p_o) hop_2_c_o)
1858    (=> (and hop_1_c_p hop_1_p_n) hop_2_c_n)
1859    (=> (and hop_1_c_p hop_1_p_q) hop_2_c_q)
1860    (=> (and hop_1_b_a hop_1_a_c) hop_2_b_c)
1861    (=> (and hop_1_b_a hop_1_a_e) hop_2_b_e)
1862    (=> (and hop_1_b_a hop_1_a_d) hop_2_b_d)
1863    (=> (and hop_1_b_a hop_1_a_g) hop_2_b_g)
1864    (=> (and hop_1_b_a hop_1_a_f) hop_2_b_f)
1865    (=> (and hop_1_b_a hop_1_a_i) hop_2_b_i)
1866    (=> (and hop_1_b_a hop_1_a_h) hop_2_b_h)
1867    (=> (and hop_1_b_a hop_1_a_k) hop_2_b_k)
1868    (=> (and hop_1_b_a hop_1_a_j) hop_2_b_j)
1869    (=> (and hop_1_b_a hop_1_a_m) hop_2_b_m)
1870    (=> (and hop_1_b_a hop_1_a_l) hop_2_b_l)
1871    (=> (and hop_1_b_a hop_1_a_o) hop_2_b_o)
1872    (=> (and hop_1_b_a hop_1_a_n) hop_2_b_n)
1873    (=> (and hop_1_b_a hop_1_a_q) hop_2_b_q)
1874    (=> (and hop_1_b_a hop_1_a_p) hop_2_b_p)
1875    (=> (and hop_1_b_c hop_1_c_a) hop_2_b_a)
1876    (=> (and hop_1_b_c hop_1_c_e) hop_2_b_e)
1877    (=> (and hop_1_b_c hop_1_c_d) hop_2_b_d)
1878    (=> (and hop_1_b_c hop_1_c_g) hop_2_b_g)
1879    (=> (and hop_1_b_c hop_1_c_f) hop_2_b_f)
1880    (=> (and hop_1_b_c hop_1_c_i) hop_2_b_i)
1881    (=> (and hop_1_b_c hop_1_c_h) hop_2_b_h)
1882    (=> (and hop_1_b_c hop_1_c_k) hop_2_b_k)
1883    (=> (and hop_1_b_c hop_1_c_j) hop_2_b_j)
1884    (=> (and hop_1_b_c hop_1_c_m) hop_2_b_m)
1885    (=> (and hop_1_b_c hop_1_c_l) hop_2_b_l)
1886    (=> (and hop_1_b_c hop_1_c_o) hop_2_b_o)
1887    (=> (and hop_1_b_c hop_1_c_n) hop_2_b_n)
1888    (=> (and hop_1_b_c hop_1_c_q) hop_2_b_q)
1889    (=> (and hop_1_b_c hop_1_c_p) hop_2_b_p)
1890    (=> (and hop_1_b_e hop_1_e_a) hop_2_b_a)
1891    (=> (and hop_1_b_e hop_1_e_c) hop_2_b_c)
1892    (=> (and hop_1_b_e hop_1_e_d) hop_2_b_d)
1893    (=> (and hop_1_b_e hop_1_e_g) hop_2_b_g)
1894    (=> (and hop_1_b_e hop_1_e_f) hop_2_b_f)
1895    (=> (and hop_1_b_e hop_1_e_i) hop_2_b_i)
1896    (=> (and hop_1_b_e hop_1_e_h) hop_2_b_h)
1897    (=> (and hop_1_b_e hop_1_e_k) hop_2_b_k)
1898    (=> (and hop_1_b_e hop_1_e_j) hop_2_b_j)
1899    (=> (and hop_1_b_e hop_1_e_m) hop_2_b_m)
1900    (=> (and hop_1_b_e hop_1_e_l) hop_2_b_l)
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1901  (=> (and hop_1_b_e hop_1_e_o) hop_2_b_o)
1902  (=> (and hop_1_b_e hop_1_e_n) hop_2_b_n)
1903  (=> (and hop_1_b_e hop_1_e_q) hop_2_b_q)
1904  (=> (and hop_1_b_e hop_1_e_p) hop_2_b_p)
1905  (=> (and hop_1_b_d hop_1_d_a) hop_2_b_a)
1906  (=> (and hop_1_b_d hop_1_d_c) hop_2_b_c)
1907  (=> (and hop_1_b_d hop_1_d_e) hop_2_b_e)
1908  (=> (and hop_1_b_d hop_1_d_g) hop_2_b_g)
1909  (=> (and hop_1_b_d hop_1_d_f) hop_2_b_f)
1910  (=> (and hop_1_b_d hop_1_d_i) hop_2_b_i)
1911  (=> (and hop_1_b_d hop_1_d_h) hop_2_b_h)
1912  (=> (and hop_1_b_d hop_1_d_k) hop_2_b_k)
1913  (=> (and hop_1_b_d hop_1_d_j) hop_2_b_j)
1914  (=> (and hop_1_b_d hop_1_d_m) hop_2_b_m)
1915  (=> (and hop_1_b_d hop_1_d_l) hop_2_b_l)
1916  (=> (and hop_1_b_d hop_1_d_o) hop_2_b_o)
1917  (=> (and hop_1_b_d hop_1_d_n) hop_2_b_n)
1918  (=> (and hop_1_b_d hop_1_d_q) hop_2_b_q)
1919  (=> (and hop_1_b_d hop_1_d_p) hop_2_b_p)
1920  (=> (and hop_1_b_g hop_1_g_a) hop_2_b_a)
1921  (=> (and hop_1_b_g hop_1_g_c) hop_2_b_c)
1922  (=> (and hop_1_b_g hop_1_g_e) hop_2_b_e)
1923  (=> (and hop_1_b_g hop_1_g_d) hop_2_b_d)
1924  (=> (and hop_1_b_g hop_1_g_f) hop_2_b_f)
1925  (=> (and hop_1_b_g hop_1_g_i) hop_2_b_i)
1926  (=> (and hop_1_b_g hop_1_g_h) hop_2_b_h)
1927  (=> (and hop_1_b_g hop_1_g_k) hop_2_b_k)
1928  (=> (and hop_1_b_g hop_1_g_j) hop_2_b_j)
1929  (=> (and hop_1_b_g hop_1_g_m) hop_2_b_m)
1930  (=> (and hop_1_b_g hop_1_g_l) hop_2_b_l)
1931  (=> (and hop_1_b_g hop_1_g_o) hop_2_b_o)
1932  (=> (and hop_1_b_g hop_1_g_n) hop_2_b_n)
1933  (=> (and hop_1_b_g hop_1_g_q) hop_2_b_q)
1934  (=> (and hop_1_b_g hop_1_g_p) hop_2_b_p)
1935  (=> (and hop_1_b_f hop_1_f_a) hop_2_b_a)
1936  (=> (and hop_1_b_f hop_1_f_c) hop_2_b_c)
1937  (=> (and hop_1_b_f hop_1_f_e) hop_2_b_e)
1938  (=> (and hop_1_b_f hop_1_f_d) hop_2_b_d)
1939  (=> (and hop_1_b_f hop_1_f_g) hop_2_b_g)
1940  (=> (and hop_1_b_f hop_1_f_i) hop_2_b_i)
1941  (=> (and hop_1_b_f hop_1_f_h) hop_2_b_h)
1942  (=> (and hop_1_b_f hop_1_f_k) hop_2_b_k)
1943  (=> (and hop_1_b_f hop_1_f_j) hop_2_b_j)
1944  (=> (and hop_1_b_f hop_1_f_m) hop_2_b_m)
1945  (=> (and hop_1_b_f hop_1_f_l) hop_2_b_l)
1946  (=> (and hop_1_b_f hop_1_f_o) hop_2_b_o)
1947  (=> (and hop_1_b_f hop_1_f_n) hop_2_b_n)
1948  (=> (and hop_1_b_f hop_1_f_q) hop_2_b_q)
1949  (=> (and hop_1_b_f hop_1_f_p) hop_2_b_p)
1950  (=> (and hop_1_b_i hop_1_i_a) hop_2_b_a)
1951  (=> (and hop_1_b_i hop_1_i_c) hop_2_b_c)
1952  (=> (and hop_1_b_i hop_1_i_e) hop_2_b_e)
1953  (=> (and hop_1_b_i hop_1_i_d) hop_2_b_d)
1954  (=> (and hop_1_b_i hop_1_i_g) hop_2_b_g)
1955  (=> (and hop_1_b_i hop_1_i_f) hop_2_b_f)
1956  (=> (and hop_1_b_i hop_1_i_h) hop_2_b_h)
1957  (=> (and hop_1_b_i hop_1_i_k) hop_2_b_k)
1958  (=> (and hop_1_b_i hop_1_i_j) hop_2_b_j)
1959  (=> (and hop_1_b_i hop_1_i_m) hop_2_b_m)
1960  (=> (and hop_1_b_i hop_1_i_l) hop_2_b_l)
1961  (=> (and hop_1_b_i hop_1_i_o) hop_2_b_o)
1962  (=> (and hop_1_b_i hop_1_i_n) hop_2_b_n)
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1963   (=> (and hop_1_b_i hop_1_i_q) hop_2_b_q)
1964   (=> (and hop_1_b_i hop_1_i_p) hop_2_b_p)
1965   (=> (and hop_1_b_h hop_1_h_a) hop_2_b_a)
1966   (=> (and hop_1_b_h hop_1_h_c) hop_2_b_c)
1967   (=> (and hop_1_b_h hop_1_h_e) hop_2_b_e)
1968   (=> (and hop_1_b_h hop_1_h_d) hop_2_b_d)
1969   (=> (and hop_1_b_h hop_1_h_g) hop_2_b_g)
1970   (=> (and hop_1_b_h hop_1_h_f) hop_2_b_f)
1971   (=> (and hop_1_b_h hop_1_h_i) hop_2_b_i)
1972   (=> (and hop_1_b_h hop_1_h_k) hop_2_b_k)
1973   (=> (and hop_1_b_h hop_1_h_j) hop_2_b_j)
1974   (=> (and hop_1_b_h hop_1_h_m) hop_2_b_m)
1975   (=> (and hop_1_b_h hop_1_h_l) hop_2_b_l)
1976   (=> (and hop_1_b_h hop_1_h_o) hop_2_b_o)
1977   (=> (and hop_1_b_h hop_1_h_n) hop_2_b_n)
1978   (=> (and hop_1_b_h hop_1_h_q) hop_2_b_q)
1979   (=> (and hop_1_b_h hop_1_h_p) hop_2_b_p)
1980   (=> (and hop_1_b_k hop_1_k_a) hop_2_b_a)
1981   (=> (and hop_1_b_k hop_1_k_c) hop_2_b_c)
1982   (=> (and hop_1_b_k hop_1_k_e) hop_2_b_e)
1983   (=> (and hop_1_b_k hop_1_k_d) hop_2_b_d)
1984   (=> (and hop_1_b_k hop_1_k_g) hop_2_b_g)
1985   (=> (and hop_1_b_k hop_1_k_f) hop_2_b_f)
1986   (=> (and hop_1_b_k hop_1_k_i) hop_2_b_i)
1987   (=> (and hop_1_b_k hop_1_k_h) hop_2_b_h)
1988   (=> (and hop_1_b_k hop_1_k_j) hop_2_b_j)
1989   (=> (and hop_1_b_k hop_1_k_m) hop_2_b_m)
1990   (=> (and hop_1_b_k hop_1_k_l) hop_2_b_l)
1991   (=> (and hop_1_b_k hop_1_k_o) hop_2_b_o)
1992   (=> (and hop_1_b_k hop_1_k_n) hop_2_b_n)
1993   (=> (and hop_1_b_k hop_1_k_q) hop_2_b_q)
1994   (=> (and hop_1_b_k hop_1_k_p) hop_2_b_p)
1995   (=> (and hop_1_b_j hop_1_j_a) hop_2_b_a)
1996   (=> (and hop_1_b_j hop_1_j_c) hop_2_b_c)
1997   (=> (and hop_1_b_j hop_1_j_e) hop_2_b_e)
1998   (=> (and hop_1_b_j hop_1_j_d) hop_2_b_d)
1999   (=> (and hop_1_b_j hop_1_j_g) hop_2_b_g)
2000   (=> (and hop_1_b_j hop_1_j_f) hop_2_b_f)
2001   (=> (and hop_1_b_j hop_1_j_i) hop_2_b_i)
2002   (=> (and hop_1_b_j hop_1_j_h) hop_2_b_h)
2003   (=> (and hop_1_b_j hop_1_j_k) hop_2_b_k)
2004   (=> (and hop_1_b_j hop_1_j_m) hop_2_b_m)
2005   (=> (and hop_1_b_j hop_1_j_l) hop_2_b_l)
2006   (=> (and hop_1_b_j hop_1_j_o) hop_2_b_o)
2007   (=> (and hop_1_b_j hop_1_j_n) hop_2_b_n)
2008   (=> (and hop_1_b_j hop_1_j_q) hop_2_b_q)
2009   (=> (and hop_1_b_j hop_1_j_p) hop_2_b_p)
2010   (=> (and hop_1_b_m hop_1_m_a) hop_2_b_a)
2011   (=> (and hop_1_b_m hop_1_m_c) hop_2_b_c)
2012   (=> (and hop_1_b_m hop_1_m_e) hop_2_b_e)
2013   (=> (and hop_1_b_m hop_1_m_d) hop_2_b_d)
2014   (=> (and hop_1_b_m hop_1_m_g) hop_2_b_g)
2015   (=> (and hop_1_b_m hop_1_m_f) hop_2_b_f)
2016   (=> (and hop_1_b_m hop_1_m_i) hop_2_b_i)
2017   (=> (and hop_1_b_m hop_1_m_h) hop_2_b_h)
2018   (=> (and hop_1_b_m hop_1_m_k) hop_2_b_k)
2019   (=> (and hop_1_b_m hop_1_m_j) hop_2_b_j)
2020   (=> (and hop_1_b_m hop_1_m_l) hop_2_b_l)
2021   (=> (and hop_1_b_m hop_1_m_o) hop_2_b_o)
2022   (=> (and hop_1_b_m hop_1_m_n) hop_2_b_n)
2023   (=> (and hop_1_b_m hop_1_m_q) hop_2_b_q)
2024   (=> (and hop_1_b_m hop_1_m_p) hop_2_b_p)
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2025  (=> (and hop_1_b_l hop_1_l_a) hop_2_b_a)
2026  (=> (and hop_1_b_l hop_1_l_c) hop_2_b_c)
2027  (=> (and hop_1_b_l hop_1_l_e) hop_2_b_e)
2028  (=> (and hop_1_b_l hop_1_l_d) hop_2_b_d)
2029  (=> (and hop_1_b_l hop_1_l_g) hop_2_b_g)
2030  (=> (and hop_1_b_l hop_1_l_f) hop_2_b_f)
2031  (=> (and hop_1_b_l hop_1_l_i) hop_2_b_i)
2032  (=> (and hop_1_b_l hop_1_l_h) hop_2_b_h)
2033  (=> (and hop_1_b_l hop_1_l_k) hop_2_b_k)
2034  (=> (and hop_1_b_l hop_1_l_j) hop_2_b_j)
2035  (=> (and hop_1_b_l hop_1_l_m) hop_2_b_m)
2036  (=> (and hop_1_b_l hop_1_l_o) hop_2_b_o)
2037  (=> (and hop_1_b_l hop_1_l_n) hop_2_b_n)
2038  (=> (and hop_1_b_l hop_1_l_q) hop_2_b_q)
2039  (=> (and hop_1_b_l hop_1_l_p) hop_2_b_p)
2040  (=> (and hop_1_b_o hop_1_o_a) hop_2_b_a)
2041  (=> (and hop_1_b_o hop_1_o_c) hop_2_b_c)
2042  (=> (and hop_1_b_o hop_1_o_e) hop_2_b_e)
2043  (=> (and hop_1_b_o hop_1_o_d) hop_2_b_d)
2044  (=> (and hop_1_b_o hop_1_o_g) hop_2_b_g)
2045  (=> (and hop_1_b_o hop_1_o_f) hop_2_b_f)
2046  (=> (and hop_1_b_o hop_1_o_i) hop_2_b_i)
2047  (=> (and hop_1_b_o hop_1_o_h) hop_2_b_h)
2048  (=> (and hop_1_b_o hop_1_o_k) hop_2_b_k)
2049  (=> (and hop_1_b_o hop_1_o_j) hop_2_b_j)
2050  (=> (and hop_1_b_o hop_1_o_m) hop_2_b_m)
2051  (=> (and hop_1_b_o hop_1_o_l) hop_2_b_l)
2052  (=> (and hop_1_b_o hop_1_o_n) hop_2_b_n)
2053  (=> (and hop_1_b_o hop_1_o_q) hop_2_b_q)
2054  (=> (and hop_1_b_o hop_1_o_p) hop_2_b_p)
2055  (=> (and hop_1_b_n hop_1_n_a) hop_2_b_a)
2056  (=> (and hop_1_b_n hop_1_n_c) hop_2_b_c)
2057  (=> (and hop_1_b_n hop_1_n_e) hop_2_b_e)
2058  (=> (and hop_1_b_n hop_1_n_d) hop_2_b_d)
2059  (=> (and hop_1_b_n hop_1_n_g) hop_2_b_g)
2060  (=> (and hop_1_b_n hop_1_n_f) hop_2_b_f)
2061  (=> (and hop_1_b_n hop_1_n_i) hop_2_b_i)
2062  (=> (and hop_1_b_n hop_1_n_h) hop_2_b_h)
2063  (=> (and hop_1_b_n hop_1_n_k) hop_2_b_k)
2064  (=> (and hop_1_b_n hop_1_n_j) hop_2_b_j)
2065  (=> (and hop_1_b_n hop_1_n_m) hop_2_b_m)
2066  (=> (and hop_1_b_n hop_1_n_l) hop_2_b_l)
2067  (=> (and hop_1_b_n hop_1_n_o) hop_2_b_o)
2068  (=> (and hop_1_b_n hop_1_n_q) hop_2_b_q)
2069  (=> (and hop_1_b_n hop_1_n_p) hop_2_b_p)
2070  (=> (and hop_1_b_q hop_1_q_a) hop_2_b_a)
2071  (=> (and hop_1_b_q hop_1_q_c) hop_2_b_c)
2072  (=> (and hop_1_b_q hop_1_q_e) hop_2_b_e)
2073  (=> (and hop_1_b_q hop_1_q_d) hop_2_b_d)
2074  (=> (and hop_1_b_q hop_1_q_g) hop_2_b_g)
2075  (=> (and hop_1_b_q hop_1_q_f) hop_2_b_f)
2076  (=> (and hop_1_b_q hop_1_q_i) hop_2_b_i)
2077  (=> (and hop_1_b_q hop_1_q_h) hop_2_b_h)
2078  (=> (and hop_1_b_q hop_1_q_k) hop_2_b_k)
2079  (=> (and hop_1_b_q hop_1_q_j) hop_2_b_j)
2080  (=> (and hop_1_b_q hop_1_q_m) hop_2_b_m)
2081  (=> (and hop_1_b_q hop_1_q_l) hop_2_b_l)
2082  (=> (and hop_1_b_q hop_1_q_o) hop_2_b_o)
2083  (=> (and hop_1_b_q hop_1_q_n) hop_2_b_n)
2084  (=> (and hop_1_b_q hop_1_q_p) hop_2_b_p)
2085  (=> (and hop_1_b_p hop_1_p_a) hop_2_b_a)
2086  (=> (and hop_1_b_p hop_1_p_c) hop_2_b_c)
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2087  (=> (and hop_1_b_p hop_1_p_e) hop_2_b_e)
2088  (=> (and hop_1_b_p hop_1_p_d) hop_2_b_d)
2089  (=> (and hop_1_b_p hop_1_p_g) hop_2_b_g)
2090  (=> (and hop_1_b_p hop_1_p_f) hop_2_b_f)
2091  (=> (and hop_1_b_p hop_1_p_i) hop_2_b_i)
2092  (=> (and hop_1_b_p hop_1_p_h) hop_2_b_h)
2093  (=> (and hop_1_b_p hop_1_p_k) hop_2_b_k)
2094  (=> (and hop_1_b_p hop_1_p_j) hop_2_b_j)
2095  (=> (and hop_1_b_p hop_1_p_m) hop_2_b_m)
2096  (=> (and hop_1_b_p hop_1_p_l) hop_2_b_l)
2097  (=> (and hop_1_b_p hop_1_p_o) hop_2_b_o)
2098  (=> (and hop_1_b_p hop_1_p_n) hop_2_b_n)
2099  (=> (and hop_1_b_p hop_1_p_q) hop_2_b_q)
2100  (=> (and hop_1_e_a hop_1_a_c) hop_2_e_c)
2101  (=> (and hop_1_e_a hop_1_a_b) hop_2_e_b)
2102  (=> (and hop_1_e_a hop_1_a_d) hop_2_e_d)
2103  (=> (and hop_1_e_a hop_1_a_g) hop_2_e_g)
2104  (=> (and hop_1_e_a hop_1_a_f) hop_2_e_f)
2105  (=> (and hop_1_e_a hop_1_a_i) hop_2_e_i)
2106  (=> (and hop_1_e_a hop_1_a_h) hop_2_e_h)
2107  (=> (and hop_1_e_a hop_1_a_k) hop_2_e_k)
2108  (=> (and hop_1_e_a hop_1_a_j) hop_2_e_j)
2109  (=> (and hop_1_e_a hop_1_a_m) hop_2_e_m)
2110  (=> (and hop_1_e_a hop_1_a_l) hop_2_e_l)
2111  (=> (and hop_1_e_a hop_1_a_o) hop_2_e_o)
2112  (=> (and hop_1_e_a hop_1_a_n) hop_2_e_n)
2113  (=> (and hop_1_e_a hop_1_a_q) hop_2_e_q)
2114  (=> (and hop_1_e_a hop_1_a_p) hop_2_e_p)
2115  (=> (and hop_1_e_c hop_1_c_a) hop_2_e_a)
2116  (=> (and hop_1_e_c hop_1_c_b) hop_2_e_b)
2117  (=> (and hop_1_e_c hop_1_c_d) hop_2_e_d)
2118  (=> (and hop_1_e_c hop_1_c_g) hop_2_e_g)
2119  (=> (and hop_1_e_c hop_1_c_f) hop_2_e_f)
2120  (=> (and hop_1_e_c hop_1_c_i) hop_2_e_i)
2121  (=> (and hop_1_e_c hop_1_c_h) hop_2_e_h)
2122  (=> (and hop_1_e_c hop_1_c_k) hop_2_e_k)
2123  (=> (and hop_1_e_c hop_1_c_j) hop_2_e_j)
2124  (=> (and hop_1_e_c hop_1_c_m) hop_2_e_m)
2125  (=> (and hop_1_e_c hop_1_c_l) hop_2_e_l)
2126  (=> (and hop_1_e_c hop_1_c_o) hop_2_e_o)
2127  (=> (and hop_1_e_c hop_1_c_n) hop_2_e_n)
2128  (=> (and hop_1_e_c hop_1_c_q) hop_2_e_q)
2129  (=> (and hop_1_e_c hop_1_c_p) hop_2_e_p)
2130  (=> (and hop_1_e_b hop_1_b_a) hop_2_e_a)
2131  (=> (and hop_1_e_b hop_1_b_c) hop_2_e_c)
2132  (=> (and hop_1_e_b hop_1_b_d) hop_2_e_d)
2133  (=> (and hop_1_e_b hop_1_b_g) hop_2_e_g)
2134  (=> (and hop_1_e_b hop_1_b_f) hop_2_e_f)
2135  (=> (and hop_1_e_b hop_1_b_i) hop_2_e_i)
2136  (=> (and hop_1_e_b hop_1_b_h) hop_2_e_h)
2137  (=> (and hop_1_e_b hop_1_b_k) hop_2_e_k)
2138  (=> (and hop_1_e_b hop_1_b_j) hop_2_e_j)
2139  (=> (and hop_1_e_b hop_1_b_m) hop_2_e_m)
2140  (=> (and hop_1_e_b hop_1_b_l) hop_2_e_l)
2141  (=> (and hop_1_e_b hop_1_b_o) hop_2_e_o)
2142  (=> (and hop_1_e_b hop_1_b_n) hop_2_e_n)
2143  (=> (and hop_1_e_b hop_1_b_q) hop_2_e_q)
2144  (=> (and hop_1_e_b hop_1_b_p) hop_2_e_p)
2145  (=> (and hop_1_e_d hop_1_d_a) hop_2_e_a)
2146  (=> (and hop_1_e_d hop_1_d_c) hop_2_e_c)
2147  (=> (and hop_1_e_d hop_1_d_b) hop_2_e_b)
2148  (=> (and hop_1_e_d hop_1_d_g) hop_2_e_g)
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2149  (=> (and hop_1_e_d hop_1_d_f) hop_2_e_f)
2150  (=> (and hop_1_e_d hop_1_d_i) hop_2_e_i)
2151  (=> (and hop_1_e_d hop_1_d_h) hop_2_e_h)
2152  (=> (and hop_1_e_d hop_1_d_k) hop_2_e_k)
2153  (=> (and hop_1_e_d hop_1_d_j) hop_2_e_j)
2154  (=> (and hop_1_e_d hop_1_d_m) hop_2_e_m)
2155  (=> (and hop_1_e_d hop_1_d_l) hop_2_e_l)
2156  (=> (and hop_1_e_d hop_1_d_o) hop_2_e_o)
2157  (=> (and hop_1_e_d hop_1_d_n) hop_2_e_n)
2158  (=> (and hop_1_e_d hop_1_d_q) hop_2_e_q)
2159  (=> (and hop_1_e_d hop_1_d_p) hop_2_e_p)
2160  (=> (and hop_1_e_g hop_1_g_a) hop_2_e_a)
2161  (=> (and hop_1_e_g hop_1_g_c) hop_2_e_c)
2162  (=> (and hop_1_e_g hop_1_g_b) hop_2_e_b)
2163  (=> (and hop_1_e_g hop_1_g_d) hop_2_e_d)
2164  (=> (and hop_1_e_g hop_1_g_f) hop_2_e_f)
2165  (=> (and hop_1_e_g hop_1_g_i) hop_2_e_i)
2166  (=> (and hop_1_e_g hop_1_g_h) hop_2_e_h)
2167  (=> (and hop_1_e_g hop_1_g_k) hop_2_e_k)
2168  (=> (and hop_1_e_g hop_1_g_j) hop_2_e_j)
2169  (=> (and hop_1_e_g hop_1_g_m) hop_2_e_m)
2170  (=> (and hop_1_e_g hop_1_g_l) hop_2_e_l)
2171  (=> (and hop_1_e_g hop_1_g_o) hop_2_e_o)
2172  (=> (and hop_1_e_g hop_1_g_n) hop_2_e_n)
2173  (=> (and hop_1_e_g hop_1_g_q) hop_2_e_q)
2174  (=> (and hop_1_e_g hop_1_g_p) hop_2_e_p)
2175  (=> (and hop_1_e_f hop_1_f_a) hop_2_e_a)
2176  (=> (and hop_1_e_f hop_1_f_c) hop_2_e_c)
2177  (=> (and hop_1_e_f hop_1_f_b) hop_2_e_b)
2178  (=> (and hop_1_e_f hop_1_f_d) hop_2_e_d)
2179  (=> (and hop_1_e_f hop_1_f_g) hop_2_e_g)
2180  (=> (and hop_1_e_f hop_1_f_i) hop_2_e_i)
2181  (=> (and hop_1_e_f hop_1_f_h) hop_2_e_h)
2182  (=> (and hop_1_e_f hop_1_f_k) hop_2_e_k)
2183  (=> (and hop_1_e_f hop_1_f_j) hop_2_e_j)
2184  (=> (and hop_1_e_f hop_1_f_m) hop_2_e_m)
2185  (=> (and hop_1_e_f hop_1_f_l) hop_2_e_l)
2186  (=> (and hop_1_e_f hop_1_f_o) hop_2_e_o)
2187  (=> (and hop_1_e_f hop_1_f_n) hop_2_e_n)
2188  (=> (and hop_1_e_f hop_1_f_q) hop_2_e_q)
2189  (=> (and hop_1_e_f hop_1_f_p) hop_2_e_p)
2190  (=> (and hop_1_e_i hop_1_i_a) hop_2_e_a)
2191  (=> (and hop_1_e_i hop_1_i_c) hop_2_e_c)
2192  (=> (and hop_1_e_i hop_1_i_b) hop_2_e_b)
2193  (=> (and hop_1_e_i hop_1_i_d) hop_2_e_d)
2194  (=> (and hop_1_e_i hop_1_i_g) hop_2_e_g)
2195  (=> (and hop_1_e_i hop_1_i_f) hop_2_e_f)
2196  (=> (and hop_1_e_i hop_1_i_h) hop_2_e_h)
2197  (=> (and hop_1_e_i hop_1_i_k) hop_2_e_k)
2198  (=> (and hop_1_e_i hop_1_i_j) hop_2_e_j)
2199  (=> (and hop_1_e_i hop_1_i_m) hop_2_e_m)
2200  (=> (and hop_1_e_i hop_1_i_l) hop_2_e_l)
2201  (=> (and hop_1_e_i hop_1_i_o) hop_2_e_o)
2202  (=> (and hop_1_e_i hop_1_i_n) hop_2_e_n)
2203  (=> (and hop_1_e_i hop_1_i_q) hop_2_e_q)
2204  (=> (and hop_1_e_i hop_1_i_p) hop_2_e_p)
2205  (=> (and hop_1_e_h hop_1_h_a) hop_2_e_a)
2206  (=> (and hop_1_e_h hop_1_h_c) hop_2_e_c)
2207  (=> (and hop_1_e_h hop_1_h_b) hop_2_e_b)
2208  (=> (and hop_1_e_h hop_1_h_d) hop_2_e_d)
2209  (=> (and hop_1_e_h hop_1_h_g) hop_2_e_g)
2210  (=> (and hop_1_e_h hop_1_h_f) hop_2_e_f)
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2211  (=> (and hop_1_e_h hop_1_h_i) hop_2_e_i)
2212  (=> (and hop_1_e_h hop_1_h_k) hop_2_e_k)
2213  (=> (and hop_1_e_h hop_1_h_j) hop_2_e_j)
2214  (=> (and hop_1_e_h hop_1_h_m) hop_2_e_m)
2215  (=> (and hop_1_e_h hop_1_h_l) hop_2_e_l)
2216  (=> (and hop_1_e_h hop_1_h_o) hop_2_e_o)
2217  (=> (and hop_1_e_h hop_1_h_n) hop_2_e_n)
2218  (=> (and hop_1_e_h hop_1_h_q) hop_2_e_q)
2219  (=> (and hop_1_e_h hop_1_h_p) hop_2_e_p)
2220  (=> (and hop_1_e_k hop_1_k_a) hop_2_e_a)
2221  (=> (and hop_1_e_k hop_1_k_c) hop_2_e_c)
2222  (=> (and hop_1_e_k hop_1_k_b) hop_2_e_b)
2223  (=> (and hop_1_e_k hop_1_k_d) hop_2_e_d)
2224  (=> (and hop_1_e_k hop_1_k_g) hop_2_e_g)
2225  (=> (and hop_1_e_k hop_1_k_f) hop_2_e_f)
2226  (=> (and hop_1_e_k hop_1_k_i) hop_2_e_i)
2227  (=> (and hop_1_e_k hop_1_k_h) hop_2_e_h)
2228  (=> (and hop_1_e_k hop_1_k_j) hop_2_e_j)
2229  (=> (and hop_1_e_k hop_1_k_m) hop_2_e_m)
2230  (=> (and hop_1_e_k hop_1_k_l) hop_2_e_l)
2231  (=> (and hop_1_e_k hop_1_k_o) hop_2_e_o)
2232  (=> (and hop_1_e_k hop_1_k_n) hop_2_e_n)
2233  (=> (and hop_1_e_k hop_1_k_q) hop_2_e_q)
2234  (=> (and hop_1_e_k hop_1_k_p) hop_2_e_p)
2235  (=> (and hop_1_e_j hop_1_j_a) hop_2_e_a)
2236  (=> (and hop_1_e_j hop_1_j_c) hop_2_e_c)
2237  (=> (and hop_1_e_j hop_1_j_b) hop_2_e_b)
2238  (=> (and hop_1_e_j hop_1_j_d) hop_2_e_d)
2239  (=> (and hop_1_e_j hop_1_j_g) hop_2_e_g)
2240  (=> (and hop_1_e_j hop_1_j_f) hop_2_e_f)
2241  (=> (and hop_1_e_j hop_1_j_i) hop_2_e_i)
2242  (=> (and hop_1_e_j hop_1_j_h) hop_2_e_h)
2243  (=> (and hop_1_e_j hop_1_j_k) hop_2_e_k)
2244  (=> (and hop_1_e_j hop_1_j_m) hop_2_e_m)
2245  (=> (and hop_1_e_j hop_1_j_l) hop_2_e_l)
2246  (=> (and hop_1_e_j hop_1_j_o) hop_2_e_o)
2247  (=> (and hop_1_e_j hop_1_j_n) hop_2_e_n)
2248  (=> (and hop_1_e_j hop_1_j_q) hop_2_e_q)
2249  (=> (and hop_1_e_j hop_1_j_p) hop_2_e_p)
2250  (=> (and hop_1_e_m hop_1_m_a) hop_2_e_a)
2251  (=> (and hop_1_e_m hop_1_m_c) hop_2_e_c)
2252  (=> (and hop_1_e_m hop_1_m_b) hop_2_e_b)
2253  (=> (and hop_1_e_m hop_1_m_d) hop_2_e_d)
2254  (=> (and hop_1_e_m hop_1_m_g) hop_2_e_g)
2255  (=> (and hop_1_e_m hop_1_m_f) hop_2_e_f)
2256  (=> (and hop_1_e_m hop_1_m_i) hop_2_e_i)
2257  (=> (and hop_1_e_m hop_1_m_h) hop_2_e_h)
2258  (=> (and hop_1_e_m hop_1_m_k) hop_2_e_k)
2259  (=> (and hop_1_e_m hop_1_m_j) hop_2_e_j)
2260  (=> (and hop_1_e_m hop_1_m_l) hop_2_e_l)
2261  (=> (and hop_1_e_m hop_1_m_o) hop_2_e_o)
2262  (=> (and hop_1_e_m hop_1_m_n) hop_2_e_n)
2263  (=> (and hop_1_e_m hop_1_m_q) hop_2_e_q)
2264  (=> (and hop_1_e_m hop_1_m_p) hop_2_e_p)
2265  (=> (and hop_1_e_l hop_1_l_a) hop_2_e_a)
2266  (=> (and hop_1_e_l hop_1_l_c) hop_2_e_c)
2267  (=> (and hop_1_e_l hop_1_l_b) hop_2_e_b)
2268  (=> (and hop_1_e_l hop_1_l_d) hop_2_e_d)
2269  (=> (and hop_1_e_l hop_1_l_g) hop_2_e_g)
2270  (=> (and hop_1_e_l hop_1_l_f) hop_2_e_f)
2271  (=> (and hop_1_e_l hop_1_l_i) hop_2_e_i)
2272  (=> (and hop_1_e_l hop_1_l_h) hop_2_e_h)
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2273  (=> (and hop_1_e_l hop_1_l_k) hop_2_e_k)
2274  (=> (and hop_1_e_l hop_1_l_j) hop_2_e_j)
2275  (=> (and hop_1_e_l hop_1_l_m) hop_2_e_m)
2276  (=> (and hop_1_e_l hop_1_l_o) hop_2_e_o)
2277  (=> (and hop_1_e_l hop_1_l_n) hop_2_e_n)
2278  (=> (and hop_1_e_l hop_1_l_q) hop_2_e_q)
2279  (=> (and hop_1_e_l hop_1_l_p) hop_2_e_p)
2280  (=> (and hop_1_e_o hop_1_o_a) hop_2_e_a)
2281  (=> (and hop_1_e_o hop_1_o_c) hop_2_e_c)
2282  (=> (and hop_1_e_o hop_1_o_b) hop_2_e_b)
2283  (=> (and hop_1_e_o hop_1_o_d) hop_2_e_d)
2284  (=> (and hop_1_e_o hop_1_o_g) hop_2_e_g)
2285  (=> (and hop_1_e_o hop_1_o_f) hop_2_e_f)
2286  (=> (and hop_1_e_o hop_1_o_i) hop_2_e_i)
2287  (=> (and hop_1_e_o hop_1_o_h) hop_2_e_h)
2288  (=> (and hop_1_e_o hop_1_o_k) hop_2_e_k)
2289  (=> (and hop_1_e_o hop_1_o_j) hop_2_e_j)
2290  (=> (and hop_1_e_o hop_1_o_m) hop_2_e_m)
2291  (=> (and hop_1_e_o hop_1_o_l) hop_2_e_l)
2292  (=> (and hop_1_e_o hop_1_o_n) hop_2_e_n)
2293  (=> (and hop_1_e_o hop_1_o_q) hop_2_e_q)
2294  (=> (and hop_1_e_o hop_1_o_p) hop_2_e_p)
2295  (=> (and hop_1_e_n hop_1_n_a) hop_2_e_a)
2296  (=> (and hop_1_e_n hop_1_n_c) hop_2_e_c)
2297  (=> (and hop_1_e_n hop_1_n_b) hop_2_e_b)
2298  (=> (and hop_1_e_n hop_1_n_d) hop_2_e_d)
2299  (=> (and hop_1_e_n hop_1_n_g) hop_2_e_g)
2300  (=> (and hop_1_e_n hop_1_n_f) hop_2_e_f)
2301  (=> (and hop_1_e_n hop_1_n_i) hop_2_e_i)
2302  (=> (and hop_1_e_n hop_1_n_h) hop_2_e_h)
2303  (=> (and hop_1_e_n hop_1_n_k) hop_2_e_k)
2304  (=> (and hop_1_e_n hop_1_n_j) hop_2_e_j)
2305  (=> (and hop_1_e_n hop_1_n_m) hop_2_e_m)
2306  (=> (and hop_1_e_n hop_1_n_l) hop_2_e_l)
2307  (=> (and hop_1_e_n hop_1_n_o) hop_2_e_o)
2308  (=> (and hop_1_e_n hop_1_n_q) hop_2_e_q)
2309  (=> (and hop_1_e_n hop_1_n_p) hop_2_e_p)
2310  (=> (and hop_1_e_q hop_1_q_a) hop_2_e_a)
2311  (=> (and hop_1_e_q hop_1_q_c) hop_2_e_c)
2312  (=> (and hop_1_e_q hop_1_q_b) hop_2_e_b)
2313  (=> (and hop_1_e_q hop_1_q_d) hop_2_e_d)
2314  (=> (and hop_1_e_q hop_1_q_g) hop_2_e_g)
2315  (=> (and hop_1_e_q hop_1_q_f) hop_2_e_f)
2316  (=> (and hop_1_e_q hop_1_q_i) hop_2_e_i)
2317  (=> (and hop_1_e_q hop_1_q_h) hop_2_e_h)
2318  (=> (and hop_1_e_q hop_1_q_k) hop_2_e_k)
2319  (=> (and hop_1_e_q hop_1_q_j) hop_2_e_j)
2320  (=> (and hop_1_e_q hop_1_q_m) hop_2_e_m)
2321  (=> (and hop_1_e_q hop_1_q_l) hop_2_e_l)
2322  (=> (and hop_1_e_q hop_1_q_o) hop_2_e_o)
2323  (=> (and hop_1_e_q hop_1_q_n) hop_2_e_n)
2324  (=> (and hop_1_e_q hop_1_q_p) hop_2_e_p)
2325  (=> (and hop_1_e_p hop_1_p_a) hop_2_e_a)
2326  (=> (and hop_1_e_p hop_1_p_c) hop_2_e_c)
2327  (=> (and hop_1_e_p hop_1_p_b) hop_2_e_b)
2328  (=> (and hop_1_e_p hop_1_p_d) hop_2_e_d)
2329  (=> (and hop_1_e_p hop_1_p_g) hop_2_e_g)
2330  (=> (and hop_1_e_p hop_1_p_f) hop_2_e_f)
2331  (=> (and hop_1_e_p hop_1_p_i) hop_2_e_i)
2332  (=> (and hop_1_e_p hop_1_p_h) hop_2_e_h)
2333  (=> (and hop_1_e_p hop_1_p_k) hop_2_e_k)
2334  (=> (and hop_1_e_p hop_1_p_j) hop_2_e_j)
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2335  (=> (and hop_1_e_p hop_1_p_m) hop_2_e_m)
2336  (=> (and hop_1_e_p hop_1_p_l) hop_2_e_l)
2337  (=> (and hop_1_e_p hop_1_p_o) hop_2_e_o)
2338  (=> (and hop_1_e_p hop_1_p_n) hop_2_e_n)
2339  (=> (and hop_1_e_p hop_1_p_q) hop_2_e_q)
2340  (=> (and hop_1_d_a hop_1_a_c) hop_2_d_c)
2341  (=> (and hop_1_d_a hop_1_a_b) hop_2_d_b)
2342  (=> (and hop_1_d_a hop_1_a_e) hop_2_d_e)
2343  (=> (and hop_1_d_a hop_1_a_g) hop_2_d_g)
2344  (=> (and hop_1_d_a hop_1_a_f) hop_2_d_f)
2345  (=> (and hop_1_d_a hop_1_a_i) hop_2_d_i)
2346  (=> (and hop_1_d_a hop_1_a_h) hop_2_d_h)
2347  (=> (and hop_1_d_a hop_1_a_k) hop_2_d_k)
2348  (=> (and hop_1_d_a hop_1_a_j) hop_2_d_j)
2349  (=> (and hop_1_d_a hop_1_a_m) hop_2_d_m)
2350  (=> (and hop_1_d_a hop_1_a_l) hop_2_d_l)
2351  (=> (and hop_1_d_a hop_1_a_o) hop_2_d_o)
2352  (=> (and hop_1_d_a hop_1_a_n) hop_2_d_n)
2353  (=> (and hop_1_d_a hop_1_a_q) hop_2_d_q)
2354  (=> (and hop_1_d_a hop_1_a_p) hop_2_d_p)
2355  (=> (and hop_1_d_c hop_1_c_a) hop_2_d_a)
2356  (=> (and hop_1_d_c hop_1_c_b) hop_2_d_b)
2357  (=> (and hop_1_d_c hop_1_c_e) hop_2_d_e)
2358  (=> (and hop_1_d_c hop_1_c_g) hop_2_d_g)
2359  (=> (and hop_1_d_c hop_1_c_f) hop_2_d_f)
2360  (=> (and hop_1_d_c hop_1_c_i) hop_2_d_i)
2361  (=> (and hop_1_d_c hop_1_c_h) hop_2_d_h)
2362  (=> (and hop_1_d_c hop_1_c_k) hop_2_d_k)
2363  (=> (and hop_1_d_c hop_1_c_j) hop_2_d_j)
2364  (=> (and hop_1_d_c hop_1_c_m) hop_2_d_m)
2365  (=> (and hop_1_d_c hop_1_c_l) hop_2_d_l)
2366  (=> (and hop_1_d_c hop_1_c_o) hop_2_d_o)
2367  (=> (and hop_1_d_c hop_1_c_n) hop_2_d_n)
2368  (=> (and hop_1_d_c hop_1_c_q) hop_2_d_q)
2369  (=> (and hop_1_d_c hop_1_c_p) hop_2_d_p)
2370  (=> (and hop_1_d_b hop_1_b_a) hop_2_d_a)
2371  (=> (and hop_1_d_b hop_1_b_c) hop_2_d_c)
2372  (=> (and hop_1_d_b hop_1_b_e) hop_2_d_e)
2373  (=> (and hop_1_d_b hop_1_b_g) hop_2_d_g)
2374  (=> (and hop_1_d_b hop_1_b_f) hop_2_d_f)
2375  (=> (and hop_1_d_b hop_1_b_i) hop_2_d_i)
2376  (=> (and hop_1_d_b hop_1_b_h) hop_2_d_h)
2377  (=> (and hop_1_d_b hop_1_b_k) hop_2_d_k)
2378  (=> (and hop_1_d_b hop_1_b_j) hop_2_d_j)
2379  (=> (and hop_1_d_b hop_1_b_m) hop_2_d_m)
2380  (=> (and hop_1_d_b hop_1_b_l) hop_2_d_l)
2381  (=> (and hop_1_d_b hop_1_b_o) hop_2_d_o)
2382  (=> (and hop_1_d_b hop_1_b_n) hop_2_d_n)
2383  (=> (and hop_1_d_b hop_1_b_q) hop_2_d_q)
2384  (=> (and hop_1_d_b hop_1_b_p) hop_2_d_p)
2385  (=> (and hop_1_d_e hop_1_e_a) hop_2_d_a)
2386  (=> (and hop_1_d_e hop_1_e_c) hop_2_d_c)
2387  (=> (and hop_1_d_e hop_1_e_b) hop_2_d_b)
2388  (=> (and hop_1_d_e hop_1_e_g) hop_2_d_g)
2389  (=> (and hop_1_d_e hop_1_e_f) hop_2_d_f)
2390  (=> (and hop_1_d_e hop_1_e_i) hop_2_d_i)
2391  (=> (and hop_1_d_e hop_1_e_h) hop_2_d_h)
2392  (=> (and hop_1_d_e hop_1_e_k) hop_2_d_k)
2393  (=> (and hop_1_d_e hop_1_e_j) hop_2_d_j)
2394  (=> (and hop_1_d_e hop_1_e_m) hop_2_d_m)
2395  (=> (and hop_1_d_e hop_1_e_l) hop_2_d_l)
2396  (=> (and hop_1_d_e hop_1_e_o) hop_2_d_o)
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2397   (=> (and hop_1_d_e hop_1_e_n) hop_2_d_n)
2398   (=> (and hop_1_d_e hop_1_e_q) hop_2_d_q)
2399   (=> (and hop_1_d_e hop_1_e_p) hop_2_d_p)
2400   (=> (and hop_1_d_g hop_1_g_a) hop_2_d_a)
2401   (=> (and hop_1_d_g hop_1_g_c) hop_2_d_c)
2402   (=> (and hop_1_d_g hop_1_g_b) hop_2_d_b)
2403   (=> (and hop_1_d_g hop_1_g_e) hop_2_d_e)
2404   (=> (and hop_1_d_g hop_1_g_f) hop_2_d_f)
2405   (=> (and hop_1_d_g hop_1_g_i) hop_2_d_i)
2406   (=> (and hop_1_d_g hop_1_g_h) hop_2_d_h)
2407   (=> (and hop_1_d_g hop_1_g_k) hop_2_d_k)
2408   (=> (and hop_1_d_g hop_1_g_j) hop_2_d_j)
2409   (=> (and hop_1_d_g hop_1_g_m) hop_2_d_m)
2410   (=> (and hop_1_d_g hop_1_g_l) hop_2_d_l)
2411   (=> (and hop_1_d_g hop_1_g_o) hop_2_d_o)
2412   (=> (and hop_1_d_g hop_1_g_n) hop_2_d_n)
2413   (=> (and hop_1_d_g hop_1_g_q) hop_2_d_q)
2414   (=> (and hop_1_d_g hop_1_g_p) hop_2_d_p)
2415   (=> (and hop_1_d_f hop_1_f_a) hop_2_d_a)
2416   (=> (and hop_1_d_f hop_1_f_c) hop_2_d_c)
2417   (=> (and hop_1_d_f hop_1_f_b) hop_2_d_b)
2418   (=> (and hop_1_d_f hop_1_f_e) hop_2_d_e)
2419   (=> (and hop_1_d_f hop_1_f_g) hop_2_d_g)
2420   (=> (and hop_1_d_f hop_1_f_i) hop_2_d_i)
2421   (=> (and hop_1_d_f hop_1_f_h) hop_2_d_h)
2422   (=> (and hop_1_d_f hop_1_f_k) hop_2_d_k)
2423   (=> (and hop_1_d_f hop_1_f_j) hop_2_d_j)
2424   (=> (and hop_1_d_f hop_1_f_m) hop_2_d_m)
2425   (=> (and hop_1_d_f hop_1_f_l) hop_2_d_l)
2426   (=> (and hop_1_d_f hop_1_f_o) hop_2_d_o)
2427   (=> (and hop_1_d_f hop_1_f_n) hop_2_d_n)
2428   (=> (and hop_1_d_f hop_1_f_q) hop_2_d_q)
2429   (=> (and hop_1_d_f hop_1_f_p) hop_2_d_p)
2430   (=> (and hop_1_d_i hop_1_i_a) hop_2_d_a)
2431   (=> (and hop_1_d_i hop_1_i_c) hop_2_d_c)
2432   (=> (and hop_1_d_i hop_1_i_b) hop_2_d_b)
2433   (=> (and hop_1_d_i hop_1_i_e) hop_2_d_e)
2434   (=> (and hop_1_d_i hop_1_i_g) hop_2_d_g)
2435   (=> (and hop_1_d_i hop_1_i_f) hop_2_d_f)
2436   (=> (and hop_1_d_i hop_1_i_h) hop_2_d_h)
2437   (=> (and hop_1_d_i hop_1_i_k) hop_2_d_k)
2438   (=> (and hop_1_d_i hop_1_i_j) hop_2_d_j)
2439   (=> (and hop_1_d_i hop_1_i_m) hop_2_d_m)
2440   (=> (and hop_1_d_i hop_1_i_l) hop_2_d_l)
2441   (=> (and hop_1_d_i hop_1_i_o) hop_2_d_o)
2442   (=> (and hop_1_d_i hop_1_i_n) hop_2_d_n)
2443   (=> (and hop_1_d_i hop_1_i_q) hop_2_d_q)
2444   (=> (and hop_1_d_i hop_1_i_p) hop_2_d_p)
2445   (=> (and hop_1_d_h hop_1_h_a) hop_2_d_a)
2446   (=> (and hop_1_d_h hop_1_h_c) hop_2_d_c)
2447   (=> (and hop_1_d_h hop_1_h_b) hop_2_d_b)
2448   (=> (and hop_1_d_h hop_1_h_e) hop_2_d_e)
2449   (=> (and hop_1_d_h hop_1_h_g) hop_2_d_g)
2450   (=> (and hop_1_d_h hop_1_h_f) hop_2_d_f)
2451   (=> (and hop_1_d_h hop_1_h_i) hop_2_d_i)
2452   (=> (and hop_1_d_h hop_1_h_k) hop_2_d_k)
2453   (=> (and hop_1_d_h hop_1_h_j) hop_2_d_j)
2454   (=> (and hop_1_d_h hop_1_h_m) hop_2_d_m)
2455   (=> (and hop_1_d_h hop_1_h_l) hop_2_d_l)
2456   (=> (and hop_1_d_h hop_1_h_o) hop_2_d_o)
2457   (=> (and hop_1_d_h hop_1_h_n) hop_2_d_n)
2458   (=> (and hop_1_d_h hop_1_h_q) hop_2_d_q)
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2459  (=> (and hop_1_d_h hop_1_h_p) hop_2_d_p)
2460  (=> (and hop_1_d_k hop_1_k_a) hop_2_d_a)
2461  (=> (and hop_1_d_k hop_1_k_c) hop_2_d_c)
2462  (=> (and hop_1_d_k hop_1_k_b) hop_2_d_b)
2463  (=> (and hop_1_d_k hop_1_k_e) hop_2_d_e)
2464  (=> (and hop_1_d_k hop_1_k_g) hop_2_d_g)
2465  (=> (and hop_1_d_k hop_1_k_f) hop_2_d_f)
2466  (=> (and hop_1_d_k hop_1_k_i) hop_2_d_i)
2467  (=> (and hop_1_d_k hop_1_k_h) hop_2_d_h)
2468  (=> (and hop_1_d_k hop_1_k_j) hop_2_d_j)
2469  (=> (and hop_1_d_k hop_1_k_m) hop_2_d_m)
2470  (=> (and hop_1_d_k hop_1_k_l) hop_2_d_l)
2471  (=> (and hop_1_d_k hop_1_k_o) hop_2_d_o)
2472  (=> (and hop_1_d_k hop_1_k_n) hop_2_d_n)
2473  (=> (and hop_1_d_k hop_1_k_q) hop_2_d_q)
2474  (=> (and hop_1_d_k hop_1_k_p) hop_2_d_p)
2475  (=> (and hop_1_d_j hop_1_j_a) hop_2_d_a)
2476  (=> (and hop_1_d_j hop_1_j_c) hop_2_d_c)
2477  (=> (and hop_1_d_j hop_1_j_b) hop_2_d_b)
2478  (=> (and hop_1_d_j hop_1_j_e) hop_2_d_e)
2479  (=> (and hop_1_d_j hop_1_j_g) hop_2_d_g)
2480  (=> (and hop_1_d_j hop_1_j_f) hop_2_d_f)
2481  (=> (and hop_1_d_j hop_1_j_i) hop_2_d_i)
2482  (=> (and hop_1_d_j hop_1_j_h) hop_2_d_h)
2483  (=> (and hop_1_d_j hop_1_j_k) hop_2_d_k)
2484  (=> (and hop_1_d_j hop_1_j_m) hop_2_d_m)
2485  (=> (and hop_1_d_j hop_1_j_l) hop_2_d_l)
2486  (=> (and hop_1_d_j hop_1_j_o) hop_2_d_o)
2487  (=> (and hop_1_d_j hop_1_j_n) hop_2_d_n)
2488  (=> (and hop_1_d_j hop_1_j_q) hop_2_d_q)
2489  (=> (and hop_1_d_j hop_1_j_p) hop_2_d_p)
2490  (=> (and hop_1_d_m hop_1_m_a) hop_2_d_a)
2491  (=> (and hop_1_d_m hop_1_m_c) hop_2_d_c)
2492  (=> (and hop_1_d_m hop_1_m_b) hop_2_d_b)
2493  (=> (and hop_1_d_m hop_1_m_e) hop_2_d_e)
2494  (=> (and hop_1_d_m hop_1_m_g) hop_2_d_g)
2495  (=> (and hop_1_d_m hop_1_m_f) hop_2_d_f)
2496  (=> (and hop_1_d_m hop_1_m_i) hop_2_d_i)
2497  (=> (and hop_1_d_m hop_1_m_h) hop_2_d_h)
2498  (=> (and hop_1_d_m hop_1_m_k) hop_2_d_k)
2499  (=> (and hop_1_d_m hop_1_m_j) hop_2_d_j)
2500  (=> (and hop_1_d_m hop_1_m_l) hop_2_d_l)
2501  (=> (and hop_1_d_m hop_1_m_o) hop_2_d_o)
2502  (=> (and hop_1_d_m hop_1_m_n) hop_2_d_n)
2503  (=> (and hop_1_d_m hop_1_m_q) hop_2_d_q)
2504  (=> (and hop_1_d_m hop_1_m_p) hop_2_d_p)
2505  (=> (and hop_1_d_l hop_1_l_a) hop_2_d_a)
2506  (=> (and hop_1_d_l hop_1_l_c) hop_2_d_c)
2507  (=> (and hop_1_d_l hop_1_l_b) hop_2_d_b)
2508  (=> (and hop_1_d_l hop_1_l_e) hop_2_d_e)
2509  (=> (and hop_1_d_l hop_1_l_g) hop_2_d_g)
2510  (=> (and hop_1_d_l hop_1_l_f) hop_2_d_f)
2511  (=> (and hop_1_d_l hop_1_l_i) hop_2_d_i)
2512  (=> (and hop_1_d_l hop_1_l_h) hop_2_d_h)
2513  (=> (and hop_1_d_l hop_1_l_k) hop_2_d_k)
2514  (=> (and hop_1_d_l hop_1_l_j) hop_2_d_j)
2515  (=> (and hop_1_d_l hop_1_l_m) hop_2_d_m)
2516  (=> (and hop_1_d_l hop_1_l_o) hop_2_d_o)
2517  (=> (and hop_1_d_l hop_1_l_n) hop_2_d_n)
2518  (=> (and hop_1_d_l hop_1_l_q) hop_2_d_q)
2519  (=> (and hop_1_d_l hop_1_l_p) hop_2_d_p)
2520  (=> (and hop_1_d_o hop_1_o_a) hop_2_d_a)
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2521  (=> (and hop_1_d_o hop_1_o_c) hop_2_d_c)
2522  (=> (and hop_1_d_o hop_1_o_b) hop_2_d_b)
2523  (=> (and hop_1_d_o hop_1_o_e) hop_2_d_e)
2524  (=> (and hop_1_d_o hop_1_o_g) hop_2_d_g)
2525  (=> (and hop_1_d_o hop_1_o_f) hop_2_d_f)
2526  (=> (and hop_1_d_o hop_1_o_i) hop_2_d_i)
2527  (=> (and hop_1_d_o hop_1_o_h) hop_2_d_h)
2528  (=> (and hop_1_d_o hop_1_o_k) hop_2_d_k)
2529  (=> (and hop_1_d_o hop_1_o_j) hop_2_d_j)
2530  (=> (and hop_1_d_o hop_1_o_m) hop_2_d_m)
2531  (=> (and hop_1_d_o hop_1_o_l) hop_2_d_l)
2532  (=> (and hop_1_d_o hop_1_o_n) hop_2_d_n)
2533  (=> (and hop_1_d_o hop_1_o_q) hop_2_d_q)
2534  (=> (and hop_1_d_o hop_1_o_p) hop_2_d_p)
2535  (=> (and hop_1_d_n hop_1_n_a) hop_2_d_a)
2536  (=> (and hop_1_d_n hop_1_n_c) hop_2_d_c)
2537  (=> (and hop_1_d_n hop_1_n_b) hop_2_d_b)
2538  (=> (and hop_1_d_n hop_1_n_e) hop_2_d_e)
2539  (=> (and hop_1_d_n hop_1_n_g) hop_2_d_g)
2540  (=> (and hop_1_d_n hop_1_n_f) hop_2_d_f)
2541  (=> (and hop_1_d_n hop_1_n_i) hop_2_d_i)
2542  (=> (and hop_1_d_n hop_1_n_h) hop_2_d_h)
2543  (=> (and hop_1_d_n hop_1_n_k) hop_2_d_k)
2544  (=> (and hop_1_d_n hop_1_n_j) hop_2_d_j)
2545  (=> (and hop_1_d_n hop_1_n_m) hop_2_d_m)
2546  (=> (and hop_1_d_n hop_1_n_l) hop_2_d_l)
2547  (=> (and hop_1_d_n hop_1_n_o) hop_2_d_o)
2548  (=> (and hop_1_d_n hop_1_n_q) hop_2_d_q)
2549  (=> (and hop_1_d_n hop_1_n_p) hop_2_d_p)
2550  (=> (and hop_1_d_q hop_1_q_a) hop_2_d_a)
2551  (=> (and hop_1_d_q hop_1_q_c) hop_2_d_c)
2552  (=> (and hop_1_d_q hop_1_q_b) hop_2_d_b)
2553  (=> (and hop_1_d_q hop_1_q_e) hop_2_d_e)
2554  (=> (and hop_1_d_q hop_1_q_g) hop_2_d_g)
2555  (=> (and hop_1_d_q hop_1_q_f) hop_2_d_f)
2556  (=> (and hop_1_d_q hop_1_q_i) hop_2_d_i)
2557  (=> (and hop_1_d_q hop_1_q_h) hop_2_d_h)
2558  (=> (and hop_1_d_q hop_1_q_k) hop_2_d_k)
2559  (=> (and hop_1_d_q hop_1_q_j) hop_2_d_j)
2560  (=> (and hop_1_d_q hop_1_q_m) hop_2_d_m)
2561  (=> (and hop_1_d_q hop_1_q_l) hop_2_d_l)
2562  (=> (and hop_1_d_q hop_1_q_o) hop_2_d_o)
2563  (=> (and hop_1_d_q hop_1_q_n) hop_2_d_n)
2564  (=> (and hop_1_d_q hop_1_q_p) hop_2_d_p)
2565  (=> (and hop_1_d_p hop_1_p_a) hop_2_d_a)
2566  (=> (and hop_1_d_p hop_1_p_c) hop_2_d_c)
2567  (=> (and hop_1_d_p hop_1_p_b) hop_2_d_b)
2568  (=> (and hop_1_d_p hop_1_p_e) hop_2_d_e)
2569  (=> (and hop_1_d_p hop_1_p_g) hop_2_d_g)
2570  (=> (and hop_1_d_p hop_1_p_f) hop_2_d_f)
2571  (=> (and hop_1_d_p hop_1_p_i) hop_2_d_i)
2572  (=> (and hop_1_d_p hop_1_p_h) hop_2_d_h)
2573  (=> (and hop_1_d_p hop_1_p_k) hop_2_d_k)
2574  (=> (and hop_1_d_p hop_1_p_j) hop_2_d_j)
2575  (=> (and hop_1_d_p hop_1_p_m) hop_2_d_m)
2576  (=> (and hop_1_d_p hop_1_p_l) hop_2_d_l)
2577  (=> (and hop_1_d_p hop_1_p_o) hop_2_d_o)
2578  (=> (and hop_1_d_p hop_1_p_n) hop_2_d_n)
2579  (=> (and hop_1_d_p hop_1_p_q) hop_2_d_q)
2580  (=> (and hop_1_g_a hop_1_a_c) hop_2_g_c)
2581  (=> (and hop_1_g_a hop_1_a_b) hop_2_g_b)
2582  (=> (and hop_1_g_a hop_1_a_e) hop_2_g_e)
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2583   (=> (and hop_1_g_a hop_1_a_d) hop_2_g_d)
2584   (=> (and hop_1_g_a hop_1_a_f) hop_2_g_f)
2585   (=> (and hop_1_g_a hop_1_a_i) hop_2_g_i)
2586   (=> (and hop_1_g_a hop_1_a_h) hop_2_g_h)
2587   (=> (and hop_1_g_a hop_1_a_k) hop_2_g_k)
2588   (=> (and hop_1_g_a hop_1_a_j) hop_2_g_j)
2589   (=> (and hop_1_g_a hop_1_a_m) hop_2_g_m)
2590   (=> (and hop_1_g_a hop_1_a_l) hop_2_g_l)
2591   (=> (and hop_1_g_a hop_1_a_o) hop_2_g_o)
2592   (=> (and hop_1_g_a hop_1_a_n) hop_2_g_n)
2593   (=> (and hop_1_g_a hop_1_a_q) hop_2_g_q)
2594   (=> (and hop_1_g_a hop_1_a_p) hop_2_g_p)
2595   (=> (and hop_1_g_c hop_1_c_a) hop_2_g_a)
2596   (=> (and hop_1_g_c hop_1_c_b) hop_2_g_b)
2597   (=> (and hop_1_g_c hop_1_c_e) hop_2_g_e)
2598   (=> (and hop_1_g_c hop_1_c_d) hop_2_g_d)
2599   (=> (and hop_1_g_c hop_1_c_f) hop_2_g_f)
2600   (=> (and hop_1_g_c hop_1_c_i) hop_2_g_i)
2601   (=> (and hop_1_g_c hop_1_c_h) hop_2_g_h)
2602   (=> (and hop_1_g_c hop_1_c_k) hop_2_g_k)
2603   (=> (and hop_1_g_c hop_1_c_j) hop_2_g_j)
2604   (=> (and hop_1_g_c hop_1_c_m) hop_2_g_m)
2605   (=> (and hop_1_g_c hop_1_c_l) hop_2_g_l)
2606   (=> (and hop_1_g_c hop_1_c_o) hop_2_g_o)
2607   (=> (and hop_1_g_c hop_1_c_n) hop_2_g_n)
2608   (=> (and hop_1_g_c hop_1_c_q) hop_2_g_q)
2609   (=> (and hop_1_g_c hop_1_c_p) hop_2_g_p)
2610   (=> (and hop_1_g_b hop_1_b_a) hop_2_g_a)
2611   (=> (and hop_1_g_b hop_1_b_c) hop_2_g_c)
2612   (=> (and hop_1_g_b hop_1_b_e) hop_2_g_e)
2613   (=> (and hop_1_g_b hop_1_b_d) hop_2_g_d)
2614   (=> (and hop_1_g_b hop_1_b_f) hop_2_g_f)
2615   (=> (and hop_1_g_b hop_1_b_i) hop_2_g_i)
2616   (=> (and hop_1_g_b hop_1_b_h) hop_2_g_h)
2617   (=> (and hop_1_g_b hop_1_b_k) hop_2_g_k)
2618   (=> (and hop_1_g_b hop_1_b_j) hop_2_g_j)
2619   (=> (and hop_1_g_b hop_1_b_m) hop_2_g_m)
2620   (=> (and hop_1_g_b hop_1_b_l) hop_2_g_l)
2621   (=> (and hop_1_g_b hop_1_b_o) hop_2_g_o)
2622   (=> (and hop_1_g_b hop_1_b_n) hop_2_g_n)
2623   (=> (and hop_1_g_b hop_1_b_q) hop_2_g_q)
2624   (=> (and hop_1_g_b hop_1_b_p) hop_2_g_p)
2625   (=> (and hop_1_g_e hop_1_e_a) hop_2_g_a)
2626   (=> (and hop_1_g_e hop_1_e_c) hop_2_g_c)
2627   (=> (and hop_1_g_e hop_1_e_b) hop_2_g_b)
2628   (=> (and hop_1_g_e hop_1_e_d) hop_2_g_d)
2629   (=> (and hop_1_g_e hop_1_e_f) hop_2_g_f)
2630   (=> (and hop_1_g_e hop_1_e_i) hop_2_g_i)
2631   (=> (and hop_1_g_e hop_1_e_h) hop_2_g_h)
2632   (=> (and hop_1_g_e hop_1_e_k) hop_2_g_k)
2633   (=> (and hop_1_g_e hop_1_e_j) hop_2_g_j)
2634   (=> (and hop_1_g_e hop_1_e_m) hop_2_g_m)
2635   (=> (and hop_1_g_e hop_1_e_l) hop_2_g_l)
2636   (=> (and hop_1_g_e hop_1_e_o) hop_2_g_o)
2637   (=> (and hop_1_g_e hop_1_e_n) hop_2_g_n)
2638   (=> (and hop_1_g_e hop_1_e_q) hop_2_g_q)
2639   (=> (and hop_1_g_e hop_1_e_p) hop_2_g_p)
2640   (=> (and hop_1_g_d hop_1_d_a) hop_2_g_a)
2641   (=> (and hop_1_g_d hop_1_d_c) hop_2_g_c)
2642   (=> (and hop_1_g_d hop_1_d_b) hop_2_g_b)
2643   (=> (and hop_1_g_d hop_1_d_e) hop_2_g_e)
2644   (=> (and hop_1_g_d hop_1_d_f) hop_2_g_f)
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2645  (=> (and hop_1_g_d hop_1_d_i) hop_2_g_i)
2646  (=> (and hop_1_g_d hop_1_d_h) hop_2_g_h)
2647  (=> (and hop_1_g_d hop_1_d_k) hop_2_g_k)
2648  (=> (and hop_1_g_d hop_1_d_j) hop_2_g_j)
2649  (=> (and hop_1_g_d hop_1_d_m) hop_2_g_m)
2650  (=> (and hop_1_g_d hop_1_d_l) hop_2_g_l)
2651  (=> (and hop_1_g_d hop_1_d_o) hop_2_g_o)
2652  (=> (and hop_1_g_d hop_1_d_n) hop_2_g_n)
2653  (=> (and hop_1_g_d hop_1_d_q) hop_2_g_q)
2654  (=> (and hop_1_g_d hop_1_d_p) hop_2_g_p)
2655  (=> (and hop_1_g_f hop_1_f_a) hop_2_g_a)
2656  (=> (and hop_1_g_f hop_1_f_c) hop_2_g_c)
2657  (=> (and hop_1_g_f hop_1_f_b) hop_2_g_b)
2658  (=> (and hop_1_g_f hop_1_f_e) hop_2_g_e)
2659  (=> (and hop_1_g_f hop_1_f_d) hop_2_g_d)
2660  (=> (and hop_1_g_f hop_1_f_i) hop_2_g_i)
2661  (=> (and hop_1_g_f hop_1_f_h) hop_2_g_h)
2662  (=> (and hop_1_g_f hop_1_f_k) hop_2_g_k)
2663  (=> (and hop_1_g_f hop_1_f_j) hop_2_g_j)
2664  (=> (and hop_1_g_f hop_1_f_m) hop_2_g_m)
2665  (=> (and hop_1_g_f hop_1_f_l) hop_2_g_l)
2666  (=> (and hop_1_g_f hop_1_f_o) hop_2_g_o)
2667  (=> (and hop_1_g_f hop_1_f_n) hop_2_g_n)
2668  (=> (and hop_1_g_f hop_1_f_q) hop_2_g_q)
2669  (=> (and hop_1_g_f hop_1_f_p) hop_2_g_p)
2670  (=> (and hop_1_g_i hop_1_i_a) hop_2_g_a)
2671  (=> (and hop_1_g_i hop_1_i_c) hop_2_g_c)
2672  (=> (and hop_1_g_i hop_1_i_b) hop_2_g_b)
2673  (=> (and hop_1_g_i hop_1_i_e) hop_2_g_e)
2674  (=> (and hop_1_g_i hop_1_i_d) hop_2_g_d)
2675  (=> (and hop_1_g_i hop_1_i_f) hop_2_g_f)
2676  (=> (and hop_1_g_i hop_1_i_h) hop_2_g_h)
2677  (=> (and hop_1_g_i hop_1_i_k) hop_2_g_k)
2678  (=> (and hop_1_g_i hop_1_i_j) hop_2_g_j)
2679  (=> (and hop_1_g_i hop_1_i_m) hop_2_g_m)
2680  (=> (and hop_1_g_i hop_1_i_l) hop_2_g_l)
2681  (=> (and hop_1_g_i hop_1_i_o) hop_2_g_o)
2682  (=> (and hop_1_g_i hop_1_i_n) hop_2_g_n)
2683  (=> (and hop_1_g_i hop_1_i_q) hop_2_g_q)
2684  (=> (and hop_1_g_i hop_1_i_p) hop_2_g_p)
2685  (=> (and hop_1_g_h hop_1_h_a) hop_2_g_a)
2686  (=> (and hop_1_g_h hop_1_h_c) hop_2_g_c)
2687  (=> (and hop_1_g_h hop_1_h_b) hop_2_g_b)
2688  (=> (and hop_1_g_h hop_1_h_e) hop_2_g_e)
2689  (=> (and hop_1_g_h hop_1_h_d) hop_2_g_d)
2690  (=> (and hop_1_g_h hop_1_h_f) hop_2_g_f)
2691  (=> (and hop_1_g_h hop_1_h_i) hop_2_g_i)
2692  (=> (and hop_1_g_h hop_1_h_k) hop_2_g_k)
2693  (=> (and hop_1_g_h hop_1_h_j) hop_2_g_j)
2694  (=> (and hop_1_g_h hop_1_h_m) hop_2_g_m)
2695  (=> (and hop_1_g_h hop_1_h_l) hop_2_g_l)
2696  (=> (and hop_1_g_h hop_1_h_o) hop_2_g_o)
2697  (=> (and hop_1_g_h hop_1_h_n) hop_2_g_n)
2698  (=> (and hop_1_g_h hop_1_h_q) hop_2_g_q)
2699  (=> (and hop_1_g_h hop_1_h_p) hop_2_g_p)
2700  (=> (and hop_1_g_k hop_1_k_a) hop_2_g_a)
2701  (=> (and hop_1_g_k hop_1_k_c) hop_2_g_c)
2702  (=> (and hop_1_g_k hop_1_k_b) hop_2_g_b)
2703  (=> (and hop_1_g_k hop_1_k_e) hop_2_g_e)
2704  (=> (and hop_1_g_k hop_1_k_d) hop_2_g_d)
2705  (=> (and hop_1_g_k hop_1_k_f) hop_2_g_f)
2706  (=> (and hop_1_g_k hop_1_k_i) hop_2_g_i)
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2707  (=> (and hop_1_g_k hop_1_k_h) hop_2_g_h)
2708  (=> (and hop_1_g_k hop_1_k_j) hop_2_g_j)
2709  (=> (and hop_1_g_k hop_1_k_m) hop_2_g_m)
2710  (=> (and hop_1_g_k hop_1_k_l) hop_2_g_l)
2711  (=> (and hop_1_g_k hop_1_k_o) hop_2_g_o)
2712  (=> (and hop_1_g_k hop_1_k_n) hop_2_g_n)
2713  (=> (and hop_1_g_k hop_1_k_q) hop_2_g_q)
2714  (=> (and hop_1_g_k hop_1_k_p) hop_2_g_p)
2715  (=> (and hop_1_g_j hop_1_j_a) hop_2_g_a)
2716  (=> (and hop_1_g_j hop_1_j_c) hop_2_g_c)
2717  (=> (and hop_1_g_j hop_1_j_b) hop_2_g_b)
2718  (=> (and hop_1_g_j hop_1_j_e) hop_2_g_e)
2719  (=> (and hop_1_g_j hop_1_j_d) hop_2_g_d)
2720  (=> (and hop_1_g_j hop_1_j_f) hop_2_g_f)
2721  (=> (and hop_1_g_j hop_1_j_i) hop_2_g_i)
2722  (=> (and hop_1_g_j hop_1_j_h) hop_2_g_h)
2723  (=> (and hop_1_g_j hop_1_j_k) hop_2_g_k)
2724  (=> (and hop_1_g_j hop_1_j_m) hop_2_g_m)
2725  (=> (and hop_1_g_j hop_1_j_l) hop_2_g_l)
2726  (=> (and hop_1_g_j hop_1_j_o) hop_2_g_o)
2727  (=> (and hop_1_g_j hop_1_j_n) hop_2_g_n)
2728  (=> (and hop_1_g_j hop_1_j_q) hop_2_g_q)
2729  (=> (and hop_1_g_j hop_1_j_p) hop_2_g_p)
2730  (=> (and hop_1_g_m hop_1_m_a) hop_2_g_a)
2731  (=> (and hop_1_g_m hop_1_m_c) hop_2_g_c)
2732  (=> (and hop_1_g_m hop_1_m_b) hop_2_g_b)
2733  (=> (and hop_1_g_m hop_1_m_e) hop_2_g_e)
2734  (=> (and hop_1_g_m hop_1_m_d) hop_2_g_d)
2735  (=> (and hop_1_g_m hop_1_m_f) hop_2_g_f)
2736  (=> (and hop_1_g_m hop_1_m_i) hop_2_g_i)
2737  (=> (and hop_1_g_m hop_1_m_h) hop_2_g_h)
2738  (=> (and hop_1_g_m hop_1_m_k) hop_2_g_k)
2739  (=> (and hop_1_g_m hop_1_m_j) hop_2_g_j)
2740  (=> (and hop_1_g_m hop_1_m_l) hop_2_g_l)
2741  (=> (and hop_1_g_m hop_1_m_o) hop_2_g_o)
2742  (=> (and hop_1_g_m hop_1_m_n) hop_2_g_n)
2743  (=> (and hop_1_g_m hop_1_m_q) hop_2_g_q)
2744  (=> (and hop_1_g_m hop_1_m_p) hop_2_g_p)
2745  (=> (and hop_1_g_l hop_1_l_a) hop_2_g_a)
2746  (=> (and hop_1_g_l hop_1_l_c) hop_2_g_c)
2747  (=> (and hop_1_g_l hop_1_l_b) hop_2_g_b)
2748  (=> (and hop_1_g_l hop_1_l_e) hop_2_g_e)
2749  (=> (and hop_1_g_l hop_1_l_d) hop_2_g_d)
2750  (=> (and hop_1_g_l hop_1_l_f) hop_2_g_f)
2751  (=> (and hop_1_g_l hop_1_l_i) hop_2_g_i)
2752  (=> (and hop_1_g_l hop_1_l_h) hop_2_g_h)
2753  (=> (and hop_1_g_l hop_1_l_k) hop_2_g_k)
2754  (=> (and hop_1_g_l hop_1_l_j) hop_2_g_j)
2755  (=> (and hop_1_g_l hop_1_l_m) hop_2_g_m)
2756  (=> (and hop_1_g_l hop_1_l_o) hop_2_g_o)
2757  (=> (and hop_1_g_l hop_1_l_n) hop_2_g_n)
2758  (=> (and hop_1_g_l hop_1_l_q) hop_2_g_q)
2759  (=> (and hop_1_g_l hop_1_l_p) hop_2_g_p)
2760  (=> (and hop_1_g_o hop_1_o_a) hop_2_g_a)
2761  (=> (and hop_1_g_o hop_1_o_c) hop_2_g_c)
2762  (=> (and hop_1_g_o hop_1_o_b) hop_2_g_b)
2763  (=> (and hop_1_g_o hop_1_o_e) hop_2_g_e)
2764  (=> (and hop_1_g_o hop_1_o_d) hop_2_g_d)
2765  (=> (and hop_1_g_o hop_1_o_f) hop_2_g_f)
2766  (=> (and hop_1_g_o hop_1_o_i) hop_2_g_i)
2767  (=> (and hop_1_g_o hop_1_o_h) hop_2_g_h)
2768  (=> (and hop_1_g_o hop_1_o_k) hop_2_g_k)
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2769  (=> (and hop_1_g_o hop_1_o_j) hop_2_g_j)
2770  (=> (and hop_1_g_o hop_1_o_m) hop_2_g_m)
2771  (=> (and hop_1_g_o hop_1_o_l) hop_2_g_l)
2772  (=> (and hop_1_g_o hop_1_o_n) hop_2_g_n)
2773  (=> (and hop_1_g_o hop_1_o_q) hop_2_g_q)
2774  (=> (and hop_1_g_o hop_1_o_p) hop_2_g_p)
2775  (=> (and hop_1_g_n hop_1_n_a) hop_2_g_a)
2776  (=> (and hop_1_g_n hop_1_n_c) hop_2_g_c)
2777  (=> (and hop_1_g_n hop_1_n_b) hop_2_g_b)
2778  (=> (and hop_1_g_n hop_1_n_e) hop_2_g_e)
2779  (=> (and hop_1_g_n hop_1_n_d) hop_2_g_d)
2780  (=> (and hop_1_g_n hop_1_n_f) hop_2_g_f)
2781  (=> (and hop_1_g_n hop_1_n_i) hop_2_g_i)
2782  (=> (and hop_1_g_n hop_1_n_h) hop_2_g_h)
2783  (=> (and hop_1_g_n hop_1_n_k) hop_2_g_k)
2784  (=> (and hop_1_g_n hop_1_n_j) hop_2_g_j)
2785  (=> (and hop_1_g_n hop_1_n_m) hop_2_g_m)
2786  (=> (and hop_1_g_n hop_1_n_l) hop_2_g_l)
2787  (=> (and hop_1_g_n hop_1_n_o) hop_2_g_o)
2788  (=> (and hop_1_g_n hop_1_n_q) hop_2_g_q)
2789  (=> (and hop_1_g_n hop_1_n_p) hop_2_g_p)
2790  (=> (and hop_1_g_q hop_1_q_a) hop_2_g_a)
2791  (=> (and hop_1_g_q hop_1_q_c) hop_2_g_c)
2792  (=> (and hop_1_g_q hop_1_q_b) hop_2_g_b)
2793  (=> (and hop_1_g_q hop_1_q_e) hop_2_g_e)
2794  (=> (and hop_1_g_q hop_1_q_d) hop_2_g_d)
2795  (=> (and hop_1_g_q hop_1_q_f) hop_2_g_f)
2796  (=> (and hop_1_g_q hop_1_q_i) hop_2_g_i)
2797  (=> (and hop_1_g_q hop_1_q_h) hop_2_g_h)
2798  (=> (and hop_1_g_q hop_1_q_k) hop_2_g_k)
2799  (=> (and hop_1_g_q hop_1_q_j) hop_2_g_j)
2800  (=> (and hop_1_g_q hop_1_q_m) hop_2_g_m)
2801  (=> (and hop_1_g_q hop_1_q_l) hop_2_g_l)
2802  (=> (and hop_1_g_q hop_1_q_o) hop_2_g_o)
2803  (=> (and hop_1_g_q hop_1_q_n) hop_2_g_n)
2804  (=> (and hop_1_g_q hop_1_q_p) hop_2_g_p)
2805  (=> (and hop_1_g_p hop_1_p_a) hop_2_g_a)
2806  (=> (and hop_1_g_p hop_1_p_c) hop_2_g_c)
2807  (=> (and hop_1_g_p hop_1_p_b) hop_2_g_b)
2808  (=> (and hop_1_g_p hop_1_p_e) hop_2_g_e)
2809  (=> (and hop_1_g_p hop_1_p_d) hop_2_g_d)
2810  (=> (and hop_1_g_p hop_1_p_f) hop_2_g_f)
2811  (=> (and hop_1_g_p hop_1_p_i) hop_2_g_i)
2812  (=> (and hop_1_g_p hop_1_p_h) hop_2_g_h)
2813  (=> (and hop_1_g_p hop_1_p_k) hop_2_g_k)
2814  (=> (and hop_1_g_p hop_1_p_j) hop_2_g_j)
2815  (=> (and hop_1_g_p hop_1_p_m) hop_2_g_m)
2816  (=> (and hop_1_g_p hop_1_p_l) hop_2_g_l)
2817  (=> (and hop_1_g_p hop_1_p_o) hop_2_g_o)
2818  (=> (and hop_1_g_p hop_1_p_n) hop_2_g_n)
2819  (=> (and hop_1_g_p hop_1_p_q) hop_2_g_q)
2820  (=> (and hop_1_f_a hop_1_a_c) hop_2_f_c)
2821  (=> (and hop_1_f_a hop_1_a_b) hop_2_f_b)
2822  (=> (and hop_1_f_a hop_1_a_e) hop_2_f_e)
2823  (=> (and hop_1_f_a hop_1_a_d) hop_2_f_d)
2824  (=> (and hop_1_f_a hop_1_a_g) hop_2_f_g)
2825  (=> (and hop_1_f_a hop_1_a_i) hop_2_f_i)
2826  (=> (and hop_1_f_a hop_1_a_h) hop_2_f_h)
2827  (=> (and hop_1_f_a hop_1_a_k) hop_2_f_k)
2828  (=> (and hop_1_f_a hop_1_a_j) hop_2_f_j)
2829  (=> (and hop_1_f_a hop_1_a_m) hop_2_f_m)
2830  (=> (and hop_1_f_a hop_1_a_l) hop_2_f_l)
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2831  (=> (and hop_1_f_a hop_1_a_o) hop_2_f_o)
2832  (=> (and hop_1_f_a hop_1_a_n) hop_2_f_n)
2833  (=> (and hop_1_f_a hop_1_a_q) hop_2_f_q)
2834  (=> (and hop_1_f_a hop_1_a_p) hop_2_f_p)
2835  (=> (and hop_1_f_c hop_1_c_a) hop_2_f_a)
2836  (=> (and hop_1_f_c hop_1_c_b) hop_2_f_b)
2837  (=> (and hop_1_f_c hop_1_c_e) hop_2_f_e)
2838  (=> (and hop_1_f_c hop_1_c_d) hop_2_f_d)
2839  (=> (and hop_1_f_c hop_1_c_g) hop_2_f_g)
2840  (=> (and hop_1_f_c hop_1_c_i) hop_2_f_i)
2841  (=> (and hop_1_f_c hop_1_c_h) hop_2_f_h)
2842  (=> (and hop_1_f_c hop_1_c_k) hop_2_f_k)
2843  (=> (and hop_1_f_c hop_1_c_j) hop_2_f_j)
2844  (=> (and hop_1_f_c hop_1_c_m) hop_2_f_m)
2845  (=> (and hop_1_f_c hop_1_c_l) hop_2_f_l)
2846  (=> (and hop_1_f_c hop_1_c_o) hop_2_f_o)
2847  (=> (and hop_1_f_c hop_1_c_n) hop_2_f_n)
2848  (=> (and hop_1_f_c hop_1_c_q) hop_2_f_q)
2849  (=> (and hop_1_f_c hop_1_c_p) hop_2_f_p)
2850  (=> (and hop_1_f_b hop_1_b_a) hop_2_f_a)
2851  (=> (and hop_1_f_b hop_1_b_c) hop_2_f_c)
2852  (=> (and hop_1_f_b hop_1_b_e) hop_2_f_e)
2853  (=> (and hop_1_f_b hop_1_b_d) hop_2_f_d)
2854  (=> (and hop_1_f_b hop_1_b_g) hop_2_f_g)
2855  (=> (and hop_1_f_b hop_1_b_i) hop_2_f_i)
2856  (=> (and hop_1_f_b hop_1_b_h) hop_2_f_h)
2857  (=> (and hop_1_f_b hop_1_b_k) hop_2_f_k)
2858  (=> (and hop_1_f_b hop_1_b_j) hop_2_f_j)
2859  (=> (and hop_1_f_b hop_1_b_m) hop_2_f_m)
2860  (=> (and hop_1_f_b hop_1_b_l) hop_2_f_l)
2861  (=> (and hop_1_f_b hop_1_b_o) hop_2_f_o)
2862  (=> (and hop_1_f_b hop_1_b_n) hop_2_f_n)
2863  (=> (and hop_1_f_b hop_1_b_q) hop_2_f_q)
2864  (=> (and hop_1_f_b hop_1_b_p) hop_2_f_p)
2865  (=> (and hop_1_f_e hop_1_e_a) hop_2_f_a)
2866  (=> (and hop_1_f_e hop_1_e_c) hop_2_f_c)
2867  (=> (and hop_1_f_e hop_1_e_b) hop_2_f_b)
2868  (=> (and hop_1_f_e hop_1_e_d) hop_2_f_d)
2869  (=> (and hop_1_f_e hop_1_e_g) hop_2_f_g)
2870  (=> (and hop_1_f_e hop_1_e_i) hop_2_f_i)
2871  (=> (and hop_1_f_e hop_1_e_h) hop_2_f_h)
2872  (=> (and hop_1_f_e hop_1_e_k) hop_2_f_k)
2873  (=> (and hop_1_f_e hop_1_e_j) hop_2_f_j)
2874  (=> (and hop_1_f_e hop_1_e_m) hop_2_f_m)
2875  (=> (and hop_1_f_e hop_1_e_l) hop_2_f_l)
2876  (=> (and hop_1_f_e hop_1_e_o) hop_2_f_o)
2877  (=> (and hop_1_f_e hop_1_e_n) hop_2_f_n)
2878  (=> (and hop_1_f_e hop_1_e_q) hop_2_f_q)
2879  (=> (and hop_1_f_e hop_1_e_p) hop_2_f_p)
2880  (=> (and hop_1_f_d hop_1_d_a) hop_2_f_a)
2881  (=> (and hop_1_f_d hop_1_d_c) hop_2_f_c)
2882  (=> (and hop_1_f_d hop_1_d_b) hop_2_f_b)
2883  (=> (and hop_1_f_d hop_1_d_e) hop_2_f_e)
2884  (=> (and hop_1_f_d hop_1_d_g) hop_2_f_g)
2885  (=> (and hop_1_f_d hop_1_d_i) hop_2_f_i)
2886  (=> (and hop_1_f_d hop_1_d_h) hop_2_f_h)
2887  (=> (and hop_1_f_d hop_1_d_k) hop_2_f_k)
2888  (=> (and hop_1_f_d hop_1_d_j) hop_2_f_j)
2889  (=> (and hop_1_f_d hop_1_d_m) hop_2_f_m)
2890  (=> (and hop_1_f_d hop_1_d_l) hop_2_f_l)
2891  (=> (and hop_1_f_d hop_1_d_o) hop_2_f_o)
2892  (=> (and hop_1_f_d hop_1_d_n) hop_2_f_n)
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2893   (=> (and hop_1_f_d hop_1_d_q) hop_2_f_q)
2894   (=> (and hop_1_f_d hop_1_d_p) hop_2_f_p)
2895   (=> (and hop_1_f_g hop_1_g_a) hop_2_f_a)
2896   (=> (and hop_1_f_g hop_1_g_c) hop_2_f_c)
2897   (=> (and hop_1_f_g hop_1_g_b) hop_2_f_b)
2898   (=> (and hop_1_f_g hop_1_g_e) hop_2_f_e)
2899   (=> (and hop_1_f_g hop_1_g_d) hop_2_f_d)
2900   (=> (and hop_1_f_g hop_1_g_i) hop_2_f_i)
2901   (=> (and hop_1_f_g hop_1_g_h) hop_2_f_h)
2902   (=> (and hop_1_f_g hop_1_g_k) hop_2_f_k)
2903   (=> (and hop_1_f_g hop_1_g_j) hop_2_f_j)
2904   (=> (and hop_1_f_g hop_1_g_m) hop_2_f_m)
2905   (=> (and hop_1_f_g hop_1_g_l) hop_2_f_l)
2906   (=> (and hop_1_f_g hop_1_g_o) hop_2_f_o)
2907   (=> (and hop_1_f_g hop_1_g_n) hop_2_f_n)
2908   (=> (and hop_1_f_g hop_1_g_q) hop_2_f_q)
2909   (=> (and hop_1_f_g hop_1_g_p) hop_2_f_p)
2910   (=> (and hop_1_f_i hop_1_i_a) hop_2_f_a)
2911   (=> (and hop_1_f_i hop_1_i_c) hop_2_f_c)
2912   (=> (and hop_1_f_i hop_1_i_b) hop_2_f_b)
2913   (=> (and hop_1_f_i hop_1_i_e) hop_2_f_e)
2914   (=> (and hop_1_f_i hop_1_i_d) hop_2_f_d)
2915   (=> (and hop_1_f_i hop_1_i_g) hop_2_f_g)
2916   (=> (and hop_1_f_i hop_1_i_h) hop_2_f_h)
2917   (=> (and hop_1_f_i hop_1_i_k) hop_2_f_k)
2918   (=> (and hop_1_f_i hop_1_i_j) hop_2_f_j)
2919   (=> (and hop_1_f_i hop_1_i_m) hop_2_f_m)
2920   (=> (and hop_1_f_i hop_1_i_l) hop_2_f_l)
2921   (=> (and hop_1_f_i hop_1_i_o) hop_2_f_o)
2922   (=> (and hop_1_f_i hop_1_i_n) hop_2_f_n)
2923   (=> (and hop_1_f_i hop_1_i_q) hop_2_f_q)
2924   (=> (and hop_1_f_i hop_1_i_p) hop_2_f_p)
2925   (=> (and hop_1_f_h hop_1_h_a) hop_2_f_a)
2926   (=> (and hop_1_f_h hop_1_h_c) hop_2_f_c)
2927   (=> (and hop_1_f_h hop_1_h_b) hop_2_f_b)
2928   (=> (and hop_1_f_h hop_1_h_e) hop_2_f_e)
2929   (=> (and hop_1_f_h hop_1_h_d) hop_2_f_d)
2930   (=> (and hop_1_f_h hop_1_h_g) hop_2_f_g)
2931   (=> (and hop_1_f_h hop_1_h_i) hop_2_f_i)
2932   (=> (and hop_1_f_h hop_1_h_k) hop_2_f_k)
2933   (=> (and hop_1_f_h hop_1_h_j) hop_2_f_j)
2934   (=> (and hop_1_f_h hop_1_h_m) hop_2_f_m)
2935   (=> (and hop_1_f_h hop_1_h_l) hop_2_f_l)
2936   (=> (and hop_1_f_h hop_1_h_o) hop_2_f_o)
2937   (=> (and hop_1_f_h hop_1_h_n) hop_2_f_n)
2938   (=> (and hop_1_f_h hop_1_h_q) hop_2_f_q)
2939   (=> (and hop_1_f_h hop_1_h_p) hop_2_f_p)
2940   (=> (and hop_1_f_k hop_1_k_a) hop_2_f_a)
2941   (=> (and hop_1_f_k hop_1_k_c) hop_2_f_c)
2942   (=> (and hop_1_f_k hop_1_k_b) hop_2_f_b)
2943   (=> (and hop_1_f_k hop_1_k_e) hop_2_f_e)
2944   (=> (and hop_1_f_k hop_1_k_d) hop_2_f_d)
2945   (=> (and hop_1_f_k hop_1_k_g) hop_2_f_g)
2946   (=> (and hop_1_f_k hop_1_k_i) hop_2_f_i)
2947   (=> (and hop_1_f_k hop_1_k_h) hop_2_f_h)
2948   (=> (and hop_1_f_k hop_1_k_j) hop_2_f_j)
2949   (=> (and hop_1_f_k hop_1_k_m) hop_2_f_m)
2950   (=> (and hop_1_f_k hop_1_k_l) hop_2_f_l)
2951   (=> (and hop_1_f_k hop_1_k_o) hop_2_f_o)
2952   (=> (and hop_1_f_k hop_1_k_n) hop_2_f_n)
2953   (=> (and hop_1_f_k hop_1_k_q) hop_2_f_q)
2954   (=> (and hop_1_f_k hop_1_k_p) hop_2_f_p)
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2955  (=> (and hop_1_f_j hop_1_j_a) hop_2_f_a)
2956  (=> (and hop_1_f_j hop_1_j_c) hop_2_f_c)
2957  (=> (and hop_1_f_j hop_1_j_b) hop_2_f_b)
2958  (=> (and hop_1_f_j hop_1_j_e) hop_2_f_e)
2959  (=> (and hop_1_f_j hop_1_j_d) hop_2_f_d)
2960  (=> (and hop_1_f_j hop_1_j_g) hop_2_f_g)
2961  (=> (and hop_1_f_j hop_1_j_i) hop_2_f_i)
2962  (=> (and hop_1_f_j hop_1_j_h) hop_2_f_h)
2963  (=> (and hop_1_f_j hop_1_j_k) hop_2_f_k)
2964  (=> (and hop_1_f_j hop_1_j_m) hop_2_f_m)
2965  (=> (and hop_1_f_j hop_1_j_l) hop_2_f_l)
2966  (=> (and hop_1_f_j hop_1_j_o) hop_2_f_o)
2967  (=> (and hop_1_f_j hop_1_j_n) hop_2_f_n)
2968  (=> (and hop_1_f_j hop_1_j_q) hop_2_f_q)
2969  (=> (and hop_1_f_j hop_1_j_p) hop_2_f_p)
2970  (=> (and hop_1_f_m hop_1_m_a) hop_2_f_a)
2971  (=> (and hop_1_f_m hop_1_m_c) hop_2_f_c)
2972  (=> (and hop_1_f_m hop_1_m_b) hop_2_f_b)
2973  (=> (and hop_1_f_m hop_1_m_e) hop_2_f_e)
2974  (=> (and hop_1_f_m hop_1_m_d) hop_2_f_d)
2975  (=> (and hop_1_f_m hop_1_m_g) hop_2_f_g)
2976  (=> (and hop_1_f_m hop_1_m_i) hop_2_f_i)
2977  (=> (and hop_1_f_m hop_1_m_h) hop_2_f_h)
2978  (=> (and hop_1_f_m hop_1_m_k) hop_2_f_k)
2979  (=> (and hop_1_f_m hop_1_m_j) hop_2_f_j)
2980  (=> (and hop_1_f_m hop_1_m_l) hop_2_f_l)
2981  (=> (and hop_1_f_m hop_1_m_o) hop_2_f_o)
2982  (=> (and hop_1_f_m hop_1_m_n) hop_2_f_n)
2983  (=> (and hop_1_f_m hop_1_m_q) hop_2_f_q)
2984  (=> (and hop_1_f_m hop_1_m_p) hop_2_f_p)
2985  (=> (and hop_1_f_l hop_1_l_a) hop_2_f_a)
2986  (=> (and hop_1_f_l hop_1_l_c) hop_2_f_c)
2987  (=> (and hop_1_f_l hop_1_l_b) hop_2_f_b)
2988  (=> (and hop_1_f_l hop_1_l_e) hop_2_f_e)
2989  (=> (and hop_1_f_l hop_1_l_d) hop_2_f_d)
2990  (=> (and hop_1_f_l hop_1_l_g) hop_2_f_g)
2991  (=> (and hop_1_f_l hop_1_l_i) hop_2_f_i)
2992  (=> (and hop_1_f_l hop_1_l_h) hop_2_f_h)
2993  (=> (and hop_1_f_l hop_1_l_k) hop_2_f_k)
2994  (=> (and hop_1_f_l hop_1_l_j) hop_2_f_j)
2995  (=> (and hop_1_f_l hop_1_l_m) hop_2_f_m)
2996  (=> (and hop_1_f_l hop_1_l_o) hop_2_f_o)
2997  (=> (and hop_1_f_l hop_1_l_n) hop_2_f_n)
2998  (=> (and hop_1_f_l hop_1_l_q) hop_2_f_q)
2999  (=> (and hop_1_f_l hop_1_l_p) hop_2_f_p)
3000  (=> (and hop_1_f_o hop_1_o_a) hop_2_f_a)
3001  (=> (and hop_1_f_o hop_1_o_c) hop_2_f_c)
3002  (=> (and hop_1_f_o hop_1_o_b) hop_2_f_b)
3003  (=> (and hop_1_f_o hop_1_o_e) hop_2_f_e)
3004  (=> (and hop_1_f_o hop_1_o_d) hop_2_f_d)
3005  (=> (and hop_1_f_o hop_1_o_g) hop_2_f_g)
3006  (=> (and hop_1_f_o hop_1_o_i) hop_2_f_i)
3007  (=> (and hop_1_f_o hop_1_o_h) hop_2_f_h)
3008  (=> (and hop_1_f_o hop_1_o_k) hop_2_f_k)
3009  (=> (and hop_1_f_o hop_1_o_j) hop_2_f_j)
3010  (=> (and hop_1_f_o hop_1_o_m) hop_2_f_m)
3011  (=> (and hop_1_f_o hop_1_o_l) hop_2_f_l)
3012  (=> (and hop_1_f_o hop_1_o_n) hop_2_f_n)
3013  (=> (and hop_1_f_o hop_1_o_q) hop_2_f_q)
3014  (=> (and hop_1_f_o hop_1_o_p) hop_2_f_p)
3015  (=> (and hop_1_f_n hop_1_n_a) hop_2_f_a)
3016  (=> (and hop_1_f_n hop_1_n_c) hop_2_f_c)
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3017  (=> (and hop_1_f_n hop_1_n_b) hop_2_f_b)
3018  (=> (and hop_1_f_n hop_1_n_e) hop_2_f_e)
3019  (=> (and hop_1_f_n hop_1_n_d) hop_2_f_d)
3020  (=> (and hop_1_f_n hop_1_n_g) hop_2_f_g)
3021  (=> (and hop_1_f_n hop_1_n_i) hop_2_f_i)
3022  (=> (and hop_1_f_n hop_1_n_h) hop_2_f_h)
3023  (=> (and hop_1_f_n hop_1_n_k) hop_2_f_k)
3024  (=> (and hop_1_f_n hop_1_n_j) hop_2_f_j)
3025  (=> (and hop_1_f_n hop_1_n_m) hop_2_f_m)
3026  (=> (and hop_1_f_n hop_1_n_l) hop_2_f_l)
3027  (=> (and hop_1_f_n hop_1_n_o) hop_2_f_o)
3028  (=> (and hop_1_f_n hop_1_n_q) hop_2_f_q)
3029  (=> (and hop_1_f_n hop_1_n_p) hop_2_f_p)
3030  (=> (and hop_1_f_q hop_1_q_a) hop_2_f_a)
3031  (=> (and hop_1_f_q hop_1_q_c) hop_2_f_c)
3032  (=> (and hop_1_f_q hop_1_q_b) hop_2_f_b)
3033  (=> (and hop_1_f_q hop_1_q_e) hop_2_f_e)
3034  (=> (and hop_1_f_q hop_1_q_d) hop_2_f_d)
3035  (=> (and hop_1_f_q hop_1_q_g) hop_2_f_g)
3036  (=> (and hop_1_f_q hop_1_q_i) hop_2_f_i)
3037  (=> (and hop_1_f_q hop_1_q_h) hop_2_f_h)
3038  (=> (and hop_1_f_q hop_1_q_k) hop_2_f_k)
3039  (=> (and hop_1_f_q hop_1_q_j) hop_2_f_j)
3040  (=> (and hop_1_f_q hop_1_q_m) hop_2_f_m)
3041  (=> (and hop_1_f_q hop_1_q_l) hop_2_f_l)
3042  (=> (and hop_1_f_q hop_1_q_o) hop_2_f_o)
3043  (=> (and hop_1_f_q hop_1_q_n) hop_2_f_n)
3044  (=> (and hop_1_f_q hop_1_q_p) hop_2_f_p)
3045  (=> (and hop_1_f_p hop_1_p_a) hop_2_f_a)
3046  (=> (and hop_1_f_p hop_1_p_c) hop_2_f_c)
3047  (=> (and hop_1_f_p hop_1_p_b) hop_2_f_b)
3048  (=> (and hop_1_f_p hop_1_p_e) hop_2_f_e)
3049  (=> (and hop_1_f_p hop_1_p_d) hop_2_f_d)
3050  (=> (and hop_1_f_p hop_1_p_g) hop_2_f_g)
3051  (=> (and hop_1_f_p hop_1_p_i) hop_2_f_i)
3052  (=> (and hop_1_f_p hop_1_p_h) hop_2_f_h)
3053  (=> (and hop_1_f_p hop_1_p_k) hop_2_f_k)
3054  (=> (and hop_1_f_p hop_1_p_j) hop_2_f_j)
3055  (=> (and hop_1_f_p hop_1_p_m) hop_2_f_m)
3056  (=> (and hop_1_f_p hop_1_p_l) hop_2_f_l)
3057  (=> (and hop_1_f_p hop_1_p_o) hop_2_f_o)
3058  (=> (and hop_1_f_p hop_1_p_n) hop_2_f_n)
3059  (=> (and hop_1_f_p hop_1_p_q) hop_2_f_q)
3060  (=> (and hop_1_i_a hop_1_a_c) hop_2_i_c)
3061  (=> (and hop_1_i_a hop_1_a_b) hop_2_i_b)
3062  (=> (and hop_1_i_a hop_1_a_e) hop_2_i_e)
3063  (=> (and hop_1_i_a hop_1_a_d) hop_2_i_d)
3064  (=> (and hop_1_i_a hop_1_a_g) hop_2_i_g)
3065  (=> (and hop_1_i_a hop_1_a_f) hop_2_i_f)
3066  (=> (and hop_1_i_a hop_1_a_h) hop_2_i_h)
3067  (=> (and hop_1_i_a hop_1_a_k) hop_2_i_k)
3068  (=> (and hop_1_i_a hop_1_a_j) hop_2_i_j)
3069  (=> (and hop_1_i_a hop_1_a_m) hop_2_i_m)
3070  (=> (and hop_1_i_a hop_1_a_l) hop_2_i_l)
3071  (=> (and hop_1_i_a hop_1_a_o) hop_2_i_o)
3072  (=> (and hop_1_i_a hop_1_a_n) hop_2_i_n)
3073  (=> (and hop_1_i_a hop_1_a_q) hop_2_i_q)
3074  (=> (and hop_1_i_a hop_1_a_p) hop_2_i_p)
3075  (=> (and hop_1_i_c hop_1_c_a) hop_2_i_a)
3076  (=> (and hop_1_i_c hop_1_c_b) hop_2_i_b)
3077  (=> (and hop_1_i_c hop_1_c_e) hop_2_i_e)
3078  (=> (and hop_1_i_c hop_1_c_d) hop_2_i_d)
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3079  (=> (and hop_1_i_c hop_1_c_g) hop_2_i_g)
3080  (=> (and hop_1_i_c hop_1_c_f) hop_2_i_f)
3081  (=> (and hop_1_i_c hop_1_c_h) hop_2_i_h)
3082  (=> (and hop_1_i_c hop_1_c_k) hop_2_i_k)
3083  (=> (and hop_1_i_c hop_1_c_j) hop_2_i_j)
3084  (=> (and hop_1_i_c hop_1_c_m) hop_2_i_m)
3085  (=> (and hop_1_i_c hop_1_c_l) hop_2_i_l)
3086  (=> (and hop_1_i_c hop_1_c_o) hop_2_i_o)
3087  (=> (and hop_1_i_c hop_1_c_n) hop_2_i_n)
3088  (=> (and hop_1_i_c hop_1_c_q) hop_2_i_q)
3089  (=> (and hop_1_i_c hop_1_c_p) hop_2_i_p)
3090  (=> (and hop_1_i_b hop_1_b_a) hop_2_i_a)
3091  (=> (and hop_1_i_b hop_1_b_c) hop_2_i_c)
3092  (=> (and hop_1_i_b hop_1_b_e) hop_2_i_e)
3093  (=> (and hop_1_i_b hop_1_b_d) hop_2_i_d)
3094  (=> (and hop_1_i_b hop_1_b_g) hop_2_i_g)
3095  (=> (and hop_1_i_b hop_1_b_f) hop_2_i_f)
3096  (=> (and hop_1_i_b hop_1_b_h) hop_2_i_h)
3097  (=> (and hop_1_i_b hop_1_b_k) hop_2_i_k)
3098  (=> (and hop_1_i_b hop_1_b_j) hop_2_i_j)
3099  (=> (and hop_1_i_b hop_1_b_m) hop_2_i_m)
3100  (=> (and hop_1_i_b hop_1_b_l) hop_2_i_l)
3101  (=> (and hop_1_i_b hop_1_b_o) hop_2_i_o)
3102  (=> (and hop_1_i_b hop_1_b_n) hop_2_i_n)
3103  (=> (and hop_1_i_b hop_1_b_q) hop_2_i_q)
3104  (=> (and hop_1_i_b hop_1_b_p) hop_2_i_p)
3105  (=> (and hop_1_i_e hop_1_e_a) hop_2_i_a)
3106  (=> (and hop_1_i_e hop_1_e_c) hop_2_i_c)
3107  (=> (and hop_1_i_e hop_1_e_b) hop_2_i_b)
3108  (=> (and hop_1_i_e hop_1_e_d) hop_2_i_d)
3109  (=> (and hop_1_i_e hop_1_e_g) hop_2_i_g)
3110  (=> (and hop_1_i_e hop_1_e_f) hop_2_i_f)
3111  (=> (and hop_1_i_e hop_1_e_h) hop_2_i_h)
3112  (=> (and hop_1_i_e hop_1_e_k) hop_2_i_k)
3113  (=> (and hop_1_i_e hop_1_e_j) hop_2_i_j)
3114  (=> (and hop_1_i_e hop_1_e_m) hop_2_i_m)
3115  (=> (and hop_1_i_e hop_1_e_l) hop_2_i_l)
3116  (=> (and hop_1_i_e hop_1_e_o) hop_2_i_o)
3117  (=> (and hop_1_i_e hop_1_e_n) hop_2_i_n)
3118  (=> (and hop_1_i_e hop_1_e_q) hop_2_i_q)
3119  (=> (and hop_1_i_e hop_1_e_p) hop_2_i_p)
3120  (=> (and hop_1_i_d hop_1_d_a) hop_2_i_a)
3121  (=> (and hop_1_i_d hop_1_d_c) hop_2_i_c)
3122  (=> (and hop_1_i_d hop_1_d_b) hop_2_i_b)
3123  (=> (and hop_1_i_d hop_1_d_e) hop_2_i_e)
3124  (=> (and hop_1_i_d hop_1_d_g) hop_2_i_g)
3125  (=> (and hop_1_i_d hop_1_d_f) hop_2_i_f)
3126  (=> (and hop_1_i_d hop_1_d_h) hop_2_i_h)
3127  (=> (and hop_1_i_d hop_1_d_k) hop_2_i_k)
3128  (=> (and hop_1_i_d hop_1_d_j) hop_2_i_j)
3129  (=> (and hop_1_i_d hop_1_d_m) hop_2_i_m)
3130  (=> (and hop_1_i_d hop_1_d_l) hop_2_i_l)
3131  (=> (and hop_1_i_d hop_1_d_o) hop_2_i_o)
3132  (=> (and hop_1_i_d hop_1_d_n) hop_2_i_n)
3133  (=> (and hop_1_i_d hop_1_d_q) hop_2_i_q)
3134  (=> (and hop_1_i_d hop_1_d_p) hop_2_i_p)
3135  (=> (and hop_1_i_g hop_1_g_a) hop_2_i_a)
3136  (=> (and hop_1_i_g hop_1_g_c) hop_2_i_c)
3137  (=> (and hop_1_i_g hop_1_g_b) hop_2_i_b)
3138  (=> (and hop_1_i_g hop_1_g_e) hop_2_i_e)
3139  (=> (and hop_1_i_g hop_1_g_d) hop_2_i_d)
3140  (=> (and hop_1_i_g hop_1_g_f) hop_2_i_f)
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3141  (=> (and hop_1_i_g hop_1_g_h) hop_2_i_h)
3142  (=> (and hop_1_i_g hop_1_g_k) hop_2_i_k)
3143  (=> (and hop_1_i_g hop_1_g_j) hop_2_i_j)
3144  (=> (and hop_1_i_g hop_1_g_m) hop_2_i_m)
3145  (=> (and hop_1_i_g hop_1_g_l) hop_2_i_l)
3146  (=> (and hop_1_i_g hop_1_g_o) hop_2_i_o)
3147  (=> (and hop_1_i_g hop_1_g_n) hop_2_i_n)
3148  (=> (and hop_1_i_g hop_1_g_q) hop_2_i_q)
3149  (=> (and hop_1_i_g hop_1_g_p) hop_2_i_p)
3150  (=> (and hop_1_i_f hop_1_f_a) hop_2_i_a)
3151  (=> (and hop_1_i_f hop_1_f_c) hop_2_i_c)
3152  (=> (and hop_1_i_f hop_1_f_b) hop_2_i_b)
3153  (=> (and hop_1_i_f hop_1_f_e) hop_2_i_e)
3154  (=> (and hop_1_i_f hop_1_f_d) hop_2_i_d)
3155  (=> (and hop_1_i_f hop_1_f_g) hop_2_i_g)
3156  (=> (and hop_1_i_f hop_1_f_h) hop_2_i_h)
3157  (=> (and hop_1_i_f hop_1_f_k) hop_2_i_k)
3158  (=> (and hop_1_i_f hop_1_f_j) hop_2_i_j)
3159  (=> (and hop_1_i_f hop_1_f_m) hop_2_i_m)
3160  (=> (and hop_1_i_f hop_1_f_l) hop_2_i_l)
3161  (=> (and hop_1_i_f hop_1_f_o) hop_2_i_o)
3162  (=> (and hop_1_i_f hop_1_f_n) hop_2_i_n)
3163  (=> (and hop_1_i_f hop_1_f_q) hop_2_i_q)
3164  (=> (and hop_1_i_f hop_1_f_p) hop_2_i_p)
3165  (=> (and hop_1_i_h hop_1_h_a) hop_2_i_a)
3166  (=> (and hop_1_i_h hop_1_h_c) hop_2_i_c)
3167  (=> (and hop_1_i_h hop_1_h_b) hop_2_i_b)
3168  (=> (and hop_1_i_h hop_1_h_e) hop_2_i_e)
3169  (=> (and hop_1_i_h hop_1_h_d) hop_2_i_d)
3170  (=> (and hop_1_i_h hop_1_h_g) hop_2_i_g)
3171  (=> (and hop_1_i_h hop_1_h_f) hop_2_i_f)
3172  (=> (and hop_1_i_h hop_1_h_k) hop_2_i_k)
3173  (=> (and hop_1_i_h hop_1_h_j) hop_2_i_j)
3174  (=> (and hop_1_i_h hop_1_h_m) hop_2_i_m)
3175  (=> (and hop_1_i_h hop_1_h_l) hop_2_i_l)
3176  (=> (and hop_1_i_h hop_1_h_o) hop_2_i_o)
3177  (=> (and hop_1_i_h hop_1_h_n) hop_2_i_n)
3178  (=> (and hop_1_i_h hop_1_h_q) hop_2_i_q)
3179  (=> (and hop_1_i_h hop_1_h_p) hop_2_i_p)
3180  (=> (and hop_1_i_k hop_1_k_a) hop_2_i_a)
3181  (=> (and hop_1_i_k hop_1_k_c) hop_2_i_c)
3182  (=> (and hop_1_i_k hop_1_k_b) hop_2_i_b)
3183  (=> (and hop_1_i_k hop_1_k_e) hop_2_i_e)
3184  (=> (and hop_1_i_k hop_1_k_d) hop_2_i_d)
3185  (=> (and hop_1_i_k hop_1_k_g) hop_2_i_g)
3186  (=> (and hop_1_i_k hop_1_k_f) hop_2_i_f)
3187  (=> (and hop_1_i_k hop_1_k_h) hop_2_i_h)
3188  (=> (and hop_1_i_k hop_1_k_j) hop_2_i_j)
3189  (=> (and hop_1_i_k hop_1_k_m) hop_2_i_m)
3190  (=> (and hop_1_i_k hop_1_k_l) hop_2_i_l)
3191  (=> (and hop_1_i_k hop_1_k_o) hop_2_i_o)
3192  (=> (and hop_1_i_k hop_1_k_n) hop_2_i_n)
3193  (=> (and hop_1_i_k hop_1_k_q) hop_2_i_q)
3194  (=> (and hop_1_i_k hop_1_k_p) hop_2_i_p)
3195  (=> (and hop_1_i_j hop_1_j_a) hop_2_i_a)
3196  (=> (and hop_1_i_j hop_1_j_c) hop_2_i_c)
3197  (=> (and hop_1_i_j hop_1_j_b) hop_2_i_b)
3198  (=> (and hop_1_i_j hop_1_j_e) hop_2_i_e)
3199  (=> (and hop_1_i_j hop_1_j_d) hop_2_i_d)
3200  (=> (and hop_1_i_j hop_1_j_g) hop_2_i_g)
3201  (=> (and hop_1_i_j hop_1_j_f) hop_2_i_f)
3202  (=> (and hop_1_i_j hop_1_j_h) hop_2_i_h)
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3203  (=> (and hop_1_i_j hop_1_j_k) hop_2_i_k)
3204  (=> (and hop_1_i_j hop_1_j_m) hop_2_i_m)
3205  (=> (and hop_1_i_j hop_1_j_l) hop_2_i_l)
3206  (=> (and hop_1_i_j hop_1_j_o) hop_2_i_o)
3207  (=> (and hop_1_i_j hop_1_j_n) hop_2_i_n)
3208  (=> (and hop_1_i_j hop_1_j_q) hop_2_i_q)
3209  (=> (and hop_1_i_j hop_1_j_p) hop_2_i_p)
3210  (=> (and hop_1_i_m hop_1_m_a) hop_2_i_a)
3211  (=> (and hop_1_i_m hop_1_m_c) hop_2_i_c)
3212  (=> (and hop_1_i_m hop_1_m_b) hop_2_i_b)
3213  (=> (and hop_1_i_m hop_1_m_e) hop_2_i_e)
3214  (=> (and hop_1_i_m hop_1_m_d) hop_2_i_d)
3215  (=> (and hop_1_i_m hop_1_m_g) hop_2_i_g)
3216  (=> (and hop_1_i_m hop_1_m_f) hop_2_i_f)
3217  (=> (and hop_1_i_m hop_1_m_h) hop_2_i_h)
3218  (=> (and hop_1_i_m hop_1_m_k) hop_2_i_k)
3219  (=> (and hop_1_i_m hop_1_m_j) hop_2_i_j)
3220  (=> (and hop_1_i_m hop_1_m_l) hop_2_i_l)
3221  (=> (and hop_1_i_m hop_1_m_o) hop_2_i_o)
3222  (=> (and hop_1_i_m hop_1_m_n) hop_2_i_n)
3223  (=> (and hop_1_i_m hop_1_m_q) hop_2_i_q)
3224  (=> (and hop_1_i_m hop_1_m_p) hop_2_i_p)
3225  (=> (and hop_1_i_l hop_1_l_a) hop_2_i_a)
3226  (=> (and hop_1_i_l hop_1_l_c) hop_2_i_c)
3227  (=> (and hop_1_i_l hop_1_l_b) hop_2_i_b)
3228  (=> (and hop_1_i_l hop_1_l_e) hop_2_i_e)
3229  (=> (and hop_1_i_l hop_1_l_d) hop_2_i_d)
3230  (=> (and hop_1_i_l hop_1_l_g) hop_2_i_g)
3231  (=> (and hop_1_i_l hop_1_l_f) hop_2_i_f)
3232  (=> (and hop_1_i_l hop_1_l_h) hop_2_i_h)
3233  (=> (and hop_1_i_l hop_1_l_k) hop_2_i_k)
3234  (=> (and hop_1_i_l hop_1_l_j) hop_2_i_j)
3235  (=> (and hop_1_i_l hop_1_l_m) hop_2_i_m)
3236  (=> (and hop_1_i_l hop_1_l_o) hop_2_i_o)
3237  (=> (and hop_1_i_l hop_1_l_n) hop_2_i_n)
3238  (=> (and hop_1_i_l hop_1_l_q) hop_2_i_q)
3239  (=> (and hop_1_i_l hop_1_l_p) hop_2_i_p)
3240  (=> (and hop_1_i_o hop_1_o_a) hop_2_i_a)
3241  (=> (and hop_1_i_o hop_1_o_c) hop_2_i_c)
3242  (=> (and hop_1_i_o hop_1_o_b) hop_2_i_b)
3243  (=> (and hop_1_i_o hop_1_o_e) hop_2_i_e)
3244  (=> (and hop_1_i_o hop_1_o_d) hop_2_i_d)
3245  (=> (and hop_1_i_o hop_1_o_g) hop_2_i_g)
3246  (=> (and hop_1_i_o hop_1_o_f) hop_2_i_f)
3247  (=> (and hop_1_i_o hop_1_o_h) hop_2_i_h)
3248  (=> (and hop_1_i_o hop_1_o_k) hop_2_i_k)
3249  (=> (and hop_1_i_o hop_1_o_j) hop_2_i_j)
3250  (=> (and hop_1_i_o hop_1_o_m) hop_2_i_m)
3251  (=> (and hop_1_i_o hop_1_o_l) hop_2_i_l)
3252  (=> (and hop_1_i_o hop_1_o_n) hop_2_i_n)
3253  (=> (and hop_1_i_o hop_1_o_q) hop_2_i_q)
3254  (=> (and hop_1_i_o hop_1_o_p) hop_2_i_p)
3255  (=> (and hop_1_i_n hop_1_n_a) hop_2_i_a)
3256  (=> (and hop_1_i_n hop_1_n_c) hop_2_i_c)
3257  (=> (and hop_1_i_n hop_1_n_b) hop_2_i_b)
3258  (=> (and hop_1_i_n hop_1_n_e) hop_2_i_e)
3259  (=> (and hop_1_i_n hop_1_n_d) hop_2_i_d)
3260  (=> (and hop_1_i_n hop_1_n_g) hop_2_i_g)
3261  (=> (and hop_1_i_n hop_1_n_f) hop_2_i_f)
3262  (=> (and hop_1_i_n hop_1_n_h) hop_2_i_h)
3263  (=> (and hop_1_i_n hop_1_n_k) hop_2_i_k)
3264  (=> (and hop_1_i_n hop_1_n_j) hop_2_i_j)
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3265  (=> (and hop_1_i_n hop_1_n_m) hop_2_i_m)
3266  (=> (and hop_1_i_n hop_1_n_l) hop_2_i_l)
3267  (=> (and hop_1_i_n hop_1_n_o) hop_2_i_o)
3268  (=> (and hop_1_i_n hop_1_n_q) hop_2_i_q)
3269  (=> (and hop_1_i_n hop_1_n_p) hop_2_i_p)
3270  (=> (and hop_1_i_q hop_1_q_a) hop_2_i_a)
3271  (=> (and hop_1_i_q hop_1_q_c) hop_2_i_c)
3272  (=> (and hop_1_i_q hop_1_q_b) hop_2_i_b)
3273  (=> (and hop_1_i_q hop_1_q_e) hop_2_i_e)
3274  (=> (and hop_1_i_q hop_1_q_d) hop_2_i_d)
3275  (=> (and hop_1_i_q hop_1_q_g) hop_2_i_g)
3276  (=> (and hop_1_i_q hop_1_q_f) hop_2_i_f)
3277  (=> (and hop_1_i_q hop_1_q_h) hop_2_i_h)
3278  (=> (and hop_1_i_q hop_1_q_k) hop_2_i_k)
3279  (=> (and hop_1_i_q hop_1_q_j) hop_2_i_j)
3280  (=> (and hop_1_i_q hop_1_q_m) hop_2_i_m)
3281  (=> (and hop_1_i_q hop_1_q_l) hop_2_i_l)
3282  (=> (and hop_1_i_q hop_1_q_o) hop_2_i_o)
3283  (=> (and hop_1_i_q hop_1_q_n) hop_2_i_n)
3284  (=> (and hop_1_i_q hop_1_q_p) hop_2_i_p)
3285  (=> (and hop_1_i_p hop_1_p_a) hop_2_i_a)
3286  (=> (and hop_1_i_p hop_1_p_c) hop_2_i_c)
3287  (=> (and hop_1_i_p hop_1_p_b) hop_2_i_b)
3288  (=> (and hop_1_i_p hop_1_p_e) hop_2_i_e)
3289  (=> (and hop_1_i_p hop_1_p_d) hop_2_i_d)
3290  (=> (and hop_1_i_p hop_1_p_g) hop_2_i_g)
3291  (=> (and hop_1_i_p hop_1_p_f) hop_2_i_f)
3292  (=> (and hop_1_i_p hop_1_p_h) hop_2_i_h)
3293  (=> (and hop_1_i_p hop_1_p_k) hop_2_i_k)
3294  (=> (and hop_1_i_p hop_1_p_j) hop_2_i_j)
3295  (=> (and hop_1_i_p hop_1_p_m) hop_2_i_m)
3296  (=> (and hop_1_i_p hop_1_p_l) hop_2_i_l)
3297  (=> (and hop_1_i_p hop_1_p_o) hop_2_i_o)
3298  (=> (and hop_1_i_p hop_1_p_n) hop_2_i_n)
3299  (=> (and hop_1_i_p hop_1_p_q) hop_2_i_q)
3300  (=> (and hop_1_h_a hop_1_a_c) hop_2_h_c)
3301  (=> (and hop_1_h_a hop_1_a_b) hop_2_h_b)
3302  (=> (and hop_1_h_a hop_1_a_e) hop_2_h_e)
3303  (=> (and hop_1_h_a hop_1_a_d) hop_2_h_d)
3304  (=> (and hop_1_h_a hop_1_a_g) hop_2_h_g)
3305  (=> (and hop_1_h_a hop_1_a_f) hop_2_h_f)
3306  (=> (and hop_1_h_a hop_1_a_i) hop_2_h_i)
3307  (=> (and hop_1_h_a hop_1_a_k) hop_2_h_k)
3308  (=> (and hop_1_h_a hop_1_a_j) hop_2_h_j)
3309  (=> (and hop_1_h_a hop_1_a_m) hop_2_h_m)
3310  (=> (and hop_1_h_a hop_1_a_l) hop_2_h_l)
3311  (=> (and hop_1_h_a hop_1_a_o) hop_2_h_o)
3312  (=> (and hop_1_h_a hop_1_a_n) hop_2_h_n)
3313  (=> (and hop_1_h_a hop_1_a_q) hop_2_h_q)
3314  (=> (and hop_1_h_a hop_1_a_p) hop_2_h_p)
3315  (=> (and hop_1_h_c hop_1_c_a) hop_2_h_a)
3316  (=> (and hop_1_h_c hop_1_c_b) hop_2_h_b)
3317  (=> (and hop_1_h_c hop_1_c_e) hop_2_h_e)
3318  (=> (and hop_1_h_c hop_1_c_d) hop_2_h_d)
3319  (=> (and hop_1_h_c hop_1_c_g) hop_2_h_g)
3320  (=> (and hop_1_h_c hop_1_c_f) hop_2_h_f)
3321  (=> (and hop_1_h_c hop_1_c_i) hop_2_h_i)
3322  (=> (and hop_1_h_c hop_1_c_k) hop_2_h_k)
3323  (=> (and hop_1_h_c hop_1_c_j) hop_2_h_j)
3324  (=> (and hop_1_h_c hop_1_c_m) hop_2_h_m)
3325  (=> (and hop_1_h_c hop_1_c_l) hop_2_h_l)
3326  (=> (and hop_1_h_c hop_1_c_o) hop_2_h_o)
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3327  (=> (and hop_1_h_c hop_1_c_n) hop_2_h_n)
3328  (=> (and hop_1_h_c hop_1_c_q) hop_2_h_q)
3329  (=> (and hop_1_h_c hop_1_c_p) hop_2_h_p)
3330  (=> (and hop_1_h_b hop_1_b_a) hop_2_h_a)
3331  (=> (and hop_1_h_b hop_1_b_c) hop_2_h_c)
3332  (=> (and hop_1_h_b hop_1_b_e) hop_2_h_e)
3333  (=> (and hop_1_h_b hop_1_b_d) hop_2_h_d)
3334  (=> (and hop_1_h_b hop_1_b_g) hop_2_h_g)
3335  (=> (and hop_1_h_b hop_1_b_f) hop_2_h_f)
3336  (=> (and hop_1_h_b hop_1_b_i) hop_2_h_i)
3337  (=> (and hop_1_h_b hop_1_b_k) hop_2_h_k)
3338  (=> (and hop_1_h_b hop_1_b_j) hop_2_h_j)
3339  (=> (and hop_1_h_b hop_1_b_m) hop_2_h_m)
3340  (=> (and hop_1_h_b hop_1_b_l) hop_2_h_l)
3341  (=> (and hop_1_h_b hop_1_b_o) hop_2_h_o)
3342  (=> (and hop_1_h_b hop_1_b_n) hop_2_h_n)
3343  (=> (and hop_1_h_b hop_1_b_q) hop_2_h_q)
3344  (=> (and hop_1_h_b hop_1_b_p) hop_2_h_p)
3345  (=> (and hop_1_h_e hop_1_e_a) hop_2_h_a)
3346  (=> (and hop_1_h_e hop_1_e_c) hop_2_h_c)
3347  (=> (and hop_1_h_e hop_1_e_b) hop_2_h_b)
3348  (=> (and hop_1_h_e hop_1_e_d) hop_2_h_d)
3349  (=> (and hop_1_h_e hop_1_e_g) hop_2_h_g)
3350  (=> (and hop_1_h_e hop_1_e_f) hop_2_h_f)
3351  (=> (and hop_1_h_e hop_1_e_i) hop_2_h_i)
3352  (=> (and hop_1_h_e hop_1_e_k) hop_2_h_k)
3353  (=> (and hop_1_h_e hop_1_e_j) hop_2_h_j)
3354  (=> (and hop_1_h_e hop_1_e_m) hop_2_h_m)
3355  (=> (and hop_1_h_e hop_1_e_l) hop_2_h_l)
3356  (=> (and hop_1_h_e hop_1_e_o) hop_2_h_o)
3357  (=> (and hop_1_h_e hop_1_e_n) hop_2_h_n)
3358  (=> (and hop_1_h_e hop_1_e_q) hop_2_h_q)
3359  (=> (and hop_1_h_e hop_1_e_p) hop_2_h_p)
3360  (=> (and hop_1_h_d hop_1_d_a) hop_2_h_a)
3361  (=> (and hop_1_h_d hop_1_d_c) hop_2_h_c)
3362  (=> (and hop_1_h_d hop_1_d_b) hop_2_h_b)
3363  (=> (and hop_1_h_d hop_1_d_e) hop_2_h_e)
3364  (=> (and hop_1_h_d hop_1_d_g) hop_2_h_g)
3365  (=> (and hop_1_h_d hop_1_d_f) hop_2_h_f)
3366  (=> (and hop_1_h_d hop_1_d_i) hop_2_h_i)
3367  (=> (and hop_1_h_d hop_1_d_k) hop_2_h_k)
3368  (=> (and hop_1_h_d hop_1_d_j) hop_2_h_j)
3369  (=> (and hop_1_h_d hop_1_d_m) hop_2_h_m)
3370  (=> (and hop_1_h_d hop_1_d_l) hop_2_h_l)
3371  (=> (and hop_1_h_d hop_1_d_o) hop_2_h_o)
3372  (=> (and hop_1_h_d hop_1_d_n) hop_2_h_n)
3373  (=> (and hop_1_h_d hop_1_d_q) hop_2_h_q)
3374  (=> (and hop_1_h_d hop_1_d_p) hop_2_h_p)
3375  (=> (and hop_1_h_g hop_1_g_a) hop_2_h_a)
3376  (=> (and hop_1_h_g hop_1_g_c) hop_2_h_c)
3377  (=> (and hop_1_h_g hop_1_g_b) hop_2_h_b)
3378  (=> (and hop_1_h_g hop_1_g_e) hop_2_h_e)
3379  (=> (and hop_1_h_g hop_1_g_d) hop_2_h_d)
3380  (=> (and hop_1_h_g hop_1_g_f) hop_2_h_f)
3381  (=> (and hop_1_h_g hop_1_g_i) hop_2_h_i)
3382  (=> (and hop_1_h_g hop_1_g_k) hop_2_h_k)
3383  (=> (and hop_1_h_g hop_1_g_j) hop_2_h_j)
3384  (=> (and hop_1_h_g hop_1_g_m) hop_2_h_m)
3385  (=> (and hop_1_h_g hop_1_g_l) hop_2_h_l)
3386  (=> (and hop_1_h_g hop_1_g_o) hop_2_h_o)
3387  (=> (and hop_1_h_g hop_1_g_n) hop_2_h_n)
3388  (=> (and hop_1_h_g hop_1_g_q) hop_2_h_q)
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3389  (=> (and hop_1_h_g hop_1_g_p) hop_2_h_p)
3390  (=> (and hop_1_h_f hop_1_f_a) hop_2_h_a)
3391  (=> (and hop_1_h_f hop_1_f_c) hop_2_h_c)
3392  (=> (and hop_1_h_f hop_1_f_b) hop_2_h_b)
3393  (=> (and hop_1_h_f hop_1_f_e) hop_2_h_e)
3394  (=> (and hop_1_h_f hop_1_f_d) hop_2_h_d)
3395  (=> (and hop_1_h_f hop_1_f_g) hop_2_h_g)
3396  (=> (and hop_1_h_f hop_1_f_i) hop_2_h_i)
3397  (=> (and hop_1_h_f hop_1_f_k) hop_2_h_k)
3398  (=> (and hop_1_h_f hop_1_f_j) hop_2_h_j)
3399  (=> (and hop_1_h_f hop_1_f_m) hop_2_h_m)
3400  (=> (and hop_1_h_f hop_1_f_l) hop_2_h_l)
3401  (=> (and hop_1_h_f hop_1_f_o) hop_2_h_o)
3402  (=> (and hop_1_h_f hop_1_f_n) hop_2_h_n)
3403  (=> (and hop_1_h_f hop_1_f_q) hop_2_h_q)
3404  (=> (and hop_1_h_f hop_1_f_p) hop_2_h_p)
3405  (=> (and hop_1_h_i hop_1_i_a) hop_2_h_a)
3406  (=> (and hop_1_h_i hop_1_i_c) hop_2_h_c)
3407  (=> (and hop_1_h_i hop_1_i_b) hop_2_h_b)
3408  (=> (and hop_1_h_i hop_1_i_e) hop_2_h_e)
3409  (=> (and hop_1_h_i hop_1_i_d) hop_2_h_d)
3410  (=> (and hop_1_h_i hop_1_i_g) hop_2_h_g)
3411  (=> (and hop_1_h_i hop_1_i_f) hop_2_h_f)
3412  (=> (and hop_1_h_i hop_1_i_k) hop_2_h_k)
3413  (=> (and hop_1_h_i hop_1_i_j) hop_2_h_j)
3414  (=> (and hop_1_h_i hop_1_i_m) hop_2_h_m)
3415  (=> (and hop_1_h_i hop_1_i_l) hop_2_h_l)
3416  (=> (and hop_1_h_i hop_1_i_o) hop_2_h_o)
3417  (=> (and hop_1_h_i hop_1_i_n) hop_2_h_n)
3418  (=> (and hop_1_h_i hop_1_i_q) hop_2_h_q)
3419  (=> (and hop_1_h_i hop_1_i_p) hop_2_h_p)
3420  (=> (and hop_1_h_k hop_1_k_a) hop_2_h_a)
3421  (=> (and hop_1_h_k hop_1_k_c) hop_2_h_c)
3422  (=> (and hop_1_h_k hop_1_k_b) hop_2_h_b)
3423  (=> (and hop_1_h_k hop_1_k_e) hop_2_h_e)
3424  (=> (and hop_1_h_k hop_1_k_d) hop_2_h_d)
3425  (=> (and hop_1_h_k hop_1_k_g) hop_2_h_g)
3426  (=> (and hop_1_h_k hop_1_k_f) hop_2_h_f)
3427  (=> (and hop_1_h_k hop_1_k_i) hop_2_h_i)
3428  (=> (and hop_1_h_k hop_1_k_j) hop_2_h_j)
3429  (=> (and hop_1_h_k hop_1_k_m) hop_2_h_m)
3430  (=> (and hop_1_h_k hop_1_k_l) hop_2_h_l)
3431  (=> (and hop_1_h_k hop_1_k_o) hop_2_h_o)
3432  (=> (and hop_1_h_k hop_1_k_n) hop_2_h_n)
3433  (=> (and hop_1_h_k hop_1_k_q) hop_2_h_q)
3434  (=> (and hop_1_h_k hop_1_k_p) hop_2_h_p)
3435  (=> (and hop_1_h_j hop_1_j_a) hop_2_h_a)
3436  (=> (and hop_1_h_j hop_1_j_c) hop_2_h_c)
3437  (=> (and hop_1_h_j hop_1_j_b) hop_2_h_b)
3438  (=> (and hop_1_h_j hop_1_j_e) hop_2_h_e)
3439  (=> (and hop_1_h_j hop_1_j_d) hop_2_h_d)
3440  (=> (and hop_1_h_j hop_1_j_g) hop_2_h_g)
3441  (=> (and hop_1_h_j hop_1_j_f) hop_2_h_f)
3442  (=> (and hop_1_h_j hop_1_j_i) hop_2_h_i)
3443  (=> (and hop_1_h_j hop_1_j_k) hop_2_h_k)
3444  (=> (and hop_1_h_j hop_1_j_m) hop_2_h_m)
3445  (=> (and hop_1_h_j hop_1_j_l) hop_2_h_l)
3446  (=> (and hop_1_h_j hop_1_j_o) hop_2_h_o)
3447  (=> (and hop_1_h_j hop_1_j_n) hop_2_h_n)
3448  (=> (and hop_1_h_j hop_1_j_q) hop_2_h_q)
3449  (=> (and hop_1_h_j hop_1_j_p) hop_2_h_p)
3450  (=> (and hop_1_h_m hop_1_m_a) hop_2_h_a)
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3451  (=> (and hop_1_h_m hop_1_m_c) hop_2_h_c)
3452  (=> (and hop_1_h_m hop_1_m_b) hop_2_h_b)
3453  (=> (and hop_1_h_m hop_1_m_e) hop_2_h_e)
3454  (=> (and hop_1_h_m hop_1_m_d) hop_2_h_d)
3455  (=> (and hop_1_h_m hop_1_m_g) hop_2_h_g)
3456  (=> (and hop_1_h_m hop_1_m_f) hop_2_h_f)
3457  (=> (and hop_1_h_m hop_1_m_i) hop_2_h_i)
3458  (=> (and hop_1_h_m hop_1_m_k) hop_2_h_k)
3459  (=> (and hop_1_h_m hop_1_m_j) hop_2_h_j)
3460  (=> (and hop_1_h_m hop_1_m_l) hop_2_h_l)
3461  (=> (and hop_1_h_m hop_1_m_o) hop_2_h_o)
3462  (=> (and hop_1_h_m hop_1_m_n) hop_2_h_n)
3463  (=> (and hop_1_h_m hop_1_m_q) hop_2_h_q)
3464  (=> (and hop_1_h_m hop_1_m_p) hop_2_h_p)
3465  (=> (and hop_1_h_l hop_1_l_a) hop_2_h_a)
3466  (=> (and hop_1_h_l hop_1_l_c) hop_2_h_c)
3467  (=> (and hop_1_h_l hop_1_l_b) hop_2_h_b)
3468  (=> (and hop_1_h_l hop_1_l_e) hop_2_h_e)
3469  (=> (and hop_1_h_l hop_1_l_d) hop_2_h_d)
3470  (=> (and hop_1_h_l hop_1_l_g) hop_2_h_g)
3471  (=> (and hop_1_h_l hop_1_l_f) hop_2_h_f)
3472  (=> (and hop_1_h_l hop_1_l_i) hop_2_h_i)
3473  (=> (and hop_1_h_l hop_1_l_k) hop_2_h_k)
3474  (=> (and hop_1_h_l hop_1_l_j) hop_2_h_j)
3475  (=> (and hop_1_h_l hop_1_l_m) hop_2_h_m)
3476  (=> (and hop_1_h_l hop_1_l_o) hop_2_h_o)
3477  (=> (and hop_1_h_l hop_1_l_n) hop_2_h_n)
3478  (=> (and hop_1_h_l hop_1_l_q) hop_2_h_q)
3479  (=> (and hop_1_h_l hop_1_l_p) hop_2_h_p)
3480  (=> (and hop_1_h_o hop_1_o_a) hop_2_h_a)
3481  (=> (and hop_1_h_o hop_1_o_c) hop_2_h_c)
3482  (=> (and hop_1_h_o hop_1_o_b) hop_2_h_b)
3483  (=> (and hop_1_h_o hop_1_o_e) hop_2_h_e)
3484  (=> (and hop_1_h_o hop_1_o_d) hop_2_h_d)
3485  (=> (and hop_1_h_o hop_1_o_g) hop_2_h_g)
3486  (=> (and hop_1_h_o hop_1_o_f) hop_2_h_f)
3487  (=> (and hop_1_h_o hop_1_o_i) hop_2_h_i)
3488  (=> (and hop_1_h_o hop_1_o_k) hop_2_h_k)
3489  (=> (and hop_1_h_o hop_1_o_j) hop_2_h_j)
3490  (=> (and hop_1_h_o hop_1_o_m) hop_2_h_m)
3491  (=> (and hop_1_h_o hop_1_o_l) hop_2_h_l)
3492  (=> (and hop_1_h_o hop_1_o_n) hop_2_h_n)
3493  (=> (and hop_1_h_o hop_1_o_q) hop_2_h_q)
3494  (=> (and hop_1_h_o hop_1_o_p) hop_2_h_p)
3495  (=> (and hop_1_h_n hop_1_n_a) hop_2_h_a)
3496  (=> (and hop_1_h_n hop_1_n_c) hop_2_h_c)
3497  (=> (and hop_1_h_n hop_1_n_b) hop_2_h_b)
3498  (=> (and hop_1_h_n hop_1_n_e) hop_2_h_e)
3499  (=> (and hop_1_h_n hop_1_n_d) hop_2_h_d)
3500  (=> (and hop_1_h_n hop_1_n_g) hop_2_h_g)
3501  (=> (and hop_1_h_n hop_1_n_f) hop_2_h_f)
3502  (=> (and hop_1_h_n hop_1_n_i) hop_2_h_i)
3503  (=> (and hop_1_h_n hop_1_n_k) hop_2_h_k)
3504  (=> (and hop_1_h_n hop_1_n_j) hop_2_h_j)
3505  (=> (and hop_1_h_n hop_1_n_m) hop_2_h_m)
3506  (=> (and hop_1_h_n hop_1_n_l) hop_2_h_l)
3507  (=> (and hop_1_h_n hop_1_n_o) hop_2_h_o)
3508  (=> (and hop_1_h_n hop_1_n_q) hop_2_h_q)
3509  (=> (and hop_1_h_n hop_1_n_p) hop_2_h_p)
3510  (=> (and hop_1_h_q hop_1_q_a) hop_2_h_a)
3511  (=> (and hop_1_h_q hop_1_q_c) hop_2_h_c)
3512  (=> (and hop_1_h_q hop_1_q_b) hop_2_h_b)
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3513  (=> (and hop_1_h_q hop_1_q_e) hop_2_h_e)
3514  (=> (and hop_1_h_q hop_1_q_d) hop_2_h_d)
3515  (=> (and hop_1_h_q hop_1_q_g) hop_2_h_g)
3516  (=> (and hop_1_h_q hop_1_q_f) hop_2_h_f)
3517  (=> (and hop_1_h_q hop_1_q_i) hop_2_h_i)
3518  (=> (and hop_1_h_q hop_1_q_k) hop_2_h_k)
3519  (=> (and hop_1_h_q hop_1_q_j) hop_2_h_j)
3520  (=> (and hop_1_h_q hop_1_q_m) hop_2_h_m)
3521  (=> (and hop_1_h_q hop_1_q_l) hop_2_h_l)
3522  (=> (and hop_1_h_q hop_1_q_o) hop_2_h_o)
3523  (=> (and hop_1_h_q hop_1_q_n) hop_2_h_n)
3524  (=> (and hop_1_h_q hop_1_q_p) hop_2_h_p)
3525  (=> (and hop_1_h_p hop_1_p_a) hop_2_h_a)
3526  (=> (and hop_1_h_p hop_1_p_c) hop_2_h_c)
3527  (=> (and hop_1_h_p hop_1_p_b) hop_2_h_b)
3528  (=> (and hop_1_h_p hop_1_p_e) hop_2_h_e)
3529  (=> (and hop_1_h_p hop_1_p_d) hop_2_h_d)
3530  (=> (and hop_1_h_p hop_1_p_g) hop_2_h_g)
3531  (=> (and hop_1_h_p hop_1_p_f) hop_2_h_f)
3532  (=> (and hop_1_h_p hop_1_p_i) hop_2_h_i)
3533  (=> (and hop_1_h_p hop_1_p_k) hop_2_h_k)
3534  (=> (and hop_1_h_p hop_1_p_j) hop_2_h_j)
3535  (=> (and hop_1_h_p hop_1_p_m) hop_2_h_m)
3536  (=> (and hop_1_h_p hop_1_p_l) hop_2_h_l)
3537  (=> (and hop_1_h_p hop_1_p_o) hop_2_h_o)
3538  (=> (and hop_1_h_p hop_1_p_n) hop_2_h_n)
3539  (=> (and hop_1_h_p hop_1_p_q) hop_2_h_q)
3540  (=> (and hop_1_k_a hop_1_a_c) hop_2_k_c)
3541  (=> (and hop_1_k_a hop_1_a_b) hop_2_k_b)
3542  (=> (and hop_1_k_a hop_1_a_e) hop_2_k_e)
3543  (=> (and hop_1_k_a hop_1_a_d) hop_2_k_d)
3544  (=> (and hop_1_k_a hop_1_a_g) hop_2_k_g)
3545  (=> (and hop_1_k_a hop_1_a_f) hop_2_k_f)
3546  (=> (and hop_1_k_a hop_1_a_i) hop_2_k_i)
3547  (=> (and hop_1_k_a hop_1_a_h) hop_2_k_h)
3548  (=> (and hop_1_k_a hop_1_a_j) hop_2_k_j)
3549  (=> (and hop_1_k_a hop_1_a_m) hop_2_k_m)
3550  (=> (and hop_1_k_a hop_1_a_l) hop_2_k_l)
3551  (=> (and hop_1_k_a hop_1_a_o) hop_2_k_o)
3552  (=> (and hop_1_k_a hop_1_a_n) hop_2_k_n)
3553  (=> (and hop_1_k_a hop_1_a_q) hop_2_k_q)
3554  (=> (and hop_1_k_a hop_1_a_p) hop_2_k_p)
3555  (=> (and hop_1_k_c hop_1_c_a) hop_2_k_a)
3556  (=> (and hop_1_k_c hop_1_c_b) hop_2_k_b)
3557  (=> (and hop_1_k_c hop_1_c_e) hop_2_k_e)
3558  (=> (and hop_1_k_c hop_1_c_d) hop_2_k_d)
3559  (=> (and hop_1_k_c hop_1_c_g) hop_2_k_g)
3560  (=> (and hop_1_k_c hop_1_c_f) hop_2_k_f)
3561  (=> (and hop_1_k_c hop_1_c_i) hop_2_k_i)
3562  (=> (and hop_1_k_c hop_1_c_h) hop_2_k_h)
3563  (=> (and hop_1_k_c hop_1_c_j) hop_2_k_j)
3564  (=> (and hop_1_k_c hop_1_c_m) hop_2_k_m)
3565  (=> (and hop_1_k_c hop_1_c_l) hop_2_k_l)
3566  (=> (and hop_1_k_c hop_1_c_o) hop_2_k_o)
3567  (=> (and hop_1_k_c hop_1_c_n) hop_2_k_n)
3568  (=> (and hop_1_k_c hop_1_c_q) hop_2_k_q)
3569  (=> (and hop_1_k_c hop_1_c_p) hop_2_k_p)
3570  (=> (and hop_1_k_b hop_1_b_a) hop_2_k_a)
3571  (=> (and hop_1_k_b hop_1_b_c) hop_2_k_c)
3572  (=> (and hop_1_k_b hop_1_b_e) hop_2_k_e)
3573  (=> (and hop_1_k_b hop_1_b_d) hop_2_k_d)
3574  (=> (and hop_1_k_b hop_1_b_g) hop_2_k_g)
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3575  (=> (and hop_1_k_b hop_1_b_f) hop_2_k_f)
3576  (=> (and hop_1_k_b hop_1_b_i) hop_2_k_i)
3577  (=> (and hop_1_k_b hop_1_b_h) hop_2_k_h)
3578  (=> (and hop_1_k_b hop_1_b_j) hop_2_k_j)
3579  (=> (and hop_1_k_b hop_1_b_m) hop_2_k_m)
3580  (=> (and hop_1_k_b hop_1_b_l) hop_2_k_l)
3581  (=> (and hop_1_k_b hop_1_b_o) hop_2_k_o)
3582  (=> (and hop_1_k_b hop_1_b_n) hop_2_k_n)
3583  (=> (and hop_1_k_b hop_1_b_q) hop_2_k_q)
3584  (=> (and hop_1_k_b hop_1_b_p) hop_2_k_p)
3585  (=> (and hop_1_k_e hop_1_e_a) hop_2_k_a)
3586  (=> (and hop_1_k_e hop_1_e_c) hop_2_k_c)
3587  (=> (and hop_1_k_e hop_1_e_b) hop_2_k_b)
3588  (=> (and hop_1_k_e hop_1_e_d) hop_2_k_d)
3589  (=> (and hop_1_k_e hop_1_e_g) hop_2_k_g)
3590  (=> (and hop_1_k_e hop_1_e_f) hop_2_k_f)
3591  (=> (and hop_1_k_e hop_1_e_i) hop_2_k_i)
3592  (=> (and hop_1_k_e hop_1_e_h) hop_2_k_h)
3593  (=> (and hop_1_k_e hop_1_e_j) hop_2_k_j)
3594  (=> (and hop_1_k_e hop_1_e_m) hop_2_k_m)
3595  (=> (and hop_1_k_e hop_1_e_l) hop_2_k_l)
3596  (=> (and hop_1_k_e hop_1_e_o) hop_2_k_o)
3597  (=> (and hop_1_k_e hop_1_e_n) hop_2_k_n)
3598  (=> (and hop_1_k_e hop_1_e_q) hop_2_k_q)
3599  (=> (and hop_1_k_e hop_1_e_p) hop_2_k_p)
3600  (=> (and hop_1_k_d hop_1_d_a) hop_2_k_a)
3601  (=> (and hop_1_k_d hop_1_d_c) hop_2_k_c)
3602  (=> (and hop_1_k_d hop_1_d_b) hop_2_k_b)
3603  (=> (and hop_1_k_d hop_1_d_e) hop_2_k_e)
3604  (=> (and hop_1_k_d hop_1_d_g) hop_2_k_g)
3605  (=> (and hop_1_k_d hop_1_d_f) hop_2_k_f)
3606  (=> (and hop_1_k_d hop_1_d_i) hop_2_k_i)
3607  (=> (and hop_1_k_d hop_1_d_h) hop_2_k_h)
3608  (=> (and hop_1_k_d hop_1_d_j) hop_2_k_j)
3609  (=> (and hop_1_k_d hop_1_d_m) hop_2_k_m)
3610  (=> (and hop_1_k_d hop_1_d_l) hop_2_k_l)
3611  (=> (and hop_1_k_d hop_1_d_o) hop_2_k_o)
3612  (=> (and hop_1_k_d hop_1_d_n) hop_2_k_n)
3613  (=> (and hop_1_k_d hop_1_d_q) hop_2_k_q)
3614  (=> (and hop_1_k_d hop_1_d_p) hop_2_k_p)
3615  (=> (and hop_1_k_g hop_1_g_a) hop_2_k_a)
3616  (=> (and hop_1_k_g hop_1_g_c) hop_2_k_c)
3617  (=> (and hop_1_k_g hop_1_g_b) hop_2_k_b)
3618  (=> (and hop_1_k_g hop_1_g_e) hop_2_k_e)
3619  (=> (and hop_1_k_g hop_1_g_d) hop_2_k_d)
3620  (=> (and hop_1_k_g hop_1_g_f) hop_2_k_f)
3621  (=> (and hop_1_k_g hop_1_g_i) hop_2_k_i)
3622  (=> (and hop_1_k_g hop_1_g_h) hop_2_k_h)
3623  (=> (and hop_1_k_g hop_1_g_j) hop_2_k_j)
3624  (=> (and hop_1_k_g hop_1_g_m) hop_2_k_m)
3625  (=> (and hop_1_k_g hop_1_g_l) hop_2_k_l)
3626  (=> (and hop_1_k_g hop_1_g_o) hop_2_k_o)
3627  (=> (and hop_1_k_g hop_1_g_n) hop_2_k_n)
3628  (=> (and hop_1_k_g hop_1_g_q) hop_2_k_q)
3629  (=> (and hop_1_k_g hop_1_g_p) hop_2_k_p)
3630  (=> (and hop_1_k_f hop_1_f_a) hop_2_k_a)
3631  (=> (and hop_1_k_f hop_1_f_c) hop_2_k_c)
3632  (=> (and hop_1_k_f hop_1_f_b) hop_2_k_b)
3633  (=> (and hop_1_k_f hop_1_f_e) hop_2_k_e)
3634  (=> (and hop_1_k_f hop_1_f_d) hop_2_k_d)
3635  (=> (and hop_1_k_f hop_1_f_g) hop_2_k_g)
3636  (=> (and hop_1_k_f hop_1_f_i) hop_2_k_i)
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3637  (=> (and hop_1_k_f hop_1_f_h) hop_2_k_h)
3638  (=> (and hop_1_k_f hop_1_f_j) hop_2_k_j)
3639  (=> (and hop_1_k_f hop_1_f_m) hop_2_k_m)
3640  (=> (and hop_1_k_f hop_1_f_l) hop_2_k_l)
3641  (=> (and hop_1_k_f hop_1_f_o) hop_2_k_o)
3642  (=> (and hop_1_k_f hop_1_f_n) hop_2_k_n)
3643  (=> (and hop_1_k_f hop_1_f_q) hop_2_k_q)
3644  (=> (and hop_1_k_f hop_1_f_p) hop_2_k_p)
3645  (=> (and hop_1_k_i hop_1_i_a) hop_2_k_a)
3646  (=> (and hop_1_k_i hop_1_i_c) hop_2_k_c)
3647  (=> (and hop_1_k_i hop_1_i_b) hop_2_k_b)
3648  (=> (and hop_1_k_i hop_1_i_e) hop_2_k_e)
3649  (=> (and hop_1_k_i hop_1_i_d) hop_2_k_d)
3650  (=> (and hop_1_k_i hop_1_i_g) hop_2_k_g)
3651  (=> (and hop_1_k_i hop_1_i_f) hop_2_k_f)
3652  (=> (and hop_1_k_i hop_1_i_h) hop_2_k_h)
3653  (=> (and hop_1_k_i hop_1_i_j) hop_2_k_j)
3654  (=> (and hop_1_k_i hop_1_i_m) hop_2_k_m)
3655  (=> (and hop_1_k_i hop_1_i_l) hop_2_k_l)
3656  (=> (and hop_1_k_i hop_1_i_o) hop_2_k_o)
3657  (=> (and hop_1_k_i hop_1_i_n) hop_2_k_n)
3658  (=> (and hop_1_k_i hop_1_i_q) hop_2_k_q)
3659  (=> (and hop_1_k_i hop_1_i_p) hop_2_k_p)
3660  (=> (and hop_1_k_h hop_1_h_a) hop_2_k_a)
3661  (=> (and hop_1_k_h hop_1_h_c) hop_2_k_c)
3662  (=> (and hop_1_k_h hop_1_h_b) hop_2_k_b)
3663  (=> (and hop_1_k_h hop_1_h_e) hop_2_k_e)
3664  (=> (and hop_1_k_h hop_1_h_d) hop_2_k_d)
3665  (=> (and hop_1_k_h hop_1_h_g) hop_2_k_g)
3666  (=> (and hop_1_k_h hop_1_h_f) hop_2_k_f)
3667  (=> (and hop_1_k_h hop_1_h_i) hop_2_k_i)
3668  (=> (and hop_1_k_h hop_1_h_j) hop_2_k_j)
3669  (=> (and hop_1_k_h hop_1_h_m) hop_2_k_m)
3670  (=> (and hop_1_k_h hop_1_h_l) hop_2_k_l)
3671  (=> (and hop_1_k_h hop_1_h_o) hop_2_k_o)
3672  (=> (and hop_1_k_h hop_1_h_n) hop_2_k_n)
3673  (=> (and hop_1_k_h hop_1_h_q) hop_2_k_q)
3674  (=> (and hop_1_k_h hop_1_h_p) hop_2_k_p)
3675  (=> (and hop_1_k_j hop_1_j_a) hop_2_k_a)
3676  (=> (and hop_1_k_j hop_1_j_c) hop_2_k_c)
3677  (=> (and hop_1_k_j hop_1_j_b) hop_2_k_b)
3678  (=> (and hop_1_k_j hop_1_j_e) hop_2_k_e)
3679  (=> (and hop_1_k_j hop_1_j_d) hop_2_k_d)
3680  (=> (and hop_1_k_j hop_1_j_g) hop_2_k_g)
3681  (=> (and hop_1_k_j hop_1_j_f) hop_2_k_f)
3682  (=> (and hop_1_k_j hop_1_j_i) hop_2_k_i)
3683  (=> (and hop_1_k_j hop_1_j_h) hop_2_k_h)
3684  (=> (and hop_1_k_j hop_1_j_m) hop_2_k_m)
3685  (=> (and hop_1_k_j hop_1_j_l) hop_2_k_l)
3686  (=> (and hop_1_k_j hop_1_j_o) hop_2_k_o)
3687  (=> (and hop_1_k_j hop_1_j_n) hop_2_k_n)
3688  (=> (and hop_1_k_j hop_1_j_q) hop_2_k_q)
3689  (=> (and hop_1_k_j hop_1_j_p) hop_2_k_p)
3690  (=> (and hop_1_k_m hop_1_m_a) hop_2_k_a)
3691  (=> (and hop_1_k_m hop_1_m_c) hop_2_k_c)
3692  (=> (and hop_1_k_m hop_1_m_b) hop_2_k_b)
3693  (=> (and hop_1_k_m hop_1_m_e) hop_2_k_e)
3694  (=> (and hop_1_k_m hop_1_m_d) hop_2_k_d)
3695  (=> (and hop_1_k_m hop_1_m_g) hop_2_k_g)
3696  (=> (and hop_1_k_m hop_1_m_f) hop_2_k_f)
3697  (=> (and hop_1_k_m hop_1_m_i) hop_2_k_i)
3698  (=> (and hop_1_k_m hop_1_m_h) hop_2_k_h)
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3699  (=> (and hop_1_k_m hop_1_m_j) hop_2_k_j)
3700  (=> (and hop_1_k_m hop_1_m_l) hop_2_k_l)
3701  (=> (and hop_1_k_m hop_1_m_o) hop_2_k_o)
3702  (=> (and hop_1_k_m hop_1_m_n) hop_2_k_n)
3703  (=> (and hop_1_k_m hop_1_m_q) hop_2_k_q)
3704  (=> (and hop_1_k_m hop_1_m_p) hop_2_k_p)
3705  (=> (and hop_1_k_l hop_1_l_a) hop_2_k_a)
3706  (=> (and hop_1_k_l hop_1_l_c) hop_2_k_c)
3707  (=> (and hop_1_k_l hop_1_l_b) hop_2_k_b)
3708  (=> (and hop_1_k_l hop_1_l_e) hop_2_k_e)
3709  (=> (and hop_1_k_l hop_1_l_d) hop_2_k_d)
3710  (=> (and hop_1_k_l hop_1_l_g) hop_2_k_g)
3711  (=> (and hop_1_k_l hop_1_l_f) hop_2_k_f)
3712  (=> (and hop_1_k_l hop_1_l_i) hop_2_k_i)
3713  (=> (and hop_1_k_l hop_1_l_h) hop_2_k_h)
3714  (=> (and hop_1_k_l hop_1_l_j) hop_2_k_j)
3715  (=> (and hop_1_k_l hop_1_l_m) hop_2_k_m)
3716  (=> (and hop_1_k_l hop_1_l_o) hop_2_k_o)
3717  (=> (and hop_1_k_l hop_1_l_n) hop_2_k_n)
3718  (=> (and hop_1_k_l hop_1_l_q) hop_2_k_q)
3719  (=> (and hop_1_k_l hop_1_l_p) hop_2_k_p)
3720  (=> (and hop_1_k_o hop_1_o_a) hop_2_k_a)
3721  (=> (and hop_1_k_o hop_1_o_c) hop_2_k_c)
3722  (=> (and hop_1_k_o hop_1_o_b) hop_2_k_b)
3723  (=> (and hop_1_k_o hop_1_o_e) hop_2_k_e)
3724  (=> (and hop_1_k_o hop_1_o_d) hop_2_k_d)
3725  (=> (and hop_1_k_o hop_1_o_g) hop_2_k_g)
3726  (=> (and hop_1_k_o hop_1_o_f) hop_2_k_f)
3727  (=> (and hop_1_k_o hop_1_o_i) hop_2_k_i)
3728  (=> (and hop_1_k_o hop_1_o_h) hop_2_k_h)
3729  (=> (and hop_1_k_o hop_1_o_j) hop_2_k_j)
3730  (=> (and hop_1_k_o hop_1_o_m) hop_2_k_m)
3731  (=> (and hop_1_k_o hop_1_o_l) hop_2_k_l)
3732  (=> (and hop_1_k_o hop_1_o_n) hop_2_k_n)
3733  (=> (and hop_1_k_o hop_1_o_q) hop_2_k_q)
3734  (=> (and hop_1_k_o hop_1_o_p) hop_2_k_p)
3735  (=> (and hop_1_k_n hop_1_n_a) hop_2_k_a)
3736  (=> (and hop_1_k_n hop_1_n_c) hop_2_k_c)
3737  (=> (and hop_1_k_n hop_1_n_b) hop_2_k_b)
3738  (=> (and hop_1_k_n hop_1_n_e) hop_2_k_e)
3739  (=> (and hop_1_k_n hop_1_n_d) hop_2_k_d)
3740  (=> (and hop_1_k_n hop_1_n_g) hop_2_k_g)
3741  (=> (and hop_1_k_n hop_1_n_f) hop_2_k_f)
3742  (=> (and hop_1_k_n hop_1_n_i) hop_2_k_i)
3743  (=> (and hop_1_k_n hop_1_n_h) hop_2_k_h)
3744  (=> (and hop_1_k_n hop_1_n_j) hop_2_k_j)
3745  (=> (and hop_1_k_n hop_1_n_m) hop_2_k_m)
3746  (=> (and hop_1_k_n hop_1_n_l) hop_2_k_l)
3747  (=> (and hop_1_k_n hop_1_n_o) hop_2_k_o)
3748  (=> (and hop_1_k_n hop_1_n_q) hop_2_k_q)
3749  (=> (and hop_1_k_n hop_1_n_p) hop_2_k_p)
3750  (=> (and hop_1_k_q hop_1_q_a) hop_2_k_a)
3751  (=> (and hop_1_k_q hop_1_q_c) hop_2_k_c)
3752  (=> (and hop_1_k_q hop_1_q_b) hop_2_k_b)
3753  (=> (and hop_1_k_q hop_1_q_e) hop_2_k_e)
3754  (=> (and hop_1_k_q hop_1_q_d) hop_2_k_d)
3755  (=> (and hop_1_k_q hop_1_q_g) hop_2_k_g)
3756  (=> (and hop_1_k_q hop_1_q_f) hop_2_k_f)
3757  (=> (and hop_1_k_q hop_1_q_i) hop_2_k_i)
3758  (=> (and hop_1_k_q hop_1_q_h) hop_2_k_h)
3759  (=> (and hop_1_k_q hop_1_q_j) hop_2_k_j)
3760  (=> (and hop_1_k_q hop_1_q_m) hop_2_k_m)
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3761   (=> (and hop_1_k_q hop_1_q_l) hop_2_k_l)
3762   (=> (and hop_1_k_q hop_1_q_o) hop_2_k_o)
3763   (=> (and hop_1_k_q hop_1_q_n) hop_2_k_n)
3764   (=> (and hop_1_k_q hop_1_q_p) hop_2_k_p)
3765   (=> (and hop_1_k_p hop_1_p_a) hop_2_k_a)
3766   (=> (and hop_1_k_p hop_1_p_c) hop_2_k_c)
3767   (=> (and hop_1_k_p hop_1_p_b) hop_2_k_b)
3768   (=> (and hop_1_k_p hop_1_p_e) hop_2_k_e)
3769   (=> (and hop_1_k_p hop_1_p_d) hop_2_k_d)
3770   (=> (and hop_1_k_p hop_1_p_g) hop_2_k_g)
3771   (=> (and hop_1_k_p hop_1_p_f) hop_2_k_f)
3772   (=> (and hop_1_k_p hop_1_p_i) hop_2_k_i)
3773   (=> (and hop_1_k_p hop_1_p_h) hop_2_k_h)
3774   (=> (and hop_1_k_p hop_1_p_j) hop_2_k_j)
3775   (=> (and hop_1_k_p hop_1_p_m) hop_2_k_m)
3776   (=> (and hop_1_k_p hop_1_p_l) hop_2_k_l)
3777   (=> (and hop_1_k_p hop_1_p_o) hop_2_k_o)
3778   (=> (and hop_1_k_p hop_1_p_n) hop_2_k_n)
3779   (=> (and hop_1_k_p hop_1_p_q) hop_2_k_q)
3780   (=> (and hop_1_j_a hop_1_a_c) hop_2_j_c)
3781   (=> (and hop_1_j_a hop_1_a_b) hop_2_j_b)
3782   (=> (and hop_1_j_a hop_1_a_e) hop_2_j_e)
3783   (=> (and hop_1_j_a hop_1_a_d) hop_2_j_d)
3784   (=> (and hop_1_j_a hop_1_a_g) hop_2_j_g)
3785   (=> (and hop_1_j_a hop_1_a_f) hop_2_j_f)
3786   (=> (and hop_1_j_a hop_1_a_i) hop_2_j_i)
3787   (=> (and hop_1_j_a hop_1_a_h) hop_2_j_h)
3788   (=> (and hop_1_j_a hop_1_a_k) hop_2_j_k)
3789   (=> (and hop_1_j_a hop_1_a_m) hop_2_j_m)
3790   (=> (and hop_1_j_a hop_1_a_l) hop_2_j_l)
3791   (=> (and hop_1_j_a hop_1_a_o) hop_2_j_o)
3792   (=> (and hop_1_j_a hop_1_a_n) hop_2_j_n)
3793   (=> (and hop_1_j_a hop_1_a_q) hop_2_j_q)
3794   (=> (and hop_1_j_a hop_1_a_p) hop_2_j_p)
3795   (=> (and hop_1_j_c hop_1_c_a) hop_2_j_a)
3796   (=> (and hop_1_j_c hop_1_c_b) hop_2_j_b)
3797   (=> (and hop_1_j_c hop_1_c_e) hop_2_j_e)
3798   (=> (and hop_1_j_c hop_1_c_d) hop_2_j_d)
3799   (=> (and hop_1_j_c hop_1_c_g) hop_2_j_g)
3800   (=> (and hop_1_j_c hop_1_c_f) hop_2_j_f)
3801   (=> (and hop_1_j_c hop_1_c_i) hop_2_j_i)
3802   (=> (and hop_1_j_c hop_1_c_h) hop_2_j_h)
3803   (=> (and hop_1_j_c hop_1_c_k) hop_2_j_k)
3804   (=> (and hop_1_j_c hop_1_c_m) hop_2_j_m)
3805   (=> (and hop_1_j_c hop_1_c_l) hop_2_j_l)
3806   (=> (and hop_1_j_c hop_1_c_o) hop_2_j_o)
3807   (=> (and hop_1_j_c hop_1_c_n) hop_2_j_n)
3808   (=> (and hop_1_j_c hop_1_c_q) hop_2_j_q)
3809   (=> (and hop_1_j_c hop_1_c_p) hop_2_j_p)
3810   (=> (and hop_1_j_b hop_1_b_a) hop_2_j_a)
3811   (=> (and hop_1_j_b hop_1_b_c) hop_2_j_c)
3812   (=> (and hop_1_j_b hop_1_b_e) hop_2_j_e)
3813   (=> (and hop_1_j_b hop_1_b_d) hop_2_j_d)
3814   (=> (and hop_1_j_b hop_1_b_g) hop_2_j_g)
3815   (=> (and hop_1_j_b hop_1_b_f) hop_2_j_f)
3816   (=> (and hop_1_j_b hop_1_b_i) hop_2_j_i)
3817   (=> (and hop_1_j_b hop_1_b_h) hop_2_j_h)
3818   (=> (and hop_1_j_b hop_1_b_k) hop_2_j_k)
3819   (=> (and hop_1_j_b hop_1_b_m) hop_2_j_m)
3820   (=> (and hop_1_j_b hop_1_b_l) hop_2_j_l)
3821   (=> (and hop_1_j_b hop_1_b_o) hop_2_j_o)
3822   (=> (and hop_1_j_b hop_1_b_n) hop_2_j_n)
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3823   (=> (and hop_1_j_b hop_1_b_q) hop_2_j_q)
3824   (=> (and hop_1_j_b hop_1_b_p) hop_2_j_p)
3825   (=> (and hop_1_j_e hop_1_e_a) hop_2_j_a)
3826   (=> (and hop_1_j_e hop_1_e_c) hop_2_j_c)
3827   (=> (and hop_1_j_e hop_1_e_b) hop_2_j_b)
3828   (=> (and hop_1_j_e hop_1_e_d) hop_2_j_d)
3829   (=> (and hop_1_j_e hop_1_e_g) hop_2_j_g)
3830   (=> (and hop_1_j_e hop_1_e_f) hop_2_j_f)
3831   (=> (and hop_1_j_e hop_1_e_i) hop_2_j_i)
3832   (=> (and hop_1_j_e hop_1_e_h) hop_2_j_h)
3833   (=> (and hop_1_j_e hop_1_e_k) hop_2_j_k)
3834   (=> (and hop_1_j_e hop_1_e_m) hop_2_j_m)
3835   (=> (and hop_1_j_e hop_1_e_l) hop_2_j_l)
3836   (=> (and hop_1_j_e hop_1_e_o) hop_2_j_o)
3837   (=> (and hop_1_j_e hop_1_e_n) hop_2_j_n)
3838   (=> (and hop_1_j_e hop_1_e_q) hop_2_j_q)
3839   (=> (and hop_1_j_e hop_1_e_p) hop_2_j_p)
3840   (=> (and hop_1_j_d hop_1_d_a) hop_2_j_a)
3841   (=> (and hop_1_j_d hop_1_d_c) hop_2_j_c)
3842   (=> (and hop_1_j_d hop_1_d_b) hop_2_j_b)
3843   (=> (and hop_1_j_d hop_1_d_e) hop_2_j_e)
3844   (=> (and hop_1_j_d hop_1_d_g) hop_2_j_g)
3845   (=> (and hop_1_j_d hop_1_d_f) hop_2_j_f)
3846   (=> (and hop_1_j_d hop_1_d_i) hop_2_j_i)
3847   (=> (and hop_1_j_d hop_1_d_h) hop_2_j_h)
3848   (=> (and hop_1_j_d hop_1_d_k) hop_2_j_k)
3849   (=> (and hop_1_j_d hop_1_d_m) hop_2_j_m)
3850   (=> (and hop_1_j_d hop_1_d_l) hop_2_j_l)
3851   (=> (and hop_1_j_d hop_1_d_o) hop_2_j_o)
3852   (=> (and hop_1_j_d hop_1_d_n) hop_2_j_n)
3853   (=> (and hop_1_j_d hop_1_d_q) hop_2_j_q)
3854   (=> (and hop_1_j_d hop_1_d_p) hop_2_j_p)
3855   (=> (and hop_1_j_g hop_1_g_a) hop_2_j_a)
3856   (=> (and hop_1_j_g hop_1_g_c) hop_2_j_c)
3857   (=> (and hop_1_j_g hop_1_g_b) hop_2_j_b)
3858   (=> (and hop_1_j_g hop_1_g_e) hop_2_j_e)
3859   (=> (and hop_1_j_g hop_1_g_d) hop_2_j_d)
3860   (=> (and hop_1_j_g hop_1_g_f) hop_2_j_f)
3861   (=> (and hop_1_j_g hop_1_g_i) hop_2_j_i)
3862   (=> (and hop_1_j_g hop_1_g_h) hop_2_j_h)
3863   (=> (and hop_1_j_g hop_1_g_k) hop_2_j_k)
3864   (=> (and hop_1_j_g hop_1_g_m) hop_2_j_m)
3865   (=> (and hop_1_j_g hop_1_g_l) hop_2_j_l)
3866   (=> (and hop_1_j_g hop_1_g_o) hop_2_j_o)
3867   (=> (and hop_1_j_g hop_1_g_n) hop_2_j_n)
3868   (=> (and hop_1_j_g hop_1_g_q) hop_2_j_q)
3869   (=> (and hop_1_j_g hop_1_g_p) hop_2_j_p)
3870   (=> (and hop_1_j_f hop_1_f_a) hop_2_j_a)
3871   (=> (and hop_1_j_f hop_1_f_c) hop_2_j_c)
3872   (=> (and hop_1_j_f hop_1_f_b) hop_2_j_b)
3873   (=> (and hop_1_j_f hop_1_f_e) hop_2_j_e)
3874   (=> (and hop_1_j_f hop_1_f_d) hop_2_j_d)
3875   (=> (and hop_1_j_f hop_1_f_g) hop_2_j_g)
3876   (=> (and hop_1_j_f hop_1_f_i) hop_2_j_i)
3877   (=> (and hop_1_j_f hop_1_f_h) hop_2_j_h)
3878   (=> (and hop_1_j_f hop_1_f_k) hop_2_j_k)
3879   (=> (and hop_1_j_f hop_1_f_m) hop_2_j_m)
3880   (=> (and hop_1_j_f hop_1_f_l) hop_2_j_l)
3881   (=> (and hop_1_j_f hop_1_f_o) hop_2_j_o)
3882   (=> (and hop_1_j_f hop_1_f_n) hop_2_j_n)
3883   (=> (and hop_1_j_f hop_1_f_q) hop_2_j_q)
3884   (=> (and hop_1_j_f hop_1_f_p) hop_2_j_p)
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3885  (=> (and hop_1_j_i hop_1_i_a) hop_2_j_a)
3886  (=> (and hop_1_j_i hop_1_i_c) hop_2_j_c)
3887  (=> (and hop_1_j_i hop_1_i_b) hop_2_j_b)
3888  (=> (and hop_1_j_i hop_1_i_e) hop_2_j_e)
3889  (=> (and hop_1_j_i hop_1_i_d) hop_2_j_d)
3890  (=> (and hop_1_j_i hop_1_i_g) hop_2_j_g)
3891  (=> (and hop_1_j_i hop_1_i_f) hop_2_j_f)
3892  (=> (and hop_1_j_i hop_1_i_h) hop_2_j_h)
3893  (=> (and hop_1_j_i hop_1_i_k) hop_2_j_k)
3894  (=> (and hop_1_j_i hop_1_i_m) hop_2_j_m)
3895  (=> (and hop_1_j_i hop_1_i_l) hop_2_j_l)
3896  (=> (and hop_1_j_i hop_1_i_o) hop_2_j_o)
3897  (=> (and hop_1_j_i hop_1_i_n) hop_2_j_n)
3898  (=> (and hop_1_j_i hop_1_i_q) hop_2_j_q)
3899  (=> (and hop_1_j_i hop_1_i_p) hop_2_j_p)
3900  (=> (and hop_1_j_h hop_1_h_a) hop_2_j_a)
3901  (=> (and hop_1_j_h hop_1_h_c) hop_2_j_c)
3902  (=> (and hop_1_j_h hop_1_h_b) hop_2_j_b)
3903  (=> (and hop_1_j_h hop_1_h_e) hop_2_j_e)
3904  (=> (and hop_1_j_h hop_1_h_d) hop_2_j_d)
3905  (=> (and hop_1_j_h hop_1_h_g) hop_2_j_g)
3906  (=> (and hop_1_j_h hop_1_h_f) hop_2_j_f)
3907  (=> (and hop_1_j_h hop_1_h_i) hop_2_j_i)
3908  (=> (and hop_1_j_h hop_1_h_k) hop_2_j_k)
3909  (=> (and hop_1_j_h hop_1_h_m) hop_2_j_m)
3910  (=> (and hop_1_j_h hop_1_h_l) hop_2_j_l)
3911  (=> (and hop_1_j_h hop_1_h_o) hop_2_j_o)
3912  (=> (and hop_1_j_h hop_1_h_n) hop_2_j_n)
3913  (=> (and hop_1_j_h hop_1_h_q) hop_2_j_q)
3914  (=> (and hop_1_j_h hop_1_h_p) hop_2_j_p)
3915  (=> (and hop_1_j_k hop_1_k_a) hop_2_j_a)
3916  (=> (and hop_1_j_k hop_1_k_c) hop_2_j_c)
3917  (=> (and hop_1_j_k hop_1_k_b) hop_2_j_b)
3918  (=> (and hop_1_j_k hop_1_k_e) hop_2_j_e)
3919  (=> (and hop_1_j_k hop_1_k_d) hop_2_j_d)
3920  (=> (and hop_1_j_k hop_1_k_g) hop_2_j_g)
3921  (=> (and hop_1_j_k hop_1_k_f) hop_2_j_f)
3922  (=> (and hop_1_j_k hop_1_k_i) hop_2_j_i)
3923  (=> (and hop_1_j_k hop_1_k_h) hop_2_j_h)
3924  (=> (and hop_1_j_k hop_1_k_m) hop_2_j_m)
3925  (=> (and hop_1_j_k hop_1_k_l) hop_2_j_l)
3926  (=> (and hop_1_j_k hop_1_k_o) hop_2_j_o)
3927  (=> (and hop_1_j_k hop_1_k_n) hop_2_j_n)
3928  (=> (and hop_1_j_k hop_1_k_q) hop_2_j_q)
3929  (=> (and hop_1_j_k hop_1_k_p) hop_2_j_p)
3930  (=> (and hop_1_j_m hop_1_m_a) hop_2_j_a)
3931  (=> (and hop_1_j_m hop_1_m_c) hop_2_j_c)
3932  (=> (and hop_1_j_m hop_1_m_b) hop_2_j_b)
3933  (=> (and hop_1_j_m hop_1_m_e) hop_2_j_e)
3934  (=> (and hop_1_j_m hop_1_m_d) hop_2_j_d)
3935  (=> (and hop_1_j_m hop_1_m_g) hop_2_j_g)
3936  (=> (and hop_1_j_m hop_1_m_f) hop_2_j_f)
3937  (=> (and hop_1_j_m hop_1_m_i) hop_2_j_i)
3938  (=> (and hop_1_j_m hop_1_m_h) hop_2_j_h)
3939  (=> (and hop_1_j_m hop_1_m_k) hop_2_j_k)
3940  (=> (and hop_1_j_m hop_1_m_l) hop_2_j_l)
3941  (=> (and hop_1_j_m hop_1_m_o) hop_2_j_o)
3942  (=> (and hop_1_j_m hop_1_m_n) hop_2_j_n)
3943  (=> (and hop_1_j_m hop_1_m_q) hop_2_j_q)
3944  (=> (and hop_1_j_m hop_1_m_p) hop_2_j_p)
3945  (=> (and hop_1_j_l hop_1_l_a) hop_2_j_a)
3946  (=> (and hop_1_j_l hop_1_l_c) hop_2_j_c)
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3947  (=> (and hop_1_j_l hop_1_l_b) hop_2_j_b)
3948  (=> (and hop_1_j_l hop_1_l_e) hop_2_j_e)
3949  (=> (and hop_1_j_l hop_1_l_d) hop_2_j_d)
3950  (=> (and hop_1_j_l hop_1_l_g) hop_2_j_g)
3951  (=> (and hop_1_j_l hop_1_l_f) hop_2_j_f)
3952  (=> (and hop_1_j_l hop_1_l_i) hop_2_j_i)
3953  (=> (and hop_1_j_l hop_1_l_h) hop_2_j_h)
3954  (=> (and hop_1_j_l hop_1_l_k) hop_2_j_k)
3955  (=> (and hop_1_j_l hop_1_l_m) hop_2_j_m)
3956  (=> (and hop_1_j_l hop_1_l_o) hop_2_j_o)
3957  (=> (and hop_1_j_l hop_1_l_n) hop_2_j_n)
3958  (=> (and hop_1_j_l hop_1_l_q) hop_2_j_q)
3959  (=> (and hop_1_j_l hop_1_l_p) hop_2_j_p)
3960  (=> (and hop_1_j_o hop_1_o_a) hop_2_j_a)
3961  (=> (and hop_1_j_o hop_1_o_c) hop_2_j_c)
3962  (=> (and hop_1_j_o hop_1_o_b) hop_2_j_b)
3963  (=> (and hop_1_j_o hop_1_o_e) hop_2_j_e)
3964  (=> (and hop_1_j_o hop_1_o_d) hop_2_j_d)
3965  (=> (and hop_1_j_o hop_1_o_g) hop_2_j_g)
3966  (=> (and hop_1_j_o hop_1_o_f) hop_2_j_f)
3967  (=> (and hop_1_j_o hop_1_o_i) hop_2_j_i)
3968  (=> (and hop_1_j_o hop_1_o_h) hop_2_j_h)
3969  (=> (and hop_1_j_o hop_1_o_k) hop_2_j_k)
3970  (=> (and hop_1_j_o hop_1_o_m) hop_2_j_m)
3971  (=> (and hop_1_j_o hop_1_o_l) hop_2_j_l)
3972  (=> (and hop_1_j_o hop_1_o_n) hop_2_j_n)
3973  (=> (and hop_1_j_o hop_1_o_q) hop_2_j_q)
3974  (=> (and hop_1_j_o hop_1_o_p) hop_2_j_p)
3975  (=> (and hop_1_j_n hop_1_n_a) hop_2_j_a)
3976  (=> (and hop_1_j_n hop_1_n_c) hop_2_j_c)
3977  (=> (and hop_1_j_n hop_1_n_b) hop_2_j_b)
3978  (=> (and hop_1_j_n hop_1_n_e) hop_2_j_e)
3979  (=> (and hop_1_j_n hop_1_n_d) hop_2_j_d)
3980  (=> (and hop_1_j_n hop_1_n_g) hop_2_j_g)
3981  (=> (and hop_1_j_n hop_1_n_f) hop_2_j_f)
3982  (=> (and hop_1_j_n hop_1_n_i) hop_2_j_i)
3983  (=> (and hop_1_j_n hop_1_n_h) hop_2_j_h)
3984  (=> (and hop_1_j_n hop_1_n_k) hop_2_j_k)
3985  (=> (and hop_1_j_n hop_1_n_m) hop_2_j_m)
3986  (=> (and hop_1_j_n hop_1_n_l) hop_2_j_l)
3987  (=> (and hop_1_j_n hop_1_n_o) hop_2_j_o)
3988  (=> (and hop_1_j_n hop_1_n_q) hop_2_j_q)
3989  (=> (and hop_1_j_n hop_1_n_p) hop_2_j_p)
3990  (=> (and hop_1_j_q hop_1_q_a) hop_2_j_a)
3991  (=> (and hop_1_j_q hop_1_q_c) hop_2_j_c)
3992  (=> (and hop_1_j_q hop_1_q_b) hop_2_j_b)
3993  (=> (and hop_1_j_q hop_1_q_e) hop_2_j_e)
3994  (=> (and hop_1_j_q hop_1_q_d) hop_2_j_d)
3995  (=> (and hop_1_j_q hop_1_q_g) hop_2_j_g)
3996  (=> (and hop_1_j_q hop_1_q_f) hop_2_j_f)
3997  (=> (and hop_1_j_q hop_1_q_i) hop_2_j_i)
3998  (=> (and hop_1_j_q hop_1_q_h) hop_2_j_h)
3999  (=> (and hop_1_j_q hop_1_q_k) hop_2_j_k)
4000  (=> (and hop_1_j_q hop_1_q_m) hop_2_j_m)
4001  (=> (and hop_1_j_q hop_1_q_l) hop_2_j_l)
4002  (=> (and hop_1_j_q hop_1_q_o) hop_2_j_o)
4003  (=> (and hop_1_j_q hop_1_q_n) hop_2_j_n)
4004  (=> (and hop_1_j_q hop_1_q_p) hop_2_j_p)
4005  (=> (and hop_1_j_p hop_1_p_a) hop_2_j_a)
4006  (=> (and hop_1_j_p hop_1_p_c) hop_2_j_c)
4007  (=> (and hop_1_j_p hop_1_p_b) hop_2_j_b)
4008  (=> (and hop_1_j_p hop_1_p_e) hop_2_j_e)
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4009  (=> (and hop_1_j_p hop_1_p_d) hop_2_j_d)
4010  (=> (and hop_1_j_p hop_1_p_g) hop_2_j_g)
4011  (=> (and hop_1_j_p hop_1_p_f) hop_2_j_f)
4012  (=> (and hop_1_j_p hop_1_p_i) hop_2_j_i)
4013  (=> (and hop_1_j_p hop_1_p_h) hop_2_j_h)
4014  (=> (and hop_1_j_p hop_1_p_k) hop_2_j_k)
4015  (=> (and hop_1_j_p hop_1_p_m) hop_2_j_m)
4016  (=> (and hop_1_j_p hop_1_p_l) hop_2_j_l)
4017  (=> (and hop_1_j_p hop_1_p_o) hop_2_j_o)
4018  (=> (and hop_1_j_p hop_1_p_n) hop_2_j_n)
4019  (=> (and hop_1_j_p hop_1_p_q) hop_2_j_q)
4020  (=> (and hop_1_m_a hop_1_a_c) hop_2_m_c)
4021  (=> (and hop_1_m_a hop_1_a_b) hop_2_m_b)
4022  (=> (and hop_1_m_a hop_1_a_e) hop_2_m_e)
4023  (=> (and hop_1_m_a hop_1_a_d) hop_2_m_d)
4024  (=> (and hop_1_m_a hop_1_a_g) hop_2_m_g)
4025  (=> (and hop_1_m_a hop_1_a_f) hop_2_m_f)
4026  (=> (and hop_1_m_a hop_1_a_i) hop_2_m_i)
4027  (=> (and hop_1_m_a hop_1_a_h) hop_2_m_h)
4028  (=> (and hop_1_m_a hop_1_a_k) hop_2_m_k)
4029  (=> (and hop_1_m_a hop_1_a_j) hop_2_m_j)
4030  (=> (and hop_1_m_a hop_1_a_l) hop_2_m_l)
4031  (=> (and hop_1_m_a hop_1_a_o) hop_2_m_o)
4032  (=> (and hop_1_m_a hop_1_a_n) hop_2_m_n)
4033  (=> (and hop_1_m_a hop_1_a_q) hop_2_m_q)
4034  (=> (and hop_1_m_a hop_1_a_p) hop_2_m_p)
4035  (=> (and hop_1_m_c hop_1_c_a) hop_2_m_a)
4036  (=> (and hop_1_m_c hop_1_c_b) hop_2_m_b)
4037  (=> (and hop_1_m_c hop_1_c_e) hop_2_m_e)
4038  (=> (and hop_1_m_c hop_1_c_d) hop_2_m_d)
4039  (=> (and hop_1_m_c hop_1_c_g) hop_2_m_g)
4040  (=> (and hop_1_m_c hop_1_c_f) hop_2_m_f)
4041  (=> (and hop_1_m_c hop_1_c_i) hop_2_m_i)
4042  (=> (and hop_1_m_c hop_1_c_h) hop_2_m_h)
4043  (=> (and hop_1_m_c hop_1_c_k) hop_2_m_k)
4044  (=> (and hop_1_m_c hop_1_c_j) hop_2_m_j)
4045  (=> (and hop_1_m_c hop_1_c_l) hop_2_m_l)
4046  (=> (and hop_1_m_c hop_1_c_o) hop_2_m_o)
4047  (=> (and hop_1_m_c hop_1_c_n) hop_2_m_n)
4048  (=> (and hop_1_m_c hop_1_c_q) hop_2_m_q)
4049  (=> (and hop_1_m_c hop_1_c_p) hop_2_m_p)
4050  (=> (and hop_1_m_b hop_1_b_a) hop_2_m_a)
4051  (=> (and hop_1_m_b hop_1_b_c) hop_2_m_c)
4052  (=> (and hop_1_m_b hop_1_b_e) hop_2_m_e)
4053  (=> (and hop_1_m_b hop_1_b_d) hop_2_m_d)
4054  (=> (and hop_1_m_b hop_1_b_g) hop_2_m_g)
4055  (=> (and hop_1_m_b hop_1_b_f) hop_2_m_f)
4056  (=> (and hop_1_m_b hop_1_b_i) hop_2_m_i)
4057  (=> (and hop_1_m_b hop_1_b_h) hop_2_m_h)
4058  (=> (and hop_1_m_b hop_1_b_k) hop_2_m_k)
4059  (=> (and hop_1_m_b hop_1_b_j) hop_2_m_j)
4060  (=> (and hop_1_m_b hop_1_b_l) hop_2_m_l)
4061  (=> (and hop_1_m_b hop_1_b_o) hop_2_m_o)
4062  (=> (and hop_1_m_b hop_1_b_n) hop_2_m_n)
4063  (=> (and hop_1_m_b hop_1_b_q) hop_2_m_q)
4064  (=> (and hop_1_m_b hop_1_b_p) hop_2_m_p)
4065  (=> (and hop_1_m_e hop_1_e_a) hop_2_m_a)
4066  (=> (and hop_1_m_e hop_1_e_c) hop_2_m_c)
4067  (=> (and hop_1_m_e hop_1_e_b) hop_2_m_b)
4068  (=> (and hop_1_m_e hop_1_e_d) hop_2_m_d)
4069  (=> (and hop_1_m_e hop_1_e_g) hop_2_m_g)
4070  (=> (and hop_1_m_e hop_1_e_f) hop_2_m_f)
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4071  (=> (and hop_1_m_e hop_1_e_i) hop_2_m_i)
4072  (=> (and hop_1_m_e hop_1_e_h) hop_2_m_h)
4073  (=> (and hop_1_m_e hop_1_e_k) hop_2_m_k)
4074  (=> (and hop_1_m_e hop_1_e_j) hop_2_m_j)
4075  (=> (and hop_1_m_e hop_1_e_l) hop_2_m_l)
4076  (=> (and hop_1_m_e hop_1_e_o) hop_2_m_o)
4077  (=> (and hop_1_m_e hop_1_e_n) hop_2_m_n)
4078  (=> (and hop_1_m_e hop_1_e_q) hop_2_m_q)
4079  (=> (and hop_1_m_e hop_1_e_p) hop_2_m_p)
4080  (=> (and hop_1_m_d hop_1_d_a) hop_2_m_a)
4081  (=> (and hop_1_m_d hop_1_d_c) hop_2_m_c)
4082  (=> (and hop_1_m_d hop_1_d_b) hop_2_m_b)
4083  (=> (and hop_1_m_d hop_1_d_e) hop_2_m_e)
4084  (=> (and hop_1_m_d hop_1_d_g) hop_2_m_g)
4085  (=> (and hop_1_m_d hop_1_d_f) hop_2_m_f)
4086  (=> (and hop_1_m_d hop_1_d_i) hop_2_m_i)
4087  (=> (and hop_1_m_d hop_1_d_h) hop_2_m_h)
4088  (=> (and hop_1_m_d hop_1_d_k) hop_2_m_k)
4089  (=> (and hop_1_m_d hop_1_d_j) hop_2_m_j)
4090  (=> (and hop_1_m_d hop_1_d_l) hop_2_m_l)
4091  (=> (and hop_1_m_d hop_1_d_o) hop_2_m_o)
4092  (=> (and hop_1_m_d hop_1_d_n) hop_2_m_n)
4093  (=> (and hop_1_m_d hop_1_d_q) hop_2_m_q)
4094  (=> (and hop_1_m_d hop_1_d_p) hop_2_m_p)
4095  (=> (and hop_1_m_g hop_1_g_a) hop_2_m_a)
4096  (=> (and hop_1_m_g hop_1_g_c) hop_2_m_c)
4097  (=> (and hop_1_m_g hop_1_g_b) hop_2_m_b)
4098  (=> (and hop_1_m_g hop_1_g_e) hop_2_m_e)
4099  (=> (and hop_1_m_g hop_1_g_d) hop_2_m_d)
4100  (=> (and hop_1_m_g hop_1_g_f) hop_2_m_f)
4101  (=> (and hop_1_m_g hop_1_g_i) hop_2_m_i)
4102  (=> (and hop_1_m_g hop_1_g_h) hop_2_m_h)
4103  (=> (and hop_1_m_g hop_1_g_k) hop_2_m_k)
4104  (=> (and hop_1_m_g hop_1_g_j) hop_2_m_j)
4105  (=> (and hop_1_m_g hop_1_g_l) hop_2_m_l)
4106  (=> (and hop_1_m_g hop_1_g_o) hop_2_m_o)
4107  (=> (and hop_1_m_g hop_1_g_n) hop_2_m_n)
4108  (=> (and hop_1_m_g hop_1_g_q) hop_2_m_q)
4109  (=> (and hop_1_m_g hop_1_g_p) hop_2_m_p)
4110  (=> (and hop_1_m_f hop_1_f_a) hop_2_m_a)
4111  (=> (and hop_1_m_f hop_1_f_c) hop_2_m_c)
4112  (=> (and hop_1_m_f hop_1_f_b) hop_2_m_b)
4113  (=> (and hop_1_m_f hop_1_f_e) hop_2_m_e)
4114  (=> (and hop_1_m_f hop_1_f_d) hop_2_m_d)
4115  (=> (and hop_1_m_f hop_1_f_g) hop_2_m_g)
4116  (=> (and hop_1_m_f hop_1_f_i) hop_2_m_i)
4117  (=> (and hop_1_m_f hop_1_f_h) hop_2_m_h)
4118  (=> (and hop_1_m_f hop_1_f_k) hop_2_m_k)
4119  (=> (and hop_1_m_f hop_1_f_j) hop_2_m_j)
4120  (=> (and hop_1_m_f hop_1_f_l) hop_2_m_l)
4121  (=> (and hop_1_m_f hop_1_f_o) hop_2_m_o)
4122  (=> (and hop_1_m_f hop_1_f_n) hop_2_m_n)
4123  (=> (and hop_1_m_f hop_1_f_q) hop_2_m_q)
4124  (=> (and hop_1_m_f hop_1_f_p) hop_2_m_p)
4125  (=> (and hop_1_m_i hop_1_i_a) hop_2_m_a)
4126  (=> (and hop_1_m_i hop_1_i_c) hop_2_m_c)
4127  (=> (and hop_1_m_i hop_1_i_b) hop_2_m_b)
4128  (=> (and hop_1_m_i hop_1_i_e) hop_2_m_e)
4129  (=> (and hop_1_m_i hop_1_i_d) hop_2_m_d)
4130  (=> (and hop_1_m_i hop_1_i_g) hop_2_m_g)
4131  (=> (and hop_1_m_i hop_1_i_f) hop_2_m_f)
4132  (=> (and hop_1_m_i hop_1_i_h) hop_2_m_h)
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```
4133  (=> (and hop_1_m_i hop_1_i_k) hop_2_m_k)
4134  (=> (and hop_1_m_i hop_1_i_j) hop_2_m_j)
4135  (=> (and hop_1_m_i hop_1_i_l) hop_2_m_l)
4136  (=> (and hop_1_m_i hop_1_i_o) hop_2_m_o)
4137  (=> (and hop_1_m_i hop_1_i_n) hop_2_m_n)
4138  (=> (and hop_1_m_i hop_1_i_q) hop_2_m_q)
4139  (=> (and hop_1_m_i hop_1_i_p) hop_2_m_p)
4140  (=> (and hop_1_m_h hop_1_h_a) hop_2_m_a)
4141  (=> (and hop_1_m_h hop_1_h_c) hop_2_m_c)
4142  (=> (and hop_1_m_h hop_1_h_b) hop_2_m_b)
4143  (=> (and hop_1_m_h hop_1_h_e) hop_2_m_e)
4144  (=> (and hop_1_m_h hop_1_h_d) hop_2_m_d)
4145  (=> (and hop_1_m_h hop_1_h_g) hop_2_m_g)
4146  (=> (and hop_1_m_h hop_1_h_f) hop_2_m_f)
4147  (=> (and hop_1_m_h hop_1_h_i) hop_2_m_i)
4148  (=> (and hop_1_m_h hop_1_h_k) hop_2_m_k)
4149  (=> (and hop_1_m_h hop_1_h_j) hop_2_m_j)
4150  (=> (and hop_1_m_h hop_1_h_l) hop_2_m_l)
4151  (=> (and hop_1_m_h hop_1_h_o) hop_2_m_o)
4152  (=> (and hop_1_m_h hop_1_h_n) hop_2_m_n)
4153  (=> (and hop_1_m_h hop_1_h_q) hop_2_m_q)
4154  (=> (and hop_1_m_h hop_1_h_p) hop_2_m_p)
4155  (=> (and hop_1_m_k hop_1_k_a) hop_2_m_a)
4156  (=> (and hop_1_m_k hop_1_k_c) hop_2_m_c)
4157  (=> (and hop_1_m_k hop_1_k_b) hop_2_m_b)
4158  (=> (and hop_1_m_k hop_1_k_e) hop_2_m_e)
4159  (=> (and hop_1_m_k hop_1_k_d) hop_2_m_d)
4160  (=> (and hop_1_m_k hop_1_k_g) hop_2_m_g)
4161  (=> (and hop_1_m_k hop_1_k_f) hop_2_m_f)
4162  (=> (and hop_1_m_k hop_1_k_i) hop_2_m_i)
4163  (=> (and hop_1_m_k hop_1_k_h) hop_2_m_h)
4164  (=> (and hop_1_m_k hop_1_k_j) hop_2_m_j)
4165  (=> (and hop_1_m_k hop_1_k_l) hop_2_m_l)
4166  (=> (and hop_1_m_k hop_1_k_o) hop_2_m_o)
4167  (=> (and hop_1_m_k hop_1_k_n) hop_2_m_n)
4168  (=> (and hop_1_m_k hop_1_k_q) hop_2_m_q)
4169  (=> (and hop_1_m_k hop_1_k_p) hop_2_m_p)
4170  (=> (and hop_1_m_j hop_1_j_a) hop_2_m_a)
4171  (=> (and hop_1_m_j hop_1_j_c) hop_2_m_c)
4172  (=> (and hop_1_m_j hop_1_j_b) hop_2_m_b)
4173  (=> (and hop_1_m_j hop_1_j_e) hop_2_m_e)
4174  (=> (and hop_1_m_j hop_1_j_d) hop_2_m_d)
4175  (=> (and hop_1_m_j hop_1_j_g) hop_2_m_g)
4176  (=> (and hop_1_m_j hop_1_j_f) hop_2_m_f)
4177  (=> (and hop_1_m_j hop_1_j_i) hop_2_m_i)
4178  (=> (and hop_1_m_j hop_1_j_h) hop_2_m_h)
4179  (=> (and hop_1_m_j hop_1_j_k) hop_2_m_k)
4180  (=> (and hop_1_m_j hop_1_j_l) hop_2_m_l)
4181  (=> (and hop_1_m_j hop_1_j_o) hop_2_m_o)
4182  (=> (and hop_1_m_j hop_1_j_n) hop_2_m_n)
4183  (=> (and hop_1_m_j hop_1_j_q) hop_2_m_q)
4184  (=> (and hop_1_m_j hop_1_j_p) hop_2_m_p)
4185  (=> (and hop_1_m_l hop_1_l_a) hop_2_m_a)
4186  (=> (and hop_1_m_l hop_1_l_c) hop_2_m_c)
4187  (=> (and hop_1_m_l hop_1_l_b) hop_2_m_b)
4188  (=> (and hop_1_m_l hop_1_l_e) hop_2_m_e)
4189  (=> (and hop_1_m_l hop_1_l_d) hop_2_m_d)
4190  (=> (and hop_1_m_l hop_1_l_g) hop_2_m_g)
4191  (=> (and hop_1_m_l hop_1_l_f) hop_2_m_f)
4192  (=> (and hop_1_m_l hop_1_l_i) hop_2_m_i)
4193  (=> (and hop_1_m_l hop_1_l_h) hop_2_m_h)
4194  (=> (and hop_1_m_l hop_1_l_k) hop_2_m_k)
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4195  (=> (and hop_1_m_l hop_1_l_j) hop_2_m_j)
4196  (=> (and hop_1_m_l hop_1_l_o) hop_2_m_o)
4197  (=> (and hop_1_m_l hop_1_l_n) hop_2_m_n)
4198  (=> (and hop_1_m_l hop_1_l_q) hop_2_m_q)
4199  (=> (and hop_1_m_l hop_1_l_p) hop_2_m_p)
4200  (=> (and hop_1_m_o hop_1_o_a) hop_2_m_a)
4201  (=> (and hop_1_m_o hop_1_o_c) hop_2_m_c)
4202  (=> (and hop_1_m_o hop_1_o_b) hop_2_m_b)
4203  (=> (and hop_1_m_o hop_1_o_e) hop_2_m_e)
4204  (=> (and hop_1_m_o hop_1_o_d) hop_2_m_d)
4205  (=> (and hop_1_m_o hop_1_o_g) hop_2_m_g)
4206  (=> (and hop_1_m_o hop_1_o_f) hop_2_m_f)
4207  (=> (and hop_1_m_o hop_1_o_i) hop_2_m_i)
4208  (=> (and hop_1_m_o hop_1_o_h) hop_2_m_h)
4209  (=> (and hop_1_m_o hop_1_o_k) hop_2_m_k)
4210  (=> (and hop_1_m_o hop_1_o_j) hop_2_m_j)
4211  (=> (and hop_1_m_o hop_1_o_l) hop_2_m_l)
4212  (=> (and hop_1_m_o hop_1_o_n) hop_2_m_n)
4213  (=> (and hop_1_m_o hop_1_o_q) hop_2_m_q)
4214  (=> (and hop_1_m_o hop_1_o_p) hop_2_m_p)
4215  (=> (and hop_1_m_n hop_1_n_a) hop_2_m_a)
4216  (=> (and hop_1_m_n hop_1_n_c) hop_2_m_c)
4217  (=> (and hop_1_m_n hop_1_n_b) hop_2_m_b)
4218  (=> (and hop_1_m_n hop_1_n_e) hop_2_m_e)
4219  (=> (and hop_1_m_n hop_1_n_d) hop_2_m_d)
4220  (=> (and hop_1_m_n hop_1_n_g) hop_2_m_g)
4221  (=> (and hop_1_m_n hop_1_n_f) hop_2_m_f)
4222  (=> (and hop_1_m_n hop_1_n_i) hop_2_m_i)
4223  (=> (and hop_1_m_n hop_1_n_h) hop_2_m_h)
4224  (=> (and hop_1_m_n hop_1_n_k) hop_2_m_k)
4225  (=> (and hop_1_m_n hop_1_n_j) hop_2_m_j)
4226  (=> (and hop_1_m_n hop_1_n_l) hop_2_m_l)
4227  (=> (and hop_1_m_n hop_1_n_o) hop_2_m_o)
4228  (=> (and hop_1_m_n hop_1_n_q) hop_2_m_q)
4229  (=> (and hop_1_m_n hop_1_n_p) hop_2_m_p)
4230  (=> (and hop_1_m_q hop_1_q_a) hop_2_m_a)
4231  (=> (and hop_1_m_q hop_1_q_c) hop_2_m_c)
4232  (=> (and hop_1_m_q hop_1_q_b) hop_2_m_b)
4233  (=> (and hop_1_m_q hop_1_q_e) hop_2_m_e)
4234  (=> (and hop_1_m_q hop_1_q_d) hop_2_m_d)
4235  (=> (and hop_1_m_q hop_1_q_g) hop_2_m_g)
4236  (=> (and hop_1_m_q hop_1_q_f) hop_2_m_f)
4237  (=> (and hop_1_m_q hop_1_q_i) hop_2_m_i)
4238  (=> (and hop_1_m_q hop_1_q_h) hop_2_m_h)
4239  (=> (and hop_1_m_q hop_1_q_k) hop_2_m_k)
4240  (=> (and hop_1_m_q hop_1_q_j) hop_2_m_j)
4241  (=> (and hop_1_m_q hop_1_q_l) hop_2_m_l)
4242  (=> (and hop_1_m_q hop_1_q_o) hop_2_m_o)
4243  (=> (and hop_1_m_q hop_1_q_n) hop_2_m_n)
4244  (=> (and hop_1_m_q hop_1_q_p) hop_2_m_p)
4245  (=> (and hop_1_m_p hop_1_p_a) hop_2_m_a)
4246  (=> (and hop_1_m_p hop_1_p_c) hop_2_m_c)
4247  (=> (and hop_1_m_p hop_1_p_b) hop_2_m_b)
4248  (=> (and hop_1_m_p hop_1_p_e) hop_2_m_e)
4249  (=> (and hop_1_m_p hop_1_p_d) hop_2_m_d)
4250  (=> (and hop_1_m_p hop_1_p_g) hop_2_m_g)
4251  (=> (and hop_1_m_p hop_1_p_f) hop_2_m_f)
4252  (=> (and hop_1_m_p hop_1_p_i) hop_2_m_i)
4253  (=> (and hop_1_m_p hop_1_p_h) hop_2_m_h)
4254  (=> (and hop_1_m_p hop_1_p_k) hop_2_m_k)
4255  (=> (and hop_1_m_p hop_1_p_j) hop_2_m_j)
4256  (=> (and hop_1_m_p hop_1_p_l) hop_2_m_l)
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4257  (=> (and hop_1_m_p hop_1_p_o) hop_2_m_o)
4258  (=> (and hop_1_m_p hop_1_p_n) hop_2_m_n)
4259  (=> (and hop_1_m_p hop_1_p_q) hop_2_m_q)
4260  (=> (and hop_1_l_a hop_1_a_c) hop_2_l_c)
4261  (=> (and hop_1_l_a hop_1_a_b) hop_2_l_b)
4262  (=> (and hop_1_l_a hop_1_a_e) hop_2_l_e)
4263  (=> (and hop_1_l_a hop_1_a_d) hop_2_l_d)
4264  (=> (and hop_1_l_a hop_1_a_g) hop_2_l_g)
4265  (=> (and hop_1_l_a hop_1_a_f) hop_2_l_f)
4266  (=> (and hop_1_l_a hop_1_a_i) hop_2_l_i)
4267  (=> (and hop_1_l_a hop_1_a_h) hop_2_l_h)
4268  (=> (and hop_1_l_a hop_1_a_k) hop_2_l_k)
4269  (=> (and hop_1_l_a hop_1_a_j) hop_2_l_j)
4270  (=> (and hop_1_l_a hop_1_a_m) hop_2_l_m)
4271  (=> (and hop_1_l_a hop_1_a_o) hop_2_l_o)
4272  (=> (and hop_1_l_a hop_1_a_n) hop_2_l_n)
4273  (=> (and hop_1_l_a hop_1_a_q) hop_2_l_q)
4274  (=> (and hop_1_l_a hop_1_a_p) hop_2_l_p)
4275  (=> (and hop_1_l_c hop_1_c_a) hop_2_l_a)
4276  (=> (and hop_1_l_c hop_1_c_b) hop_2_l_b)
4277  (=> (and hop_1_l_c hop_1_c_e) hop_2_l_e)
4278  (=> (and hop_1_l_c hop_1_c_d) hop_2_l_d)
4279  (=> (and hop_1_l_c hop_1_c_g) hop_2_l_g)
4280  (=> (and hop_1_l_c hop_1_c_f) hop_2_l_f)
4281  (=> (and hop_1_l_c hop_1_c_i) hop_2_l_i)
4282  (=> (and hop_1_l_c hop_1_c_h) hop_2_l_h)
4283  (=> (and hop_1_l_c hop_1_c_k) hop_2_l_k)
4284  (=> (and hop_1_l_c hop_1_c_j) hop_2_l_j)
4285  (=> (and hop_1_l_c hop_1_c_m) hop_2_l_m)
4286  (=> (and hop_1_l_c hop_1_c_o) hop_2_l_o)
4287  (=> (and hop_1_l_c hop_1_c_n) hop_2_l_n)
4288  (=> (and hop_1_l_c hop_1_c_q) hop_2_l_q)
4289  (=> (and hop_1_l_c hop_1_c_p) hop_2_l_p)
4290  (=> (and hop_1_l_b hop_1_b_a) hop_2_l_a)
4291  (=> (and hop_1_l_b hop_1_b_c) hop_2_l_c)
4292  (=> (and hop_1_l_b hop_1_b_e) hop_2_l_e)
4293  (=> (and hop_1_l_b hop_1_b_d) hop_2_l_d)
4294  (=> (and hop_1_l_b hop_1_b_g) hop_2_l_g)
4295  (=> (and hop_1_l_b hop_1_b_f) hop_2_l_f)
4296  (=> (and hop_1_l_b hop_1_b_i) hop_2_l_i)
4297  (=> (and hop_1_l_b hop_1_b_h) hop_2_l_h)
4298  (=> (and hop_1_l_b hop_1_b_k) hop_2_l_k)
4299  (=> (and hop_1_l_b hop_1_b_j) hop_2_l_j)
4300  (=> (and hop_1_l_b hop_1_b_m) hop_2_l_m)
4301  (=> (and hop_1_l_b hop_1_b_o) hop_2_l_o)
4302  (=> (and hop_1_l_b hop_1_b_n) hop_2_l_n)
4303  (=> (and hop_1_l_b hop_1_b_q) hop_2_l_q)
4304  (=> (and hop_1_l_b hop_1_b_p) hop_2_l_p)
4305  (=> (and hop_1_l_e hop_1_e_a) hop_2_l_a)
4306  (=> (and hop_1_l_e hop_1_e_c) hop_2_l_c)
4307  (=> (and hop_1_l_e hop_1_e_b) hop_2_l_b)
4308  (=> (and hop_1_l_e hop_1_e_d) hop_2_l_d)
4309  (=> (and hop_1_l_e hop_1_e_g) hop_2_l_g)
4310  (=> (and hop_1_l_e hop_1_e_f) hop_2_l_f)
4311  (=> (and hop_1_l_e hop_1_e_i) hop_2_l_i)
4312  (=> (and hop_1_l_e hop_1_e_h) hop_2_l_h)
4313  (=> (and hop_1_l_e hop_1_e_k) hop_2_l_k)
4314  (=> (and hop_1_l_e hop_1_e_j) hop_2_l_j)
4315  (=> (and hop_1_l_e hop_1_e_m) hop_2_l_m)
4316  (=> (and hop_1_l_e hop_1_e_o) hop_2_l_o)
4317  (=> (and hop_1_l_e hop_1_e_n) hop_2_l_n)
4318  (=> (and hop_1_l_e hop_1_e_q) hop_2_l_q)
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4319  (=> (and hop_1_l_e hop_1_e_p) hop_2_l_p)
4320  (=> (and hop_1_l_d hop_1_d_a) hop_2_l_a)
4321  (=> (and hop_1_l_d hop_1_d_c) hop_2_l_c)
4322  (=> (and hop_1_l_d hop_1_d_b) hop_2_l_b)
4323  (=> (and hop_1_l_d hop_1_d_e) hop_2_l_e)
4324  (=> (and hop_1_l_d hop_1_d_g) hop_2_l_g)
4325  (=> (and hop_1_l_d hop_1_d_f) hop_2_l_f)
4326  (=> (and hop_1_l_d hop_1_d_i) hop_2_l_i)
4327  (=> (and hop_1_l_d hop_1_d_h) hop_2_l_h)
4328  (=> (and hop_1_l_d hop_1_d_k) hop_2_l_k)
4329  (=> (and hop_1_l_d hop_1_d_j) hop_2_l_j)
4330  (=> (and hop_1_l_d hop_1_d_m) hop_2_l_m)
4331  (=> (and hop_1_l_d hop_1_d_o) hop_2_l_o)
4332  (=> (and hop_1_l_d hop_1_d_n) hop_2_l_n)
4333  (=> (and hop_1_l_d hop_1_d_q) hop_2_l_q)
4334  (=> (and hop_1_l_d hop_1_d_p) hop_2_l_p)
4335  (=> (and hop_1_l_g hop_1_g_a) hop_2_l_a)
4336  (=> (and hop_1_l_g hop_1_g_c) hop_2_l_c)
4337  (=> (and hop_1_l_g hop_1_g_b) hop_2_l_b)
4338  (=> (and hop_1_l_g hop_1_g_e) hop_2_l_e)
4339  (=> (and hop_1_l_g hop_1_g_d) hop_2_l_d)
4340  (=> (and hop_1_l_g hop_1_g_f) hop_2_l_f)
4341  (=> (and hop_1_l_g hop_1_g_i) hop_2_l_i)
4342  (=> (and hop_1_l_g hop_1_g_h) hop_2_l_h)
4343  (=> (and hop_1_l_g hop_1_g_k) hop_2_l_k)
4344  (=> (and hop_1_l_g hop_1_g_j) hop_2_l_j)
4345  (=> (and hop_1_l_g hop_1_g_m) hop_2_l_m)
4346  (=> (and hop_1_l_g hop_1_g_o) hop_2_l_o)
4347  (=> (and hop_1_l_g hop_1_g_n) hop_2_l_n)
4348  (=> (and hop_1_l_g hop_1_g_q) hop_2_l_q)
4349  (=> (and hop_1_l_g hop_1_g_p) hop_2_l_p)
4350  (=> (and hop_1_l_f hop_1_f_a) hop_2_l_a)
4351  (=> (and hop_1_l_f hop_1_f_c) hop_2_l_c)
4352  (=> (and hop_1_l_f hop_1_f_b) hop_2_l_b)
4353  (=> (and hop_1_l_f hop_1_f_e) hop_2_l_e)
4354  (=> (and hop_1_l_f hop_1_f_d) hop_2_l_d)
4355  (=> (and hop_1_l_f hop_1_f_g) hop_2_l_g)
4356  (=> (and hop_1_l_f hop_1_f_i) hop_2_l_i)
4357  (=> (and hop_1_l_f hop_1_f_h) hop_2_l_h)
4358  (=> (and hop_1_l_f hop_1_f_k) hop_2_l_k)
4359  (=> (and hop_1_l_f hop_1_f_j) hop_2_l_j)
4360  (=> (and hop_1_l_f hop_1_f_m) hop_2_l_m)
4361  (=> (and hop_1_l_f hop_1_f_o) hop_2_l_o)
4362  (=> (and hop_1_l_f hop_1_f_n) hop_2_l_n)
4363  (=> (and hop_1_l_f hop_1_f_q) hop_2_l_q)
4364  (=> (and hop_1_l_f hop_1_f_p) hop_2_l_p)
4365  (=> (and hop_1_l_i hop_1_i_a) hop_2_l_a)
4366  (=> (and hop_1_l_i hop_1_i_c) hop_2_l_c)
4367  (=> (and hop_1_l_i hop_1_i_b) hop_2_l_b)
4368  (=> (and hop_1_l_i hop_1_i_e) hop_2_l_e)
4369  (=> (and hop_1_l_i hop_1_i_d) hop_2_l_d)
4370  (=> (and hop_1_l_i hop_1_i_g) hop_2_l_g)
4371  (=> (and hop_1_l_i hop_1_i_f) hop_2_l_f)
4372  (=> (and hop_1_l_i hop_1_i_h) hop_2_l_h)
4373  (=> (and hop_1_l_i hop_1_i_k) hop_2_l_k)
4374  (=> (and hop_1_l_i hop_1_i_j) hop_2_l_j)
4375  (=> (and hop_1_l_i hop_1_i_m) hop_2_l_m)
4376  (=> (and hop_1_l_i hop_1_i_o) hop_2_l_o)
4377  (=> (and hop_1_l_i hop_1_i_n) hop_2_l_n)
4378  (=> (and hop_1_l_i hop_1_i_q) hop_2_l_q)
4379  (=> (and hop_1_l_i hop_1_i_p) hop_2_l_p)
4380  (=> (and hop_1_l_h hop_1_h_a) hop_2_l_a)
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4381  (=> (and hop_1_l_h hop_1_h_c) hop_2_l_c)
4382  (=> (and hop_1_l_h hop_1_h_b) hop_2_l_b)
4383  (=> (and hop_1_l_h hop_1_h_e) hop_2_l_e)
4384  (=> (and hop_1_l_h hop_1_h_d) hop_2_l_d)
4385  (=> (and hop_1_l_h hop_1_h_g) hop_2_l_g)
4386  (=> (and hop_1_l_h hop_1_h_f) hop_2_l_f)
4387  (=> (and hop_1_l_h hop_1_h_i) hop_2_l_i)
4388  (=> (and hop_1_l_h hop_1_h_k) hop_2_l_k)
4389  (=> (and hop_1_l_h hop_1_h_j) hop_2_l_j)
4390  (=> (and hop_1_l_h hop_1_h_m) hop_2_l_m)
4391  (=> (and hop_1_l_h hop_1_h_o) hop_2_l_o)
4392  (=> (and hop_1_l_h hop_1_h_n) hop_2_l_n)
4393  (=> (and hop_1_l_h hop_1_h_q) hop_2_l_q)
4394  (=> (and hop_1_l_h hop_1_h_p) hop_2_l_p)
4395  (=> (and hop_1_l_k hop_1_k_a) hop_2_l_a)
4396  (=> (and hop_1_l_k hop_1_k_c) hop_2_l_c)
4397  (=> (and hop_1_l_k hop_1_k_b) hop_2_l_b)
4398  (=> (and hop_1_l_k hop_1_k_e) hop_2_l_e)
4399  (=> (and hop_1_l_k hop_1_k_d) hop_2_l_d)
4400  (=> (and hop_1_l_k hop_1_k_g) hop_2_l_g)
4401  (=> (and hop_1_l_k hop_1_k_f) hop_2_l_f)
4402  (=> (and hop_1_l_k hop_1_k_i) hop_2_l_i)
4403  (=> (and hop_1_l_k hop_1_k_h) hop_2_l_h)
4404  (=> (and hop_1_l_k hop_1_k_j) hop_2_l_j)
4405  (=> (and hop_1_l_k hop_1_k_m) hop_2_l_m)
4406  (=> (and hop_1_l_k hop_1_k_o) hop_2_l_o)
4407  (=> (and hop_1_l_k hop_1_k_n) hop_2_l_n)
4408  (=> (and hop_1_l_k hop_1_k_q) hop_2_l_q)
4409  (=> (and hop_1_l_k hop_1_k_p) hop_2_l_p)
4410  (=> (and hop_1_l_j hop_1_j_a) hop_2_l_a)
4411  (=> (and hop_1_l_j hop_1_j_c) hop_2_l_c)
4412  (=> (and hop_1_l_j hop_1_j_b) hop_2_l_b)
4413  (=> (and hop_1_l_j hop_1_j_e) hop_2_l_e)
4414  (=> (and hop_1_l_j hop_1_j_d) hop_2_l_d)
4415  (=> (and hop_1_l_j hop_1_j_g) hop_2_l_g)
4416  (=> (and hop_1_l_j hop_1_j_f) hop_2_l_f)
4417  (=> (and hop_1_l_j hop_1_j_i) hop_2_l_i)
4418  (=> (and hop_1_l_j hop_1_j_h) hop_2_l_h)
4419  (=> (and hop_1_l_j hop_1_j_k) hop_2_l_k)
4420  (=> (and hop_1_l_j hop_1_j_m) hop_2_l_m)
4421  (=> (and hop_1_l_j hop_1_j_o) hop_2_l_o)
4422  (=> (and hop_1_l_j hop_1_j_n) hop_2_l_n)
4423  (=> (and hop_1_l_j hop_1_j_q) hop_2_l_q)
4424  (=> (and hop_1_l_j hop_1_j_p) hop_2_l_p)
4425  (=> (and hop_1_l_m hop_1_m_a) hop_2_l_a)
4426  (=> (and hop_1_l_m hop_1_m_c) hop_2_l_c)
4427  (=> (and hop_1_l_m hop_1_m_b) hop_2_l_b)
4428  (=> (and hop_1_l_m hop_1_m_e) hop_2_l_e)
4429  (=> (and hop_1_l_m hop_1_m_d) hop_2_l_d)
4430  (=> (and hop_1_l_m hop_1_m_g) hop_2_l_g)
4431  (=> (and hop_1_l_m hop_1_m_f) hop_2_l_f)
4432  (=> (and hop_1_l_m hop_1_m_i) hop_2_l_i)
4433  (=> (and hop_1_l_m hop_1_m_h) hop_2_l_h)
4434  (=> (and hop_1_l_m hop_1_m_k) hop_2_l_k)
4435  (=> (and hop_1_l_m hop_1_m_j) hop_2_l_j)
4436  (=> (and hop_1_l_m hop_1_m_o) hop_2_l_o)
4437  (=> (and hop_1_l_m hop_1_m_n) hop_2_l_n)
4438  (=> (and hop_1_l_m hop_1_m_q) hop_2_l_q)
4439  (=> (and hop_1_l_m hop_1_m_p) hop_2_l_p)
4440  (=> (and hop_1_l_o hop_1_o_a) hop_2_l_a)
4441  (=> (and hop_1_l_o hop_1_o_c) hop_2_l_c)
4442  (=> (and hop_1_l_o hop_1_o_b) hop_2_l_b)
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4443  (=> (and hop_1_l_o hop_1_o_e) hop_2_l_e)
4444  (=> (and hop_1_l_o hop_1_o_d) hop_2_l_d)
4445  (=> (and hop_1_l_o hop_1_o_g) hop_2_l_g)
4446  (=> (and hop_1_l_o hop_1_o_f) hop_2_l_f)
4447  (=> (and hop_1_l_o hop_1_o_i) hop_2_l_i)
4448  (=> (and hop_1_l_o hop_1_o_h) hop_2_l_h)
4449  (=> (and hop_1_l_o hop_1_o_k) hop_2_l_k)
4450  (=> (and hop_1_l_o hop_1_o_j) hop_2_l_j)
4451  (=> (and hop_1_l_o hop_1_o_m) hop_2_l_m)
4452  (=> (and hop_1_l_o hop_1_o_n) hop_2_l_n)
4453  (=> (and hop_1_l_o hop_1_o_q) hop_2_l_q)
4454  (=> (and hop_1_l_o hop_1_o_p) hop_2_l_p)
4455  (=> (and hop_1_l_n hop_1_n_a) hop_2_l_a)
4456  (=> (and hop_1_l_n hop_1_n_c) hop_2_l_c)
4457  (=> (and hop_1_l_n hop_1_n_b) hop_2_l_b)
4458  (=> (and hop_1_l_n hop_1_n_e) hop_2_l_e)
4459  (=> (and hop_1_l_n hop_1_n_d) hop_2_l_d)
4460  (=> (and hop_1_l_n hop_1_n_g) hop_2_l_g)
4461  (=> (and hop_1_l_n hop_1_n_f) hop_2_l_f)
4462  (=> (and hop_1_l_n hop_1_n_i) hop_2_l_i)
4463  (=> (and hop_1_l_n hop_1_n_h) hop_2_l_h)
4464  (=> (and hop_1_l_n hop_1_n_k) hop_2_l_k)
4465  (=> (and hop_1_l_n hop_1_n_j) hop_2_l_j)
4466  (=> (and hop_1_l_n hop_1_n_m) hop_2_l_m)
4467  (=> (and hop_1_l_n hop_1_n_o) hop_2_l_o)
4468  (=> (and hop_1_l_n hop_1_n_q) hop_2_l_q)
4469  (=> (and hop_1_l_n hop_1_n_p) hop_2_l_p)
4470  (=> (and hop_1_l_q hop_1_q_a) hop_2_l_a)
4471  (=> (and hop_1_l_q hop_1_q_c) hop_2_l_c)
4472  (=> (and hop_1_l_q hop_1_q_b) hop_2_l_b)
4473  (=> (and hop_1_l_q hop_1_q_e) hop_2_l_e)
4474  (=> (and hop_1_l_q hop_1_q_d) hop_2_l_d)
4475  (=> (and hop_1_l_q hop_1_q_g) hop_2_l_g)
4476  (=> (and hop_1_l_q hop_1_q_f) hop_2_l_f)
4477  (=> (and hop_1_l_q hop_1_q_i) hop_2_l_i)
4478  (=> (and hop_1_l_q hop_1_q_h) hop_2_l_h)
4479  (=> (and hop_1_l_q hop_1_q_k) hop_2_l_k)
4480  (=> (and hop_1_l_q hop_1_q_j) hop_2_l_j)
4481  (=> (and hop_1_l_q hop_1_q_m) hop_2_l_m)
4482  (=> (and hop_1_l_q hop_1_q_o) hop_2_l_o)
4483  (=> (and hop_1_l_q hop_1_q_n) hop_2_l_n)
4484  (=> (and hop_1_l_q hop_1_q_p) hop_2_l_p)
4485  (=> (and hop_1_l_p hop_1_p_a) hop_2_l_a)
4486  (=> (and hop_1_l_p hop_1_p_c) hop_2_l_c)
4487  (=> (and hop_1_l_p hop_1_p_b) hop_2_l_b)
4488  (=> (and hop_1_l_p hop_1_p_e) hop_2_l_e)
4489  (=> (and hop_1_l_p hop_1_p_d) hop_2_l_d)
4490  (=> (and hop_1_l_p hop_1_p_g) hop_2_l_g)
4491  (=> (and hop_1_l_p hop_1_p_f) hop_2_l_f)
4492  (=> (and hop_1_l_p hop_1_p_i) hop_2_l_i)
4493  (=> (and hop_1_l_p hop_1_p_h) hop_2_l_h)
4494  (=> (and hop_1_l_p hop_1_p_k) hop_2_l_k)
4495  (=> (and hop_1_l_p hop_1_p_j) hop_2_l_j)
4496  (=> (and hop_1_l_p hop_1_p_m) hop_2_l_m)
4497  (=> (and hop_1_l_p hop_1_p_o) hop_2_l_o)
4498  (=> (and hop_1_l_p hop_1_p_n) hop_2_l_n)
4499  (=> (and hop_1_l_p hop_1_p_q) hop_2_l_q)
4500  (=> (and hop_1_o_a hop_1_a_c) hop_2_o_c)
4501  (=> (and hop_1_o_a hop_1_a_b) hop_2_o_b)
4502  (=> (and hop_1_o_a hop_1_a_e) hop_2_o_e)
4503  (=> (and hop_1_o_a hop_1_a_d) hop_2_o_d)
4504  (=> (and hop_1_o_a hop_1_a_g) hop_2_o_g)
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4505  (=> (and hop_1_o_a hop_1_a_f) hop_2_o_f)
4506  (=> (and hop_1_o_a hop_1_a_i) hop_2_o_i)
4507  (=> (and hop_1_o_a hop_1_a_h) hop_2_o_h)
4508  (=> (and hop_1_o_a hop_1_a_k) hop_2_o_k)
4509  (=> (and hop_1_o_a hop_1_a_j) hop_2_o_j)
4510  (=> (and hop_1_o_a hop_1_a_m) hop_2_o_m)
4511  (=> (and hop_1_o_a hop_1_a_l) hop_2_o_l)
4512  (=> (and hop_1_o_a hop_1_a_n) hop_2_o_n)
4513  (=> (and hop_1_o_a hop_1_a_q) hop_2_o_q)
4514  (=> (and hop_1_o_a hop_1_a_p) hop_2_o_p)
4515  (=> (and hop_1_o_c hop_1_c_a) hop_2_o_a)
4516  (=> (and hop_1_o_c hop_1_c_b) hop_2_o_b)
4517  (=> (and hop_1_o_c hop_1_c_e) hop_2_o_e)
4518  (=> (and hop_1_o_c hop_1_c_d) hop_2_o_d)
4519  (=> (and hop_1_o_c hop_1_c_g) hop_2_o_g)
4520  (=> (and hop_1_o_c hop_1_c_f) hop_2_o_f)
4521  (=> (and hop_1_o_c hop_1_c_i) hop_2_o_i)
4522  (=> (and hop_1_o_c hop_1_c_h) hop_2_o_h)
4523  (=> (and hop_1_o_c hop_1_c_k) hop_2_o_k)
4524  (=> (and hop_1_o_c hop_1_c_j) hop_2_o_j)
4525  (=> (and hop_1_o_c hop_1_c_m) hop_2_o_m)
4526  (=> (and hop_1_o_c hop_1_c_l) hop_2_o_l)
4527  (=> (and hop_1_o_c hop_1_c_n) hop_2_o_n)
4528  (=> (and hop_1_o_c hop_1_c_q) hop_2_o_q)
4529  (=> (and hop_1_o_c hop_1_c_p) hop_2_o_p)
4530  (=> (and hop_1_o_b hop_1_b_a) hop_2_o_a)
4531  (=> (and hop_1_o_b hop_1_b_c) hop_2_o_c)
4532  (=> (and hop_1_o_b hop_1_b_e) hop_2_o_e)
4533  (=> (and hop_1_o_b hop_1_b_d) hop_2_o_d)
4534  (=> (and hop_1_o_b hop_1_b_g) hop_2_o_g)
4535  (=> (and hop_1_o_b hop_1_b_f) hop_2_o_f)
4536  (=> (and hop_1_o_b hop_1_b_i) hop_2_o_i)
4537  (=> (and hop_1_o_b hop_1_b_h) hop_2_o_h)
4538  (=> (and hop_1_o_b hop_1_b_k) hop_2_o_k)
4539  (=> (and hop_1_o_b hop_1_b_j) hop_2_o_j)
4540  (=> (and hop_1_o_b hop_1_b_m) hop_2_o_m)
4541  (=> (and hop_1_o_b hop_1_b_l) hop_2_o_l)
4542  (=> (and hop_1_o_b hop_1_b_n) hop_2_o_n)
4543  (=> (and hop_1_o_b hop_1_b_q) hop_2_o_q)
4544  (=> (and hop_1_o_b hop_1_b_p) hop_2_o_p)
4545  (=> (and hop_1_o_e hop_1_e_a) hop_2_o_a)
4546  (=> (and hop_1_o_e hop_1_e_c) hop_2_o_c)
4547  (=> (and hop_1_o_e hop_1_e_b) hop_2_o_b)
4548  (=> (and hop_1_o_e hop_1_e_d) hop_2_o_d)
4549  (=> (and hop_1_o_e hop_1_e_g) hop_2_o_g)
4550  (=> (and hop_1_o_e hop_1_e_f) hop_2_o_f)
4551  (=> (and hop_1_o_e hop_1_e_i) hop_2_o_i)
4552  (=> (and hop_1_o_e hop_1_e_h) hop_2_o_h)
4553  (=> (and hop_1_o_e hop_1_e_k) hop_2_o_k)
4554  (=> (and hop_1_o_e hop_1_e_j) hop_2_o_j)
4555  (=> (and hop_1_o_e hop_1_e_m) hop_2_o_m)
4556  (=> (and hop_1_o_e hop_1_e_l) hop_2_o_l)
4557  (=> (and hop_1_o_e hop_1_e_n) hop_2_o_n)
4558  (=> (and hop_1_o_e hop_1_e_q) hop_2_o_q)
4559  (=> (and hop_1_o_e hop_1_e_p) hop_2_o_p)
4560  (=> (and hop_1_o_d hop_1_d_a) hop_2_o_a)
4561  (=> (and hop_1_o_d hop_1_d_c) hop_2_o_c)
4562  (=> (and hop_1_o_d hop_1_d_b) hop_2_o_b)
4563  (=> (and hop_1_o_d hop_1_d_e) hop_2_o_e)
4564  (=> (and hop_1_o_d hop_1_d_g) hop_2_o_g)
4565  (=> (and hop_1_o_d hop_1_d_f) hop_2_o_f)
4566  (=> (and hop_1_o_d hop_1_d_i) hop_2_o_i)
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4567  (=> (and hop_1_o_d hop_1_d_h) hop_2_o_h)
4568  (=> (and hop_1_o_d hop_1_d_k) hop_2_o_k)
4569  (=> (and hop_1_o_d hop_1_d_j) hop_2_o_j)
4570  (=> (and hop_1_o_d hop_1_d_m) hop_2_o_m)
4571  (=> (and hop_1_o_d hop_1_d_l) hop_2_o_l)
4572  (=> (and hop_1_o_d hop_1_d_n) hop_2_o_n)
4573  (=> (and hop_1_o_d hop_1_d_q) hop_2_o_q)
4574  (=> (and hop_1_o_d hop_1_d_p) hop_2_o_p)
4575  (=> (and hop_1_o_g hop_1_g_a) hop_2_o_a)
4576  (=> (and hop_1_o_g hop_1_g_c) hop_2_o_c)
4577  (=> (and hop_1_o_g hop_1_g_b) hop_2_o_b)
4578  (=> (and hop_1_o_g hop_1_g_e) hop_2_o_e)
4579  (=> (and hop_1_o_g hop_1_g_d) hop_2_o_d)
4580  (=> (and hop_1_o_g hop_1_g_f) hop_2_o_f)
4581  (=> (and hop_1_o_g hop_1_g_i) hop_2_o_i)
4582  (=> (and hop_1_o_g hop_1_g_h) hop_2_o_h)
4583  (=> (and hop_1_o_g hop_1_g_k) hop_2_o_k)
4584  (=> (and hop_1_o_g hop_1_g_j) hop_2_o_j)
4585  (=> (and hop_1_o_g hop_1_g_m) hop_2_o_m)
4586  (=> (and hop_1_o_g hop_1_g_l) hop_2_o_l)
4587  (=> (and hop_1_o_g hop_1_g_n) hop_2_o_n)
4588  (=> (and hop_1_o_g hop_1_g_q) hop_2_o_q)
4589  (=> (and hop_1_o_g hop_1_g_p) hop_2_o_p)
4590  (=> (and hop_1_o_f hop_1_f_a) hop_2_o_a)
4591  (=> (and hop_1_o_f hop_1_f_c) hop_2_o_c)
4592  (=> (and hop_1_o_f hop_1_f_b) hop_2_o_b)
4593  (=> (and hop_1_o_f hop_1_f_e) hop_2_o_e)
4594  (=> (and hop_1_o_f hop_1_f_d) hop_2_o_d)
4595  (=> (and hop_1_o_f hop_1_f_g) hop_2_o_g)
4596  (=> (and hop_1_o_f hop_1_f_i) hop_2_o_i)
4597  (=> (and hop_1_o_f hop_1_f_h) hop_2_o_h)
4598  (=> (and hop_1_o_f hop_1_f_k) hop_2_o_k)
4599  (=> (and hop_1_o_f hop_1_f_j) hop_2_o_j)
4600  (=> (and hop_1_o_f hop_1_f_m) hop_2_o_m)
4601  (=> (and hop_1_o_f hop_1_f_l) hop_2_o_l)
4602  (=> (and hop_1_o_f hop_1_f_n) hop_2_o_n)
4603  (=> (and hop_1_o_f hop_1_f_q) hop_2_o_q)
4604  (=> (and hop_1_o_f hop_1_f_p) hop_2_o_p)
4605  (=> (and hop_1_o_i hop_1_i_a) hop_2_o_a)
4606  (=> (and hop_1_o_i hop_1_i_c) hop_2_o_c)
4607  (=> (and hop_1_o_i hop_1_i_b) hop_2_o_b)
4608  (=> (and hop_1_o_i hop_1_i_e) hop_2_o_e)
4609  (=> (and hop_1_o_i hop_1_i_d) hop_2_o_d)
4610  (=> (and hop_1_o_i hop_1_i_g) hop_2_o_g)
4611  (=> (and hop_1_o_i hop_1_i_f) hop_2_o_f)
4612  (=> (and hop_1_o_i hop_1_i_h) hop_2_o_h)
4613  (=> (and hop_1_o_i hop_1_i_k) hop_2_o_k)
4614  (=> (and hop_1_o_i hop_1_i_j) hop_2_o_j)
4615  (=> (and hop_1_o_i hop_1_i_m) hop_2_o_m)
4616  (=> (and hop_1_o_i hop_1_i_l) hop_2_o_l)
4617  (=> (and hop_1_o_i hop_1_i_n) hop_2_o_n)
4618  (=> (and hop_1_o_i hop_1_i_q) hop_2_o_q)
4619  (=> (and hop_1_o_i hop_1_i_p) hop_2_o_p)
4620  (=> (and hop_1_o_h hop_1_h_a) hop_2_o_a)
4621  (=> (and hop_1_o_h hop_1_h_c) hop_2_o_c)
4622  (=> (and hop_1_o_h hop_1_h_b) hop_2_o_b)
4623  (=> (and hop_1_o_h hop_1_h_e) hop_2_o_e)
4624  (=> (and hop_1_o_h hop_1_h_d) hop_2_o_d)
4625  (=> (and hop_1_o_h hop_1_h_g) hop_2_o_g)
4626  (=> (and hop_1_o_h hop_1_h_f) hop_2_o_f)
4627  (=> (and hop_1_o_h hop_1_h_i) hop_2_o_i)
4628  (=> (and hop_1_o_h hop_1_h_k) hop_2_o_k)
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4629  (=> (and hop_1_o_h hop_1_h_j) hop_2_o_j)
4630  (=> (and hop_1_o_h hop_1_h_m) hop_2_o_m)
4631  (=> (and hop_1_o_h hop_1_h_l) hop_2_o_l)
4632  (=> (and hop_1_o_h hop_1_h_n) hop_2_o_n)
4633  (=> (and hop_1_o_h hop_1_h_q) hop_2_o_q)
4634  (=> (and hop_1_o_h hop_1_h_p) hop_2_o_p)
4635  (=> (and hop_1_o_k hop_1_k_a) hop_2_o_a)
4636  (=> (and hop_1_o_k hop_1_k_c) hop_2_o_c)
4637  (=> (and hop_1_o_k hop_1_k_b) hop_2_o_b)
4638  (=> (and hop_1_o_k hop_1_k_e) hop_2_o_e)
4639  (=> (and hop_1_o_k hop_1_k_d) hop_2_o_d)
4640  (=> (and hop_1_o_k hop_1_k_g) hop_2_o_g)
4641  (=> (and hop_1_o_k hop_1_k_f) hop_2_o_f)
4642  (=> (and hop_1_o_k hop_1_k_i) hop_2_o_i)
4643  (=> (and hop_1_o_k hop_1_k_h) hop_2_o_h)
4644  (=> (and hop_1_o_k hop_1_k_j) hop_2_o_j)
4645  (=> (and hop_1_o_k hop_1_k_m) hop_2_o_m)
4646  (=> (and hop_1_o_k hop_1_k_l) hop_2_o_l)
4647  (=> (and hop_1_o_k hop_1_k_n) hop_2_o_n)
4648  (=> (and hop_1_o_k hop_1_k_q) hop_2_o_q)
4649  (=> (and hop_1_o_k hop_1_k_p) hop_2_o_p)
4650  (=> (and hop_1_o_j hop_1_j_a) hop_2_o_a)
4651  (=> (and hop_1_o_j hop_1_j_c) hop_2_o_c)
4652  (=> (and hop_1_o_j hop_1_j_b) hop_2_o_b)
4653  (=> (and hop_1_o_j hop_1_j_e) hop_2_o_e)
4654  (=> (and hop_1_o_j hop_1_j_d) hop_2_o_d)
4655  (=> (and hop_1_o_j hop_1_j_g) hop_2_o_g)
4656  (=> (and hop_1_o_j hop_1_j_f) hop_2_o_f)
4657  (=> (and hop_1_o_j hop_1_j_i) hop_2_o_i)
4658  (=> (and hop_1_o_j hop_1_j_h) hop_2_o_h)
4659  (=> (and hop_1_o_j hop_1_j_k) hop_2_o_k)
4660  (=> (and hop_1_o_j hop_1_j_m) hop_2_o_m)
4661  (=> (and hop_1_o_j hop_1_j_l) hop_2_o_l)
4662  (=> (and hop_1_o_j hop_1_j_n) hop_2_o_n)
4663  (=> (and hop_1_o_j hop_1_j_q) hop_2_o_q)
4664  (=> (and hop_1_o_j hop_1_j_p) hop_2_o_p)
4665  (=> (and hop_1_o_m hop_1_m_a) hop_2_o_a)
4666  (=> (and hop_1_o_m hop_1_m_c) hop_2_o_c)
4667  (=> (and hop_1_o_m hop_1_m_b) hop_2_o_b)
4668  (=> (and hop_1_o_m hop_1_m_e) hop_2_o_e)
4669  (=> (and hop_1_o_m hop_1_m_d) hop_2_o_d)
4670  (=> (and hop_1_o_m hop_1_m_g) hop_2_o_g)
4671  (=> (and hop_1_o_m hop_1_m_f) hop_2_o_f)
4672  (=> (and hop_1_o_m hop_1_m_i) hop_2_o_i)
4673  (=> (and hop_1_o_m hop_1_m_h) hop_2_o_h)
4674  (=> (and hop_1_o_m hop_1_m_k) hop_2_o_k)
4675  (=> (and hop_1_o_m hop_1_m_j) hop_2_o_j)
4676  (=> (and hop_1_o_m hop_1_m_l) hop_2_o_l)
4677  (=> (and hop_1_o_m hop_1_m_n) hop_2_o_n)
4678  (=> (and hop_1_o_m hop_1_m_q) hop_2_o_q)
4679  (=> (and hop_1_o_m hop_1_m_p) hop_2_o_p)
4680  (=> (and hop_1_o_l hop_1_l_a) hop_2_o_a)
4681  (=> (and hop_1_o_l hop_1_l_c) hop_2_o_c)
4682  (=> (and hop_1_o_l hop_1_l_b) hop_2_o_b)
4683  (=> (and hop_1_o_l hop_1_l_e) hop_2_o_e)
4684  (=> (and hop_1_o_l hop_1_l_d) hop_2_o_d)
4685  (=> (and hop_1_o_l hop_1_l_g) hop_2_o_g)
4686  (=> (and hop_1_o_l hop_1_l_f) hop_2_o_f)
4687  (=> (and hop_1_o_l hop_1_l_i) hop_2_o_i)
4688  (=> (and hop_1_o_l hop_1_l_h) hop_2_o_h)
4689  (=> (and hop_1_o_l hop_1_l_k) hop_2_o_k)
4690  (=> (and hop_1_o_l hop_1_l_j) hop_2_o_j)
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4691  (=> (and hop_1_o_l hop_1_l_m) hop_2_o_m)
4692  (=> (and hop_1_o_l hop_1_l_n) hop_2_o_n)
4693  (=> (and hop_1_o_l hop_1_l_q) hop_2_o_q)
4694  (=> (and hop_1_o_l hop_1_l_p) hop_2_o_p)
4695  (=> (and hop_1_o_n hop_1_n_a) hop_2_o_a)
4696  (=> (and hop_1_o_n hop_1_n_c) hop_2_o_c)
4697  (=> (and hop_1_o_n hop_1_n_b) hop_2_o_b)
4698  (=> (and hop_1_o_n hop_1_n_e) hop_2_o_e)
4699  (=> (and hop_1_o_n hop_1_n_d) hop_2_o_d)
4700  (=> (and hop_1_o_n hop_1_n_g) hop_2_o_g)
4701  (=> (and hop_1_o_n hop_1_n_f) hop_2_o_f)
4702  (=> (and hop_1_o_n hop_1_n_i) hop_2_o_i)
4703  (=> (and hop_1_o_n hop_1_n_h) hop_2_o_h)
4704  (=> (and hop_1_o_n hop_1_n_k) hop_2_o_k)
4705  (=> (and hop_1_o_n hop_1_n_j) hop_2_o_j)
4706  (=> (and hop_1_o_n hop_1_n_m) hop_2_o_m)
4707  (=> (and hop_1_o_n hop_1_n_l) hop_2_o_l)
4708  (=> (and hop_1_o_n hop_1_n_q) hop_2_o_q)
4709  (=> (and hop_1_o_n hop_1_n_p) hop_2_o_p)
4710  (=> (and hop_1_o_q hop_1_q_a) hop_2_o_a)
4711  (=> (and hop_1_o_q hop_1_q_c) hop_2_o_c)
4712  (=> (and hop_1_o_q hop_1_q_b) hop_2_o_b)
4713  (=> (and hop_1_o_q hop_1_q_e) hop_2_o_e)
4714  (=> (and hop_1_o_q hop_1_q_d) hop_2_o_d)
4715  (=> (and hop_1_o_q hop_1_q_g) hop_2_o_g)
4716  (=> (and hop_1_o_q hop_1_q_f) hop_2_o_f)
4717  (=> (and hop_1_o_q hop_1_q_i) hop_2_o_i)
4718  (=> (and hop_1_o_q hop_1_q_h) hop_2_o_h)
4719  (=> (and hop_1_o_q hop_1_q_k) hop_2_o_k)
4720  (=> (and hop_1_o_q hop_1_q_j) hop_2_o_j)
4721  (=> (and hop_1_o_q hop_1_q_m) hop_2_o_m)
4722  (=> (and hop_1_o_q hop_1_q_l) hop_2_o_l)
4723  (=> (and hop_1_o_q hop_1_q_n) hop_2_o_n)
4724  (=> (and hop_1_o_q hop_1_q_p) hop_2_o_p)
4725  (=> (and hop_1_o_p hop_1_p_a) hop_2_o_a)
4726  (=> (and hop_1_o_p hop_1_p_c) hop_2_o_c)
4727  (=> (and hop_1_o_p hop_1_p_b) hop_2_o_b)
4728  (=> (and hop_1_o_p hop_1_p_e) hop_2_o_e)
4729  (=> (and hop_1_o_p hop_1_p_d) hop_2_o_d)
4730  (=> (and hop_1_o_p hop_1_p_g) hop_2_o_g)
4731  (=> (and hop_1_o_p hop_1_p_f) hop_2_o_f)
4732  (=> (and hop_1_o_p hop_1_p_i) hop_2_o_i)
4733  (=> (and hop_1_o_p hop_1_p_h) hop_2_o_h)
4734  (=> (and hop_1_o_p hop_1_p_k) hop_2_o_k)
4735  (=> (and hop_1_o_p hop_1_p_j) hop_2_o_j)
4736  (=> (and hop_1_o_p hop_1_p_m) hop_2_o_m)
4737  (=> (and hop_1_o_p hop_1_p_l) hop_2_o_l)
4738  (=> (and hop_1_o_p hop_1_p_n) hop_2_o_n)
4739  (=> (and hop_1_o_p hop_1_p_q) hop_2_o_q)
4740  (=> (and hop_1_n_a hop_1_a_c) hop_2_n_c)
4741  (=> (and hop_1_n_a hop_1_a_b) hop_2_n_b)
4742  (=> (and hop_1_n_a hop_1_a_e) hop_2_n_e)
4743  (=> (and hop_1_n_a hop_1_a_d) hop_2_n_d)
4744  (=> (and hop_1_n_a hop_1_a_g) hop_2_n_g)
4745  (=> (and hop_1_n_a hop_1_a_f) hop_2_n_f)
4746  (=> (and hop_1_n_a hop_1_a_i) hop_2_n_i)
4747  (=> (and hop_1_n_a hop_1_a_h) hop_2_n_h)
4748  (=> (and hop_1_n_a hop_1_a_k) hop_2_n_k)
4749  (=> (and hop_1_n_a hop_1_a_j) hop_2_n_j)
4750  (=> (and hop_1_n_a hop_1_a_m) hop_2_n_m)
4751  (=> (and hop_1_n_a hop_1_a_l) hop_2_n_l)
4752  (=> (and hop_1_n_a hop_1_a_o) hop_2_n_o)
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4753   (=> (and hop_1_n_a hop_1_a_q) hop_2_n_q)
4754   (=> (and hop_1_n_a hop_1_a_p) hop_2_n_p)
4755   (=> (and hop_1_n_c hop_1_c_a) hop_2_n_a)
4756   (=> (and hop_1_n_c hop_1_c_b) hop_2_n_b)
4757   (=> (and hop_1_n_c hop_1_c_e) hop_2_n_e)
4758   (=> (and hop_1_n_c hop_1_c_d) hop_2_n_d)
4759   (=> (and hop_1_n_c hop_1_c_g) hop_2_n_g)
4760   (=> (and hop_1_n_c hop_1_c_f) hop_2_n_f)
4761   (=> (and hop_1_n_c hop_1_c_i) hop_2_n_i)
4762   (=> (and hop_1_n_c hop_1_c_h) hop_2_n_h)
4763   (=> (and hop_1_n_c hop_1_c_k) hop_2_n_k)
4764   (=> (and hop_1_n_c hop_1_c_j) hop_2_n_j)
4765   (=> (and hop_1_n_c hop_1_c_m) hop_2_n_m)
4766   (=> (and hop_1_n_c hop_1_c_l) hop_2_n_l)
4767   (=> (and hop_1_n_c hop_1_c_o) hop_2_n_o)
4768   (=> (and hop_1_n_c hop_1_c_q) hop_2_n_q)
4769   (=> (and hop_1_n_c hop_1_c_p) hop_2_n_p)
4770   (=> (and hop_1_n_b hop_1_b_a) hop_2_n_a)
4771   (=> (and hop_1_n_b hop_1_b_c) hop_2_n_c)
4772   (=> (and hop_1_n_b hop_1_b_e) hop_2_n_e)
4773   (=> (and hop_1_n_b hop_1_b_d) hop_2_n_d)
4774   (=> (and hop_1_n_b hop_1_b_g) hop_2_n_g)
4775   (=> (and hop_1_n_b hop_1_b_f) hop_2_n_f)
4776   (=> (and hop_1_n_b hop_1_b_i) hop_2_n_i)
4777   (=> (and hop_1_n_b hop_1_b_h) hop_2_n_h)
4778   (=> (and hop_1_n_b hop_1_b_k) hop_2_n_k)
4779   (=> (and hop_1_n_b hop_1_b_j) hop_2_n_j)
4780   (=> (and hop_1_n_b hop_1_b_m) hop_2_n_m)
4781   (=> (and hop_1_n_b hop_1_b_l) hop_2_n_l)
4782   (=> (and hop_1_n_b hop_1_b_o) hop_2_n_o)
4783   (=> (and hop_1_n_b hop_1_b_q) hop_2_n_q)
4784   (=> (and hop_1_n_b hop_1_b_p) hop_2_n_p)
4785   (=> (and hop_1_n_e hop_1_e_a) hop_2_n_a)
4786   (=> (and hop_1_n_e hop_1_e_c) hop_2_n_c)
4787   (=> (and hop_1_n_e hop_1_e_b) hop_2_n_b)
4788   (=> (and hop_1_n_e hop_1_e_d) hop_2_n_d)
4789   (=> (and hop_1_n_e hop_1_e_g) hop_2_n_g)
4790   (=> (and hop_1_n_e hop_1_e_f) hop_2_n_f)
4791   (=> (and hop_1_n_e hop_1_e_i) hop_2_n_i)
4792   (=> (and hop_1_n_e hop_1_e_h) hop_2_n_h)
4793   (=> (and hop_1_n_e hop_1_e_k) hop_2_n_k)
4794   (=> (and hop_1_n_e hop_1_e_j) hop_2_n_j)
4795   (=> (and hop_1_n_e hop_1_e_m) hop_2_n_m)
4796   (=> (and hop_1_n_e hop_1_e_l) hop_2_n_l)
4797   (=> (and hop_1_n_e hop_1_e_o) hop_2_n_o)
4798   (=> (and hop_1_n_e hop_1_e_q) hop_2_n_q)
4799   (=> (and hop_1_n_e hop_1_e_p) hop_2_n_p)
4800   (=> (and hop_1_n_d hop_1_d_a) hop_2_n_a)
4801   (=> (and hop_1_n_d hop_1_d_c) hop_2_n_c)
4802   (=> (and hop_1_n_d hop_1_d_b) hop_2_n_b)
4803   (=> (and hop_1_n_d hop_1_d_e) hop_2_n_e)
4804   (=> (and hop_1_n_d hop_1_d_g) hop_2_n_g)
4805   (=> (and hop_1_n_d hop_1_d_f) hop_2_n_f)
4806   (=> (and hop_1_n_d hop_1_d_i) hop_2_n_i)
4807   (=> (and hop_1_n_d hop_1_d_h) hop_2_n_h)
4808   (=> (and hop_1_n_d hop_1_d_k) hop_2_n_k)
4809   (=> (and hop_1_n_d hop_1_d_j) hop_2_n_j)
4810   (=> (and hop_1_n_d hop_1_d_m) hop_2_n_m)
4811   (=> (and hop_1_n_d hop_1_d_l) hop_2_n_l)
4812   (=> (and hop_1_n_d hop_1_d_o) hop_2_n_o)
4813   (=> (and hop_1_n_d hop_1_d_q) hop_2_n_q)
4814   (=> (and hop_1_n_d hop_1_d_p) hop_2_n_p)
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4815  (=> (and hop_1_n_g hop_1_g_a) hop_2_n_a)
4816  (=> (and hop_1_n_g hop_1_g_c) hop_2_n_c)
4817  (=> (and hop_1_n_g hop_1_g_b) hop_2_n_b)
4818  (=> (and hop_1_n_g hop_1_g_e) hop_2_n_e)
4819  (=> (and hop_1_n_g hop_1_g_d) hop_2_n_d)
4820  (=> (and hop_1_n_g hop_1_g_f) hop_2_n_f)
4821  (=> (and hop_1_n_g hop_1_g_i) hop_2_n_i)
4822  (=> (and hop_1_n_g hop_1_g_h) hop_2_n_h)
4823  (=> (and hop_1_n_g hop_1_g_k) hop_2_n_k)
4824  (=> (and hop_1_n_g hop_1_g_j) hop_2_n_j)
4825  (=> (and hop_1_n_g hop_1_g_m) hop_2_n_m)
4826  (=> (and hop_1_n_g hop_1_g_l) hop_2_n_l)
4827  (=> (and hop_1_n_g hop_1_g_o) hop_2_n_o)
4828  (=> (and hop_1_n_g hop_1_g_q) hop_2_n_q)
4829  (=> (and hop_1_n_g hop_1_g_p) hop_2_n_p)
4830  (=> (and hop_1_n_f hop_1_f_a) hop_2_n_a)
4831  (=> (and hop_1_n_f hop_1_f_c) hop_2_n_c)
4832  (=> (and hop_1_n_f hop_1_f_b) hop_2_n_b)
4833  (=> (and hop_1_n_f hop_1_f_e) hop_2_n_e)
4834  (=> (and hop_1_n_f hop_1_f_d) hop_2_n_d)
4835  (=> (and hop_1_n_f hop_1_f_g) hop_2_n_g)
4836  (=> (and hop_1_n_f hop_1_f_i) hop_2_n_i)
4837  (=> (and hop_1_n_f hop_1_f_h) hop_2_n_h)
4838  (=> (and hop_1_n_f hop_1_f_k) hop_2_n_k)
4839  (=> (and hop_1_n_f hop_1_f_j) hop_2_n_j)
4840  (=> (and hop_1_n_f hop_1_f_m) hop_2_n_m)
4841  (=> (and hop_1_n_f hop_1_f_l) hop_2_n_l)
4842  (=> (and hop_1_n_f hop_1_f_o) hop_2_n_o)
4843  (=> (and hop_1_n_f hop_1_f_q) hop_2_n_q)
4844  (=> (and hop_1_n_f hop_1_f_p) hop_2_n_p)
4845  (=> (and hop_1_n_i hop_1_i_a) hop_2_n_a)
4846  (=> (and hop_1_n_i hop_1_i_c) hop_2_n_c)
4847  (=> (and hop_1_n_i hop_1_i_b) hop_2_n_b)
4848  (=> (and hop_1_n_i hop_1_i_e) hop_2_n_e)
4849  (=> (and hop_1_n_i hop_1_i_d) hop_2_n_d)
4850  (=> (and hop_1_n_i hop_1_i_g) hop_2_n_g)
4851  (=> (and hop_1_n_i hop_1_i_f) hop_2_n_f)
4852  (=> (and hop_1_n_i hop_1_i_h) hop_2_n_h)
4853  (=> (and hop_1_n_i hop_1_i_k) hop_2_n_k)
4854  (=> (and hop_1_n_i hop_1_i_j) hop_2_n_j)
4855  (=> (and hop_1_n_i hop_1_i_m) hop_2_n_m)
4856  (=> (and hop_1_n_i hop_1_i_l) hop_2_n_l)
4857  (=> (and hop_1_n_i hop_1_i_o) hop_2_n_o)
4858  (=> (and hop_1_n_i hop_1_i_q) hop_2_n_q)
4859  (=> (and hop_1_n_i hop_1_i_p) hop_2_n_p)
4860  (=> (and hop_1_n_h hop_1_h_a) hop_2_n_a)
4861  (=> (and hop_1_n_h hop_1_h_c) hop_2_n_c)
4862  (=> (and hop_1_n_h hop_1_h_b) hop_2_n_b)
4863  (=> (and hop_1_n_h hop_1_h_e) hop_2_n_e)
4864  (=> (and hop_1_n_h hop_1_h_d) hop_2_n_d)
4865  (=> (and hop_1_n_h hop_1_h_g) hop_2_n_g)
4866  (=> (and hop_1_n_h hop_1_h_f) hop_2_n_f)
4867  (=> (and hop_1_n_h hop_1_h_i) hop_2_n_i)
4868  (=> (and hop_1_n_h hop_1_h_k) hop_2_n_k)
4869  (=> (and hop_1_n_h hop_1_h_j) hop_2_n_j)
4870  (=> (and hop_1_n_h hop_1_h_m) hop_2_n_m)
4871  (=> (and hop_1_n_h hop_1_h_l) hop_2_n_l)
4872  (=> (and hop_1_n_h hop_1_h_o) hop_2_n_o)
4873  (=> (and hop_1_n_h hop_1_h_q) hop_2_n_q)
4874  (=> (and hop_1_n_h hop_1_h_p) hop_2_n_p)
4875  (=> (and hop_1_n_k hop_1_k_a) hop_2_n_a)
4876  (=> (and hop_1_n_k hop_1_k_c) hop_2_n_c)
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4877  (=> (and hop_1_n_k hop_1_k_b) hop_2_n_b)
4878  (=> (and hop_1_n_k hop_1_k_e) hop_2_n_e)
4879  (=> (and hop_1_n_k hop_1_k_d) hop_2_n_d)
4880  (=> (and hop_1_n_k hop_1_k_g) hop_2_n_g)
4881  (=> (and hop_1_n_k hop_1_k_f) hop_2_n_f)
4882  (=> (and hop_1_n_k hop_1_k_i) hop_2_n_i)
4883  (=> (and hop_1_n_k hop_1_k_h) hop_2_n_h)
4884  (=> (and hop_1_n_k hop_1_k_j) hop_2_n_j)
4885  (=> (and hop_1_n_k hop_1_k_m) hop_2_n_m)
4886  (=> (and hop_1_n_k hop_1_k_l) hop_2_n_l)
4887  (=> (and hop_1_n_k hop_1_k_o) hop_2_n_o)
4888  (=> (and hop_1_n_k hop_1_k_q) hop_2_n_q)
4889  (=> (and hop_1_n_k hop_1_k_p) hop_2_n_p)
4890  (=> (and hop_1_n_j hop_1_j_a) hop_2_n_a)
4891  (=> (and hop_1_n_j hop_1_j_c) hop_2_n_c)
4892  (=> (and hop_1_n_j hop_1_j_b) hop_2_n_b)
4893  (=> (and hop_1_n_j hop_1_j_e) hop_2_n_e)
4894  (=> (and hop_1_n_j hop_1_j_d) hop_2_n_d)
4895  (=> (and hop_1_n_j hop_1_j_g) hop_2_n_g)
4896  (=> (and hop_1_n_j hop_1_j_f) hop_2_n_f)
4897  (=> (and hop_1_n_j hop_1_j_i) hop_2_n_i)
4898  (=> (and hop_1_n_j hop_1_j_h) hop_2_n_h)
4899  (=> (and hop_1_n_j hop_1_j_k) hop_2_n_k)
4900  (=> (and hop_1_n_j hop_1_j_m) hop_2_n_m)
4901  (=> (and hop_1_n_j hop_1_j_l) hop_2_n_l)
4902  (=> (and hop_1_n_j hop_1_j_o) hop_2_n_o)
4903  (=> (and hop_1_n_j hop_1_j_q) hop_2_n_q)
4904  (=> (and hop_1_n_j hop_1_j_p) hop_2_n_p)
4905  (=> (and hop_1_n_m hop_1_m_a) hop_2_n_a)
4906  (=> (and hop_1_n_m hop_1_m_c) hop_2_n_c)
4907  (=> (and hop_1_n_m hop_1_m_b) hop_2_n_b)
4908  (=> (and hop_1_n_m hop_1_m_e) hop_2_n_e)
4909  (=> (and hop_1_n_m hop_1_m_d) hop_2_n_d)
4910  (=> (and hop_1_n_m hop_1_m_g) hop_2_n_g)
4911  (=> (and hop_1_n_m hop_1_m_f) hop_2_n_f)
4912  (=> (and hop_1_n_m hop_1_m_i) hop_2_n_i)
4913  (=> (and hop_1_n_m hop_1_m_h) hop_2_n_h)
4914  (=> (and hop_1_n_m hop_1_m_k) hop_2_n_k)
4915  (=> (and hop_1_n_m hop_1_m_j) hop_2_n_j)
4916  (=> (and hop_1_n_m hop_1_m_l) hop_2_n_l)
4917  (=> (and hop_1_n_m hop_1_m_o) hop_2_n_o)
4918  (=> (and hop_1_n_m hop_1_m_q) hop_2_n_q)
4919  (=> (and hop_1_n_m hop_1_m_p) hop_2_n_p)
4920  (=> (and hop_1_n_l hop_1_l_a) hop_2_n_a)
4921  (=> (and hop_1_n_l hop_1_l_c) hop_2_n_c)
4922  (=> (and hop_1_n_l hop_1_l_b) hop_2_n_b)
4923  (=> (and hop_1_n_l hop_1_l_e) hop_2_n_e)
4924  (=> (and hop_1_n_l hop_1_l_d) hop_2_n_d)
4925  (=> (and hop_1_n_l hop_1_l_g) hop_2_n_g)
4926  (=> (and hop_1_n_l hop_1_l_f) hop_2_n_f)
4927  (=> (and hop_1_n_l hop_1_l_i) hop_2_n_i)
4928  (=> (and hop_1_n_l hop_1_l_h) hop_2_n_h)
4929  (=> (and hop_1_n_l hop_1_l_k) hop_2_n_k)
4930  (=> (and hop_1_n_l hop_1_l_j) hop_2_n_j)
4931  (=> (and hop_1_n_l hop_1_l_m) hop_2_n_m)
4932  (=> (and hop_1_n_l hop_1_l_o) hop_2_n_o)
4933  (=> (and hop_1_n_l hop_1_l_q) hop_2_n_q)
4934  (=> (and hop_1_n_l hop_1_l_p) hop_2_n_p)
4935  (=> (and hop_1_n_o hop_1_o_a) hop_2_n_a)
4936  (=> (and hop_1_n_o hop_1_o_c) hop_2_n_c)
4937  (=> (and hop_1_n_o hop_1_o_b) hop_2_n_b)
4938  (=> (and hop_1_n_o hop_1_o_e) hop_2_n_e)
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4939  (=> (and hop_1_n_o hop_1_o_d) hop_2_n_d)
4940  (=> (and hop_1_n_o hop_1_o_g) hop_2_n_g)
4941  (=> (and hop_1_n_o hop_1_o_f) hop_2_n_f)
4942  (=> (and hop_1_n_o hop_1_o_i) hop_2_n_i)
4943  (=> (and hop_1_n_o hop_1_o_h) hop_2_n_h)
4944  (=> (and hop_1_n_o hop_1_o_k) hop_2_n_k)
4945  (=> (and hop_1_n_o hop_1_o_j) hop_2_n_j)
4946  (=> (and hop_1_n_o hop_1_o_m) hop_2_n_m)
4947  (=> (and hop_1_n_o hop_1_o_l) hop_2_n_l)
4948  (=> (and hop_1_n_o hop_1_o_q) hop_2_n_q)
4949  (=> (and hop_1_n_o hop_1_o_p) hop_2_n_p)
4950  (=> (and hop_1_n_q hop_1_q_a) hop_2_n_a)
4951  (=> (and hop_1_n_q hop_1_q_c) hop_2_n_c)
4952  (=> (and hop_1_n_q hop_1_q_b) hop_2_n_b)
4953  (=> (and hop_1_n_q hop_1_q_e) hop_2_n_e)
4954  (=> (and hop_1_n_q hop_1_q_d) hop_2_n_d)
4955  (=> (and hop_1_n_q hop_1_q_g) hop_2_n_g)
4956  (=> (and hop_1_n_q hop_1_q_f) hop_2_n_f)
4957  (=> (and hop_1_n_q hop_1_q_i) hop_2_n_i)
4958  (=> (and hop_1_n_q hop_1_q_h) hop_2_n_h)
4959  (=> (and hop_1_n_q hop_1_q_k) hop_2_n_k)
4960  (=> (and hop_1_n_q hop_1_q_j) hop_2_n_j)
4961  (=> (and hop_1_n_q hop_1_q_m) hop_2_n_m)
4962  (=> (and hop_1_n_q hop_1_q_l) hop_2_n_l)
4963  (=> (and hop_1_n_q hop_1_q_o) hop_2_n_o)
4964  (=> (and hop_1_n_q hop_1_q_p) hop_2_n_p)
4965  (=> (and hop_1_n_p hop_1_p_a) hop_2_n_a)
4966  (=> (and hop_1_n_p hop_1_p_c) hop_2_n_c)
4967  (=> (and hop_1_n_p hop_1_p_b) hop_2_n_b)
4968  (=> (and hop_1_n_p hop_1_p_e) hop_2_n_e)
4969  (=> (and hop_1_n_p hop_1_p_d) hop_2_n_d)
4970  (=> (and hop_1_n_p hop_1_p_g) hop_2_n_g)
4971  (=> (and hop_1_n_p hop_1_p_f) hop_2_n_f)
4972  (=> (and hop_1_n_p hop_1_p_i) hop_2_n_i)
4973  (=> (and hop_1_n_p hop_1_p_h) hop_2_n_h)
4974  (=> (and hop_1_n_p hop_1_p_k) hop_2_n_k)
4975  (=> (and hop_1_n_p hop_1_p_j) hop_2_n_j)
4976  (=> (and hop_1_n_p hop_1_p_m) hop_2_n_m)
4977  (=> (and hop_1_n_p hop_1_p_l) hop_2_n_l)
4978  (=> (and hop_1_n_p hop_1_p_o) hop_2_n_o)
4979  (=> (and hop_1_n_p hop_1_p_q) hop_2_n_q)
4980  (=> (and hop_1_q_a hop_1_a_c) hop_2_q_c)
4981  (=> (and hop_1_q_a hop_1_a_b) hop_2_q_b)
4982  (=> (and hop_1_q_a hop_1_a_e) hop_2_q_e)
4983  (=> (and hop_1_q_a hop_1_a_d) hop_2_q_d)
4984  (=> (and hop_1_q_a hop_1_a_g) hop_2_q_g)
4985  (=> (and hop_1_q_a hop_1_a_f) hop_2_q_f)
4986  (=> (and hop_1_q_a hop_1_a_i) hop_2_q_i)
4987  (=> (and hop_1_q_a hop_1_a_h) hop_2_q_h)
4988  (=> (and hop_1_q_a hop_1_a_k) hop_2_q_k)
4989  (=> (and hop_1_q_a hop_1_a_j) hop_2_q_j)
4990  (=> (and hop_1_q_a hop_1_a_m) hop_2_q_m)
4991  (=> (and hop_1_q_a hop_1_a_l) hop_2_q_l)
4992  (=> (and hop_1_q_a hop_1_a_o) hop_2_q_o)
4993  (=> (and hop_1_q_a hop_1_a_n) hop_2_q_n)
4994  (=> (and hop_1_q_a hop_1_a_p) hop_2_q_p)
4995  (=> (and hop_1_q_c hop_1_c_a) hop_2_q_a)
4996  (=> (and hop_1_q_c hop_1_c_b) hop_2_q_b)
4997  (=> (and hop_1_q_c hop_1_c_e) hop_2_q_e)
4998  (=> (and hop_1_q_c hop_1_c_d) hop_2_q_d)
4999  (=> (and hop_1_q_c hop_1_c_g) hop_2_q_g)
5000  (=> (and hop_1_q_c hop_1_c_f) hop_2_q_f)
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5001  (=> (and hop_1_q_c hop_1_c_i) hop_2_q_i)
5002  (=> (and hop_1_q_c hop_1_c_h) hop_2_q_h)
5003  (=> (and hop_1_q_c hop_1_c_k) hop_2_q_k)
5004  (=> (and hop_1_q_c hop_1_c_j) hop_2_q_j)
5005  (=> (and hop_1_q_c hop_1_c_m) hop_2_q_m)
5006  (=> (and hop_1_q_c hop_1_c_l) hop_2_q_l)
5007  (=> (and hop_1_q_c hop_1_c_o) hop_2_q_o)
5008  (=> (and hop_1_q_c hop_1_c_n) hop_2_q_n)
5009  (=> (and hop_1_q_c hop_1_c_p) hop_2_q_p)
5010  (=> (and hop_1_q_b hop_1_b_a) hop_2_q_a)
5011  (=> (and hop_1_q_b hop_1_b_c) hop_2_q_c)
5012  (=> (and hop_1_q_b hop_1_b_e) hop_2_q_e)
5013  (=> (and hop_1_q_b hop_1_b_d) hop_2_q_d)
5014  (=> (and hop_1_q_b hop_1_b_g) hop_2_q_g)
5015  (=> (and hop_1_q_b hop_1_b_f) hop_2_q_f)
5016  (=> (and hop_1_q_b hop_1_b_i) hop_2_q_i)
5017  (=> (and hop_1_q_b hop_1_b_h) hop_2_q_h)
5018  (=> (and hop_1_q_b hop_1_b_k) hop_2_q_k)
5019  (=> (and hop_1_q_b hop_1_b_j) hop_2_q_j)
5020  (=> (and hop_1_q_b hop_1_b_m) hop_2_q_m)
5021  (=> (and hop_1_q_b hop_1_b_l) hop_2_q_l)
5022  (=> (and hop_1_q_b hop_1_b_o) hop_2_q_o)
5023  (=> (and hop_1_q_b hop_1_b_n) hop_2_q_n)
5024  (=> (and hop_1_q_b hop_1_b_p) hop_2_q_p)
5025  (=> (and hop_1_q_e hop_1_e_a) hop_2_q_a)
5026  (=> (and hop_1_q_e hop_1_e_c) hop_2_q_c)
5027  (=> (and hop_1_q_e hop_1_e_b) hop_2_q_b)
5028  (=> (and hop_1_q_e hop_1_e_d) hop_2_q_d)
5029  (=> (and hop_1_q_e hop_1_e_g) hop_2_q_g)
5030  (=> (and hop_1_q_e hop_1_e_f) hop_2_q_f)
5031  (=> (and hop_1_q_e hop_1_e_i) hop_2_q_i)
5032  (=> (and hop_1_q_e hop_1_e_h) hop_2_q_h)
5033  (=> (and hop_1_q_e hop_1_e_k) hop_2_q_k)
5034  (=> (and hop_1_q_e hop_1_e_j) hop_2_q_j)
5035  (=> (and hop_1_q_e hop_1_e_m) hop_2_q_m)
5036  (=> (and hop_1_q_e hop_1_e_l) hop_2_q_l)
5037  (=> (and hop_1_q_e hop_1_e_o) hop_2_q_o)
5038  (=> (and hop_1_q_e hop_1_e_n) hop_2_q_n)
5039  (=> (and hop_1_q_e hop_1_e_p) hop_2_q_p)
5040  (=> (and hop_1_q_d hop_1_d_a) hop_2_q_a)
5041  (=> (and hop_1_q_d hop_1_d_c) hop_2_q_c)
5042  (=> (and hop_1_q_d hop_1_d_b) hop_2_q_b)
5043  (=> (and hop_1_q_d hop_1_d_e) hop_2_q_e)
5044  (=> (and hop_1_q_d hop_1_d_g) hop_2_q_g)
5045  (=> (and hop_1_q_d hop_1_d_f) hop_2_q_f)
5046  (=> (and hop_1_q_d hop_1_d_i) hop_2_q_i)
5047  (=> (and hop_1_q_d hop_1_d_h) hop_2_q_h)
5048  (=> (and hop_1_q_d hop_1_d_k) hop_2_q_k)
5049  (=> (and hop_1_q_d hop_1_d_j) hop_2_q_j)
5050  (=> (and hop_1_q_d hop_1_d_m) hop_2_q_m)
5051  (=> (and hop_1_q_d hop_1_d_l) hop_2_q_l)
5052  (=> (and hop_1_q_d hop_1_d_o) hop_2_q_o)
5053  (=> (and hop_1_q_d hop_1_d_n) hop_2_q_n)
5054  (=> (and hop_1_q_d hop_1_d_p) hop_2_q_p)
5055  (=> (and hop_1_q_g hop_1_g_a) hop_2_q_a)
5056  (=> (and hop_1_q_g hop_1_g_c) hop_2_q_c)
5057  (=> (and hop_1_q_g hop_1_g_b) hop_2_q_b)
5058  (=> (and hop_1_q_g hop_1_g_e) hop_2_q_e)
5059  (=> (and hop_1_q_g hop_1_g_d) hop_2_q_d)
5060  (=> (and hop_1_q_g hop_1_g_f) hop_2_q_f)
5061  (=> (and hop_1_q_g hop_1_g_i) hop_2_q_i)
5062  (=> (and hop_1_q_g hop_1_g_h) hop_2_q_h)
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5063  (=> (and hop_1_q_g hop_1_g_k) hop_2_q_k)
5064  (=> (and hop_1_q_g hop_1_g_j) hop_2_q_j)
5065  (=> (and hop_1_q_g hop_1_g_m) hop_2_q_m)
5066  (=> (and hop_1_q_g hop_1_g_l) hop_2_q_l)
5067  (=> (and hop_1_q_g hop_1_g_o) hop_2_q_o)
5068  (=> (and hop_1_q_g hop_1_g_n) hop_2_q_n)
5069  (=> (and hop_1_q_g hop_1_g_p) hop_2_q_p)
5070  (=> (and hop_1_q_f hop_1_f_a) hop_2_q_a)
5071  (=> (and hop_1_q_f hop_1_f_c) hop_2_q_c)
5072  (=> (and hop_1_q_f hop_1_f_b) hop_2_q_b)
5073  (=> (and hop_1_q_f hop_1_f_e) hop_2_q_e)
5074  (=> (and hop_1_q_f hop_1_f_d) hop_2_q_d)
5075  (=> (and hop_1_q_f hop_1_f_g) hop_2_q_g)
5076  (=> (and hop_1_q_f hop_1_f_i) hop_2_q_i)
5077  (=> (and hop_1_q_f hop_1_f_h) hop_2_q_h)
5078  (=> (and hop_1_q_f hop_1_f_k) hop_2_q_k)
5079  (=> (and hop_1_q_f hop_1_f_j) hop_2_q_j)
5080  (=> (and hop_1_q_f hop_1_f_m) hop_2_q_m)
5081  (=> (and hop_1_q_f hop_1_f_l) hop_2_q_l)
5082  (=> (and hop_1_q_f hop_1_f_o) hop_2_q_o)
5083  (=> (and hop_1_q_f hop_1_f_n) hop_2_q_n)
5084  (=> (and hop_1_q_f hop_1_f_p) hop_2_q_p)
5085  (=> (and hop_1_q_i hop_1_i_a) hop_2_q_a)
5086  (=> (and hop_1_q_i hop_1_i_c) hop_2_q_c)
5087  (=> (and hop_1_q_i hop_1_i_b) hop_2_q_b)
5088  (=> (and hop_1_q_i hop_1_i_e) hop_2_q_e)
5089  (=> (and hop_1_q_i hop_1_i_d) hop_2_q_d)
5090  (=> (and hop_1_q_i hop_1_i_g) hop_2_q_g)
5091  (=> (and hop_1_q_i hop_1_i_f) hop_2_q_f)
5092  (=> (and hop_1_q_i hop_1_i_h) hop_2_q_h)
5093  (=> (and hop_1_q_i hop_1_i_k) hop_2_q_k)
5094  (=> (and hop_1_q_i hop_1_i_j) hop_2_q_j)
5095  (=> (and hop_1_q_i hop_1_i_m) hop_2_q_m)
5096  (=> (and hop_1_q_i hop_1_i_l) hop_2_q_l)
5097  (=> (and hop_1_q_i hop_1_i_o) hop_2_q_o)
5098  (=> (and hop_1_q_i hop_1_i_n) hop_2_q_n)
5099  (=> (and hop_1_q_i hop_1_i_p) hop_2_q_p)
5100  (=> (and hop_1_q_h hop_1_h_a) hop_2_q_a)
5101  (=> (and hop_1_q_h hop_1_h_c) hop_2_q_c)
5102  (=> (and hop_1_q_h hop_1_h_b) hop_2_q_b)
5103  (=> (and hop_1_q_h hop_1_h_e) hop_2_q_e)
5104  (=> (and hop_1_q_h hop_1_h_d) hop_2_q_d)
5105  (=> (and hop_1_q_h hop_1_h_g) hop_2_q_g)
5106  (=> (and hop_1_q_h hop_1_h_f) hop_2_q_f)
5107  (=> (and hop_1_q_h hop_1_h_i) hop_2_q_i)
5108  (=> (and hop_1_q_h hop_1_h_k) hop_2_q_k)
5109  (=> (and hop_1_q_h hop_1_h_j) hop_2_q_j)
5110  (=> (and hop_1_q_h hop_1_h_m) hop_2_q_m)
5111  (=> (and hop_1_q_h hop_1_h_l) hop_2_q_l)
5112  (=> (and hop_1_q_h hop_1_h_o) hop_2_q_o)
5113  (=> (and hop_1_q_h hop_1_h_n) hop_2_q_n)
5114  (=> (and hop_1_q_h hop_1_h_p) hop_2_q_p)
5115  (=> (and hop_1_q_k hop_1_k_a) hop_2_q_a)
5116  (=> (and hop_1_q_k hop_1_k_c) hop_2_q_c)
5117  (=> (and hop_1_q_k hop_1_k_b) hop_2_q_b)
5118  (=> (and hop_1_q_k hop_1_k_e) hop_2_q_e)
5119  (=> (and hop_1_q_k hop_1_k_d) hop_2_q_d)
5120  (=> (and hop_1_q_k hop_1_k_g) hop_2_q_g)
5121  (=> (and hop_1_q_k hop_1_k_f) hop_2_q_f)
5122  (=> (and hop_1_q_k hop_1_k_i) hop_2_q_i)
5123  (=> (and hop_1_q_k hop_1_k_h) hop_2_q_h)
5124  (=> (and hop_1_q_k hop_1_k_j) hop_2_q_j)
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```
5125  (=> (and hop_1_q_k hop_1_k_m) hop_2_q_m)
5126  (=> (and hop_1_q_k hop_1_k_l) hop_2_q_l)
5127  (=> (and hop_1_q_k hop_1_k_o) hop_2_q_o)
5128  (=> (and hop_1_q_k hop_1_k_n) hop_2_q_n)
5129  (=> (and hop_1_q_k hop_1_k_p) hop_2_q_p)
5130  (=> (and hop_1_q_j hop_1_j_a) hop_2_q_a)
5131  (=> (and hop_1_q_j hop_1_j_c) hop_2_q_c)
5132  (=> (and hop_1_q_j hop_1_j_b) hop_2_q_b)
5133  (=> (and hop_1_q_j hop_1_j_e) hop_2_q_e)
5134  (=> (and hop_1_q_j hop_1_j_d) hop_2_q_d)
5135  (=> (and hop_1_q_j hop_1_j_g) hop_2_q_g)
5136  (=> (and hop_1_q_j hop_1_j_f) hop_2_q_f)
5137  (=> (and hop_1_q_j hop_1_j_i) hop_2_q_i)
5138  (=> (and hop_1_q_j hop_1_j_h) hop_2_q_h)
5139  (=> (and hop_1_q_j hop_1_j_k) hop_2_q_k)
5140  (=> (and hop_1_q_j hop_1_j_m) hop_2_q_m)
5141  (=> (and hop_1_q_j hop_1_j_l) hop_2_q_l)
5142  (=> (and hop_1_q_j hop_1_j_o) hop_2_q_o)
5143  (=> (and hop_1_q_j hop_1_j_n) hop_2_q_n)
5144  (=> (and hop_1_q_j hop_1_j_p) hop_2_q_p)
5145  (=> (and hop_1_q_m hop_1_m_a) hop_2_q_a)
5146  (=> (and hop_1_q_m hop_1_m_c) hop_2_q_c)
5147  (=> (and hop_1_q_m hop_1_m_b) hop_2_q_b)
5148  (=> (and hop_1_q_m hop_1_m_e) hop_2_q_e)
5149  (=> (and hop_1_q_m hop_1_m_d) hop_2_q_d)
5150  (=> (and hop_1_q_m hop_1_m_g) hop_2_q_g)
5151  (=> (and hop_1_q_m hop_1_m_f) hop_2_q_f)
5152  (=> (and hop_1_q_m hop_1_m_i) hop_2_q_i)
5153  (=> (and hop_1_q_m hop_1_m_h) hop_2_q_h)
5154  (=> (and hop_1_q_m hop_1_m_k) hop_2_q_k)
5155  (=> (and hop_1_q_m hop_1_m_j) hop_2_q_j)
5156  (=> (and hop_1_q_m hop_1_m_l) hop_2_q_l)
5157  (=> (and hop_1_q_m hop_1_m_o) hop_2_q_o)
5158  (=> (and hop_1_q_m hop_1_m_n) hop_2_q_n)
5159  (=> (and hop_1_q_m hop_1_m_p) hop_2_q_p)
5160  (=> (and hop_1_q_l hop_1_l_a) hop_2_q_a)
5161  (=> (and hop_1_q_l hop_1_l_c) hop_2_q_c)
5162  (=> (and hop_1_q_l hop_1_l_b) hop_2_q_b)
5163  (=> (and hop_1_q_l hop_1_l_e) hop_2_q_e)
5164  (=> (and hop_1_q_l hop_1_l_d) hop_2_q_d)
5165  (=> (and hop_1_q_l hop_1_l_g) hop_2_q_g)
5166  (=> (and hop_1_q_l hop_1_l_f) hop_2_q_f)
5167  (=> (and hop_1_q_l hop_1_l_i) hop_2_q_i)
5168  (=> (and hop_1_q_l hop_1_l_h) hop_2_q_h)
5169  (=> (and hop_1_q_l hop_1_l_k) hop_2_q_k)
5170  (=> (and hop_1_q_l hop_1_l_j) hop_2_q_j)
5171  (=> (and hop_1_q_l hop_1_l_m) hop_2_q_m)
5172  (=> (and hop_1_q_l hop_1_l_o) hop_2_q_o)
5173  (=> (and hop_1_q_l hop_1_l_n) hop_2_q_n)
5174  (=> (and hop_1_q_l hop_1_l_p) hop_2_q_p)
5175  (=> (and hop_1_q_o hop_1_o_a) hop_2_q_a)
5176  (=> (and hop_1_q_o hop_1_o_c) hop_2_q_c)
5177  (=> (and hop_1_q_o hop_1_o_b) hop_2_q_b)
5178  (=> (and hop_1_q_o hop_1_o_e) hop_2_q_e)
5179  (=> (and hop_1_q_o hop_1_o_d) hop_2_q_d)
5180  (=> (and hop_1_q_o hop_1_o_g) hop_2_q_g)
5181  (=> (and hop_1_q_o hop_1_o_f) hop_2_q_f)
5182  (=> (and hop_1_q_o hop_1_o_i) hop_2_q_i)
5183  (=> (and hop_1_q_o hop_1_o_h) hop_2_q_h)
5184  (=> (and hop_1_q_o hop_1_o_k) hop_2_q_k)
5185  (=> (and hop_1_q_o hop_1_o_j) hop_2_q_j)
5186  (=> (and hop_1_q_o hop_1_o_m) hop_2_q_m)
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5187  (=> (and hop_1_q_o hop_1_o_l) hop_2_q_l)
5188  (=> (and hop_1_q_o hop_1_o_n) hop_2_q_n)
5189  (=> (and hop_1_q_o hop_1_o_p) hop_2_q_p)
5190  (=> (and hop_1_q_n hop_1_n_a) hop_2_q_a)
5191  (=> (and hop_1_q_n hop_1_n_c) hop_2_q_c)
5192  (=> (and hop_1_q_n hop_1_n_b) hop_2_q_b)
5193  (=> (and hop_1_q_n hop_1_n_e) hop_2_q_e)
5194  (=> (and hop_1_q_n hop_1_n_d) hop_2_q_d)
5195  (=> (and hop_1_q_n hop_1_n_g) hop_2_q_g)
5196  (=> (and hop_1_q_n hop_1_n_f) hop_2_q_f)
5197  (=> (and hop_1_q_n hop_1_n_i) hop_2_q_i)
5198  (=> (and hop_1_q_n hop_1_n_h) hop_2_q_h)
5199  (=> (and hop_1_q_n hop_1_n_k) hop_2_q_k)
5200  (=> (and hop_1_q_n hop_1_n_j) hop_2_q_j)
5201  (=> (and hop_1_q_n hop_1_n_m) hop_2_q_m)
5202  (=> (and hop_1_q_n hop_1_n_l) hop_2_q_l)
5203  (=> (and hop_1_q_n hop_1_n_o) hop_2_q_o)
5204  (=> (and hop_1_q_n hop_1_n_p) hop_2_q_p)
5205  (=> (and hop_1_q_p hop_1_p_a) hop_2_q_a)
5206  (=> (and hop_1_q_p hop_1_p_c) hop_2_q_c)
5207  (=> (and hop_1_q_p hop_1_p_b) hop_2_q_b)
5208  (=> (and hop_1_q_p hop_1_p_e) hop_2_q_e)
5209  (=> (and hop_1_q_p hop_1_p_d) hop_2_q_d)
5210  (=> (and hop_1_q_p hop_1_p_g) hop_2_q_g)
5211  (=> (and hop_1_q_p hop_1_p_f) hop_2_q_f)
5212  (=> (and hop_1_q_p hop_1_p_i) hop_2_q_i)
5213  (=> (and hop_1_q_p hop_1_p_h) hop_2_q_h)
5214  (=> (and hop_1_q_p hop_1_p_k) hop_2_q_k)
5215  (=> (and hop_1_q_p hop_1_p_j) hop_2_q_j)
5216  (=> (and hop_1_q_p hop_1_p_m) hop_2_q_m)
5217  (=> (and hop_1_q_p hop_1_p_l) hop_2_q_l)
5218  (=> (and hop_1_q_p hop_1_p_o) hop_2_q_o)
5219  (=> (and hop_1_q_p hop_1_p_n) hop_2_q_n)
5220  (=> (and hop_1_p_a hop_1_a_c) hop_2_p_c)
5221  (=> (and hop_1_p_a hop_1_a_b) hop_2_p_b)
5222  (=> (and hop_1_p_a hop_1_a_e) hop_2_p_e)
5223  (=> (and hop_1_p_a hop_1_a_d) hop_2_p_d)
5224  (=> (and hop_1_p_a hop_1_a_g) hop_2_p_g)
5225  (=> (and hop_1_p_a hop_1_a_f) hop_2_p_f)
5226  (=> (and hop_1_p_a hop_1_a_i) hop_2_p_i)
5227  (=> (and hop_1_p_a hop_1_a_h) hop_2_p_h)
5228  (=> (and hop_1_p_a hop_1_a_k) hop_2_p_k)
5229  (=> (and hop_1_p_a hop_1_a_j) hop_2_p_j)
5230  (=> (and hop_1_p_a hop_1_a_m) hop_2_p_m)
5231  (=> (and hop_1_p_a hop_1_a_l) hop_2_p_l)
5232  (=> (and hop_1_p_a hop_1_a_o) hop_2_p_o)
5233  (=> (and hop_1_p_a hop_1_a_n) hop_2_p_n)
5234  (=> (and hop_1_p_a hop_1_a_q) hop_2_p_q)
5235  (=> (and hop_1_p_c hop_1_c_a) hop_2_p_a)
5236  (=> (and hop_1_p_c hop_1_c_b) hop_2_p_b)
5237  (=> (and hop_1_p_c hop_1_c_e) hop_2_p_e)
5238  (=> (and hop_1_p_c hop_1_c_d) hop_2_p_d)
5239  (=> (and hop_1_p_c hop_1_c_g) hop_2_p_g)
5240  (=> (and hop_1_p_c hop_1_c_f) hop_2_p_f)
5241  (=> (and hop_1_p_c hop_1_c_i) hop_2_p_i)
5242  (=> (and hop_1_p_c hop_1_c_h) hop_2_p_h)
5243  (=> (and hop_1_p_c hop_1_c_k) hop_2_p_k)
5244  (=> (and hop_1_p_c hop_1_c_j) hop_2_p_j)
5245  (=> (and hop_1_p_c hop_1_c_m) hop_2_p_m)
5246  (=> (and hop_1_p_c hop_1_c_l) hop_2_p_l)
5247  (=> (and hop_1_p_c hop_1_c_o) hop_2_p_o)
5248  (=> (and hop_1_p_c hop_1_c_n) hop_2_p_n)
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5249  (=> (and hop_1_p_c hop_1_c_q) hop_2_p_q)
5250  (=> (and hop_1_p_b hop_1_b_a) hop_2_p_a)
5251  (=> (and hop_1_p_b hop_1_b_c) hop_2_p_c)
5252  (=> (and hop_1_p_b hop_1_b_e) hop_2_p_e)
5253  (=> (and hop_1_p_b hop_1_b_d) hop_2_p_d)
5254  (=> (and hop_1_p_b hop_1_b_g) hop_2_p_g)
5255  (=> (and hop_1_p_b hop_1_b_f) hop_2_p_f)
5256  (=> (and hop_1_p_b hop_1_b_i) hop_2_p_i)
5257  (=> (and hop_1_p_b hop_1_b_h) hop_2_p_h)
5258  (=> (and hop_1_p_b hop_1_b_k) hop_2_p_k)
5259  (=> (and hop_1_p_b hop_1_b_j) hop_2_p_j)
5260  (=> (and hop_1_p_b hop_1_b_m) hop_2_p_m)
5261  (=> (and hop_1_p_b hop_1_b_l) hop_2_p_l)
5262  (=> (and hop_1_p_b hop_1_b_o) hop_2_p_o)
5263  (=> (and hop_1_p_b hop_1_b_n) hop_2_p_n)
5264  (=> (and hop_1_p_b hop_1_b_q) hop_2_p_q)
5265  (=> (and hop_1_p_e hop_1_e_a) hop_2_p_a)
5266  (=> (and hop_1_p_e hop_1_e_c) hop_2_p_c)
5267  (=> (and hop_1_p_e hop_1_e_b) hop_2_p_b)
5268  (=> (and hop_1_p_e hop_1_e_d) hop_2_p_d)
5269  (=> (and hop_1_p_e hop_1_e_g) hop_2_p_g)
5270  (=> (and hop_1_p_e hop_1_e_f) hop_2_p_f)
5271  (=> (and hop_1_p_e hop_1_e_i) hop_2_p_i)
5272  (=> (and hop_1_p_e hop_1_e_h) hop_2_p_h)
5273  (=> (and hop_1_p_e hop_1_e_k) hop_2_p_k)
5274  (=> (and hop_1_p_e hop_1_e_j) hop_2_p_j)
5275  (=> (and hop_1_p_e hop_1_e_m) hop_2_p_m)
5276  (=> (and hop_1_p_e hop_1_e_l) hop_2_p_l)
5277  (=> (and hop_1_p_e hop_1_e_o) hop_2_p_o)
5278  (=> (and hop_1_p_e hop_1_e_n) hop_2_p_n)
5279  (=> (and hop_1_p_e hop_1_e_q) hop_2_p_q)
5280  (=> (and hop_1_p_d hop_1_d_a) hop_2_p_a)
5281  (=> (and hop_1_p_d hop_1_d_c) hop_2_p_c)
5282  (=> (and hop_1_p_d hop_1_d_b) hop_2_p_b)
5283  (=> (and hop_1_p_d hop_1_d_e) hop_2_p_e)
5284  (=> (and hop_1_p_d hop_1_d_g) hop_2_p_g)
5285  (=> (and hop_1_p_d hop_1_d_f) hop_2_p_f)
5286  (=> (and hop_1_p_d hop_1_d_i) hop_2_p_i)
5287  (=> (and hop_1_p_d hop_1_d_h) hop_2_p_h)
5288  (=> (and hop_1_p_d hop_1_d_k) hop_2_p_k)
5289  (=> (and hop_1_p_d hop_1_d_j) hop_2_p_j)
5290  (=> (and hop_1_p_d hop_1_d_m) hop_2_p_m)
5291  (=> (and hop_1_p_d hop_1_d_l) hop_2_p_l)
5292  (=> (and hop_1_p_d hop_1_d_o) hop_2_p_o)
5293  (=> (and hop_1_p_d hop_1_d_n) hop_2_p_n)
5294  (=> (and hop_1_p_d hop_1_d_q) hop_2_p_q)
5295  (=> (and hop_1_p_g hop_1_g_a) hop_2_p_a)
5296  (=> (and hop_1_p_g hop_1_g_c) hop_2_p_c)
5297  (=> (and hop_1_p_g hop_1_g_b) hop_2_p_b)
5298  (=> (and hop_1_p_g hop_1_g_e) hop_2_p_e)
5299  (=> (and hop_1_p_g hop_1_g_d) hop_2_p_d)
5300  (=> (and hop_1_p_g hop_1_g_f) hop_2_p_f)
5301  (=> (and hop_1_p_g hop_1_g_i) hop_2_p_i)
5302  (=> (and hop_1_p_g hop_1_g_h) hop_2_p_h)
5303  (=> (and hop_1_p_g hop_1_g_k) hop_2_p_k)
5304  (=> (and hop_1_p_g hop_1_g_j) hop_2_p_j)
5305  (=> (and hop_1_p_g hop_1_g_m) hop_2_p_m)
5306  (=> (and hop_1_p_g hop_1_g_l) hop_2_p_l)
5307  (=> (and hop_1_p_g hop_1_g_o) hop_2_p_o)
5308  (=> (and hop_1_p_g hop_1_g_n) hop_2_p_n)
5309  (=> (and hop_1_p_g hop_1_g_q) hop_2_p_q)
5310  (=> (and hop_1_p_f hop_1_f_a) hop_2_p_a)
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5311  (=> (and hop_1_p_f hop_1_f_c) hop_2_p_c)
5312  (=> (and hop_1_p_f hop_1_f_b) hop_2_p_b)
5313  (=> (and hop_1_p_f hop_1_f_e) hop_2_p_e)
5314  (=> (and hop_1_p_f hop_1_f_d) hop_2_p_d)
5315  (=> (and hop_1_p_f hop_1_f_g) hop_2_p_g)
5316  (=> (and hop_1_p_f hop_1_f_i) hop_2_p_i)
5317  (=> (and hop_1_p_f hop_1_f_h) hop_2_p_h)
5318  (=> (and hop_1_p_f hop_1_f_k) hop_2_p_k)
5319  (=> (and hop_1_p_f hop_1_f_j) hop_2_p_j)
5320  (=> (and hop_1_p_f hop_1_f_m) hop_2_p_m)
5321  (=> (and hop_1_p_f hop_1_f_l) hop_2_p_l)
5322  (=> (and hop_1_p_f hop_1_f_o) hop_2_p_o)
5323  (=> (and hop_1_p_f hop_1_f_n) hop_2_p_n)
5324  (=> (and hop_1_p_f hop_1_f_q) hop_2_p_q)
5325  (=> (and hop_1_p_i hop_1_i_a) hop_2_p_a)
5326  (=> (and hop_1_p_i hop_1_i_c) hop_2_p_c)
5327  (=> (and hop_1_p_i hop_1_i_b) hop_2_p_b)
5328  (=> (and hop_1_p_i hop_1_i_e) hop_2_p_e)
5329  (=> (and hop_1_p_i hop_1_i_d) hop_2_p_d)
5330  (=> (and hop_1_p_i hop_1_i_g) hop_2_p_g)
5331  (=> (and hop_1_p_i hop_1_i_f) hop_2_p_f)
5332  (=> (and hop_1_p_i hop_1_i_h) hop_2_p_h)
5333  (=> (and hop_1_p_i hop_1_i_k) hop_2_p_k)
5334  (=> (and hop_1_p_i hop_1_i_j) hop_2_p_j)
5335  (=> (and hop_1_p_i hop_1_i_m) hop_2_p_m)
5336  (=> (and hop_1_p_i hop_1_i_l) hop_2_p_l)
5337  (=> (and hop_1_p_i hop_1_i_o) hop_2_p_o)
5338  (=> (and hop_1_p_i hop_1_i_n) hop_2_p_n)
5339  (=> (and hop_1_p_i hop_1_i_q) hop_2_p_q)
5340  (=> (and hop_1_p_h hop_1_h_a) hop_2_p_a)
5341  (=> (and hop_1_p_h hop_1_h_c) hop_2_p_c)
5342  (=> (and hop_1_p_h hop_1_h_b) hop_2_p_b)
5343  (=> (and hop_1_p_h hop_1_h_e) hop_2_p_e)
5344  (=> (and hop_1_p_h hop_1_h_d) hop_2_p_d)
5345  (=> (and hop_1_p_h hop_1_h_g) hop_2_p_g)
5346  (=> (and hop_1_p_h hop_1_h_f) hop_2_p_f)
5347  (=> (and hop_1_p_h hop_1_h_i) hop_2_p_i)
5348  (=> (and hop_1_p_h hop_1_h_k) hop_2_p_k)
5349  (=> (and hop_1_p_h hop_1_h_j) hop_2_p_j)
5350  (=> (and hop_1_p_h hop_1_h_m) hop_2_p_m)
5351  (=> (and hop_1_p_h hop_1_h_l) hop_2_p_l)
5352  (=> (and hop_1_p_h hop_1_h_o) hop_2_p_o)
5353  (=> (and hop_1_p_h hop_1_h_n) hop_2_p_n)
5354  (=> (and hop_1_p_h hop_1_h_q) hop_2_p_q)
5355  (=> (and hop_1_p_k hop_1_k_a) hop_2_p_a)
5356  (=> (and hop_1_p_k hop_1_k_c) hop_2_p_c)
5357  (=> (and hop_1_p_k hop_1_k_b) hop_2_p_b)
5358  (=> (and hop_1_p_k hop_1_k_e) hop_2_p_e)
5359  (=> (and hop_1_p_k hop_1_k_d) hop_2_p_d)
5360  (=> (and hop_1_p_k hop_1_k_g) hop_2_p_g)
5361  (=> (and hop_1_p_k hop_1_k_f) hop_2_p_f)
5362  (=> (and hop_1_p_k hop_1_k_i) hop_2_p_i)
5363  (=> (and hop_1_p_k hop_1_k_h) hop_2_p_h)
5364  (=> (and hop_1_p_k hop_1_k_j) hop_2_p_j)
5365  (=> (and hop_1_p_k hop_1_k_m) hop_2_p_m)
5366  (=> (and hop_1_p_k hop_1_k_l) hop_2_p_l)
5367  (=> (and hop_1_p_k hop_1_k_o) hop_2_p_o)
5368  (=> (and hop_1_p_k hop_1_k_n) hop_2_p_n)
5369  (=> (and hop_1_p_k hop_1_k_q) hop_2_p_q)
5370  (=> (and hop_1_p_j hop_1_j_a) hop_2_p_a)
5371  (=> (and hop_1_p_j hop_1_j_c) hop_2_p_c)
5372  (=> (and hop_1_p_j hop_1_j_b) hop_2_p_b)
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5373  (=> (and hop_1_p_j hop_1_j_e) hop_2_p_e)
5374  (=> (and hop_1_p_j hop_1_j_d) hop_2_p_d)
5375  (=> (and hop_1_p_j hop_1_j_g) hop_2_p_g)
5376  (=> (and hop_1_p_j hop_1_j_f) hop_2_p_f)
5377  (=> (and hop_1_p_j hop_1_j_i) hop_2_p_i)
5378  (=> (and hop_1_p_j hop_1_j_h) hop_2_p_h)
5379  (=> (and hop_1_p_j hop_1_j_k) hop_2_p_k)
5380  (=> (and hop_1_p_j hop_1_j_m) hop_2_p_m)
5381  (=> (and hop_1_p_j hop_1_j_l) hop_2_p_l)
5382  (=> (and hop_1_p_j hop_1_j_o) hop_2_p_o)
5383  (=> (and hop_1_p_j hop_1_j_n) hop_2_p_n)
5384  (=> (and hop_1_p_j hop_1_j_q) hop_2_p_q)
5385  (=> (and hop_1_p_m hop_1_m_a) hop_2_p_a)
5386  (=> (and hop_1_p_m hop_1_m_c) hop_2_p_c)
5387  (=> (and hop_1_p_m hop_1_m_b) hop_2_p_b)
5388  (=> (and hop_1_p_m hop_1_m_e) hop_2_p_e)
5389  (=> (and hop_1_p_m hop_1_m_d) hop_2_p_d)
5390  (=> (and hop_1_p_m hop_1_m_g) hop_2_p_g)
5391  (=> (and hop_1_p_m hop_1_m_f) hop_2_p_f)
5392  (=> (and hop_1_p_m hop_1_m_i) hop_2_p_i)
5393  (=> (and hop_1_p_m hop_1_m_h) hop_2_p_h)
5394  (=> (and hop_1_p_m hop_1_m_k) hop_2_p_k)
5395  (=> (and hop_1_p_m hop_1_m_j) hop_2_p_j)
5396  (=> (and hop_1_p_m hop_1_m_l) hop_2_p_l)
5397  (=> (and hop_1_p_m hop_1_m_o) hop_2_p_o)
5398  (=> (and hop_1_p_m hop_1_m_n) hop_2_p_n)
5399  (=> (and hop_1_p_m hop_1_m_q) hop_2_p_q)
5400  (=> (and hop_1_p_l hop_1_l_a) hop_2_p_a)
5401  (=> (and hop_1_p_l hop_1_l_c) hop_2_p_c)
5402  (=> (and hop_1_p_l hop_1_l_b) hop_2_p_b)
5403  (=> (and hop_1_p_l hop_1_l_e) hop_2_p_e)
5404  (=> (and hop_1_p_l hop_1_l_d) hop_2_p_d)
5405  (=> (and hop_1_p_l hop_1_l_g) hop_2_p_g)
5406  (=> (and hop_1_p_l hop_1_l_f) hop_2_p_f)
5407  (=> (and hop_1_p_l hop_1_l_i) hop_2_p_i)
5408  (=> (and hop_1_p_l hop_1_l_h) hop_2_p_h)
5409  (=> (and hop_1_p_l hop_1_l_k) hop_2_p_k)
5410  (=> (and hop_1_p_l hop_1_l_j) hop_2_p_j)
5411  (=> (and hop_1_p_l hop_1_l_m) hop_2_p_m)
5412  (=> (and hop_1_p_l hop_1_l_o) hop_2_p_o)
5413  (=> (and hop_1_p_l hop_1_l_n) hop_2_p_n)
5414  (=> (and hop_1_p_l hop_1_l_q) hop_2_p_q)
5415  (=> (and hop_1_p_o hop_1_o_a) hop_2_p_a)
5416  (=> (and hop_1_p_o hop_1_o_c) hop_2_p_c)
5417  (=> (and hop_1_p_o hop_1_o_b) hop_2_p_b)
5418  (=> (and hop_1_p_o hop_1_o_e) hop_2_p_e)
5419  (=> (and hop_1_p_o hop_1_o_d) hop_2_p_d)
5420  (=> (and hop_1_p_o hop_1_o_g) hop_2_p_g)
5421  (=> (and hop_1_p_o hop_1_o_f) hop_2_p_f)
5422  (=> (and hop_1_p_o hop_1_o_i) hop_2_p_i)
5423  (=> (and hop_1_p_o hop_1_o_h) hop_2_p_h)
5424  (=> (and hop_1_p_o hop_1_o_k) hop_2_p_k)
5425  (=> (and hop_1_p_o hop_1_o_j) hop_2_p_j)
5426  (=> (and hop_1_p_o hop_1_o_m) hop_2_p_m)
5427  (=> (and hop_1_p_o hop_1_o_l) hop_2_p_l)
5428  (=> (and hop_1_p_o hop_1_o_n) hop_2_p_n)
5429  (=> (and hop_1_p_o hop_1_o_q) hop_2_p_q)
5430  (=> (and hop_1_p_n hop_1_n_a) hop_2_p_a)
5431  (=> (and hop_1_p_n hop_1_n_c) hop_2_p_c)
5432  (=> (and hop_1_p_n hop_1_n_b) hop_2_p_b)
5433  (=> (and hop_1_p_n hop_1_n_e) hop_2_p_e)
5434  (=> (and hop_1_p_n hop_1_n_d) hop_2_p_d)
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5435  (=> (and hop_1_p_n hop_1_n_g) hop_2_p_g)
5436  (=> (and hop_1_p_n hop_1_n_f) hop_2_p_f)
5437  (=> (and hop_1_p_n hop_1_n_i) hop_2_p_i)
5438  (=> (and hop_1_p_n hop_1_n_h) hop_2_p_h)
5439  (=> (and hop_1_p_n hop_1_n_k) hop_2_p_k)
5440  (=> (and hop_1_p_n hop_1_n_j) hop_2_p_j)
5441  (=> (and hop_1_p_n hop_1_n_m) hop_2_p_m)
5442  (=> (and hop_1_p_n hop_1_n_l) hop_2_p_l)
5443  (=> (and hop_1_p_n hop_1_n_o) hop_2_p_o)
5444  (=> (and hop_1_p_n hop_1_n_q) hop_2_p_q)
5445  (=> (and hop_1_p_q hop_1_q_a) hop_2_p_a)
5446  (=> (and hop_1_p_q hop_1_q_c) hop_2_p_c)
5447  (=> (and hop_1_p_q hop_1_q_b) hop_2_p_b)
5448  (=> (and hop_1_p_q hop_1_q_e) hop_2_p_e)
5449  (=> (and hop_1_p_q hop_1_q_d) hop_2_p_d)
5450  (=> (and hop_1_p_q hop_1_q_g) hop_2_p_g)
5451  (=> (and hop_1_p_q hop_1_q_f) hop_2_p_f)
5452  (=> (and hop_1_p_q hop_1_q_i) hop_2_p_i)
5453  (=> (and hop_1_p_q hop_1_q_h) hop_2_p_h)
5454  (=> (and hop_1_p_q hop_1_q_k) hop_2_p_k)
5455  (=> (and hop_1_p_q hop_1_q_j) hop_2_p_j)
5456  (=> (and hop_1_p_q hop_1_q_m) hop_2_p_m)
5457  (=> (and hop_1_p_q hop_1_q_l) hop_2_p_l)
5458  (=> (and hop_1_p_q hop_1_q_o) hop_2_p_o)
5459  (=> (and hop_1_p_q hop_1_q_n) hop_2_p_n)
5460  (=> hop_2_a_c hop_3_a_c)
5461  (=> hop_2_a_b hop_3_a_b)
5462  (=> hop_2_a_e hop_3_a_e)
5463  (=> hop_2_a_d hop_3_a_d)
5464  (=> hop_2_a_g hop_3_a_g)
5465  (=> hop_2_a_f hop_3_a_f)
5466  (=> hop_2_a_i hop_3_a_i)
5467  (=> hop_2_a_h hop_3_a_h)
5468  (=> hop_2_a_k hop_3_a_k)
5469  (=> hop_2_a_j hop_3_a_j)
5470  (=> hop_2_a_m hop_3_a_m)
5471  (=> hop_2_a_l hop_3_a_l)
5472  (=> hop_2_a_o hop_3_a_o)
5473  (=> hop_2_a_n hop_3_a_n)
5474  (=> hop_2_a_q hop_3_a_q)
5475  (=> hop_2_a_p hop_3_a_p)
5476  (=> hop_2_c_a hop_3_c_a)
5477  (=> hop_2_c_b hop_3_c_b)
5478  (=> hop_2_c_e hop_3_c_e)
5479  (=> hop_2_c_d hop_3_c_d)
5480  (=> hop_2_c_g hop_3_c_g)
5481  (=> hop_2_c_f hop_3_c_f)
5482  (=> hop_2_c_i hop_3_c_i)
5483  (=> hop_2_c_h hop_3_c_h)
5484  (=> hop_2_c_k hop_3_c_k)
5485  (=> hop_2_c_j hop_3_c_j)
5486  (=> hop_2_c_m hop_3_c_m)
5487  (=> hop_2_c_l hop_3_c_l)
5488  (=> hop_2_c_o hop_3_c_o)
5489  (=> hop_2_c_n hop_3_c_n)
5490  (=> hop_2_c_q hop_3_c_q)
5491  (=> hop_2_c_p hop_3_c_p)
5492  (=> hop_2_b_a hop_3_b_a)
5493  (=> hop_2_b_c hop_3_b_c)
5494  (=> hop_2_b_e hop_3_b_e)
5495  (=> hop_2_b_d hop_3_b_d)
5496  (=> hop_2_b_g hop_3_b_g)
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5497    (=> hop_2_b_f hop_3_b_f)
5498    (=> hop_2_b_i hop_3_b_i)
5499    (=> hop_2_b_h hop_3_b_h)
5500    (=> hop_2_b_k hop_3_b_k)
5501    (=> hop_2_b_j hop_3_b_j)
5502    (=> hop_2_b_m hop_3_b_m)
5503    (=> hop_2_b_l hop_3_b_l)
5504    (=> hop_2_b_o hop_3_b_o)
5505    (=> hop_2_b_n hop_3_b_n)
5506    (=> hop_2_b_q hop_3_b_q)
5507    (=> hop_2_b_p hop_3_b_p)
5508    (=> hop_2_e_a hop_3_e_a)
5509    (=> hop_2_e_c hop_3_e_c)
5510    (=> hop_2_e_b hop_3_e_b)
5511    (=> hop_2_e_d hop_3_e_d)
5512    (=> hop_2_e_g hop_3_e_g)
5513    (=> hop_2_e_f hop_3_e_f)
5514    (=> hop_2_e_i hop_3_e_i)
5515    (=> hop_2_e_h hop_3_e_h)
5516    (=> hop_2_e_k hop_3_e_k)
5517    (=> hop_2_e_j hop_3_e_j)
5518    (=> hop_2_e_m hop_3_e_m)
5519    (=> hop_2_e_l hop_3_e_l)
5520    (=> hop_2_e_o hop_3_e_o)
5521    (=> hop_2_e_n hop_3_e_n)
5522    (=> hop_2_e_q hop_3_e_q)
5523    (=> hop_2_e_p hop_3_e_p)
5524    (=> hop_2_d_a hop_3_d_a)
5525    (=> hop_2_d_c hop_3_d_c)
5526    (=> hop_2_d_b hop_3_d_b)
5527    (=> hop_2_d_e hop_3_d_e)
5528    (=> hop_2_d_g hop_3_d_g)
5529    (=> hop_2_d_f hop_3_d_f)
5530    (=> hop_2_d_i hop_3_d_i)
5531    (=> hop_2_d_h hop_3_d_h)
5532    (=> hop_2_d_k hop_3_d_k)
5533    (=> hop_2_d_j hop_3_d_j)
5534    (=> hop_2_d_m hop_3_d_m)
5535    (=> hop_2_d_l hop_3_d_l)
5536    (=> hop_2_d_o hop_3_d_o)
5537    (=> hop_2_d_n hop_3_d_n)
5538    (=> hop_2_d_q hop_3_d_q)
5539    (=> hop_2_d_p hop_3_d_p)
5540    (=> hop_2_g_a hop_3_g_a)
5541    (=> hop_2_g_c hop_3_g_c)
5542    (=> hop_2_g_b hop_3_g_b)
5543    (=> hop_2_g_e hop_3_g_e)
5544    (=> hop_2_g_d hop_3_g_d)
5545    (=> hop_2_g_f hop_3_g_f)
5546    (=> hop_2_g_i hop_3_g_i)
5547    (=> hop_2_g_h hop_3_g_h)
5548    (=> hop_2_g_k hop_3_g_k)
5549    (=> hop_2_g_j hop_3_g_j)
5550    (=> hop_2_g_m hop_3_g_m)
5551    (=> hop_2_g_l hop_3_g_l)
5552    (=> hop_2_g_o hop_3_g_o)
5553    (=> hop_2_g_n hop_3_g_n)
5554    (=> hop_2_g_q hop_3_g_q)
5555    (=> hop_2_g_p hop_3_g_p)
5556    (=> hop_2_f_a hop_3_f_a)
5557    (=> hop_2_f_c hop_3_f_c)
5558    (=> hop_2_f_b hop_3_f_b)
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5559    (=> hop_2_f_e hop_3_f_e)
5560    (=> hop_2_f_d hop_3_f_d)
5561    (=> hop_2_f_g hop_3_f_g)
5562    (=> hop_2_f_i hop_3_f_i)
5563    (=> hop_2_f_h hop_3_f_h)
5564    (=> hop_2_f_k hop_3_f_k)
5565    (=> hop_2_f_j hop_3_f_j)
5566    (=> hop_2_f_m hop_3_f_m)
5567    (=> hop_2_f_l hop_3_f_l)
5568    (=> hop_2_f_o hop_3_f_o)
5569    (=> hop_2_f_n hop_3_f_n)
5570    (=> hop_2_f_q hop_3_f_q)
5571    (=> hop_2_f_p hop_3_f_p)
5572    (=> hop_2_i_a hop_3_i_a)
5573    (=> hop_2_i_c hop_3_i_c)
5574    (=> hop_2_i_b hop_3_i_b)
5575    (=> hop_2_i_e hop_3_i_e)
5576    (=> hop_2_i_d hop_3_i_d)
5577    (=> hop_2_i_g hop_3_i_g)
5578    (=> hop_2_i_f hop_3_i_f)
5579    (=> hop_2_i_h hop_3_i_h)
5580    (=> hop_2_i_k hop_3_i_k)
5581    (=> hop_2_i_j hop_3_i_j)
5582    (=> hop_2_i_m hop_3_i_m)
5583    (=> hop_2_i_l hop_3_i_l)
5584    (=> hop_2_i_o hop_3_i_o)
5585    (=> hop_2_i_n hop_3_i_n)
5586    (=> hop_2_i_q hop_3_i_q)
5587    (=> hop_2_i_p hop_3_i_p)
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5589    (=> hop_2_h_c hop_3_h_c)
5590    (=> hop_2_h_b hop_3_h_b)
5591    (=> hop_2_h_e hop_3_h_e)
5592    (=> hop_2_h_d hop_3_h_d)
5593    (=> hop_2_h_g hop_3_h_g)
5594    (=> hop_2_h_f hop_3_h_f)
5595    (=> hop_2_h_i hop_3_h_i)
5596    (=> hop_2_h_k hop_3_h_k)
5597    (=> hop_2_h_j hop_3_h_j)
5598    (=> hop_2_h_m hop_3_h_m)
5599    (=> hop_2_h_l hop_3_h_l)
5600    (=> hop_2_h_o hop_3_h_o)
5601    (=> hop_2_h_n hop_3_h_n)
5602    (=> hop_2_h_q hop_3_h_q)
5603    (=> hop_2_h_p hop_3_h_p)
5604    (=> hop_2_k_a hop_3_k_a)
5605    (=> hop_2_k_c hop_3_k_c)
5606    (=> hop_2_k_b hop_3_k_b)
5607    (=> hop_2_k_e hop_3_k_e)
5608    (=> hop_2_k_d hop_3_k_d)
5609    (=> hop_2_k_g hop_3_k_g)
5610    (=> hop_2_k_f hop_3_k_f)
5611    (=> hop_2_k_i hop_3_k_i)
5612    (=> hop_2_k_h hop_3_k_h)
5613    (=> hop_2_k_j hop_3_k_j)
5614    (=> hop_2_k_m hop_3_k_m)
5615    (=> hop_2_k_l hop_3_k_l)
5616    (=> hop_2_k_o hop_3_k_o)
5617    (=> hop_2_k_n hop_3_k_n)
5618    (=> hop_2_k_q hop_3_k_q)
5619    (=> hop_2_k_p hop_3_k_p)
5620    (=> hop_2_j_a hop_3_j_a)
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5621  (=> hop_2_j_c hop_3_j_c)
5622  (=> hop_2_j_b hop_3_j_b)
5623  (=> hop_2_j_e hop_3_j_e)
5624  (=> hop_2_j_d hop_3_j_d)
5625  (=> hop_2_j_g hop_3_j_g)
5626  (=> hop_2_j_f hop_3_j_f)
5627  (=> hop_2_j_i hop_3_j_i)
5628  (=> hop_2_j_h hop_3_j_h)
5629  (=> hop_2_j_k hop_3_j_k)
5630  (=> hop_2_j_m hop_3_j_m)
5631  (=> hop_2_j_l hop_3_j_l)
5632  (=> hop_2_j_o hop_3_j_o)
5633  (=> hop_2_j_n hop_3_j_n)
5634  (=> hop_2_j_q hop_3_j_q)
5635  (=> hop_2_j_p hop_3_j_p)
5636  (=> hop_2_m_a hop_3_m_a)
5637  (=> hop_2_m_c hop_3_m_c)
5638  (=> hop_2_m_b hop_3_m_b)
5639  (=> hop_2_m_e hop_3_m_e)
5640  (=> hop_2_m_d hop_3_m_d)
5641  (=> hop_2_m_g hop_3_m_g)
5642  (=> hop_2_m_f hop_3_m_f)
5643  (=> hop_2_m_i hop_3_m_i)
5644  (=> hop_2_m_h hop_3_m_h)
5645  (=> hop_2_m_k hop_3_m_k)
5646  (=> hop_2_m_j hop_3_m_j)
5647  (=> hop_2_m_l hop_3_m_l)
5648  (=> hop_2_m_o hop_3_m_o)
5649  (=> hop_2_m_n hop_3_m_n)
5650  (=> hop_2_m_q hop_3_m_q)
5651  (=> hop_2_m_p hop_3_m_p)
5652  (=> hop_2_l_a hop_3_l_a)
5653  (=> hop_2_l_c hop_3_l_c)
5654  (=> hop_2_l_b hop_3_l_b)
5655  (=> hop_2_l_e hop_3_l_e)
5656  (=> hop_2_l_d hop_3_l_d)
5657  (=> hop_2_l_g hop_3_l_g)
5658  (=> hop_2_l_f hop_3_l_f)
5659  (=> hop_2_l_i hop_3_l_i)
5660  (=> hop_2_l_h hop_3_l_h)
5661  (=> hop_2_l_k hop_3_l_k)
5662  (=> hop_2_l_j hop_3_l_j)
5663  (=> hop_2_l_m hop_3_l_m)
5664  (=> hop_2_l_o hop_3_l_o)
5665  (=> hop_2_l_n hop_3_l_n)
5666  (=> hop_2_l_q hop_3_l_q)
5667  (=> hop_2_l_p hop_3_l_p)
5668  (=> hop_2_o_a hop_3_o_a)
5669  (=> hop_2_o_c hop_3_o_c)
5670  (=> hop_2_o_b hop_3_o_b)
5671  (=> hop_2_o_e hop_3_o_e)
5672  (=> hop_2_o_d hop_3_o_d)
5673  (=> hop_2_o_g hop_3_o_g)
5674  (=> hop_2_o_f hop_3_o_f)
5675  (=> hop_2_o_i hop_3_o_i)
5676  (=> hop_2_o_h hop_3_o_h)
5677  (=> hop_2_o_k hop_3_o_k)
5678  (=> hop_2_o_j hop_3_o_j)
5679  (=> hop_2_o_m hop_3_o_m)
5680  (=> hop_2_o_l hop_3_o_l)
5681  (=> hop_2_o_n hop_3_o_n)
5682  (=> hop_2_o_q hop_3_o_q)
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5683  (=> hop_2_o_p hop_3_o_p)
5684  (=> hop_2_n_a hop_3_n_a)
5685  (=> hop_2_n_c hop_3_n_c)
5686  (=> hop_2_n_b hop_3_n_b)
5687  (=> hop_2_n_e hop_3_n_e)
5688  (=> hop_2_n_d hop_3_n_d)
5689  (=> hop_2_n_g hop_3_n_g)
5690  (=> hop_2_n_f hop_3_n_f)
5691  (=> hop_2_n_i hop_3_n_i)
5692  (=> hop_2_n_h hop_3_n_h)
5693  (=> hop_2_n_k hop_3_n_k)
5694  (=> hop_2_n_j hop_3_n_j)
5695  (=> hop_2_n_m hop_3_n_m)
5696  (=> hop_2_n_l hop_3_n_l)
5697  (=> hop_2_n_o hop_3_n_o)
5698  (=> hop_2_n_q hop_3_n_q)
5699  (=> hop_2_n_p hop_3_n_p)
5700  (=> hop_2_q_a hop_3_q_a)
5701  (=> hop_2_q_c hop_3_q_c)
5702  (=> hop_2_q_b hop_3_q_b)
5703  (=> hop_2_q_e hop_3_q_e)
5704  (=> hop_2_q_d hop_3_q_d)
5705  (=> hop_2_q_g hop_3_q_g)
5706  (=> hop_2_q_f hop_3_q_f)
5707  (=> hop_2_q_i hop_3_q_i)
5708  (=> hop_2_q_h hop_3_q_h)
5709  (=> hop_2_q_k hop_3_q_k)
5710  (=> hop_2_q_j hop_3_q_j)
5711  (=> hop_2_q_m hop_3_q_m)
5712  (=> hop_2_q_l hop_3_q_l)
5713  (=> hop_2_q_o hop_3_q_o)
5714  (=> hop_2_q_n hop_3_q_n)
5715  (=> hop_2_q_p hop_3_q_p)
5716  (=> hop_2_p_a hop_3_p_a)
5717  (=> hop_2_p_c hop_3_p_c)
5718  (=> hop_2_p_b hop_3_p_b)
5719  (=> hop_2_p_e hop_3_p_e)
5720  (=> hop_2_p_d hop_3_p_d)
5721  (=> hop_2_p_g hop_3_p_g)
5722  (=> hop_2_p_f hop_3_p_f)
5723  (=> hop_2_p_i hop_3_p_i)
5724  (=> hop_2_p_h hop_3_p_h)
5725  (=> hop_2_p_k hop_3_p_k)
5726  (=> hop_2_p_j hop_3_p_j)
5727  (=> hop_2_p_m hop_3_p_m)
5728  (=> hop_2_p_l hop_3_p_l)
5729  (=> hop_2_p_o hop_3_p_o)
5730  (=> hop_2_p_n hop_3_p_n)
5731  (=> hop_2_p_q hop_3_p_q)
5732  (=> (and hop_2_a_c hop_1_c_b) hop_3_a_b)
5733  (=> (and hop_2_a_c hop_1_c_e) hop_3_a_e)
5734  (=> (and hop_2_a_c hop_1_c_d) hop_3_a_d)
5735  (=> (and hop_2_a_c hop_1_c_g) hop_3_a_g)
5736  (=> (and hop_2_a_c hop_1_c_f) hop_3_a_f)
5737  (=> (and hop_2_a_c hop_1_c_i) hop_3_a_i)
5738  (=> (and hop_2_a_c hop_1_c_h) hop_3_a_h)
5739  (=> (and hop_2_a_c hop_1_c_k) hop_3_a_k)
5740  (=> (and hop_2_a_c hop_1_c_j) hop_3_a_j)
5741  (=> (and hop_2_a_c hop_1_c_m) hop_3_a_m)
5742  (=> (and hop_2_a_c hop_1_c_l) hop_3_a_l)
5743  (=> (and hop_2_a_c hop_1_c_o) hop_3_a_o)
5744  (=> (and hop_2_a_c hop_1_c_n) hop_3_a_n)
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```
5745  (=> (and hop_2_a_c hop_1_c_q) hop_3_a_q)
5746  (=> (and hop_2_a_c hop_1_c_p) hop_3_a_p)
5747  (=> (and hop_2_a_b hop_1_b_c) hop_3_a_c)
5748  (=> (and hop_2_a_b hop_1_b_e) hop_3_a_e)
5749  (=> (and hop_2_a_b hop_1_b_d) hop_3_a_d)
5750  (=> (and hop_2_a_b hop_1_b_g) hop_3_a_g)
5751  (=> (and hop_2_a_b hop_1_b_f) hop_3_a_f)
5752  (=> (and hop_2_a_b hop_1_b_i) hop_3_a_i)
5753  (=> (and hop_2_a_b hop_1_b_h) hop_3_a_h)
5754  (=> (and hop_2_a_b hop_1_b_k) hop_3_a_k)
5755  (=> (and hop_2_a_b hop_1_b_j) hop_3_a_j)
5756  (=> (and hop_2_a_b hop_1_b_m) hop_3_a_m)
5757  (=> (and hop_2_a_b hop_1_b_l) hop_3_a_l)
5758  (=> (and hop_2_a_b hop_1_b_o) hop_3_a_o)
5759  (=> (and hop_2_a_b hop_1_b_n) hop_3_a_n)
5760  (=> (and hop_2_a_b hop_1_b_q) hop_3_a_q)
5761  (=> (and hop_2_a_b hop_1_b_p) hop_3_a_p)
5762  (=> (and hop_2_a_e hop_1_e_c) hop_3_a_c)
5763  (=> (and hop_2_a_e hop_1_e_b) hop_3_a_b)
5764  (=> (and hop_2_a_e hop_1_e_d) hop_3_a_d)
5765  (=> (and hop_2_a_e hop_1_e_g) hop_3_a_g)
5766  (=> (and hop_2_a_e hop_1_e_f) hop_3_a_f)
5767  (=> (and hop_2_a_e hop_1_e_i) hop_3_a_i)
5768  (=> (and hop_2_a_e hop_1_e_h) hop_3_a_h)
5769  (=> (and hop_2_a_e hop_1_e_k) hop_3_a_k)
5770  (=> (and hop_2_a_e hop_1_e_j) hop_3_a_j)
5771  (=> (and hop_2_a_e hop_1_e_m) hop_3_a_m)
5772  (=> (and hop_2_a_e hop_1_e_l) hop_3_a_l)
5773  (=> (and hop_2_a_e hop_1_e_o) hop_3_a_o)
5774  (=> (and hop_2_a_e hop_1_e_n) hop_3_a_n)
5775  (=> (and hop_2_a_e hop_1_e_q) hop_3_a_q)
5776  (=> (and hop_2_a_e hop_1_e_p) hop_3_a_p)
5777  (=> (and hop_2_a_d hop_1_d_c) hop_3_a_c)
5778  (=> (and hop_2_a_d hop_1_d_b) hop_3_a_b)
5779  (=> (and hop_2_a_d hop_1_d_e) hop_3_a_e)
5780  (=> (and hop_2_a_d hop_1_d_g) hop_3_a_g)
5781  (=> (and hop_2_a_d hop_1_d_f) hop_3_a_f)
5782  (=> (and hop_2_a_d hop_1_d_i) hop_3_a_i)
5783  (=> (and hop_2_a_d hop_1_d_h) hop_3_a_h)
5784  (=> (and hop_2_a_d hop_1_d_k) hop_3_a_k)
5785  (=> (and hop_2_a_d hop_1_d_j) hop_3_a_j)
5786  (=> (and hop_2_a_d hop_1_d_m) hop_3_a_m)
5787  (=> (and hop_2_a_d hop_1_d_l) hop_3_a_l)
5788  (=> (and hop_2_a_d hop_1_d_o) hop_3_a_o)
5789  (=> (and hop_2_a_d hop_1_d_n) hop_3_a_n)
5790  (=> (and hop_2_a_d hop_1_d_q) hop_3_a_q)
5791  (=> (and hop_2_a_d hop_1_d_p) hop_3_a_p)
5792  (=> (and hop_2_a_g hop_1_g_c) hop_3_a_c)
5793  (=> (and hop_2_a_g hop_1_g_b) hop_3_a_b)
5794  (=> (and hop_2_a_g hop_1_g_e) hop_3_a_e)
5795  (=> (and hop_2_a_g hop_1_g_d) hop_3_a_d)
5796  (=> (and hop_2_a_g hop_1_g_f) hop_3_a_f)
5797  (=> (and hop_2_a_g hop_1_g_i) hop_3_a_i)
5798  (=> (and hop_2_a_g hop_1_g_h) hop_3_a_h)
5799  (=> (and hop_2_a_g hop_1_g_k) hop_3_a_k)
5800  (=> (and hop_2_a_g hop_1_g_j) hop_3_a_j)
5801  (=> (and hop_2_a_g hop_1_g_m) hop_3_a_m)
5802  (=> (and hop_2_a_g hop_1_g_l) hop_3_a_l)
5803  (=> (and hop_2_a_g hop_1_g_o) hop_3_a_o)
5804  (=> (and hop_2_a_g hop_1_g_n) hop_3_a_n)
5805  (=> (and hop_2_a_g hop_1_g_q) hop_3_a_q)
5806  (=> (and hop_2_a_g hop_1_g_p) hop_3_a_p)
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5807  (=> (and hop_2_a_f hop_1_f_c) hop_3_a_c)
5808  (=> (and hop_2_a_f hop_1_f_b) hop_3_a_b)
5809  (=> (and hop_2_a_f hop_1_f_e) hop_3_a_e)
5810  (=> (and hop_2_a_f hop_1_f_d) hop_3_a_d)
5811  (=> (and hop_2_a_f hop_1_f_g) hop_3_a_g)
5812  (=> (and hop_2_a_f hop_1_f_i) hop_3_a_i)
5813  (=> (and hop_2_a_f hop_1_f_h) hop_3_a_h)
5814  (=> (and hop_2_a_f hop_1_f_k) hop_3_a_k)
5815  (=> (and hop_2_a_f hop_1_f_j) hop_3_a_j)
5816  (=> (and hop_2_a_f hop_1_f_m) hop_3_a_m)
5817  (=> (and hop_2_a_f hop_1_f_l) hop_3_a_l)
5818  (=> (and hop_2_a_f hop_1_f_o) hop_3_a_o)
5819  (=> (and hop_2_a_f hop_1_f_n) hop_3_a_n)
5820  (=> (and hop_2_a_f hop_1_f_q) hop_3_a_q)
5821  (=> (and hop_2_a_f hop_1_f_p) hop_3_a_p)
5822  (=> (and hop_2_a_i hop_1_i_c) hop_3_a_c)
5823  (=> (and hop_2_a_i hop_1_i_b) hop_3_a_b)
5824  (=> (and hop_2_a_i hop_1_i_e) hop_3_a_e)
5825  (=> (and hop_2_a_i hop_1_i_d) hop_3_a_d)
5826  (=> (and hop_2_a_i hop_1_i_g) hop_3_a_g)
5827  (=> (and hop_2_a_i hop_1_i_f) hop_3_a_f)
5828  (=> (and hop_2_a_i hop_1_i_h) hop_3_a_h)
5829  (=> (and hop_2_a_i hop_1_i_k) hop_3_a_k)
5830  (=> (and hop_2_a_i hop_1_i_j) hop_3_a_j)
5831  (=> (and hop_2_a_i hop_1_i_m) hop_3_a_m)
5832  (=> (and hop_2_a_i hop_1_i_l) hop_3_a_l)
5833  (=> (and hop_2_a_i hop_1_i_o) hop_3_a_o)
5834  (=> (and hop_2_a_i hop_1_i_n) hop_3_a_n)
5835  (=> (and hop_2_a_i hop_1_i_q) hop_3_a_q)
5836  (=> (and hop_2_a_i hop_1_i_p) hop_3_a_p)
5837  (=> (and hop_2_a_h hop_1_h_c) hop_3_a_c)
5838  (=> (and hop_2_a_h hop_1_h_b) hop_3_a_b)
5839  (=> (and hop_2_a_h hop_1_h_e) hop_3_a_e)
5840  (=> (and hop_2_a_h hop_1_h_d) hop_3_a_d)
5841  (=> (and hop_2_a_h hop_1_h_g) hop_3_a_g)
5842  (=> (and hop_2_a_h hop_1_h_f) hop_3_a_f)
5843  (=> (and hop_2_a_h hop_1_h_i) hop_3_a_i)
5844  (=> (and hop_2_a_h hop_1_h_k) hop_3_a_k)
5845  (=> (and hop_2_a_h hop_1_h_j) hop_3_a_j)
5846  (=> (and hop_2_a_h hop_1_h_m) hop_3_a_m)
5847  (=> (and hop_2_a_h hop_1_h_l) hop_3_a_l)
5848  (=> (and hop_2_a_h hop_1_h_o) hop_3_a_o)
5849  (=> (and hop_2_a_h hop_1_h_n) hop_3_a_n)
5850  (=> (and hop_2_a_h hop_1_h_q) hop_3_a_q)
5851  (=> (and hop_2_a_h hop_1_h_p) hop_3_a_p)
5852  (=> (and hop_2_a_k hop_1_k_c) hop_3_a_c)
5853  (=> (and hop_2_a_k hop_1_k_b) hop_3_a_b)
5854  (=> (and hop_2_a_k hop_1_k_e) hop_3_a_e)
5855  (=> (and hop_2_a_k hop_1_k_d) hop_3_a_d)
5856  (=> (and hop_2_a_k hop_1_k_g) hop_3_a_g)
5857  (=> (and hop_2_a_k hop_1_k_f) hop_3_a_f)
5858  (=> (and hop_2_a_k hop_1_k_i) hop_3_a_i)
5859  (=> (and hop_2_a_k hop_1_k_h) hop_3_a_h)
5860  (=> (and hop_2_a_k hop_1_k_j) hop_3_a_j)
5861  (=> (and hop_2_a_k hop_1_k_m) hop_3_a_m)
5862  (=> (and hop_2_a_k hop_1_k_l) hop_3_a_l)
5863  (=> (and hop_2_a_k hop_1_k_o) hop_3_a_o)
5864  (=> (and hop_2_a_k hop_1_k_n) hop_3_a_n)
5865  (=> (and hop_2_a_k hop_1_k_q) hop_3_a_q)
5866  (=> (and hop_2_a_k hop_1_k_p) hop_3_a_p)
5867  (=> (and hop_2_a_j hop_1_j_c) hop_3_a_c)
5868  (=> (and hop_2_a_j hop_1_j_b) hop_3_a_b)
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5869  (=> (and hop_2_a_j hop_1_j_e) hop_3_a_e)
5870  (=> (and hop_2_a_j hop_1_j_d) hop_3_a_d)
5871  (=> (and hop_2_a_j hop_1_j_g) hop_3_a_g)
5872  (=> (and hop_2_a_j hop_1_j_f) hop_3_a_f)
5873  (=> (and hop_2_a_j hop_1_j_i) hop_3_a_i)
5874  (=> (and hop_2_a_j hop_1_j_h) hop_3_a_h)
5875  (=> (and hop_2_a_j hop_1_j_k) hop_3_a_k)
5876  (=> (and hop_2_a_j hop_1_j_m) hop_3_a_m)
5877  (=> (and hop_2_a_j hop_1_j_l) hop_3_a_l)
5878  (=> (and hop_2_a_j hop_1_j_o) hop_3_a_o)
5879  (=> (and hop_2_a_j hop_1_j_n) hop_3_a_n)
5880  (=> (and hop_2_a_j hop_1_j_q) hop_3_a_q)
5881  (=> (and hop_2_a_j hop_1_j_p) hop_3_a_p)
5882  (=> (and hop_2_a_m hop_1_m_c) hop_3_a_c)
5883  (=> (and hop_2_a_m hop_1_m_b) hop_3_a_b)
5884  (=> (and hop_2_a_m hop_1_m_e) hop_3_a_e)
5885  (=> (and hop_2_a_m hop_1_m_d) hop_3_a_d)
5886  (=> (and hop_2_a_m hop_1_m_g) hop_3_a_g)
5887  (=> (and hop_2_a_m hop_1_m_f) hop_3_a_f)
5888  (=> (and hop_2_a_m hop_1_m_i) hop_3_a_i)
5889  (=> (and hop_2_a_m hop_1_m_h) hop_3_a_h)
5890  (=> (and hop_2_a_m hop_1_m_k) hop_3_a_k)
5891  (=> (and hop_2_a_m hop_1_m_j) hop_3_a_j)
5892  (=> (and hop_2_a_m hop_1_m_l) hop_3_a_l)
5893  (=> (and hop_2_a_m hop_1_m_o) hop_3_a_o)
5894  (=> (and hop_2_a_m hop_1_m_n) hop_3_a_n)
5895  (=> (and hop_2_a_m hop_1_m_q) hop_3_a_q)
5896  (=> (and hop_2_a_m hop_1_m_p) hop_3_a_p)
5897  (=> (and hop_2_a_l hop_1_l_c) hop_3_a_c)
5898  (=> (and hop_2_a_l hop_1_l_b) hop_3_a_b)
5899  (=> (and hop_2_a_l hop_1_l_e) hop_3_a_e)
5900  (=> (and hop_2_a_l hop_1_l_d) hop_3_a_d)
5901  (=> (and hop_2_a_l hop_1_l_g) hop_3_a_g)
5902  (=> (and hop_2_a_l hop_1_l_f) hop_3_a_f)
5903  (=> (and hop_2_a_l hop_1_l_i) hop_3_a_i)
5904  (=> (and hop_2_a_l hop_1_l_h) hop_3_a_h)
5905  (=> (and hop_2_a_l hop_1_l_k) hop_3_a_k)
5906  (=> (and hop_2_a_l hop_1_l_j) hop_3_a_j)
5907  (=> (and hop_2_a_l hop_1_l_m) hop_3_a_m)
5908  (=> (and hop_2_a_l hop_1_l_o) hop_3_a_o)
5909  (=> (and hop_2_a_l hop_1_l_n) hop_3_a_n)
5910  (=> (and hop_2_a_l hop_1_l_q) hop_3_a_q)
5911  (=> (and hop_2_a_l hop_1_l_p) hop_3_a_p)
5912  (=> (and hop_2_a_o hop_1_o_c) hop_3_a_c)
5913  (=> (and hop_2_a_o hop_1_o_b) hop_3_a_b)
5914  (=> (and hop_2_a_o hop_1_o_e) hop_3_a_e)
5915  (=> (and hop_2_a_o hop_1_o_d) hop_3_a_d)
5916  (=> (and hop_2_a_o hop_1_o_g) hop_3_a_g)
5917  (=> (and hop_2_a_o hop_1_o_f) hop_3_a_f)
5918  (=> (and hop_2_a_o hop_1_o_i) hop_3_a_i)
5919  (=> (and hop_2_a_o hop_1_o_h) hop_3_a_h)
5920  (=> (and hop_2_a_o hop_1_o_k) hop_3_a_k)
5921  (=> (and hop_2_a_o hop_1_o_j) hop_3_a_j)
5922  (=> (and hop_2_a_o hop_1_o_m) hop_3_a_m)
5923  (=> (and hop_2_a_o hop_1_o_l) hop_3_a_l)
5924  (=> (and hop_2_a_o hop_1_o_n) hop_3_a_n)
5925  (=> (and hop_2_a_o hop_1_o_q) hop_3_a_q)
5926  (=> (and hop_2_a_o hop_1_o_p) hop_3_a_p)
5927  (=> (and hop_2_a_n hop_1_n_c) hop_3_a_c)
5928  (=> (and hop_2_a_n hop_1_n_b) hop_3_a_b)
5929  (=> (and hop_2_a_n hop_1_n_e) hop_3_a_e)
5930  (=> (and hop_2_a_n hop_1_n_d) hop_3_a_d)
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5931  (=> (and hop_2_a_n hop_1_n_g) hop_3_a_g)
5932  (=> (and hop_2_a_n hop_1_n_f) hop_3_a_f)
5933  (=> (and hop_2_a_n hop_1_n_i) hop_3_a_i)
5934  (=> (and hop_2_a_n hop_1_n_h) hop_3_a_h)
5935  (=> (and hop_2_a_n hop_1_n_k) hop_3_a_k)
5936  (=> (and hop_2_a_n hop_1_n_j) hop_3_a_j)
5937  (=> (and hop_2_a_n hop_1_n_m) hop_3_a_m)
5938  (=> (and hop_2_a_n hop_1_n_l) hop_3_a_l)
5939  (=> (and hop_2_a_n hop_1_n_o) hop_3_a_o)
5940  (=> (and hop_2_a_n hop_1_n_q) hop_3_a_q)
5941  (=> (and hop_2_a_n hop_1_n_p) hop_3_a_p)
5942  (=> (and hop_2_a_q hop_1_q_c) hop_3_a_c)
5943  (=> (and hop_2_a_q hop_1_q_b) hop_3_a_b)
5944  (=> (and hop_2_a_q hop_1_q_e) hop_3_a_e)
5945  (=> (and hop_2_a_q hop_1_q_d) hop_3_a_d)
5946  (=> (and hop_2_a_q hop_1_q_g) hop_3_a_g)
5947  (=> (and hop_2_a_q hop_1_q_f) hop_3_a_f)
5948  (=> (and hop_2_a_q hop_1_q_i) hop_3_a_i)
5949  (=> (and hop_2_a_q hop_1_q_h) hop_3_a_h)
5950  (=> (and hop_2_a_q hop_1_q_k) hop_3_a_k)
5951  (=> (and hop_2_a_q hop_1_q_j) hop_3_a_j)
5952  (=> (and hop_2_a_q hop_1_q_m) hop_3_a_m)
5953  (=> (and hop_2_a_q hop_1_q_l) hop_3_a_l)
5954  (=> (and hop_2_a_q hop_1_q_o) hop_3_a_o)
5955  (=> (and hop_2_a_q hop_1_q_n) hop_3_a_n)
5956  (=> (and hop_2_a_q hop_1_q_p) hop_3_a_p)
5957  (=> (and hop_2_a_p hop_1_p_c) hop_3_a_c)
5958  (=> (and hop_2_a_p hop_1_p_b) hop_3_a_b)
5959  (=> (and hop_2_a_p hop_1_p_e) hop_3_a_e)
5960  (=> (and hop_2_a_p hop_1_p_d) hop_3_a_d)
5961  (=> (and hop_2_a_p hop_1_p_g) hop_3_a_g)
5962  (=> (and hop_2_a_p hop_1_p_f) hop_3_a_f)
5963  (=> (and hop_2_a_p hop_1_p_i) hop_3_a_i)
5964  (=> (and hop_2_a_p hop_1_p_h) hop_3_a_h)
5965  (=> (and hop_2_a_p hop_1_p_k) hop_3_a_k)
5966  (=> (and hop_2_a_p hop_1_p_j) hop_3_a_j)
5967  (=> (and hop_2_a_p hop_1_p_m) hop_3_a_m)
5968  (=> (and hop_2_a_p hop_1_p_l) hop_3_a_l)
5969  (=> (and hop_2_a_p hop_1_p_o) hop_3_a_o)
5970  (=> (and hop_2_a_p hop_1_p_n) hop_3_a_n)
5971  (=> (and hop_2_a_p hop_1_p_q) hop_3_a_q)
5972  (=> (and hop_2_c_a hop_1_a_b) hop_3_c_b)
5973  (=> (and hop_2_c_a hop_1_a_e) hop_3_c_e)
5974  (=> (and hop_2_c_a hop_1_a_d) hop_3_c_d)
5975  (=> (and hop_2_c_a hop_1_a_g) hop_3_c_g)
5976  (=> (and hop_2_c_a hop_1_a_f) hop_3_c_f)
5977  (=> (and hop_2_c_a hop_1_a_i) hop_3_c_i)
5978  (=> (and hop_2_c_a hop_1_a_h) hop_3_c_h)
5979  (=> (and hop_2_c_a hop_1_a_k) hop_3_c_k)
5980  (=> (and hop_2_c_a hop_1_a_j) hop_3_c_j)
5981  (=> (and hop_2_c_a hop_1_a_m) hop_3_c_m)
5982  (=> (and hop_2_c_a hop_1_a_l) hop_3_c_l)
5983  (=> (and hop_2_c_a hop_1_a_o) hop_3_c_o)
5984  (=> (and hop_2_c_a hop_1_a_n) hop_3_c_n)
5985  (=> (and hop_2_c_a hop_1_a_q) hop_3_c_q)
5986  (=> (and hop_2_c_a hop_1_a_p) hop_3_c_p)
5987  (=> (and hop_2_c_b hop_1_b_a) hop_3_c_a)
5988  (=> (and hop_2_c_b hop_1_b_e) hop_3_c_e)
5989  (=> (and hop_2_c_b hop_1_b_d) hop_3_c_d)
5990  (=> (and hop_2_c_b hop_1_b_g) hop_3_c_g)
5991  (=> (and hop_2_c_b hop_1_b_f) hop_3_c_f)
5992  (=> (and hop_2_c_b hop_1_b_i) hop_3_c_i)
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5993  (=> (and hop_2_c_b hop_1_b_h) hop_3_c_h)
5994  (=> (and hop_2_c_b hop_1_b_k) hop_3_c_k)
5995  (=> (and hop_2_c_b hop_1_b_j) hop_3_c_j)
5996  (=> (and hop_2_c_b hop_1_b_m) hop_3_c_m)
5997  (=> (and hop_2_c_b hop_1_b_l) hop_3_c_l)
5998  (=> (and hop_2_c_b hop_1_b_o) hop_3_c_o)
5999  (=> (and hop_2_c_b hop_1_b_n) hop_3_c_n)
6000  (=> (and hop_2_c_b hop_1_b_q) hop_3_c_q)
6001  (=> (and hop_2_c_b hop_1_b_p) hop_3_c_p)
6002  (=> (and hop_2_c_e hop_1_e_a) hop_3_c_a)
6003  (=> (and hop_2_c_e hop_1_e_b) hop_3_c_b)
6004  (=> (and hop_2_c_e hop_1_e_d) hop_3_c_d)
6005  (=> (and hop_2_c_e hop_1_e_g) hop_3_c_g)
6006  (=> (and hop_2_c_e hop_1_e_f) hop_3_c_f)
6007  (=> (and hop_2_c_e hop_1_e_i) hop_3_c_i)
6008  (=> (and hop_2_c_e hop_1_e_h) hop_3_c_h)
6009  (=> (and hop_2_c_e hop_1_e_k) hop_3_c_k)
6010  (=> (and hop_2_c_e hop_1_e_j) hop_3_c_j)
6011  (=> (and hop_2_c_e hop_1_e_m) hop_3_c_m)
6012  (=> (and hop_2_c_e hop_1_e_l) hop_3_c_l)
6013  (=> (and hop_2_c_e hop_1_e_o) hop_3_c_o)
6014  (=> (and hop_2_c_e hop_1_e_n) hop_3_c_n)
6015  (=> (and hop_2_c_e hop_1_e_q) hop_3_c_q)
6016  (=> (and hop_2_c_e hop_1_e_p) hop_3_c_p)
6017  (=> (and hop_2_c_d hop_1_d_a) hop_3_c_a)
6018  (=> (and hop_2_c_d hop_1_d_b) hop_3_c_b)
6019  (=> (and hop_2_c_d hop_1_d_e) hop_3_c_e)
6020  (=> (and hop_2_c_d hop_1_d_g) hop_3_c_g)
6021  (=> (and hop_2_c_d hop_1_d_f) hop_3_c_f)
6022  (=> (and hop_2_c_d hop_1_d_i) hop_3_c_i)
6023  (=> (and hop_2_c_d hop_1_d_h) hop_3_c_h)
6024  (=> (and hop_2_c_d hop_1_d_k) hop_3_c_k)
6025  (=> (and hop_2_c_d hop_1_d_j) hop_3_c_j)
6026  (=> (and hop_2_c_d hop_1_d_m) hop_3_c_m)
6027  (=> (and hop_2_c_d hop_1_d_l) hop_3_c_l)
6028  (=> (and hop_2_c_d hop_1_d_o) hop_3_c_o)
6029  (=> (and hop_2_c_d hop_1_d_n) hop_3_c_n)
6030  (=> (and hop_2_c_d hop_1_d_q) hop_3_c_q)
6031  (=> (and hop_2_c_d hop_1_d_p) hop_3_c_p)
6032  (=> (and hop_2_c_g hop_1_g_a) hop_3_c_a)
6033  (=> (and hop_2_c_g hop_1_g_b) hop_3_c_b)
6034  (=> (and hop_2_c_g hop_1_g_e) hop_3_c_e)
6035  (=> (and hop_2_c_g hop_1_g_d) hop_3_c_d)
6036  (=> (and hop_2_c_g hop_1_g_f) hop_3_c_f)
6037  (=> (and hop_2_c_g hop_1_g_i) hop_3_c_i)
6038  (=> (and hop_2_c_g hop_1_g_h) hop_3_c_h)
6039  (=> (and hop_2_c_g hop_1_g_k) hop_3_c_k)
6040  (=> (and hop_2_c_g hop_1_g_j) hop_3_c_j)
6041  (=> (and hop_2_c_g hop_1_g_m) hop_3_c_m)
6042  (=> (and hop_2_c_g hop_1_g_l) hop_3_c_l)
6043  (=> (and hop_2_c_g hop_1_g_o) hop_3_c_o)
6044  (=> (and hop_2_c_g hop_1_g_n) hop_3_c_n)
6045  (=> (and hop_2_c_g hop_1_g_q) hop_3_c_q)
6046  (=> (and hop_2_c_g hop_1_g_p) hop_3_c_p)
6047  (=> (and hop_2_c_f hop_1_f_a) hop_3_c_a)
6048  (=> (and hop_2_c_f hop_1_f_b) hop_3_c_b)
6049  (=> (and hop_2_c_f hop_1_f_e) hop_3_c_e)
6050  (=> (and hop_2_c_f hop_1_f_d) hop_3_c_d)
6051  (=> (and hop_2_c_f hop_1_f_g) hop_3_c_g)
6052  (=> (and hop_2_c_f hop_1_f_i) hop_3_c_i)
6053  (=> (and hop_2_c_f hop_1_f_h) hop_3_c_h)
6054  (=> (and hop_2_c_f hop_1_f_k) hop_3_c_k)
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6055  (=> (and hop_2_c_f hop_1_f_j) hop_3_c_j)
6056  (=> (and hop_2_c_f hop_1_f_m) hop_3_c_m)
6057  (=> (and hop_2_c_f hop_1_f_l) hop_3_c_l)
6058  (=> (and hop_2_c_f hop_1_f_o) hop_3_c_o)
6059  (=> (and hop_2_c_f hop_1_f_n) hop_3_c_n)
6060  (=> (and hop_2_c_f hop_1_f_q) hop_3_c_q)
6061  (=> (and hop_2_c_f hop_1_f_p) hop_3_c_p)
6062  (=> (and hop_2_c_i hop_1_i_a) hop_3_c_a)
6063  (=> (and hop_2_c_i hop_1_i_b) hop_3_c_b)
6064  (=> (and hop_2_c_i hop_1_i_e) hop_3_c_e)
6065  (=> (and hop_2_c_i hop_1_i_d) hop_3_c_d)
6066  (=> (and hop_2_c_i hop_1_i_g) hop_3_c_g)
6067  (=> (and hop_2_c_i hop_1_i_f) hop_3_c_f)
6068  (=> (and hop_2_c_i hop_1_i_h) hop_3_c_h)
6069  (=> (and hop_2_c_i hop_1_i_k) hop_3_c_k)
6070  (=> (and hop_2_c_i hop_1_i_j) hop_3_c_j)
6071  (=> (and hop_2_c_i hop_1_i_m) hop_3_c_m)
6072  (=> (and hop_2_c_i hop_1_i_l) hop_3_c_l)
6073  (=> (and hop_2_c_i hop_1_i_o) hop_3_c_o)
6074  (=> (and hop_2_c_i hop_1_i_n) hop_3_c_n)
6075  (=> (and hop_2_c_i hop_1_i_q) hop_3_c_q)
6076  (=> (and hop_2_c_i hop_1_i_p) hop_3_c_p)
6077  (=> (and hop_2_c_h hop_1_h_a) hop_3_c_a)
6078  (=> (and hop_2_c_h hop_1_h_b) hop_3_c_b)
6079  (=> (and hop_2_c_h hop_1_h_e) hop_3_c_e)
6080  (=> (and hop_2_c_h hop_1_h_d) hop_3_c_d)
6081  (=> (and hop_2_c_h hop_1_h_g) hop_3_c_g)
6082  (=> (and hop_2_c_h hop_1_h_f) hop_3_c_f)
6083  (=> (and hop_2_c_h hop_1_h_i) hop_3_c_i)
6084  (=> (and hop_2_c_h hop_1_h_k) hop_3_c_k)
6085  (=> (and hop_2_c_h hop_1_h_j) hop_3_c_j)
6086  (=> (and hop_2_c_h hop_1_h_m) hop_3_c_m)
6087  (=> (and hop_2_c_h hop_1_h_l) hop_3_c_l)
6088  (=> (and hop_2_c_h hop_1_h_o) hop_3_c_o)
6089  (=> (and hop_2_c_h hop_1_h_n) hop_3_c_n)
6090  (=> (and hop_2_c_h hop_1_h_q) hop_3_c_q)
6091  (=> (and hop_2_c_h hop_1_h_p) hop_3_c_p)
6092  (=> (and hop_2_c_k hop_1_k_a) hop_3_c_a)
6093  (=> (and hop_2_c_k hop_1_k_b) hop_3_c_b)
6094  (=> (and hop_2_c_k hop_1_k_e) hop_3_c_e)
6095  (=> (and hop_2_c_k hop_1_k_d) hop_3_c_d)
6096  (=> (and hop_2_c_k hop_1_k_g) hop_3_c_g)
6097  (=> (and hop_2_c_k hop_1_k_f) hop_3_c_f)
6098  (=> (and hop_2_c_k hop_1_k_i) hop_3_c_i)
6099  (=> (and hop_2_c_k hop_1_k_h) hop_3_c_h)
6100  (=> (and hop_2_c_k hop_1_k_j) hop_3_c_j)
6101  (=> (and hop_2_c_k hop_1_k_m) hop_3_c_m)
6102  (=> (and hop_2_c_k hop_1_k_l) hop_3_c_l)
6103  (=> (and hop_2_c_k hop_1_k_o) hop_3_c_o)
6104  (=> (and hop_2_c_k hop_1_k_n) hop_3_c_n)
6105  (=> (and hop_2_c_k hop_1_k_q) hop_3_c_q)
6106  (=> (and hop_2_c_k hop_1_k_p) hop_3_c_p)
6107  (=> (and hop_2_c_j hop_1_j_a) hop_3_c_a)
6108  (=> (and hop_2_c_j hop_1_j_b) hop_3_c_b)
6109  (=> (and hop_2_c_j hop_1_j_e) hop_3_c_e)
6110  (=> (and hop_2_c_j hop_1_j_d) hop_3_c_d)
6111  (=> (and hop_2_c_j hop_1_j_g) hop_3_c_g)
6112  (=> (and hop_2_c_j hop_1_j_f) hop_3_c_f)
6113  (=> (and hop_2_c_j hop_1_j_i) hop_3_c_i)
6114  (=> (and hop_2_c_j hop_1_j_h) hop_3_c_h)
6115  (=> (and hop_2_c_j hop_1_j_k) hop_3_c_k)
6116  (=> (and hop_2_c_j hop_1_j_m) hop_3_c_m)
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6117  (=> (and hop_2_c_j hop_1_j_l) hop_3_c_l)
6118  (=> (and hop_2_c_j hop_1_j_o) hop_3_c_o)
6119  (=> (and hop_2_c_j hop_1_j_n) hop_3_c_n)
6120  (=> (and hop_2_c_j hop_1_j_q) hop_3_c_q)
6121  (=> (and hop_2_c_j hop_1_j_p) hop_3_c_p)
6122  (=> (and hop_2_c_m hop_1_m_a) hop_3_c_a)
6123  (=> (and hop_2_c_m hop_1_m_b) hop_3_c_b)
6124  (=> (and hop_2_c_m hop_1_m_e) hop_3_c_e)
6125  (=> (and hop_2_c_m hop_1_m_d) hop_3_c_d)
6126  (=> (and hop_2_c_m hop_1_m_g) hop_3_c_g)
6127  (=> (and hop_2_c_m hop_1_m_f) hop_3_c_f)
6128  (=> (and hop_2_c_m hop_1_m_i) hop_3_c_i)
6129  (=> (and hop_2_c_m hop_1_m_h) hop_3_c_h)
6130  (=> (and hop_2_c_m hop_1_m_k) hop_3_c_k)
6131  (=> (and hop_2_c_m hop_1_m_j) hop_3_c_j)
6132  (=> (and hop_2_c_m hop_1_m_l) hop_3_c_l)
6133  (=> (and hop_2_c_m hop_1_m_o) hop_3_c_o)
6134  (=> (and hop_2_c_m hop_1_m_n) hop_3_c_n)
6135  (=> (and hop_2_c_m hop_1_m_q) hop_3_c_q)
6136  (=> (and hop_2_c_m hop_1_m_p) hop_3_c_p)
6137  (=> (and hop_2_c_l hop_1_l_a) hop_3_c_a)
6138  (=> (and hop_2_c_l hop_1_l_b) hop_3_c_b)
6139  (=> (and hop_2_c_l hop_1_l_e) hop_3_c_e)
6140  (=> (and hop_2_c_l hop_1_l_d) hop_3_c_d)
6141  (=> (and hop_2_c_l hop_1_l_g) hop_3_c_g)
6142  (=> (and hop_2_c_l hop_1_l_f) hop_3_c_f)
6143  (=> (and hop_2_c_l hop_1_l_i) hop_3_c_i)
6144  (=> (and hop_2_c_l hop_1_l_h) hop_3_c_h)
6145  (=> (and hop_2_c_l hop_1_l_k) hop_3_c_k)
6146  (=> (and hop_2_c_l hop_1_l_j) hop_3_c_j)
6147  (=> (and hop_2_c_l hop_1_l_m) hop_3_c_m)
6148  (=> (and hop_2_c_l hop_1_l_o) hop_3_c_o)
6149  (=> (and hop_2_c_l hop_1_l_n) hop_3_c_n)
6150  (=> (and hop_2_c_l hop_1_l_q) hop_3_c_q)
6151  (=> (and hop_2_c_l hop_1_l_p) hop_3_c_p)
6152  (=> (and hop_2_c_o hop_1_o_a) hop_3_c_a)
6153  (=> (and hop_2_c_o hop_1_o_b) hop_3_c_b)
6154  (=> (and hop_2_c_o hop_1_o_e) hop_3_c_e)
6155  (=> (and hop_2_c_o hop_1_o_d) hop_3_c_d)
6156  (=> (and hop_2_c_o hop_1_o_g) hop_3_c_g)
6157  (=> (and hop_2_c_o hop_1_o_f) hop_3_c_f)
6158  (=> (and hop_2_c_o hop_1_o_i) hop_3_c_i)
6159  (=> (and hop_2_c_o hop_1_o_h) hop_3_c_h)
6160  (=> (and hop_2_c_o hop_1_o_k) hop_3_c_k)
6161  (=> (and hop_2_c_o hop_1_o_j) hop_3_c_j)
6162  (=> (and hop_2_c_o hop_1_o_m) hop_3_c_m)
6163  (=> (and hop_2_c_o hop_1_o_l) hop_3_c_l)
6164  (=> (and hop_2_c_o hop_1_o_n) hop_3_c_n)
6165  (=> (and hop_2_c_o hop_1_o_q) hop_3_c_q)
6166  (=> (and hop_2_c_o hop_1_o_p) hop_3_c_p)
6167  (=> (and hop_2_c_n hop_1_n_a) hop_3_c_a)
6168  (=> (and hop_2_c_n hop_1_n_b) hop_3_c_b)
6169  (=> (and hop_2_c_n hop_1_n_e) hop_3_c_e)
6170  (=> (and hop_2_c_n hop_1_n_d) hop_3_c_d)
6171  (=> (and hop_2_c_n hop_1_n_g) hop_3_c_g)
6172  (=> (and hop_2_c_n hop_1_n_f) hop_3_c_f)
6173  (=> (and hop_2_c_n hop_1_n_i) hop_3_c_i)
6174  (=> (and hop_2_c_n hop_1_n_h) hop_3_c_h)
6175  (=> (and hop_2_c_n hop_1_n_k) hop_3_c_k)
6176  (=> (and hop_2_c_n hop_1_n_j) hop_3_c_j)
6177  (=> (and hop_2_c_n hop_1_n_m) hop_3_c_m)
6178  (=> (and hop_2_c_n hop_1_n_l) hop_3_c_l)
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6179   (=> (and hop_2_c_n hop_1_n_o) hop_3_c_o)
6180   (=> (and hop_2_c_n hop_1_n_q) hop_3_c_q)
6181   (=> (and hop_2_c_n hop_1_n_p) hop_3_c_p)
6182   (=> (and hop_2_c_q hop_1_q_a) hop_3_c_a)
6183   (=> (and hop_2_c_q hop_1_q_b) hop_3_c_b)
6184   (=> (and hop_2_c_q hop_1_q_e) hop_3_c_e)
6185   (=> (and hop_2_c_q hop_1_q_d) hop_3_c_d)
6186   (=> (and hop_2_c_q hop_1_q_g) hop_3_c_g)
6187   (=> (and hop_2_c_q hop_1_q_f) hop_3_c_f)
6188   (=> (and hop_2_c_q hop_1_q_i) hop_3_c_i)
6189   (=> (and hop_2_c_q hop_1_q_h) hop_3_c_h)
6190   (=> (and hop_2_c_q hop_1_q_k) hop_3_c_k)
6191   (=> (and hop_2_c_q hop_1_q_j) hop_3_c_j)
6192   (=> (and hop_2_c_q hop_1_q_m) hop_3_c_m)
6193   (=> (and hop_2_c_q hop_1_q_l) hop_3_c_l)
6194   (=> (and hop_2_c_q hop_1_q_o) hop_3_c_o)
6195   (=> (and hop_2_c_q hop_1_q_n) hop_3_c_n)
6196   (=> (and hop_2_c_q hop_1_q_p) hop_3_c_p)
6197   (=> (and hop_2_c_p hop_1_p_a) hop_3_c_a)
6198   (=> (and hop_2_c_p hop_1_p_b) hop_3_c_b)
6199   (=> (and hop_2_c_p hop_1_p_e) hop_3_c_e)
6200   (=> (and hop_2_c_p hop_1_p_d) hop_3_c_d)
6201   (=> (and hop_2_c_p hop_1_p_g) hop_3_c_g)
6202   (=> (and hop_2_c_p hop_1_p_f) hop_3_c_f)
6203   (=> (and hop_2_c_p hop_1_p_i) hop_3_c_i)
6204   (=> (and hop_2_c_p hop_1_p_h) hop_3_c_h)
6205   (=> (and hop_2_c_p hop_1_p_k) hop_3_c_k)
6206   (=> (and hop_2_c_p hop_1_p_j) hop_3_c_j)
6207   (=> (and hop_2_c_p hop_1_p_m) hop_3_c_m)
6208   (=> (and hop_2_c_p hop_1_p_l) hop_3_c_l)
6209   (=> (and hop_2_c_p hop_1_p_o) hop_3_c_o)
6210   (=> (and hop_2_c_p hop_1_p_n) hop_3_c_n)
6211   (=> (and hop_2_c_p hop_1_p_q) hop_3_c_q)
6212   (=> (and hop_2_b_a hop_1_a_c) hop_3_b_c)
6213   (=> (and hop_2_b_a hop_1_a_e) hop_3_b_e)
6214   (=> (and hop_2_b_a hop_1_a_d) hop_3_b_d)
6215   (=> (and hop_2_b_a hop_1_a_g) hop_3_b_g)
6216   (=> (and hop_2_b_a hop_1_a_f) hop_3_b_f)
6217   (=> (and hop_2_b_a hop_1_a_i) hop_3_b_i)
6218   (=> (and hop_2_b_a hop_1_a_h) hop_3_b_h)
6219   (=> (and hop_2_b_a hop_1_a_k) hop_3_b_k)
6220   (=> (and hop_2_b_a hop_1_a_j) hop_3_b_j)
6221   (=> (and hop_2_b_a hop_1_a_m) hop_3_b_m)
6222   (=> (and hop_2_b_a hop_1_a_l) hop_3_b_l)
6223   (=> (and hop_2_b_a hop_1_a_o) hop_3_b_o)
6224   (=> (and hop_2_b_a hop_1_a_n) hop_3_b_n)
6225   (=> (and hop_2_b_a hop_1_a_q) hop_3_b_q)
6226   (=> (and hop_2_b_a hop_1_a_p) hop_3_b_p)
6227   (=> (and hop_2_b_c hop_1_c_a) hop_3_b_a)
6228   (=> (and hop_2_b_c hop_1_c_e) hop_3_b_e)
6229   (=> (and hop_2_b_c hop_1_c_d) hop_3_b_d)
6230   (=> (and hop_2_b_c hop_1_c_g) hop_3_b_g)
6231   (=> (and hop_2_b_c hop_1_c_f) hop_3_b_f)
6232   (=> (and hop_2_b_c hop_1_c_i) hop_3_b_i)
6233   (=> (and hop_2_b_c hop_1_c_h) hop_3_b_h)
6234   (=> (and hop_2_b_c hop_1_c_k) hop_3_b_k)
6235   (=> (and hop_2_b_c hop_1_c_j) hop_3_b_j)
6236   (=> (and hop_2_b_c hop_1_c_m) hop_3_b_m)
6237   (=> (and hop_2_b_c hop_1_c_l) hop_3_b_l)
6238   (=> (and hop_2_b_c hop_1_c_o) hop_3_b_o)
6239   (=> (and hop_2_b_c hop_1_c_n) hop_3_b_n)
6240   (=> (and hop_2_b_c hop_1_c_q) hop_3_b_q)
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6241  (=> (and hop_2_b_c hop_1_c_p) hop_3_b_p)
6242  (=> (and hop_2_b_e hop_1_e_a) hop_3_b_a)
6243  (=> (and hop_2_b_e hop_1_e_c) hop_3_b_c)
6244  (=> (and hop_2_b_e hop_1_e_d) hop_3_b_d)
6245  (=> (and hop_2_b_e hop_1_e_g) hop_3_b_g)
6246  (=> (and hop_2_b_e hop_1_e_f) hop_3_b_f)
6247  (=> (and hop_2_b_e hop_1_e_i) hop_3_b_i)
6248  (=> (and hop_2_b_e hop_1_e_h) hop_3_b_h)
6249  (=> (and hop_2_b_e hop_1_e_k) hop_3_b_k)
6250  (=> (and hop_2_b_e hop_1_e_j) hop_3_b_j)
6251  (=> (and hop_2_b_e hop_1_e_m) hop_3_b_m)
6252  (=> (and hop_2_b_e hop_1_e_l) hop_3_b_l)
6253  (=> (and hop_2_b_e hop_1_e_o) hop_3_b_o)
6254  (=> (and hop_2_b_e hop_1_e_n) hop_3_b_n)
6255  (=> (and hop_2_b_e hop_1_e_q) hop_3_b_q)
6256  (=> (and hop_2_b_e hop_1_e_p) hop_3_b_p)
6257  (=> (and hop_2_b_d hop_1_d_a) hop_3_b_a)
6258  (=> (and hop_2_b_d hop_1_d_c) hop_3_b_c)
6259  (=> (and hop_2_b_d hop_1_d_e) hop_3_b_e)
6260  (=> (and hop_2_b_d hop_1_d_g) hop_3_b_g)
6261  (=> (and hop_2_b_d hop_1_d_f) hop_3_b_f)
6262  (=> (and hop_2_b_d hop_1_d_i) hop_3_b_i)
6263  (=> (and hop_2_b_d hop_1_d_h) hop_3_b_h)
6264  (=> (and hop_2_b_d hop_1_d_k) hop_3_b_k)
6265  (=> (and hop_2_b_d hop_1_d_j) hop_3_b_j)
6266  (=> (and hop_2_b_d hop_1_d_m) hop_3_b_m)
6267  (=> (and hop_2_b_d hop_1_d_l) hop_3_b_l)
6268  (=> (and hop_2_b_d hop_1_d_o) hop_3_b_o)
6269  (=> (and hop_2_b_d hop_1_d_n) hop_3_b_n)
6270  (=> (and hop_2_b_d hop_1_d_q) hop_3_b_q)
6271  (=> (and hop_2_b_d hop_1_d_p) hop_3_b_p)
6272  (=> (and hop_2_b_g hop_1_g_a) hop_3_b_a)
6273  (=> (and hop_2_b_g hop_1_g_c) hop_3_b_c)
6274  (=> (and hop_2_b_g hop_1_g_e) hop_3_b_e)
6275  (=> (and hop_2_b_g hop_1_g_d) hop_3_b_d)
6276  (=> (and hop_2_b_g hop_1_g_f) hop_3_b_f)
6277  (=> (and hop_2_b_g hop_1_g_i) hop_3_b_i)
6278  (=> (and hop_2_b_g hop_1_g_h) hop_3_b_h)
6279  (=> (and hop_2_b_g hop_1_g_k) hop_3_b_k)
6280  (=> (and hop_2_b_g hop_1_g_j) hop_3_b_j)
6281  (=> (and hop_2_b_g hop_1_g_m) hop_3_b_m)
6282  (=> (and hop_2_b_g hop_1_g_l) hop_3_b_l)
6283  (=> (and hop_2_b_g hop_1_g_o) hop_3_b_o)
6284  (=> (and hop_2_b_g hop_1_g_n) hop_3_b_n)
6285  (=> (and hop_2_b_g hop_1_g_q) hop_3_b_q)
6286  (=> (and hop_2_b_g hop_1_g_p) hop_3_b_p)
6287  (=> (and hop_2_b_f hop_1_f_a) hop_3_b_a)
6288  (=> (and hop_2_b_f hop_1_f_c) hop_3_b_c)
6289  (=> (and hop_2_b_f hop_1_f_e) hop_3_b_e)
6290  (=> (and hop_2_b_f hop_1_f_d) hop_3_b_d)
6291  (=> (and hop_2_b_f hop_1_f_g) hop_3_b_g)
6292  (=> (and hop_2_b_f hop_1_f_i) hop_3_b_i)
6293  (=> (and hop_2_b_f hop_1_f_h) hop_3_b_h)
6294  (=> (and hop_2_b_f hop_1_f_k) hop_3_b_k)
6295  (=> (and hop_2_b_f hop_1_f_j) hop_3_b_j)
6296  (=> (and hop_2_b_f hop_1_f_m) hop_3_b_m)
6297  (=> (and hop_2_b_f hop_1_f_l) hop_3_b_l)
6298  (=> (and hop_2_b_f hop_1_f_o) hop_3_b_o)
6299  (=> (and hop_2_b_f hop_1_f_n) hop_3_b_n)
6300  (=> (and hop_2_b_f hop_1_f_q) hop_3_b_q)
6301  (=> (and hop_2_b_f hop_1_f_p) hop_3_b_p)
6302  (=> (and hop_2_b_i hop_1_i_a) hop_3_b_a)
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6303  (=> (and hop_2_b_i hop_1_i_c) hop_3_b_c)
6304  (=> (and hop_2_b_i hop_1_i_e) hop_3_b_e)
6305  (=> (and hop_2_b_i hop_1_i_d) hop_3_b_d)
6306  (=> (and hop_2_b_i hop_1_i_g) hop_3_b_g)
6307  (=> (and hop_2_b_i hop_1_i_f) hop_3_b_f)
6308  (=> (and hop_2_b_i hop_1_i_h) hop_3_b_h)
6309  (=> (and hop_2_b_i hop_1_i_k) hop_3_b_k)
6310  (=> (and hop_2_b_i hop_1_i_j) hop_3_b_j)
6311  (=> (and hop_2_b_i hop_1_i_m) hop_3_b_m)
6312  (=> (and hop_2_b_i hop_1_i_l) hop_3_b_l)
6313  (=> (and hop_2_b_i hop_1_i_o) hop_3_b_o)
6314  (=> (and hop_2_b_i hop_1_i_n) hop_3_b_n)
6315  (=> (and hop_2_b_i hop_1_i_q) hop_3_b_q)
6316  (=> (and hop_2_b_i hop_1_i_p) hop_3_b_p)
6317  (=> (and hop_2_b_h hop_1_h_a) hop_3_b_a)
6318  (=> (and hop_2_b_h hop_1_h_c) hop_3_b_c)
6319  (=> (and hop_2_b_h hop_1_h_e) hop_3_b_e)
6320  (=> (and hop_2_b_h hop_1_h_d) hop_3_b_d)
6321  (=> (and hop_2_b_h hop_1_h_g) hop_3_b_g)
6322  (=> (and hop_2_b_h hop_1_h_f) hop_3_b_f)
6323  (=> (and hop_2_b_h hop_1_h_i) hop_3_b_i)
6324  (=> (and hop_2_b_h hop_1_h_k) hop_3_b_k)
6325  (=> (and hop_2_b_h hop_1_h_j) hop_3_b_j)
6326  (=> (and hop_2_b_h hop_1_h_m) hop_3_b_m)
6327  (=> (and hop_2_b_h hop_1_h_l) hop_3_b_l)
6328  (=> (and hop_2_b_h hop_1_h_o) hop_3_b_o)
6329  (=> (and hop_2_b_h hop_1_h_n) hop_3_b_n)
6330  (=> (and hop_2_b_h hop_1_h_q) hop_3_b_q)
6331  (=> (and hop_2_b_h hop_1_h_p) hop_3_b_p)
6332  (=> (and hop_2_b_k hop_1_k_a) hop_3_b_a)
6333  (=> (and hop_2_b_k hop_1_k_c) hop_3_b_c)
6334  (=> (and hop_2_b_k hop_1_k_e) hop_3_b_e)
6335  (=> (and hop_2_b_k hop_1_k_d) hop_3_b_d)
6336  (=> (and hop_2_b_k hop_1_k_g) hop_3_b_g)
6337  (=> (and hop_2_b_k hop_1_k_f) hop_3_b_f)
6338  (=> (and hop_2_b_k hop_1_k_i) hop_3_b_i)
6339  (=> (and hop_2_b_k hop_1_k_h) hop_3_b_h)
6340  (=> (and hop_2_b_k hop_1_k_j) hop_3_b_j)
6341  (=> (and hop_2_b_k hop_1_k_m) hop_3_b_m)
6342  (=> (and hop_2_b_k hop_1_k_l) hop_3_b_l)
6343  (=> (and hop_2_b_k hop_1_k_o) hop_3_b_o)
6344  (=> (and hop_2_b_k hop_1_k_n) hop_3_b_n)
6345  (=> (and hop_2_b_k hop_1_k_q) hop_3_b_q)
6346  (=> (and hop_2_b_k hop_1_k_p) hop_3_b_p)
6347  (=> (and hop_2_b_j hop_1_j_a) hop_3_b_a)
6348  (=> (and hop_2_b_j hop_1_j_c) hop_3_b_c)
6349  (=> (and hop_2_b_j hop_1_j_e) hop_3_b_e)
6350  (=> (and hop_2_b_j hop_1_j_d) hop_3_b_d)
6351  (=> (and hop_2_b_j hop_1_j_g) hop_3_b_g)
6352  (=> (and hop_2_b_j hop_1_j_f) hop_3_b_f)
6353  (=> (and hop_2_b_j hop_1_j_i) hop_3_b_i)
6354  (=> (and hop_2_b_j hop_1_j_h) hop_3_b_h)
6355  (=> (and hop_2_b_j hop_1_j_k) hop_3_b_k)
6356  (=> (and hop_2_b_j hop_1_j_m) hop_3_b_m)
6357  (=> (and hop_2_b_j hop_1_j_l) hop_3_b_l)
6358  (=> (and hop_2_b_j hop_1_j_o) hop_3_b_o)
6359  (=> (and hop_2_b_j hop_1_j_n) hop_3_b_n)
6360  (=> (and hop_2_b_j hop_1_j_q) hop_3_b_q)
6361  (=> (and hop_2_b_j hop_1_j_p) hop_3_b_p)
6362  (=> (and hop_2_b_m hop_1_m_a) hop_3_b_a)
6363  (=> (and hop_2_b_m hop_1_m_c) hop_3_b_c)
6364  (=> (and hop_2_b_m hop_1_m_e) hop_3_b_e)
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6365  (=> (and hop_2_b_m hop_1_m_d) hop_3_b_d)
6366  (=> (and hop_2_b_m hop_1_m_g) hop_3_b_g)
6367  (=> (and hop_2_b_m hop_1_m_f) hop_3_b_f)
6368  (=> (and hop_2_b_m hop_1_m_i) hop_3_b_i)
6369  (=> (and hop_2_b_m hop_1_m_h) hop_3_b_h)
6370  (=> (and hop_2_b_m hop_1_m_k) hop_3_b_k)
6371  (=> (and hop_2_b_m hop_1_m_j) hop_3_b_j)
6372  (=> (and hop_2_b_m hop_1_m_l) hop_3_b_l)
6373  (=> (and hop_2_b_m hop_1_m_o) hop_3_b_o)
6374  (=> (and hop_2_b_m hop_1_m_n) hop_3_b_n)
6375  (=> (and hop_2_b_m hop_1_m_q) hop_3_b_q)
6376  (=> (and hop_2_b_m hop_1_m_p) hop_3_b_p)
6377  (=> (and hop_2_b_l hop_1_l_a) hop_3_b_a)
6378  (=> (and hop_2_b_l hop_1_l_c) hop_3_b_c)
6379  (=> (and hop_2_b_l hop_1_l_e) hop_3_b_e)
6380  (=> (and hop_2_b_l hop_1_l_d) hop_3_b_d)
6381  (=> (and hop_2_b_l hop_1_l_g) hop_3_b_g)
6382  (=> (and hop_2_b_l hop_1_l_f) hop_3_b_f)
6383  (=> (and hop_2_b_l hop_1_l_i) hop_3_b_i)
6384  (=> (and hop_2_b_l hop_1_l_h) hop_3_b_h)
6385  (=> (and hop_2_b_l hop_1_l_k) hop_3_b_k)
6386  (=> (and hop_2_b_l hop_1_l_j) hop_3_b_j)
6387  (=> (and hop_2_b_l hop_1_l_m) hop_3_b_m)
6388  (=> (and hop_2_b_l hop_1_l_o) hop_3_b_o)
6389  (=> (and hop_2_b_l hop_1_l_n) hop_3_b_n)
6390  (=> (and hop_2_b_l hop_1_l_q) hop_3_b_q)
6391  (=> (and hop_2_b_l hop_1_l_p) hop_3_b_p)
6392  (=> (and hop_2_b_o hop_1_o_a) hop_3_b_a)
6393  (=> (and hop_2_b_o hop_1_o_c) hop_3_b_c)
6394  (=> (and hop_2_b_o hop_1_o_e) hop_3_b_e)
6395  (=> (and hop_2_b_o hop_1_o_d) hop_3_b_d)
6396  (=> (and hop_2_b_o hop_1_o_g) hop_3_b_g)
6397  (=> (and hop_2_b_o hop_1_o_f) hop_3_b_f)
6398  (=> (and hop_2_b_o hop_1_o_i) hop_3_b_i)
6399  (=> (and hop_2_b_o hop_1_o_h) hop_3_b_h)
6400  (=> (and hop_2_b_o hop_1_o_k) hop_3_b_k)
6401  (=> (and hop_2_b_o hop_1_o_j) hop_3_b_j)
6402  (=> (and hop_2_b_o hop_1_o_m) hop_3_b_m)
6403  (=> (and hop_2_b_o hop_1_o_l) hop_3_b_l)
6404  (=> (and hop_2_b_o hop_1_o_n) hop_3_b_n)
6405  (=> (and hop_2_b_o hop_1_o_q) hop_3_b_q)
6406  (=> (and hop_2_b_o hop_1_o_p) hop_3_b_p)
6407  (=> (and hop_2_b_n hop_1_n_a) hop_3_b_a)
6408  (=> (and hop_2_b_n hop_1_n_c) hop_3_b_c)
6409  (=> (and hop_2_b_n hop_1_n_e) hop_3_b_e)
6410  (=> (and hop_2_b_n hop_1_n_d) hop_3_b_d)
6411  (=> (and hop_2_b_n hop_1_n_g) hop_3_b_g)
6412  (=> (and hop_2_b_n hop_1_n_f) hop_3_b_f)
6413  (=> (and hop_2_b_n hop_1_n_i) hop_3_b_i)
6414  (=> (and hop_2_b_n hop_1_n_h) hop_3_b_h)
6415  (=> (and hop_2_b_n hop_1_n_k) hop_3_b_k)
6416  (=> (and hop_2_b_n hop_1_n_j) hop_3_b_j)
6417  (=> (and hop_2_b_n hop_1_n_m) hop_3_b_m)
6418  (=> (and hop_2_b_n hop_1_n_l) hop_3_b_l)
6419  (=> (and hop_2_b_n hop_1_n_o) hop_3_b_o)
6420  (=> (and hop_2_b_n hop_1_n_q) hop_3_b_q)
6421  (=> (and hop_2_b_n hop_1_n_p) hop_3_b_p)
6422  (=> (and hop_2_b_q hop_1_q_a) hop_3_b_a)
6423  (=> (and hop_2_b_q hop_1_q_c) hop_3_b_c)
6424  (=> (and hop_2_b_q hop_1_q_e) hop_3_b_e)
6425  (=> (and hop_2_b_q hop_1_q_d) hop_3_b_d)
6426  (=> (and hop_2_b_q hop_1_q_g) hop_3_b_g)
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6427  (=> (and hop_2_b_q hop_1_q_f) hop_3_b_f)
6428  (=> (and hop_2_b_q hop_1_q_i) hop_3_b_i)
6429  (=> (and hop_2_b_q hop_1_q_h) hop_3_b_h)
6430  (=> (and hop_2_b_q hop_1_q_k) hop_3_b_k)
6431  (=> (and hop_2_b_q hop_1_q_j) hop_3_b_j)
6432  (=> (and hop_2_b_q hop_1_q_m) hop_3_b_m)
6433  (=> (and hop_2_b_q hop_1_q_l) hop_3_b_l)
6434  (=> (and hop_2_b_q hop_1_q_o) hop_3_b_o)
6435  (=> (and hop_2_b_q hop_1_q_n) hop_3_b_n)
6436  (=> (and hop_2_b_q hop_1_q_p) hop_3_b_p)
6437  (=> (and hop_2_b_p hop_1_p_a) hop_3_b_a)
6438  (=> (and hop_2_b_p hop_1_p_c) hop_3_b_c)
6439  (=> (and hop_2_b_p hop_1_p_e) hop_3_b_e)
6440  (=> (and hop_2_b_p hop_1_p_d) hop_3_b_d)
6441  (=> (and hop_2_b_p hop_1_p_g) hop_3_b_g)
6442  (=> (and hop_2_b_p hop_1_p_f) hop_3_b_f)
6443  (=> (and hop_2_b_p hop_1_p_i) hop_3_b_i)
6444  (=> (and hop_2_b_p hop_1_p_h) hop_3_b_h)
6445  (=> (and hop_2_b_p hop_1_p_k) hop_3_b_k)
6446  (=> (and hop_2_b_p hop_1_p_j) hop_3_b_j)
6447  (=> (and hop_2_b_p hop_1_p_m) hop_3_b_m)
6448  (=> (and hop_2_b_p hop_1_p_l) hop_3_b_l)
6449  (=> (and hop_2_b_p hop_1_p_o) hop_3_b_o)
6450  (=> (and hop_2_b_p hop_1_p_n) hop_3_b_n)
6451  (=> (and hop_2_b_p hop_1_p_q) hop_3_b_q)
6452  (=> (and hop_2_e_a hop_1_a_c) hop_3_e_c)
6453  (=> (and hop_2_e_a hop_1_a_b) hop_3_e_b)
6454  (=> (and hop_2_e_a hop_1_a_d) hop_3_e_d)
6455  (=> (and hop_2_e_a hop_1_a_g) hop_3_e_g)
6456  (=> (and hop_2_e_a hop_1_a_f) hop_3_e_f)
6457  (=> (and hop_2_e_a hop_1_a_i) hop_3_e_i)
6458  (=> (and hop_2_e_a hop_1_a_h) hop_3_e_h)
6459  (=> (and hop_2_e_a hop_1_a_k) hop_3_e_k)
6460  (=> (and hop_2_e_a hop_1_a_j) hop_3_e_j)
6461  (=> (and hop_2_e_a hop_1_a_m) hop_3_e_m)
6462  (=> (and hop_2_e_a hop_1_a_l) hop_3_e_l)
6463  (=> (and hop_2_e_a hop_1_a_o) hop_3_e_o)
6464  (=> (and hop_2_e_a hop_1_a_n) hop_3_e_n)
6465  (=> (and hop_2_e_a hop_1_a_q) hop_3_e_q)
6466  (=> (and hop_2_e_a hop_1_a_p) hop_3_e_p)
6467  (=> (and hop_2_e_c hop_1_c_a) hop_3_e_a)
6468  (=> (and hop_2_e_c hop_1_c_b) hop_3_e_b)
6469  (=> (and hop_2_e_c hop_1_c_d) hop_3_e_d)
6470  (=> (and hop_2_e_c hop_1_c_g) hop_3_e_g)
6471  (=> (and hop_2_e_c hop_1_c_f) hop_3_e_f)
6472  (=> (and hop_2_e_c hop_1_c_i) hop_3_e_i)
6473  (=> (and hop_2_e_c hop_1_c_h) hop_3_e_h)
6474  (=> (and hop_2_e_c hop_1_c_k) hop_3_e_k)
6475  (=> (and hop_2_e_c hop_1_c_j) hop_3_e_j)
6476  (=> (and hop_2_e_c hop_1_c_m) hop_3_e_m)
6477  (=> (and hop_2_e_c hop_1_c_l) hop_3_e_l)
6478  (=> (and hop_2_e_c hop_1_c_o) hop_3_e_o)
6479  (=> (and hop_2_e_c hop_1_c_n) hop_3_e_n)
6480  (=> (and hop_2_e_c hop_1_c_q) hop_3_e_q)
6481  (=> (and hop_2_e_c hop_1_c_p) hop_3_e_p)
6482  (=> (and hop_2_e_b hop_1_b_a) hop_3_e_a)
6483  (=> (and hop_2_e_b hop_1_b_c) hop_3_e_c)
6484  (=> (and hop_2_e_b hop_1_b_d) hop_3_e_d)
6485  (=> (and hop_2_e_b hop_1_b_g) hop_3_e_g)
6486  (=> (and hop_2_e_b hop_1_b_f) hop_3_e_f)
6487  (=> (and hop_2_e_b hop_1_b_i) hop_3_e_i)
6488  (=> (and hop_2_e_b hop_1_b_h) hop_3_e_h)
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6489  (=> (and hop_2_e_b hop_1_b_k) hop_3_e_k)
6490  (=> (and hop_2_e_b hop_1_b_j) hop_3_e_j)
6491  (=> (and hop_2_e_b hop_1_b_m) hop_3_e_m)
6492  (=> (and hop_2_e_b hop_1_b_l) hop_3_e_l)
6493  (=> (and hop_2_e_b hop_1_b_o) hop_3_e_o)
6494  (=> (and hop_2_e_b hop_1_b_n) hop_3_e_n)
6495  (=> (and hop_2_e_b hop_1_b_q) hop_3_e_q)
6496  (=> (and hop_2_e_b hop_1_b_p) hop_3_e_p)
6497  (=> (and hop_2_e_d hop_1_d_a) hop_3_e_a)
6498  (=> (and hop_2_e_d hop_1_d_c) hop_3_e_c)
6499  (=> (and hop_2_e_d hop_1_d_b) hop_3_e_b)
6500  (=> (and hop_2_e_d hop_1_d_g) hop_3_e_g)
6501  (=> (and hop_2_e_d hop_1_d_f) hop_3_e_f)
6502  (=> (and hop_2_e_d hop_1_d_i) hop_3_e_i)
6503  (=> (and hop_2_e_d hop_1_d_h) hop_3_e_h)
6504  (=> (and hop_2_e_d hop_1_d_k) hop_3_e_k)
6505  (=> (and hop_2_e_d hop_1_d_j) hop_3_e_j)
6506  (=> (and hop_2_e_d hop_1_d_m) hop_3_e_m)
6507  (=> (and hop_2_e_d hop_1_d_l) hop_3_e_l)
6508  (=> (and hop_2_e_d hop_1_d_o) hop_3_e_o)
6509  (=> (and hop_2_e_d hop_1_d_n) hop_3_e_n)
6510  (=> (and hop_2_e_d hop_1_d_q) hop_3_e_q)
6511  (=> (and hop_2_e_d hop_1_d_p) hop_3_e_p)
6512  (=> (and hop_2_e_g hop_1_g_a) hop_3_e_a)
6513  (=> (and hop_2_e_g hop_1_g_c) hop_3_e_c)
6514  (=> (and hop_2_e_g hop_1_g_b) hop_3_e_b)
6515  (=> (and hop_2_e_g hop_1_g_d) hop_3_e_d)
6516  (=> (and hop_2_e_g hop_1_g_f) hop_3_e_f)
6517  (=> (and hop_2_e_g hop_1_g_i) hop_3_e_i)
6518  (=> (and hop_2_e_g hop_1_g_h) hop_3_e_h)
6519  (=> (and hop_2_e_g hop_1_g_k) hop_3_e_k)
6520  (=> (and hop_2_e_g hop_1_g_j) hop_3_e_j)
6521  (=> (and hop_2_e_g hop_1_g_m) hop_3_e_m)
6522  (=> (and hop_2_e_g hop_1_g_l) hop_3_e_l)
6523  (=> (and hop_2_e_g hop_1_g_o) hop_3_e_o)
6524  (=> (and hop_2_e_g hop_1_g_n) hop_3_e_n)
6525  (=> (and hop_2_e_g hop_1_g_q) hop_3_e_q)
6526  (=> (and hop_2_e_g hop_1_g_p) hop_3_e_p)
6527  (=> (and hop_2_e_f hop_1_f_a) hop_3_e_a)
6528  (=> (and hop_2_e_f hop_1_f_c) hop_3_e_c)
6529  (=> (and hop_2_e_f hop_1_f_b) hop_3_e_b)
6530  (=> (and hop_2_e_f hop_1_f_d) hop_3_e_d)
6531  (=> (and hop_2_e_f hop_1_f_g) hop_3_e_g)
6532  (=> (and hop_2_e_f hop_1_f_i) hop_3_e_i)
6533  (=> (and hop_2_e_f hop_1_f_h) hop_3_e_h)
6534  (=> (and hop_2_e_f hop_1_f_k) hop_3_e_k)
6535  (=> (and hop_2_e_f hop_1_f_j) hop_3_e_j)
6536  (=> (and hop_2_e_f hop_1_f_m) hop_3_e_m)
6537  (=> (and hop_2_e_f hop_1_f_l) hop_3_e_l)
6538  (=> (and hop_2_e_f hop_1_f_o) hop_3_e_o)
6539  (=> (and hop_2_e_f hop_1_f_n) hop_3_e_n)
6540  (=> (and hop_2_e_f hop_1_f_q) hop_3_e_q)
6541  (=> (and hop_2_e_f hop_1_f_p) hop_3_e_p)
6542  (=> (and hop_2_e_i hop_1_i_a) hop_3_e_a)
6543  (=> (and hop_2_e_i hop_1_i_c) hop_3_e_c)
6544  (=> (and hop_2_e_i hop_1_i_b) hop_3_e_b)
6545  (=> (and hop_2_e_i hop_1_i_d) hop_3_e_d)
6546  (=> (and hop_2_e_i hop_1_i_g) hop_3_e_g)
6547  (=> (and hop_2_e_i hop_1_i_f) hop_3_e_f)
6548  (=> (and hop_2_e_i hop_1_i_h) hop_3_e_h)
6549  (=> (and hop_2_e_i hop_1_i_k) hop_3_e_k)
6550  (=> (and hop_2_e_i hop_1_i_j) hop_3_e_j)
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6551  (=> (and hop_2_e_i hop_1_i_m) hop_3_e_m)
6552  (=> (and hop_2_e_i hop_1_i_l) hop_3_e_l)
6553  (=> (and hop_2_e_i hop_1_i_o) hop_3_e_o)
6554  (=> (and hop_2_e_i hop_1_i_n) hop_3_e_n)
6555  (=> (and hop_2_e_i hop_1_i_q) hop_3_e_q)
6556  (=> (and hop_2_e_i hop_1_i_p) hop_3_e_p)
6557  (=> (and hop_2_e_h hop_1_h_a) hop_3_e_a)
6558  (=> (and hop_2_e_h hop_1_h_c) hop_3_e_c)
6559  (=> (and hop_2_e_h hop_1_h_b) hop_3_e_b)
6560  (=> (and hop_2_e_h hop_1_h_d) hop_3_e_d)
6561  (=> (and hop_2_e_h hop_1_h_g) hop_3_e_g)
6562  (=> (and hop_2_e_h hop_1_h_f) hop_3_e_f)
6563  (=> (and hop_2_e_h hop_1_h_i) hop_3_e_i)
6564  (=> (and hop_2_e_h hop_1_h_k) hop_3_e_k)
6565  (=> (and hop_2_e_h hop_1_h_j) hop_3_e_j)
6566  (=> (and hop_2_e_h hop_1_h_m) hop_3_e_m)
6567  (=> (and hop_2_e_h hop_1_h_l) hop_3_e_l)
6568  (=> (and hop_2_e_h hop_1_h_o) hop_3_e_o)
6569  (=> (and hop_2_e_h hop_1_h_n) hop_3_e_n)
6570  (=> (and hop_2_e_h hop_1_h_q) hop_3_e_q)
6571  (=> (and hop_2_e_h hop_1_h_p) hop_3_e_p)
6572  (=> (and hop_2_e_k hop_1_k_a) hop_3_e_a)
6573  (=> (and hop_2_e_k hop_1_k_c) hop_3_e_c)
6574  (=> (and hop_2_e_k hop_1_k_b) hop_3_e_b)
6575  (=> (and hop_2_e_k hop_1_k_d) hop_3_e_d)
6576  (=> (and hop_2_e_k hop_1_k_g) hop_3_e_g)
6577  (=> (and hop_2_e_k hop_1_k_f) hop_3_e_f)
6578  (=> (and hop_2_e_k hop_1_k_i) hop_3_e_i)
6579  (=> (and hop_2_e_k hop_1_k_h) hop_3_e_h)
6580  (=> (and hop_2_e_k hop_1_k_j) hop_3_e_j)
6581  (=> (and hop_2_e_k hop_1_k_m) hop_3_e_m)
6582  (=> (and hop_2_e_k hop_1_k_l) hop_3_e_l)
6583  (=> (and hop_2_e_k hop_1_k_o) hop_3_e_o)
6584  (=> (and hop_2_e_k hop_1_k_n) hop_3_e_n)
6585  (=> (and hop_2_e_k hop_1_k_q) hop_3_e_q)
6586  (=> (and hop_2_e_k hop_1_k_p) hop_3_e_p)
6587  (=> (and hop_2_e_j hop_1_j_a) hop_3_e_a)
6588  (=> (and hop_2_e_j hop_1_j_c) hop_3_e_c)
6589  (=> (and hop_2_e_j hop_1_j_b) hop_3_e_b)
6590  (=> (and hop_2_e_j hop_1_j_d) hop_3_e_d)
6591  (=> (and hop_2_e_j hop_1_j_g) hop_3_e_g)
6592  (=> (and hop_2_e_j hop_1_j_f) hop_3_e_f)
6593  (=> (and hop_2_e_j hop_1_j_i) hop_3_e_i)
6594  (=> (and hop_2_e_j hop_1_j_h) hop_3_e_h)
6595  (=> (and hop_2_e_j hop_1_j_k) hop_3_e_k)
6596  (=> (and hop_2_e_j hop_1_j_m) hop_3_e_m)
6597  (=> (and hop_2_e_j hop_1_j_l) hop_3_e_l)
6598  (=> (and hop_2_e_j hop_1_j_o) hop_3_e_o)
6599  (=> (and hop_2_e_j hop_1_j_n) hop_3_e_n)
6600  (=> (and hop_2_e_j hop_1_j_q) hop_3_e_q)
6601  (=> (and hop_2_e_j hop_1_j_p) hop_3_e_p)
6602  (=> (and hop_2_e_m hop_1_m_a) hop_3_e_a)
6603  (=> (and hop_2_e_m hop_1_m_c) hop_3_e_c)
6604  (=> (and hop_2_e_m hop_1_m_b) hop_3_e_b)
6605  (=> (and hop_2_e_m hop_1_m_d) hop_3_e_d)
6606  (=> (and hop_2_e_m hop_1_m_g) hop_3_e_g)
6607  (=> (and hop_2_e_m hop_1_m_f) hop_3_e_f)
6608  (=> (and hop_2_e_m hop_1_m_i) hop_3_e_i)
6609  (=> (and hop_2_e_m hop_1_m_h) hop_3_e_h)
6610  (=> (and hop_2_e_m hop_1_m_k) hop_3_e_k)
6611  (=> (and hop_2_e_m hop_1_m_j) hop_3_e_j)
6612  (=> (and hop_2_e_m hop_1_m_l) hop_3_e_l)
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6613  (=> (and hop_2_e_m hop_1_m_o) hop_3_e_o)
6614  (=> (and hop_2_e_m hop_1_m_n) hop_3_e_n)
6615  (=> (and hop_2_e_m hop_1_m_q) hop_3_e_q)
6616  (=> (and hop_2_e_m hop_1_m_p) hop_3_e_p)
6617  (=> (and hop_2_e_l hop_1_l_a) hop_3_e_a)
6618  (=> (and hop_2_e_l hop_1_l_c) hop_3_e_c)
6619  (=> (and hop_2_e_l hop_1_l_b) hop_3_e_b)
6620  (=> (and hop_2_e_l hop_1_l_d) hop_3_e_d)
6621  (=> (and hop_2_e_l hop_1_l_g) hop_3_e_g)
6622  (=> (and hop_2_e_l hop_1_l_f) hop_3_e_f)
6623  (=> (and hop_2_e_l hop_1_l_i) hop_3_e_i)
6624  (=> (and hop_2_e_l hop_1_l_h) hop_3_e_h)
6625  (=> (and hop_2_e_l hop_1_l_k) hop_3_e_k)
6626  (=> (and hop_2_e_l hop_1_l_j) hop_3_e_j)
6627  (=> (and hop_2_e_l hop_1_l_m) hop_3_e_m)
6628  (=> (and hop_2_e_l hop_1_l_o) hop_3_e_o)
6629  (=> (and hop_2_e_l hop_1_l_n) hop_3_e_n)
6630  (=> (and hop_2_e_l hop_1_l_q) hop_3_e_q)
6631  (=> (and hop_2_e_l hop_1_l_p) hop_3_e_p)
6632  (=> (and hop_2_e_o hop_1_o_a) hop_3_e_a)
6633  (=> (and hop_2_e_o hop_1_o_c) hop_3_e_c)
6634  (=> (and hop_2_e_o hop_1_o_b) hop_3_e_b)
6635  (=> (and hop_2_e_o hop_1_o_d) hop_3_e_d)
6636  (=> (and hop_2_e_o hop_1_o_g) hop_3_e_g)
6637  (=> (and hop_2_e_o hop_1_o_f) hop_3_e_f)
6638  (=> (and hop_2_e_o hop_1_o_i) hop_3_e_i)
6639  (=> (and hop_2_e_o hop_1_o_h) hop_3_e_h)
6640  (=> (and hop_2_e_o hop_1_o_k) hop_3_e_k)
6641  (=> (and hop_2_e_o hop_1_o_j) hop_3_e_j)
6642  (=> (and hop_2_e_o hop_1_o_m) hop_3_e_m)
6643  (=> (and hop_2_e_o hop_1_o_l) hop_3_e_l)
6644  (=> (and hop_2_e_o hop_1_o_n) hop_3_e_n)
6645  (=> (and hop_2_e_o hop_1_o_q) hop_3_e_q)
6646  (=> (and hop_2_e_o hop_1_o_p) hop_3_e_p)
6647  (=> (and hop_2_e_n hop_1_n_a) hop_3_e_a)
6648  (=> (and hop_2_e_n hop_1_n_c) hop_3_e_c)
6649  (=> (and hop_2_e_n hop_1_n_b) hop_3_e_b)
6650  (=> (and hop_2_e_n hop_1_n_d) hop_3_e_d)
6651  (=> (and hop_2_e_n hop_1_n_g) hop_3_e_g)
6652  (=> (and hop_2_e_n hop_1_n_f) hop_3_e_f)
6653  (=> (and hop_2_e_n hop_1_n_i) hop_3_e_i)
6654  (=> (and hop_2_e_n hop_1_n_h) hop_3_e_h)
6655  (=> (and hop_2_e_n hop_1_n_k) hop_3_e_k)
6656  (=> (and hop_2_e_n hop_1_n_j) hop_3_e_j)
6657  (=> (and hop_2_e_n hop_1_n_m) hop_3_e_m)
6658  (=> (and hop_2_e_n hop_1_n_l) hop_3_e_l)
6659  (=> (and hop_2_e_n hop_1_n_o) hop_3_e_o)
6660  (=> (and hop_2_e_n hop_1_n_q) hop_3_e_q)
6661  (=> (and hop_2_e_n hop_1_n_p) hop_3_e_p)
6662  (=> (and hop_2_e_q hop_1_q_a) hop_3_e_a)
6663  (=> (and hop_2_e_q hop_1_q_c) hop_3_e_c)
6664  (=> (and hop_2_e_q hop_1_q_b) hop_3_e_b)
6665  (=> (and hop_2_e_q hop_1_q_d) hop_3_e_d)
6666  (=> (and hop_2_e_q hop_1_q_g) hop_3_e_g)
6667  (=> (and hop_2_e_q hop_1_q_f) hop_3_e_f)
6668  (=> (and hop_2_e_q hop_1_q_i) hop_3_e_i)
6669  (=> (and hop_2_e_q hop_1_q_h) hop_3_e_h)
6670  (=> (and hop_2_e_q hop_1_q_k) hop_3_e_k)
6671  (=> (and hop_2_e_q hop_1_q_j) hop_3_e_j)
6672  (=> (and hop_2_e_q hop_1_q_m) hop_3_e_m)
6673  (=> (and hop_2_e_q hop_1_q_l) hop_3_e_l)
6674  (=> (and hop_2_e_q hop_1_q_o) hop_3_e_o)
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6675  (=> (and hop_2_e_q hop_1_q_n) hop_3_e_n)
6676  (=> (and hop_2_e_q hop_1_q_p) hop_3_e_p)
6677  (=> (and hop_2_e_p hop_1_p_a) hop_3_e_a)
6678  (=> (and hop_2_e_p hop_1_p_c) hop_3_e_c)
6679  (=> (and hop_2_e_p hop_1_p_b) hop_3_e_b)
6680  (=> (and hop_2_e_p hop_1_p_d) hop_3_e_d)
6681  (=> (and hop_2_e_p hop_1_p_g) hop_3_e_g)
6682  (=> (and hop_2_e_p hop_1_p_f) hop_3_e_f)
6683  (=> (and hop_2_e_p hop_1_p_i) hop_3_e_i)
6684  (=> (and hop_2_e_p hop_1_p_h) hop_3_e_h)
6685  (=> (and hop_2_e_p hop_1_p_k) hop_3_e_k)
6686  (=> (and hop_2_e_p hop_1_p_j) hop_3_e_j)
6687  (=> (and hop_2_e_p hop_1_p_m) hop_3_e_m)
6688  (=> (and hop_2_e_p hop_1_p_l) hop_3_e_l)
6689  (=> (and hop_2_e_p hop_1_p_o) hop_3_e_o)
6690  (=> (and hop_2_e_p hop_1_p_n) hop_3_e_n)
6691  (=> (and hop_2_e_p hop_1_p_q) hop_3_e_q)
6692  (=> (and hop_2_d_a hop_1_a_c) hop_3_d_c)
6693  (=> (and hop_2_d_a hop_1_a_b) hop_3_d_b)
6694  (=> (and hop_2_d_a hop_1_a_e) hop_3_d_e)
6695  (=> (and hop_2_d_a hop_1_a_g) hop_3_d_g)
6696  (=> (and hop_2_d_a hop_1_a_f) hop_3_d_f)
6697  (=> (and hop_2_d_a hop_1_a_i) hop_3_d_i)
6698  (=> (and hop_2_d_a hop_1_a_h) hop_3_d_h)
6699  (=> (and hop_2_d_a hop_1_a_k) hop_3_d_k)
6700  (=> (and hop_2_d_a hop_1_a_j) hop_3_d_j)
6701  (=> (and hop_2_d_a hop_1_a_m) hop_3_d_m)
6702  (=> (and hop_2_d_a hop_1_a_l) hop_3_d_l)
6703  (=> (and hop_2_d_a hop_1_a_o) hop_3_d_o)
6704  (=> (and hop_2_d_a hop_1_a_n) hop_3_d_n)
6705  (=> (and hop_2_d_a hop_1_a_q) hop_3_d_q)
6706  (=> (and hop_2_d_a hop_1_a_p) hop_3_d_p)
6707  (=> (and hop_2_d_c hop_1_c_a) hop_3_d_a)
6708  (=> (and hop_2_d_c hop_1_c_b) hop_3_d_b)
6709  (=> (and hop_2_d_c hop_1_c_e) hop_3_d_e)
6710  (=> (and hop_2_d_c hop_1_c_g) hop_3_d_g)
6711  (=> (and hop_2_d_c hop_1_c_f) hop_3_d_f)
6712  (=> (and hop_2_d_c hop_1_c_i) hop_3_d_i)
6713  (=> (and hop_2_d_c hop_1_c_h) hop_3_d_h)
6714  (=> (and hop_2_d_c hop_1_c_k) hop_3_d_k)
6715  (=> (and hop_2_d_c hop_1_c_j) hop_3_d_j)
6716  (=> (and hop_2_d_c hop_1_c_m) hop_3_d_m)
6717  (=> (and hop_2_d_c hop_1_c_l) hop_3_d_l)
6718  (=> (and hop_2_d_c hop_1_c_o) hop_3_d_o)
6719  (=> (and hop_2_d_c hop_1_c_n) hop_3_d_n)
6720  (=> (and hop_2_d_c hop_1_c_q) hop_3_d_q)
6721  (=> (and hop_2_d_c hop_1_c_p) hop_3_d_p)
6722  (=> (and hop_2_d_b hop_1_b_a) hop_3_d_a)
6723  (=> (and hop_2_d_b hop_1_b_c) hop_3_d_c)
6724  (=> (and hop_2_d_b hop_1_b_e) hop_3_d_e)
6725  (=> (and hop_2_d_b hop_1_b_g) hop_3_d_g)
6726  (=> (and hop_2_d_b hop_1_b_f) hop_3_d_f)
6727  (=> (and hop_2_d_b hop_1_b_i) hop_3_d_i)
6728  (=> (and hop_2_d_b hop_1_b_h) hop_3_d_h)
6729  (=> (and hop_2_d_b hop_1_b_k) hop_3_d_k)
6730  (=> (and hop_2_d_b hop_1_b_j) hop_3_d_j)
6731  (=> (and hop_2_d_b hop_1_b_m) hop_3_d_m)
6732  (=> (and hop_2_d_b hop_1_b_l) hop_3_d_l)
6733  (=> (and hop_2_d_b hop_1_b_o) hop_3_d_o)
6734  (=> (and hop_2_d_b hop_1_b_n) hop_3_d_n)
6735  (=> (and hop_2_d_b hop_1_b_q) hop_3_d_q)
6736  (=> (and hop_2_d_b hop_1_b_p) hop_3_d_p)
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6737  (=> (and hop_2_d_e hop_1_e_a) hop_3_d_a)
6738  (=> (and hop_2_d_e hop_1_e_c) hop_3_d_c)
6739  (=> (and hop_2_d_e hop_1_e_b) hop_3_d_b)
6740  (=> (and hop_2_d_e hop_1_e_g) hop_3_d_g)
6741  (=> (and hop_2_d_e hop_1_e_f) hop_3_d_f)
6742  (=> (and hop_2_d_e hop_1_e_i) hop_3_d_i)
6743  (=> (and hop_2_d_e hop_1_e_h) hop_3_d_h)
6744  (=> (and hop_2_d_e hop_1_e_k) hop_3_d_k)
6745  (=> (and hop_2_d_e hop_1_e_j) hop_3_d_j)
6746  (=> (and hop_2_d_e hop_1_e_m) hop_3_d_m)
6747  (=> (and hop_2_d_e hop_1_e_l) hop_3_d_l)
6748  (=> (and hop_2_d_e hop_1_e_o) hop_3_d_o)
6749  (=> (and hop_2_d_e hop_1_e_n) hop_3_d_n)
6750  (=> (and hop_2_d_e hop_1_e_q) hop_3_d_q)
6751  (=> (and hop_2_d_e hop_1_e_p) hop_3_d_p)
6752  (=> (and hop_2_d_g hop_1_g_a) hop_3_d_a)
6753  (=> (and hop_2_d_g hop_1_g_c) hop_3_d_c)
6754  (=> (and hop_2_d_g hop_1_g_b) hop_3_d_b)
6755  (=> (and hop_2_d_g hop_1_g_e) hop_3_d_e)
6756  (=> (and hop_2_d_g hop_1_g_f) hop_3_d_f)
6757  (=> (and hop_2_d_g hop_1_g_i) hop_3_d_i)
6758  (=> (and hop_2_d_g hop_1_g_h) hop_3_d_h)
6759  (=> (and hop_2_d_g hop_1_g_k) hop_3_d_k)
6760  (=> (and hop_2_d_g hop_1_g_j) hop_3_d_j)
6761  (=> (and hop_2_d_g hop_1_g_m) hop_3_d_m)
6762  (=> (and hop_2_d_g hop_1_g_l) hop_3_d_l)
6763  (=> (and hop_2_d_g hop_1_g_o) hop_3_d_o)
6764  (=> (and hop_2_d_g hop_1_g_n) hop_3_d_n)
6765  (=> (and hop_2_d_g hop_1_g_q) hop_3_d_q)
6766  (=> (and hop_2_d_g hop_1_g_p) hop_3_d_p)
6767  (=> (and hop_2_d_f hop_1_f_a) hop_3_d_a)
6768  (=> (and hop_2_d_f hop_1_f_c) hop_3_d_c)
6769  (=> (and hop_2_d_f hop_1_f_b) hop_3_d_b)
6770  (=> (and hop_2_d_f hop_1_f_e) hop_3_d_e)
6771  (=> (and hop_2_d_f hop_1_f_g) hop_3_d_g)
6772  (=> (and hop_2_d_f hop_1_f_i) hop_3_d_i)
6773  (=> (and hop_2_d_f hop_1_f_h) hop_3_d_h)
6774  (=> (and hop_2_d_f hop_1_f_k) hop_3_d_k)
6775  (=> (and hop_2_d_f hop_1_f_j) hop_3_d_j)
6776  (=> (and hop_2_d_f hop_1_f_m) hop_3_d_m)
6777  (=> (and hop_2_d_f hop_1_f_l) hop_3_d_l)
6778  (=> (and hop_2_d_f hop_1_f_o) hop_3_d_o)
6779  (=> (and hop_2_d_f hop_1_f_n) hop_3_d_n)
6780  (=> (and hop_2_d_f hop_1_f_q) hop_3_d_q)
6781  (=> (and hop_2_d_f hop_1_f_p) hop_3_d_p)
6782  (=> (and hop_2_d_i hop_1_i_a) hop_3_d_a)
6783  (=> (and hop_2_d_i hop_1_i_c) hop_3_d_c)
6784  (=> (and hop_2_d_i hop_1_i_b) hop_3_d_b)
6785  (=> (and hop_2_d_i hop_1_i_e) hop_3_d_e)
6786  (=> (and hop_2_d_i hop_1_i_g) hop_3_d_g)
6787  (=> (and hop_2_d_i hop_1_i_f) hop_3_d_f)
6788  (=> (and hop_2_d_i hop_1_i_h) hop_3_d_h)
6789  (=> (and hop_2_d_i hop_1_i_k) hop_3_d_k)
6790  (=> (and hop_2_d_i hop_1_i_j) hop_3_d_j)
6791  (=> (and hop_2_d_i hop_1_i_m) hop_3_d_m)
6792  (=> (and hop_2_d_i hop_1_i_l) hop_3_d_l)
6793  (=> (and hop_2_d_i hop_1_i_o) hop_3_d_o)
6794  (=> (and hop_2_d_i hop_1_i_n) hop_3_d_n)
6795  (=> (and hop_2_d_i hop_1_i_q) hop_3_d_q)
6796  (=> (and hop_2_d_i hop_1_i_p) hop_3_d_p)
6797  (=> (and hop_2_d_h hop_1_h_a) hop_3_d_a)
6798  (=> (and hop_2_d_h hop_1_h_c) hop_3_d_c)
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6799  (=> (and hop_2_d_h hop_1_h_b) hop_3_d_b)
6800  (=> (and hop_2_d_h hop_1_h_e) hop_3_d_e)
6801  (=> (and hop_2_d_h hop_1_h_g) hop_3_d_g)
6802  (=> (and hop_2_d_h hop_1_h_f) hop_3_d_f)
6803  (=> (and hop_2_d_h hop_1_h_i) hop_3_d_i)
6804  (=> (and hop_2_d_h hop_1_h_k) hop_3_d_k)
6805  (=> (and hop_2_d_h hop_1_h_j) hop_3_d_j)
6806  (=> (and hop_2_d_h hop_1_h_m) hop_3_d_m)
6807  (=> (and hop_2_d_h hop_1_h_l) hop_3_d_l)
6808  (=> (and hop_2_d_h hop_1_h_o) hop_3_d_o)
6809  (=> (and hop_2_d_h hop_1_h_n) hop_3_d_n)
6810  (=> (and hop_2_d_h hop_1_h_q) hop_3_d_q)
6811  (=> (and hop_2_d_h hop_1_h_p) hop_3_d_p)
6812  (=> (and hop_2_d_k hop_1_k_a) hop_3_d_a)
6813  (=> (and hop_2_d_k hop_1_k_c) hop_3_d_c)
6814  (=> (and hop_2_d_k hop_1_k_b) hop_3_d_b)
6815  (=> (and hop_2_d_k hop_1_k_e) hop_3_d_e)
6816  (=> (and hop_2_d_k hop_1_k_g) hop_3_d_g)
6817  (=> (and hop_2_d_k hop_1_k_f) hop_3_d_f)
6818  (=> (and hop_2_d_k hop_1_k_i) hop_3_d_i)
6819  (=> (and hop_2_d_k hop_1_k_h) hop_3_d_h)
6820  (=> (and hop_2_d_k hop_1_k_j) hop_3_d_j)
6821  (=> (and hop_2_d_k hop_1_k_m) hop_3_d_m)
6822  (=> (and hop_2_d_k hop_1_k_l) hop_3_d_l)
6823  (=> (and hop_2_d_k hop_1_k_o) hop_3_d_o)
6824  (=> (and hop_2_d_k hop_1_k_n) hop_3_d_n)
6825  (=> (and hop_2_d_k hop_1_k_q) hop_3_d_q)
6826  (=> (and hop_2_d_k hop_1_k_p) hop_3_d_p)
6827  (=> (and hop_2_d_j hop_1_j_a) hop_3_d_a)
6828  (=> (and hop_2_d_j hop_1_j_c) hop_3_d_c)
6829  (=> (and hop_2_d_j hop_1_j_b) hop_3_d_b)
6830  (=> (and hop_2_d_j hop_1_j_e) hop_3_d_e)
6831  (=> (and hop_2_d_j hop_1_j_g) hop_3_d_g)
6832  (=> (and hop_2_d_j hop_1_j_f) hop_3_d_f)
6833  (=> (and hop_2_d_j hop_1_j_i) hop_3_d_i)
6834  (=> (and hop_2_d_j hop_1_j_h) hop_3_d_h)
6835  (=> (and hop_2_d_j hop_1_j_k) hop_3_d_k)
6836  (=> (and hop_2_d_j hop_1_j_m) hop_3_d_m)
6837  (=> (and hop_2_d_j hop_1_j_l) hop_3_d_l)
6838  (=> (and hop_2_d_j hop_1_j_o) hop_3_d_o)
6839  (=> (and hop_2_d_j hop_1_j_n) hop_3_d_n)
6840  (=> (and hop_2_d_j hop_1_j_q) hop_3_d_q)
6841  (=> (and hop_2_d_j hop_1_j_p) hop_3_d_p)
6842  (=> (and hop_2_d_m hop_1_m_a) hop_3_d_a)
6843  (=> (and hop_2_d_m hop_1_m_c) hop_3_d_c)
6844  (=> (and hop_2_d_m hop_1_m_b) hop_3_d_b)
6845  (=> (and hop_2_d_m hop_1_m_e) hop_3_d_e)
6846  (=> (and hop_2_d_m hop_1_m_g) hop_3_d_g)
6847  (=> (and hop_2_d_m hop_1_m_f) hop_3_d_f)
6848  (=> (and hop_2_d_m hop_1_m_i) hop_3_d_i)
6849  (=> (and hop_2_d_m hop_1_m_h) hop_3_d_h)
6850  (=> (and hop_2_d_m hop_1_m_k) hop_3_d_k)
6851  (=> (and hop_2_d_m hop_1_m_j) hop_3_d_j)
6852  (=> (and hop_2_d_m hop_1_m_l) hop_3_d_l)
6853  (=> (and hop_2_d_m hop_1_m_o) hop_3_d_o)
6854  (=> (and hop_2_d_m hop_1_m_n) hop_3_d_n)
6855  (=> (and hop_2_d_m hop_1_m_q) hop_3_d_q)
6856  (=> (and hop_2_d_m hop_1_m_p) hop_3_d_p)
6857  (=> (and hop_2_d_l hop_1_l_a) hop_3_d_a)
6858  (=> (and hop_2_d_l hop_1_l_c) hop_3_d_c)
6859  (=> (and hop_2_d_l hop_1_l_b) hop_3_d_b)
6860  (=> (and hop_2_d_l hop_1_l_e) hop_3_d_e)
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6861  (=> (and hop_2_d_l hop_1_l_g) hop_3_d_g)
6862  (=> (and hop_2_d_l hop_1_l_f) hop_3_d_f)
6863  (=> (and hop_2_d_l hop_1_l_i) hop_3_d_i)
6864  (=> (and hop_2_d_l hop_1_l_h) hop_3_d_h)
6865  (=> (and hop_2_d_l hop_1_l_k) hop_3_d_k)
6866  (=> (and hop_2_d_l hop_1_l_j) hop_3_d_j)
6867  (=> (and hop_2_d_l hop_1_l_m) hop_3_d_m)
6868  (=> (and hop_2_d_l hop_1_l_o) hop_3_d_o)
6869  (=> (and hop_2_d_l hop_1_l_n) hop_3_d_n)
6870  (=> (and hop_2_d_l hop_1_l_q) hop_3_d_q)
6871  (=> (and hop_2_d_l hop_1_l_p) hop_3_d_p)
6872  (=> (and hop_2_d_o hop_1_o_a) hop_3_d_a)
6873  (=> (and hop_2_d_o hop_1_o_c) hop_3_d_c)
6874  (=> (and hop_2_d_o hop_1_o_b) hop_3_d_b)
6875  (=> (and hop_2_d_o hop_1_o_e) hop_3_d_e)
6876  (=> (and hop_2_d_o hop_1_o_g) hop_3_d_g)
6877  (=> (and hop_2_d_o hop_1_o_f) hop_3_d_f)
6878  (=> (and hop_2_d_o hop_1_o_i) hop_3_d_i)
6879  (=> (and hop_2_d_o hop_1_o_h) hop_3_d_h)
6880  (=> (and hop_2_d_o hop_1_o_k) hop_3_d_k)
6881  (=> (and hop_2_d_o hop_1_o_j) hop_3_d_j)
6882  (=> (and hop_2_d_o hop_1_o_m) hop_3_d_m)
6883  (=> (and hop_2_d_o hop_1_o_l) hop_3_d_l)
6884  (=> (and hop_2_d_o hop_1_o_n) hop_3_d_n)
6885  (=> (and hop_2_d_o hop_1_o_q) hop_3_d_q)
6886  (=> (and hop_2_d_o hop_1_o_p) hop_3_d_p)
6887  (=> (and hop_2_d_n hop_1_n_a) hop_3_d_a)
6888  (=> (and hop_2_d_n hop_1_n_c) hop_3_d_c)
6889  (=> (and hop_2_d_n hop_1_n_b) hop_3_d_b)
6890  (=> (and hop_2_d_n hop_1_n_e) hop_3_d_e)
6891  (=> (and hop_2_d_n hop_1_n_g) hop_3_d_g)
6892  (=> (and hop_2_d_n hop_1_n_f) hop_3_d_f)
6893  (=> (and hop_2_d_n hop_1_n_i) hop_3_d_i)
6894  (=> (and hop_2_d_n hop_1_n_h) hop_3_d_h)
6895  (=> (and hop_2_d_n hop_1_n_k) hop_3_d_k)
6896  (=> (and hop_2_d_n hop_1_n_j) hop_3_d_j)
6897  (=> (and hop_2_d_n hop_1_n_m) hop_3_d_m)
6898  (=> (and hop_2_d_n hop_1_n_l) hop_3_d_l)
6899  (=> (and hop_2_d_n hop_1_n_o) hop_3_d_o)
6900  (=> (and hop_2_d_n hop_1_n_q) hop_3_d_q)
6901  (=> (and hop_2_d_n hop_1_n_p) hop_3_d_p)
6902  (=> (and hop_2_d_q hop_1_q_a) hop_3_d_a)
6903  (=> (and hop_2_d_q hop_1_q_c) hop_3_d_c)
6904  (=> (and hop_2_d_q hop_1_q_b) hop_3_d_b)
6905  (=> (and hop_2_d_q hop_1_q_e) hop_3_d_e)
6906  (=> (and hop_2_d_q hop_1_q_g) hop_3_d_g)
6907  (=> (and hop_2_d_q hop_1_q_f) hop_3_d_f)
6908  (=> (and hop_2_d_q hop_1_q_i) hop_3_d_i)
6909  (=> (and hop_2_d_q hop_1_q_h) hop_3_d_h)
6910  (=> (and hop_2_d_q hop_1_q_k) hop_3_d_k)
6911  (=> (and hop_2_d_q hop_1_q_j) hop_3_d_j)
6912  (=> (and hop_2_d_q hop_1_q_m) hop_3_d_m)
6913  (=> (and hop_2_d_q hop_1_q_l) hop_3_d_l)
6914  (=> (and hop_2_d_q hop_1_q_o) hop_3_d_o)
6915  (=> (and hop_2_d_q hop_1_q_n) hop_3_d_n)
6916  (=> (and hop_2_d_q hop_1_q_p) hop_3_d_p)
6917  (=> (and hop_2_d_p hop_1_p_a) hop_3_d_a)
6918  (=> (and hop_2_d_p hop_1_p_c) hop_3_d_c)
6919  (=> (and hop_2_d_p hop_1_p_b) hop_3_d_b)
6920  (=> (and hop_2_d_p hop_1_p_e) hop_3_d_e)
6921  (=> (and hop_2_d_p hop_1_p_g) hop_3_d_g)
6922  (=> (and hop_2_d_p hop_1_p_f) hop_3_d_f)
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6923  (=> (and hop_2_d_p hop_1_p_i) hop_3_d_i)
6924  (=> (and hop_2_d_p hop_1_p_h) hop_3_d_h)
6925  (=> (and hop_2_d_p hop_1_p_k) hop_3_d_k)
6926  (=> (and hop_2_d_p hop_1_p_j) hop_3_d_j)
6927  (=> (and hop_2_d_p hop_1_p_m) hop_3_d_m)
6928  (=> (and hop_2_d_p hop_1_p_l) hop_3_d_l)
6929  (=> (and hop_2_d_p hop_1_p_o) hop_3_d_o)
6930  (=> (and hop_2_d_p hop_1_p_n) hop_3_d_n)
6931  (=> (and hop_2_d_p hop_1_p_q) hop_3_d_q)
6932  (=> (and hop_2_g_a hop_1_a_c) hop_3_g_c)
6933  (=> (and hop_2_g_a hop_1_a_b) hop_3_g_b)
6934  (=> (and hop_2_g_a hop_1_a_e) hop_3_g_e)
6935  (=> (and hop_2_g_a hop_1_a_d) hop_3_g_d)
6936  (=> (and hop_2_g_a hop_1_a_f) hop_3_g_f)
6937  (=> (and hop_2_g_a hop_1_a_i) hop_3_g_i)
6938  (=> (and hop_2_g_a hop_1_a_h) hop_3_g_h)
6939  (=> (and hop_2_g_a hop_1_a_k) hop_3_g_k)
6940  (=> (and hop_2_g_a hop_1_a_j) hop_3_g_j)
6941  (=> (and hop_2_g_a hop_1_a_m) hop_3_g_m)
6942  (=> (and hop_2_g_a hop_1_a_l) hop_3_g_l)
6943  (=> (and hop_2_g_a hop_1_a_o) hop_3_g_o)
6944  (=> (and hop_2_g_a hop_1_a_n) hop_3_g_n)
6945  (=> (and hop_2_g_a hop_1_a_q) hop_3_g_q)
6946  (=> (and hop_2_g_a hop_1_a_p) hop_3_g_p)
6947  (=> (and hop_2_g_c hop_1_c_a) hop_3_g_a)
6948  (=> (and hop_2_g_c hop_1_c_b) hop_3_g_b)
6949  (=> (and hop_2_g_c hop_1_c_e) hop_3_g_e)
6950  (=> (and hop_2_g_c hop_1_c_d) hop_3_g_d)
6951  (=> (and hop_2_g_c hop_1_c_f) hop_3_g_f)
6952  (=> (and hop_2_g_c hop_1_c_i) hop_3_g_i)
6953  (=> (and hop_2_g_c hop_1_c_h) hop_3_g_h)
6954  (=> (and hop_2_g_c hop_1_c_k) hop_3_g_k)
6955  (=> (and hop_2_g_c hop_1_c_j) hop_3_g_j)
6956  (=> (and hop_2_g_c hop_1_c_m) hop_3_g_m)
6957  (=> (and hop_2_g_c hop_1_c_l) hop_3_g_l)
6958  (=> (and hop_2_g_c hop_1_c_o) hop_3_g_o)
6959  (=> (and hop_2_g_c hop_1_c_n) hop_3_g_n)
6960  (=> (and hop_2_g_c hop_1_c_q) hop_3_g_q)
6961  (=> (and hop_2_g_c hop_1_c_p) hop_3_g_p)
6962  (=> (and hop_2_g_b hop_1_b_a) hop_3_g_a)
6963  (=> (and hop_2_g_b hop_1_b_c) hop_3_g_c)
6964  (=> (and hop_2_g_b hop_1_b_e) hop_3_g_e)
6965  (=> (and hop_2_g_b hop_1_b_d) hop_3_g_d)
6966  (=> (and hop_2_g_b hop_1_b_f) hop_3_g_f)
6967  (=> (and hop_2_g_b hop_1_b_i) hop_3_g_i)
6968  (=> (and hop_2_g_b hop_1_b_h) hop_3_g_h)
6969  (=> (and hop_2_g_b hop_1_b_k) hop_3_g_k)
6970  (=> (and hop_2_g_b hop_1_b_j) hop_3_g_j)
6971  (=> (and hop_2_g_b hop_1_b_m) hop_3_g_m)
6972  (=> (and hop_2_g_b hop_1_b_l) hop_3_g_l)
6973  (=> (and hop_2_g_b hop_1_b_o) hop_3_g_o)
6974  (=> (and hop_2_g_b hop_1_b_n) hop_3_g_n)
6975  (=> (and hop_2_g_b hop_1_b_q) hop_3_g_q)
6976  (=> (and hop_2_g_b hop_1_b_p) hop_3_g_p)
6977  (=> (and hop_2_g_e hop_1_e_a) hop_3_g_a)
6978  (=> (and hop_2_g_e hop_1_e_c) hop_3_g_c)
6979  (=> (and hop_2_g_e hop_1_e_b) hop_3_g_b)
6980  (=> (and hop_2_g_e hop_1_e_d) hop_3_g_d)
6981  (=> (and hop_2_g_e hop_1_e_f) hop_3_g_f)
6982  (=> (and hop_2_g_e hop_1_e_i) hop_3_g_i)
6983  (=> (and hop_2_g_e hop_1_e_h) hop_3_g_h)
6984  (=> (and hop_2_g_e hop_1_e_k) hop_3_g_k)
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6985  (=> (and hop_2_g_e hop_1_e_j) hop_3_g_j)
6986  (=> (and hop_2_g_e hop_1_e_m) hop_3_g_m)
6987  (=> (and hop_2_g_e hop_1_e_l) hop_3_g_l)
6988  (=> (and hop_2_g_e hop_1_e_o) hop_3_g_o)
6989  (=> (and hop_2_g_e hop_1_e_n) hop_3_g_n)
6990  (=> (and hop_2_g_e hop_1_e_q) hop_3_g_q)
6991  (=> (and hop_2_g_e hop_1_e_p) hop_3_g_p)
6992  (=> (and hop_2_g_d hop_1_d_a) hop_3_g_a)
6993  (=> (and hop_2_g_d hop_1_d_c) hop_3_g_c)
6994  (=> (and hop_2_g_d hop_1_d_b) hop_3_g_b)
6995  (=> (and hop_2_g_d hop_1_d_e) hop_3_g_e)
6996  (=> (and hop_2_g_d hop_1_d_f) hop_3_g_f)
6997  (=> (and hop_2_g_d hop_1_d_i) hop_3_g_i)
6998  (=> (and hop_2_g_d hop_1_d_h) hop_3_g_h)
6999  (=> (and hop_2_g_d hop_1_d_k) hop_3_g_k)
7000  (=> (and hop_2_g_d hop_1_d_j) hop_3_g_j)
7001  (=> (and hop_2_g_d hop_1_d_m) hop_3_g_m)
7002  (=> (and hop_2_g_d hop_1_d_l) hop_3_g_l)
7003  (=> (and hop_2_g_d hop_1_d_o) hop_3_g_o)
7004  (=> (and hop_2_g_d hop_1_d_n) hop_3_g_n)
7005  (=> (and hop_2_g_d hop_1_d_q) hop_3_g_q)
7006  (=> (and hop_2_g_d hop_1_d_p) hop_3_g_p)
7007  (=> (and hop_2_g_f hop_1_f_a) hop_3_g_a)
7008  (=> (and hop_2_g_f hop_1_f_c) hop_3_g_c)
7009  (=> (and hop_2_g_f hop_1_f_b) hop_3_g_b)
7010  (=> (and hop_2_g_f hop_1_f_e) hop_3_g_e)
7011  (=> (and hop_2_g_f hop_1_f_d) hop_3_g_d)
7012  (=> (and hop_2_g_f hop_1_f_i) hop_3_g_i)
7013  (=> (and hop_2_g_f hop_1_f_h) hop_3_g_h)
7014  (=> (and hop_2_g_f hop_1_f_k) hop_3_g_k)
7015  (=> (and hop_2_g_f hop_1_f_j) hop_3_g_j)
7016  (=> (and hop_2_g_f hop_1_f_m) hop_3_g_m)
7017  (=> (and hop_2_g_f hop_1_f_l) hop_3_g_l)
7018  (=> (and hop_2_g_f hop_1_f_o) hop_3_g_o)
7019  (=> (and hop_2_g_f hop_1_f_n) hop_3_g_n)
7020  (=> (and hop_2_g_f hop_1_f_q) hop_3_g_q)
7021  (=> (and hop_2_g_f hop_1_f_p) hop_3_g_p)
7022  (=> (and hop_2_g_i hop_1_i_a) hop_3_g_a)
7023  (=> (and hop_2_g_i hop_1_i_c) hop_3_g_c)
7024  (=> (and hop_2_g_i hop_1_i_b) hop_3_g_b)
7025  (=> (and hop_2_g_i hop_1_i_e) hop_3_g_e)
7026  (=> (and hop_2_g_i hop_1_i_d) hop_3_g_d)
7027  (=> (and hop_2_g_i hop_1_i_f) hop_3_g_f)
7028  (=> (and hop_2_g_i hop_1_i_h) hop_3_g_h)
7029  (=> (and hop_2_g_i hop_1_i_k) hop_3_g_k)
7030  (=> (and hop_2_g_i hop_1_i_j) hop_3_g_j)
7031  (=> (and hop_2_g_i hop_1_i_m) hop_3_g_m)
7032  (=> (and hop_2_g_i hop_1_i_l) hop_3_g_l)
7033  (=> (and hop_2_g_i hop_1_i_o) hop_3_g_o)
7034  (=> (and hop_2_g_i hop_1_i_n) hop_3_g_n)
7035  (=> (and hop_2_g_i hop_1_i_q) hop_3_g_q)
7036  (=> (and hop_2_g_i hop_1_i_p) hop_3_g_p)
7037  (=> (and hop_2_g_h hop_1_h_a) hop_3_g_a)
7038  (=> (and hop_2_g_h hop_1_h_c) hop_3_g_c)
7039  (=> (and hop_2_g_h hop_1_h_b) hop_3_g_b)
7040  (=> (and hop_2_g_h hop_1_h_e) hop_3_g_e)
7041  (=> (and hop_2_g_h hop_1_h_d) hop_3_g_d)
7042  (=> (and hop_2_g_h hop_1_h_f) hop_3_g_f)
7043  (=> (and hop_2_g_h hop_1_h_i) hop_3_g_i)
7044  (=> (and hop_2_g_h hop_1_h_k) hop_3_g_k)
7045  (=> (and hop_2_g_h hop_1_h_j) hop_3_g_j)
7046  (=> (and hop_2_g_h hop_1_h_m) hop_3_g_m)
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7047   (=> (and hop_2_g_h hop_1_h_l) hop_3_g_l)
7048   (=> (and hop_2_g_h hop_1_h_o) hop_3_g_o)
7049   (=> (and hop_2_g_h hop_1_h_n) hop_3_g_n)
7050   (=> (and hop_2_g_h hop_1_h_q) hop_3_g_q)
7051   (=> (and hop_2_g_h hop_1_h_p) hop_3_g_p)
7052   (=> (and hop_2_g_k hop_1_k_a) hop_3_g_a)
7053   (=> (and hop_2_g_k hop_1_k_c) hop_3_g_c)
7054   (=> (and hop_2_g_k hop_1_k_b) hop_3_g_b)
7055   (=> (and hop_2_g_k hop_1_k_e) hop_3_g_e)
7056   (=> (and hop_2_g_k hop_1_k_d) hop_3_g_d)
7057   (=> (and hop_2_g_k hop_1_k_f) hop_3_g_f)
7058   (=> (and hop_2_g_k hop_1_k_i) hop_3_g_i)
7059   (=> (and hop_2_g_k hop_1_k_h) hop_3_g_h)
7060   (=> (and hop_2_g_k hop_1_k_j) hop_3_g_j)
7061   (=> (and hop_2_g_k hop_1_k_m) hop_3_g_m)
7062   (=> (and hop_2_g_k hop_1_k_l) hop_3_g_l)
7063   (=> (and hop_2_g_k hop_1_k_o) hop_3_g_o)
7064   (=> (and hop_2_g_k hop_1_k_n) hop_3_g_n)
7065   (=> (and hop_2_g_k hop_1_k_q) hop_3_g_q)
7066   (=> (and hop_2_g_k hop_1_k_p) hop_3_g_p)
7067   (=> (and hop_2_g_j hop_1_j_a) hop_3_g_a)
7068   (=> (and hop_2_g_j hop_1_j_c) hop_3_g_c)
7069   (=> (and hop_2_g_j hop_1_j_b) hop_3_g_b)
7070   (=> (and hop_2_g_j hop_1_j_e) hop_3_g_e)
7071   (=> (and hop_2_g_j hop_1_j_d) hop_3_g_d)
7072   (=> (and hop_2_g_j hop_1_j_f) hop_3_g_f)
7073   (=> (and hop_2_g_j hop_1_j_i) hop_3_g_i)
7074   (=> (and hop_2_g_j hop_1_j_h) hop_3_g_h)
7075   (=> (and hop_2_g_j hop_1_j_k) hop_3_g_k)
7076   (=> (and hop_2_g_j hop_1_j_m) hop_3_g_m)
7077   (=> (and hop_2_g_j hop_1_j_l) hop_3_g_l)
7078   (=> (and hop_2_g_j hop_1_j_o) hop_3_g_o)
7079   (=> (and hop_2_g_j hop_1_j_n) hop_3_g_n)
7080   (=> (and hop_2_g_j hop_1_j_q) hop_3_g_q)
7081   (=> (and hop_2_g_j hop_1_j_p) hop_3_g_p)
7082   (=> (and hop_2_g_m hop_1_m_a) hop_3_g_a)
7083   (=> (and hop_2_g_m hop_1_m_c) hop_3_g_c)
7084   (=> (and hop_2_g_m hop_1_m_b) hop_3_g_b)
7085   (=> (and hop_2_g_m hop_1_m_e) hop_3_g_e)
7086   (=> (and hop_2_g_m hop_1_m_d) hop_3_g_d)
7087   (=> (and hop_2_g_m hop_1_m_f) hop_3_g_f)
7088   (=> (and hop_2_g_m hop_1_m_i) hop_3_g_i)
7089   (=> (and hop_2_g_m hop_1_m_h) hop_3_g_h)
7090   (=> (and hop_2_g_m hop_1_m_k) hop_3_g_k)
7091   (=> (and hop_2_g_m hop_1_m_j) hop_3_g_j)
7092   (=> (and hop_2_g_m hop_1_m_l) hop_3_g_l)
7093   (=> (and hop_2_g_m hop_1_m_o) hop_3_g_o)
7094   (=> (and hop_2_g_m hop_1_m_n) hop_3_g_n)
7095   (=> (and hop_2_g_m hop_1_m_q) hop_3_g_q)
7096   (=> (and hop_2_g_m hop_1_m_p) hop_3_g_p)
7097   (=> (and hop_2_g_l hop_1_l_a) hop_3_g_a)
7098   (=> (and hop_2_g_l hop_1_l_c) hop_3_g_c)
7099   (=> (and hop_2_g_l hop_1_l_b) hop_3_g_b)
7100   (=> (and hop_2_g_l hop_1_l_e) hop_3_g_e)
7101   (=> (and hop_2_g_l hop_1_l_d) hop_3_g_d)
7102   (=> (and hop_2_g_l hop_1_l_f) hop_3_g_f)
7103   (=> (and hop_2_g_l hop_1_l_i) hop_3_g_i)
7104   (=> (and hop_2_g_l hop_1_l_h) hop_3_g_h)
7105   (=> (and hop_2_g_l hop_1_l_k) hop_3_g_k)
7106   (=> (and hop_2_g_l hop_1_l_j) hop_3_g_j)
7107   (=> (and hop_2_g_l hop_1_l_m) hop_3_g_m)
7108   (=> (and hop_2_g_l hop_1_l_o) hop_3_g_o)
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7109  (=> (and hop_2_g_l hop_1_l_n) hop_3_g_n)
7110  (=> (and hop_2_g_l hop_1_l_q) hop_3_g_q)
7111  (=> (and hop_2_g_l hop_1_l_p) hop_3_g_p)
7112  (=> (and hop_2_g_o hop_1_o_a) hop_3_g_a)
7113  (=> (and hop_2_g_o hop_1_o_c) hop_3_g_c)
7114  (=> (and hop_2_g_o hop_1_o_b) hop_3_g_b)
7115  (=> (and hop_2_g_o hop_1_o_e) hop_3_g_e)
7116  (=> (and hop_2_g_o hop_1_o_d) hop_3_g_d)
7117  (=> (and hop_2_g_o hop_1_o_f) hop_3_g_f)
7118  (=> (and hop_2_g_o hop_1_o_i) hop_3_g_i)
7119  (=> (and hop_2_g_o hop_1_o_h) hop_3_g_h)
7120  (=> (and hop_2_g_o hop_1_o_k) hop_3_g_k)
7121  (=> (and hop_2_g_o hop_1_o_j) hop_3_g_j)
7122  (=> (and hop_2_g_o hop_1_o_m) hop_3_g_m)
7123  (=> (and hop_2_g_o hop_1_o_l) hop_3_g_l)
7124  (=> (and hop_2_g_o hop_1_o_n) hop_3_g_n)
7125  (=> (and hop_2_g_o hop_1_o_q) hop_3_g_q)
7126  (=> (and hop_2_g_o hop_1_o_p) hop_3_g_p)
7127  (=> (and hop_2_g_n hop_1_n_a) hop_3_g_a)
7128  (=> (and hop_2_g_n hop_1_n_c) hop_3_g_c)
7129  (=> (and hop_2_g_n hop_1_n_b) hop_3_g_b)
7130  (=> (and hop_2_g_n hop_1_n_e) hop_3_g_e)
7131  (=> (and hop_2_g_n hop_1_n_d) hop_3_g_d)
7132  (=> (and hop_2_g_n hop_1_n_f) hop_3_g_f)
7133  (=> (and hop_2_g_n hop_1_n_i) hop_3_g_i)
7134  (=> (and hop_2_g_n hop_1_n_h) hop_3_g_h)
7135  (=> (and hop_2_g_n hop_1_n_k) hop_3_g_k)
7136  (=> (and hop_2_g_n hop_1_n_j) hop_3_g_j)
7137  (=> (and hop_2_g_n hop_1_n_m) hop_3_g_m)
7138  (=> (and hop_2_g_n hop_1_n_l) hop_3_g_l)
7139  (=> (and hop_2_g_n hop_1_n_o) hop_3_g_o)
7140  (=> (and hop_2_g_n hop_1_n_q) hop_3_g_q)
7141  (=> (and hop_2_g_n hop_1_n_p) hop_3_g_p)
7142  (=> (and hop_2_g_q hop_1_q_a) hop_3_g_a)
7143  (=> (and hop_2_g_q hop_1_q_c) hop_3_g_c)
7144  (=> (and hop_2_g_q hop_1_q_b) hop_3_g_b)
7145  (=> (and hop_2_g_q hop_1_q_e) hop_3_g_e)
7146  (=> (and hop_2_g_q hop_1_q_d) hop_3_g_d)
7147  (=> (and hop_2_g_q hop_1_q_f) hop_3_g_f)
7148  (=> (and hop_2_g_q hop_1_q_i) hop_3_g_i)
7149  (=> (and hop_2_g_q hop_1_q_h) hop_3_g_h)
7150  (=> (and hop_2_g_q hop_1_q_k) hop_3_g_k)
7151  (=> (and hop_2_g_q hop_1_q_j) hop_3_g_j)
7152  (=> (and hop_2_g_q hop_1_q_m) hop_3_g_m)
7153  (=> (and hop_2_g_q hop_1_q_l) hop_3_g_l)
7154  (=> (and hop_2_g_q hop_1_q_o) hop_3_g_o)
7155  (=> (and hop_2_g_q hop_1_q_n) hop_3_g_n)
7156  (=> (and hop_2_g_q hop_1_q_p) hop_3_g_p)
7157  (=> (and hop_2_g_p hop_1_p_a) hop_3_g_a)
7158  (=> (and hop_2_g_p hop_1_p_c) hop_3_g_c)
7159  (=> (and hop_2_g_p hop_1_p_b) hop_3_g_b)
7160  (=> (and hop_2_g_p hop_1_p_e) hop_3_g_e)
7161  (=> (and hop_2_g_p hop_1_p_d) hop_3_g_d)
7162  (=> (and hop_2_g_p hop_1_p_f) hop_3_g_f)
7163  (=> (and hop_2_g_p hop_1_p_i) hop_3_g_i)
7164  (=> (and hop_2_g_p hop_1_p_h) hop_3_g_h)
7165  (=> (and hop_2_g_p hop_1_p_k) hop_3_g_k)
7166  (=> (and hop_2_g_p hop_1_p_j) hop_3_g_j)
7167  (=> (and hop_2_g_p hop_1_p_m) hop_3_g_m)
7168  (=> (and hop_2_g_p hop_1_p_l) hop_3_g_l)
7169  (=> (and hop_2_g_p hop_1_p_o) hop_3_g_o)
7170  (=> (and hop_2_g_p hop_1_p_n) hop_3_g_n)
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7171  (=> (and hop_2_g_p hop_1_p_q) hop_3_g_q)
7172  (=> (and hop_2_f_a hop_1_a_c) hop_3_f_c)
7173  (=> (and hop_2_f_a hop_1_a_b) hop_3_f_b)
7174  (=> (and hop_2_f_a hop_1_a_e) hop_3_f_e)
7175  (=> (and hop_2_f_a hop_1_a_d) hop_3_f_d)
7176  (=> (and hop_2_f_a hop_1_a_g) hop_3_f_g)
7177  (=> (and hop_2_f_a hop_1_a_i) hop_3_f_i)
7178  (=> (and hop_2_f_a hop_1_a_h) hop_3_f_h)
7179  (=> (and hop_2_f_a hop_1_a_k) hop_3_f_k)
7180  (=> (and hop_2_f_a hop_1_a_j) hop_3_f_j)
7181  (=> (and hop_2_f_a hop_1_a_m) hop_3_f_m)
7182  (=> (and hop_2_f_a hop_1_a_l) hop_3_f_l)
7183  (=> (and hop_2_f_a hop_1_a_o) hop_3_f_o)
7184  (=> (and hop_2_f_a hop_1_a_n) hop_3_f_n)
7185  (=> (and hop_2_f_a hop_1_a_q) hop_3_f_q)
7186  (=> (and hop_2_f_a hop_1_a_p) hop_3_f_p)
7187  (=> (and hop_2_f_c hop_1_c_a) hop_3_f_a)
7188  (=> (and hop_2_f_c hop_1_c_b) hop_3_f_b)
7189  (=> (and hop_2_f_c hop_1_c_e) hop_3_f_e)
7190  (=> (and hop_2_f_c hop_1_c_d) hop_3_f_d)
7191  (=> (and hop_2_f_c hop_1_c_g) hop_3_f_g)
7192  (=> (and hop_2_f_c hop_1_c_i) hop_3_f_i)
7193  (=> (and hop_2_f_c hop_1_c_h) hop_3_f_h)
7194  (=> (and hop_2_f_c hop_1_c_k) hop_3_f_k)
7195  (=> (and hop_2_f_c hop_1_c_j) hop_3_f_j)
7196  (=> (and hop_2_f_c hop_1_c_m) hop_3_f_m)
7197  (=> (and hop_2_f_c hop_1_c_l) hop_3_f_l)
7198  (=> (and hop_2_f_c hop_1_c_o) hop_3_f_o)
7199  (=> (and hop_2_f_c hop_1_c_n) hop_3_f_n)
7200  (=> (and hop_2_f_c hop_1_c_q) hop_3_f_q)
7201  (=> (and hop_2_f_c hop_1_c_p) hop_3_f_p)
7202  (=> (and hop_2_f_b hop_1_b_a) hop_3_f_a)
7203  (=> (and hop_2_f_b hop_1_b_c) hop_3_f_c)
7204  (=> (and hop_2_f_b hop_1_b_e) hop_3_f_e)
7205  (=> (and hop_2_f_b hop_1_b_d) hop_3_f_d)
7206  (=> (and hop_2_f_b hop_1_b_g) hop_3_f_g)
7207  (=> (and hop_2_f_b hop_1_b_i) hop_3_f_i)
7208  (=> (and hop_2_f_b hop_1_b_h) hop_3_f_h)
7209  (=> (and hop_2_f_b hop_1_b_k) hop_3_f_k)
7210  (=> (and hop_2_f_b hop_1_b_j) hop_3_f_j)
7211  (=> (and hop_2_f_b hop_1_b_m) hop_3_f_m)
7212  (=> (and hop_2_f_b hop_1_b_l) hop_3_f_l)
7213  (=> (and hop_2_f_b hop_1_b_o) hop_3_f_o)
7214  (=> (and hop_2_f_b hop_1_b_n) hop_3_f_n)
7215  (=> (and hop_2_f_b hop_1_b_q) hop_3_f_q)
7216  (=> (and hop_2_f_b hop_1_b_p) hop_3_f_p)
7217  (=> (and hop_2_f_e hop_1_e_a) hop_3_f_a)
7218  (=> (and hop_2_f_e hop_1_e_c) hop_3_f_c)
7219  (=> (and hop_2_f_e hop_1_e_b) hop_3_f_b)
7220  (=> (and hop_2_f_e hop_1_e_d) hop_3_f_d)
7221  (=> (and hop_2_f_e hop_1_e_g) hop_3_f_g)
7222  (=> (and hop_2_f_e hop_1_e_i) hop_3_f_i)
7223  (=> (and hop_2_f_e hop_1_e_h) hop_3_f_h)
7224  (=> (and hop_2_f_e hop_1_e_k) hop_3_f_k)
7225  (=> (and hop_2_f_e hop_1_e_j) hop_3_f_j)
7226  (=> (and hop_2_f_e hop_1_e_m) hop_3_f_m)
7227  (=> (and hop_2_f_e hop_1_e_l) hop_3_f_l)
7228  (=> (and hop_2_f_e hop_1_e_o) hop_3_f_o)
7229  (=> (and hop_2_f_e hop_1_e_n) hop_3_f_n)
7230  (=> (and hop_2_f_e hop_1_e_q) hop_3_f_q)
7231  (=> (and hop_2_f_e hop_1_e_p) hop_3_f_p)
7232  (=> (and hop_2_f_d hop_1_d_a) hop_3_f_a)
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7233  (=> (and hop_2_f_d hop_1_d_c) hop_3_f_c)
7234  (=> (and hop_2_f_d hop_1_d_b) hop_3_f_b)
7235  (=> (and hop_2_f_d hop_1_d_e) hop_3_f_e)
7236  (=> (and hop_2_f_d hop_1_d_g) hop_3_f_g)
7237  (=> (and hop_2_f_d hop_1_d_i) hop_3_f_i)
7238  (=> (and hop_2_f_d hop_1_d_h) hop_3_f_h)
7239  (=> (and hop_2_f_d hop_1_d_k) hop_3_f_k)
7240  (=> (and hop_2_f_d hop_1_d_j) hop_3_f_j)
7241  (=> (and hop_2_f_d hop_1_d_m) hop_3_f_m)
7242  (=> (and hop_2_f_d hop_1_d_l) hop_3_f_l)
7243  (=> (and hop_2_f_d hop_1_d_o) hop_3_f_o)
7244  (=> (and hop_2_f_d hop_1_d_n) hop_3_f_n)
7245  (=> (and hop_2_f_d hop_1_d_q) hop_3_f_q)
7246  (=> (and hop_2_f_d hop_1_d_p) hop_3_f_p)
7247  (=> (and hop_2_f_g hop_1_g_a) hop_3_f_a)
7248  (=> (and hop_2_f_g hop_1_g_c) hop_3_f_c)
7249  (=> (and hop_2_f_g hop_1_g_b) hop_3_f_b)
7250  (=> (and hop_2_f_g hop_1_g_e) hop_3_f_e)
7251  (=> (and hop_2_f_g hop_1_g_d) hop_3_f_d)
7252  (=> (and hop_2_f_g hop_1_g_i) hop_3_f_i)
7253  (=> (and hop_2_f_g hop_1_g_h) hop_3_f_h)
7254  (=> (and hop_2_f_g hop_1_g_k) hop_3_f_k)
7255  (=> (and hop_2_f_g hop_1_g_j) hop_3_f_j)
7256  (=> (and hop_2_f_g hop_1_g_m) hop_3_f_m)
7257  (=> (and hop_2_f_g hop_1_g_l) hop_3_f_l)
7258  (=> (and hop_2_f_g hop_1_g_o) hop_3_f_o)
7259  (=> (and hop_2_f_g hop_1_g_n) hop_3_f_n)
7260  (=> (and hop_2_f_g hop_1_g_q) hop_3_f_q)
7261  (=> (and hop_2_f_g hop_1_g_p) hop_3_f_p)
7262  (=> (and hop_2_f_i hop_1_i_a) hop_3_f_a)
7263  (=> (and hop_2_f_i hop_1_i_c) hop_3_f_c)
7264  (=> (and hop_2_f_i hop_1_i_b) hop_3_f_b)
7265  (=> (and hop_2_f_i hop_1_i_e) hop_3_f_e)
7266  (=> (and hop_2_f_i hop_1_i_d) hop_3_f_d)
7267  (=> (and hop_2_f_i hop_1_i_g) hop_3_f_g)
7268  (=> (and hop_2_f_i hop_1_i_h) hop_3_f_h)
7269  (=> (and hop_2_f_i hop_1_i_k) hop_3_f_k)
7270  (=> (and hop_2_f_i hop_1_i_j) hop_3_f_j)
7271  (=> (and hop_2_f_i hop_1_i_m) hop_3_f_m)
7272  (=> (and hop_2_f_i hop_1_i_l) hop_3_f_l)
7273  (=> (and hop_2_f_i hop_1_i_o) hop_3_f_o)
7274  (=> (and hop_2_f_i hop_1_i_n) hop_3_f_n)
7275  (=> (and hop_2_f_i hop_1_i_q) hop_3_f_q)
7276  (=> (and hop_2_f_i hop_1_i_p) hop_3_f_p)
7277  (=> (and hop_2_f_h hop_1_h_a) hop_3_f_a)
7278  (=> (and hop_2_f_h hop_1_h_c) hop_3_f_c)
7279  (=> (and hop_2_f_h hop_1_h_b) hop_3_f_b)
7280  (=> (and hop_2_f_h hop_1_h_e) hop_3_f_e)
7281  (=> (and hop_2_f_h hop_1_h_d) hop_3_f_d)
7282  (=> (and hop_2_f_h hop_1_h_g) hop_3_f_g)
7283  (=> (and hop_2_f_h hop_1_h_i) hop_3_f_i)
7284  (=> (and hop_2_f_h hop_1_h_k) hop_3_f_k)
7285  (=> (and hop_2_f_h hop_1_h_j) hop_3_f_j)
7286  (=> (and hop_2_f_h hop_1_h_m) hop_3_f_m)
7287  (=> (and hop_2_f_h hop_1_h_l) hop_3_f_l)
7288  (=> (and hop_2_f_h hop_1_h_o) hop_3_f_o)
7289  (=> (and hop_2_f_h hop_1_h_n) hop_3_f_n)
7290  (=> (and hop_2_f_h hop_1_h_q) hop_3_f_q)
7291  (=> (and hop_2_f_h hop_1_h_p) hop_3_f_p)
7292  (=> (and hop_2_f_k hop_1_k_a) hop_3_f_a)
7293  (=> (and hop_2_f_k hop_1_k_c) hop_3_f_c)
7294  (=> (and hop_2_f_k hop_1_k_b) hop_3_f_b)
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7295  (=> (and hop_2_f_k hop_1_k_e) hop_3_f_e)
7296  (=> (and hop_2_f_k hop_1_k_d) hop_3_f_d)
7297  (=> (and hop_2_f_k hop_1_k_g) hop_3_f_g)
7298  (=> (and hop_2_f_k hop_1_k_i) hop_3_f_i)
7299  (=> (and hop_2_f_k hop_1_k_h) hop_3_f_h)
7300  (=> (and hop_2_f_k hop_1_k_j) hop_3_f_j)
7301  (=> (and hop_2_f_k hop_1_k_m) hop_3_f_m)
7302  (=> (and hop_2_f_k hop_1_k_l) hop_3_f_l)
7303  (=> (and hop_2_f_k hop_1_k_o) hop_3_f_o)
7304  (=> (and hop_2_f_k hop_1_k_n) hop_3_f_n)
7305  (=> (and hop_2_f_k hop_1_k_q) hop_3_f_q)
7306  (=> (and hop_2_f_k hop_1_k_p) hop_3_f_p)
7307  (=> (and hop_2_f_j hop_1_j_a) hop_3_f_a)
7308  (=> (and hop_2_f_j hop_1_j_c) hop_3_f_c)
7309  (=> (and hop_2_f_j hop_1_j_b) hop_3_f_b)
7310  (=> (and hop_2_f_j hop_1_j_e) hop_3_f_e)
7311  (=> (and hop_2_f_j hop_1_j_d) hop_3_f_d)
7312  (=> (and hop_2_f_j hop_1_j_g) hop_3_f_g)
7313  (=> (and hop_2_f_j hop_1_j_i) hop_3_f_i)
7314  (=> (and hop_2_f_j hop_1_j_h) hop_3_f_h)
7315  (=> (and hop_2_f_j hop_1_j_k) hop_3_f_k)
7316  (=> (and hop_2_f_j hop_1_j_m) hop_3_f_m)
7317  (=> (and hop_2_f_j hop_1_j_l) hop_3_f_l)
7318  (=> (and hop_2_f_j hop_1_j_o) hop_3_f_o)
7319  (=> (and hop_2_f_j hop_1_j_n) hop_3_f_n)
7320  (=> (and hop_2_f_j hop_1_j_q) hop_3_f_q)
7321  (=> (and hop_2_f_j hop_1_j_p) hop_3_f_p)
7322  (=> (and hop_2_f_m hop_1_m_a) hop_3_f_a)
7323  (=> (and hop_2_f_m hop_1_m_c) hop_3_f_c)
7324  (=> (and hop_2_f_m hop_1_m_b) hop_3_f_b)
7325  (=> (and hop_2_f_m hop_1_m_e) hop_3_f_e)
7326  (=> (and hop_2_f_m hop_1_m_d) hop_3_f_d)
7327  (=> (and hop_2_f_m hop_1_m_g) hop_3_f_g)
7328  (=> (and hop_2_f_m hop_1_m_i) hop_3_f_i)
7329  (=> (and hop_2_f_m hop_1_m_h) hop_3_f_h)
7330  (=> (and hop_2_f_m hop_1_m_k) hop_3_f_k)
7331  (=> (and hop_2_f_m hop_1_m_j) hop_3_f_j)
7332  (=> (and hop_2_f_m hop_1_m_l) hop_3_f_l)
7333  (=> (and hop_2_f_m hop_1_m_o) hop_3_f_o)
7334  (=> (and hop_2_f_m hop_1_m_n) hop_3_f_n)
7335  (=> (and hop_2_f_m hop_1_m_q) hop_3_f_q)
7336  (=> (and hop_2_f_m hop_1_m_p) hop_3_f_p)
7337  (=> (and hop_2_f_l hop_1_l_a) hop_3_f_a)
7338  (=> (and hop_2_f_l hop_1_l_c) hop_3_f_c)
7339  (=> (and hop_2_f_l hop_1_l_b) hop_3_f_b)
7340  (=> (and hop_2_f_l hop_1_l_e) hop_3_f_e)
7341  (=> (and hop_2_f_l hop_1_l_d) hop_3_f_d)
7342  (=> (and hop_2_f_l hop_1_l_g) hop_3_f_g)
7343  (=> (and hop_2_f_l hop_1_l_i) hop_3_f_i)
7344  (=> (and hop_2_f_l hop_1_l_h) hop_3_f_h)
7345  (=> (and hop_2_f_l hop_1_l_k) hop_3_f_k)
7346  (=> (and hop_2_f_l hop_1_l_j) hop_3_f_j)
7347  (=> (and hop_2_f_l hop_1_l_m) hop_3_f_m)
7348  (=> (and hop_2_f_l hop_1_l_o) hop_3_f_o)
7349  (=> (and hop_2_f_l hop_1_l_n) hop_3_f_n)
7350  (=> (and hop_2_f_l hop_1_l_q) hop_3_f_q)
7351  (=> (and hop_2_f_l hop_1_l_p) hop_3_f_p)
7352  (=> (and hop_2_f_o hop_1_o_a) hop_3_f_a)
7353  (=> (and hop_2_f_o hop_1_o_c) hop_3_f_c)
7354  (=> (and hop_2_f_o hop_1_o_b) hop_3_f_b)
7355  (=> (and hop_2_f_o hop_1_o_e) hop_3_f_e)
7356  (=> (and hop_2_f_o hop_1_o_d) hop_3_f_d)
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7357  (=> (and hop_2_f_o hop_1_o_g) hop_3_f_g)
7358  (=> (and hop_2_f_o hop_1_o_i) hop_3_f_i)
7359  (=> (and hop_2_f_o hop_1_o_h) hop_3_f_h)
7360  (=> (and hop_2_f_o hop_1_o_k) hop_3_f_k)
7361  (=> (and hop_2_f_o hop_1_o_j) hop_3_f_j)
7362  (=> (and hop_2_f_o hop_1_o_m) hop_3_f_m)
7363  (=> (and hop_2_f_o hop_1_o_l) hop_3_f_l)
7364  (=> (and hop_2_f_o hop_1_o_n) hop_3_f_n)
7365  (=> (and hop_2_f_o hop_1_o_q) hop_3_f_q)
7366  (=> (and hop_2_f_o hop_1_o_p) hop_3_f_p)
7367  (=> (and hop_2_f_n hop_1_n_a) hop_3_f_a)
7368  (=> (and hop_2_f_n hop_1_n_c) hop_3_f_c)
7369  (=> (and hop_2_f_n hop_1_n_b) hop_3_f_b)
7370  (=> (and hop_2_f_n hop_1_n_e) hop_3_f_e)
7371  (=> (and hop_2_f_n hop_1_n_d) hop_3_f_d)
7372  (=> (and hop_2_f_n hop_1_n_g) hop_3_f_g)
7373  (=> (and hop_2_f_n hop_1_n_i) hop_3_f_i)
7374  (=> (and hop_2_f_n hop_1_n_h) hop_3_f_h)
7375  (=> (and hop_2_f_n hop_1_n_k) hop_3_f_k)
7376  (=> (and hop_2_f_n hop_1_n_j) hop_3_f_j)
7377  (=> (and hop_2_f_n hop_1_n_m) hop_3_f_m)
7378  (=> (and hop_2_f_n hop_1_n_l) hop_3_f_l)
7379  (=> (and hop_2_f_n hop_1_n_o) hop_3_f_o)
7380  (=> (and hop_2_f_n hop_1_n_q) hop_3_f_q)
7381  (=> (and hop_2_f_n hop_1_n_p) hop_3_f_p)
7382  (=> (and hop_2_f_q hop_1_q_a) hop_3_f_a)
7383  (=> (and hop_2_f_q hop_1_q_c) hop_3_f_c)
7384  (=> (and hop_2_f_q hop_1_q_b) hop_3_f_b)
7385  (=> (and hop_2_f_q hop_1_q_e) hop_3_f_e)
7386  (=> (and hop_2_f_q hop_1_q_d) hop_3_f_d)
7387  (=> (and hop_2_f_q hop_1_q_g) hop_3_f_g)
7388  (=> (and hop_2_f_q hop_1_q_i) hop_3_f_i)
7389  (=> (and hop_2_f_q hop_1_q_h) hop_3_f_h)
7390  (=> (and hop_2_f_q hop_1_q_k) hop_3_f_k)
7391  (=> (and hop_2_f_q hop_1_q_j) hop_3_f_j)
7392  (=> (and hop_2_f_q hop_1_q_m) hop_3_f_m)
7393  (=> (and hop_2_f_q hop_1_q_l) hop_3_f_l)
7394  (=> (and hop_2_f_q hop_1_q_o) hop_3_f_o)
7395  (=> (and hop_2_f_q hop_1_q_n) hop_3_f_n)
7396  (=> (and hop_2_f_q hop_1_q_p) hop_3_f_p)
7397  (=> (and hop_2_f_p hop_1_p_a) hop_3_f_a)
7398  (=> (and hop_2_f_p hop_1_p_c) hop_3_f_c)
7399  (=> (and hop_2_f_p hop_1_p_b) hop_3_f_b)
7400  (=> (and hop_2_f_p hop_1_p_e) hop_3_f_e)
7401  (=> (and hop_2_f_p hop_1_p_d) hop_3_f_d)
7402  (=> (and hop_2_f_p hop_1_p_g) hop_3_f_g)
7403  (=> (and hop_2_f_p hop_1_p_i) hop_3_f_i)
7404  (=> (and hop_2_f_p hop_1_p_h) hop_3_f_h)
7405  (=> (and hop_2_f_p hop_1_p_k) hop_3_f_k)
7406  (=> (and hop_2_f_p hop_1_p_j) hop_3_f_j)
7407  (=> (and hop_2_f_p hop_1_p_m) hop_3_f_m)
7408  (=> (and hop_2_f_p hop_1_p_l) hop_3_f_l)
7409  (=> (and hop_2_f_p hop_1_p_o) hop_3_f_o)
7410  (=> (and hop_2_f_p hop_1_p_n) hop_3_f_n)
7411  (=> (and hop_2_f_p hop_1_p_q) hop_3_f_q)
7412  (=> (and hop_2_i_a hop_1_a_c) hop_3_i_c)
7413  (=> (and hop_2_i_a hop_1_a_b) hop_3_i_b)
7414  (=> (and hop_2_i_a hop_1_a_e) hop_3_i_e)
7415  (=> (and hop_2_i_a hop_1_a_d) hop_3_i_d)
7416  (=> (and hop_2_i_a hop_1_a_g) hop_3_i_g)
7417  (=> (and hop_2_i_a hop_1_a_f) hop_3_i_f)
7418  (=> (and hop_2_i_a hop_1_a_h) hop_3_i_h)
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7419  (=> (and hop_2_i_a hop_1_a_k) hop_3_i_k)
7420  (=> (and hop_2_i_a hop_1_a_j) hop_3_i_j)
7421  (=> (and hop_2_i_a hop_1_a_m) hop_3_i_m)
7422  (=> (and hop_2_i_a hop_1_a_l) hop_3_i_l)
7423  (=> (and hop_2_i_a hop_1_a_o) hop_3_i_o)
7424  (=> (and hop_2_i_a hop_1_a_n) hop_3_i_n)
7425  (=> (and hop_2_i_a hop_1_a_q) hop_3_i_q)
7426  (=> (and hop_2_i_a hop_1_a_p) hop_3_i_p)
7427  (=> (and hop_2_i_c hop_1_c_a) hop_3_i_a)
7428  (=> (and hop_2_i_c hop_1_c_b) hop_3_i_b)
7429  (=> (and hop_2_i_c hop_1_c_e) hop_3_i_e)
7430  (=> (and hop_2_i_c hop_1_c_d) hop_3_i_d)
7431  (=> (and hop_2_i_c hop_1_c_g) hop_3_i_g)
7432  (=> (and hop_2_i_c hop_1_c_f) hop_3_i_f)
7433  (=> (and hop_2_i_c hop_1_c_h) hop_3_i_h)
7434  (=> (and hop_2_i_c hop_1_c_k) hop_3_i_k)
7435  (=> (and hop_2_i_c hop_1_c_j) hop_3_i_j)
7436  (=> (and hop_2_i_c hop_1_c_m) hop_3_i_m)
7437  (=> (and hop_2_i_c hop_1_c_l) hop_3_i_l)
7438  (=> (and hop_2_i_c hop_1_c_o) hop_3_i_o)
7439  (=> (and hop_2_i_c hop_1_c_n) hop_3_i_n)
7440  (=> (and hop_2_i_c hop_1_c_q) hop_3_i_q)
7441  (=> (and hop_2_i_c hop_1_c_p) hop_3_i_p)
7442  (=> (and hop_2_i_b hop_1_b_a) hop_3_i_a)
7443  (=> (and hop_2_i_b hop_1_b_c) hop_3_i_c)
7444  (=> (and hop_2_i_b hop_1_b_e) hop_3_i_e)
7445  (=> (and hop_2_i_b hop_1_b_d) hop_3_i_d)
7446  (=> (and hop_2_i_b hop_1_b_g) hop_3_i_g)
7447  (=> (and hop_2_i_b hop_1_b_f) hop_3_i_f)
7448  (=> (and hop_2_i_b hop_1_b_h) hop_3_i_h)
7449  (=> (and hop_2_i_b hop_1_b_k) hop_3_i_k)
7450  (=> (and hop_2_i_b hop_1_b_j) hop_3_i_j)
7451  (=> (and hop_2_i_b hop_1_b_m) hop_3_i_m)
7452  (=> (and hop_2_i_b hop_1_b_l) hop_3_i_l)
7453  (=> (and hop_2_i_b hop_1_b_o) hop_3_i_o)
7454  (=> (and hop_2_i_b hop_1_b_n) hop_3_i_n)
7455  (=> (and hop_2_i_b hop_1_b_q) hop_3_i_q)
7456  (=> (and hop_2_i_b hop_1_b_p) hop_3_i_p)
7457  (=> (and hop_2_i_e hop_1_e_a) hop_3_i_a)
7458  (=> (and hop_2_i_e hop_1_e_c) hop_3_i_c)
7459  (=> (and hop_2_i_e hop_1_e_b) hop_3_i_b)
7460  (=> (and hop_2_i_e hop_1_e_d) hop_3_i_d)
7461  (=> (and hop_2_i_e hop_1_e_g) hop_3_i_g)
7462  (=> (and hop_2_i_e hop_1_e_f) hop_3_i_f)
7463  (=> (and hop_2_i_e hop_1_e_h) hop_3_i_h)
7464  (=> (and hop_2_i_e hop_1_e_k) hop_3_i_k)
7465  (=> (and hop_2_i_e hop_1_e_j) hop_3_i_j)
7466  (=> (and hop_2_i_e hop_1_e_m) hop_3_i_m)
7467  (=> (and hop_2_i_e hop_1_e_l) hop_3_i_l)
7468  (=> (and hop_2_i_e hop_1_e_o) hop_3_i_o)
7469  (=> (and hop_2_i_e hop_1_e_n) hop_3_i_n)
7470  (=> (and hop_2_i_e hop_1_e_q) hop_3_i_q)
7471  (=> (and hop_2_i_e hop_1_e_p) hop_3_i_p)
7472  (=> (and hop_2_i_d hop_1_d_a) hop_3_i_a)
7473  (=> (and hop_2_i_d hop_1_d_c) hop_3_i_c)
7474  (=> (and hop_2_i_d hop_1_d_b) hop_3_i_b)
7475  (=> (and hop_2_i_d hop_1_d_e) hop_3_i_e)
7476  (=> (and hop_2_i_d hop_1_d_g) hop_3_i_g)
7477  (=> (and hop_2_i_d hop_1_d_f) hop_3_i_f)
7478  (=> (and hop_2_i_d hop_1_d_h) hop_3_i_h)
7479  (=> (and hop_2_i_d hop_1_d_k) hop_3_i_k)
7480  (=> (and hop_2_i_d hop_1_d_j) hop_3_i_j)
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7481  (=> (and hop_2_i_d hop_1_d_m) hop_3_i_m)
7482  (=> (and hop_2_i_d hop_1_d_l) hop_3_i_l)
7483  (=> (and hop_2_i_d hop_1_d_o) hop_3_i_o)
7484  (=> (and hop_2_i_d hop_1_d_n) hop_3_i_n)
7485  (=> (and hop_2_i_d hop_1_d_q) hop_3_i_q)
7486  (=> (and hop_2_i_d hop_1_d_p) hop_3_i_p)
7487  (=> (and hop_2_i_g hop_1_g_a) hop_3_i_a)
7488  (=> (and hop_2_i_g hop_1_g_c) hop_3_i_c)
7489  (=> (and hop_2_i_g hop_1_g_b) hop_3_i_b)
7490  (=> (and hop_2_i_g hop_1_g_e) hop_3_i_e)
7491  (=> (and hop_2_i_g hop_1_g_d) hop_3_i_d)
7492  (=> (and hop_2_i_g hop_1_g_f) hop_3_i_f)
7493  (=> (and hop_2_i_g hop_1_g_h) hop_3_i_h)
7494  (=> (and hop_2_i_g hop_1_g_k) hop_3_i_k)
7495  (=> (and hop_2_i_g hop_1_g_j) hop_3_i_j)
7496  (=> (and hop_2_i_g hop_1_g_m) hop_3_i_m)
7497  (=> (and hop_2_i_g hop_1_g_l) hop_3_i_l)
7498  (=> (and hop_2_i_g hop_1_g_o) hop_3_i_o)
7499  (=> (and hop_2_i_g hop_1_g_n) hop_3_i_n)
7500  (=> (and hop_2_i_g hop_1_g_q) hop_3_i_q)
7501  (=> (and hop_2_i_g hop_1_g_p) hop_3_i_p)
7502  (=> (and hop_2_i_f hop_1_f_a) hop_3_i_a)
7503  (=> (and hop_2_i_f hop_1_f_c) hop_3_i_c)
7504  (=> (and hop_2_i_f hop_1_f_b) hop_3_i_b)
7505  (=> (and hop_2_i_f hop_1_f_e) hop_3_i_e)
7506  (=> (and hop_2_i_f hop_1_f_d) hop_3_i_d)
7507  (=> (and hop_2_i_f hop_1_f_g) hop_3_i_g)
7508  (=> (and hop_2_i_f hop_1_f_h) hop_3_i_h)
7509  (=> (and hop_2_i_f hop_1_f_k) hop_3_i_k)
7510  (=> (and hop_2_i_f hop_1_f_j) hop_3_i_j)
7511  (=> (and hop_2_i_f hop_1_f_m) hop_3_i_m)
7512  (=> (and hop_2_i_f hop_1_f_l) hop_3_i_l)
7513  (=> (and hop_2_i_f hop_1_f_o) hop_3_i_o)
7514  (=> (and hop_2_i_f hop_1_f_n) hop_3_i_n)
7515  (=> (and hop_2_i_f hop_1_f_q) hop_3_i_q)
7516  (=> (and hop_2_i_f hop_1_f_p) hop_3_i_p)
7517  (=> (and hop_2_i_h hop_1_h_a) hop_3_i_a)
7518  (=> (and hop_2_i_h hop_1_h_c) hop_3_i_c)
7519  (=> (and hop_2_i_h hop_1_h_b) hop_3_i_b)
7520  (=> (and hop_2_i_h hop_1_h_e) hop_3_i_e)
7521  (=> (and hop_2_i_h hop_1_h_d) hop_3_i_d)
7522  (=> (and hop_2_i_h hop_1_h_g) hop_3_i_g)
7523  (=> (and hop_2_i_h hop_1_h_f) hop_3_i_f)
7524  (=> (and hop_2_i_h hop_1_h_k) hop_3_i_k)
7525  (=> (and hop_2_i_h hop_1_h_j) hop_3_i_j)
7526  (=> (and hop_2_i_h hop_1_h_m) hop_3_i_m)
7527  (=> (and hop_2_i_h hop_1_h_l) hop_3_i_l)
7528  (=> (and hop_2_i_h hop_1_h_o) hop_3_i_o)
7529  (=> (and hop_2_i_h hop_1_h_n) hop_3_i_n)
7530  (=> (and hop_2_i_h hop_1_h_q) hop_3_i_q)
7531  (=> (and hop_2_i_h hop_1_h_p) hop_3_i_p)
7532  (=> (and hop_2_i_k hop_1_k_a) hop_3_i_a)
7533  (=> (and hop_2_i_k hop_1_k_c) hop_3_i_c)
7534  (=> (and hop_2_i_k hop_1_k_b) hop_3_i_b)
7535  (=> (and hop_2_i_k hop_1_k_e) hop_3_i_e)
7536  (=> (and hop_2_i_k hop_1_k_d) hop_3_i_d)
7537  (=> (and hop_2_i_k hop_1_k_g) hop_3_i_g)
7538  (=> (and hop_2_i_k hop_1_k_f) hop_3_i_f)
7539  (=> (and hop_2_i_k hop_1_k_h) hop_3_i_h)
7540  (=> (and hop_2_i_k hop_1_k_j) hop_3_i_j)
7541  (=> (and hop_2_i_k hop_1_k_m) hop_3_i_m)
7542  (=> (and hop_2_i_k hop_1_k_l) hop_3_i_l)
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7543  (=> (and hop_2_i_k hop_1_k_o) hop_3_i_o)
7544  (=> (and hop_2_i_k hop_1_k_n) hop_3_i_n)
7545  (=> (and hop_2_i_k hop_1_k_q) hop_3_i_q)
7546  (=> (and hop_2_i_k hop_1_k_p) hop_3_i_p)
7547  (=> (and hop_2_i_j hop_1_j_a) hop_3_i_a)
7548  (=> (and hop_2_i_j hop_1_j_c) hop_3_i_c)
7549  (=> (and hop_2_i_j hop_1_j_b) hop_3_i_b)
7550  (=> (and hop_2_i_j hop_1_j_e) hop_3_i_e)
7551  (=> (and hop_2_i_j hop_1_j_d) hop_3_i_d)
7552  (=> (and hop_2_i_j hop_1_j_g) hop_3_i_g)
7553  (=> (and hop_2_i_j hop_1_j_f) hop_3_i_f)
7554  (=> (and hop_2_i_j hop_1_j_h) hop_3_i_h)
7555  (=> (and hop_2_i_j hop_1_j_k) hop_3_i_k)
7556  (=> (and hop_2_i_j hop_1_j_m) hop_3_i_m)
7557  (=> (and hop_2_i_j hop_1_j_l) hop_3_i_l)
7558  (=> (and hop_2_i_j hop_1_j_o) hop_3_i_o)
7559  (=> (and hop_2_i_j hop_1_j_n) hop_3_i_n)
7560  (=> (and hop_2_i_j hop_1_j_q) hop_3_i_q)
7561  (=> (and hop_2_i_j hop_1_j_p) hop_3_i_p)
7562  (=> (and hop_2_i_m hop_1_m_a) hop_3_i_a)
7563  (=> (and hop_2_i_m hop_1_m_c) hop_3_i_c)
7564  (=> (and hop_2_i_m hop_1_m_b) hop_3_i_b)
7565  (=> (and hop_2_i_m hop_1_m_e) hop_3_i_e)
7566  (=> (and hop_2_i_m hop_1_m_d) hop_3_i_d)
7567  (=> (and hop_2_i_m hop_1_m_g) hop_3_i_g)
7568  (=> (and hop_2_i_m hop_1_m_f) hop_3_i_f)
7569  (=> (and hop_2_i_m hop_1_m_h) hop_3_i_h)
7570  (=> (and hop_2_i_m hop_1_m_k) hop_3_i_k)
7571  (=> (and hop_2_i_m hop_1_m_j) hop_3_i_j)
7572  (=> (and hop_2_i_m hop_1_m_l) hop_3_i_l)
7573  (=> (and hop_2_i_m hop_1_m_o) hop_3_i_o)
7574  (=> (and hop_2_i_m hop_1_m_n) hop_3_i_n)
7575  (=> (and hop_2_i_m hop_1_m_q) hop_3_i_q)
7576  (=> (and hop_2_i_m hop_1_m_p) hop_3_i_p)
7577  (=> (and hop_2_i_l hop_1_l_a) hop_3_i_a)
7578  (=> (and hop_2_i_l hop_1_l_c) hop_3_i_c)
7579  (=> (and hop_2_i_l hop_1_l_b) hop_3_i_b)
7580  (=> (and hop_2_i_l hop_1_l_e) hop_3_i_e)
7581  (=> (and hop_2_i_l hop_1_l_d) hop_3_i_d)
7582  (=> (and hop_2_i_l hop_1_l_g) hop_3_i_g)
7583  (=> (and hop_2_i_l hop_1_l_f) hop_3_i_f)
7584  (=> (and hop_2_i_l hop_1_l_h) hop_3_i_h)
7585  (=> (and hop_2_i_l hop_1_l_k) hop_3_i_k)
7586  (=> (and hop_2_i_l hop_1_l_j) hop_3_i_j)
7587  (=> (and hop_2_i_l hop_1_l_m) hop_3_i_m)
7588  (=> (and hop_2_i_l hop_1_l_o) hop_3_i_o)
7589  (=> (and hop_2_i_l hop_1_l_n) hop_3_i_n)
7590  (=> (and hop_2_i_l hop_1_l_q) hop_3_i_q)
7591  (=> (and hop_2_i_l hop_1_l_p) hop_3_i_p)
7592  (=> (and hop_2_i_o hop_1_o_a) hop_3_i_a)
7593  (=> (and hop_2_i_o hop_1_o_c) hop_3_i_c)
7594  (=> (and hop_2_i_o hop_1_o_b) hop_3_i_b)
7595  (=> (and hop_2_i_o hop_1_o_e) hop_3_i_e)
7596  (=> (and hop_2_i_o hop_1_o_d) hop_3_i_d)
7597  (=> (and hop_2_i_o hop_1_o_g) hop_3_i_g)
7598  (=> (and hop_2_i_o hop_1_o_f) hop_3_i_f)
7599  (=> (and hop_2_i_o hop_1_o_h) hop_3_i_h)
7600  (=> (and hop_2_i_o hop_1_o_k) hop_3_i_k)
7601  (=> (and hop_2_i_o hop_1_o_j) hop_3_i_j)
7602  (=> (and hop_2_i_o hop_1_o_m) hop_3_i_m)
7603  (=> (and hop_2_i_o hop_1_o_l) hop_3_i_l)
7604  (=> (and hop_2_i_o hop_1_o_n) hop_3_i_n)
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7605  (=> (and hop_2_i_o hop_1_o_q) hop_3_i_q)
7606  (=> (and hop_2_i_o hop_1_o_p) hop_3_i_p)
7607  (=> (and hop_2_i_n hop_1_n_a) hop_3_i_a)
7608  (=> (and hop_2_i_n hop_1_n_c) hop_3_i_c)
7609  (=> (and hop_2_i_n hop_1_n_b) hop_3_i_b)
7610  (=> (and hop_2_i_n hop_1_n_e) hop_3_i_e)
7611  (=> (and hop_2_i_n hop_1_n_d) hop_3_i_d)
7612  (=> (and hop_2_i_n hop_1_n_g) hop_3_i_g)
7613  (=> (and hop_2_i_n hop_1_n_f) hop_3_i_f)
7614  (=> (and hop_2_i_n hop_1_n_h) hop_3_i_h)
7615  (=> (and hop_2_i_n hop_1_n_k) hop_3_i_k)
7616  (=> (and hop_2_i_n hop_1_n_j) hop_3_i_j)
7617  (=> (and hop_2_i_n hop_1_n_m) hop_3_i_m)
7618  (=> (and hop_2_i_n hop_1_n_l) hop_3_i_l)
7619  (=> (and hop_2_i_n hop_1_n_o) hop_3_i_o)
7620  (=> (and hop_2_i_n hop_1_n_q) hop_3_i_q)
7621  (=> (and hop_2_i_n hop_1_n_p) hop_3_i_p)
7622  (=> (and hop_2_i_q hop_1_q_a) hop_3_i_a)
7623  (=> (and hop_2_i_q hop_1_q_c) hop_3_i_c)
7624  (=> (and hop_2_i_q hop_1_q_b) hop_3_i_b)
7625  (=> (and hop_2_i_q hop_1_q_e) hop_3_i_e)
7626  (=> (and hop_2_i_q hop_1_q_d) hop_3_i_d)
7627  (=> (and hop_2_i_q hop_1_q_g) hop_3_i_g)
7628  (=> (and hop_2_i_q hop_1_q_f) hop_3_i_f)
7629  (=> (and hop_2_i_q hop_1_q_h) hop_3_i_h)
7630  (=> (and hop_2_i_q hop_1_q_k) hop_3_i_k)
7631  (=> (and hop_2_i_q hop_1_q_j) hop_3_i_j)
7632  (=> (and hop_2_i_q hop_1_q_m) hop_3_i_m)
7633  (=> (and hop_2_i_q hop_1_q_l) hop_3_i_l)
7634  (=> (and hop_2_i_q hop_1_q_o) hop_3_i_o)
7635  (=> (and hop_2_i_q hop_1_q_n) hop_3_i_n)
7636  (=> (and hop_2_i_q hop_1_q_p) hop_3_i_p)
7637  (=> (and hop_2_i_p hop_1_p_a) hop_3_i_a)
7638  (=> (and hop_2_i_p hop_1_p_c) hop_3_i_c)
7639  (=> (and hop_2_i_p hop_1_p_b) hop_3_i_b)
7640  (=> (and hop_2_i_p hop_1_p_e) hop_3_i_e)
7641  (=> (and hop_2_i_p hop_1_p_d) hop_3_i_d)
7642  (=> (and hop_2_i_p hop_1_p_g) hop_3_i_g)
7643  (=> (and hop_2_i_p hop_1_p_f) hop_3_i_f)
7644  (=> (and hop_2_i_p hop_1_p_h) hop_3_i_h)
7645  (=> (and hop_2_i_p hop_1_p_k) hop_3_i_k)
7646  (=> (and hop_2_i_p hop_1_p_j) hop_3_i_j)
7647  (=> (and hop_2_i_p hop_1_p_m) hop_3_i_m)
7648  (=> (and hop_2_i_p hop_1_p_l) hop_3_i_l)
7649  (=> (and hop_2_i_p hop_1_p_o) hop_3_i_o)
7650  (=> (and hop_2_i_p hop_1_p_n) hop_3_i_n)
7651  (=> (and hop_2_i_p hop_1_p_q) hop_3_i_q)
7652  (=> (and hop_2_h_a hop_1_a_c) hop_3_h_c)
7653  (=> (and hop_2_h_a hop_1_a_b) hop_3_h_b)
7654  (=> (and hop_2_h_a hop_1_a_e) hop_3_h_e)
7655  (=> (and hop_2_h_a hop_1_a_d) hop_3_h_d)
7656  (=> (and hop_2_h_a hop_1_a_g) hop_3_h_g)
7657  (=> (and hop_2_h_a hop_1_a_f) hop_3_h_f)
7658  (=> (and hop_2_h_a hop_1_a_i) hop_3_h_i)
7659  (=> (and hop_2_h_a hop_1_a_k) hop_3_h_k)
7660  (=> (and hop_2_h_a hop_1_a_j) hop_3_h_j)
7661  (=> (and hop_2_h_a hop_1_a_m) hop_3_h_m)
7662  (=> (and hop_2_h_a hop_1_a_l) hop_3_h_l)
7663  (=> (and hop_2_h_a hop_1_a_o) hop_3_h_o)
7664  (=> (and hop_2_h_a hop_1_a_n) hop_3_h_n)
7665  (=> (and hop_2_h_a hop_1_a_q) hop_3_h_q)
7666  (=> (and hop_2_h_a hop_1_a_p) hop_3_h_p)
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7667  (=> (and hop_2_h_c hop_1_c_a) hop_3_h_a)
7668  (=> (and hop_2_h_c hop_1_c_b) hop_3_h_b)
7669  (=> (and hop_2_h_c hop_1_c_e) hop_3_h_e)
7670  (=> (and hop_2_h_c hop_1_c_d) hop_3_h_d)
7671  (=> (and hop_2_h_c hop_1_c_g) hop_3_h_g)
7672  (=> (and hop_2_h_c hop_1_c_f) hop_3_h_f)
7673  (=> (and hop_2_h_c hop_1_c_i) hop_3_h_i)
7674  (=> (and hop_2_h_c hop_1_c_k) hop_3_h_k)
7675  (=> (and hop_2_h_c hop_1_c_j) hop_3_h_j)
7676  (=> (and hop_2_h_c hop_1_c_m) hop_3_h_m)
7677  (=> (and hop_2_h_c hop_1_c_l) hop_3_h_l)
7678  (=> (and hop_2_h_c hop_1_c_o) hop_3_h_o)
7679  (=> (and hop_2_h_c hop_1_c_n) hop_3_h_n)
7680  (=> (and hop_2_h_c hop_1_c_q) hop_3_h_q)
7681  (=> (and hop_2_h_c hop_1_c_p) hop_3_h_p)
7682  (=> (and hop_2_h_b hop_1_b_a) hop_3_h_a)
7683  (=> (and hop_2_h_b hop_1_b_c) hop_3_h_c)
7684  (=> (and hop_2_h_b hop_1_b_e) hop_3_h_e)
7685  (=> (and hop_2_h_b hop_1_b_d) hop_3_h_d)
7686  (=> (and hop_2_h_b hop_1_b_g) hop_3_h_g)
7687  (=> (and hop_2_h_b hop_1_b_f) hop_3_h_f)
7688  (=> (and hop_2_h_b hop_1_b_i) hop_3_h_i)
7689  (=> (and hop_2_h_b hop_1_b_k) hop_3_h_k)
7690  (=> (and hop_2_h_b hop_1_b_j) hop_3_h_j)
7691  (=> (and hop_2_h_b hop_1_b_m) hop_3_h_m)
7692  (=> (and hop_2_h_b hop_1_b_l) hop_3_h_l)
7693  (=> (and hop_2_h_b hop_1_b_o) hop_3_h_o)
7694  (=> (and hop_2_h_b hop_1_b_n) hop_3_h_n)
7695  (=> (and hop_2_h_b hop_1_b_q) hop_3_h_q)
7696  (=> (and hop_2_h_b hop_1_b_p) hop_3_h_p)
7697  (=> (and hop_2_h_e hop_1_e_a) hop_3_h_a)
7698  (=> (and hop_2_h_e hop_1_e_c) hop_3_h_c)
7699  (=> (and hop_2_h_e hop_1_e_b) hop_3_h_b)
7700  (=> (and hop_2_h_e hop_1_e_d) hop_3_h_d)
7701  (=> (and hop_2_h_e hop_1_e_g) hop_3_h_g)
7702  (=> (and hop_2_h_e hop_1_e_f) hop_3_h_f)
7703  (=> (and hop_2_h_e hop_1_e_i) hop_3_h_i)
7704  (=> (and hop_2_h_e hop_1_e_k) hop_3_h_k)
7705  (=> (and hop_2_h_e hop_1_e_j) hop_3_h_j)
7706  (=> (and hop_2_h_e hop_1_e_m) hop_3_h_m)
7707  (=> (and hop_2_h_e hop_1_e_l) hop_3_h_l)
7708  (=> (and hop_2_h_e hop_1_e_o) hop_3_h_o)
7709  (=> (and hop_2_h_e hop_1_e_n) hop_3_h_n)
7710  (=> (and hop_2_h_e hop_1_e_q) hop_3_h_q)
7711  (=> (and hop_2_h_e hop_1_e_p) hop_3_h_p)
7712  (=> (and hop_2_h_d hop_1_d_a) hop_3_h_a)
7713  (=> (and hop_2_h_d hop_1_d_c) hop_3_h_c)
7714  (=> (and hop_2_h_d hop_1_d_b) hop_3_h_b)
7715  (=> (and hop_2_h_d hop_1_d_e) hop_3_h_e)
7716  (=> (and hop_2_h_d hop_1_d_g) hop_3_h_g)
7717  (=> (and hop_2_h_d hop_1_d_f) hop_3_h_f)
7718  (=> (and hop_2_h_d hop_1_d_i) hop_3_h_i)
7719  (=> (and hop_2_h_d hop_1_d_k) hop_3_h_k)
7720  (=> (and hop_2_h_d hop_1_d_j) hop_3_h_j)
7721  (=> (and hop_2_h_d hop_1_d_m) hop_3_h_m)
7722  (=> (and hop_2_h_d hop_1_d_l) hop_3_h_l)
7723  (=> (and hop_2_h_d hop_1_d_o) hop_3_h_o)
7724  (=> (and hop_2_h_d hop_1_d_n) hop_3_h_n)
7725  (=> (and hop_2_h_d hop_1_d_q) hop_3_h_q)
7726  (=> (and hop_2_h_d hop_1_d_p) hop_3_h_p)
7727  (=> (and hop_2_h_g hop_1_g_a) hop_3_h_a)
7728  (=> (and hop_2_h_g hop_1_g_c) hop_3_h_c)
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7729   (=> (and hop_2_h_g hop_1_g_b) hop_3_h_b)
7730   (=> (and hop_2_h_g hop_1_g_e) hop_3_h_e)
7731   (=> (and hop_2_h_g hop_1_g_d) hop_3_h_d)
7732   (=> (and hop_2_h_g hop_1_g_f) hop_3_h_f)
7733   (=> (and hop_2_h_g hop_1_g_i) hop_3_h_i)
7734   (=> (and hop_2_h_g hop_1_g_k) hop_3_h_k)
7735   (=> (and hop_2_h_g hop_1_g_j) hop_3_h_j)
7736   (=> (and hop_2_h_g hop_1_g_m) hop_3_h_m)
7737   (=> (and hop_2_h_g hop_1_g_l) hop_3_h_l)
7738   (=> (and hop_2_h_g hop_1_g_o) hop_3_h_o)
7739   (=> (and hop_2_h_g hop_1_g_n) hop_3_h_n)
7740   (=> (and hop_2_h_g hop_1_g_q) hop_3_h_q)
7741   (=> (and hop_2_h_g hop_1_g_p) hop_3_h_p)
7742   (=> (and hop_2_h_f hop_1_f_a) hop_3_h_a)
7743   (=> (and hop_2_h_f hop_1_f_c) hop_3_h_c)
7744   (=> (and hop_2_h_f hop_1_f_b) hop_3_h_b)
7745   (=> (and hop_2_h_f hop_1_f_e) hop_3_h_e)
7746   (=> (and hop_2_h_f hop_1_f_d) hop_3_h_d)
7747   (=> (and hop_2_h_f hop_1_f_g) hop_3_h_g)
7748   (=> (and hop_2_h_f hop_1_f_i) hop_3_h_i)
7749   (=> (and hop_2_h_f hop_1_f_k) hop_3_h_k)
7750   (=> (and hop_2_h_f hop_1_f_j) hop_3_h_j)
7751   (=> (and hop_2_h_f hop_1_f_m) hop_3_h_m)
7752   (=> (and hop_2_h_f hop_1_f_l) hop_3_h_l)
7753   (=> (and hop_2_h_f hop_1_f_o) hop_3_h_o)
7754   (=> (and hop_2_h_f hop_1_f_n) hop_3_h_n)
7755   (=> (and hop_2_h_f hop_1_f_q) hop_3_h_q)
7756   (=> (and hop_2_h_f hop_1_f_p) hop_3_h_p)
7757   (=> (and hop_2_h_i hop_1_i_a) hop_3_h_a)
7758   (=> (and hop_2_h_i hop_1_i_c) hop_3_h_c)
7759   (=> (and hop_2_h_i hop_1_i_b) hop_3_h_b)
7760   (=> (and hop_2_h_i hop_1_i_e) hop_3_h_e)
7761   (=> (and hop_2_h_i hop_1_i_d) hop_3_h_d)
7762   (=> (and hop_2_h_i hop_1_i_g) hop_3_h_g)
7763   (=> (and hop_2_h_i hop_1_i_f) hop_3_h_f)
7764   (=> (and hop_2_h_i hop_1_i_k) hop_3_h_k)
7765   (=> (and hop_2_h_i hop_1_i_j) hop_3_h_j)
7766   (=> (and hop_2_h_i hop_1_i_m) hop_3_h_m)
7767   (=> (and hop_2_h_i hop_1_i_l) hop_3_h_l)
7768   (=> (and hop_2_h_i hop_1_i_o) hop_3_h_o)
7769   (=> (and hop_2_h_i hop_1_i_n) hop_3_h_n)
7770   (=> (and hop_2_h_i hop_1_i_q) hop_3_h_q)
7771   (=> (and hop_2_h_i hop_1_i_p) hop_3_h_p)
7772   (=> (and hop_2_h_k hop_1_k_a) hop_3_h_a)
7773   (=> (and hop_2_h_k hop_1_k_c) hop_3_h_c)
7774   (=> (and hop_2_h_k hop_1_k_b) hop_3_h_b)
7775   (=> (and hop_2_h_k hop_1_k_e) hop_3_h_e)
7776   (=> (and hop_2_h_k hop_1_k_d) hop_3_h_d)
7777   (=> (and hop_2_h_k hop_1_k_g) hop_3_h_g)
7778   (=> (and hop_2_h_k hop_1_k_f) hop_3_h_f)
7779   (=> (and hop_2_h_k hop_1_k_i) hop_3_h_i)
7780   (=> (and hop_2_h_k hop_1_k_j) hop_3_h_j)
7781   (=> (and hop_2_h_k hop_1_k_m) hop_3_h_m)
7782   (=> (and hop_2_h_k hop_1_k_l) hop_3_h_l)
7783   (=> (and hop_2_h_k hop_1_k_o) hop_3_h_o)
7784   (=> (and hop_2_h_k hop_1_k_n) hop_3_h_n)
7785   (=> (and hop_2_h_k hop_1_k_q) hop_3_h_q)
7786   (=> (and hop_2_h_k hop_1_k_p) hop_3_h_p)
7787   (=> (and hop_2_h_j hop_1_j_a) hop_3_h_a)
7788   (=> (and hop_2_h_j hop_1_j_c) hop_3_h_c)
7789   (=> (and hop_2_h_j hop_1_j_b) hop_3_h_b)
7790   (=> (and hop_2_h_j hop_1_j_e) hop_3_h_e)
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7791   (=> (and hop_2_h_j hop_1_j_d) hop_3_h_d)
7792   (=> (and hop_2_h_j hop_1_j_g) hop_3_h_g)
7793   (=> (and hop_2_h_j hop_1_j_f) hop_3_h_f)
7794   (=> (and hop_2_h_j hop_1_j_i) hop_3_h_i)
7795   (=> (and hop_2_h_j hop_1_j_k) hop_3_h_k)
7796   (=> (and hop_2_h_j hop_1_j_m) hop_3_h_m)
7797   (=> (and hop_2_h_j hop_1_j_l) hop_3_h_l)
7798   (=> (and hop_2_h_j hop_1_j_o) hop_3_h_o)
7799   (=> (and hop_2_h_j hop_1_j_n) hop_3_h_n)
7800   (=> (and hop_2_h_j hop_1_j_q) hop_3_h_q)
7801   (=> (and hop_2_h_j hop_1_j_p) hop_3_h_p)
7802   (=> (and hop_2_h_m hop_1_m_a) hop_3_h_a)
7803   (=> (and hop_2_h_m hop_1_m_c) hop_3_h_c)
7804   (=> (and hop_2_h_m hop_1_m_b) hop_3_h_b)
7805   (=> (and hop_2_h_m hop_1_m_e) hop_3_h_e)
7806   (=> (and hop_2_h_m hop_1_m_d) hop_3_h_d)
7807   (=> (and hop_2_h_m hop_1_m_g) hop_3_h_g)
7808   (=> (and hop_2_h_m hop_1_m_f) hop_3_h_f)
7809   (=> (and hop_2_h_m hop_1_m_i) hop_3_h_i)
7810   (=> (and hop_2_h_m hop_1_m_k) hop_3_h_k)
7811   (=> (and hop_2_h_m hop_1_m_j) hop_3_h_j)
7812   (=> (and hop_2_h_m hop_1_m_l) hop_3_h_l)
7813   (=> (and hop_2_h_m hop_1_m_o) hop_3_h_o)
7814   (=> (and hop_2_h_m hop_1_m_n) hop_3_h_n)
7815   (=> (and hop_2_h_m hop_1_m_q) hop_3_h_q)
7816   (=> (and hop_2_h_m hop_1_m_p) hop_3_h_p)
7817   (=> (and hop_2_h_l hop_1_l_a) hop_3_h_a)
7818   (=> (and hop_2_h_l hop_1_l_c) hop_3_h_c)
7819   (=> (and hop_2_h_l hop_1_l_b) hop_3_h_b)
7820   (=> (and hop_2_h_l hop_1_l_e) hop_3_h_e)
7821   (=> (and hop_2_h_l hop_1_l_d) hop_3_h_d)
7822   (=> (and hop_2_h_l hop_1_l_g) hop_3_h_g)
7823   (=> (and hop_2_h_l hop_1_l_f) hop_3_h_f)
7824   (=> (and hop_2_h_l hop_1_l_i) hop_3_h_i)
7825   (=> (and hop_2_h_l hop_1_l_k) hop_3_h_k)
7826   (=> (and hop_2_h_l hop_1_l_j) hop_3_h_j)
7827   (=> (and hop_2_h_l hop_1_l_m) hop_3_h_m)
7828   (=> (and hop_2_h_l hop_1_l_o) hop_3_h_o)
7829   (=> (and hop_2_h_l hop_1_l_n) hop_3_h_n)
7830   (=> (and hop_2_h_l hop_1_l_q) hop_3_h_q)
7831   (=> (and hop_2_h_l hop_1_l_p) hop_3_h_p)
7832   (=> (and hop_2_h_o hop_1_o_a) hop_3_h_a)
7833   (=> (and hop_2_h_o hop_1_o_c) hop_3_h_c)
7834   (=> (and hop_2_h_o hop_1_o_b) hop_3_h_b)
7835   (=> (and hop_2_h_o hop_1_o_e) hop_3_h_e)
7836   (=> (and hop_2_h_o hop_1_o_d) hop_3_h_d)
7837   (=> (and hop_2_h_o hop_1_o_g) hop_3_h_g)
7838   (=> (and hop_2_h_o hop_1_o_f) hop_3_h_f)
7839   (=> (and hop_2_h_o hop_1_o_i) hop_3_h_i)
7840   (=> (and hop_2_h_o hop_1_o_k) hop_3_h_k)
7841   (=> (and hop_2_h_o hop_1_o_j) hop_3_h_j)
7842   (=> (and hop_2_h_o hop_1_o_m) hop_3_h_m)
7843   (=> (and hop_2_h_o hop_1_o_l) hop_3_h_l)
7844   (=> (and hop_2_h_o hop_1_o_n) hop_3_h_n)
7845   (=> (and hop_2_h_o hop_1_o_q) hop_3_h_q)
7846   (=> (and hop_2_h_o hop_1_o_p) hop_3_h_p)
7847   (=> (and hop_2_h_n hop_1_n_a) hop_3_h_a)
7848   (=> (and hop_2_h_n hop_1_n_c) hop_3_h_c)
7849   (=> (and hop_2_h_n hop_1_n_b) hop_3_h_b)
7850   (=> (and hop_2_h_n hop_1_n_e) hop_3_h_e)
7851   (=> (and hop_2_h_n hop_1_n_d) hop_3_h_d)
7852   (=> (and hop_2_h_n hop_1_n_g) hop_3_h_g)
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7853  (=> (and hop_2_h_n hop_1_n_f) hop_3_h_f)
7854  (=> (and hop_2_h_n hop_1_n_i) hop_3_h_i)
7855  (=> (and hop_2_h_n hop_1_n_k) hop_3_h_k)
7856  (=> (and hop_2_h_n hop_1_n_j) hop_3_h_j)
7857  (=> (and hop_2_h_n hop_1_n_m) hop_3_h_m)
7858  (=> (and hop_2_h_n hop_1_n_l) hop_3_h_l)
7859  (=> (and hop_2_h_n hop_1_n_o) hop_3_h_o)
7860  (=> (and hop_2_h_n hop_1_n_q) hop_3_h_q)
7861  (=> (and hop_2_h_n hop_1_n_p) hop_3_h_p)
7862  (=> (and hop_2_h_q hop_1_q_a) hop_3_h_a)
7863  (=> (and hop_2_h_q hop_1_q_c) hop_3_h_c)
7864  (=> (and hop_2_h_q hop_1_q_b) hop_3_h_b)
7865  (=> (and hop_2_h_q hop_1_q_e) hop_3_h_e)
7866  (=> (and hop_2_h_q hop_1_q_d) hop_3_h_d)
7867  (=> (and hop_2_h_q hop_1_q_g) hop_3_h_g)
7868  (=> (and hop_2_h_q hop_1_q_f) hop_3_h_f)
7869  (=> (and hop_2_h_q hop_1_q_i) hop_3_h_i)
7870  (=> (and hop_2_h_q hop_1_q_k) hop_3_h_k)
7871  (=> (and hop_2_h_q hop_1_q_j) hop_3_h_j)
7872  (=> (and hop_2_h_q hop_1_q_m) hop_3_h_m)
7873  (=> (and hop_2_h_q hop_1_q_l) hop_3_h_l)
7874  (=> (and hop_2_h_q hop_1_q_o) hop_3_h_o)
7875  (=> (and hop_2_h_q hop_1_q_n) hop_3_h_n)
7876  (=> (and hop_2_h_q hop_1_q_p) hop_3_h_p)
7877  (=> (and hop_2_h_p hop_1_p_a) hop_3_h_a)
7878  (=> (and hop_2_h_p hop_1_p_c) hop_3_h_c)
7879  (=> (and hop_2_h_p hop_1_p_b) hop_3_h_b)
7880  (=> (and hop_2_h_p hop_1_p_e) hop_3_h_e)
7881  (=> (and hop_2_h_p hop_1_p_d) hop_3_h_d)
7882  (=> (and hop_2_h_p hop_1_p_g) hop_3_h_g)
7883  (=> (and hop_2_h_p hop_1_p_f) hop_3_h_f)
7884  (=> (and hop_2_h_p hop_1_p_i) hop_3_h_i)
7885  (=> (and hop_2_h_p hop_1_p_k) hop_3_h_k)
7886  (=> (and hop_2_h_p hop_1_p_j) hop_3_h_j)
7887  (=> (and hop_2_h_p hop_1_p_m) hop_3_h_m)
7888  (=> (and hop_2_h_p hop_1_p_l) hop_3_h_l)
7889  (=> (and hop_2_h_p hop_1_p_o) hop_3_h_o)
7890  (=> (and hop_2_h_p hop_1_p_n) hop_3_h_n)
7891  (=> (and hop_2_h_p hop_1_p_q) hop_3_h_q)
7892  (=> (and hop_2_k_a hop_1_a_c) hop_3_k_c)
7893  (=> (and hop_2_k_a hop_1_a_b) hop_3_k_b)
7894  (=> (and hop_2_k_a hop_1_a_e) hop_3_k_e)
7895  (=> (and hop_2_k_a hop_1_a_d) hop_3_k_d)
7896  (=> (and hop_2_k_a hop_1_a_g) hop_3_k_g)
7897  (=> (and hop_2_k_a hop_1_a_f) hop_3_k_f)
7898  (=> (and hop_2_k_a hop_1_a_i) hop_3_k_i)
7899  (=> (and hop_2_k_a hop_1_a_h) hop_3_k_h)
7900  (=> (and hop_2_k_a hop_1_a_j) hop_3_k_j)
7901  (=> (and hop_2_k_a hop_1_a_m) hop_3_k_m)
7902  (=> (and hop_2_k_a hop_1_a_l) hop_3_k_l)
7903  (=> (and hop_2_k_a hop_1_a_o) hop_3_k_o)
7904  (=> (and hop_2_k_a hop_1_a_n) hop_3_k_n)
7905  (=> (and hop_2_k_a hop_1_a_q) hop_3_k_q)
7906  (=> (and hop_2_k_a hop_1_a_p) hop_3_k_p)
7907  (=> (and hop_2_k_c hop_1_c_a) hop_3_k_a)
7908  (=> (and hop_2_k_c hop_1_c_b) hop_3_k_b)
7909  (=> (and hop_2_k_c hop_1_c_e) hop_3_k_e)
7910  (=> (and hop_2_k_c hop_1_c_d) hop_3_k_d)
7911  (=> (and hop_2_k_c hop_1_c_g) hop_3_k_g)
7912  (=> (and hop_2_k_c hop_1_c_f) hop_3_k_f)
7913  (=> (and hop_2_k_c hop_1_c_i) hop_3_k_i)
7914  (=> (and hop_2_k_c hop_1_c_h) hop_3_k_h)
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7915  (=> (and hop_2_k_c hop_1_c_j) hop_3_k_j)
7916  (=> (and hop_2_k_c hop_1_c_m) hop_3_k_m)
7917  (=> (and hop_2_k_c hop_1_c_l) hop_3_k_l)
7918  (=> (and hop_2_k_c hop_1_c_o) hop_3_k_o)
7919  (=> (and hop_2_k_c hop_1_c_n) hop_3_k_n)
7920  (=> (and hop_2_k_c hop_1_c_q) hop_3_k_q)
7921  (=> (and hop_2_k_c hop_1_c_p) hop_3_k_p)
7922  (=> (and hop_2_k_b hop_1_b_a) hop_3_k_a)
7923  (=> (and hop_2_k_b hop_1_b_c) hop_3_k_c)
7924  (=> (and hop_2_k_b hop_1_b_e) hop_3_k_e)
7925  (=> (and hop_2_k_b hop_1_b_d) hop_3_k_d)
7926  (=> (and hop_2_k_b hop_1_b_g) hop_3_k_g)
7927  (=> (and hop_2_k_b hop_1_b_f) hop_3_k_f)
7928  (=> (and hop_2_k_b hop_1_b_i) hop_3_k_i)
7929  (=> (and hop_2_k_b hop_1_b_h) hop_3_k_h)
7930  (=> (and hop_2_k_b hop_1_b_j) hop_3_k_j)
7931  (=> (and hop_2_k_b hop_1_b_m) hop_3_k_m)
7932  (=> (and hop_2_k_b hop_1_b_l) hop_3_k_l)
7933  (=> (and hop_2_k_b hop_1_b_o) hop_3_k_o)
7934  (=> (and hop_2_k_b hop_1_b_n) hop_3_k_n)
7935  (=> (and hop_2_k_b hop_1_b_q) hop_3_k_q)
7936  (=> (and hop_2_k_b hop_1_b_p) hop_3_k_p)
7937  (=> (and hop_2_k_e hop_1_e_a) hop_3_k_a)
7938  (=> (and hop_2_k_e hop_1_e_c) hop_3_k_c)
7939  (=> (and hop_2_k_e hop_1_e_b) hop_3_k_b)
7940  (=> (and hop_2_k_e hop_1_e_d) hop_3_k_d)
7941  (=> (and hop_2_k_e hop_1_e_g) hop_3_k_g)
7942  (=> (and hop_2_k_e hop_1_e_f) hop_3_k_f)
7943  (=> (and hop_2_k_e hop_1_e_i) hop_3_k_i)
7944  (=> (and hop_2_k_e hop_1_e_h) hop_3_k_h)
7945  (=> (and hop_2_k_e hop_1_e_j) hop_3_k_j)
7946  (=> (and hop_2_k_e hop_1_e_m) hop_3_k_m)
7947  (=> (and hop_2_k_e hop_1_e_l) hop_3_k_l)
7948  (=> (and hop_2_k_e hop_1_e_o) hop_3_k_o)
7949  (=> (and hop_2_k_e hop_1_e_n) hop_3_k_n)
7950  (=> (and hop_2_k_e hop_1_e_q) hop_3_k_q)
7951  (=> (and hop_2_k_e hop_1_e_p) hop_3_k_p)
7952  (=> (and hop_2_k_d hop_1_d_a) hop_3_k_a)
7953  (=> (and hop_2_k_d hop_1_d_c) hop_3_k_c)
7954  (=> (and hop_2_k_d hop_1_d_b) hop_3_k_b)
7955  (=> (and hop_2_k_d hop_1_d_e) hop_3_k_e)
7956  (=> (and hop_2_k_d hop_1_d_g) hop_3_k_g)
7957  (=> (and hop_2_k_d hop_1_d_f) hop_3_k_f)
7958  (=> (and hop_2_k_d hop_1_d_i) hop_3_k_i)
7959  (=> (and hop_2_k_d hop_1_d_h) hop_3_k_h)
7960  (=> (and hop_2_k_d hop_1_d_j) hop_3_k_j)
7961  (=> (and hop_2_k_d hop_1_d_m) hop_3_k_m)
7962  (=> (and hop_2_k_d hop_1_d_l) hop_3_k_l)
7963  (=> (and hop_2_k_d hop_1_d_o) hop_3_k_o)
7964  (=> (and hop_2_k_d hop_1_d_n) hop_3_k_n)
7965  (=> (and hop_2_k_d hop_1_d_q) hop_3_k_q)
7966  (=> (and hop_2_k_d hop_1_d_p) hop_3_k_p)
7967  (=> (and hop_2_k_g hop_1_g_a) hop_3_k_a)
7968  (=> (and hop_2_k_g hop_1_g_c) hop_3_k_c)
7969  (=> (and hop_2_k_g hop_1_g_b) hop_3_k_b)
7970  (=> (and hop_2_k_g hop_1_g_e) hop_3_k_e)
7971  (=> (and hop_2_k_g hop_1_g_d) hop_3_k_d)
7972  (=> (and hop_2_k_g hop_1_g_f) hop_3_k_f)
7973  (=> (and hop_2_k_g hop_1_g_i) hop_3_k_i)
7974  (=> (and hop_2_k_g hop_1_g_h) hop_3_k_h)
7975  (=> (and hop_2_k_g hop_1_g_j) hop_3_k_j)
7976  (=> (and hop_2_k_g hop_1_g_m) hop_3_k_m)
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7977  (=> (and hop_2_k_g hop_1_g_l) hop_3_k_l)
7978  (=> (and hop_2_k_g hop_1_g_o) hop_3_k_o)
7979  (=> (and hop_2_k_g hop_1_g_n) hop_3_k_n)
7980  (=> (and hop_2_k_g hop_1_g_q) hop_3_k_q)
7981  (=> (and hop_2_k_g hop_1_g_p) hop_3_k_p)
7982  (=> (and hop_2_k_f hop_1_f_a) hop_3_k_a)
7983  (=> (and hop_2_k_f hop_1_f_c) hop_3_k_c)
7984  (=> (and hop_2_k_f hop_1_f_b) hop_3_k_b)
7985  (=> (and hop_2_k_f hop_1_f_e) hop_3_k_e)
7986  (=> (and hop_2_k_f hop_1_f_d) hop_3_k_d)
7987  (=> (and hop_2_k_f hop_1_f_g) hop_3_k_g)
7988  (=> (and hop_2_k_f hop_1_f_i) hop_3_k_i)
7989  (=> (and hop_2_k_f hop_1_f_h) hop_3_k_h)
7990  (=> (and hop_2_k_f hop_1_f_j) hop_3_k_j)
7991  (=> (and hop_2_k_f hop_1_f_m) hop_3_k_m)
7992  (=> (and hop_2_k_f hop_1_f_l) hop_3_k_l)
7993  (=> (and hop_2_k_f hop_1_f_o) hop_3_k_o)
7994  (=> (and hop_2_k_f hop_1_f_n) hop_3_k_n)
7995  (=> (and hop_2_k_f hop_1_f_q) hop_3_k_q)
7996  (=> (and hop_2_k_f hop_1_f_p) hop_3_k_p)
7997  (=> (and hop_2_k_i hop_1_i_a) hop_3_k_a)
7998  (=> (and hop_2_k_i hop_1_i_c) hop_3_k_c)
7999  (=> (and hop_2_k_i hop_1_i_b) hop_3_k_b)
8000  (=> (and hop_2_k_i hop_1_i_e) hop_3_k_e)
8001  (=> (and hop_2_k_i hop_1_i_d) hop_3_k_d)
8002  (=> (and hop_2_k_i hop_1_i_g) hop_3_k_g)
8003  (=> (and hop_2_k_i hop_1_i_f) hop_3_k_f)
8004  (=> (and hop_2_k_i hop_1_i_h) hop_3_k_h)
8005  (=> (and hop_2_k_i hop_1_i_j) hop_3_k_j)
8006  (=> (and hop_2_k_i hop_1_i_m) hop_3_k_m)
8007  (=> (and hop_2_k_i hop_1_i_l) hop_3_k_l)
8008  (=> (and hop_2_k_i hop_1_i_o) hop_3_k_o)
8009  (=> (and hop_2_k_i hop_1_i_n) hop_3_k_n)
8010  (=> (and hop_2_k_i hop_1_i_q) hop_3_k_q)
8011  (=> (and hop_2_k_i hop_1_i_p) hop_3_k_p)
8012  (=> (and hop_2_k_h hop_1_h_a) hop_3_k_a)
8013  (=> (and hop_2_k_h hop_1_h_c) hop_3_k_c)
8014  (=> (and hop_2_k_h hop_1_h_b) hop_3_k_b)
8015  (=> (and hop_2_k_h hop_1_h_e) hop_3_k_e)
8016  (=> (and hop_2_k_h hop_1_h_d) hop_3_k_d)
8017  (=> (and hop_2_k_h hop_1_h_g) hop_3_k_g)
8018  (=> (and hop_2_k_h hop_1_h_f) hop_3_k_f)
8019  (=> (and hop_2_k_h hop_1_h_i) hop_3_k_i)
8020  (=> (and hop_2_k_h hop_1_h_j) hop_3_k_j)
8021  (=> (and hop_2_k_h hop_1_h_m) hop_3_k_m)
8022  (=> (and hop_2_k_h hop_1_h_l) hop_3_k_l)
8023  (=> (and hop_2_k_h hop_1_h_o) hop_3_k_o)
8024  (=> (and hop_2_k_h hop_1_h_n) hop_3_k_n)
8025  (=> (and hop_2_k_h hop_1_h_q) hop_3_k_q)
8026  (=> (and hop_2_k_h hop_1_h_p) hop_3_k_p)
8027  (=> (and hop_2_k_j hop_1_j_a) hop_3_k_a)
8028  (=> (and hop_2_k_j hop_1_j_c) hop_3_k_c)
8029  (=> (and hop_2_k_j hop_1_j_b) hop_3_k_b)
8030  (=> (and hop_2_k_j hop_1_j_e) hop_3_k_e)
8031  (=> (and hop_2_k_j hop_1_j_d) hop_3_k_d)
8032  (=> (and hop_2_k_j hop_1_j_g) hop_3_k_g)
8033  (=> (and hop_2_k_j hop_1_j_f) hop_3_k_f)
8034  (=> (and hop_2_k_j hop_1_j_i) hop_3_k_i)
8035  (=> (and hop_2_k_j hop_1_j_h) hop_3_k_h)
8036  (=> (and hop_2_k_j hop_1_j_m) hop_3_k_m)
8037  (=> (and hop_2_k_j hop_1_j_l) hop_3_k_l)
8038  (=> (and hop_2_k_j hop_1_j_o) hop_3_k_o)
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8039  (=> (and hop_2_k_j hop_1_j_n) hop_3_k_n)
8040  (=> (and hop_2_k_j hop_1_j_q) hop_3_k_q)
8041  (=> (and hop_2_k_j hop_1_j_p) hop_3_k_p)
8042  (=> (and hop_2_k_m hop_1_m_a) hop_3_k_a)
8043  (=> (and hop_2_k_m hop_1_m_c) hop_3_k_c)
8044  (=> (and hop_2_k_m hop_1_m_b) hop_3_k_b)
8045  (=> (and hop_2_k_m hop_1_m_e) hop_3_k_e)
8046  (=> (and hop_2_k_m hop_1_m_d) hop_3_k_d)
8047  (=> (and hop_2_k_m hop_1_m_g) hop_3_k_g)
8048  (=> (and hop_2_k_m hop_1_m_f) hop_3_k_f)
8049  (=> (and hop_2_k_m hop_1_m_i) hop_3_k_i)
8050  (=> (and hop_2_k_m hop_1_m_h) hop_3_k_h)
8051  (=> (and hop_2_k_m hop_1_m_j) hop_3_k_j)
8052  (=> (and hop_2_k_m hop_1_m_l) hop_3_k_l)
8053  (=> (and hop_2_k_m hop_1_m_o) hop_3_k_o)
8054  (=> (and hop_2_k_m hop_1_m_n) hop_3_k_n)
8055  (=> (and hop_2_k_m hop_1_m_q) hop_3_k_q)
8056  (=> (and hop_2_k_m hop_1_m_p) hop_3_k_p)
8057  (=> (and hop_2_k_l hop_1_l_a) hop_3_k_a)
8058  (=> (and hop_2_k_l hop_1_l_c) hop_3_k_c)
8059  (=> (and hop_2_k_l hop_1_l_b) hop_3_k_b)
8060  (=> (and hop_2_k_l hop_1_l_e) hop_3_k_e)
8061  (=> (and hop_2_k_l hop_1_l_d) hop_3_k_d)
8062  (=> (and hop_2_k_l hop_1_l_g) hop_3_k_g)
8063  (=> (and hop_2_k_l hop_1_l_f) hop_3_k_f)
8064  (=> (and hop_2_k_l hop_1_l_i) hop_3_k_i)
8065  (=> (and hop_2_k_l hop_1_l_h) hop_3_k_h)
8066  (=> (and hop_2_k_l hop_1_l_j) hop_3_k_j)
8067  (=> (and hop_2_k_l hop_1_l_m) hop_3_k_m)
8068  (=> (and hop_2_k_l hop_1_l_o) hop_3_k_o)
8069  (=> (and hop_2_k_l hop_1_l_n) hop_3_k_n)
8070  (=> (and hop_2_k_l hop_1_l_q) hop_3_k_q)
8071  (=> (and hop_2_k_l hop_1_l_p) hop_3_k_p)
8072  (=> (and hop_2_k_o hop_1_o_a) hop_3_k_a)
8073  (=> (and hop_2_k_o hop_1_o_c) hop_3_k_c)
8074  (=> (and hop_2_k_o hop_1_o_b) hop_3_k_b)
8075  (=> (and hop_2_k_o hop_1_o_e) hop_3_k_e)
8076  (=> (and hop_2_k_o hop_1_o_d) hop_3_k_d)
8077  (=> (and hop_2_k_o hop_1_o_g) hop_3_k_g)
8078  (=> (and hop_2_k_o hop_1_o_f) hop_3_k_f)
8079  (=> (and hop_2_k_o hop_1_o_i) hop_3_k_i)
8080  (=> (and hop_2_k_o hop_1_o_h) hop_3_k_h)
8081  (=> (and hop_2_k_o hop_1_o_j) hop_3_k_j)
8082  (=> (and hop_2_k_o hop_1_o_m) hop_3_k_m)
8083  (=> (and hop_2_k_o hop_1_o_l) hop_3_k_l)
8084  (=> (and hop_2_k_o hop_1_o_n) hop_3_k_n)
8085  (=> (and hop_2_k_o hop_1_o_q) hop_3_k_q)
8086  (=> (and hop_2_k_o hop_1_o_p) hop_3_k_p)
8087  (=> (and hop_2_k_n hop_1_n_a) hop_3_k_a)
8088  (=> (and hop_2_k_n hop_1_n_c) hop_3_k_c)
8089  (=> (and hop_2_k_n hop_1_n_b) hop_3_k_b)
8090  (=> (and hop_2_k_n hop_1_n_e) hop_3_k_e)
8091  (=> (and hop_2_k_n hop_1_n_d) hop_3_k_d)
8092  (=> (and hop_2_k_n hop_1_n_g) hop_3_k_g)
8093  (=> (and hop_2_k_n hop_1_n_f) hop_3_k_f)
8094  (=> (and hop_2_k_n hop_1_n_i) hop_3_k_i)
8095  (=> (and hop_2_k_n hop_1_n_h) hop_3_k_h)
8096  (=> (and hop_2_k_n hop_1_n_j) hop_3_k_j)
8097  (=> (and hop_2_k_n hop_1_n_m) hop_3_k_m)
8098  (=> (and hop_2_k_n hop_1_n_l) hop_3_k_l)
8099  (=> (and hop_2_k_n hop_1_n_o) hop_3_k_o)
8100  (=> (and hop_2_k_n hop_1_n_q) hop_3_k_q)
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8101  (=> (and hop_2_k_n hop_1_n_p) hop_3_k_p)
8102  (=> (and hop_2_k_q hop_1_q_a) hop_3_k_a)
8103  (=> (and hop_2_k_q hop_1_q_c) hop_3_k_c)
8104  (=> (and hop_2_k_q hop_1_q_b) hop_3_k_b)
8105  (=> (and hop_2_k_q hop_1_q_e) hop_3_k_e)
8106  (=> (and hop_2_k_q hop_1_q_d) hop_3_k_d)
8107  (=> (and hop_2_k_q hop_1_q_g) hop_3_k_g)
8108  (=> (and hop_2_k_q hop_1_q_f) hop_3_k_f)
8109  (=> (and hop_2_k_q hop_1_q_i) hop_3_k_i)
8110  (=> (and hop_2_k_q hop_1_q_h) hop_3_k_h)
8111  (=> (and hop_2_k_q hop_1_q_j) hop_3_k_j)
8112  (=> (and hop_2_k_q hop_1_q_m) hop_3_k_m)
8113  (=> (and hop_2_k_q hop_1_q_l) hop_3_k_l)
8114  (=> (and hop_2_k_q hop_1_q_o) hop_3_k_o)
8115  (=> (and hop_2_k_q hop_1_q_n) hop_3_k_n)
8116  (=> (and hop_2_k_q hop_1_q_p) hop_3_k_p)
8117  (=> (and hop_2_k_p hop_1_p_a) hop_3_k_a)
8118  (=> (and hop_2_k_p hop_1_p_c) hop_3_k_c)
8119  (=> (and hop_2_k_p hop_1_p_b) hop_3_k_b)
8120  (=> (and hop_2_k_p hop_1_p_e) hop_3_k_e)
8121  (=> (and hop_2_k_p hop_1_p_d) hop_3_k_d)
8122  (=> (and hop_2_k_p hop_1_p_g) hop_3_k_g)
8123  (=> (and hop_2_k_p hop_1_p_f) hop_3_k_f)
8124  (=> (and hop_2_k_p hop_1_p_i) hop_3_k_i)
8125  (=> (and hop_2_k_p hop_1_p_h) hop_3_k_h)
8126  (=> (and hop_2_k_p hop_1_p_j) hop_3_k_j)
8127  (=> (and hop_2_k_p hop_1_p_m) hop_3_k_m)
8128  (=> (and hop_2_k_p hop_1_p_l) hop_3_k_l)
8129  (=> (and hop_2_k_p hop_1_p_o) hop_3_k_o)
8130  (=> (and hop_2_k_p hop_1_p_n) hop_3_k_n)
8131  (=> (and hop_2_k_p hop_1_p_q) hop_3_k_q)
8132  (=> (and hop_2_j_a hop_1_a_c) hop_3_j_c)
8133  (=> (and hop_2_j_a hop_1_a_b) hop_3_j_b)
8134  (=> (and hop_2_j_a hop_1_a_e) hop_3_j_e)
8135  (=> (and hop_2_j_a hop_1_a_d) hop_3_j_d)
8136  (=> (and hop_2_j_a hop_1_a_g) hop_3_j_g)
8137  (=> (and hop_2_j_a hop_1_a_f) hop_3_j_f)
8138  (=> (and hop_2_j_a hop_1_a_i) hop_3_j_i)
8139  (=> (and hop_2_j_a hop_1_a_h) hop_3_j_h)
8140  (=> (and hop_2_j_a hop_1_a_k) hop_3_j_k)
8141  (=> (and hop_2_j_a hop_1_a_m) hop_3_j_m)
8142  (=> (and hop_2_j_a hop_1_a_l) hop_3_j_l)
8143  (=> (and hop_2_j_a hop_1_a_o) hop_3_j_o)
8144  (=> (and hop_2_j_a hop_1_a_n) hop_3_j_n)
8145  (=> (and hop_2_j_a hop_1_a_q) hop_3_j_q)
8146  (=> (and hop_2_j_a hop_1_a_p) hop_3_j_p)
8147  (=> (and hop_2_j_c hop_1_c_a) hop_3_j_a)
8148  (=> (and hop_2_j_c hop_1_c_b) hop_3_j_b)
8149  (=> (and hop_2_j_c hop_1_c_e) hop_3_j_e)
8150  (=> (and hop_2_j_c hop_1_c_d) hop_3_j_d)
8151  (=> (and hop_2_j_c hop_1_c_g) hop_3_j_g)
8152  (=> (and hop_2_j_c hop_1_c_f) hop_3_j_f)
8153  (=> (and hop_2_j_c hop_1_c_i) hop_3_j_i)
8154  (=> (and hop_2_j_c hop_1_c_h) hop_3_j_h)
8155  (=> (and hop_2_j_c hop_1_c_k) hop_3_j_k)
8156  (=> (and hop_2_j_c hop_1_c_m) hop_3_j_m)
8157  (=> (and hop_2_j_c hop_1_c_l) hop_3_j_l)
8158  (=> (and hop_2_j_c hop_1_c_o) hop_3_j_o)
8159  (=> (and hop_2_j_c hop_1_c_n) hop_3_j_n)
8160  (=> (and hop_2_j_c hop_1_c_q) hop_3_j_q)
8161  (=> (and hop_2_j_c hop_1_c_p) hop_3_j_p)
8162  (=> (and hop_2_j_b hop_1_b_a) hop_3_j_a)
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8163  (=> (and hop_2_j_b hop_1_b_c) hop_3_j_c)
8164  (=> (and hop_2_j_b hop_1_b_e) hop_3_j_e)
8165  (=> (and hop_2_j_b hop_1_b_d) hop_3_j_d)
8166  (=> (and hop_2_j_b hop_1_b_g) hop_3_j_g)
8167  (=> (and hop_2_j_b hop_1_b_f) hop_3_j_f)
8168  (=> (and hop_2_j_b hop_1_b_i) hop_3_j_i)
8169  (=> (and hop_2_j_b hop_1_b_h) hop_3_j_h)
8170  (=> (and hop_2_j_b hop_1_b_k) hop_3_j_k)
8171  (=> (and hop_2_j_b hop_1_b_m) hop_3_j_m)
8172  (=> (and hop_2_j_b hop_1_b_l) hop_3_j_l)
8173  (=> (and hop_2_j_b hop_1_b_o) hop_3_j_o)
8174  (=> (and hop_2_j_b hop_1_b_n) hop_3_j_n)
8175  (=> (and hop_2_j_b hop_1_b_q) hop_3_j_q)
8176  (=> (and hop_2_j_b hop_1_b_p) hop_3_j_p)
8177  (=> (and hop_2_j_e hop_1_e_a) hop_3_j_a)
8178  (=> (and hop_2_j_e hop_1_e_c) hop_3_j_c)
8179  (=> (and hop_2_j_e hop_1_e_b) hop_3_j_b)
8180  (=> (and hop_2_j_e hop_1_e_d) hop_3_j_d)
8181  (=> (and hop_2_j_e hop_1_e_g) hop_3_j_g)
8182  (=> (and hop_2_j_e hop_1_e_f) hop_3_j_f)
8183  (=> (and hop_2_j_e hop_1_e_i) hop_3_j_i)
8184  (=> (and hop_2_j_e hop_1_e_h) hop_3_j_h)
8185  (=> (and hop_2_j_e hop_1_e_k) hop_3_j_k)
8186  (=> (and hop_2_j_e hop_1_e_m) hop_3_j_m)
8187  (=> (and hop_2_j_e hop_1_e_l) hop_3_j_l)
8188  (=> (and hop_2_j_e hop_1_e_o) hop_3_j_o)
8189  (=> (and hop_2_j_e hop_1_e_n) hop_3_j_n)
8190  (=> (and hop_2_j_e hop_1_e_q) hop_3_j_q)
8191  (=> (and hop_2_j_e hop_1_e_p) hop_3_j_p)
8192  (=> (and hop_2_j_d hop_1_d_a) hop_3_j_a)
8193  (=> (and hop_2_j_d hop_1_d_c) hop_3_j_c)
8194  (=> (and hop_2_j_d hop_1_d_b) hop_3_j_b)
8195  (=> (and hop_2_j_d hop_1_d_e) hop_3_j_e)
8196  (=> (and hop_2_j_d hop_1_d_g) hop_3_j_g)
8197  (=> (and hop_2_j_d hop_1_d_f) hop_3_j_f)
8198  (=> (and hop_2_j_d hop_1_d_i) hop_3_j_i)
8199  (=> (and hop_2_j_d hop_1_d_h) hop_3_j_h)
8200  (=> (and hop_2_j_d hop_1_d_k) hop_3_j_k)
8201  (=> (and hop_2_j_d hop_1_d_m) hop_3_j_m)
8202  (=> (and hop_2_j_d hop_1_d_l) hop_3_j_l)
8203  (=> (and hop_2_j_d hop_1_d_o) hop_3_j_o)
8204  (=> (and hop_2_j_d hop_1_d_n) hop_3_j_n)
8205  (=> (and hop_2_j_d hop_1_d_q) hop_3_j_q)
8206  (=> (and hop_2_j_d hop_1_d_p) hop_3_j_p)
8207  (=> (and hop_2_j_g hop_1_g_a) hop_3_j_a)
8208  (=> (and hop_2_j_g hop_1_g_c) hop_3_j_c)
8209  (=> (and hop_2_j_g hop_1_g_b) hop_3_j_b)
8210  (=> (and hop_2_j_g hop_1_g_e) hop_3_j_e)
8211  (=> (and hop_2_j_g hop_1_g_d) hop_3_j_d)
8212  (=> (and hop_2_j_g hop_1_g_f) hop_3_j_f)
8213  (=> (and hop_2_j_g hop_1_g_i) hop_3_j_i)
8214  (=> (and hop_2_j_g hop_1_g_h) hop_3_j_h)
8215  (=> (and hop_2_j_g hop_1_g_k) hop_3_j_k)
8216  (=> (and hop_2_j_g hop_1_g_m) hop_3_j_m)
8217  (=> (and hop_2_j_g hop_1_g_l) hop_3_j_l)
8218  (=> (and hop_2_j_g hop_1_g_o) hop_3_j_o)
8219  (=> (and hop_2_j_g hop_1_g_n) hop_3_j_n)
8220  (=> (and hop_2_j_g hop_1_g_q) hop_3_j_q)
8221  (=> (and hop_2_j_g hop_1_g_p) hop_3_j_p)
8222  (=> (and hop_2_j_f hop_1_f_a) hop_3_j_a)
8223  (=> (and hop_2_j_f hop_1_f_c) hop_3_j_c)
8224  (=> (and hop_2_j_f hop_1_f_b) hop_3_j_b)
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8225  (=> (and hop_2_j_f hop_1_f_e) hop_3_j_e)
8226  (=> (and hop_2_j_f hop_1_f_d) hop_3_j_d)
8227  (=> (and hop_2_j_f hop_1_f_g) hop_3_j_g)
8228  (=> (and hop_2_j_f hop_1_f_i) hop_3_j_i)
8229  (=> (and hop_2_j_f hop_1_f_h) hop_3_j_h)
8230  (=> (and hop_2_j_f hop_1_f_k) hop_3_j_k)
8231  (=> (and hop_2_j_f hop_1_f_m) hop_3_j_m)
8232  (=> (and hop_2_j_f hop_1_f_l) hop_3_j_l)
8233  (=> (and hop_2_j_f hop_1_f_o) hop_3_j_o)
8234  (=> (and hop_2_j_f hop_1_f_n) hop_3_j_n)
8235  (=> (and hop_2_j_f hop_1_f_q) hop_3_j_q)
8236  (=> (and hop_2_j_f hop_1_f_p) hop_3_j_p)
8237  (=> (and hop_2_j_i hop_1_i_a) hop_3_j_a)
8238  (=> (and hop_2_j_i hop_1_i_c) hop_3_j_c)
8239  (=> (and hop_2_j_i hop_1_i_b) hop_3_j_b)
8240  (=> (and hop_2_j_i hop_1_i_e) hop_3_j_e)
8241  (=> (and hop_2_j_i hop_1_i_d) hop_3_j_d)
8242  (=> (and hop_2_j_i hop_1_i_g) hop_3_j_g)
8243  (=> (and hop_2_j_i hop_1_i_f) hop_3_j_f)
8244  (=> (and hop_2_j_i hop_1_i_h) hop_3_j_h)
8245  (=> (and hop_2_j_i hop_1_i_k) hop_3_j_k)
8246  (=> (and hop_2_j_i hop_1_i_m) hop_3_j_m)
8247  (=> (and hop_2_j_i hop_1_i_l) hop_3_j_l)
8248  (=> (and hop_2_j_i hop_1_i_o) hop_3_j_o)
8249  (=> (and hop_2_j_i hop_1_i_n) hop_3_j_n)
8250  (=> (and hop_2_j_i hop_1_i_q) hop_3_j_q)
8251  (=> (and hop_2_j_i hop_1_i_p) hop_3_j_p)
8252  (=> (and hop_2_j_h hop_1_h_a) hop_3_j_a)
8253  (=> (and hop_2_j_h hop_1_h_c) hop_3_j_c)
8254  (=> (and hop_2_j_h hop_1_h_b) hop_3_j_b)
8255  (=> (and hop_2_j_h hop_1_h_e) hop_3_j_e)
8256  (=> (and hop_2_j_h hop_1_h_d) hop_3_j_d)
8257  (=> (and hop_2_j_h hop_1_h_g) hop_3_j_g)
8258  (=> (and hop_2_j_h hop_1_h_f) hop_3_j_f)
8259  (=> (and hop_2_j_h hop_1_h_i) hop_3_j_i)
8260  (=> (and hop_2_j_h hop_1_h_k) hop_3_j_k)
8261  (=> (and hop_2_j_h hop_1_h_m) hop_3_j_m)
8262  (=> (and hop_2_j_h hop_1_h_l) hop_3_j_l)
8263  (=> (and hop_2_j_h hop_1_h_o) hop_3_j_o)
8264  (=> (and hop_2_j_h hop_1_h_n) hop_3_j_n)
8265  (=> (and hop_2_j_h hop_1_h_q) hop_3_j_q)
8266  (=> (and hop_2_j_h hop_1_h_p) hop_3_j_p)
8267  (=> (and hop_2_j_k hop_1_k_a) hop_3_j_a)
8268  (=> (and hop_2_j_k hop_1_k_c) hop_3_j_c)
8269  (=> (and hop_2_j_k hop_1_k_b) hop_3_j_b)
8270  (=> (and hop_2_j_k hop_1_k_e) hop_3_j_e)
8271  (=> (and hop_2_j_k hop_1_k_d) hop_3_j_d)
8272  (=> (and hop_2_j_k hop_1_k_g) hop_3_j_g)
8273  (=> (and hop_2_j_k hop_1_k_f) hop_3_j_f)
8274  (=> (and hop_2_j_k hop_1_k_i) hop_3_j_i)
8275  (=> (and hop_2_j_k hop_1_k_h) hop_3_j_h)
8276  (=> (and hop_2_j_k hop_1_k_m) hop_3_j_m)
8277  (=> (and hop_2_j_k hop_1_k_l) hop_3_j_l)
8278  (=> (and hop_2_j_k hop_1_k_o) hop_3_j_o)
8279  (=> (and hop_2_j_k hop_1_k_n) hop_3_j_n)
8280  (=> (and hop_2_j_k hop_1_k_q) hop_3_j_q)
8281  (=> (and hop_2_j_k hop_1_k_p) hop_3_j_p)
8282  (=> (and hop_2_j_m hop_1_m_a) hop_3_j_a)
8283  (=> (and hop_2_j_m hop_1_m_c) hop_3_j_c)
8284  (=> (and hop_2_j_m hop_1_m_b) hop_3_j_b)
8285  (=> (and hop_2_j_m hop_1_m_e) hop_3_j_e)
8286  (=> (and hop_2_j_m hop_1_m_d) hop_3_j_d)
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8287  (=> (and hop_2_j_m hop_1_m_g) hop_3_j_g)
8288  (=> (and hop_2_j_m hop_1_m_f) hop_3_j_f)
8289  (=> (and hop_2_j_m hop_1_m_i) hop_3_j_i)
8290  (=> (and hop_2_j_m hop_1_m_h) hop_3_j_h)
8291  (=> (and hop_2_j_m hop_1_m_k) hop_3_j_k)
8292  (=> (and hop_2_j_m hop_1_m_l) hop_3_j_l)
8293  (=> (and hop_2_j_m hop_1_m_o) hop_3_j_o)
8294  (=> (and hop_2_j_m hop_1_m_n) hop_3_j_n)
8295  (=> (and hop_2_j_m hop_1_m_q) hop_3_j_q)
8296  (=> (and hop_2_j_m hop_1_m_p) hop_3_j_p)
8297  (=> (and hop_2_j_l hop_1_l_a) hop_3_j_a)
8298  (=> (and hop_2_j_l hop_1_l_c) hop_3_j_c)
8299  (=> (and hop_2_j_l hop_1_l_b) hop_3_j_b)
8300  (=> (and hop_2_j_l hop_1_l_e) hop_3_j_e)
8301  (=> (and hop_2_j_l hop_1_l_d) hop_3_j_d)
8302  (=> (and hop_2_j_l hop_1_l_g) hop_3_j_g)
8303  (=> (and hop_2_j_l hop_1_l_f) hop_3_j_f)
8304  (=> (and hop_2_j_l hop_1_l_i) hop_3_j_i)
8305  (=> (and hop_2_j_l hop_1_l_h) hop_3_j_h)
8306  (=> (and hop_2_j_l hop_1_l_k) hop_3_j_k)
8307  (=> (and hop_2_j_l hop_1_l_m) hop_3_j_m)
8308  (=> (and hop_2_j_l hop_1_l_o) hop_3_j_o)
8309  (=> (and hop_2_j_l hop_1_l_n) hop_3_j_n)
8310  (=> (and hop_2_j_l hop_1_l_q) hop_3_j_q)
8311  (=> (and hop_2_j_l hop_1_l_p) hop_3_j_p)
8312  (=> (and hop_2_j_o hop_1_o_a) hop_3_j_a)
8313  (=> (and hop_2_j_o hop_1_o_c) hop_3_j_c)
8314  (=> (and hop_2_j_o hop_1_o_b) hop_3_j_b)
8315  (=> (and hop_2_j_o hop_1_o_e) hop_3_j_e)
8316  (=> (and hop_2_j_o hop_1_o_d) hop_3_j_d)
8317  (=> (and hop_2_j_o hop_1_o_g) hop_3_j_g)
8318  (=> (and hop_2_j_o hop_1_o_f) hop_3_j_f)
8319  (=> (and hop_2_j_o hop_1_o_i) hop_3_j_i)
8320  (=> (and hop_2_j_o hop_1_o_h) hop_3_j_h)
8321  (=> (and hop_2_j_o hop_1_o_k) hop_3_j_k)
8322  (=> (and hop_2_j_o hop_1_o_m) hop_3_j_m)
8323  (=> (and hop_2_j_o hop_1_o_l) hop_3_j_l)
8324  (=> (and hop_2_j_o hop_1_o_n) hop_3_j_n)
8325  (=> (and hop_2_j_o hop_1_o_q) hop_3_j_q)
8326  (=> (and hop_2_j_o hop_1_o_p) hop_3_j_p)
8327  (=> (and hop_2_j_n hop_1_n_a) hop_3_j_a)
8328  (=> (and hop_2_j_n hop_1_n_c) hop_3_j_c)
8329  (=> (and hop_2_j_n hop_1_n_b) hop_3_j_b)
8330  (=> (and hop_2_j_n hop_1_n_e) hop_3_j_e)
8331  (=> (and hop_2_j_n hop_1_n_d) hop_3_j_d)
8332  (=> (and hop_2_j_n hop_1_n_g) hop_3_j_g)
8333  (=> (and hop_2_j_n hop_1_n_f) hop_3_j_f)
8334  (=> (and hop_2_j_n hop_1_n_i) hop_3_j_i)
8335  (=> (and hop_2_j_n hop_1_n_h) hop_3_j_h)
8336  (=> (and hop_2_j_n hop_1_n_k) hop_3_j_k)
8337  (=> (and hop_2_j_n hop_1_n_m) hop_3_j_m)
8338  (=> (and hop_2_j_n hop_1_n_l) hop_3_j_l)
8339  (=> (and hop_2_j_n hop_1_n_o) hop_3_j_o)
8340  (=> (and hop_2_j_n hop_1_n_q) hop_3_j_q)
8341  (=> (and hop_2_j_n hop_1_n_p) hop_3_j_p)
8342  (=> (and hop_2_j_q hop_1_q_a) hop_3_j_a)
8343  (=> (and hop_2_j_q hop_1_q_c) hop_3_j_c)
8344  (=> (and hop_2_j_q hop_1_q_b) hop_3_j_b)
8345  (=> (and hop_2_j_q hop_1_q_e) hop_3_j_e)
8346  (=> (and hop_2_j_q hop_1_q_d) hop_3_j_d)
8347  (=> (and hop_2_j_q hop_1_q_g) hop_3_j_g)
8348  (=> (and hop_2_j_q hop_1_q_f) hop_3_j_f)
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8349  (=> (and hop_2_j_q hop_1_q_i) hop_3_j_i)
8350  (=> (and hop_2_j_q hop_1_q_h) hop_3_j_h)
8351  (=> (and hop_2_j_q hop_1_q_k) hop_3_j_k)
8352  (=> (and hop_2_j_q hop_1_q_m) hop_3_j_m)
8353  (=> (and hop_2_j_q hop_1_q_l) hop_3_j_l)
8354  (=> (and hop_2_j_q hop_1_q_o) hop_3_j_o)
8355  (=> (and hop_2_j_q hop_1_q_n) hop_3_j_n)
8356  (=> (and hop_2_j_q hop_1_q_p) hop_3_j_p)
8357  (=> (and hop_2_j_p hop_1_p_a) hop_3_j_a)
8358  (=> (and hop_2_j_p hop_1_p_c) hop_3_j_c)
8359  (=> (and hop_2_j_p hop_1_p_b) hop_3_j_b)
8360  (=> (and hop_2_j_p hop_1_p_e) hop_3_j_e)
8361  (=> (and hop_2_j_p hop_1_p_d) hop_3_j_d)
8362  (=> (and hop_2_j_p hop_1_p_g) hop_3_j_g)
8363  (=> (and hop_2_j_p hop_1_p_f) hop_3_j_f)
8364  (=> (and hop_2_j_p hop_1_p_i) hop_3_j_i)
8365  (=> (and hop_2_j_p hop_1_p_h) hop_3_j_h)
8366  (=> (and hop_2_j_p hop_1_p_k) hop_3_j_k)
8367  (=> (and hop_2_j_p hop_1_p_m) hop_3_j_m)
8368  (=> (and hop_2_j_p hop_1_p_l) hop_3_j_l)
8369  (=> (and hop_2_j_p hop_1_p_o) hop_3_j_o)
8370  (=> (and hop_2_j_p hop_1_p_n) hop_3_j_n)
8371  (=> (and hop_2_j_p hop_1_p_q) hop_3_j_q)
8372  (=> (and hop_2_m_a hop_1_a_c) hop_3_m_c)
8373  (=> (and hop_2_m_a hop_1_a_b) hop_3_m_b)
8374  (=> (and hop_2_m_a hop_1_a_e) hop_3_m_e)
8375  (=> (and hop_2_m_a hop_1_a_d) hop_3_m_d)
8376  (=> (and hop_2_m_a hop_1_a_g) hop_3_m_g)
8377  (=> (and hop_2_m_a hop_1_a_f) hop_3_m_f)
8378  (=> (and hop_2_m_a hop_1_a_i) hop_3_m_i)
8379  (=> (and hop_2_m_a hop_1_a_h) hop_3_m_h)
8380  (=> (and hop_2_m_a hop_1_a_k) hop_3_m_k)
8381  (=> (and hop_2_m_a hop_1_a_j) hop_3_m_j)
8382  (=> (and hop_2_m_a hop_1_a_l) hop_3_m_l)
8383  (=> (and hop_2_m_a hop_1_a_o) hop_3_m_o)
8384  (=> (and hop_2_m_a hop_1_a_n) hop_3_m_n)
8385  (=> (and hop_2_m_a hop_1_a_q) hop_3_m_q)
8386  (=> (and hop_2_m_a hop_1_a_p) hop_3_m_p)
8387  (=> (and hop_2_m_c hop_1_c_a) hop_3_m_a)
8388  (=> (and hop_2_m_c hop_1_c_b) hop_3_m_b)
8389  (=> (and hop_2_m_c hop_1_c_e) hop_3_m_e)
8390  (=> (and hop_2_m_c hop_1_c_d) hop_3_m_d)
8391  (=> (and hop_2_m_c hop_1_c_g) hop_3_m_g)
8392  (=> (and hop_2_m_c hop_1_c_f) hop_3_m_f)
8393  (=> (and hop_2_m_c hop_1_c_i) hop_3_m_i)
8394  (=> (and hop_2_m_c hop_1_c_h) hop_3_m_h)
8395  (=> (and hop_2_m_c hop_1_c_k) hop_3_m_k)
8396  (=> (and hop_2_m_c hop_1_c_j) hop_3_m_j)
8397  (=> (and hop_2_m_c hop_1_c_l) hop_3_m_l)
8398  (=> (and hop_2_m_c hop_1_c_o) hop_3_m_o)
8399  (=> (and hop_2_m_c hop_1_c_n) hop_3_m_n)
8400  (=> (and hop_2_m_c hop_1_c_q) hop_3_m_q)
8401  (=> (and hop_2_m_c hop_1_c_p) hop_3_m_p)
8402  (=> (and hop_2_m_b hop_1_b_a) hop_3_m_a)
8403  (=> (and hop_2_m_b hop_1_b_c) hop_3_m_c)
8404  (=> (and hop_2_m_b hop_1_b_e) hop_3_m_e)
8405  (=> (and hop_2_m_b hop_1_b_d) hop_3_m_d)
8406  (=> (and hop_2_m_b hop_1_b_g) hop_3_m_g)
8407  (=> (and hop_2_m_b hop_1_b_f) hop_3_m_f)
8408  (=> (and hop_2_m_b hop_1_b_i) hop_3_m_i)
8409  (=> (and hop_2_m_b hop_1_b_h) hop_3_m_h)
8410  (=> (and hop_2_m_b hop_1_b_k) hop_3_m_k)
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8411  (=> (and hop_2_m_b hop_1_b_j) hop_3_m_j)
8412  (=> (and hop_2_m_b hop_1_b_l) hop_3_m_l)
8413  (=> (and hop_2_m_b hop_1_b_o) hop_3_m_o)
8414  (=> (and hop_2_m_b hop_1_b_n) hop_3_m_n)
8415  (=> (and hop_2_m_b hop_1_b_q) hop_3_m_q)
8416  (=> (and hop_2_m_b hop_1_b_p) hop_3_m_p)
8417  (=> (and hop_2_m_e hop_1_e_a) hop_3_m_a)
8418  (=> (and hop_2_m_e hop_1_e_c) hop_3_m_c)
8419  (=> (and hop_2_m_e hop_1_e_b) hop_3_m_b)
8420  (=> (and hop_2_m_e hop_1_e_d) hop_3_m_d)
8421  (=> (and hop_2_m_e hop_1_e_g) hop_3_m_g)
8422  (=> (and hop_2_m_e hop_1_e_f) hop_3_m_f)
8423  (=> (and hop_2_m_e hop_1_e_i) hop_3_m_i)
8424  (=> (and hop_2_m_e hop_1_e_h) hop_3_m_h)
8425  (=> (and hop_2_m_e hop_1_e_k) hop_3_m_k)
8426  (=> (and hop_2_m_e hop_1_e_j) hop_3_m_j)
8427  (=> (and hop_2_m_e hop_1_e_l) hop_3_m_l)
8428  (=> (and hop_2_m_e hop_1_e_o) hop_3_m_o)
8429  (=> (and hop_2_m_e hop_1_e_n) hop_3_m_n)
8430  (=> (and hop_2_m_e hop_1_e_q) hop_3_m_q)
8431  (=> (and hop_2_m_e hop_1_e_p) hop_3_m_p)
8432  (=> (and hop_2_m_d hop_1_d_a) hop_3_m_a)
8433  (=> (and hop_2_m_d hop_1_d_c) hop_3_m_c)
8434  (=> (and hop_2_m_d hop_1_d_b) hop_3_m_b)
8435  (=> (and hop_2_m_d hop_1_d_e) hop_3_m_e)
8436  (=> (and hop_2_m_d hop_1_d_g) hop_3_m_g)
8437  (=> (and hop_2_m_d hop_1_d_f) hop_3_m_f)
8438  (=> (and hop_2_m_d hop_1_d_i) hop_3_m_i)
8439  (=> (and hop_2_m_d hop_1_d_h) hop_3_m_h)
8440  (=> (and hop_2_m_d hop_1_d_k) hop_3_m_k)
8441  (=> (and hop_2_m_d hop_1_d_j) hop_3_m_j)
8442  (=> (and hop_2_m_d hop_1_d_l) hop_3_m_l)
8443  (=> (and hop_2_m_d hop_1_d_o) hop_3_m_o)
8444  (=> (and hop_2_m_d hop_1_d_n) hop_3_m_n)
8445  (=> (and hop_2_m_d hop_1_d_q) hop_3_m_q)
8446  (=> (and hop_2_m_d hop_1_d_p) hop_3_m_p)
8447  (=> (and hop_2_m_g hop_1_g_a) hop_3_m_a)
8448  (=> (and hop_2_m_g hop_1_g_c) hop_3_m_c)
8449  (=> (and hop_2_m_g hop_1_g_b) hop_3_m_b)
8450  (=> (and hop_2_m_g hop_1_g_e) hop_3_m_e)
8451  (=> (and hop_2_m_g hop_1_g_d) hop_3_m_d)
8452  (=> (and hop_2_m_g hop_1_g_f) hop_3_m_f)
8453  (=> (and hop_2_m_g hop_1_g_i) hop_3_m_i)
8454  (=> (and hop_2_m_g hop_1_g_h) hop_3_m_h)
8455  (=> (and hop_2_m_g hop_1_g_k) hop_3_m_k)
8456  (=> (and hop_2_m_g hop_1_g_j) hop_3_m_j)
8457  (=> (and hop_2_m_g hop_1_g_l) hop_3_m_l)
8458  (=> (and hop_2_m_g hop_1_g_o) hop_3_m_o)
8459  (=> (and hop_2_m_g hop_1_g_n) hop_3_m_n)
8460  (=> (and hop_2_m_g hop_1_g_q) hop_3_m_q)
8461  (=> (and hop_2_m_g hop_1_g_p) hop_3_m_p)
8462  (=> (and hop_2_m_f hop_1_f_a) hop_3_m_a)
8463  (=> (and hop_2_m_f hop_1_f_c) hop_3_m_c)
8464  (=> (and hop_2_m_f hop_1_f_b) hop_3_m_b)
8465  (=> (and hop_2_m_f hop_1_f_e) hop_3_m_e)
8466  (=> (and hop_2_m_f hop_1_f_d) hop_3_m_d)
8467  (=> (and hop_2_m_f hop_1_f_g) hop_3_m_g)
8468  (=> (and hop_2_m_f hop_1_f_i) hop_3_m_i)
8469  (=> (and hop_2_m_f hop_1_f_h) hop_3_m_h)
8470  (=> (and hop_2_m_f hop_1_f_k) hop_3_m_k)
8471  (=> (and hop_2_m_f hop_1_f_j) hop_3_m_j)
8472  (=> (and hop_2_m_f hop_1_f_l) hop_3_m_l)
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8473    (=> (and hop_2_m_f hop_1_f_o) hop_3_m_o)
8474    (=> (and hop_2_m_f hop_1_f_n) hop_3_m_n)
8475    (=> (and hop_2_m_f hop_1_f_q) hop_3_m_q)
8476    (=> (and hop_2_m_f hop_1_f_p) hop_3_m_p)
8477    (=> (and hop_2_m_i hop_1_i_a) hop_3_m_a)
8478    (=> (and hop_2_m_i hop_1_i_c) hop_3_m_c)
8479    (=> (and hop_2_m_i hop_1_i_b) hop_3_m_b)
8480    (=> (and hop_2_m_i hop_1_i_e) hop_3_m_e)
8481    (=> (and hop_2_m_i hop_1_i_d) hop_3_m_d)
8482    (=> (and hop_2_m_i hop_1_i_g) hop_3_m_g)
8483    (=> (and hop_2_m_i hop_1_i_f) hop_3_m_f)
8484    (=> (and hop_2_m_i hop_1_i_h) hop_3_m_h)
8485    (=> (and hop_2_m_i hop_1_i_k) hop_3_m_k)
8486    (=> (and hop_2_m_i hop_1_i_j) hop_3_m_j)
8487    (=> (and hop_2_m_i hop_1_i_l) hop_3_m_l)
8488    (=> (and hop_2_m_i hop_1_i_o) hop_3_m_o)
8489    (=> (and hop_2_m_i hop_1_i_n) hop_3_m_n)
8490    (=> (and hop_2_m_i hop_1_i_q) hop_3_m_q)
8491    (=> (and hop_2_m_i hop_1_i_p) hop_3_m_p)
8492    (=> (and hop_2_m_h hop_1_h_a) hop_3_m_a)
8493    (=> (and hop_2_m_h hop_1_h_c) hop_3_m_c)
8494    (=> (and hop_2_m_h hop_1_h_b) hop_3_m_b)
8495    (=> (and hop_2_m_h hop_1_h_e) hop_3_m_e)
8496    (=> (and hop_2_m_h hop_1_h_d) hop_3_m_d)
8497    (=> (and hop_2_m_h hop_1_h_g) hop_3_m_g)
8498    (=> (and hop_2_m_h hop_1_h_f) hop_3_m_f)
8499    (=> (and hop_2_m_h hop_1_h_i) hop_3_m_i)
8500    (=> (and hop_2_m_h hop_1_h_k) hop_3_m_k)
8501    (=> (and hop_2_m_h hop_1_h_j) hop_3_m_j)
8502    (=> (and hop_2_m_h hop_1_h_l) hop_3_m_l)
8503    (=> (and hop_2_m_h hop_1_h_o) hop_3_m_o)
8504    (=> (and hop_2_m_h hop_1_h_n) hop_3_m_n)
8505    (=> (and hop_2_m_h hop_1_h_q) hop_3_m_q)
8506    (=> (and hop_2_m_h hop_1_h_p) hop_3_m_p)
8507    (=> (and hop_2_m_k hop_1_k_a) hop_3_m_a)
8508    (=> (and hop_2_m_k hop_1_k_c) hop_3_m_c)
8509    (=> (and hop_2_m_k hop_1_k_b) hop_3_m_b)
8510    (=> (and hop_2_m_k hop_1_k_e) hop_3_m_e)
8511    (=> (and hop_2_m_k hop_1_k_d) hop_3_m_d)
8512    (=> (and hop_2_m_k hop_1_k_g) hop_3_m_g)
8513    (=> (and hop_2_m_k hop_1_k_f) hop_3_m_f)
8514    (=> (and hop_2_m_k hop_1_k_i) hop_3_m_i)
8515    (=> (and hop_2_m_k hop_1_k_h) hop_3_m_h)
8516    (=> (and hop_2_m_k hop_1_k_j) hop_3_m_j)
8517    (=> (and hop_2_m_k hop_1_k_l) hop_3_m_l)
8518    (=> (and hop_2_m_k hop_1_k_o) hop_3_m_o)
8519    (=> (and hop_2_m_k hop_1_k_n) hop_3_m_n)
8520    (=> (and hop_2_m_k hop_1_k_q) hop_3_m_q)
8521    (=> (and hop_2_m_k hop_1_k_p) hop_3_m_p)
8522    (=> (and hop_2_m_j hop_1_j_a) hop_3_m_a)
8523    (=> (and hop_2_m_j hop_1_j_c) hop_3_m_c)
8524    (=> (and hop_2_m_j hop_1_j_b) hop_3_m_b)
8525    (=> (and hop_2_m_j hop_1_j_e) hop_3_m_e)
8526    (=> (and hop_2_m_j hop_1_j_d) hop_3_m_d)
8527    (=> (and hop_2_m_j hop_1_j_g) hop_3_m_g)
8528    (=> (and hop_2_m_j hop_1_j_f) hop_3_m_f)
8529    (=> (and hop_2_m_j hop_1_j_i) hop_3_m_i)
8530    (=> (and hop_2_m_j hop_1_j_h) hop_3_m_h)
8531    (=> (and hop_2_m_j hop_1_j_k) hop_3_m_k)
8532    (=> (and hop_2_m_j hop_1_j_l) hop_3_m_l)
8533    (=> (and hop_2_m_j hop_1_j_o) hop_3_m_o)
8534    (=> (and hop_2_m_j hop_1_j_n) hop_3_m_n)
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8535  (=> (and hop_2_m_j hop_1_j_q) hop_3_m_q)
8536  (=> (and hop_2_m_j hop_1_j_p) hop_3_m_p)
8537  (=> (and hop_2_m_l hop_1_l_a) hop_3_m_a)
8538  (=> (and hop_2_m_l hop_1_l_c) hop_3_m_c)
8539  (=> (and hop_2_m_l hop_1_l_b) hop_3_m_b)
8540  (=> (and hop_2_m_l hop_1_l_e) hop_3_m_e)
8541  (=> (and hop_2_m_l hop_1_l_d) hop_3_m_d)
8542  (=> (and hop_2_m_l hop_1_l_g) hop_3_m_g)
8543  (=> (and hop_2_m_l hop_1_l_f) hop_3_m_f)
8544  (=> (and hop_2_m_l hop_1_l_i) hop_3_m_i)
8545  (=> (and hop_2_m_l hop_1_l_h) hop_3_m_h)
8546  (=> (and hop_2_m_l hop_1_l_k) hop_3_m_k)
8547  (=> (and hop_2_m_l hop_1_l_j) hop_3_m_j)
8548  (=> (and hop_2_m_l hop_1_l_o) hop_3_m_o)
8549  (=> (and hop_2_m_l hop_1_l_n) hop_3_m_n)
8550  (=> (and hop_2_m_l hop_1_l_q) hop_3_m_q)
8551  (=> (and hop_2_m_l hop_1_l_p) hop_3_m_p)
8552  (=> (and hop_2_m_o hop_1_o_a) hop_3_m_a)
8553  (=> (and hop_2_m_o hop_1_o_c) hop_3_m_c)
8554  (=> (and hop_2_m_o hop_1_o_b) hop_3_m_b)
8555  (=> (and hop_2_m_o hop_1_o_e) hop_3_m_e)
8556  (=> (and hop_2_m_o hop_1_o_d) hop_3_m_d)
8557  (=> (and hop_2_m_o hop_1_o_g) hop_3_m_g)
8558  (=> (and hop_2_m_o hop_1_o_f) hop_3_m_f)
8559  (=> (and hop_2_m_o hop_1_o_i) hop_3_m_i)
8560  (=> (and hop_2_m_o hop_1_o_h) hop_3_m_h)
8561  (=> (and hop_2_m_o hop_1_o_k) hop_3_m_k)
8562  (=> (and hop_2_m_o hop_1_o_j) hop_3_m_j)
8563  (=> (and hop_2_m_o hop_1_o_l) hop_3_m_l)
8564  (=> (and hop_2_m_o hop_1_o_n) hop_3_m_n)
8565  (=> (and hop_2_m_o hop_1_o_q) hop_3_m_q)
8566  (=> (and hop_2_m_o hop_1_o_p) hop_3_m_p)
8567  (=> (and hop_2_m_n hop_1_n_a) hop_3_m_a)
8568  (=> (and hop_2_m_n hop_1_n_c) hop_3_m_c)
8569  (=> (and hop_2_m_n hop_1_n_b) hop_3_m_b)
8570  (=> (and hop_2_m_n hop_1_n_e) hop_3_m_e)
8571  (=> (and hop_2_m_n hop_1_n_d) hop_3_m_d)
8572  (=> (and hop_2_m_n hop_1_n_g) hop_3_m_g)
8573  (=> (and hop_2_m_n hop_1_n_f) hop_3_m_f)
8574  (=> (and hop_2_m_n hop_1_n_i) hop_3_m_i)
8575  (=> (and hop_2_m_n hop_1_n_h) hop_3_m_h)
8576  (=> (and hop_2_m_n hop_1_n_k) hop_3_m_k)
8577  (=> (and hop_2_m_n hop_1_n_j) hop_3_m_j)
8578  (=> (and hop_2_m_n hop_1_n_l) hop_3_m_l)
8579  (=> (and hop_2_m_n hop_1_n_o) hop_3_m_o)
8580  (=> (and hop_2_m_n hop_1_n_q) hop_3_m_q)
8581  (=> (and hop_2_m_n hop_1_n_p) hop_3_m_p)
8582  (=> (and hop_2_m_q hop_1_q_a) hop_3_m_a)
8583  (=> (and hop_2_m_q hop_1_q_c) hop_3_m_c)
8584  (=> (and hop_2_m_q hop_1_q_b) hop_3_m_b)
8585  (=> (and hop_2_m_q hop_1_q_e) hop_3_m_e)
8586  (=> (and hop_2_m_q hop_1_q_d) hop_3_m_d)
8587  (=> (and hop_2_m_q hop_1_q_g) hop_3_m_g)
8588  (=> (and hop_2_m_q hop_1_q_f) hop_3_m_f)
8589  (=> (and hop_2_m_q hop_1_q_i) hop_3_m_i)
8590  (=> (and hop_2_m_q hop_1_q_h) hop_3_m_h)
8591  (=> (and hop_2_m_q hop_1_q_k) hop_3_m_k)
8592  (=> (and hop_2_m_q hop_1_q_j) hop_3_m_j)
8593  (=> (and hop_2_m_q hop_1_q_l) hop_3_m_l)
8594  (=> (and hop_2_m_q hop_1_q_o) hop_3_m_o)
8595  (=> (and hop_2_m_q hop_1_q_n) hop_3_m_n)
8596  (=> (and hop_2_m_q hop_1_q_p) hop_3_m_p)
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8597  (=> (and hop_2_m_p hop_1_p_a) hop_3_m_a)
8598  (=> (and hop_2_m_p hop_1_p_c) hop_3_m_c)
8599  (=> (and hop_2_m_p hop_1_p_b) hop_3_m_b)
8600  (=> (and hop_2_m_p hop_1_p_e) hop_3_m_e)
8601  (=> (and hop_2_m_p hop_1_p_d) hop_3_m_d)
8602  (=> (and hop_2_m_p hop_1_p_g) hop_3_m_g)
8603  (=> (and hop_2_m_p hop_1_p_f) hop_3_m_f)
8604  (=> (and hop_2_m_p hop_1_p_i) hop_3_m_i)
8605  (=> (and hop_2_m_p hop_1_p_h) hop_3_m_h)
8606  (=> (and hop_2_m_p hop_1_p_k) hop_3_m_k)
8607  (=> (and hop_2_m_p hop_1_p_j) hop_3_m_j)
8608  (=> (and hop_2_m_p hop_1_p_l) hop_3_m_l)
8609  (=> (and hop_2_m_p hop_1_p_o) hop_3_m_o)
8610  (=> (and hop_2_m_p hop_1_p_n) hop_3_m_n)
8611  (=> (and hop_2_m_p hop_1_p_q) hop_3_m_q)
8612  (=> (and hop_2_l_a hop_1_a_c) hop_3_l_c)
8613  (=> (and hop_2_l_a hop_1_a_b) hop_3_l_b)
8614  (=> (and hop_2_l_a hop_1_a_e) hop_3_l_e)
8615  (=> (and hop_2_l_a hop_1_a_d) hop_3_l_d)
8616  (=> (and hop_2_l_a hop_1_a_g) hop_3_l_g)
8617  (=> (and hop_2_l_a hop_1_a_f) hop_3_l_f)
8618  (=> (and hop_2_l_a hop_1_a_i) hop_3_l_i)
8619  (=> (and hop_2_l_a hop_1_a_h) hop_3_l_h)
8620  (=> (and hop_2_l_a hop_1_a_k) hop_3_l_k)
8621  (=> (and hop_2_l_a hop_1_a_j) hop_3_l_j)
8622  (=> (and hop_2_l_a hop_1_a_m) hop_3_l_m)
8623  (=> (and hop_2_l_a hop_1_a_o) hop_3_l_o)
8624  (=> (and hop_2_l_a hop_1_a_n) hop_3_l_n)
8625  (=> (and hop_2_l_a hop_1_a_q) hop_3_l_q)
8626  (=> (and hop_2_l_a hop_1_a_p) hop_3_l_p)
8627  (=> (and hop_2_l_c hop_1_c_a) hop_3_l_a)
8628  (=> (and hop_2_l_c hop_1_c_b) hop_3_l_b)
8629  (=> (and hop_2_l_c hop_1_c_e) hop_3_l_e)
8630  (=> (and hop_2_l_c hop_1_c_d) hop_3_l_d)
8631  (=> (and hop_2_l_c hop_1_c_g) hop_3_l_g)
8632  (=> (and hop_2_l_c hop_1_c_f) hop_3_l_f)
8633  (=> (and hop_2_l_c hop_1_c_i) hop_3_l_i)
8634  (=> (and hop_2_l_c hop_1_c_h) hop_3_l_h)
8635  (=> (and hop_2_l_c hop_1_c_k) hop_3_l_k)
8636  (=> (and hop_2_l_c hop_1_c_j) hop_3_l_j)
8637  (=> (and hop_2_l_c hop_1_c_m) hop_3_l_m)
8638  (=> (and hop_2_l_c hop_1_c_o) hop_3_l_o)
8639  (=> (and hop_2_l_c hop_1_c_n) hop_3_l_n)
8640  (=> (and hop_2_l_c hop_1_c_q) hop_3_l_q)
8641  (=> (and hop_2_l_c hop_1_c_p) hop_3_l_p)
8642  (=> (and hop_2_l_b hop_1_b_a) hop_3_l_a)
8643  (=> (and hop_2_l_b hop_1_b_c) hop_3_l_c)
8644  (=> (and hop_2_l_b hop_1_b_e) hop_3_l_e)
8645  (=> (and hop_2_l_b hop_1_b_d) hop_3_l_d)
8646  (=> (and hop_2_l_b hop_1_b_g) hop_3_l_g)
8647  (=> (and hop_2_l_b hop_1_b_f) hop_3_l_f)
8648  (=> (and hop_2_l_b hop_1_b_i) hop_3_l_i)
8649  (=> (and hop_2_l_b hop_1_b_h) hop_3_l_h)
8650  (=> (and hop_2_l_b hop_1_b_k) hop_3_l_k)
8651  (=> (and hop_2_l_b hop_1_b_j) hop_3_l_j)
8652  (=> (and hop_2_l_b hop_1_b_m) hop_3_l_m)
8653  (=> (and hop_2_l_b hop_1_b_o) hop_3_l_o)
8654  (=> (and hop_2_l_b hop_1_b_n) hop_3_l_n)
8655  (=> (and hop_2_l_b hop_1_b_q) hop_3_l_q)
8656  (=> (and hop_2_l_b hop_1_b_p) hop_3_l_p)
8657  (=> (and hop_2_l_e hop_1_e_a) hop_3_l_a)
8658  (=> (and hop_2_l_e hop_1_e_c) hop_3_l_c)
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8659  (=> (and hop_2_l_e hop_1_e_b) hop_3_l_b)
8660  (=> (and hop_2_l_e hop_1_e_d) hop_3_l_d)
8661  (=> (and hop_2_l_e hop_1_e_g) hop_3_l_g)
8662  (=> (and hop_2_l_e hop_1_e_f) hop_3_l_f)
8663  (=> (and hop_2_l_e hop_1_e_i) hop_3_l_i)
8664  (=> (and hop_2_l_e hop_1_e_h) hop_3_l_h)
8665  (=> (and hop_2_l_e hop_1_e_k) hop_3_l_k)
8666  (=> (and hop_2_l_e hop_1_e_j) hop_3_l_j)
8667  (=> (and hop_2_l_e hop_1_e_m) hop_3_l_m)
8668  (=> (and hop_2_l_e hop_1_e_o) hop_3_l_o)
8669  (=> (and hop_2_l_e hop_1_e_n) hop_3_l_n)
8670  (=> (and hop_2_l_e hop_1_e_q) hop_3_l_q)
8671  (=> (and hop_2_l_e hop_1_e_p) hop_3_l_p)
8672  (=> (and hop_2_l_d hop_1_d_a) hop_3_l_a)
8673  (=> (and hop_2_l_d hop_1_d_c) hop_3_l_c)
8674  (=> (and hop_2_l_d hop_1_d_b) hop_3_l_b)
8675  (=> (and hop_2_l_d hop_1_d_e) hop_3_l_e)
8676  (=> (and hop_2_l_d hop_1_d_g) hop_3_l_g)
8677  (=> (and hop_2_l_d hop_1_d_f) hop_3_l_f)
8678  (=> (and hop_2_l_d hop_1_d_i) hop_3_l_i)
8679  (=> (and hop_2_l_d hop_1_d_h) hop_3_l_h)
8680  (=> (and hop_2_l_d hop_1_d_k) hop_3_l_k)
8681  (=> (and hop_2_l_d hop_1_d_j) hop_3_l_j)
8682  (=> (and hop_2_l_d hop_1_d_m) hop_3_l_m)
8683  (=> (and hop_2_l_d hop_1_d_o) hop_3_l_o)
8684  (=> (and hop_2_l_d hop_1_d_n) hop_3_l_n)
8685  (=> (and hop_2_l_d hop_1_d_q) hop_3_l_q)
8686  (=> (and hop_2_l_d hop_1_d_p) hop_3_l_p)
8687  (=> (and hop_2_l_g hop_1_g_a) hop_3_l_a)
8688  (=> (and hop_2_l_g hop_1_g_c) hop_3_l_c)
8689  (=> (and hop_2_l_g hop_1_g_b) hop_3_l_b)
8690  (=> (and hop_2_l_g hop_1_g_e) hop_3_l_e)
8691  (=> (and hop_2_l_g hop_1_g_d) hop_3_l_d)
8692  (=> (and hop_2_l_g hop_1_g_f) hop_3_l_f)
8693  (=> (and hop_2_l_g hop_1_g_i) hop_3_l_i)
8694  (=> (and hop_2_l_g hop_1_g_h) hop_3_l_h)
8695  (=> (and hop_2_l_g hop_1_g_k) hop_3_l_k)
8696  (=> (and hop_2_l_g hop_1_g_j) hop_3_l_j)
8697  (=> (and hop_2_l_g hop_1_g_m) hop_3_l_m)
8698  (=> (and hop_2_l_g hop_1_g_o) hop_3_l_o)
8699  (=> (and hop_2_l_g hop_1_g_n) hop_3_l_n)
8700  (=> (and hop_2_l_g hop_1_g_q) hop_3_l_q)
8701  (=> (and hop_2_l_g hop_1_g_p) hop_3_l_p)
8702  (=> (and hop_2_l_f hop_1_f_a) hop_3_l_a)
8703  (=> (and hop_2_l_f hop_1_f_c) hop_3_l_c)
8704  (=> (and hop_2_l_f hop_1_f_b) hop_3_l_b)
8705  (=> (and hop_2_l_f hop_1_f_e) hop_3_l_e)
8706  (=> (and hop_2_l_f hop_1_f_d) hop_3_l_d)
8707  (=> (and hop_2_l_f hop_1_f_g) hop_3_l_g)
8708  (=> (and hop_2_l_f hop_1_f_i) hop_3_l_i)
8709  (=> (and hop_2_l_f hop_1_f_h) hop_3_l_h)
8710  (=> (and hop_2_l_f hop_1_f_k) hop_3_l_k)
8711  (=> (and hop_2_l_f hop_1_f_j) hop_3_l_j)
8712  (=> (and hop_2_l_f hop_1_f_m) hop_3_l_m)
8713  (=> (and hop_2_l_f hop_1_f_o) hop_3_l_o)
8714  (=> (and hop_2_l_f hop_1_f_n) hop_3_l_n)
8715  (=> (and hop_2_l_f hop_1_f_q) hop_3_l_q)
8716  (=> (and hop_2_l_f hop_1_f_p) hop_3_l_p)
8717  (=> (and hop_2_l_i hop_1_i_a) hop_3_l_a)
8718  (=> (and hop_2_l_i hop_1_i_c) hop_3_l_c)
8719  (=> (and hop_2_l_i hop_1_i_b) hop_3_l_b)
8720  (=> (and hop_2_l_i hop_1_i_e) hop_3_l_e)
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8721  (=> (and hop_2_l_i hop_1_i_d) hop_3_l_d)
8722  (=> (and hop_2_l_i hop_1_i_g) hop_3_l_g)
8723  (=> (and hop_2_l_i hop_1_i_f) hop_3_l_f)
8724  (=> (and hop_2_l_i hop_1_i_h) hop_3_l_h)
8725  (=> (and hop_2_l_i hop_1_i_k) hop_3_l_k)
8726  (=> (and hop_2_l_i hop_1_i_j) hop_3_l_j)
8727  (=> (and hop_2_l_i hop_1_i_m) hop_3_l_m)
8728  (=> (and hop_2_l_i hop_1_i_o) hop_3_l_o)
8729  (=> (and hop_2_l_i hop_1_i_n) hop_3_l_n)
8730  (=> (and hop_2_l_i hop_1_i_q) hop_3_l_q)
8731  (=> (and hop_2_l_i hop_1_i_p) hop_3_l_p)
8732  (=> (and hop_2_l_h hop_1_h_a) hop_3_l_a)
8733  (=> (and hop_2_l_h hop_1_h_c) hop_3_l_c)
8734  (=> (and hop_2_l_h hop_1_h_b) hop_3_l_b)
8735  (=> (and hop_2_l_h hop_1_h_e) hop_3_l_e)
8736  (=> (and hop_2_l_h hop_1_h_d) hop_3_l_d)
8737  (=> (and hop_2_l_h hop_1_h_g) hop_3_l_g)
8738  (=> (and hop_2_l_h hop_1_h_f) hop_3_l_f)
8739  (=> (and hop_2_l_h hop_1_h_i) hop_3_l_i)
8740  (=> (and hop_2_l_h hop_1_h_k) hop_3_l_k)
8741  (=> (and hop_2_l_h hop_1_h_j) hop_3_l_j)
8742  (=> (and hop_2_l_h hop_1_h_m) hop_3_l_m)
8743  (=> (and hop_2_l_h hop_1_h_o) hop_3_l_o)
8744  (=> (and hop_2_l_h hop_1_h_n) hop_3_l_n)
8745  (=> (and hop_2_l_h hop_1_h_q) hop_3_l_q)
8746  (=> (and hop_2_l_h hop_1_h_p) hop_3_l_p)
8747  (=> (and hop_2_l_k hop_1_k_a) hop_3_l_a)
8748  (=> (and hop_2_l_k hop_1_k_c) hop_3_l_c)
8749  (=> (and hop_2_l_k hop_1_k_b) hop_3_l_b)
8750  (=> (and hop_2_l_k hop_1_k_e) hop_3_l_e)
8751  (=> (and hop_2_l_k hop_1_k_d) hop_3_l_d)
8752  (=> (and hop_2_l_k hop_1_k_g) hop_3_l_g)
8753  (=> (and hop_2_l_k hop_1_k_f) hop_3_l_f)
8754  (=> (and hop_2_l_k hop_1_k_i) hop_3_l_i)
8755  (=> (and hop_2_l_k hop_1_k_h) hop_3_l_h)
8756  (=> (and hop_2_l_k hop_1_k_j) hop_3_l_j)
8757  (=> (and hop_2_l_k hop_1_k_m) hop_3_l_m)
8758  (=> (and hop_2_l_k hop_1_k_o) hop_3_l_o)
8759  (=> (and hop_2_l_k hop_1_k_n) hop_3_l_n)
8760  (=> (and hop_2_l_k hop_1_k_q) hop_3_l_q)
8761  (=> (and hop_2_l_k hop_1_k_p) hop_3_l_p)
8762  (=> (and hop_2_l_j hop_1_j_a) hop_3_l_a)
8763  (=> (and hop_2_l_j hop_1_j_c) hop_3_l_c)
8764  (=> (and hop_2_l_j hop_1_j_b) hop_3_l_b)
8765  (=> (and hop_2_l_j hop_1_j_e) hop_3_l_e)
8766  (=> (and hop_2_l_j hop_1_j_d) hop_3_l_d)
8767  (=> (and hop_2_l_j hop_1_j_g) hop_3_l_g)
8768  (=> (and hop_2_l_j hop_1_j_f) hop_3_l_f)
8769  (=> (and hop_2_l_j hop_1_j_i) hop_3_l_i)
8770  (=> (and hop_2_l_j hop_1_j_h) hop_3_l_h)
8771  (=> (and hop_2_l_j hop_1_j_k) hop_3_l_k)
8772  (=> (and hop_2_l_j hop_1_j_m) hop_3_l_m)
8773  (=> (and hop_2_l_j hop_1_j_o) hop_3_l_o)
8774  (=> (and hop_2_l_j hop_1_j_n) hop_3_l_n)
8775  (=> (and hop_2_l_j hop_1_j_q) hop_3_l_q)
8776  (=> (and hop_2_l_j hop_1_j_p) hop_3_l_p)
8777  (=> (and hop_2_l_m hop_1_m_a) hop_3_l_a)
8778  (=> (and hop_2_l_m hop_1_m_c) hop_3_l_c)
8779  (=> (and hop_2_l_m hop_1_m_b) hop_3_l_b)
8780  (=> (and hop_2_l_m hop_1_m_e) hop_3_l_e)
8781  (=> (and hop_2_l_m hop_1_m_d) hop_3_l_d)
8782  (=> (and hop_2_l_m hop_1_m_g) hop_3_l_g)
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8783  (=> (and hop_2_l_m hop_1_m_f) hop_3_l_f)
8784  (=> (and hop_2_l_m hop_1_m_i) hop_3_l_i)
8785  (=> (and hop_2_l_m hop_1_m_h) hop_3_l_h)
8786  (=> (and hop_2_l_m hop_1_m_k) hop_3_l_k)
8787  (=> (and hop_2_l_m hop_1_m_j) hop_3_l_j)
8788  (=> (and hop_2_l_m hop_1_m_o) hop_3_l_o)
8789  (=> (and hop_2_l_m hop_1_m_n) hop_3_l_n)
8790  (=> (and hop_2_l_m hop_1_m_q) hop_3_l_q)
8791  (=> (and hop_2_l_m hop_1_m_p) hop_3_l_p)
8792  (=> (and hop_2_l_o hop_1_o_a) hop_3_l_a)
8793  (=> (and hop_2_l_o hop_1_o_c) hop_3_l_c)
8794  (=> (and hop_2_l_o hop_1_o_b) hop_3_l_b)
8795  (=> (and hop_2_l_o hop_1_o_e) hop_3_l_e)
8796  (=> (and hop_2_l_o hop_1_o_d) hop_3_l_d)
8797  (=> (and hop_2_l_o hop_1_o_g) hop_3_l_g)
8798  (=> (and hop_2_l_o hop_1_o_f) hop_3_l_f)
8799  (=> (and hop_2_l_o hop_1_o_i) hop_3_l_i)
8800  (=> (and hop_2_l_o hop_1_o_h) hop_3_l_h)
8801  (=> (and hop_2_l_o hop_1_o_k) hop_3_l_k)
8802  (=> (and hop_2_l_o hop_1_o_j) hop_3_l_j)
8803  (=> (and hop_2_l_o hop_1_o_m) hop_3_l_m)
8804  (=> (and hop_2_l_o hop_1_o_n) hop_3_l_n)
8805  (=> (and hop_2_l_o hop_1_o_q) hop_3_l_q)
8806  (=> (and hop_2_l_o hop_1_o_p) hop_3_l_p)
8807  (=> (and hop_2_l_n hop_1_n_a) hop_3_l_a)
8808  (=> (and hop_2_l_n hop_1_n_c) hop_3_l_c)
8809  (=> (and hop_2_l_n hop_1_n_b) hop_3_l_b)
8810  (=> (and hop_2_l_n hop_1_n_e) hop_3_l_e)
8811  (=> (and hop_2_l_n hop_1_n_d) hop_3_l_d)
8812  (=> (and hop_2_l_n hop_1_n_g) hop_3_l_g)
8813  (=> (and hop_2_l_n hop_1_n_f) hop_3_l_f)
8814  (=> (and hop_2_l_n hop_1_n_i) hop_3_l_i)
8815  (=> (and hop_2_l_n hop_1_n_h) hop_3_l_h)
8816  (=> (and hop_2_l_n hop_1_n_k) hop_3_l_k)
8817  (=> (and hop_2_l_n hop_1_n_j) hop_3_l_j)
8818  (=> (and hop_2_l_n hop_1_n_m) hop_3_l_m)
8819  (=> (and hop_2_l_n hop_1_n_o) hop_3_l_o)
8820  (=> (and hop_2_l_n hop_1_n_q) hop_3_l_q)
8821  (=> (and hop_2_l_n hop_1_n_p) hop_3_l_p)
8822  (=> (and hop_2_l_q hop_1_q_a) hop_3_l_a)
8823  (=> (and hop_2_l_q hop_1_q_c) hop_3_l_c)
8824  (=> (and hop_2_l_q hop_1_q_b) hop_3_l_b)
8825  (=> (and hop_2_l_q hop_1_q_e) hop_3_l_e)
8826  (=> (and hop_2_l_q hop_1_q_d) hop_3_l_d)
8827  (=> (and hop_2_l_q hop_1_q_g) hop_3_l_g)
8828  (=> (and hop_2_l_q hop_1_q_f) hop_3_l_f)
8829  (=> (and hop_2_l_q hop_1_q_i) hop_3_l_i)
8830  (=> (and hop_2_l_q hop_1_q_h) hop_3_l_h)
8831  (=> (and hop_2_l_q hop_1_q_k) hop_3_l_k)
8832  (=> (and hop_2_l_q hop_1_q_j) hop_3_l_j)
8833  (=> (and hop_2_l_q hop_1_q_m) hop_3_l_m)
8834  (=> (and hop_2_l_q hop_1_q_o) hop_3_l_o)
8835  (=> (and hop_2_l_q hop_1_q_n) hop_3_l_n)
8836  (=> (and hop_2_l_q hop_1_q_p) hop_3_l_p)
8837  (=> (and hop_2_l_p hop_1_p_a) hop_3_l_a)
8838  (=> (and hop_2_l_p hop_1_p_c) hop_3_l_c)
8839  (=> (and hop_2_l_p hop_1_p_b) hop_3_l_b)
8840  (=> (and hop_2_l_p hop_1_p_e) hop_3_l_e)
8841  (=> (and hop_2_l_p hop_1_p_d) hop_3_l_d)
8842  (=> (and hop_2_l_p hop_1_p_g) hop_3_l_g)
8843  (=> (and hop_2_l_p hop_1_p_f) hop_3_l_f)
8844  (=> (and hop_2_l_p hop_1_p_i) hop_3_l_i)
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8845  (=> (and hop_2_l_p hop_1_p_h) hop_3_l_h)
8846  (=> (and hop_2_l_p hop_1_p_k) hop_3_l_k)
8847  (=> (and hop_2_l_p hop_1_p_j) hop_3_l_j)
8848  (=> (and hop_2_l_p hop_1_p_m) hop_3_l_m)
8849  (=> (and hop_2_l_p hop_1_p_o) hop_3_l_o)
8850  (=> (and hop_2_l_p hop_1_p_n) hop_3_l_n)
8851  (=> (and hop_2_l_p hop_1_p_q) hop_3_l_q)
8852  (=> (and hop_2_o_a hop_1_a_c) hop_3_o_c)
8853  (=> (and hop_2_o_a hop_1_a_b) hop_3_o_b)
8854  (=> (and hop_2_o_a hop_1_a_e) hop_3_o_e)
8855  (=> (and hop_2_o_a hop_1_a_d) hop_3_o_d)
8856  (=> (and hop_2_o_a hop_1_a_g) hop_3_o_g)
8857  (=> (and hop_2_o_a hop_1_a_f) hop_3_o_f)
8858  (=> (and hop_2_o_a hop_1_a_i) hop_3_o_i)
8859  (=> (and hop_2_o_a hop_1_a_h) hop_3_o_h)
8860  (=> (and hop_2_o_a hop_1_a_k) hop_3_o_k)
8861  (=> (and hop_2_o_a hop_1_a_j) hop_3_o_j)
8862  (=> (and hop_2_o_a hop_1_a_m) hop_3_o_m)
8863  (=> (and hop_2_o_a hop_1_a_l) hop_3_o_l)
8864  (=> (and hop_2_o_a hop_1_a_n) hop_3_o_n)
8865  (=> (and hop_2_o_a hop_1_a_q) hop_3_o_q)
8866  (=> (and hop_2_o_a hop_1_a_p) hop_3_o_p)
8867  (=> (and hop_2_o_c hop_1_c_a) hop_3_o_a)
8868  (=> (and hop_2_o_c hop_1_c_b) hop_3_o_b)
8869  (=> (and hop_2_o_c hop_1_c_e) hop_3_o_e)
8870  (=> (and hop_2_o_c hop_1_c_d) hop_3_o_d)
8871  (=> (and hop_2_o_c hop_1_c_g) hop_3_o_g)
8872  (=> (and hop_2_o_c hop_1_c_f) hop_3_o_f)
8873  (=> (and hop_2_o_c hop_1_c_i) hop_3_o_i)
8874  (=> (and hop_2_o_c hop_1_c_h) hop_3_o_h)
8875  (=> (and hop_2_o_c hop_1_c_k) hop_3_o_k)
8876  (=> (and hop_2_o_c hop_1_c_j) hop_3_o_j)
8877  (=> (and hop_2_o_c hop_1_c_m) hop_3_o_m)
8878  (=> (and hop_2_o_c hop_1_c_l) hop_3_o_l)
8879  (=> (and hop_2_o_c hop_1_c_n) hop_3_o_n)
8880  (=> (and hop_2_o_c hop_1_c_q) hop_3_o_q)
8881  (=> (and hop_2_o_c hop_1_c_p) hop_3_o_p)
8882  (=> (and hop_2_o_b hop_1_b_a) hop_3_o_a)
8883  (=> (and hop_2_o_b hop_1_b_c) hop_3_o_c)
8884  (=> (and hop_2_o_b hop_1_b_e) hop_3_o_e)
8885  (=> (and hop_2_o_b hop_1_b_d) hop_3_o_d)
8886  (=> (and hop_2_o_b hop_1_b_g) hop_3_o_g)
8887  (=> (and hop_2_o_b hop_1_b_f) hop_3_o_f)
8888  (=> (and hop_2_o_b hop_1_b_i) hop_3_o_i)
8889  (=> (and hop_2_o_b hop_1_b_h) hop_3_o_h)
8890  (=> (and hop_2_o_b hop_1_b_k) hop_3_o_k)
8891  (=> (and hop_2_o_b hop_1_b_j) hop_3_o_j)
8892  (=> (and hop_2_o_b hop_1_b_m) hop_3_o_m)
8893  (=> (and hop_2_o_b hop_1_b_l) hop_3_o_l)
8894  (=> (and hop_2_o_b hop_1_b_n) hop_3_o_n)
8895  (=> (and hop_2_o_b hop_1_b_q) hop_3_o_q)
8896  (=> (and hop_2_o_b hop_1_b_p) hop_3_o_p)
8897  (=> (and hop_2_o_e hop_1_e_a) hop_3_o_a)
8898  (=> (and hop_2_o_e hop_1_e_c) hop_3_o_c)
8899  (=> (and hop_2_o_e hop_1_e_b) hop_3_o_b)
8900  (=> (and hop_2_o_e hop_1_e_d) hop_3_o_d)
8901  (=> (and hop_2_o_e hop_1_e_g) hop_3_o_g)
8902  (=> (and hop_2_o_e hop_1_e_f) hop_3_o_f)
8903  (=> (and hop_2_o_e hop_1_e_i) hop_3_o_i)
8904  (=> (and hop_2_o_e hop_1_e_h) hop_3_o_h)
8905  (=> (and hop_2_o_e hop_1_e_k) hop_3_o_k)
8906  (=> (and hop_2_o_e hop_1_e_j) hop_3_o_j)
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8907  (=> (and hop_2_o_e hop_1_e_m) hop_3_o_m)
8908  (=> (and hop_2_o_e hop_1_e_l) hop_3_o_l)
8909  (=> (and hop_2_o_e hop_1_e_n) hop_3_o_n)
8910  (=> (and hop_2_o_e hop_1_e_q) hop_3_o_q)
8911  (=> (and hop_2_o_e hop_1_e_p) hop_3_o_p)
8912  (=> (and hop_2_o_d hop_1_d_a) hop_3_o_a)
8913  (=> (and hop_2_o_d hop_1_d_c) hop_3_o_c)
8914  (=> (and hop_2_o_d hop_1_d_b) hop_3_o_b)
8915  (=> (and hop_2_o_d hop_1_d_e) hop_3_o_e)
8916  (=> (and hop_2_o_d hop_1_d_g) hop_3_o_g)
8917  (=> (and hop_2_o_d hop_1_d_f) hop_3_o_f)
8918  (=> (and hop_2_o_d hop_1_d_i) hop_3_o_i)
8919  (=> (and hop_2_o_d hop_1_d_h) hop_3_o_h)
8920  (=> (and hop_2_o_d hop_1_d_k) hop_3_o_k)
8921  (=> (and hop_2_o_d hop_1_d_j) hop_3_o_j)
8922  (=> (and hop_2_o_d hop_1_d_m) hop_3_o_m)
8923  (=> (and hop_2_o_d hop_1_d_l) hop_3_o_l)
8924  (=> (and hop_2_o_d hop_1_d_n) hop_3_o_n)
8925  (=> (and hop_2_o_d hop_1_d_q) hop_3_o_q)
8926  (=> (and hop_2_o_d hop_1_d_p) hop_3_o_p)
8927  (=> (and hop_2_o_g hop_1_g_a) hop_3_o_a)
8928  (=> (and hop_2_o_g hop_1_g_c) hop_3_o_c)
8929  (=> (and hop_2_o_g hop_1_g_b) hop_3_o_b)
8930  (=> (and hop_2_o_g hop_1_g_e) hop_3_o_e)
8931  (=> (and hop_2_o_g hop_1_g_d) hop_3_o_d)
8932  (=> (and hop_2_o_g hop_1_g_f) hop_3_o_f)
8933  (=> (and hop_2_o_g hop_1_g_i) hop_3_o_i)
8934  (=> (and hop_2_o_g hop_1_g_h) hop_3_o_h)
8935  (=> (and hop_2_o_g hop_1_g_k) hop_3_o_k)
8936  (=> (and hop_2_o_g hop_1_g_j) hop_3_o_j)
8937  (=> (and hop_2_o_g hop_1_g_m) hop_3_o_m)
8938  (=> (and hop_2_o_g hop_1_g_l) hop_3_o_l)
8939  (=> (and hop_2_o_g hop_1_g_n) hop_3_o_n)
8940  (=> (and hop_2_o_g hop_1_g_q) hop_3_o_q)
8941  (=> (and hop_2_o_g hop_1_g_p) hop_3_o_p)
8942  (=> (and hop_2_o_f hop_1_f_a) hop_3_o_a)
8943  (=> (and hop_2_o_f hop_1_f_c) hop_3_o_c)
8944  (=> (and hop_2_o_f hop_1_f_b) hop_3_o_b)
8945  (=> (and hop_2_o_f hop_1_f_e) hop_3_o_e)
8946  (=> (and hop_2_o_f hop_1_f_d) hop_3_o_d)
8947  (=> (and hop_2_o_f hop_1_f_g) hop_3_o_g)
8948  (=> (and hop_2_o_f hop_1_f_i) hop_3_o_i)
8949  (=> (and hop_2_o_f hop_1_f_h) hop_3_o_h)
8950  (=> (and hop_2_o_f hop_1_f_k) hop_3_o_k)
8951  (=> (and hop_2_o_f hop_1_f_j) hop_3_o_j)
8952  (=> (and hop_2_o_f hop_1_f_m) hop_3_o_m)
8953  (=> (and hop_2_o_f hop_1_f_l) hop_3_o_l)
8954  (=> (and hop_2_o_f hop_1_f_n) hop_3_o_n)
8955  (=> (and hop_2_o_f hop_1_f_q) hop_3_o_q)
8956  (=> (and hop_2_o_f hop_1_f_p) hop_3_o_p)
8957  (=> (and hop_2_o_i hop_1_i_a) hop_3_o_a)
8958  (=> (and hop_2_o_i hop_1_i_c) hop_3_o_c)
8959  (=> (and hop_2_o_i hop_1_i_b) hop_3_o_b)
8960  (=> (and hop_2_o_i hop_1_i_e) hop_3_o_e)
8961  (=> (and hop_2_o_i hop_1_i_d) hop_3_o_d)
8962  (=> (and hop_2_o_i hop_1_i_g) hop_3_o_g)
8963  (=> (and hop_2_o_i hop_1_i_f) hop_3_o_f)
8964  (=> (and hop_2_o_i hop_1_i_h) hop_3_o_h)
8965  (=> (and hop_2_o_i hop_1_i_k) hop_3_o_k)
8966  (=> (and hop_2_o_i hop_1_i_j) hop_3_o_j)
8967  (=> (and hop_2_o_i hop_1_i_m) hop_3_o_m)
8968  (=> (and hop_2_o_i hop_1_i_l) hop_3_o_l)
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8969  (=> (and hop_2_o_i hop_1_i_n) hop_3_o_n)
8970  (=> (and hop_2_o_i hop_1_i_q) hop_3_o_q)
8971  (=> (and hop_2_o_i hop_1_i_p) hop_3_o_p)
8972  (=> (and hop_2_o_h hop_1_h_a) hop_3_o_a)
8973  (=> (and hop_2_o_h hop_1_h_c) hop_3_o_c)
8974  (=> (and hop_2_o_h hop_1_h_b) hop_3_o_b)
8975  (=> (and hop_2_o_h hop_1_h_e) hop_3_o_e)
8976  (=> (and hop_2_o_h hop_1_h_d) hop_3_o_d)
8977  (=> (and hop_2_o_h hop_1_h_g) hop_3_o_g)
8978  (=> (and hop_2_o_h hop_1_h_f) hop_3_o_f)
8979  (=> (and hop_2_o_h hop_1_h_i) hop_3_o_i)
8980  (=> (and hop_2_o_h hop_1_h_k) hop_3_o_k)
8981  (=> (and hop_2_o_h hop_1_h_j) hop_3_o_j)
8982  (=> (and hop_2_o_h hop_1_h_m) hop_3_o_m)
8983  (=> (and hop_2_o_h hop_1_h_l) hop_3_o_l)
8984  (=> (and hop_2_o_h hop_1_h_n) hop_3_o_n)
8985  (=> (and hop_2_o_h hop_1_h_q) hop_3_o_q)
8986  (=> (and hop_2_o_h hop_1_h_p) hop_3_o_p)
8987  (=> (and hop_2_o_k hop_1_k_a) hop_3_o_a)
8988  (=> (and hop_2_o_k hop_1_k_c) hop_3_o_c)
8989  (=> (and hop_2_o_k hop_1_k_b) hop_3_o_b)
8990  (=> (and hop_2_o_k hop_1_k_e) hop_3_o_e)
8991  (=> (and hop_2_o_k hop_1_k_d) hop_3_o_d)
8992  (=> (and hop_2_o_k hop_1_k_g) hop_3_o_g)
8993  (=> (and hop_2_o_k hop_1_k_f) hop_3_o_f)
8994  (=> (and hop_2_o_k hop_1_k_i) hop_3_o_i)
8995  (=> (and hop_2_o_k hop_1_k_h) hop_3_o_h)
8996  (=> (and hop_2_o_k hop_1_k_j) hop_3_o_j)
8997  (=> (and hop_2_o_k hop_1_k_m) hop_3_o_m)
8998  (=> (and hop_2_o_k hop_1_k_l) hop_3_o_l)
8999  (=> (and hop_2_o_k hop_1_k_n) hop_3_o_n)
9000  (=> (and hop_2_o_k hop_1_k_q) hop_3_o_q)
9001  (=> (and hop_2_o_k hop_1_k_p) hop_3_o_p)
9002  (=> (and hop_2_o_j hop_1_j_a) hop_3_o_a)
9003  (=> (and hop_2_o_j hop_1_j_c) hop_3_o_c)
9004  (=> (and hop_2_o_j hop_1_j_b) hop_3_o_b)
9005  (=> (and hop_2_o_j hop_1_j_e) hop_3_o_e)
9006  (=> (and hop_2_o_j hop_1_j_d) hop_3_o_d)
9007  (=> (and hop_2_o_j hop_1_j_g) hop_3_o_g)
9008  (=> (and hop_2_o_j hop_1_j_f) hop_3_o_f)
9009  (=> (and hop_2_o_j hop_1_j_i) hop_3_o_i)
9010  (=> (and hop_2_o_j hop_1_j_h) hop_3_o_h)
9011  (=> (and hop_2_o_j hop_1_j_k) hop_3_o_k)
9012  (=> (and hop_2_o_j hop_1_j_m) hop_3_o_m)
9013  (=> (and hop_2_o_j hop_1_j_l) hop_3_o_l)
9014  (=> (and hop_2_o_j hop_1_j_n) hop_3_o_n)
9015  (=> (and hop_2_o_j hop_1_j_q) hop_3_o_q)
9016  (=> (and hop_2_o_j hop_1_j_p) hop_3_o_p)
9017  (=> (and hop_2_o_m hop_1_m_a) hop_3_o_a)
9018  (=> (and hop_2_o_m hop_1_m_c) hop_3_o_c)
9019  (=> (and hop_2_o_m hop_1_m_b) hop_3_o_b)
9020  (=> (and hop_2_o_m hop_1_m_e) hop_3_o_e)
9021  (=> (and hop_2_o_m hop_1_m_d) hop_3_o_d)
9022  (=> (and hop_2_o_m hop_1_m_g) hop_3_o_g)
9023  (=> (and hop_2_o_m hop_1_m_f) hop_3_o_f)
9024  (=> (and hop_2_o_m hop_1_m_i) hop_3_o_i)
9025  (=> (and hop_2_o_m hop_1_m_h) hop_3_o_h)
9026  (=> (and hop_2_o_m hop_1_m_k) hop_3_o_k)
9027  (=> (and hop_2_o_m hop_1_m_j) hop_3_o_j)
9028  (=> (and hop_2_o_m hop_1_m_l) hop_3_o_l)
9029  (=> (and hop_2_o_m hop_1_m_n) hop_3_o_n)
9030  (=> (and hop_2_o_m hop_1_m_q) hop_3_o_q)
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9031  (=> (and hop_2_o_m hop_1_m_p) hop_3_o_p)
9032  (=> (and hop_2_o_l hop_1_l_a) hop_3_o_a)
9033  (=> (and hop_2_o_l hop_1_l_c) hop_3_o_c)
9034  (=> (and hop_2_o_l hop_1_l_b) hop_3_o_b)
9035  (=> (and hop_2_o_l hop_1_l_e) hop_3_o_e)
9036  (=> (and hop_2_o_l hop_1_l_d) hop_3_o_d)
9037  (=> (and hop_2_o_l hop_1_l_g) hop_3_o_g)
9038  (=> (and hop_2_o_l hop_1_l_f) hop_3_o_f)
9039  (=> (and hop_2_o_l hop_1_l_i) hop_3_o_i)
9040  (=> (and hop_2_o_l hop_1_l_h) hop_3_o_h)
9041  (=> (and hop_2_o_l hop_1_l_k) hop_3_o_k)
9042  (=> (and hop_2_o_l hop_1_l_j) hop_3_o_j)
9043  (=> (and hop_2_o_l hop_1_l_m) hop_3_o_m)
9044  (=> (and hop_2_o_l hop_1_l_n) hop_3_o_n)
9045  (=> (and hop_2_o_l hop_1_l_q) hop_3_o_q)
9046  (=> (and hop_2_o_l hop_1_l_p) hop_3_o_p)
9047  (=> (and hop_2_o_n hop_1_n_a) hop_3_o_a)
9048  (=> (and hop_2_o_n hop_1_n_c) hop_3_o_c)
9049  (=> (and hop_2_o_n hop_1_n_b) hop_3_o_b)
9050  (=> (and hop_2_o_n hop_1_n_e) hop_3_o_e)
9051  (=> (and hop_2_o_n hop_1_n_d) hop_3_o_d)
9052  (=> (and hop_2_o_n hop_1_n_g) hop_3_o_g)
9053  (=> (and hop_2_o_n hop_1_n_f) hop_3_o_f)
9054  (=> (and hop_2_o_n hop_1_n_i) hop_3_o_i)
9055  (=> (and hop_2_o_n hop_1_n_h) hop_3_o_h)
9056  (=> (and hop_2_o_n hop_1_n_k) hop_3_o_k)
9057  (=> (and hop_2_o_n hop_1_n_j) hop_3_o_j)
9058  (=> (and hop_2_o_n hop_1_n_m) hop_3_o_m)
9059  (=> (and hop_2_o_n hop_1_n_l) hop_3_o_l)
9060  (=> (and hop_2_o_n hop_1_n_q) hop_3_o_q)
9061  (=> (and hop_2_o_n hop_1_n_p) hop_3_o_p)
9062  (=> (and hop_2_o_q hop_1_q_a) hop_3_o_a)
9063  (=> (and hop_2_o_q hop_1_q_c) hop_3_o_c)
9064  (=> (and hop_2_o_q hop_1_q_b) hop_3_o_b)
9065  (=> (and hop_2_o_q hop_1_q_e) hop_3_o_e)
9066  (=> (and hop_2_o_q hop_1_q_d) hop_3_o_d)
9067  (=> (and hop_2_o_q hop_1_q_g) hop_3_o_g)
9068  (=> (and hop_2_o_q hop_1_q_f) hop_3_o_f)
9069  (=> (and hop_2_o_q hop_1_q_i) hop_3_o_i)
9070  (=> (and hop_2_o_q hop_1_q_h) hop_3_o_h)
9071  (=> (and hop_2_o_q hop_1_q_k) hop_3_o_k)
9072  (=> (and hop_2_o_q hop_1_q_j) hop_3_o_j)
9073  (=> (and hop_2_o_q hop_1_q_m) hop_3_o_m)
9074  (=> (and hop_2_o_q hop_1_q_l) hop_3_o_l)
9075  (=> (and hop_2_o_q hop_1_q_n) hop_3_o_n)
9076  (=> (and hop_2_o_q hop_1_q_p) hop_3_o_p)
9077  (=> (and hop_2_o_p hop_1_p_a) hop_3_o_a)
9078  (=> (and hop_2_o_p hop_1_p_c) hop_3_o_c)
9079  (=> (and hop_2_o_p hop_1_p_b) hop_3_o_b)
9080  (=> (and hop_2_o_p hop_1_p_e) hop_3_o_e)
9081  (=> (and hop_2_o_p hop_1_p_d) hop_3_o_d)
9082  (=> (and hop_2_o_p hop_1_p_g) hop_3_o_g)
9083  (=> (and hop_2_o_p hop_1_p_f) hop_3_o_f)
9084  (=> (and hop_2_o_p hop_1_p_i) hop_3_o_i)
9085  (=> (and hop_2_o_p hop_1_p_h) hop_3_o_h)
9086  (=> (and hop_2_o_p hop_1_p_k) hop_3_o_k)
9087  (=> (and hop_2_o_p hop_1_p_j) hop_3_o_j)
9088  (=> (and hop_2_o_p hop_1_p_m) hop_3_o_m)
9089  (=> (and hop_2_o_p hop_1_p_l) hop_3_o_l)
9090  (=> (and hop_2_o_p hop_1_p_n) hop_3_o_n)
9091  (=> (and hop_2_o_p hop_1_p_q) hop_3_o_q)
9092  (=> (and hop_2_n_a hop_1_a_c) hop_3_n_c)
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9093  (=> (and hop_2_n_a hop_1_a_b) hop_3_n_b)
9094  (=> (and hop_2_n_a hop_1_a_e) hop_3_n_e)
9095  (=> (and hop_2_n_a hop_1_a_d) hop_3_n_d)
9096  (=> (and hop_2_n_a hop_1_a_g) hop_3_n_g)
9097  (=> (and hop_2_n_a hop_1_a_f) hop_3_n_f)
9098  (=> (and hop_2_n_a hop_1_a_i) hop_3_n_i)
9099  (=> (and hop_2_n_a hop_1_a_h) hop_3_n_h)
9100  (=> (and hop_2_n_a hop_1_a_k) hop_3_n_k)
9101  (=> (and hop_2_n_a hop_1_a_j) hop_3_n_j)
9102  (=> (and hop_2_n_a hop_1_a_m) hop_3_n_m)
9103  (=> (and hop_2_n_a hop_1_a_l) hop_3_n_l)
9104  (=> (and hop_2_n_a hop_1_a_o) hop_3_n_o)
9105  (=> (and hop_2_n_a hop_1_a_q) hop_3_n_q)
9106  (=> (and hop_2_n_a hop_1_a_p) hop_3_n_p)
9107  (=> (and hop_2_n_c hop_1_c_a) hop_3_n_a)
9108  (=> (and hop_2_n_c hop_1_c_b) hop_3_n_b)
9109  (=> (and hop_2_n_c hop_1_c_e) hop_3_n_e)
9110  (=> (and hop_2_n_c hop_1_c_d) hop_3_n_d)
9111  (=> (and hop_2_n_c hop_1_c_g) hop_3_n_g)
9112  (=> (and hop_2_n_c hop_1_c_f) hop_3_n_f)
9113  (=> (and hop_2_n_c hop_1_c_i) hop_3_n_i)
9114  (=> (and hop_2_n_c hop_1_c_h) hop_3_n_h)
9115  (=> (and hop_2_n_c hop_1_c_k) hop_3_n_k)
9116  (=> (and hop_2_n_c hop_1_c_j) hop_3_n_j)
9117  (=> (and hop_2_n_c hop_1_c_m) hop_3_n_m)
9118  (=> (and hop_2_n_c hop_1_c_l) hop_3_n_l)
9119  (=> (and hop_2_n_c hop_1_c_o) hop_3_n_o)
9120  (=> (and hop_2_n_c hop_1_c_q) hop_3_n_q)
9121  (=> (and hop_2_n_c hop_1_c_p) hop_3_n_p)
9122  (=> (and hop_2_n_b hop_1_b_a) hop_3_n_a)
9123  (=> (and hop_2_n_b hop_1_b_c) hop_3_n_c)
9124  (=> (and hop_2_n_b hop_1_b_e) hop_3_n_e)
9125  (=> (and hop_2_n_b hop_1_b_d) hop_3_n_d)
9126  (=> (and hop_2_n_b hop_1_b_g) hop_3_n_g)
9127  (=> (and hop_2_n_b hop_1_b_f) hop_3_n_f)
9128  (=> (and hop_2_n_b hop_1_b_i) hop_3_n_i)
9129  (=> (and hop_2_n_b hop_1_b_h) hop_3_n_h)
9130  (=> (and hop_2_n_b hop_1_b_k) hop_3_n_k)
9131  (=> (and hop_2_n_b hop_1_b_j) hop_3_n_j)
9132  (=> (and hop_2_n_b hop_1_b_m) hop_3_n_m)
9133  (=> (and hop_2_n_b hop_1_b_l) hop_3_n_l)
9134  (=> (and hop_2_n_b hop_1_b_o) hop_3_n_o)
9135  (=> (and hop_2_n_b hop_1_b_q) hop_3_n_q)
9136  (=> (and hop_2_n_b hop_1_b_p) hop_3_n_p)
9137  (=> (and hop_2_n_e hop_1_e_a) hop_3_n_a)
9138  (=> (and hop_2_n_e hop_1_e_c) hop_3_n_c)
9139  (=> (and hop_2_n_e hop_1_e_b) hop_3_n_b)
9140  (=> (and hop_2_n_e hop_1_e_d) hop_3_n_d)
9141  (=> (and hop_2_n_e hop_1_e_g) hop_3_n_g)
9142  (=> (and hop_2_n_e hop_1_e_f) hop_3_n_f)
9143  (=> (and hop_2_n_e hop_1_e_i) hop_3_n_i)
9144  (=> (and hop_2_n_e hop_1_e_h) hop_3_n_h)
9145  (=> (and hop_2_n_e hop_1_e_k) hop_3_n_k)
9146  (=> (and hop_2_n_e hop_1_e_j) hop_3_n_j)
9147  (=> (and hop_2_n_e hop_1_e_m) hop_3_n_m)
9148  (=> (and hop_2_n_e hop_1_e_l) hop_3_n_l)
9149  (=> (and hop_2_n_e hop_1_e_o) hop_3_n_o)
9150  (=> (and hop_2_n_e hop_1_e_q) hop_3_n_q)
9151  (=> (and hop_2_n_e hop_1_e_p) hop_3_n_p)
9152  (=> (and hop_2_n_d hop_1_d_a) hop_3_n_a)
9153  (=> (and hop_2_n_d hop_1_d_c) hop_3_n_c)
9154  (=> (and hop_2_n_d hop_1_d_b) hop_3_n_b)
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9155  (=> (and hop_2_n_d hop_1_d_e) hop_3_n_e)
9156  (=> (and hop_2_n_d hop_1_d_g) hop_3_n_g)
9157  (=> (and hop_2_n_d hop_1_d_f) hop_3_n_f)
9158  (=> (and hop_2_n_d hop_1_d_i) hop_3_n_i)
9159  (=> (and hop_2_n_d hop_1_d_h) hop_3_n_h)
9160  (=> (and hop_2_n_d hop_1_d_k) hop_3_n_k)
9161  (=> (and hop_2_n_d hop_1_d_j) hop_3_n_j)
9162  (=> (and hop_2_n_d hop_1_d_m) hop_3_n_m)
9163  (=> (and hop_2_n_d hop_1_d_l) hop_3_n_l)
9164  (=> (and hop_2_n_d hop_1_d_o) hop_3_n_o)
9165  (=> (and hop_2_n_d hop_1_d_q) hop_3_n_q)
9166  (=> (and hop_2_n_d hop_1_d_p) hop_3_n_p)
9167  (=> (and hop_2_n_g hop_1_g_a) hop_3_n_a)
9168  (=> (and hop_2_n_g hop_1_g_c) hop_3_n_c)
9169  (=> (and hop_2_n_g hop_1_g_b) hop_3_n_b)
9170  (=> (and hop_2_n_g hop_1_g_e) hop_3_n_e)
9171  (=> (and hop_2_n_g hop_1_g_d) hop_3_n_d)
9172  (=> (and hop_2_n_g hop_1_g_f) hop_3_n_f)
9173  (=> (and hop_2_n_g hop_1_g_i) hop_3_n_i)
9174  (=> (and hop_2_n_g hop_1_g_h) hop_3_n_h)
9175  (=> (and hop_2_n_g hop_1_g_k) hop_3_n_k)
9176  (=> (and hop_2_n_g hop_1_g_j) hop_3_n_j)
9177  (=> (and hop_2_n_g hop_1_g_m) hop_3_n_m)
9178  (=> (and hop_2_n_g hop_1_g_l) hop_3_n_l)
9179  (=> (and hop_2_n_g hop_1_g_o) hop_3_n_o)
9180  (=> (and hop_2_n_g hop_1_g_q) hop_3_n_q)
9181  (=> (and hop_2_n_g hop_1_g_p) hop_3_n_p)
9182  (=> (and hop_2_n_f hop_1_f_a) hop_3_n_a)
9183  (=> (and hop_2_n_f hop_1_f_c) hop_3_n_c)
9184  (=> (and hop_2_n_f hop_1_f_b) hop_3_n_b)
9185  (=> (and hop_2_n_f hop_1_f_e) hop_3_n_e)
9186  (=> (and hop_2_n_f hop_1_f_d) hop_3_n_d)
9187  (=> (and hop_2_n_f hop_1_f_g) hop_3_n_g)
9188  (=> (and hop_2_n_f hop_1_f_i) hop_3_n_i)
9189  (=> (and hop_2_n_f hop_1_f_h) hop_3_n_h)
9190  (=> (and hop_2_n_f hop_1_f_k) hop_3_n_k)
9191  (=> (and hop_2_n_f hop_1_f_j) hop_3_n_j)
9192  (=> (and hop_2_n_f hop_1_f_m) hop_3_n_m)
9193  (=> (and hop_2_n_f hop_1_f_l) hop_3_n_l)
9194  (=> (and hop_2_n_f hop_1_f_o) hop_3_n_o)
9195  (=> (and hop_2_n_f hop_1_f_q) hop_3_n_q)
9196  (=> (and hop_2_n_f hop_1_f_p) hop_3_n_p)
9197  (=> (and hop_2_n_i hop_1_i_a) hop_3_n_a)
9198  (=> (and hop_2_n_i hop_1_i_c) hop_3_n_c)
9199  (=> (and hop_2_n_i hop_1_i_b) hop_3_n_b)
9200  (=> (and hop_2_n_i hop_1_i_e) hop_3_n_e)
9201  (=> (and hop_2_n_i hop_1_i_d) hop_3_n_d)
9202  (=> (and hop_2_n_i hop_1_i_g) hop_3_n_g)
9203  (=> (and hop_2_n_i hop_1_i_f) hop_3_n_f)
9204  (=> (and hop_2_n_i hop_1_i_h) hop_3_n_h)
9205  (=> (and hop_2_n_i hop_1_i_k) hop_3_n_k)
9206  (=> (and hop_2_n_i hop_1_i_j) hop_3_n_j)
9207  (=> (and hop_2_n_i hop_1_i_m) hop_3_n_m)
9208  (=> (and hop_2_n_i hop_1_i_l) hop_3_n_l)
9209  (=> (and hop_2_n_i hop_1_i_o) hop_3_n_o)
9210  (=> (and hop_2_n_i hop_1_i_q) hop_3_n_q)
9211  (=> (and hop_2_n_i hop_1_i_p) hop_3_n_p)
9212  (=> (and hop_2_n_h hop_1_h_a) hop_3_n_a)
9213  (=> (and hop_2_n_h hop_1_h_c) hop_3_n_c)
9214  (=> (and hop_2_n_h hop_1_h_b) hop_3_n_b)
9215  (=> (and hop_2_n_h hop_1_h_e) hop_3_n_e)
9216  (=> (and hop_2_n_h hop_1_h_d) hop_3_n_d)
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9217  (=> (and hop_2_n_h hop_1_h_g) hop_3_n_g)
9218  (=> (and hop_2_n_h hop_1_h_f) hop_3_n_f)
9219  (=> (and hop_2_n_h hop_1_h_i) hop_3_n_i)
9220  (=> (and hop_2_n_h hop_1_h_k) hop_3_n_k)
9221  (=> (and hop_2_n_h hop_1_h_j) hop_3_n_j)
9222  (=> (and hop_2_n_h hop_1_h_m) hop_3_n_m)
9223  (=> (and hop_2_n_h hop_1_h_l) hop_3_n_l)
9224  (=> (and hop_2_n_h hop_1_h_o) hop_3_n_o)
9225  (=> (and hop_2_n_h hop_1_h_q) hop_3_n_q)
9226  (=> (and hop_2_n_h hop_1_h_p) hop_3_n_p)
9227  (=> (and hop_2_n_k hop_1_k_a) hop_3_n_a)
9228  (=> (and hop_2_n_k hop_1_k_c) hop_3_n_c)
9229  (=> (and hop_2_n_k hop_1_k_b) hop_3_n_b)
9230  (=> (and hop_2_n_k hop_1_k_e) hop_3_n_e)
9231  (=> (and hop_2_n_k hop_1_k_d) hop_3_n_d)
9232  (=> (and hop_2_n_k hop_1_k_g) hop_3_n_g)
9233  (=> (and hop_2_n_k hop_1_k_f) hop_3_n_f)
9234  (=> (and hop_2_n_k hop_1_k_i) hop_3_n_i)
9235  (=> (and hop_2_n_k hop_1_k_h) hop_3_n_h)
9236  (=> (and hop_2_n_k hop_1_k_j) hop_3_n_j)
9237  (=> (and hop_2_n_k hop_1_k_m) hop_3_n_m)
9238  (=> (and hop_2_n_k hop_1_k_l) hop_3_n_l)
9239  (=> (and hop_2_n_k hop_1_k_o) hop_3_n_o)
9240  (=> (and hop_2_n_k hop_1_k_q) hop_3_n_q)
9241  (=> (and hop_2_n_k hop_1_k_p) hop_3_n_p)
9242  (=> (and hop_2_n_j hop_1_j_a) hop_3_n_a)
9243  (=> (and hop_2_n_j hop_1_j_c) hop_3_n_c)
9244  (=> (and hop_2_n_j hop_1_j_b) hop_3_n_b)
9245  (=> (and hop_2_n_j hop_1_j_e) hop_3_n_e)
9246  (=> (and hop_2_n_j hop_1_j_d) hop_3_n_d)
9247  (=> (and hop_2_n_j hop_1_j_g) hop_3_n_g)
9248  (=> (and hop_2_n_j hop_1_j_f) hop_3_n_f)
9249  (=> (and hop_2_n_j hop_1_j_i) hop_3_n_i)
9250  (=> (and hop_2_n_j hop_1_j_h) hop_3_n_h)
9251  (=> (and hop_2_n_j hop_1_j_k) hop_3_n_k)
9252  (=> (and hop_2_n_j hop_1_j_m) hop_3_n_m)
9253  (=> (and hop_2_n_j hop_1_j_l) hop_3_n_l)
9254  (=> (and hop_2_n_j hop_1_j_o) hop_3_n_o)
9255  (=> (and hop_2_n_j hop_1_j_q) hop_3_n_q)
9256  (=> (and hop_2_n_j hop_1_j_p) hop_3_n_p)
9257  (=> (and hop_2_n_m hop_1_m_a) hop_3_n_a)
9258  (=> (and hop_2_n_m hop_1_m_c) hop_3_n_c)
9259  (=> (and hop_2_n_m hop_1_m_b) hop_3_n_b)
9260  (=> (and hop_2_n_m hop_1_m_e) hop_3_n_e)
9261  (=> (and hop_2_n_m hop_1_m_d) hop_3_n_d)
9262  (=> (and hop_2_n_m hop_1_m_g) hop_3_n_g)
9263  (=> (and hop_2_n_m hop_1_m_f) hop_3_n_f)
9264  (=> (and hop_2_n_m hop_1_m_i) hop_3_n_i)
9265  (=> (and hop_2_n_m hop_1_m_h) hop_3_n_h)
9266  (=> (and hop_2_n_m hop_1_m_k) hop_3_n_k)
9267  (=> (and hop_2_n_m hop_1_m_j) hop_3_n_j)
9268  (=> (and hop_2_n_m hop_1_m_l) hop_3_n_l)
9269  (=> (and hop_2_n_m hop_1_m_o) hop_3_n_o)
9270  (=> (and hop_2_n_m hop_1_m_q) hop_3_n_q)
9271  (=> (and hop_2_n_m hop_1_m_p) hop_3_n_p)
9272  (=> (and hop_2_n_l hop_1_l_a) hop_3_n_a)
9273  (=> (and hop_2_n_l hop_1_l_c) hop_3_n_c)
9274  (=> (and hop_2_n_l hop_1_l_b) hop_3_n_b)
9275  (=> (and hop_2_n_l hop_1_l_e) hop_3_n_e)
9276  (=> (and hop_2_n_l hop_1_l_d) hop_3_n_d)
9277  (=> (and hop_2_n_l hop_1_l_g) hop_3_n_g)
9278  (=> (and hop_2_n_l hop_1_l_f) hop_3_n_f)
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9279  (=> (and hop_2_n_l hop_1_l_i) hop_3_n_i)
9280  (=> (and hop_2_n_l hop_1_l_h) hop_3_n_h)
9281  (=> (and hop_2_n_l hop_1_l_k) hop_3_n_k)
9282  (=> (and hop_2_n_l hop_1_l_j) hop_3_n_j)
9283  (=> (and hop_2_n_l hop_1_l_m) hop_3_n_m)
9284  (=> (and hop_2_n_l hop_1_l_o) hop_3_n_o)
9285  (=> (and hop_2_n_l hop_1_l_q) hop_3_n_q)
9286  (=> (and hop_2_n_l hop_1_l_p) hop_3_n_p)
9287  (=> (and hop_2_n_o hop_1_o_a) hop_3_n_a)
9288  (=> (and hop_2_n_o hop_1_o_c) hop_3_n_c)
9289  (=> (and hop_2_n_o hop_1_o_b) hop_3_n_b)
9290  (=> (and hop_2_n_o hop_1_o_e) hop_3_n_e)
9291  (=> (and hop_2_n_o hop_1_o_d) hop_3_n_d)
9292  (=> (and hop_2_n_o hop_1_o_g) hop_3_n_g)
9293  (=> (and hop_2_n_o hop_1_o_f) hop_3_n_f)
9294  (=> (and hop_2_n_o hop_1_o_i) hop_3_n_i)
9295  (=> (and hop_2_n_o hop_1_o_h) hop_3_n_h)
9296  (=> (and hop_2_n_o hop_1_o_k) hop_3_n_k)
9297  (=> (and hop_2_n_o hop_1_o_j) hop_3_n_j)
9298  (=> (and hop_2_n_o hop_1_o_m) hop_3_n_m)
9299  (=> (and hop_2_n_o hop_1_o_l) hop_3_n_l)
9300  (=> (and hop_2_n_o hop_1_o_q) hop_3_n_q)
9301  (=> (and hop_2_n_o hop_1_o_p) hop_3_n_p)
9302  (=> (and hop_2_n_q hop_1_q_a) hop_3_n_a)
9303  (=> (and hop_2_n_q hop_1_q_c) hop_3_n_c)
9304  (=> (and hop_2_n_q hop_1_q_b) hop_3_n_b)
9305  (=> (and hop_2_n_q hop_1_q_e) hop_3_n_e)
9306  (=> (and hop_2_n_q hop_1_q_d) hop_3_n_d)
9307  (=> (and hop_2_n_q hop_1_q_g) hop_3_n_g)
9308  (=> (and hop_2_n_q hop_1_q_f) hop_3_n_f)
9309  (=> (and hop_2_n_q hop_1_q_i) hop_3_n_i)
9310  (=> (and hop_2_n_q hop_1_q_h) hop_3_n_h)
9311  (=> (and hop_2_n_q hop_1_q_k) hop_3_n_k)
9312  (=> (and hop_2_n_q hop_1_q_j) hop_3_n_j)
9313  (=> (and hop_2_n_q hop_1_q_m) hop_3_n_m)
9314  (=> (and hop_2_n_q hop_1_q_l) hop_3_n_l)
9315  (=> (and hop_2_n_q hop_1_q_o) hop_3_n_o)
9316  (=> (and hop_2_n_q hop_1_q_p) hop_3_n_p)
9317  (=> (and hop_2_n_p hop_1_p_a) hop_3_n_a)
9318  (=> (and hop_2_n_p hop_1_p_c) hop_3_n_c)
9319  (=> (and hop_2_n_p hop_1_p_b) hop_3_n_b)
9320  (=> (and hop_2_n_p hop_1_p_e) hop_3_n_e)
9321  (=> (and hop_2_n_p hop_1_p_d) hop_3_n_d)
9322  (=> (and hop_2_n_p hop_1_p_g) hop_3_n_g)
9323  (=> (and hop_2_n_p hop_1_p_f) hop_3_n_f)
9324  (=> (and hop_2_n_p hop_1_p_i) hop_3_n_i)
9325  (=> (and hop_2_n_p hop_1_p_h) hop_3_n_h)
9326  (=> (and hop_2_n_p hop_1_p_k) hop_3_n_k)
9327  (=> (and hop_2_n_p hop_1_p_j) hop_3_n_j)
9328  (=> (and hop_2_n_p hop_1_p_m) hop_3_n_m)
9329  (=> (and hop_2_n_p hop_1_p_l) hop_3_n_l)
9330  (=> (and hop_2_n_p hop_1_p_o) hop_3_n_o)
9331  (=> (and hop_2_n_p hop_1_p_q) hop_3_n_q)
9332  (=> (and hop_2_q_a hop_1_a_c) hop_3_q_c)
9333  (=> (and hop_2_q_a hop_1_a_b) hop_3_q_b)
9334  (=> (and hop_2_q_a hop_1_a_e) hop_3_q_e)
9335  (=> (and hop_2_q_a hop_1_a_d) hop_3_q_d)
9336  (=> (and hop_2_q_a hop_1_a_g) hop_3_q_g)
9337  (=> (and hop_2_q_a hop_1_a_f) hop_3_q_f)
9338  (=> (and hop_2_q_a hop_1_a_i) hop_3_q_i)
9339  (=> (and hop_2_q_a hop_1_a_h) hop_3_q_h)
9340  (=> (and hop_2_q_a hop_1_a_k) hop_3_q_k)
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9341  (=> (and hop_2_q_a hop_1_a_j) hop_3_q_j)
9342  (=> (and hop_2_q_a hop_1_a_m) hop_3_q_m)
9343  (=> (and hop_2_q_a hop_1_a_l) hop_3_q_l)
9344  (=> (and hop_2_q_a hop_1_a_o) hop_3_q_o)
9345  (=> (and hop_2_q_a hop_1_a_n) hop_3_q_n)
9346  (=> (and hop_2_q_a hop_1_a_p) hop_3_q_p)
9347  (=> (and hop_2_q_c hop_1_c_a) hop_3_q_a)
9348  (=> (and hop_2_q_c hop_1_c_b) hop_3_q_b)
9349  (=> (and hop_2_q_c hop_1_c_e) hop_3_q_e)
9350  (=> (and hop_2_q_c hop_1_c_d) hop_3_q_d)
9351  (=> (and hop_2_q_c hop_1_c_g) hop_3_q_g)
9352  (=> (and hop_2_q_c hop_1_c_f) hop_3_q_f)
9353  (=> (and hop_2_q_c hop_1_c_i) hop_3_q_i)
9354  (=> (and hop_2_q_c hop_1_c_h) hop_3_q_h)
9355  (=> (and hop_2_q_c hop_1_c_k) hop_3_q_k)
9356  (=> (and hop_2_q_c hop_1_c_j) hop_3_q_j)
9357  (=> (and hop_2_q_c hop_1_c_m) hop_3_q_m)
9358  (=> (and hop_2_q_c hop_1_c_l) hop_3_q_l)
9359  (=> (and hop_2_q_c hop_1_c_o) hop_3_q_o)
9360  (=> (and hop_2_q_c hop_1_c_n) hop_3_q_n)
9361  (=> (and hop_2_q_c hop_1_c_p) hop_3_q_p)
9362  (=> (and hop_2_q_b hop_1_b_a) hop_3_q_a)
9363  (=> (and hop_2_q_b hop_1_b_c) hop_3_q_c)
9364  (=> (and hop_2_q_b hop_1_b_e) hop_3_q_e)
9365  (=> (and hop_2_q_b hop_1_b_d) hop_3_q_d)
9366  (=> (and hop_2_q_b hop_1_b_g) hop_3_q_g)
9367  (=> (and hop_2_q_b hop_1_b_f) hop_3_q_f)
9368  (=> (and hop_2_q_b hop_1_b_i) hop_3_q_i)
9369  (=> (and hop_2_q_b hop_1_b_h) hop_3_q_h)
9370  (=> (and hop_2_q_b hop_1_b_k) hop_3_q_k)
9371  (=> (and hop_2_q_b hop_1_b_j) hop_3_q_j)
9372  (=> (and hop_2_q_b hop_1_b_m) hop_3_q_m)
9373  (=> (and hop_2_q_b hop_1_b_l) hop_3_q_l)
9374  (=> (and hop_2_q_b hop_1_b_o) hop_3_q_o)
9375  (=> (and hop_2_q_b hop_1_b_n) hop_3_q_n)
9376  (=> (and hop_2_q_b hop_1_b_p) hop_3_q_p)
9377  (=> (and hop_2_q_e hop_1_e_a) hop_3_q_a)
9378  (=> (and hop_2_q_e hop_1_e_c) hop_3_q_c)
9379  (=> (and hop_2_q_e hop_1_e_b) hop_3_q_b)
9380  (=> (and hop_2_q_e hop_1_e_d) hop_3_q_d)
9381  (=> (and hop_2_q_e hop_1_e_g) hop_3_q_g)
9382  (=> (and hop_2_q_e hop_1_e_f) hop_3_q_f)
9383  (=> (and hop_2_q_e hop_1_e_i) hop_3_q_i)
9384  (=> (and hop_2_q_e hop_1_e_h) hop_3_q_h)
9385  (=> (and hop_2_q_e hop_1_e_k) hop_3_q_k)
9386  (=> (and hop_2_q_e hop_1_e_j) hop_3_q_j)
9387  (=> (and hop_2_q_e hop_1_e_m) hop_3_q_m)
9388  (=> (and hop_2_q_e hop_1_e_l) hop_3_q_l)
9389  (=> (and hop_2_q_e hop_1_e_o) hop_3_q_o)
9390  (=> (and hop_2_q_e hop_1_e_n) hop_3_q_n)
9391  (=> (and hop_2_q_e hop_1_e_p) hop_3_q_p)
9392  (=> (and hop_2_q_d hop_1_d_a) hop_3_q_a)
9393  (=> (and hop_2_q_d hop_1_d_c) hop_3_q_c)
9394  (=> (and hop_2_q_d hop_1_d_b) hop_3_q_b)
9395  (=> (and hop_2_q_d hop_1_d_e) hop_3_q_e)
9396  (=> (and hop_2_q_d hop_1_d_g) hop_3_q_g)
9397  (=> (and hop_2_q_d hop_1_d_f) hop_3_q_f)
9398  (=> (and hop_2_q_d hop_1_d_i) hop_3_q_i)
9399  (=> (and hop_2_q_d hop_1_d_h) hop_3_q_h)
9400  (=> (and hop_2_q_d hop_1_d_k) hop_3_q_k)
9401  (=> (and hop_2_q_d hop_1_d_j) hop_3_q_j)
9402  (=> (and hop_2_q_d hop_1_d_m) hop_3_q_m)
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9403  (=> (and hop_2_q_d hop_1_d_l) hop_3_q_l)
9404  (=> (and hop_2_q_d hop_1_d_o) hop_3_q_o)
9405  (=> (and hop_2_q_d hop_1_d_n) hop_3_q_n)
9406  (=> (and hop_2_q_d hop_1_d_p) hop_3_q_p)
9407  (=> (and hop_2_q_g hop_1_g_a) hop_3_q_a)
9408  (=> (and hop_2_q_g hop_1_g_c) hop_3_q_c)
9409  (=> (and hop_2_q_g hop_1_g_b) hop_3_q_b)
9410  (=> (and hop_2_q_g hop_1_g_e) hop_3_q_e)
9411  (=> (and hop_2_q_g hop_1_g_d) hop_3_q_d)
9412  (=> (and hop_2_q_g hop_1_g_f) hop_3_q_f)
9413  (=> (and hop_2_q_g hop_1_g_i) hop_3_q_i)
9414  (=> (and hop_2_q_g hop_1_g_h) hop_3_q_h)
9415  (=> (and hop_2_q_g hop_1_g_k) hop_3_q_k)
9416  (=> (and hop_2_q_g hop_1_g_j) hop_3_q_j)
9417  (=> (and hop_2_q_g hop_1_g_m) hop_3_q_m)
9418  (=> (and hop_2_q_g hop_1_g_l) hop_3_q_l)
9419  (=> (and hop_2_q_g hop_1_g_o) hop_3_q_o)
9420  (=> (and hop_2_q_g hop_1_g_n) hop_3_q_n)
9421  (=> (and hop_2_q_g hop_1_g_p) hop_3_q_p)
9422  (=> (and hop_2_q_f hop_1_f_a) hop_3_q_a)
9423  (=> (and hop_2_q_f hop_1_f_c) hop_3_q_c)
9424  (=> (and hop_2_q_f hop_1_f_b) hop_3_q_b)
9425  (=> (and hop_2_q_f hop_1_f_e) hop_3_q_e)
9426  (=> (and hop_2_q_f hop_1_f_d) hop_3_q_d)
9427  (=> (and hop_2_q_f hop_1_f_g) hop_3_q_g)
9428  (=> (and hop_2_q_f hop_1_f_i) hop_3_q_i)
9429  (=> (and hop_2_q_f hop_1_f_h) hop_3_q_h)
9430  (=> (and hop_2_q_f hop_1_f_k) hop_3_q_k)
9431  (=> (and hop_2_q_f hop_1_f_j) hop_3_q_j)
9432  (=> (and hop_2_q_f hop_1_f_m) hop_3_q_m)
9433  (=> (and hop_2_q_f hop_1_f_l) hop_3_q_l)
9434  (=> (and hop_2_q_f hop_1_f_o) hop_3_q_o)
9435  (=> (and hop_2_q_f hop_1_f_n) hop_3_q_n)
9436  (=> (and hop_2_q_f hop_1_f_p) hop_3_q_p)
9437  (=> (and hop_2_q_i hop_1_i_a) hop_3_q_a)
9438  (=> (and hop_2_q_i hop_1_i_c) hop_3_q_c)
9439  (=> (and hop_2_q_i hop_1_i_b) hop_3_q_b)
9440  (=> (and hop_2_q_i hop_1_i_e) hop_3_q_e)
9441  (=> (and hop_2_q_i hop_1_i_d) hop_3_q_d)
9442  (=> (and hop_2_q_i hop_1_i_g) hop_3_q_g)
9443  (=> (and hop_2_q_i hop_1_i_f) hop_3_q_f)
9444  (=> (and hop_2_q_i hop_1_i_h) hop_3_q_h)
9445  (=> (and hop_2_q_i hop_1_i_k) hop_3_q_k)
9446  (=> (and hop_2_q_i hop_1_i_j) hop_3_q_j)
9447  (=> (and hop_2_q_i hop_1_i_m) hop_3_q_m)
9448  (=> (and hop_2_q_i hop_1_i_l) hop_3_q_l)
9449  (=> (and hop_2_q_i hop_1_i_o) hop_3_q_o)
9450  (=> (and hop_2_q_i hop_1_i_n) hop_3_q_n)
9451  (=> (and hop_2_q_i hop_1_i_p) hop_3_q_p)
9452  (=> (and hop_2_q_h hop_1_h_a) hop_3_q_a)
9453  (=> (and hop_2_q_h hop_1_h_c) hop_3_q_c)
9454  (=> (and hop_2_q_h hop_1_h_b) hop_3_q_b)
9455  (=> (and hop_2_q_h hop_1_h_e) hop_3_q_e)
9456  (=> (and hop_2_q_h hop_1_h_d) hop_3_q_d)
9457  (=> (and hop_2_q_h hop_1_h_g) hop_3_q_g)
9458  (=> (and hop_2_q_h hop_1_h_f) hop_3_q_f)
9459  (=> (and hop_2_q_h hop_1_h_i) hop_3_q_i)
9460  (=> (and hop_2_q_h hop_1_h_k) hop_3_q_k)
9461  (=> (and hop_2_q_h hop_1_h_j) hop_3_q_j)
9462  (=> (and hop_2_q_h hop_1_h_m) hop_3_q_m)
9463  (=> (and hop_2_q_h hop_1_h_l) hop_3_q_l)
9464  (=> (and hop_2_q_h hop_1_h_o) hop_3_q_o)
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9465  (=> (and hop_2_q_h hop_1_h_n) hop_3_q_n)
9466  (=> (and hop_2_q_h hop_1_h_p) hop_3_q_p)
9467  (=> (and hop_2_q_k hop_1_k_a) hop_3_q_a)
9468  (=> (and hop_2_q_k hop_1_k_c) hop_3_q_c)
9469  (=> (and hop_2_q_k hop_1_k_b) hop_3_q_b)
9470  (=> (and hop_2_q_k hop_1_k_e) hop_3_q_e)
9471  (=> (and hop_2_q_k hop_1_k_d) hop_3_q_d)
9472  (=> (and hop_2_q_k hop_1_k_g) hop_3_q_g)
9473  (=> (and hop_2_q_k hop_1_k_f) hop_3_q_f)
9474  (=> (and hop_2_q_k hop_1_k_i) hop_3_q_i)
9475  (=> (and hop_2_q_k hop_1_k_h) hop_3_q_h)
9476  (=> (and hop_2_q_k hop_1_k_j) hop_3_q_j)
9477  (=> (and hop_2_q_k hop_1_k_m) hop_3_q_m)
9478  (=> (and hop_2_q_k hop_1_k_l) hop_3_q_l)
9479  (=> (and hop_2_q_k hop_1_k_o) hop_3_q_o)
9480  (=> (and hop_2_q_k hop_1_k_n) hop_3_q_n)
9481  (=> (and hop_2_q_k hop_1_k_p) hop_3_q_p)
9482  (=> (and hop_2_q_j hop_1_j_a) hop_3_q_a)
9483  (=> (and hop_2_q_j hop_1_j_c) hop_3_q_c)
9484  (=> (and hop_2_q_j hop_1_j_b) hop_3_q_b)
9485  (=> (and hop_2_q_j hop_1_j_e) hop_3_q_e)
9486  (=> (and hop_2_q_j hop_1_j_d) hop_3_q_d)
9487  (=> (and hop_2_q_j hop_1_j_g) hop_3_q_g)
9488  (=> (and hop_2_q_j hop_1_j_f) hop_3_q_f)
9489  (=> (and hop_2_q_j hop_1_j_i) hop_3_q_i)
9490  (=> (and hop_2_q_j hop_1_j_h) hop_3_q_h)
9491  (=> (and hop_2_q_j hop_1_j_k) hop_3_q_k)
9492  (=> (and hop_2_q_j hop_1_j_m) hop_3_q_m)
9493  (=> (and hop_2_q_j hop_1_j_l) hop_3_q_l)
9494  (=> (and hop_2_q_j hop_1_j_o) hop_3_q_o)
9495  (=> (and hop_2_q_j hop_1_j_n) hop_3_q_n)
9496  (=> (and hop_2_q_j hop_1_j_p) hop_3_q_p)
9497  (=> (and hop_2_q_m hop_1_m_a) hop_3_q_a)
9498  (=> (and hop_2_q_m hop_1_m_c) hop_3_q_c)
9499  (=> (and hop_2_q_m hop_1_m_b) hop_3_q_b)
9500  (=> (and hop_2_q_m hop_1_m_e) hop_3_q_e)
9501  (=> (and hop_2_q_m hop_1_m_d) hop_3_q_d)
9502  (=> (and hop_2_q_m hop_1_m_g) hop_3_q_g)
9503  (=> (and hop_2_q_m hop_1_m_f) hop_3_q_f)
9504  (=> (and hop_2_q_m hop_1_m_i) hop_3_q_i)
9505  (=> (and hop_2_q_m hop_1_m_h) hop_3_q_h)
9506  (=> (and hop_2_q_m hop_1_m_k) hop_3_q_k)
9507  (=> (and hop_2_q_m hop_1_m_j) hop_3_q_j)
9508  (=> (and hop_2_q_m hop_1_m_l) hop_3_q_l)
9509  (=> (and hop_2_q_m hop_1_m_o) hop_3_q_o)
9510  (=> (and hop_2_q_m hop_1_m_n) hop_3_q_n)
9511  (=> (and hop_2_q_m hop_1_m_p) hop_3_q_p)
9512  (=> (and hop_2_q_l hop_1_l_a) hop_3_q_a)
9513  (=> (and hop_2_q_l hop_1_l_c) hop_3_q_c)
9514  (=> (and hop_2_q_l hop_1_l_b) hop_3_q_b)
9515  (=> (and hop_2_q_l hop_1_l_e) hop_3_q_e)
9516  (=> (and hop_2_q_l hop_1_l_d) hop_3_q_d)
9517  (=> (and hop_2_q_l hop_1_l_g) hop_3_q_g)
9518  (=> (and hop_2_q_l hop_1_l_f) hop_3_q_f)
9519  (=> (and hop_2_q_l hop_1_l_i) hop_3_q_i)
9520  (=> (and hop_2_q_l hop_1_l_h) hop_3_q_h)
9521  (=> (and hop_2_q_l hop_1_l_k) hop_3_q_k)
9522  (=> (and hop_2_q_l hop_1_l_j) hop_3_q_j)
9523  (=> (and hop_2_q_l hop_1_l_m) hop_3_q_m)
9524  (=> (and hop_2_q_l hop_1_l_o) hop_3_q_o)
9525  (=> (and hop_2_q_l hop_1_l_n) hop_3_q_n)
9526  (=> (and hop_2_q_l hop_1_l_p) hop_3_q_p)
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9527  (=> (and hop_2_q_o hop_1_o_a) hop_3_q_a)
9528  (=> (and hop_2_q_o hop_1_o_c) hop_3_q_c)
9529  (=> (and hop_2_q_o hop_1_o_b) hop_3_q_b)
9530  (=> (and hop_2_q_o hop_1_o_e) hop_3_q_e)
9531  (=> (and hop_2_q_o hop_1_o_d) hop_3_q_d)
9532  (=> (and hop_2_q_o hop_1_o_g) hop_3_q_g)
9533  (=> (and hop_2_q_o hop_1_o_f) hop_3_q_f)
9534  (=> (and hop_2_q_o hop_1_o_i) hop_3_q_i)
9535  (=> (and hop_2_q_o hop_1_o_h) hop_3_q_h)
9536  (=> (and hop_2_q_o hop_1_o_k) hop_3_q_k)
9537  (=> (and hop_2_q_o hop_1_o_j) hop_3_q_j)
9538  (=> (and hop_2_q_o hop_1_o_m) hop_3_q_m)
9539  (=> (and hop_2_q_o hop_1_o_l) hop_3_q_l)
9540  (=> (and hop_2_q_o hop_1_o_n) hop_3_q_n)
9541  (=> (and hop_2_q_o hop_1_o_p) hop_3_q_p)
9542  (=> (and hop_2_q_n hop_1_n_a) hop_3_q_a)
9543  (=> (and hop_2_q_n hop_1_n_c) hop_3_q_c)
9544  (=> (and hop_2_q_n hop_1_n_b) hop_3_q_b)
9545  (=> (and hop_2_q_n hop_1_n_e) hop_3_q_e)
9546  (=> (and hop_2_q_n hop_1_n_d) hop_3_q_d)
9547  (=> (and hop_2_q_n hop_1_n_g) hop_3_q_g)
9548  (=> (and hop_2_q_n hop_1_n_f) hop_3_q_f)
9549  (=> (and hop_2_q_n hop_1_n_i) hop_3_q_i)
9550  (=> (and hop_2_q_n hop_1_n_h) hop_3_q_h)
9551  (=> (and hop_2_q_n hop_1_n_k) hop_3_q_k)
9552  (=> (and hop_2_q_n hop_1_n_j) hop_3_q_j)
9553  (=> (and hop_2_q_n hop_1_n_m) hop_3_q_m)
9554  (=> (and hop_2_q_n hop_1_n_l) hop_3_q_l)
9555  (=> (and hop_2_q_n hop_1_n_o) hop_3_q_o)
9556  (=> (and hop_2_q_n hop_1_n_p) hop_3_q_p)
9557  (=> (and hop_2_q_p hop_1_p_a) hop_3_q_a)
9558  (=> (and hop_2_q_p hop_1_p_c) hop_3_q_c)
9559  (=> (and hop_2_q_p hop_1_p_b) hop_3_q_b)
9560  (=> (and hop_2_q_p hop_1_p_e) hop_3_q_e)
9561  (=> (and hop_2_q_p hop_1_p_d) hop_3_q_d)
9562  (=> (and hop_2_q_p hop_1_p_g) hop_3_q_g)
9563  (=> (and hop_2_q_p hop_1_p_f) hop_3_q_f)
9564  (=> (and hop_2_q_p hop_1_p_i) hop_3_q_i)
9565  (=> (and hop_2_q_p hop_1_p_h) hop_3_q_h)
9566  (=> (and hop_2_q_p hop_1_p_k) hop_3_q_k)
9567  (=> (and hop_2_q_p hop_1_p_j) hop_3_q_j)
9568  (=> (and hop_2_q_p hop_1_p_m) hop_3_q_m)
9569  (=> (and hop_2_q_p hop_1_p_l) hop_3_q_l)
9570  (=> (and hop_2_q_p hop_1_p_o) hop_3_q_o)
9571  (=> (and hop_2_q_p hop_1_p_n) hop_3_q_n)
9572  (=> (and hop_2_p_a hop_1_a_c) hop_3_p_c)
9573  (=> (and hop_2_p_a hop_1_a_b) hop_3_p_b)
9574  (=> (and hop_2_p_a hop_1_a_e) hop_3_p_e)
9575  (=> (and hop_2_p_a hop_1_a_d) hop_3_p_d)
9576  (=> (and hop_2_p_a hop_1_a_g) hop_3_p_g)
9577  (=> (and hop_2_p_a hop_1_a_f) hop_3_p_f)
9578  (=> (and hop_2_p_a hop_1_a_i) hop_3_p_i)
9579  (=> (and hop_2_p_a hop_1_a_h) hop_3_p_h)
9580  (=> (and hop_2_p_a hop_1_a_k) hop_3_p_k)
9581  (=> (and hop_2_p_a hop_1_a_j) hop_3_p_j)
9582  (=> (and hop_2_p_a hop_1_a_m) hop_3_p_m)
9583  (=> (and hop_2_p_a hop_1_a_l) hop_3_p_l)
9584  (=> (and hop_2_p_a hop_1_a_o) hop_3_p_o)
9585  (=> (and hop_2_p_a hop_1_a_n) hop_3_p_n)
9586  (=> (and hop_2_p_a hop_1_a_q) hop_3_p_q)
9587  (=> (and hop_2_p_c hop_1_c_a) hop_3_p_a)
9588  (=> (and hop_2_p_c hop_1_c_b) hop_3_p_b)
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9589  (=> (and hop_2_p_c hop_1_c_e) hop_3_p_e)
9590  (=> (and hop_2_p_c hop_1_c_d) hop_3_p_d)
9591  (=> (and hop_2_p_c hop_1_c_g) hop_3_p_g)
9592  (=> (and hop_2_p_c hop_1_c_f) hop_3_p_f)
9593  (=> (and hop_2_p_c hop_1_c_i) hop_3_p_i)
9594  (=> (and hop_2_p_c hop_1_c_h) hop_3_p_h)
9595  (=> (and hop_2_p_c hop_1_c_k) hop_3_p_k)
9596  (=> (and hop_2_p_c hop_1_c_j) hop_3_p_j)
9597  (=> (and hop_2_p_c hop_1_c_m) hop_3_p_m)
9598  (=> (and hop_2_p_c hop_1_c_l) hop_3_p_l)
9599  (=> (and hop_2_p_c hop_1_c_o) hop_3_p_o)
9600  (=> (and hop_2_p_c hop_1_c_n) hop_3_p_n)
9601  (=> (and hop_2_p_c hop_1_c_q) hop_3_p_q)
9602  (=> (and hop_2_p_b hop_1_b_a) hop_3_p_a)
9603  (=> (and hop_2_p_b hop_1_b_c) hop_3_p_c)
9604  (=> (and hop_2_p_b hop_1_b_e) hop_3_p_e)
9605  (=> (and hop_2_p_b hop_1_b_d) hop_3_p_d)
9606  (=> (and hop_2_p_b hop_1_b_g) hop_3_p_g)
9607  (=> (and hop_2_p_b hop_1_b_f) hop_3_p_f)
9608  (=> (and hop_2_p_b hop_1_b_i) hop_3_p_i)
9609  (=> (and hop_2_p_b hop_1_b_h) hop_3_p_h)
9610  (=> (and hop_2_p_b hop_1_b_k) hop_3_p_k)
9611  (=> (and hop_2_p_b hop_1_b_j) hop_3_p_j)
9612  (=> (and hop_2_p_b hop_1_b_m) hop_3_p_m)
9613  (=> (and hop_2_p_b hop_1_b_l) hop_3_p_l)
9614  (=> (and hop_2_p_b hop_1_b_o) hop_3_p_o)
9615  (=> (and hop_2_p_b hop_1_b_n) hop_3_p_n)
9616  (=> (and hop_2_p_b hop_1_b_q) hop_3_p_q)
9617  (=> (and hop_2_p_e hop_1_e_a) hop_3_p_a)
9618  (=> (and hop_2_p_e hop_1_e_c) hop_3_p_c)
9619  (=> (and hop_2_p_e hop_1_e_b) hop_3_p_b)
9620  (=> (and hop_2_p_e hop_1_e_d) hop_3_p_d)
9621  (=> (and hop_2_p_e hop_1_e_g) hop_3_p_g)
9622  (=> (and hop_2_p_e hop_1_e_f) hop_3_p_f)
9623  (=> (and hop_2_p_e hop_1_e_i) hop_3_p_i)
9624  (=> (and hop_2_p_e hop_1_e_h) hop_3_p_h)
9625  (=> (and hop_2_p_e hop_1_e_k) hop_3_p_k)
9626  (=> (and hop_2_p_e hop_1_e_j) hop_3_p_j)
9627  (=> (and hop_2_p_e hop_1_e_m) hop_3_p_m)
9628  (=> (and hop_2_p_e hop_1_e_l) hop_3_p_l)
9629  (=> (and hop_2_p_e hop_1_e_o) hop_3_p_o)
9630  (=> (and hop_2_p_e hop_1_e_n) hop_3_p_n)
9631  (=> (and hop_2_p_e hop_1_e_q) hop_3_p_q)
9632  (=> (and hop_2_p_d hop_1_d_a) hop_3_p_a)
9633  (=> (and hop_2_p_d hop_1_d_c) hop_3_p_c)
9634  (=> (and hop_2_p_d hop_1_d_b) hop_3_p_b)
9635  (=> (and hop_2_p_d hop_1_d_e) hop_3_p_e)
9636  (=> (and hop_2_p_d hop_1_d_g) hop_3_p_g)
9637  (=> (and hop_2_p_d hop_1_d_f) hop_3_p_f)
9638  (=> (and hop_2_p_d hop_1_d_i) hop_3_p_i)
9639  (=> (and hop_2_p_d hop_1_d_h) hop_3_p_h)
9640  (=> (and hop_2_p_d hop_1_d_k) hop_3_p_k)
9641  (=> (and hop_2_p_d hop_1_d_j) hop_3_p_j)
9642  (=> (and hop_2_p_d hop_1_d_m) hop_3_p_m)
9643  (=> (and hop_2_p_d hop_1_d_l) hop_3_p_l)
9644  (=> (and hop_2_p_d hop_1_d_o) hop_3_p_o)
9645  (=> (and hop_2_p_d hop_1_d_n) hop_3_p_n)
9646  (=> (and hop_2_p_d hop_1_d_q) hop_3_p_q)
9647  (=> (and hop_2_p_g hop_1_g_a) hop_3_p_a)
9648  (=> (and hop_2_p_g hop_1_g_c) hop_3_p_c)
9649  (=> (and hop_2_p_g hop_1_g_b) hop_3_p_b)
9650  (=> (and hop_2_p_g hop_1_g_e) hop_3_p_e)
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9651  (=> (and hop_2_p_g hop_1_g_d) hop_3_p_d)
9652  (=> (and hop_2_p_g hop_1_g_f) hop_3_p_f)
9653  (=> (and hop_2_p_g hop_1_g_i) hop_3_p_i)
9654  (=> (and hop_2_p_g hop_1_g_h) hop_3_p_h)
9655  (=> (and hop_2_p_g hop_1_g_k) hop_3_p_k)
9656  (=> (and hop_2_p_g hop_1_g_j) hop_3_p_j)
9657  (=> (and hop_2_p_g hop_1_g_m) hop_3_p_m)
9658  (=> (and hop_2_p_g hop_1_g_l) hop_3_p_l)
9659  (=> (and hop_2_p_g hop_1_g_o) hop_3_p_o)
9660  (=> (and hop_2_p_g hop_1_g_n) hop_3_p_n)
9661  (=> (and hop_2_p_g hop_1_g_q) hop_3_p_q)
9662  (=> (and hop_2_p_f hop_1_f_a) hop_3_p_a)
9663  (=> (and hop_2_p_f hop_1_f_c) hop_3_p_c)
9664  (=> (and hop_2_p_f hop_1_f_b) hop_3_p_b)
9665  (=> (and hop_2_p_f hop_1_f_e) hop_3_p_e)
9666  (=> (and hop_2_p_f hop_1_f_d) hop_3_p_d)
9667  (=> (and hop_2_p_f hop_1_f_g) hop_3_p_g)
9668  (=> (and hop_2_p_f hop_1_f_i) hop_3_p_i)
9669  (=> (and hop_2_p_f hop_1_f_h) hop_3_p_h)
9670  (=> (and hop_2_p_f hop_1_f_k) hop_3_p_k)
9671  (=> (and hop_2_p_f hop_1_f_j) hop_3_p_j)
9672  (=> (and hop_2_p_f hop_1_f_m) hop_3_p_m)
9673  (=> (and hop_2_p_f hop_1_f_l) hop_3_p_l)
9674  (=> (and hop_2_p_f hop_1_f_o) hop_3_p_o)
9675  (=> (and hop_2_p_f hop_1_f_n) hop_3_p_n)
9676  (=> (and hop_2_p_f hop_1_f_q) hop_3_p_q)
9677  (=> (and hop_2_p_i hop_1_i_a) hop_3_p_a)
9678  (=> (and hop_2_p_i hop_1_i_c) hop_3_p_c)
9679  (=> (and hop_2_p_i hop_1_i_b) hop_3_p_b)
9680  (=> (and hop_2_p_i hop_1_i_e) hop_3_p_e)
9681  (=> (and hop_2_p_i hop_1_i_d) hop_3_p_d)
9682  (=> (and hop_2_p_i hop_1_i_g) hop_3_p_g)
9683  (=> (and hop_2_p_i hop_1_i_f) hop_3_p_f)
9684  (=> (and hop_2_p_i hop_1_i_h) hop_3_p_h)
9685  (=> (and hop_2_p_i hop_1_i_k) hop_3_p_k)
9686  (=> (and hop_2_p_i hop_1_i_j) hop_3_p_j)
9687  (=> (and hop_2_p_i hop_1_i_m) hop_3_p_m)
9688  (=> (and hop_2_p_i hop_1_i_l) hop_3_p_l)
9689  (=> (and hop_2_p_i hop_1_i_o) hop_3_p_o)
9690  (=> (and hop_2_p_i hop_1_i_n) hop_3_p_n)
9691  (=> (and hop_2_p_i hop_1_i_q) hop_3_p_q)
9692  (=> (and hop_2_p_h hop_1_h_a) hop_3_p_a)
9693  (=> (and hop_2_p_h hop_1_h_c) hop_3_p_c)
9694  (=> (and hop_2_p_h hop_1_h_b) hop_3_p_b)
9695  (=> (and hop_2_p_h hop_1_h_e) hop_3_p_e)
9696  (=> (and hop_2_p_h hop_1_h_d) hop_3_p_d)
9697  (=> (and hop_2_p_h hop_1_h_g) hop_3_p_g)
9698  (=> (and hop_2_p_h hop_1_h_f) hop_3_p_f)
9699  (=> (and hop_2_p_h hop_1_h_i) hop_3_p_i)
9700  (=> (and hop_2_p_h hop_1_h_k) hop_3_p_k)
9701  (=> (and hop_2_p_h hop_1_h_j) hop_3_p_j)
9702  (=> (and hop_2_p_h hop_1_h_m) hop_3_p_m)
9703  (=> (and hop_2_p_h hop_1_h_l) hop_3_p_l)
9704  (=> (and hop_2_p_h hop_1_h_o) hop_3_p_o)
9705  (=> (and hop_2_p_h hop_1_h_n) hop_3_p_n)
9706  (=> (and hop_2_p_h hop_1_h_q) hop_3_p_q)
9707  (=> (and hop_2_p_k hop_1_k_a) hop_3_p_a)
9708  (=> (and hop_2_p_k hop_1_k_c) hop_3_p_c)
9709  (=> (and hop_2_p_k hop_1_k_b) hop_3_p_b)
9710  (=> (and hop_2_p_k hop_1_k_e) hop_3_p_e)
9711  (=> (and hop_2_p_k hop_1_k_d) hop_3_p_d)
9712  (=> (and hop_2_p_k hop_1_k_g) hop_3_p_g)
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9713  (=> (and hop_2_p_k hop_1_k_f) hop_3_p_f)
9714  (=> (and hop_2_p_k hop_1_k_i) hop_3_p_i)
9715  (=> (and hop_2_p_k hop_1_k_h) hop_3_p_h)
9716  (=> (and hop_2_p_k hop_1_k_j) hop_3_p_j)
9717  (=> (and hop_2_p_k hop_1_k_m) hop_3_p_m)
9718  (=> (and hop_2_p_k hop_1_k_l) hop_3_p_l)
9719  (=> (and hop_2_p_k hop_1_k_o) hop_3_p_o)
9720  (=> (and hop_2_p_k hop_1_k_n) hop_3_p_n)
9721  (=> (and hop_2_p_k hop_1_k_q) hop_3_p_q)
9722  (=> (and hop_2_p_j hop_1_j_a) hop_3_p_a)
9723  (=> (and hop_2_p_j hop_1_j_c) hop_3_p_c)
9724  (=> (and hop_2_p_j hop_1_j_b) hop_3_p_b)
9725  (=> (and hop_2_p_j hop_1_j_e) hop_3_p_e)
9726  (=> (and hop_2_p_j hop_1_j_d) hop_3_p_d)
9727  (=> (and hop_2_p_j hop_1_j_g) hop_3_p_g)
9728  (=> (and hop_2_p_j hop_1_j_f) hop_3_p_f)
9729  (=> (and hop_2_p_j hop_1_j_i) hop_3_p_i)
9730  (=> (and hop_2_p_j hop_1_j_h) hop_3_p_h)
9731  (=> (and hop_2_p_j hop_1_j_k) hop_3_p_k)
9732  (=> (and hop_2_p_j hop_1_j_m) hop_3_p_m)
9733  (=> (and hop_2_p_j hop_1_j_l) hop_3_p_l)
9734  (=> (and hop_2_p_j hop_1_j_o) hop_3_p_o)
9735  (=> (and hop_2_p_j hop_1_j_n) hop_3_p_n)
9736  (=> (and hop_2_p_j hop_1_j_q) hop_3_p_q)
9737  (=> (and hop_2_p_m hop_1_m_a) hop_3_p_a)
9738  (=> (and hop_2_p_m hop_1_m_c) hop_3_p_c)
9739  (=> (and hop_2_p_m hop_1_m_b) hop_3_p_b)
9740  (=> (and hop_2_p_m hop_1_m_e) hop_3_p_e)
9741  (=> (and hop_2_p_m hop_1_m_d) hop_3_p_d)
9742  (=> (and hop_2_p_m hop_1_m_g) hop_3_p_g)
9743  (=> (and hop_2_p_m hop_1_m_f) hop_3_p_f)
9744  (=> (and hop_2_p_m hop_1_m_i) hop_3_p_i)
9745  (=> (and hop_2_p_m hop_1_m_h) hop_3_p_h)
9746  (=> (and hop_2_p_m hop_1_m_k) hop_3_p_k)
9747  (=> (and hop_2_p_m hop_1_m_j) hop_3_p_j)
9748  (=> (and hop_2_p_m hop_1_m_l) hop_3_p_l)
9749  (=> (and hop_2_p_m hop_1_m_o) hop_3_p_o)
9750  (=> (and hop_2_p_m hop_1_m_n) hop_3_p_n)
9751  (=> (and hop_2_p_m hop_1_m_q) hop_3_p_q)
9752  (=> (and hop_2_p_l hop_1_l_a) hop_3_p_a)
9753  (=> (and hop_2_p_l hop_1_l_c) hop_3_p_c)
9754  (=> (and hop_2_p_l hop_1_l_b) hop_3_p_b)
9755  (=> (and hop_2_p_l hop_1_l_e) hop_3_p_e)
9756  (=> (and hop_2_p_l hop_1_l_d) hop_3_p_d)
9757  (=> (and hop_2_p_l hop_1_l_g) hop_3_p_g)
9758  (=> (and hop_2_p_l hop_1_l_f) hop_3_p_f)
9759  (=> (and hop_2_p_l hop_1_l_i) hop_3_p_i)
9760  (=> (and hop_2_p_l hop_1_l_h) hop_3_p_h)
9761  (=> (and hop_2_p_l hop_1_l_k) hop_3_p_k)
9762  (=> (and hop_2_p_l hop_1_l_j) hop_3_p_j)
9763  (=> (and hop_2_p_l hop_1_l_m) hop_3_p_m)
9764  (=> (and hop_2_p_l hop_1_l_o) hop_3_p_o)
9765  (=> (and hop_2_p_l hop_1_l_n) hop_3_p_n)
9766  (=> (and hop_2_p_l hop_1_l_q) hop_3_p_q)
9767  (=> (and hop_2_p_o hop_1_o_a) hop_3_p_a)
9768  (=> (and hop_2_p_o hop_1_o_c) hop_3_p_c)
9769  (=> (and hop_2_p_o hop_1_o_b) hop_3_p_b)
9770  (=> (and hop_2_p_o hop_1_o_e) hop_3_p_e)
9771  (=> (and hop_2_p_o hop_1_o_d) hop_3_p_d)
9772  (=> (and hop_2_p_o hop_1_o_g) hop_3_p_g)
9773  (=> (and hop_2_p_o hop_1_o_f) hop_3_p_f)
9774  (=> (and hop_2_p_o hop_1_o_i) hop_3_p_i)
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9775  (=> (and hop_2_p_o hop_1_o_h) hop_3_p_h)
9776  (=> (and hop_2_p_o hop_1_o_k) hop_3_p_k)
9777  (=> (and hop_2_p_o hop_1_o_j) hop_3_p_j)
9778  (=> (and hop_2_p_o hop_1_o_m) hop_3_p_m)
9779  (=> (and hop_2_p_o hop_1_o_l) hop_3_p_l)
9780  (=> (and hop_2_p_o hop_1_o_n) hop_3_p_n)
9781  (=> (and hop_2_p_o hop_1_o_q) hop_3_p_q)
9782  (=> (and hop_2_p_n hop_1_n_a) hop_3_p_a)
9783  (=> (and hop_2_p_n hop_1_n_c) hop_3_p_c)
9784  (=> (and hop_2_p_n hop_1_n_b) hop_3_p_b)
9785  (=> (and hop_2_p_n hop_1_n_e) hop_3_p_e)
9786  (=> (and hop_2_p_n hop_1_n_d) hop_3_p_d)
9787  (=> (and hop_2_p_n hop_1_n_g) hop_3_p_g)
9788  (=> (and hop_2_p_n hop_1_n_f) hop_3_p_f)
9789  (=> (and hop_2_p_n hop_1_n_i) hop_3_p_i)
9790  (=> (and hop_2_p_n hop_1_n_h) hop_3_p_h)
9791  (=> (and hop_2_p_n hop_1_n_k) hop_3_p_k)
9792  (=> (and hop_2_p_n hop_1_n_j) hop_3_p_j)
9793  (=> (and hop_2_p_n hop_1_n_m) hop_3_p_m)
9794  (=> (and hop_2_p_n hop_1_n_l) hop_3_p_l)
9795  (=> (and hop_2_p_n hop_1_n_o) hop_3_p_o)
9796  (=> (and hop_2_p_n hop_1_n_q) hop_3_p_q)
9797  (=> (and hop_2_p_q hop_1_q_a) hop_3_p_a)
9798  (=> (and hop_2_p_q hop_1_q_c) hop_3_p_c)
9799  (=> (and hop_2_p_q hop_1_q_b) hop_3_p_b)
9800  (=> (and hop_2_p_q hop_1_q_e) hop_3_p_e)
9801  (=> (and hop_2_p_q hop_1_q_d) hop_3_p_d)
9802  (=> (and hop_2_p_q hop_1_q_g) hop_3_p_g)
9803  (=> (and hop_2_p_q hop_1_q_f) hop_3_p_f)
9804  (=> (and hop_2_p_q hop_1_q_i) hop_3_p_i)
9805  (=> (and hop_2_p_q hop_1_q_h) hop_3_p_h)
9806  (=> (and hop_2_p_q hop_1_q_k) hop_3_p_k)
9807  (=> (and hop_2_p_q hop_1_q_j) hop_3_p_j)
9808  (=> (and hop_2_p_q hop_1_q_m) hop_3_p_m)
9809  (=> (and hop_2_p_q hop_1_q_l) hop_3_p_l)
9810  (=> (and hop_2_p_q hop_1_q_o) hop_3_p_o)
9811  (=> (and hop_2_p_q hop_1_q_n) hop_3_p_n)
9812  (=> hop_3_a_c (not (= chan_a chan_c)))
9813  (=> hop_3_a_b (not (= chan_a chan_b)))
9814  (=> hop_3_a_e (not (= chan_a chan_e)))
9815  (=> hop_3_a_d (not (= chan_a chan_d)))
9816  (=> hop_3_a_g (not (= chan_a chan_g)))
9817  (=> hop_3_a_f (not (= chan_a chan_f)))
9818  (=> hop_3_a_i (not (= chan_a chan_i)))
9819  (=> hop_3_a_h (not (= chan_a chan_h)))
9820  (=> hop_3_a_k (not (= chan_a chan_k)))
9821  (=> hop_3_a_j (not (= chan_a chan_j)))
9822  (=> hop_3_a_m (not (= chan_a chan_m)))
9823  (=> hop_3_a_l (not (= chan_a chan_l)))
9824  (=> hop_3_a_o (not (= chan_a chan_o)))
9825  (=> hop_3_a_n (not (= chan_a chan_n)))
9826  (=> hop_3_a_q (not (= chan_a chan_q)))
9827  (=> hop_3_a_p (not (= chan_a chan_p)))
9828  (=> hop_3_c_a (not (= chan_c chan_a)))
9829  (=> hop_3_c_b (not (= chan_c chan_b)))
9830  (=> hop_3_c_e (not (= chan_c chan_e)))
9831  (=> hop_3_c_d (not (= chan_c chan_d)))
9832  (=> hop_3_c_g (not (= chan_c chan_g)))
9833  (=> hop_3_c_f (not (= chan_c chan_f)))
9834  (=> hop_3_c_i (not (= chan_c chan_i)))
9835  (=> hop_3_c_h (not (= chan_c chan_h)))
9836  (=> hop_3_c_k (not (= chan_c chan_k)))
```

```
9837  (=> hop_3_c_j (not (= chan_c chan_j)))
9838  (=> hop_3_c_m (not (= chan_c chan_m)))
9839  (=> hop_3_c_l (not (= chan_c chan_l)))
9840  (=> hop_3_c_o (not (= chan_c chan_o)))
9841  (=> hop_3_c_n (not (= chan_c chan_n)))
9842  (=> hop_3_c_q (not (= chan_c chan_q)))
9843  (=> hop_3_c_p (not (= chan_c chan_p)))
9844  (=> hop_3_b_a (not (= chan_b chan_a)))
9845  (=> hop_3_b_c (not (= chan_b chan_c)))
9846  (=> hop_3_b_e (not (= chan_b chan_e)))
9847  (=> hop_3_b_d (not (= chan_b chan_d)))
9848  (=> hop_3_b_g (not (= chan_b chan_g)))
9849  (=> hop_3_b_f (not (= chan_b chan_f)))
9850  (=> hop_3_b_i (not (= chan_b chan_i)))
9851  (=> hop_3_b_h (not (= chan_b chan_h)))
9852  (=> hop_3_b_k (not (= chan_b chan_k)))
9853  (=> hop_3_b_j (not (= chan_b chan_j)))
9854  (=> hop_3_b_m (not (= chan_b chan_m)))
9855  (=> hop_3_b_l (not (= chan_b chan_l)))
9856  (=> hop_3_b_o (not (= chan_b chan_o)))
9857  (=> hop_3_b_n (not (= chan_b chan_n)))
9858  (=> hop_3_b_q (not (= chan_b chan_q)))
9859  (=> hop_3_b_p (not (= chan_b chan_p)))
9860  (=> hop_3_e_a (not (= chan_e chan_a)))
9861  (=> hop_3_e_c (not (= chan_e chan_c)))
9862  (=> hop_3_e_b (not (= chan_e chan_b)))
9863  (=> hop_3_e_d (not (= chan_e chan_d)))
9864  (=> hop_3_e_g (not (= chan_e chan_g)))
9865  (=> hop_3_e_f (not (= chan_e chan_f)))
9866  (=> hop_3_e_i (not (= chan_e chan_i)))
9867  (=> hop_3_e_h (not (= chan_e chan_h)))
9868  (=> hop_3_e_k (not (= chan_e chan_k)))
9869  (=> hop_3_e_j (not (= chan_e chan_j)))
9870  (=> hop_3_e_m (not (= chan_e chan_m)))
9871  (=> hop_3_e_l (not (= chan_e chan_l)))
9872  (=> hop_3_e_o (not (= chan_e chan_o)))
9873  (=> hop_3_e_n (not (= chan_e chan_n)))
9874  (=> hop_3_e_q (not (= chan_e chan_q)))
9875  (=> hop_3_e_p (not (= chan_e chan_p)))
9876  (=> hop_3_d_a (not (= chan_d chan_a)))
9877  (=> hop_3_d_c (not (= chan_d chan_c)))
9878  (=> hop_3_d_b (not (= chan_d chan_b)))
9879  (=> hop_3_d_e (not (= chan_d chan_e)))
9880  (=> hop_3_d_g (not (= chan_d chan_g)))
9881  (=> hop_3_d_f (not (= chan_d chan_f)))
9882  (=> hop_3_d_i (not (= chan_d chan_i)))
9883  (=> hop_3_d_h (not (= chan_d chan_h)))
9884  (=> hop_3_d_k (not (= chan_d chan_k)))
9885  (=> hop_3_d_j (not (= chan_d chan_j)))
9886  (=> hop_3_d_m (not (= chan_d chan_m)))
9887  (=> hop_3_d_l (not (= chan_d chan_l)))
9888  (=> hop_3_d_o (not (= chan_d chan_o)))
9889  (=> hop_3_d_n (not (= chan_d chan_n)))
9890  (=> hop_3_d_q (not (= chan_d chan_q)))
9891  (=> hop_3_d_p (not (= chan_d chan_p)))
9892  (=> hop_3_g_a (not (= chan_g chan_a)))
9893  (=> hop_3_g_c (not (= chan_g chan_c)))
9894  (=> hop_3_g_b (not (= chan_g chan_b)))
9895  (=> hop_3_g_e (not (= chan_g chan_e)))
9896  (=> hop_3_g_d (not (= chan_g chan_d)))
9897  (=> hop_3_g_f (not (= chan_g chan_f)))
9898  (=> hop_3_g_i (not (= chan_g chan_i)))
```

```
9899   (=> hop_3_g_h (not (= chan_g chan_h)))
9900   (=> hop_3_g_k (not (= chan_g chan_k)))
9901   (=> hop_3_g_j (not (= chan_g chan_j)))
9902   (=> hop_3_g_m (not (= chan_g chan_m)))
9903   (=> hop_3_g_l (not (= chan_g chan_l)))
9904   (=> hop_3_g_o (not (= chan_g chan_o)))
9905   (=> hop_3_g_n (not (= chan_g chan_n)))
9906   (=> hop_3_g_q (not (= chan_g chan_q)))
9907   (=> hop_3_g_p (not (= chan_g chan_p)))
9908   (=> hop_3_f_a (not (= chan_f chan_a)))
9909   (=> hop_3_f_c (not (= chan_f chan_c)))
9910   (=> hop_3_f_b (not (= chan_f chan_b)))
9911   (=> hop_3_f_e (not (= chan_f chan_e)))
9912   (=> hop_3_f_d (not (= chan_f chan_d)))
9913   (=> hop_3_f_g (not (= chan_f chan_g)))
9914   (=> hop_3_f_i (not (= chan_f chan_i)))
9915   (=> hop_3_f_h (not (= chan_f chan_h)))
9916   (=> hop_3_f_k (not (= chan_f chan_k)))
9917   (=> hop_3_f_j (not (= chan_f chan_j)))
9918   (=> hop_3_f_m (not (= chan_f chan_m)))
9919   (=> hop_3_f_l (not (= chan_f chan_l)))
9920   (=> hop_3_f_o (not (= chan_f chan_o)))
9921   (=> hop_3_f_n (not (= chan_f chan_n)))
9922   (=> hop_3_f_q (not (= chan_f chan_q)))
9923   (=> hop_3_f_p (not (= chan_f chan_p)))
9924   (=> hop_3_i_a (not (= chan_i chan_a)))
9925   (=> hop_3_i_c (not (= chan_i chan_c)))
9926   (=> hop_3_i_b (not (= chan_i chan_b)))
9927   (=> hop_3_i_e (not (= chan_i chan_e)))
9928   (=> hop_3_i_d (not (= chan_i chan_d)))
9929   (=> hop_3_i_g (not (= chan_i chan_g)))
9930   (=> hop_3_i_f (not (= chan_i chan_f)))
9931   (=> hop_3_i_h (not (= chan_i chan_h)))
9932   (=> hop_3_i_k (not (= chan_i chan_k)))
9933   (=> hop_3_i_j (not (= chan_i chan_j)))
9934   (=> hop_3_i_m (not (= chan_i chan_m)))
9935   (=> hop_3_i_l (not (= chan_i chan_l)))
9936   (=> hop_3_i_o (not (= chan_i chan_o)))
9937   (=> hop_3_i_n (not (= chan_i chan_n)))
9938   (=> hop_3_i_q (not (= chan_i chan_q)))
9939   (=> hop_3_i_p (not (= chan_i chan_p)))
9940   (=> hop_3_h_a (not (= chan_h chan_a)))
9941   (=> hop_3_h_c (not (= chan_h chan_c)))
9942   (=> hop_3_h_b (not (= chan_h chan_b)))
9943   (=> hop_3_h_e (not (= chan_h chan_e)))
9944   (=> hop_3_h_d (not (= chan_h chan_d)))
9945   (=> hop_3_h_g (not (= chan_h chan_g)))
9946   (=> hop_3_h_f (not (= chan_h chan_f)))
9947   (=> hop_3_h_i (not (= chan_h chan_i)))
9948   (=> hop_3_h_k (not (= chan_h chan_k)))
9949   (=> hop_3_h_j (not (= chan_h chan_j)))
9950   (=> hop_3_h_m (not (= chan_h chan_m)))
9951   (=> hop_3_h_l (not (= chan_h chan_l)))
9952   (=> hop_3_h_o (not (= chan_h chan_o)))
9953   (=> hop_3_h_n (not (= chan_h chan_n)))
9954   (=> hop_3_h_q (not (= chan_h chan_q)))
9955   (=> hop_3_h_p (not (= chan_h chan_p)))
9956   (=> hop_3_k_a (not (= chan_k chan_a)))
9957   (=> hop_3_k_c (not (= chan_k chan_c)))
9958   (=> hop_3_k_b (not (= chan_k chan_b)))
9959   (=> hop_3_k_e (not (= chan_k chan_e)))
9960   (=> hop_3_k_d (not (= chan_k chan_d)))
```

```
9961   (=> hop_3_k_g (not (= chan_k chan_g)))
9962   (=> hop_3_k_f (not (= chan_k chan_f)))
9963   (=> hop_3_k_i (not (= chan_k chan_i)))
9964   (=> hop_3_k_h (not (= chan_k chan_h)))
9965   (=> hop_3_k_j (not (= chan_k chan_j)))
9966   (=> hop_3_k_m (not (= chan_k chan_m)))
9967   (=> hop_3_k_l (not (= chan_k chan_l)))
9968   (=> hop_3_k_o (not (= chan_k chan_o)))
9969   (=> hop_3_k_n (not (= chan_k chan_n)))
9970   (=> hop_3_k_q (not (= chan_k chan_q)))
9971   (=> hop_3_k_p (not (= chan_k chan_p)))
9972   (=> hop_3_j_a (not (= chan_j chan_a)))
9973   (=> hop_3_j_c (not (= chan_j chan_c)))
9974   (=> hop_3_j_b (not (= chan_j chan_b)))
9975   (=> hop_3_j_e (not (= chan_j chan_e)))
9976   (=> hop_3_j_d (not (= chan_j chan_d)))
9977   (=> hop_3_j_g (not (= chan_j chan_g)))
9978   (=> hop_3_j_f (not (= chan_j chan_f)))
9979   (=> hop_3_j_i (not (= chan_j chan_i)))
9980   (=> hop_3_j_h (not (= chan_j chan_h)))
9981   (=> hop_3_j_k (not (= chan_j chan_k)))
9982   (=> hop_3_j_m (not (= chan_j chan_m)))
9983   (=> hop_3_j_l (not (= chan_j chan_l)))
9984   (=> hop_3_j_o (not (= chan_j chan_o)))
9985   (=> hop_3_j_n (not (= chan_j chan_n)))
9986   (=> hop_3_j_q (not (= chan_j chan_q)))
9987   (=> hop_3_j_p (not (= chan_j chan_p)))
9988   (=> hop_3_m_a (not (= chan_m chan_a)))
9989   (=> hop_3_m_c (not (= chan_m chan_c)))
9990   (=> hop_3_m_b (not (= chan_m chan_b)))
9991   (=> hop_3_m_e (not (= chan_m chan_e)))
9992   (=> hop_3_m_d (not (= chan_m chan_d)))
9993   (=> hop_3_m_g (not (= chan_m chan_g)))
9994   (=> hop_3_m_f (not (= chan_m chan_f)))
9995   (=> hop_3_m_i (not (= chan_m chan_i)))
9996   (=> hop_3_m_h (not (= chan_m chan_h)))
9997   (=> hop_3_m_k (not (= chan_m chan_k)))
9998   (=> hop_3_m_j (not (= chan_m chan_j)))
9999   (=> hop_3_m_l (not (= chan_m chan_l)))
10000  (=> hop_3_m_o (not (= chan_m chan_o)))
10001  (=> hop_3_m_n (not (= chan_m chan_n)))
10002  (=> hop_3_m_q (not (= chan_m chan_q)))
10003  (=> hop_3_m_p (not (= chan_m chan_p)))
10004  (=> hop_3_l_a (not (= chan_l chan_a)))
10005  (=> hop_3_l_c (not (= chan_l chan_c)))
10006  (=> hop_3_l_b (not (= chan_l chan_b)))
10007  (=> hop_3_l_e (not (= chan_l chan_e)))
10008  (=> hop_3_l_d (not (= chan_l chan_d)))
10009  (=> hop_3_l_g (not (= chan_l chan_g)))
10010  (=> hop_3_l_f (not (= chan_l chan_f)))
10011  (=> hop_3_l_i (not (= chan_l chan_i)))
10012  (=> hop_3_l_h (not (= chan_l chan_h)))
10013  (=> hop_3_l_k (not (= chan_l chan_k)))
10014  (=> hop_3_l_j (not (= chan_l chan_j)))
10015  (=> hop_3_l_m (not (= chan_l chan_m)))
10016  (=> hop_3_l_o (not (= chan_l chan_o)))
10017  (=> hop_3_l_n (not (= chan_l chan_n)))
10018  (=> hop_3_l_q (not (= chan_l chan_q)))
10019  (=> hop_3_l_p (not (= chan_l chan_p)))
10020  (=> hop_3_o_a (not (= chan_o chan_a)))
10021  (=> hop_3_o_c (not (= chan_o chan_c)))
10022  (=> hop_3_o_b (not (= chan_o chan_b)))
```

```
10023   (=> hop_3_o_e (not (= chan_o chan_e)))
10024   (=> hop_3_o_d (not (= chan_o chan_d)))
10025   (=> hop_3_o_g (not (= chan_o chan_g)))
10026   (=> hop_3_o_f (not (= chan_o chan_f)))
10027   (=> hop_3_o_i (not (= chan_o chan_i)))
10028   (=> hop_3_o_h (not (= chan_o chan_h)))
10029   (=> hop_3_o_k (not (= chan_o chan_k)))
10030   (=> hop_3_o_j (not (= chan_o chan_j)))
10031   (=> hop_3_o_m (not (= chan_o chan_m)))
10032   (=> hop_3_o_l (not (= chan_o chan_l)))
10033   (=> hop_3_o_n (not (= chan_o chan_n)))
10034   (=> hop_3_o_q (not (= chan_o chan_q)))
10035   (=> hop_3_o_p (not (= chan_o chan_p)))
10036   (=> hop_3_n_a (not (= chan_n chan_a)))
10037   (=> hop_3_n_c (not (= chan_n chan_c)))
10038   (=> hop_3_n_b (not (= chan_n chan_b)))
10039   (=> hop_3_n_e (not (= chan_n chan_e)))
10040   (=> hop_3_n_d (not (= chan_n chan_d)))
10041   (=> hop_3_n_g (not (= chan_n chan_g)))
10042   (=> hop_3_n_f (not (= chan_n chan_f)))
10043   (=> hop_3_n_i (not (= chan_n chan_i)))
10044   (=> hop_3_n_h (not (= chan_n chan_h)))
10045   (=> hop_3_n_k (not (= chan_n chan_k)))
10046   (=> hop_3_n_j (not (= chan_n chan_j)))
10047   (=> hop_3_n_m (not (= chan_n chan_m)))
10048   (=> hop_3_n_l (not (= chan_n chan_l)))
10049   (=> hop_3_n_o (not (= chan_n chan_o)))
10050   (=> hop_3_n_q (not (= chan_n chan_q)))
10051   (=> hop_3_n_p (not (= chan_n chan_p)))
10052   (=> hop_3_q_a (not (= chan_q chan_a)))
10053   (=> hop_3_q_c (not (= chan_q chan_c)))
10054   (=> hop_3_q_b (not (= chan_q chan_b)))
10055   (=> hop_3_q_e (not (= chan_q chan_e)))
10056   (=> hop_3_q_d (not (= chan_q chan_d)))
10057   (=> hop_3_q_g (not (= chan_q chan_g)))
10058   (=> hop_3_q_f (not (= chan_q chan_f)))
10059   (=> hop_3_q_i (not (= chan_q chan_i)))
10060   (=> hop_3_q_h (not (= chan_q chan_h)))
10061   (=> hop_3_q_k (not (= chan_q chan_k)))
10062   (=> hop_3_q_j (not (= chan_q chan_j)))
10063   (=> hop_3_q_m (not (= chan_q chan_m)))
10064   (=> hop_3_q_l (not (= chan_q chan_l)))
10065   (=> hop_3_q_o (not (= chan_q chan_o)))
10066   (=> hop_3_q_n (not (= chan_q chan_n)))
10067   (=> hop_3_q_p (not (= chan_q chan_p)))
10068   (=> hop_3_p_a (not (= chan_p chan_a)))
10069   (=> hop_3_p_c (not (= chan_p chan_c)))
10070   (=> hop_3_p_b (not (= chan_p chan_b)))
10071   (=> hop_3_p_e (not (= chan_p chan_e)))
10072   (=> hop_3_p_d (not (= chan_p chan_d)))
10073   (=> hop_3_p_g (not (= chan_p chan_g)))
10074   (=> hop_3_p_f (not (= chan_p chan_f)))
10075   (=> hop_3_p_i (not (= chan_p chan_i)))
10076   (=> hop_3_p_h (not (= chan_p chan_h)))
10077   (=> hop_3_p_k (not (= chan_p chan_k)))
10078   (=> hop_3_p_j (not (= chan_p chan_j)))
10079   (=> hop_3_p_m (not (= chan_p chan_m)))
10080   (=> hop_3_p_l (not (= chan_p chan_l)))
10081   (=> hop_3_p_o (not (= chan_p chan_o)))
10082   (=> hop_3_p_n (not (= chan_p chan_n)))
10083   (=> hop_3_p_q (not (= chan_p chan_q)))
10084   (>= chan_a 0)
```

```
10085  (<= chan_a 10)
10086  (>= chan_c 0)
10087  (<= chan_c 10)
10088  (>= chan_b 0)
10089  (<= chan_b 10)
10090  (>= chan_e 0)
10091  (<= chan_e 10)
10092  (>= chan_d 0)
10093  (<= chan_d 10)
10094  (>= chan_g 0)
10095  (<= chan_g 10)
10096  (>= chan_f 0)
10097  (<= chan_f 10)
10098  (>= chan_i 0)
10099  (<= chan_i 10)
10100  (>= chan_h 0)
10101  (<= chan_h 10)
10102  (>= chan_k 0)
10103  (<= chan_k 10)
10104  (>= chan_j 0)
10105  (<= chan_j 10)
10106  (>= chan_m 0)
10107  (<= chan_m 10)
10108  (>= chan_l 0)
10109  (<= chan_l 10)
10110  (>= chan_o 0)
10111  (<= chan_o 10)
10112  (>= chan_n 0)
10113  (<= chan_n 10)
10114  (>= chan_q 0)
10115  (<= chan_q 10)
10116  (>= chan_p 0)
10117  (<= chan_p 10)
10118  ))
10119  (check-sat)
10120  (get-model)
```

Appendix 35

The generated output for Question 4(c)

```
1   sat
2   (model
3     (define-fun hop_3_o_e () Bool
4       false)
5     (define-fun chan_a () Int
6       6)
7     (define-fun hop_3_q_d () Bool
8       true)
9     (define-fun hop_3_o_f () Bool
10      true)
11    (define-fun chan_k () Int
12      3)
13    (define-fun chan_g () Int
14      9)
15    (define-fun hop_3_q_h () Bool
16      true)
17    (define-fun hop_3_n_a () Bool
18      true)
19    (define-fun chan_o () Int
20      7)
21    (define-fun hop_3_o_d () Bool
22      true)
23    (define-fun hop_3_q_a () Bool
24      true)
25    (define-fun hop_3_b_q () Bool
26      true)
27    (define-fun chan_c () Int
28      4)
29    (define-fun chan_l () Int
30      6)
31    (define-fun hop_3_n_b () Bool
32      true)
33    (define-fun chan_n () Int
34      8)
35    (define-fun hop_3_b_l () Bool
36      true)
37    (define-fun hop_3_o_b () Bool
38      true)
39    (define-fun chan_b () Int
40      3)
```

```
41    (define-fun hop_3_e_o () Bool
42      false)
43    (define-fun hop_3_k_b () Bool
44      false)
45    (define-fun hop_3_b_k () Bool
46      false)
47    (define-fun chan_h () Int
48      2)
49    (define-fun hop_3_a_l () Bool
50      false)
51    (define-fun hop_3_c_o () Bool
52      true)
53    (define-fun hop_3_g_q () Bool
54      false)
55    (define-fun hop_3_c_h () Bool
56      true)
57    (define-fun hop_3_b_p () Bool
58      true)
59    (define-fun chan_d () Int
60      5)
61    (define-fun hop_3_f_o () Bool
62      true)
63    (define-fun hop_3_q_e () Bool
64      true)
65    (define-fun hop_3_q_c () Bool
66      true)
67    (define-fun hop_3_h_c () Bool
68      true)
69    (define-fun hop_3_d_m () Bool
70      false)
71    (define-fun chan_m () Int
72      5)
73    (define-fun hop_3_b_n () Bool
74      true)
75    (define-fun hop_3_n_c () Bool
76      true)
77    (define-fun hop_3_a_q () Bool
78      true)
79    (define-fun hop_3_d_q () Bool
80      true)
81    (define-fun hop_3_o_c () Bool
82      true)
83    (define-fun hop_3_h_q () Bool
84      true)
85    (define-fun hop_3_c_g () Bool
86      true)
87    (define-fun hop_3_c_j () Bool
88      false)
89    (define-fun hop_3_c_n () Bool
90      true)
91    (define-fun hop_3_p_c () Bool
92      true)
93    (define-fun chan_e () Int
94      7)
95    (define-fun chan_p () Int
96      10)
97    (define-fun hop_3_q_b () Bool
98      true)
99    (define-fun hop_3_e_q () Bool
100     true)
101   (define-fun hop_3_p_d () Bool
102     true)
```

```
103    (define-fun chan_i () Int
104      1)
105    (define-fun hop_3_l_a () Bool
106      false)
107    (define-fun hop_3_c_p () Bool
108      true)
109    (define-fun hop_3_d_p () Bool
110      true)
111    (define-fun chan_f () Int
112      0)
113    (define-fun hop_3_q_g () Bool
114      false)
115    (define-fun hop_3_c_q () Bool
116      true)
117    (define-fun hop_3_p_b () Bool
118      true)
119    (define-fun hop_3_i_c () Bool
120      true)
121    (define-fun hop_3_o_a () Bool
122      true)
123    (define-fun hop_3_c_i () Bool
124      true)
125    (define-fun chan_q () Int
126      9)
127    (define-fun hop_3_c_l () Bool
128      true)
129    (define-fun hop_3_a_p () Bool
130      true)
131    (define-fun hop_3_j_c () Bool
132      false)
133    (define-fun hop_3_c_k () Bool
134      true)
135    (define-fun hop_3_p_a () Bool
136      true)
137    (define-fun hop_3_a_n () Bool
138      true)
139    (define-fun hop_3_c_m () Bool
140      true)
141    (define-fun hop_3_g_c () Bool
142      true)
143    (define-fun hop_3_m_d () Bool
144      false)
145    (define-fun chan_j () Int
146      4)
147    (define-fun hop_2_p_f () Bool
148      true)
149    (define-fun hop_2_p_e () Bool
150      true)
151    (define-fun hop_2_q_k () Bool
152      false)
153    (define-fun hop_2_q_i () Bool
154      true)
155    (define-fun hop_2_q_f () Bool
156      true)
157    (define-fun hop_2_n_d () Bool
158      true)
159    (define-fun hop_2_o_j () Bool
160      true)
161    (define-fun hop_2_o_h () Bool
162      false)
163    (define-fun hop_2_o_i () Bool
164      false)
```

```
165    (define-fun hop_2_o_g () Bool
166      false)
167    (define-fun hop_2_l_d () Bool
168      false)
169    (define-fun hop_2_m_f () Bool
170      false)
171    (define-fun hop_2_m_e () Bool
172      false)
173    (define-fun hop_2_j_b () Bool
174      false)
175    (define-fun hop_2_k_d () Bool
176      false)
177    (define-fun hop_2_h_p () Bool
178      true)
179    (define-fun hop_2_h_n () Bool
180      true)
181    (define-fun hop_2_h_b () Bool
182      true)
183    (define-fun hop_2_i_b () Bool
184      true)
185    (define-fun hop_2_f_p () Bool
186      true)
187    (define-fun hop_2_f_m () Bool
188      true)
189    (define-fun hop_2_g_p () Bool
190      false)
191    (define-fun hop_2_g_n () Bool
192      false)
193    (define-fun hop_2_g_b () Bool
194      true)
195    (define-fun hop_2_d_n () Bool
196      true)
197    (define-fun hop_2_d_l () Bool
198      false)
199    (define-fun hop_2_d_k () Bool
200      false)
201    (define-fun hop_2_e_p () Bool
202      false)
203    (define-fun hop_2_e_n () Bool
204      true)
205    (define-fun hop_2_e_m () Bool
206      false)
207    (define-fun hop_2_b_j () Bool
208      true)
209    (define-fun hop_2_b_h () Bool
210      false)
211    (define-fun hop_2_b_i () Bool
212      true)
213    (define-fun hop_2_b_g () Bool
214      false)
215    (define-fun hop_2_c_f () Bool
216      false)
217    (define-fun hop_2_c_e () Bool
218      true)
219    (define-fun hop_2_a_j () Bool
220      false)
221    (define-fun hop_2_a_h () Bool
222      false)
223    (define-fun hop_2_a_i () Bool
224      false)
225    (define-fun hop_2_a_g () Bool
226      false)
```

```
227     (define-fun hop_2_p_d () Bool
228       true)
229     (define-fun hop_2_p_b () Bool
230       true)
231     (define-fun hop_2_p_c () Bool
232       true)
233     (define-fun hop_2_p_a () Bool
234       true)
235     (define-fun hop_2_q_h () Bool
236       false)
237     (define-fun hop_2_q_g () Bool
238       false)
239     (define-fun hop_2_q_d () Bool
240       true)
241     (define-fun hop_2_q_e () Bool
242       false)
243     (define-fun hop_2_q_b () Bool
244       true)
245     (define-fun hop_2_q_c () Bool
246       true)
247     (define-fun hop_2_q_a () Bool
248       true)
249     (define-fun hop_2_n_b () Bool
250       true)
251     (define-fun hop_2_n_c () Bool
252       true)
253     (define-fun hop_2_n_a () Bool
254       true)
255     (define-fun hop_2_o_f () Bool
256       true)
257     (define-fun hop_2_o_d () Bool
258       false)
259     (define-fun hop_2_o_e () Bool
260       false)
261     (define-fun hop_2_o_b () Bool
262       true)
263     (define-fun hop_2_o_c () Bool
264       true)
265     (define-fun hop_2_o_a () Bool
266       true)
267     (define-fun hop_2_l_b () Bool
268       false)
269     (define-fun hop_2_l_c () Bool
270       false)
271     (define-fun hop_2_l_a () Bool
272       false)
273     (define-fun hop_2_m_d () Bool
274       false)
275     (define-fun hop_2_m_b () Bool
276       false)
277     (define-fun hop_2_m_c () Bool
278       false)
279     (define-fun hop_2_m_a () Bool
280       false)
281     (define-fun hop_2_j_c () Bool
282       false)
283     (define-fun hop_2_k_b () Bool
284       false)
285     (define-fun hop_2_k_c () Bool
286       false)
287     (define-fun hop_2_k_a () Bool
288       false)
```

```
289    (define-fun hop_2_h_q () Bool
290      true)
291    (define-fun hop_2_h_c () Bool
292      true)
293    (define-fun hop_2_i_c () Bool
294      true)
295    (define-fun hop_2_f_o () Bool
296      true)
297    (define-fun hop_2_g_q () Bool
298      false)
299    (define-fun hop_2_g_c () Bool
300      true)
301    (define-fun hop_2_d_p () Bool
302      false)
303    (define-fun hop_2_d_q () Bool
304      true)
305    (define-fun hop_2_d_o () Bool
306      false)
307    (define-fun hop_2_d_m () Bool
308      false)
309    (define-fun hop_2_e_q () Bool
310      true)
311    (define-fun hop_2_e_o () Bool
312      false)
313    (define-fun hop_2_b_p () Bool
314      false)
315    (define-fun hop_2_b_q () Bool
316      true)
317    (define-fun hop_2_b_n () Bool
318      true)
319    (define-fun hop_2_b_o () Bool
320      false)
321    (define-fun hop_2_b_l () Bool
322      false)
323    (define-fun hop_2_b_m () Bool
324      false)
325    (define-fun hop_2_b_k () Bool
326      false)
327    (define-fun hop_2_c_p () Bool
328      true)
329    (define-fun hop_2_c_q () Bool
330      true)
331    (define-fun hop_2_c_n () Bool
332      false)
333    (define-fun hop_2_c_o () Bool
334      true)
335    (define-fun hop_2_c_l () Bool
336      false)
337    (define-fun hop_2_c_m () Bool
338      true)
339    (define-fun hop_2_c_j () Bool
340      false)
341    (define-fun hop_2_c_k () Bool
342      true)
343    (define-fun hop_2_c_h () Bool
344      true)
345    (define-fun hop_2_c_i () Bool
346      false)
347    (define-fun hop_2_c_g () Bool
348      true)
349    (define-fun hop_2_a_p () Bool
350      false)
```

```
351    (define-fun hop_2_a_q () Bool
352      true)
353    (define-fun hop_2_a_n () Bool
354      false)
355    (define-fun hop_2_a_o () Bool
356      false)
357    (define-fun hop_2_a_l () Bool
358      false)
359    (define-fun hop_2_a_m () Bool
360      false)
361    (define-fun hop_2_a_k () Bool
362      false)
363    (define-fun hop_3_p_g () Bool
364      true)
365    (define-fun hop_3_p_h () Bool
366      true)
367    (define-fun hop_3_p_f () Bool
368      true)
369    (define-fun hop_3_p_e () Bool
370      true)
371    (define-fun hop_3_q_k () Bool
372      true)
373    (define-fun hop_3_q_i () Bool
374      true)
375    (define-fun hop_3_q_f () Bool
376      true)
377    (define-fun hop_3_n_g () Bool
378      true)
379    (define-fun hop_3_n_h () Bool
380      true)
381    (define-fun hop_3_n_e () Bool
382      true)
383    (define-fun hop_3_n_d () Bool
384      true)
385    (define-fun hop_3_o_j () Bool
386      true)
387    (define-fun hop_3_o_i () Bool
388      true)
389    (define-fun hop_3_o_h () Bool
390      true)
391    (define-fun hop_3_o_g () Bool
392      true)
393    (define-fun hop_3_l_d () Bool
394      true)
395    (define-fun hop_3_m_f () Bool
396      true)
397    (define-fun hop_3_m_e () Bool
398      true)
399    (define-fun hop_3_j_o () Bool
400      true)
401    (define-fun hop_3_j_b () Bool
402      true)
403    (define-fun hop_3_j_a () Bool
404      true)
405    (define-fun hop_3_j_g () Bool
406      true)
407    (define-fun hop_3_k_q () Bool
408      true)
409    (define-fun hop_3_k_f () Bool
410      true)
411    (define-fun hop_3_k_d () Bool
412      true)
```

```
413    (define-fun hop_3_h_p () Bool
414      true)
415    (define-fun hop_3_h_o () Bool
416      true)
417    (define-fun hop_3_h_n () Bool
418      true)
419    (define-fun hop_3_h_b () Bool
420      true)
421    (define-fun hop_3_h_a () Bool
422      true)
423    (define-fun hop_3_i_q () Bool
424      true)
425    (define-fun hop_3_i_o () Bool
426      true)
427    (define-fun hop_3_i_b () Bool
428      true)
429    (define-fun hop_3_i_a () Bool
430      true)
431    (define-fun hop_3_f_q () Bool
432      true)
433    (define-fun hop_3_f_p () Bool
434      true)
435    (define-fun hop_3_f_m () Bool
436      true)
437    (define-fun hop_3_f_k () Bool
438      true)
439    (define-fun hop_3_f_g () Bool
440      true)
441    (define-fun hop_3_f_c () Bool
442      true)
443    (define-fun hop_3_g_n () Bool
444      true)
445    (define-fun hop_3_g_p () Bool
446      true)
447    (define-fun hop_3_g_o () Bool
448      true)
449    (define-fun hop_3_g_j () Bool
450      true)
451    (define-fun hop_3_g_f () Bool
452      true)
453    (define-fun hop_3_g_b () Bool
454      true)
455    (define-fun hop_3_g_a () Bool
456      true)
457    (define-fun hop_3_d_n () Bool
458      true)
459    (define-fun hop_3_d_l () Bool
460      true)
461    (define-fun hop_3_d_k () Bool
462      true)
463    (define-fun hop_3_e_p () Bool
464      true)
465    (define-fun hop_3_e_n () Bool
466      true)
467    (define-fun hop_3_e_m () Bool
468      true)
469    (define-fun hop_3_e_c () Bool
470      true)
471    (define-fun hop_3_b_j () Bool
472      true)
473    (define-fun hop_3_b_h () Bool
474      true)
```

```
475    (define-fun hop_3_b_i () Bool
476      true)
477    (define-fun hop_3_b_g () Bool
478      true)
479    (define-fun hop_3_c_f () Bool
480      true)
481    (define-fun hop_3_c_e () Bool
482      true)
483    (define-fun hop_3_a_j () Bool
484      true)
485    (define-fun hop_3_a_h () Bool
486      true)
487    (define-fun hop_3_a_i () Bool
488      true)
489    (define-fun hop_3_a_g () Bool
490      true)
491    (define-fun hop_3_p_q () Bool
492      true)
493    (define-fun hop_3_p_n () Bool
494      true)
495    (define-fun hop_3_p_o () Bool
496      true)
497    (define-fun hop_3_p_l () Bool
498      true)
499    (define-fun hop_3_p_m () Bool
500      true)
501    (define-fun hop_3_p_j () Bool
502      true)
503    (define-fun hop_3_p_k () Bool
504      true)
505    (define-fun hop_3_p_i () Bool
506      true)
507    (define-fun hop_3_q_p () Bool
508      true)
509    (define-fun hop_3_q_n () Bool
510      true)
511    (define-fun hop_3_q_o () Bool
512      true)
513    (define-fun hop_3_q_l () Bool
514      true)
515    (define-fun hop_3_q_m () Bool
516      true)
517    (define-fun hop_3_q_j () Bool
518      true)
519    (define-fun hop_3_n_p () Bool
520      true)
521    (define-fun hop_3_n_q () Bool
522      true)
523    (define-fun hop_3_n_o () Bool
524      true)
525    (define-fun hop_3_n_l () Bool
526      true)
527    (define-fun hop_3_n_m () Bool
528      true)
529    (define-fun hop_3_n_j () Bool
530      true)
531    (define-fun hop_3_n_k () Bool
532      true)
533    (define-fun hop_3_n_i () Bool
534      true)
535    (define-fun hop_3_n_f () Bool
536      true)
```

```
537    (define-fun hop_3_o_p () Bool
538      true)
539    (define-fun hop_3_o_q () Bool
540      true)
541    (define-fun hop_3_o_n () Bool
542      true)
543    (define-fun hop_3_o_l () Bool
544      true)
545    (define-fun hop_3_o_m () Bool
546      true)
547    (define-fun hop_3_o_k () Bool
548      true)
549    (define-fun hop_3_l_p () Bool
550      true)
551    (define-fun hop_3_l_q () Bool
552      true)
553    (define-fun hop_3_l_n () Bool
554      true)
555    (define-fun hop_3_l_o () Bool
556      true)
557    (define-fun hop_3_l_m () Bool
558      true)
559    (define-fun hop_3_l_j () Bool
560      true)
561    (define-fun hop_3_l_k () Bool
562      true)
563    (define-fun hop_3_l_h () Bool
564      true)
565    (define-fun hop_3_l_i () Bool
566      true)
567    (define-fun hop_3_l_f () Bool
568      true)
569    (define-fun hop_3_l_g () Bool
570      true)
571    (define-fun hop_3_l_e () Bool
572      true)
573    (define-fun hop_3_m_p () Bool
574      true)
575    (define-fun hop_3_m_q () Bool
576      true)
577    (define-fun hop_3_m_n () Bool
578      true)
579    (define-fun hop_3_m_o () Bool
580      true)
581    (define-fun hop_3_m_l () Bool
582      true)
583    (define-fun hop_3_m_j () Bool
584      true)
585    (define-fun hop_3_m_k () Bool
586      true)
587    (define-fun hop_3_m_h () Bool
588      true)
589    (define-fun hop_3_m_i () Bool
590      true)
591    (define-fun hop_3_m_g () Bool
592      true)
593    (define-fun hop_3_j_p () Bool
594      true)
595    (define-fun hop_3_j_q () Bool
596      true)
597    (define-fun hop_3_j_n () Bool
598      true)
```

```
599    (define-fun hop_3_j_l () Bool
600      true)
601    (define-fun hop_3_j_m () Bool
602      true)
603    (define-fun hop_3_j_k () Bool
604      true)
605    (define-fun hop_3_j_h () Bool
606      true)
607    (define-fun hop_3_j_i () Bool
608      true)
609    (define-fun hop_3_j_f () Bool
610      true)
611    (define-fun hop_3_j_d () Bool
612      true)
613    (define-fun hop_3_j_e () Bool
614      true)
615    (define-fun hop_3_k_p () Bool
616      true)
617    (define-fun hop_3_k_n () Bool
618      true)
619    (define-fun hop_3_k_o () Bool
620      true)
621    (define-fun hop_3_k_l () Bool
622      true)
623    (define-fun hop_3_k_m () Bool
624      true)
625    (define-fun hop_3_k_j () Bool
626      true)
627    (define-fun hop_3_k_h () Bool
628      true)
629    (define-fun hop_3_k_i () Bool
630      true)
631    (define-fun hop_3_k_g () Bool
632      true)
633    (define-fun hop_3_k_e () Bool
634      true)
635    (define-fun hop_3_h_l () Bool
636      true)
637    (define-fun hop_3_h_m () Bool
638      true)
639    (define-fun hop_3_h_j () Bool
640      true)
641    (define-fun hop_3_h_k () Bool
642      true)
643    (define-fun hop_3_h_i () Bool
644      true)
645    (define-fun hop_3_h_f () Bool
646      true)
647    (define-fun hop_3_h_g () Bool
648      true)
649    (define-fun hop_3_h_d () Bool
650      true)
651    (define-fun hop_3_h_e () Bool
652      true)
653    (define-fun hop_3_i_p () Bool
654      true)
655    (define-fun hop_3_i_n () Bool
656      true)
657    (define-fun hop_3_i_l () Bool
658      true)
659    (define-fun hop_3_i_m () Bool
660      true)
```

```
661    (define-fun hop_3_i_j () Bool
662      true)
663    (define-fun hop_3_i_k () Bool
664      true)
665    (define-fun hop_3_i_h () Bool
666      true)
667    (define-fun hop_3_i_f () Bool
668      true)
669    (define-fun hop_3_i_g () Bool
670      true)
671    (define-fun hop_3_i_d () Bool
672      true)
673    (define-fun hop_3_i_e () Bool
674      true)
675    (define-fun hop_3_f_n () Bool
676      true)
677    (define-fun hop_3_f_l () Bool
678      true)
679    (define-fun hop_3_f_j () Bool
680      true)
681    (define-fun hop_3_f_h () Bool
682      true)
683    (define-fun hop_3_f_i () Bool
684      true)
685    (define-fun hop_3_f_d () Bool
686      true)
687    (define-fun hop_3_f_e () Bool
688      true)
689    (define-fun hop_3_f_b () Bool
690      true)
691    (define-fun hop_3_f_a () Bool
692      true)
693    (define-fun hop_3_g_l () Bool
694      true)
695    (define-fun hop_3_g_m () Bool
696      true)
697    (define-fun hop_3_g_k () Bool
698      true)
699    (define-fun hop_3_g_h () Bool
700      true)
701    (define-fun hop_3_g_i () Bool
702      true)
703    (define-fun hop_3_g_d () Bool
704      true)
705    (define-fun hop_3_g_e () Bool
706      true)
707    (define-fun hop_3_d_j () Bool
708      true)
709    (define-fun hop_3_d_h () Bool
710      true)
711    (define-fun hop_3_d_i () Bool
712      true)
713    (define-fun hop_3_d_f () Bool
714      true)
715    (define-fun hop_3_d_g () Bool
716      true)
717    (define-fun hop_3_d_e () Bool
718      true)
719    (define-fun hop_3_d_b () Bool
720      true)
721    (define-fun hop_3_d_c () Bool
722      true)
```

```
723    (define-fun hop_3_d_a () Bool
724      true)
725    (define-fun hop_3_e_l () Bool
726      true)
727    (define-fun hop_3_e_j () Bool
728      true)
729    (define-fun hop_3_e_k () Bool
730      true)
731    (define-fun hop_3_e_h () Bool
732      true)
733    (define-fun hop_3_e_i () Bool
734      true)
735    (define-fun hop_3_e_f () Bool
736      true)
737    (define-fun hop_3_e_g () Bool
738      true)
739    (define-fun hop_3_e_d () Bool
740      true)
741    (define-fun hop_3_e_b () Bool
742      true)
743    (define-fun hop_3_e_a () Bool
744      true)
745    (define-fun hop_3_b_f () Bool
746      true)
747    (define-fun hop_3_b_d () Bool
748      true)
749    (define-fun hop_3_b_e () Bool
750      true)
751    (define-fun hop_3_b_c () Bool
752      true)
753    (define-fun hop_3_b_a () Bool
754      true)
755    (define-fun hop_3_c_d () Bool
756      true)
757    (define-fun hop_3_c_b () Bool
758      true)
759    (define-fun hop_3_c_a () Bool
760      true)
761    (define-fun hop_3_a_f () Bool
762      true)
763    (define-fun hop_3_a_d () Bool
764      true)
765    (define-fun hop_3_a_e () Bool
766      true)
767    (define-fun hop_3_a_b () Bool
768      true)
769    (define-fun hop_3_a_c () Bool
770      true)
771    (define-fun hop_2_p_j () Bool
772      true)
773    (define-fun hop_2_p_i () Bool
774      true)
775    (define-fun hop_2_p_k () Bool
776      true)
777    (define-fun hop_2_q_o () Bool
778      true)
779    (define-fun hop_2_q_m () Bool
780      true)
781    (define-fun hop_2_q_l () Bool
782      true)
783    (define-fun hop_2_q_j () Bool
784      true)
```

```
785    (define-fun hop_2_n_o () Bool
786      true)
787    (define-fun hop_2_n_m () Bool
788      true)
789    (define-fun hop_2_n_k () Bool
790      true)
791    (define-fun hop_2_n_i () Bool
792      true)
793    (define-fun hop_2_n_f () Bool
794      true)
795    (define-fun hop_2_o_q () Bool
796      true)
797    (define-fun hop_2_o_n () Bool
798      true)
799    (define-fun hop_2_o_l () Bool
800      true)
801    (define-fun hop_2_o_k () Bool
802      true)
803    (define-fun hop_2_l_q () Bool
804      true)
805    (define-fun hop_2_l_o () Bool
806      true)
807    (define-fun hop_2_l_g () Bool
808      true)
809    (define-fun hop_2_l_h () Bool
810      true)
811    (define-fun hop_2_l_f () Bool
812      true)
813    (define-fun hop_2_l_e () Bool
814      true)
815    (define-fun hop_2_m_q () Bool
816      true)
817    (define-fun hop_2_m_n () Bool
818      true)
819    (define-fun hop_2_m_j () Bool
820      true)
821    (define-fun hop_2_m_i () Bool
822      true)
823    (define-fun hop_2_m_h () Bool
824      true)
825    (define-fun hop_2_m_g () Bool
826      true)
827    (define-fun hop_2_j_q () Bool
828      true)
829    (define-fun hop_2_j_p () Bool
830      true)
831    (define-fun hop_2_j_m () Bool
832      true)
833    (define-fun hop_2_j_k () Bool
834      true)
835    (define-fun hop_2_j_h () Bool
836      true)
837    (define-fun hop_2_j_e () Bool
838      true)
839    (define-fun hop_2_j_d () Bool
840      true)
841    (define-fun hop_2_k_n () Bool
842      true)
843    (define-fun hop_2_k_j () Bool
844      true)
845    (define-fun hop_2_k_p () Bool
846      true)
```

```
847    (define-fun hop_2_k_o () Bool
848      true)
849    (define-fun hop_2_k_i () Bool
850      true)
851    (define-fun hop_2_k_e () Bool
852      true)
853    (define-fun hop_2_h_m () Bool
854      true)
855    (define-fun hop_2_h_l () Bool
856      true)
857    (define-fun hop_2_h_j () Bool
858      true)
859    (define-fun hop_2_h_f () Bool
860      true)
861    (define-fun hop_2_h_d () Bool
862      true)
863    (define-fun hop_2_i_p () Bool
864      true)
865    (define-fun hop_2_i_m () Bool
866      true)
867    (define-fun hop_2_i_n () Bool
868      true)
869    (define-fun hop_2_i_k () Bool
870      true)
871    (define-fun hop_2_i_g () Bool
872      true)
873    (define-fun hop_2_i_d () Bool
874      true)
875    (define-fun hop_2_f_n () Bool
876      true)
877    (define-fun hop_2_f_l () Bool
878      true)
879    (define-fun hop_2_f_h () Bool
880      true)
881    (define-fun hop_2_f_e () Bool
882      true)
883    (define-fun hop_2_f_b () Bool
884      true)
885    (define-fun hop_2_f_a () Bool
886      true)
887    (define-fun hop_2_g_l () Bool
888      true)
889    (define-fun hop_2_g_m () Bool
890      true)
891    (define-fun hop_2_g_i () Bool
892      true)
893    (define-fun hop_2_g_d () Bool
894      true)
895    (define-fun hop_2_d_j () Bool
896      true)
897    (define-fun hop_2_d_h () Bool
898      true)
899    (define-fun hop_2_d_i () Bool
900      true)
901    (define-fun hop_2_d_g () Bool
902      true)
903    (define-fun hop_2_d_c () Bool
904      true)
905    (define-fun hop_2_e_l () Bool
906      true)
907    (define-fun hop_2_e_j () Bool
908      true)
```

```
909    (define-fun hop_2_e_k () Bool
910      true)
911    (define-fun hop_2_e_f () Bool
912      true)
913    (define-fun hop_2_e_b () Bool
914      true)
915    (define-fun hop_2_e_a () Bool
916      true)
917    (define-fun hop_2_b_f () Bool
918      true)
919    (define-fun hop_2_b_e () Bool
920      true)
921    (define-fun hop_2_c_d () Bool
922      true)
923    (define-fun hop_2_c_a () Bool
924      true)
925    (define-fun hop_2_a_f () Bool
926      true)
927    (define-fun hop_2_a_e () Bool
928      true)
929    (define-fun hop_2_a_c () Bool
930      true)
931    (define-fun hop_2_p_q () Bool
932      true)
933    (define-fun hop_2_p_n () Bool
934      true)
935    (define-fun hop_2_p_o () Bool
936      true)
937    (define-fun hop_2_p_l () Bool
938      true)
939    (define-fun hop_2_p_m () Bool
940      true)
941    (define-fun hop_2_q_p () Bool
942      true)
943    (define-fun hop_2_q_n () Bool
944      true)
945    (define-fun hop_2_n_p () Bool
946      true)
947    (define-fun hop_2_n_q () Bool
948      true)
949    (define-fun hop_2_n_l () Bool
950      true)
951    (define-fun hop_2_n_j () Bool
952      true)
953    (define-fun hop_2_o_p () Bool
954      true)
955    (define-fun hop_2_o_m () Bool
956      true)
957    (define-fun hop_2_l_p () Bool
958      true)
959    (define-fun hop_2_l_n () Bool
960      true)
961    (define-fun hop_2_l_m () Bool
962      true)
963    (define-fun hop_2_l_j () Bool
964      true)
965    (define-fun hop_2_l_k () Bool
966      true)
967    (define-fun hop_2_l_i () Bool
968      true)
969    (define-fun hop_2_m_p () Bool
970      true)
```

```
971    (define-fun hop_2_m_o () Bool
972      true)
973    (define-fun hop_2_m_l () Bool
974      true)
975    (define-fun hop_2_m_k () Bool
976      true)
977    (define-fun hop_2_j_n () Bool
978      true)
979    (define-fun hop_2_j_l () Bool
980      true)
981    (define-fun hop_2_j_i () Bool
982      true)
983    (define-fun hop_2_j_f () Bool
984      true)
985    (define-fun hop_2_k_l () Bool
986      true)
987    (define-fun hop_2_k_m () Bool
988      true)
989    (define-fun hop_2_k_h () Bool
990      true)
991    (define-fun hop_2_k_g () Bool
992      true)
993    (define-fun hop_2_h_k () Bool
994      true)
995    (define-fun hop_2_h_i () Bool
996      true)
997    (define-fun hop_2_h_g () Bool
998      true)
999    (define-fun hop_2_h_e () Bool
1000      true)
1001    (define-fun hop_2_i_l () Bool
1002      true)
1003    (define-fun hop_2_i_j () Bool
1004      true)
1005    (define-fun hop_2_i_h () Bool
1006      true)
1007    (define-fun hop_2_i_f () Bool
1008      true)
1009    (define-fun hop_2_i_e () Bool
1010      true)
1011    (define-fun hop_2_f_j () Bool
1012      true)
1013    (define-fun hop_2_f_i () Bool
1014      true)
1015    (define-fun hop_2_f_d () Bool
1016      true)
1017    (define-fun hop_2_g_k () Bool
1018      true)
1019    (define-fun hop_2_g_h () Bool
1020      true)
1021    (define-fun hop_2_g_e () Bool
1022      true)
1023    (define-fun hop_2_d_f () Bool
1024      true)
1025    (define-fun hop_2_d_e () Bool
1026      true)
1027    (define-fun hop_2_d_b () Bool
1028      true)
1029    (define-fun hop_2_d_a () Bool
1030      true)
1031    (define-fun hop_2_e_h () Bool
1032      true)
```

```
1033    (define-fun hop_2_e_i () Bool
1034       true)
1035    (define-fun hop_2_e_g () Bool
1036       true)
1037    (define-fun hop_2_e_d () Bool
1038       true)
1039    (define-fun hop_2_b_d () Bool
1040       true)
1041    (define-fun hop_2_b_c () Bool
1042       true)
1043    (define-fun hop_2_b_a () Bool
1044       true)
1045    (define-fun hop_2_c_b () Bool
1046       true)
1047    (define-fun hop_2_a_d () Bool
1048       true)
1049    (define-fun hop_2_a_b () Bool
1050       true)
1051    (define-fun hop_1_p_q () Bool
1052       true)
1053    (define-fun hop_1_p_n () Bool
1054       true)
1055    (define-fun hop_1_p_o () Bool
1056       true)
1057    (define-fun hop_1_p_l () Bool
1058       true)
1059    (define-fun hop_1_p_m () Bool
1060       true)
1061    (define-fun hop_1_p_j () Bool
1062       false)
1063    (define-fun hop_1_p_k () Bool
1064       false)
1065    (define-fun hop_1_p_h () Bool
1066       false)
1067    (define-fun hop_1_p_i () Bool
1068       false)
1069    (define-fun hop_1_p_f () Bool
1070       false)
1071    (define-fun hop_1_p_g () Bool
1072       false)
1073    (define-fun hop_1_p_d () Bool
1074       false)
1075    (define-fun hop_1_p_e () Bool
1076       false)
1077    (define-fun hop_1_p_b () Bool
1078       false)
1079    (define-fun hop_1_p_c () Bool
1080       false)
1081    (define-fun hop_1_p_a () Bool
1082       false)
1083    (define-fun hop_1_q_p () Bool
1084       true)
1085    (define-fun hop_1_q_n () Bool
1086       true)
1087    (define-fun hop_1_q_o () Bool
1088       false)
1089    (define-fun hop_1_q_l () Bool
1090       false)
1091    (define-fun hop_1_q_m () Bool
1092       false)
1093    (define-fun hop_1_q_j () Bool
1094       false)
```

```
1095    (define-fun hop_1_q_k () Bool
1096      false)
1097    (define-fun hop_1_q_h () Bool
1098      false)
1099    (define-fun hop_1_q_i () Bool
1100      false)
1101    (define-fun hop_1_q_f () Bool
1102      false)
1103    (define-fun hop_1_q_g () Bool
1104      false)
1105    (define-fun hop_1_q_d () Bool
1106      false)
1107    (define-fun hop_1_q_e () Bool
1108      false)
1109    (define-fun hop_1_q_b () Bool
1110      false)
1111    (define-fun hop_1_q_c () Bool
1112      false)
1113    (define-fun hop_1_q_a () Bool
1114      false)
1115    (define-fun hop_1_n_p () Bool
1116      true)
1117    (define-fun hop_1_n_q () Bool
1118      true)
1119    (define-fun hop_1_n_o () Bool
1120      false)
1121    (define-fun hop_1_n_l () Bool
1122      true)
1123    (define-fun hop_1_n_m () Bool
1124      false)
1125    (define-fun hop_1_n_j () Bool
1126      true)
1127    (define-fun hop_1_n_k () Bool
1128      false)
1129    (define-fun hop_1_n_h () Bool
1130      false)
1131    (define-fun hop_1_n_i () Bool
1132      false)
1133    (define-fun hop_1_n_f () Bool
1134      false)
1135    (define-fun hop_1_n_g () Bool
1136      false)
1137    (define-fun hop_1_n_d () Bool
1138      false)
1139    (define-fun hop_1_n_e () Bool
1140      false)
1141    (define-fun hop_1_n_b () Bool
1142      false)
1143    (define-fun hop_1_n_c () Bool
1144      false)
1145    (define-fun hop_1_n_a () Bool
1146      false)
1147    (define-fun hop_1_o_p () Bool
1148      true)
1149    (define-fun hop_1_o_q () Bool
1150      false)
1151    (define-fun hop_1_o_n () Bool
1152      false)
1153    (define-fun hop_1_o_l () Bool
1154      false)
1155    (define-fun hop_1_o_m () Bool
1156      true)
```

```
1157    (define-fun hop_1_o_j () Bool
1158      false)
1159    (define-fun hop_1_o_k () Bool
1160      false)
1161    (define-fun hop_1_o_h () Bool
1162      false)
1163    (define-fun hop_1_o_i () Bool
1164      false)
1165    (define-fun hop_1_o_f () Bool
1166      false)
1167    (define-fun hop_1_o_g () Bool
1168      false)
1169    (define-fun hop_1_o_d () Bool
1170      false)
1171    (define-fun hop_1_o_e () Bool
1172      false)
1173    (define-fun hop_1_o_b () Bool
1174      false)
1175    (define-fun hop_1_o_c () Bool
1176      false)
1177    (define-fun hop_1_o_a () Bool
1178      false)
1179    (define-fun hop_1_l_p () Bool
1180      true)
1181    (define-fun hop_1_l_q () Bool
1182      false)
1183    (define-fun hop_1_l_n () Bool
1184      true)
1185    (define-fun hop_1_l_o () Bool
1186      false)
1187    (define-fun hop_1_l_m () Bool
1188      true)
1189    (define-fun hop_1_l_j () Bool
1190      true)
1191    (define-fun hop_1_l_k () Bool
1192      true)
1193    (define-fun hop_1_l_h () Bool
1194      false)
1195    (define-fun hop_1_l_i () Bool
1196      true)
1197    (define-fun hop_1_l_f () Bool
1198      false)
1199    (define-fun hop_1_l_g () Bool
1200      false)
1201    (define-fun hop_1_l_d () Bool
1202      false)
1203    (define-fun hop_1_l_e () Bool
1204      false)
1205    (define-fun hop_1_l_b () Bool
1206      false)
1207    (define-fun hop_1_l_c () Bool
1208      false)
1209    (define-fun hop_1_l_a () Bool
1210      false)
1211    (define-fun hop_1_m_p () Bool
1212      true)
1213    (define-fun hop_1_m_q () Bool
1214      false)
1215    (define-fun hop_1_m_n () Bool
1216      false)
1217    (define-fun hop_1_m_o () Bool
1218      true)
```

```
1219    (define-fun hop_1_m_l () Bool
1220      true)
1221    (define-fun hop_1_m_j () Bool
1222      false)
1223    (define-fun hop_1_m_k () Bool
1224      true)
1225    (define-fun hop_1_m_h () Bool
1226      false)
1227    (define-fun hop_1_m_i () Bool
1228      false)
1229    (define-fun hop_1_m_f () Bool
1230      false)
1231    (define-fun hop_1_m_g () Bool
1232      false)
1233    (define-fun hop_1_m_d () Bool
1234      false)
1235    (define-fun hop_1_m_e () Bool
1236      false)
1237    (define-fun hop_1_m_b () Bool
1238      false)
1239    (define-fun hop_1_m_c () Bool
1240      false)
1241    (define-fun hop_1_m_a () Bool
1242      false)
1243    (define-fun hop_1_j_p () Bool
1244      false)
1245    (define-fun hop_1_j_q () Bool
1246      false)
1247    (define-fun hop_1_j_n () Bool
1248      true)
1249    (define-fun hop_1_j_o () Bool
1250      false)
1251    (define-fun hop_1_j_l () Bool
1252      true)
1253    (define-fun hop_1_j_m () Bool
1254      false)
1255    (define-fun hop_1_j_k () Bool
1256      false)
1257    (define-fun hop_1_j_h () Bool
1258      false)
1259    (define-fun hop_1_j_i () Bool
1260      true)
1261    (define-fun hop_1_j_f () Bool
1262      true)
1263    (define-fun hop_1_j_g () Bool
1264      false)
1265    (define-fun hop_1_j_d () Bool
1266      false)
1267    (define-fun hop_1_j_e () Bool
1268      false)
1269    (define-fun hop_1_j_b () Bool
1270      false)
1271    (define-fun hop_1_j_c () Bool
1272      false)
1273    (define-fun hop_1_j_a () Bool
1274      false)
1275    (define-fun hop_1_k_p () Bool
1276      false)
1277    (define-fun hop_1_k_q () Bool
1278      false)
1279    (define-fun hop_1_k_n () Bool
1280      false)
```

```
1281    (define-fun hop_1_k_o () Bool
1282      false)
1283    (define-fun hop_1_k_l () Bool
1284      true)
1285    (define-fun hop_1_k_m () Bool
1286      true)
1287    (define-fun hop_1_k_j () Bool
1288      false)
1289    (define-fun hop_1_k_h () Bool
1290      true)
1291    (define-fun hop_1_k_i () Bool
1292      false)
1293    (define-fun hop_1_k_f () Bool
1294      false)
1295    (define-fun hop_1_k_g () Bool
1296      true)
1297    (define-fun hop_1_k_d () Bool
1298      false)
1299    (define-fun hop_1_k_e () Bool
1300      false)
1301    (define-fun hop_1_k_b () Bool
1302      false)
1303    (define-fun hop_1_k_c () Bool
1304      false)
1305    (define-fun hop_1_k_a () Bool
1306      false)
1307    (define-fun hop_1_h_p () Bool
1308      false)
1309    (define-fun hop_1_h_q () Bool
1310      false)
1311    (define-fun hop_1_h_n () Bool
1312      false)
1313    (define-fun hop_1_h_o () Bool
1314      false)
1315    (define-fun hop_1_h_l () Bool
1316      false)
1317    (define-fun hop_1_h_m () Bool
1318      false)
1319    (define-fun hop_1_h_j () Bool
1320      false)
1321    (define-fun hop_1_h_k () Bool
1322      true)
1323    (define-fun hop_1_h_i () Bool
1324      true)
1325    (define-fun hop_1_h_f () Bool
1326      false)
1327    (define-fun hop_1_h_g () Bool
1328      true)
1329    (define-fun hop_1_h_d () Bool
1330      false)
1331    (define-fun hop_1_h_e () Bool
1332      true)
1333    (define-fun hop_1_h_b () Bool
1334      false)
1335    (define-fun hop_1_h_c () Bool
1336      false)
1337    (define-fun hop_1_h_a () Bool
1338      false)
1339    (define-fun hop_1_i_p () Bool
1340      false)
1341    (define-fun hop_1_i_q () Bool
1342      false)
```

```
1343    (define-fun hop_1_i_n () Bool
1344      false)
1345    (define-fun hop_1_i_o () Bool
1346      false)
1347    (define-fun hop_1_i_l () Bool
1348      true)
1349    (define-fun hop_1_i_m () Bool
1350      false)
1351    (define-fun hop_1_i_j () Bool
1352      true)
1353    (define-fun hop_1_i_k () Bool
1354      false)
1355    (define-fun hop_1_i_h () Bool
1356      true)
1357    (define-fun hop_1_i_f () Bool
1358      true)
1359    (define-fun hop_1_i_g () Bool
1360      false)
1361    (define-fun hop_1_i_d () Bool
1362      false)
1363    (define-fun hop_1_i_e () Bool
1364      true)
1365    (define-fun hop_1_i_b () Bool
1366      false)
1367    (define-fun hop_1_i_c () Bool
1368      false)
1369    (define-fun hop_1_i_a () Bool
1370      false)
1371    (define-fun hop_1_f_p () Bool
1372      false)
1373    (define-fun hop_1_f_q () Bool
1374      false)
1375    (define-fun hop_1_f_n () Bool
1376      false)
1377    (define-fun hop_1_f_o () Bool
1378      false)
1379    (define-fun hop_1_f_l () Bool
1380      false)
1381    (define-fun hop_1_f_m () Bool
1382      false)
1383    (define-fun hop_1_f_j () Bool
1384      true)
1385    (define-fun hop_1_f_k () Bool
1386      false)
1387    (define-fun hop_1_f_h () Bool
1388      false)
1389    (define-fun hop_1_f_i () Bool
1390      true)
1391    (define-fun hop_1_f_g () Bool
1392      false)
1393    (define-fun hop_1_f_d () Bool
1394      true)
1395    (define-fun hop_1_f_e () Bool
1396      false)
1397    (define-fun hop_1_f_b () Bool
1398      false)
1399    (define-fun hop_1_f_c () Bool
1400      false)
1401    (define-fun hop_1_f_a () Bool
1402      false)
1403    (define-fun hop_1_g_p () Bool
1404      false)
```

```
1405    (define-fun hop_1_g_q () Bool
1406      false)
1407    (define-fun hop_1_g_n () Bool
1408      false)
1409    (define-fun hop_1_g_o () Bool
1410      false)
1411    (define-fun hop_1_g_l () Bool
1412      false)
1413    (define-fun hop_1_g_m () Bool
1414      false)
1415    (define-fun hop_1_g_j () Bool
1416      false)
1417    (define-fun hop_1_g_k () Bool
1418      true)
1419    (define-fun hop_1_g_h () Bool
1420      true)
1421    (define-fun hop_1_g_i () Bool
1422      false)
1423    (define-fun hop_1_g_f () Bool
1424      false)
1425    (define-fun hop_1_g_d () Bool
1426      false)
1427    (define-fun hop_1_g_e () Bool
1428      true)
1429    (define-fun hop_1_g_b () Bool
1430      false)
1431    (define-fun hop_1_g_c () Bool
1432      false)
1433    (define-fun hop_1_g_a () Bool
1434      false)
1435    (define-fun hop_1_d_p () Bool
1436      false)
1437    (define-fun hop_1_d_q () Bool
1438      false)
1439    (define-fun hop_1_d_n () Bool
1440      false)
1441    (define-fun hop_1_d_o () Bool
1442      false)
1443    (define-fun hop_1_d_l () Bool
1444      false)
1445    (define-fun hop_1_d_m () Bool
1446      false)
1447    (define-fun hop_1_d_j () Bool
1448      false)
1449    (define-fun hop_1_d_k () Bool
1450      false)
1451    (define-fun hop_1_d_h () Bool
1452      false)
1453    (define-fun hop_1_d_i () Bool
1454      false)
1455    (define-fun hop_1_d_f () Bool
1456      true)
1457    (define-fun hop_1_d_g () Bool
1458      false)
1459    (define-fun hop_1_d_e () Bool
1460      true)
1461    (define-fun hop_1_d_b () Bool
1462      true)
1463    (define-fun hop_1_d_c () Bool
1464      false)
1465    (define-fun hop_1_d_a () Bool
1466      true)
```

```
1467    (define-fun hop_1_e_p () Bool
1468      false)
1469    (define-fun hop_1_e_q () Bool
1470      false)
1471    (define-fun hop_1_e_n () Bool
1472      false)
1473    (define-fun hop_1_e_o () Bool
1474      false)
1475    (define-fun hop_1_e_l () Bool
1476      false)
1477    (define-fun hop_1_e_m () Bool
1478      false)
1479    (define-fun hop_1_e_j () Bool
1480      false)
1481    (define-fun hop_1_e_k () Bool
1482      false)
1483    (define-fun hop_1_e_h () Bool
1484      true)
1485    (define-fun hop_1_e_i () Bool
1486      true)
1487    (define-fun hop_1_e_f () Bool
1488      false)
1489    (define-fun hop_1_e_g () Bool
1490      true)
1491    (define-fun hop_1_e_d () Bool
1492      true)
1493    (define-fun hop_1_e_b () Bool
1494      false)
1495    (define-fun hop_1_e_c () Bool
1496      false)
1497    (define-fun hop_1_e_a () Bool
1498      false)
1499    (define-fun hop_1_b_p () Bool
1500      false)
1501    (define-fun hop_1_b_q () Bool
1502      false)
1503    (define-fun hop_1_b_n () Bool
1504      false)
1505    (define-fun hop_1_b_o () Bool
1506      false)
1507    (define-fun hop_1_b_l () Bool
1508      false)
1509    (define-fun hop_1_b_m () Bool
1510      false)
1511    (define-fun hop_1_b_j () Bool
1512      false)
1513    (define-fun hop_1_b_k () Bool
1514      false)
1515    (define-fun hop_1_b_h () Bool
1516      false)
1517    (define-fun hop_1_b_i () Bool
1518      false)
1519    (define-fun hop_1_b_f () Bool
1520      false)
1521    (define-fun hop_1_b_g () Bool
1522      false)
1523    (define-fun hop_1_b_d () Bool
1524      true)
1525    (define-fun hop_1_b_e () Bool
1526      false)
1527    (define-fun hop_1_b_c () Bool
1528      true)
```

```
1529    (define-fun hop_1_b_a () Bool
1530      true)
1531    (define-fun hop_1_c_p () Bool
1532      false)
1533    (define-fun hop_1_c_q () Bool
1534      false)
1535    (define-fun hop_1_c_n () Bool
1536      false)
1537    (define-fun hop_1_c_o () Bool
1538      false)
1539    (define-fun hop_1_c_l () Bool
1540      false)
1541    (define-fun hop_1_c_m () Bool
1542      false)
1543    (define-fun hop_1_c_j () Bool
1544      false)
1545    (define-fun hop_1_c_k () Bool
1546      false)
1547    (define-fun hop_1_c_h () Bool
1548      false)
1549    (define-fun hop_1_c_i () Bool
1550      false)
1551    (define-fun hop_1_c_f () Bool
1552      false)
1553    (define-fun hop_1_c_g () Bool
1554      false)
1555    (define-fun hop_1_c_d () Bool
1556      false)
1557    (define-fun hop_1_c_e () Bool
1558      false)
1559    (define-fun hop_1_c_b () Bool
1560      true)
1561    (define-fun hop_1_c_a () Bool
1562      false)
1563    (define-fun hop_1_a_p () Bool
1564      false)
1565    (define-fun hop_1_a_q () Bool
1566      false)
1567    (define-fun hop_1_a_n () Bool
1568      false)
1569    (define-fun hop_1_a_o () Bool
1570      false)
1571    (define-fun hop_1_a_l () Bool
1572      false)
1573    (define-fun hop_1_a_m () Bool
1574      false)
1575    (define-fun hop_1_a_j () Bool
1576      false)
1577    (define-fun hop_1_a_k () Bool
1578      false)
1579    (define-fun hop_1_a_h () Bool
1580      false)
1581    (define-fun hop_1_a_i () Bool
1582      false)
1583    (define-fun hop_1_a_f () Bool
1584      false)
1585    (define-fun hop_1_a_g () Bool
1586      false)
1587    (define-fun hop_1_a_d () Bool
1588      true)
1589    (define-fun hop_1_a_e () Bool
1590      false)
```

```
1591    (define-fun hop_1_a_b () Bool
1592      true)
1593    (define-fun hop_1_a_c () Bool
1594      false)
1595  )
```