Practical Exercise 1: Planner

The Coffee Server Planning and Approximate Reasoning



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Master in Artificial Inteligence

 1^{st} Semester

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November 6, 2016

Abstract

The STRIPS algorithm, an automated planner developed by Richard Fikes and Nils Nilsson in 1971 at SRI International, can be applied to any state-based problem represented by a set of operators and predicates. In this paper we use STRIPS to solve a problem where a robot has to prepare and serve coffee to several offices in a building, designing specific heuristic functions for this domain.

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1 Introduction

In this paper, we present a solution for the practical proposed exercise [1] in PAR course [2]. In the following sections our team presents a definition of the problem and analyzes its characteristics, in order to formalize it as a set of operators and predicates to be able to solve it using the STRIPS algorithm [3]. Later our team proposes several heuristic methods to optimize the result of the solver for this specific problem and presents a solution implemented in Java [4]. Finally, a table of results is presented and analyzed.

Appendix A contains the system requirements and the necessary instructions to execute the proposed solution.

2 Definition of the Problem

The problem, called The Coffee Server [1], considers the following scenario:

"There is a squared building composed by 36 offices, which are located in a matrix of 6 rows and 6 columns. From each office it is possible to move (horizontally or vertically) to the adjacent offices. The building has some coffee machines in some offices that can make 1, 2 or 3 cups of coffee at one time.

The people working at the offices may ask for coffee and a robot called "Clooney" is in charge of serving the coffees required. Each office may ask for 1, 2 or 3 coffees but not more. The petitions of coffee are done all at early morning (just when work starts) so that the robot can plan the service procedure. Each petition has to be served in a single service.

The goal is to serve all the drinks to all the offices in an efficient way (minimizing the travel inside the building, in order to not disturb the people working).

The robot will start with a given initial configuration (different for each test), with some petitions of coffee on a subset of the offices in the building. The initial configuration also establishes the positions of the coffee machines and the initial position of the robot. In the goal state no more petitions are pending to be served."

In this practical exercise our team have to design and implement (in Java) a linear planner with a stack of goals (STRIPS) that can discover how to go efficiently from an initial state of the world to the goal state explained before.

3 Analysis of the Problem

This section formalizes the problem as a set of predicates, parameters, operators and constraints, as it is defined in the problem definition [1].

The predicates to be considered are the following:

- Robot-location(o): the robot is in office o.
- Robot-free: the robot has no cup of coffee
- Robot-loaded(n): the robot has n cups of coffee
- Petition(o,n): office o wants n cups of coffee
- Served(o): office o has been served, no more coffee is needed in this office
- Machine(o,n): there is a coffee machine in office o that produces n cups of coffee each time (with n equal to 1, 2 or 3)
- Steps(x): the total distance travelled by the robot (calculated with Manhattan distance)

The operators to be considered are the following:

- Make(o,n): the robot makes n cups of coffee in the machine located at office o
 - Preconditions: Robot-location(o), Robot-free, Machine(o,n)
 - Postconditions: Robot-loaded(n), ¬Robot-free
- Move(o1,o2): the robot moves from o1 to o2
 - Preconditions: Robot-location(o1), Steps(x) ¹.
 - Postconditions: Robot-location(o2), Steps(x+distance(o1,o2)), ¬Robot-location(o1), ¬Steps(x)
- Serve(o,n): the robot delivers n cups of coffee to office o
 - Preconditions: Robot-location(o), Robot-loaded(n), Petition(o,n)
 - Postconditions: Served(o), Robot-free, ¬Petition(o,n), ¬Robot-loaded(n)

There are three types of parameters to be considered:

- o: this parameter represents a location in the grid in terms of the number of the office. Since we have a finite 6×6 grid, the allowed value for this parameter is oi, where i is a natural number between 1 and 36 (inclusive).
- n: represents the number of coffees. We only consider petitions and machines up to 3 coffees, so it can only take the values 1, 2 and 3.

¹As we will see in section 5, the Steps(x) precondition has been removed from the final implementation, since it always exists in the current state.

• x: this parameter represents a certain number of steps (i.e. a single or accumulated Manhattan distance), and its value can take any natural number (including 0).

Constraints that simplify the problem, as stated in [1]:

- 1. The robot only makes coffee for a single petition each time. That is, the robot cannot make 3 cups of coffee to serve two different offices. First, will make coffee of one office and serve it, and after will go to the same or another coffee machine to serve the second office.
- 2. If a petition is of n cups, the robot will make coffee only with a unique machine of capacity n. That is, the robot cannot make coffee with 2 or more machines and accumulate the cups to serve a unique petition.

Without taking into account the Steps(x) predicate, the search space of this problem is gigantic: Robot-location has 36 possible parameters, the robot has 4 possible states (free or loaded with 1, 2 or 3 coffees) and each petition can be served or still pending. Taking into account the Steps(x) predicate, the search space of this problem becomes infinite, since x can take any value in \mathbb{N} .

"STRIPS uses a GPS-like means-end analysis strategy [5]. This combination of means-ends analysis and formal theorem-proving methods allows objects (world models) much more complex and general than any of those used in GPS and provides more powerful search heuristics than those found in theorem-proving programs" [3]. Thanks to this property, we can solve our problem although the search space is infinite.

4 Planning Algorithm

This section presents and analyzes the different heuristics proposed for the solution of the problem, explaining the domain knowledge behind them. We recall from the notes of the course [6] that the STRIPS algorithm has three potential situations in which a problem-dependent strategy may be deployed in order to improve the performance of the planner (or even to make it work correctly):

- 1. When choosing an operator to achieve a certain predicate.
- 2. When sorting a set of predicates to add them to the stack.
- 3. When instantiating a parameter of a partially instantiated predicate.

We study each case separately.

4.1 Choosing an operator

When the top element of the stack is a predicate that is not contained in the current state, the STRIPS algorithm looks for an operator that adds this predicate to the current state. In a general example, it could be the case that there were several operators that had that predicate in their postcondition list, some of them perhaps representing a better choice than others. In that case, after studying the specific problem, we may be able to design an intelligent strategy to choose the most appropriate operator.

In the Coffee Server problem, however, each predicate satisfies that only appears in the post-condition list of one of the operators, so we don't have to deal with this problem.

4.2 Sorting a Set of Predicates

In general, given a set of predicates, the order in which we add its predicates to the stack can become crucial in order to make the planner more efficient, or even to avoid loops. When dealing with a specific problem, a previous analysis of it might suggest us some strategies about how to sort the predicates appropriately.

In the Coffee Server problem we distinguish two kinds of set of predicates depending on the sorting process: firstly, the one associated with the goal state, which is the only that can contain Served(o) predicates; and secondly, the sets of predicates related to the precondition lists of the three operators. We detail the domain-knowledge applied to each of them separately,

Sorting the Goal State

A reasonable goal state consists in a set of one or more Served(o) predicates plus an optional single Robot-location(o) to state the final office position of the robot. A goal state can potentially contain other predicates, but they are not relevant for this heuristic.

First of all, it is straightforward to see that all Served(o) predicates should be placed in the stack on top of the Robot-location(o). Then, a more complex strategy is required to sort the different Served(o) predicates. We point out that the order of these predicates may highly determine the number of steps of the itinerary followed by the robot, which is just the quantity that we would like to minimize.

We propose an heuristic function based on sorting the Served(o) predicates by looking for sequences of nearby ones (considering the Manhattan distance) starting from the initial and, it it is stated in the goal state, from the final position as well. More specifically:

- 1. We start looking for the Served(o) predicate whose position parameter is the closest to the initial position of the robot; it will be the first element taken into account by the planning process. This step defines the top part of the stack.
- 2. In the next step, if the goal state defines a final position for the robot and there are still unordered Served(o) predicates, we look for the Served(o) predicate whose position parameter is the closest to the final position of the robot; it will become the last Served(o) element taken into account by the planner. This step defines the bottom part of the stack
- 3. Until all Served(o) predicates are ordered, we repeat:
 - (a) We consider the last Served(o) predicate added to the top part of the stack, and look for its closest Served(o9 predicate among the remaining ones; it will be the following Served(o) predicate in that top part of the stack.
 - (b) If there are still unordered Served(o) predicates and the goal state defines a final position, we consider now the last Served(o) predicate added to the bottom part of the stack, and again look for its closest Served(o) predicate among the remaining ones; it will become the top Served(o) predicate in that bottom part of the stack.

This is a fairly simple process that allows us to obtain a reasonable order of serving the commands, avoiding considering two consecutive far petitions while there are closer ones, as well as taking into

account the final state (provided it is stated in the goal state) besides the initial one so that, if possible, the robot does not serve the last coffee request far from its final position.

Note that our heuristic does not guarantee an optimal organization at all; it does not even take into account the locations of the coffee machines when sorting the Served(o) predicates. A more sophisticated heuristic may lead to solutions closer (or equal) to the optimal one, but in that case it is actually resolving the entire planning problem beforehand.

Sorting the precondition list of an operator

When adding the predicates of a precondition list, we realize that:

- If the precondition list corresponds to the Move(o1,o2) operator, it doesn't matter the order in which its predicates are added to the stack.
- If the precondition list corresponds to the Make([o],n) operator, it is desirable to add its predicates in the following order

```
Firstly, Robot-location([o]);
```

- Then Machine([o], n);
- Lastly, Robot-free.

In that way, the top element of the stack is Robot-free (to ensure that the robot is not holding coffees already), the second one Machine([o], n) (to look for the location of a Machine that can make a given number of coffees), and finally we validate Robot-location([o]) (to make the robot be at the location of the selected machine).

• If the precondition list corresponds to the Serve(o,[n]) operator, there is also a preferred order when adding its predicates to the stack:

```
- Firstly, Robot-location(o);
```

- Then Robot-loaded([n]);
- Lastly, Petition(o,[n]).

Thus, the first predicate to be evaluated is Petition(o,[n]) (to look for the number of coffees requested at that office), the next one is Robot-loaded([n]) (to make sure that it holds the requested number of coffees), and Robot-location(o) afterwards (to make the robot be at the office where it must serve those coffees).

• We point out that, when sorting the precondition list of a Make(o,n) or Serve(o,n) operator, different orders than the ones shown above may lead to fool behaviours of the robot, or even to stop the planner without finding a solution; these effects are consequences of illogical or nonexisting matches for the required instantiations.

We also note that the all orders stated above are compatible with a general order provided that it respects the priorities shown in Table 1, where it doesn't matter the relative order between predicates that share the same priority.

For instance, given a set of predicates that comes from a precondition list, one valid order for looking for the predicates (and add them to the stack if found) is the following:

```
Steps(x), Robot-location(o), Machine(o,n), Robot-loaded(n), Robot-free, Petition(o,n)
```

On top of the stack	On the middle	At the bottom	No matters	
Petition	Robot-loaded	Robot-location	Stone	
Robot-free	Machine	1100001-10Cat1011	Steps	

Table 1: Preferences that must satisfy a general order.

4.3 Instantiating a Parameter

When considering predicates that are partially instantiated, the STRIPS algorithm searches for possible values of the non-instantiated parameters taking into account the current state at that moment. In a specific problem, when different candidates for a given instantiation are found, the domain-knowledge of that problem can help to define an heuristic function in order to find the most appropriate value among the candidates.

In the Coffee Server problem, if the sorting of the sets of predicates is made as we have explained in the previous subsection, the STRIPS algorithm can only find the following partially instantiated predicates²: Machine([o],n) (coming from the precondition list of the Make([o],n) operator); Petition([o,n])(from Serve([o,n]) operator); Robot-location([o,n]) (from Move([o,n]) operator); Note that the parameters between brackets are the uninstantiated ones.

For each of these predicates, the STRIPS algorithm tries to obtain a valid value for its parameter by matching the corresponding predicate with predicates in the current state that have the same name and, if the predicate we want to instantiate has already an instantiated parameter, share the same value of this parameter as well. In our case, whereas the algorithm only returns a single match for Petition(o,[n]) and Robot-location([o1]), it can actually return a set of several valid matches for Machine([o],n).

When we have different candidates for the position of the Machine predicate, as we are interested in minimizing the number of steps, our strategy is to choose the position o' among them that minimizes

$$d_{Manhattan}(o_0, o') + d_{Manhattan}(o', o_f)$$

, Where o_0 is the current location of the robot and o_f the location of the petition that is being considered at that specific moment ³.

With this heuristic function we guarantee that the robot always goes to the coffee machine that, given the current location, implies the lower number of steps required to go to make the coffees and then go to serve them.

5 Implementation Design

The implementation of the solution for this problem is divided into two parts:

- 1. The general STRIPS algorithm.
- 2. The particular case of the coffee server, as an extension of part 1.

²one may note that steps([x]) is not in the list. This is due to the fact that, in our implementation, the predicate Steps(x) is not contained in the precondition list of the Move(01,02) operator, as it is explained in Section 5

 $^{^{3}}o_{f}$ can be found by looking for the position parameter of the unique Serve operator that is present in the stack at that instant.

Figure 1 is a simplification of the system class diagram, where classes are grouped by the package in which they are included. A more complete class diagram of the system can be found in Appendix B.

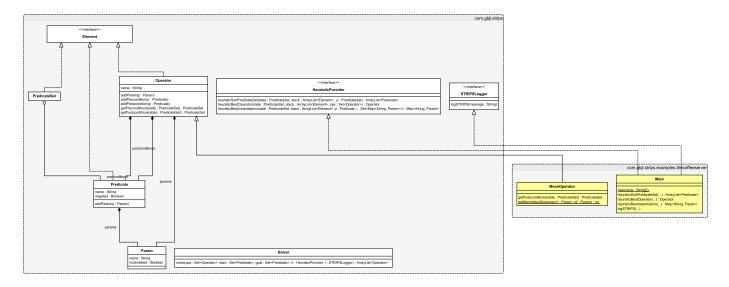


Figure 1: Simple class diagram

Package com.gbjl.strips contains the general STRIPS algorithm that, in summary, consists on these classes:

- Solver: this class implements the STRIPS algorithm and it is executed when the method solve(...) is called with a given set of operators, an initial state, a goal state, a heuristic provider and a logger.
- HeuristicProvider: this interface provides the three heuristic functions that the solver uses, as explained in Section 4. Class Solver calls those functions when needed.
- STRIPSLogger: this interface provides a function for logging messages. Class Solver calls this function several times to give information about what it is doing, as well as changes in the current state or the current stack.
- Element: this interface represents an element of the stack. In this simplification it has no methods, but internally it provides a function for the instantiation of parameters.
- Param: this class represents a parameter of a predicate or operator. It has a name and it can be instantiated (or not).
- Predicate: this class represents a predicate. It has a name, it can be negated (or not) and it contains a list of parameters.
- Operator: this class represents an operator. It has a name, a list of parameters, a list of preconditions and a list of postconditions. It can be extended with a subclass in order to implement advanced features, such as the Move operator of our coffee server problem, which requires a special case for managing the postcondition of Steps(x+d).
- PredicateSet: this class represents a set of predicates.

Package com.gbjl.strips.examples.thecoffeeserver contains the particular case of the coffee server that consists on these classes:

- Main: this class is the start point of the problem. It defines all the required operators (with its parameters, preconditions and postconditions), reads the initial and goal states from a given file and executes the STRIPS algorithm using com.gbjs.strips.Solve. It also provides the required heuristic functions and the logger function, that stores the algorithm log in a given file.
- MoveOperator: this class extends from Operator. It adds the required parameters, preconditions and postconditions to itself and overrides the getPostconditions(...) method, to be able to return the predicate Steps(x+d) based on the current state Steps(x) predicate. In order to simplify the problem, predicate Steps(x) has not been included in the list of preconditions of this operator, since it always exists in the current state.

6 Results

In this section we present and compare the results of several testing cases solved by our system:

- Case 1: the example proposed in the problem definition. It consists on 5 petitions and 5 machines, and the proposal solves it with 25 steps.
- Case 2: a random example. It consists on 10 petitions and 10 machines.
- Case 3: another random example, but without a Robot-location(o) predicate in the goal state. It consists on 5 petitions and 5 machines.
- Case 4: a difficult case for our heuristic functions, that solve the problem in a very inefficient way. This is an example of a worst-case scenario for our solution: all petitions are distributed on two ends of the grid, and satisfy that all their suitable machines are located in their opposite end. We expect the robot to be constantly crossing without optimizing the travels at all.
- Case 5: an impossible case, where there is a petition of 1 coffees but no machines. It is expected that the program throws an error.
- Case 6: a random case with a lot of petitions (11) but few machines (3).

We point out that the exact input for each of these cases can be fount in Appendix C.

Table 2 shows the performance of our algorithm measured in the number of steps the robot must do in order to achieve the goal state. This number is compared with the optimal solution, found using an algorithm not presented in this paper. Appendix C contains a detailed representation of the state and stack evolution of each execution of these tests.

In case 5, the program throws the following message: Error. Predicate "Machine([o],1)" cannot be instantiated in the state "Petition(o1,1);Steps(0);Robot-free;Robot-location(o1);".

In case 4, as we expected, we obtain the worst result by far. The robot, as we can see with much more detail in Appendix C, Case 4, instead of taking advantage of the crossings from one

Case	1 cup petition	2 cup petition	3 cup petition	1 cup machines	2 cup machines	3 cup machines	Final steps	Optimal solution
1	3	1	1	2	2	1	25	25
2	6	2	2	2	2	6	56	52
3	2	2	1	1	1	3	43	39
4	1	1	1	1	1	1	42	26
5	1	0	0	0	0	0	N/A	N/A
6	6	3	2	1	1	1	69	61

Table 2: Results of the different cases

end to the other to serve the petitions of both sides at the same time, does respect the sequence of nearest petitions that the heuristic provides it and, consequently, delivers the petitions with a larger number of steps than required.

As the table shows, our solution is near the optimal solution for the major part of cases, but it is very inefficient for specific cases where the heuristic function do not sort the Served(o) predicates in a good way, since it does not take in account the position of the machines. However, this table is short and does not represents correctly the performance of our solution.

In order to have a better idea of the performance of the algorithm, we also created 300 random cases, where each case has a random number of machines between 1 and 36 and a random number of petitions between 1 and 36. All cases can be solved, since there exists a machine that makes N coffees for each petition of N coffees.

Figures 3, 3 and CHART3 represent the relation between the number of petitions, the number of machines and the number of steps required to solve the problem.

In 3 we can see how the number of petitions is directly correlated with the number of needed steps. Due to the low number of offices in the building, it is hard to determine the kind of correlation between both variables. However, from our point of view, it looks like an exponential function.

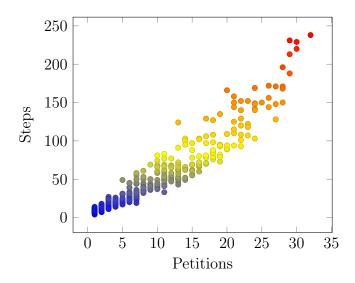


Figure 2: Relation between petitions and steps

In 3 we can see how the number of machines define a top limit to the number of needed steps.

This limit is an inverse correlation between the two variables. Under this limit, the number of steps required to solve the problem does not follow any special distribution.

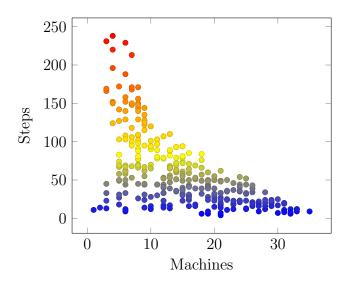


Figure 3: Relation between machines and steps

7 Conclusions and Future Work

In sections 2 and 3, our team presented a definition of the problem and analyzed its characteristics, in order to formalize it as a set of operators and predicates to be able to solve it using the STRIPS algorithm.

Later, in section 4, our team proposed several heuristic functions to optimize the result of the solver for this specific problem.

In section 5, we presented a solution implemented in Java and we explained the details of the object oriented architecture.

Finally, a table of results was presented and analyzed, and we concluded that our solution is near to the optimal one, but in some cases can be very inefficient.

In general, due to the nature of the STRIPS algorithm, this program does not find the optimal plan for serving coffee with the minimum number of robot steps. Nevertheless, it can be close to it in many situations thanks to the proposed heuristic functions. Optimal solutions for this problem may be found using, for example, a non-linear planning algorithm with regression, but this subject is out of the scope of this paper.

References

- [1] Problem definition, https://moodle.urv.cat/moodle/pluginfile.php/2303642/mod_resource/content/4/PlannerExercise16-17.pdf
- [2] PAR course https://moodle.urv.cat/docnet/guia_docent/index.php?centre=17& ensenyament=1768&assignatura=17685204&font=12&any_academic=2016_17&modalitat=p
- [3] STRIPS paper http://ai.stanford.edu/~nilsson/OnlinePubs-Nils/PublishedPapers/strips.pdf
- [4] JAVA
- [5] Ernst, G. and . 4ewell, A. GPS: A Case Study in Generality and Problem Solving. ACM Monograph Series. Academic Press, New York, New York, 1969
- [6] Notes of the PAR course

Appendix A: Instructions to Execute the Program

System requirements

- Microsoft Windows Vista or higher. (older versions are not supported by Microsoft⁴ at the date of the publication of this paper).
- Java JDK 1.8⁵

Step 1: build

In the command line console, go to the project directory and execute the following command:

```
build-thecoffeeserver.bat
```

Step 2: run

Now, to run the program, execute the following command:

```
java -jar out/thecoffeeserver.jar <input file> <output file>
```

where:

- <input file> is a file containing the initial and goal states, with the format stated in the problem definition.
- <output file> is the file where the program will store a detailed log of the solving process, including the plan (as a list of operators) to achieve the goal state from the initial state.

To run the input proposed in the problem definition, execute the following command:

```
java -jar out/thecoffeeserver.jar docs/thecoffeeserver/case1.txt
   out/output.txt
```

The output of the program will be stored in out/output.txt.

⁴https://support.microsoft.com/en-us/help/13853/windows-lifecycle-fact-sheet

 $^{^5 \}mathtt{http://www.oracle.com/technetwork/es/java/javase/downloads/index.html}$

Appendix B: Complete Class Diagram

This is a complete class diagram of the system. Note that relation multiplicities have been omitted.

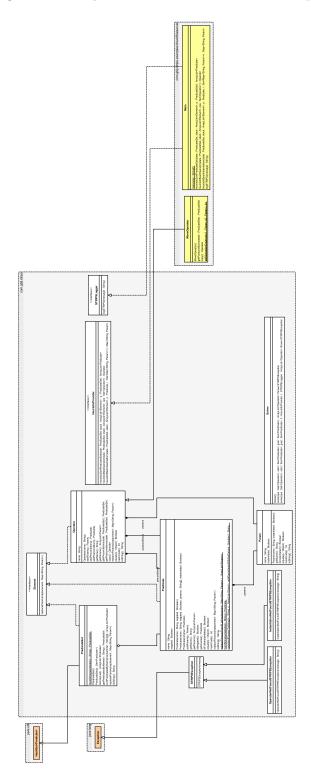


Figure 4: Complete class diagram

Appendix C: Test Results

This appendix contains a detailed representation of the state and stack evolution of each test execution proposed in section REFERENCIASECCIONTESTS.

For reasons of space, we abbreviated some predicates with the following dictionary:

- Robot-loaded $\rightarrow RL$
- Robot-free $\rightarrow RF$
- Robot-location $\rightarrow R$
- Steps \rightarrow ST
- Machine \rightarrow M
- Petition \rightarrow P
- Served \rightarrow S

For the same reason, when we represent a state using a 6x6 board with predicates in the corresponding cells, we omitted those parameters that reference office locations, since they are implicitly represented. For example, if M(2) is written in the cell (2,3) of a board, it means Machine(o14,2).

Case 1

Input File

```
InitialState=Robot-location(o1); Machine(o4,3); Machine(o8,1); Machine
  (o21,2); Machine(o23,1); Machine(o31,2); Petition(o3,1); Petition(
  o11,3); Petition(o12,1); Petition(o13,2); Petition(o25,1);

GoalState=Robot-location(o7); Served(o3); Served(o11); Served(o12);
  Served(o13); Served(o25);
```

State evolution

	P(1)	M(3)		
M(1)			P(3)	P(1)
	M(2)		M(1)	
	M(1)	M(1) M(2)	M(1) M(3) M(2) M(2)	M(1) M(3) P(3) M(2) M(1) M(1)

Robot-free; Steps(0) Initial state

	P(1)	M(3)		
R M(1)			P(3)	P(1)
	M(2)		M(1)	
		R M(1)	R M(1)	R M(1) P(3)

Robot-free; Steps(2) Intermediate state 1

		P(1)	M(3)		
	R M(1)			P(3)	P(1)
P(2)					
		M(2)		M(1)	
P(1)					
M(2)					

Robot-loaded(1); Steps(2) Intermediate state 2

Intermediate state 4									
			M(3)						
		S	R						
	M(1)			P(3)	P(1)				
P(2)									
		M(2)		M(1)					
P(1)									

Robot-free; Steps(4)

Robot-free; Steps(5) Intermediate state 5

		S	M(3) R		
	M(1)			P(3)	P(1)
P(2)					
		M(2)		M(1)	
P(1)					
M(2)					

Robot-loaded(3); Steps(5) Intermediate state 6

		S	M(3)		
	M(1)			R P(3)	P(1)
P(2)					
		M(2)		M(1)	
P(1)					
M(2)					

Robot-loaded(3); Steps(7) Intermediate state 7

		S	M(3)		
	M(1)			S R	P(1)
P(2)					
		M(2)		M(1)	
P(1)					
M(2)					

Robot-free; Steps(7) Intermediate state 8

		S	M(3)		
	M(1)			S	P(1)
P(2)					
		M(2)		M(1) R	
P(1)					
M(2)					

Robot-free; Steps(9) Intermediate state 9

			3.6703		
		5	M(3)		
	M(1)			S	P(1)
P(2)					
		M(2)		M(1) R	
P(1)					
M(2)					

PAR

Robot-loaded(1); Steps(9) Intermediate state 10

		S	M(3)		
	M(1)			S	P(1) R
P(2)					
		M(2)		M(1)	
P(1)					
M(2)					

 $\begin{array}{c} {\bf Robot\text{-}loaded(1);\ Steps(12)} \\ {\bf Intermediate\ state\ 11} \end{array}$

		S	M(3)		
	M(1)			S	S R
P(2)					
		M(2)		M(1)	
P(1)					
M(2)					

Robot-free; Steps(12) Intermediate state 12

		S	M(3)		
	M(1)			S	S
P(2)					
		M(2)		M(1) R	
P(1)					
M(2)					

Robot-free; Steps(15) Intermediate state 13

		S	M(3)		
	M(1)			S	S
P(2)					
		M(2)		M(1) R	
P(1)					
M(2)					

Robot-loaded(1); Steps(15) Intermediate state 14

		S	M(3)		
	M(1)			S	S
P(2)					
		M(2)		M(1)	
R					
R P(1)					
M(2)					

Robot-loaded(1); Steps(20) Intermediate state 15

		S	M(3)		
	M(1)			S	S
P(2)					
		M(2)		M(1)	
R					
S					
M(2)					

Robot-free; Steps(20) Intermediate state 16

		S	M(3)		
	M(1)			S	S
P(2)					
		M(2)		M(1)	
S					
R M(2)					
M(2)					

Robot-free; Steps(21) Intermediate state 17

		S	M(3)		
	M(1)			S	S
P(2)					
		M(2)		M(1)	
S					
R					
M(2)					

Robot-loaded(2); Steps(21) Intermediate state 18

			S	M(3)		
Γ		M(1)			S	S
	R P(2)					
Γ			M(2)		M(1)	
Γ	S					
	M(2)					

Robot-loaded(2); Steps(24) Intermediate state 19

		S	M(3)		
	M(1)			S	S
S					
R					
		M(2)		M(1)	
S					
M(2)					

Robot-free; Steps(24) Intermediate state 20

		S	M(3)		
R	M(1)			S	S
S					
		M(2)		M(1)	
S					
M(2)					

Robot-free; Steps(25)Final state

	S		
R		S	S
S			
S			

Goal state

Stack evolution

C1(-2)
Served(o3)
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), B(o7), S(o11)\}$

Stack #1

Petition(o3,[n])
Robot-loaded([n])
Robot-location(o3)
$\{R(o3), RL([n]), P(o3,[n])\}$
Serve(o3,[n])
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #2

Robot-loaded(1)
Robot-location(o3)
$\{R(o3), RL(1), P(o3,1)\}$
Serve(o3,1)
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #3

Robot-free
Machine([o],1)
Robot-location([o])
$\{M([o],1), R([o]), RF\}$
Make([o],1)
Robot-location(o3)
{R(o3), RL(1), P(o3,1)}
Serve(o3,1)
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}\$

Stack #4

Machine([o],1)
Robot-location([o])
$\{M([o],1), R([o]), RF\}$
Make([o],1)
Robot-location(o3)
$\{R(o3), RL(1), P(o3,1)\}$
Serve(o3,1)
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #5

Robot-location(o8)
$\{M(o8,1), R(o8), RF\}$
Make(08,1)
Robot-location(o3)
$\{R(o3), RL(1), P(o3,1)\}$
Serve(o3,1)
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #6

Robot-location([o1])
{R([o1])}
Move([o1],o8)
{M(o8,1), R(o8), RF}
Make(o8,1)
Robot-location(o3)
{R(o3), RL(1), P(o3,1)}
Serve(o3,1)
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #7

{R(o1)}
Move(o1,o8)
$\{M(o8,1), R(o8), RF\}$
Make(08,1)
Robot-location(o3)
$\{R(o3), RL(1), P(o3,1)\}$
Serve(o3,1)
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #8

Move(o1,o8)
$\{M(o8,1), R(o8), RF\}$
Make(o8,1)
Robot-location(o3)
$\{R(o3), RL(1), P(o3,1)\}$
Serve(o3,1)
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #9

$\{M(o8,1), R(o8), RF\}$
Make(08,1)
Robot-location(o3)
$\{R(o3), RL(1), P(o3,1)\}$
Serve(o3,1)
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #10

Make(08,1)
Robot-location(o3)
$\{R(o3), RL(1), P(o3,1)\}$
Serve(o3,1)
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #11

Robot-location(o3)
{R(o3), RL(1), P(o3,1)}
Serve(o3,1)
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}\$

Stack #12

Robot-location([o1])
$\{R([o1])\}$
Move([o1],o3)
$\{R(o3), RL(1), P(o3,1)\}$
Serve(o3,1)
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #13

{R(o8)}
Move(08,03)
{R(o3), RL(1), P(o3,1)}
Serve(o3,1)
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #14

Move(o8,o3)
$\{R(o3), RL(1), P(o3,1)\}$
Serve(o3,1)
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}

Stack #15

$\{R(o3), RL(1), P(o3,1)\}$
Serve(o3,1)
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #16

Serve(o3,1)
Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #17

Served(o11)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #18

Petition(o11,[n])
Robot-loaded([n])
Robot-location(o11)
$\{R(o11), RL([n]), P(o11,[n])\}$
Serve(o11,[n])
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), B(o7), S(o11)\}$

Stack #19

To 1 (1 1 1/0)
Robot-loaded(3)
Robot-location(o11)
$\{R(o11), RL(3), P(o11,3)\}$
Serve(o11,3)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}

Stack #20

Robot-free
Machine([o],3)
Robot-location([o])
$\{R([o]), RF, M([o],3)\}$
Make([o],3)
Robot-location(o11)
{R(o11), RL(3), P(o11,3)}
Serve(o11,3)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}\$

Stack #21

Machine([o],3)
Robot-location([o])
$\{R([o]), RF, M([o],3)\}$
Make([o],3)
Robot-location(o11)
{R(o11), RL(3), P(o11,3)}
Serve(o11,3)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #22

Robot-location(o4)
{R(o4), RF, M(o4,3)}
Make(o4,3)
Robot-location(o11)
$\{R(o11), RL(3), P(o11,3)\}$
Serve(o11,3)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #23

Robot-location([o1])
{R([o1])}
Move([o1],o4)
$\{R(o4), RF, M(o4,3)\}$
Make(o4,3)
Robot-location(o11)
{R(o11), RL(3), P(o11,3)}
Serve(o11,3)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}

Stack #24

Stack #25

Move(o3,o4)
$\{R(o4), RF, M(o4,3)\}$
Make(o4,3)
Robot-location(o11)
{R(o11), RL(3), P(o11,3)}
Serve(o11,3)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #26

$\{R(o4), RF, M(o4,3)\}$
Make(o4,3)
Robot-location(o11)
{R(o11), RL(3), P(o11,3)}
Serve(o11,3)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #27

Make(o4,3)
Robot-location(o11)
{R(o11), RL(3), P(o11,3)}
Serve(o11,3)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #28

Robot-location(o11)
$\{R(o11), RL(3), P(o11,3)\}$
Serve(o11,3)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #29

Robot-location([o1])
$\{R([o1])\}$
Move([o1],o11)
{R(o11), RL(3), P(o11,3)}
Serve(o11,3)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #30

{R(o4)}
Move(o4,o11)
$\{R(o11), RL(3), P(o11,3)\}$
Serve(o11,3)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #31

Move(o4,o11)
{R(o11), RL(3), P(o11,3)}
Serve(o11,3)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #32

$\{R(o11), RL(3), P(o11,3)\}$
Serve(o11,3)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), B(o7), S(o11)\}$

Stack #33

Serve(o11,3)
Served(o12)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #34

Served(o12)	
Served(o25)	
Served(o13)	
Robot-location(o7)	
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$	

Stack #35

Petition(o12,[n])
Robot-loaded([n])
Robot-location(o12)
$\{R(o12), RL([n]), P(o12,[n])\}$
Serve(o12,[n])
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #36

Stack #56

Robot-loaded(1)	Move(o11,o23)	{R(o12), RL(1), P(o12,1)}
Robot-location(o12)	{M(o23,1), R(o23), RF}	Serve(o12,1)
{R(o12), RL(1), P(o12,1)}	Make(o23,1)	Served(o25)
Serve(o12,1)	Robot-location(o12)	Served(o13)
Served(o25)	{R(o12), RL(1), P(o12,1)}	Robot-location(o7)
Served(o13)	Serve(o12,1)	{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}
Robot-location(o7)	Served(o25)	
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}\$	Served(o13)	Stack #50
Ct1 #25	Robot-location(o7)	
Stack #37	$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}\$	
	Stack #43	Serve(o12,1)
		Served(o25)
Robot-free		Served(o13) Robot-location(o7)
	{M(o23,1), R(o23), RF}	{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}
$\{M([o],1), R([o]), RF\}$	Make(o23,1)	{5(05), 5(012), 5(013), 5(023), 11(01), 5(011)}
$\frac{\{W([0],1), W([0]), WY\}}{Make([0],1)}$	Robot-location(o12)	Stack #51
Robot-location(o12)	{R(o12), RL(1), P(o12,1)}	H -
{R(o12), RL(1), P(o12,1)}	Serve(o12,1)	
Serve(o12,1)	Served(o25)	9 1/ 95)
Served(o25)	Served(o13)	Served(o25)
Served(o13)	Robot-location(o7)	Served(o13) Robot-location(o7)
Robot-location(o7)	$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$	{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}\$	Stack #44	(5(65), 5(612), 5(613), 5(623), 11(61), 5(611)}
Stack #38	Stack #44	Stack #52
Stack #00		
	Make(o23,1)	Petition(o25,[n])
Machine([o],1)	Robot-location(o12)	$\frac{\text{Robot-loaded}([n])}{\text{Robot-loaded}([n])}$
$\begin{array}{c} \operatorname{Robot-location}([o]) \\ \{\operatorname{M}([o],1), \operatorname{R}([o]), \operatorname{RF}\} \end{array}$		Robot-location(o25)
$\frac{\{N([0],1), R([0]), RF\}}{Make([0],1)}$	Served(025)	{R(o25), P(o25,[n]), RL([n])}
Robot-location(o12)	Served(023)	Serve(o25,[n])
{R(o12), RL(1), P(o12,1)}	Robot-location(o7)	Served(o13)
Serve(o12,1)	{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}	Robot-location(o7)
Served(o25)		$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}\$
Served(o13)	Stack #45	Stack #53
Robot-location(o7)		Stack #33
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}\$		
Stack #39	Robot-location(o12)	
Stack #00	{R(o12), RL(1), P(o12,1)}	Robot-loaded(1)
	Serve(o12,1)	Robot-location(o25)
	Served(o25)	$\{R(o25), P(o25,1), RL(1)\}\$ Serve(o25,1)
Robot-location(o23)	Served(o13)	Served(o13)
$\{M(o23,1), R(o23), RF\}$	Robot-location(07)	Robot-location(o7)
Make(o23,1) Robot-location(o12)	$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$	{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}
{R(o12), RL(1), P(o12,1)}	Stack #46	
$\frac{\{R(012), RL(1), R(012,1)\}}{\text{Serve}(012,1)}$	Druck # 10	Stack #54
Served(o25)		
Served(o13)		
Robot-location(o7)	Robot-location([o1])	Robot-free
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}\$		Machine([o],1)
Ct1- // 40	{R(o12), RL(1), P(o12,1)}	Robot-location([o])
Stack #40	Serve(o12,1)	$\{M([o],1), R([o]), RF\}$
	Served(o25)	Make([o],1)
	Served(o13)	Robot-location(o25)
Robot-location([o1])	Robot-location(o7)	$\{R(o25), P(o25,1), RL(1)\}$
{R([o1])}	$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$	Serve(o25,1) Served(o13)
Move([o1],o23)	G. 1 # #=	Robot-location(o7)
$\{M(o23,1), R(o23), RF\}$	Stack #47	{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}
Make(o23,1) Robot-location(o12)		[[[]]] [[]] [[] [] [] [] [
{R(o12), RL(1), P(o12,1)}		Stack #55
Serve(o12,1)	{R(o23)}	
Served(o25)	Move(o23,o12)	
Served(o13)	$\{R(o12), RL(1), P(o12,1)\}$	Machine([o],1)
Robot-location(o7)	Serve(o12,1)	Robot-location([o])
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}\$	Served(o25) Served(o13)	{M([o],1), R([o]), RF}
Ct 1	Robot-location(o7)	Make([o],1)
Stack #41	{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}	Robot-location(o25)
	($\{R(o25), P(o25,1), RL(1)\}$
	Stack #48	Serve(o25,1)
{R(o11)}		Served(o13)
Move(o11,o23)		Robot-location(o7) $\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$
{M(o23,1), R(o23), RF}	Move(o23,o12)	[[[[[[[[[[[[[[[[[[[[
Make(o23,1)	10000(020,012)	Q. 1 ##A

Move(o23,o12)
$\{R(o12), RL(1), P(o12,1)\}$
Serve(o12,1)
Served(o25)
Served(o13)
Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$

Stack #49

 $\begin{cases} R(o11) \} \\ Move(o11,o23) \\ \{M(o23,1), R(o23), RF\} \\ Make(o23,1) \end{cases} \\ Robot-location(o12) \\ \{R(o12), RL(1), P(o12,1)\} \\ Serve(o12,1) \\ Served(o25) \\ Served(o13) \\ Robot-location(o7) \\ \{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\} \end{cases}$

D. L. (1) (1) (20)	D 1 - (1 - (1 1))	D. L. d. C.
Robot-location(o23)	Robot-location([o1])	Robot-free
{M(o23,1), R(o23), RF}	$\frac{\{R([o1])\}}{M}$	Machine([o],2)
Make(o23,1)	Move([o1],o25)	Robot-location([o])
Robot-location(o25)	$\{R(o25), P(o25,1), RL(1)\}$	$\{R([o]), RF, M([o],2)\}$
$\{R(o25), P(o25,1), RL(1)\}$	Serve(025,1)	Make([o],2)
Serve(o25,1)	Served(o13)	Robot-location(o13)
Served(o13)	Robot-location(o7)	$\{P(o13,2), RL(2), R(o13)\}$
Robot-location(o7)	$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$	Serve(o13,2)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}\$		Robot-location(o7)
Stack #57	Stack #64	$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$
		Stack #72
D. 1 (5 1)	{R(o23)}	
Robot-location([o1])	Move(o23,o25)	75.11. (5.10)
{R([o1])}	$\{R(o25), P(o25,1), RL(1)\}$	Machine([o],2)
Move([o1],o23)	Serve(o25,1)	Robot-location([o])
$\{M(o23,1), R(o23), RF\}$	Served(o13)	$\{R([o]), RF, M([o],2)\}$
Make(o23,1)	Robot-location(o7)	Make([o],2)
Robot-location(o25)	$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$	Robot-location(o13)
$\{R(o25), P(o25,1), RL(1)\}$		$\{P(o13,2), RL(2), R(o13)\}$
Serve(o25,1)	Stack #65	Serve(o13,2)
Served(o13)		Robot-location(o7)
Robot-location(o7)		$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$		
Stack #58	$\frac{\text{Move}(o23,o25)}{\{\text{R}(o25),\text{P}(o25,1),\text{RL}(1)\}}$	Stack #73
	Serve(o25,1) Served(o13)	
	Robot-location(o7)	Robot-location(o31)
{R(o12)}	{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}	{R(o31), RF, M(o31,2)}
Move(o12,o23)	() // ~ () // ~ () -// ~ (~ -//) ~ (~ -//)	Make(o31,2)
{M(o23,1), R(o23), RF}	Stack #66	Robot-location(o13)
Make(o23,1)	Too	{P(o13,2), RL(2), R(o13)}
Robot-location(o25)		Serve(013,2)
$\{R(o25), P(o25,1), RL(1)\}$	$\{R(o25), P(o25,1), RL(1)\}$	Robot-location(07)
Serve(o25,1)	Serve(o25,1)	$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$
Served(o13)	Served(o13)	Ct. 1 //F4
Robot-location(o7)	Robot-location(o7)	Stack #74
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}\$	{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}	
G. 1 #F0	[5(00), 5(012), 5(010), 5(020), 11(01), 5(011)]	
Stack #59	Stack #67	$ \begin{array}{c} \operatorname{Robot-location}([o1]) \\ \{\operatorname{R}([o1])\} \\ \operatorname{Move}([o1],o31) \end{array} $
Move(o12,o23)	G (27 1)	$\{R(o31), RF, M(o31,2)\}$
$\{M(o23,1), R(o23), RF\}$	Serve(o25,1)	Make(o31,2)
Make(o23,1)	Served(o13)	Robot-location(o13)
Robot-location(o25)	Robot-location(o7)	{P(o13,2), RL(2), R(o13)}
{R(o25), P(o25,1), RL(1)}	$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$	Serve(o13,2)
Serve(o25,1)		Robot-location(o7)
Served(o13)	Stack #68	{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}
Robot-location(o7)		[=(==), =(===), =(===), =(==), =(==),
{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}		Stack #75
	Served(o13)	
Stack #60	Robot-location(o7)	
	{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}	
	{5(03), 5(012), 5(013), 5(023), 11(01), 5(011)}	$\{R(o25)\}$
	Stools #60	Move(o25,o31)
$\{M(o23,1), R(o23), RF\}$	Stack #69	$\{R(o31), RF, M(o31,2)\}$
Make(o23,1)		Make(o31,2)
Robot-location(o25)		Robot-location(o13)
$\{R(o25), P(o25,1), RL(1)\}$	Petition(o13,[n])	$\{P(o13,2), RL(2), R(o13)\}$
Serve(o25,1)	Robot-loaded([n])	Serve(o13,2)
Served(o13)	Robot-location(o13)	Robot-location(o7)
Robot-location(o7)	{P(o13,[n]), RL([n]), R(o13)}	${S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}$
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}\$	$\frac{\{1(013,[n]),112([n]),11(010)\}}{\text{Serve}(013,[n])}$	
	Robot-location(o7)	Stack #76
Stack #61	{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}	
	Stack #70	
	Stack #10	Move(o25,o31)
Make(o23,1)		$\{R(o31), RF, M(o31,2)\}$
Robot-location(o25)		Make(o31,2)
{R(o25), P(o25,1), RL(1)}	Robot-loaded(2)	Robot-location(o13)
Serve(o25,1)	Robot-location(o13)	{P(o13,2), RL(2), R(o13)}
Served(o13)	{P(o13,2), RL(2), R(o13)}	Serve(o13,2)
Robot-location(o7)	Serve(o13,2)	Robot-location(o7)
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$	Robot-location(o7)	$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$
	{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}	
Stack #62	Stack #71	Stack #77
	Stack #11	
Robot-location(o25)		{R(o31), RF, M(o31,2)}
{R(o25), P(o25,1), RL(1)}		Make(031,2)
Serve(o25,1)		Robot-location(o13)
Served(o13)		{P(o13,2), RL(2), R(o13)}
Robot-location(o7)		Serve(013,2)
{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}		Robot-location(o7)
		{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}
Stack #63		[(),(),(),(),(),()
		Stack #78

Stack #90

Make(o31,2)	{R(o31)}	Robot-location(o7)
Robot-location(o13)	Move(o31,o13)	{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}
{P(o13,2), RL(2), R(o13)}	{P(o13,2), RL(2), R(o13)}	{5(03), 5(012), 5(013), 5(023), 11(01), 5(011)}
Serve(013,2)	Serve(013,2)	Stack #86
Robot-location(o7)	Robot-location(o7)	Stack #80
$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}\$	$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$	
Ct1 //70	C4 . 1 #80	Robot-location([o1])
Stack #79	Stack #82	{R([o1])}
		Move([o1],o7)
		{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}
Robot-location(o13)	Move(o31,o13)	[5(00), 5(012), 5(010), 5(020), 11(01), 5(011)]
{P(o13,2), RL(2), R(o13)}	{P(o13,2), RL(2), R(o13)}	Stack #87
Serve(013,2)	Serve(o13,2)	State To
Robot-location(o7)	Robot-location(o7)	
{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}	{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}	
{5(03), 5(012), 5(013), 5(023), 1t(01), 5(011)}	[5(03), 5(012), 5(013), 5(023), 11(01), 5(011)]	{R(o13)}
Stack #80	Stack #83	Move(o13,o7)
Stack #00	Stack #00	$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}$
		Stack #88
Robot-location([o1])	$\{P(o13,2), RL(2), R(o13)\}$	
{R([o1])}	Serve(o13,2)	
Move([o1],o13)	Robot-location(o7)	
{P(o13,2), RL(2), R(o13)}	{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}	Move(o13,o7)
Serve(o13,2)		$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}\$
Robot-location(o7)	Stack #84	
{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)}		Stack #89
C C // C // C // C // C -// C C -// C C // C // // C		
Stack #81		
	Serve(o13,2)	$\{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)\}\$
	Robot-location(o7)	[5(03), 5(012), 5(013), 5(023), K(01), 5(011)}

{S(o3), S(o12), S(o13), S(o25), R(o7), S(o11)} Stack #85

Case 2

Input File

```
InitialState=Petition(o33,2); Robot-location(o16); Machine(o25,3);
    Machine(o24,3); Machine(o29,3); Machine(o28,3); Machine(o7,2);
    Petition(o6,2); Machine(o11,1); Petition(o17,1); Petition(o19,3);
    Petition(o13,3); Machine(o3,3); Petition(o18,1); Petition(o31,1);
    Petition(o1,1); Machine(o16,1); Petition(o27,1); Machine(o5,2);
    Machine(o8,3); Petition(o26,1);

GoalState=Served(o6); Served(o13); Robot-location(o7); Served(o1);
    Served(o33); Served(o19); Served(o18); Served(o31); Served(o27);
    Served(o17); Served(o26);
```

State evolution

P(1)		M(3)		M(2)	P(2)
M(2)	M(3)			M(1)	
P(3)			R M(1)	P(1)	P(1)
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-free; Steps(0) Initial state

D/1)	1	M(3)		1/(2)	D(9)
F(1)		W(3)		IVI (2)	P(2)
M(2)	M(3)			M(1)	
P(3)			R M(1)	P(1)	P(1)
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-loaded(1); Steps(0) Intermediate state 1

P(1)		M(3)		M(2)	P(2)
M(2)	M(3)			M(1)	
P(3)			M(1)	P(1) R	P(1)
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-loaded(1); Steps(1) Intermediate state 2

P(1)		M(3)		M(2)	P(2)
M(2)	M(3)			M(1)	
P(3)			M(1)	S R	P(1)
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-free; Steps(1)Intermediate state 3

P(1)		M(3)		M(2)	P(2)
M(2)	M(3)			M(1)	
P(3)			R M(1)	S	P(1)
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-free; Steps(2) Intermediate state 4

P(1)		M(3)		M(2)	P(2)
M(2)	M(3)			M(1)	
P(3)			R M(1)	S	P(1)
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-loaded(1); Steps(2) Intermediate state 5

P(1)		M(3)		M(2)	P(2)
M(2)	M(3)			M(1)	
P(3)			M(1)	S	P(1) R
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-loaded(1); Steps(4) Intermediate state 6

P(1)		M(3)		M(2)	P(2)
M(2)	M(3)			M(1)	
P(3)			M(1)	S	S R
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-free; Steps(4) Intermediate state 7

P(1)		M(3)		R M(2)	P(2)
M(2)	M(3)			M(1)	
P(3)			M(1)	S	S
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-free; Steps(7) Intermediate state 8

P(1)		M(3)		R M(2)	P(2)
M(2)	M(3)			M(1)	
P(3)			M(1)	S	S
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-loaded(2); Steps(7) Intermediate state 9

P(1)		M(3)		M(2)	R P(2)
M(2)	M(3)			M(1)	
P(3)			M(1)	S	S
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-loaded(2); Steps(8) Intermediate state 10

P(1)		M(3)		M(2)	R S
M(2)	M(3)			M(1)	
P(3)			M(1)	S	S
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-free; Steps(8) Intermediate state 11

P(1)		M(3)		M(2)	S
M(2)	M(3)			R M(1)	
P(3)			M(1)	S	S
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-free; Steps(10) Intermediate state 12

P(1)		M(3)		M(2)	S
M(2)	M(3)			R M(1)	
P(3)			M(1)	S	S
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-loaded(1); Steps(10) Intermediate state 13

P(1) R		M(3)		M(2)	S
M(2)	M(3)			M(1)	
P(3)			M(1)	S	S
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-loaded(1); Steps(15) Intermediate state 14

S R		M(3)		M(2)	S
M(2)	M(3)			M(1)	
P(3)			M(1)	S	S
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-free; Steps(15) Intermediate state 15

S		M(3)		M(2)	S
M(2)	M(3)			M(1)	
P(3)			R M(1)	S	S
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-free; Steps(20) Intermediate state 16

S		M(3)		M(2)	S
M(2)	M(3)			M(1)	
P(3)			R M(1)	S	S
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1)		P(2)			

Robot-loaded(1); Steps(20) Intermediate state 17

S		M(3)		M(2)	S
M(2)	M(3)			M(1)	
P(3)			M(1)	S	S
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
P(1) R		P(2)			

Robot-loaded(1); Steps(26) Intermediate state 18

S		M(3)		M(2)	S
M(2)	M(3)			M(1)	
P(3)			M(1)	S	S
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
S R		P(2)			

Robot-free; Steps(26) Intermediate state 19

		3.5(0)		3.5(0)	_
S		M(3)		M(2)	S
M(2) R	M(3)			M(1)	
P(3)			M(1)	S	S
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
S		P(2)			

Robot-free; Steps(30) Intermediate state 20

S		M(3)		M(2)	S
M(2) R	M(3)			M(1)	
P(3)			M(1)	S	S
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
S		P(2)			

Robot-loaded(2); Steps(30) Intermediate state 21

S		M(3)		M(2)	S
M(2)	M(3)			M(1)	
P(3)			M(1)	S	S
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
Q		P(2)			
U		D			

Robot-loaded(2); Steps(36) Intermediate state 22

S		M(3)		M(2)	S
M(2)	M(3)			M(1)	
P(3)			M(1)	S	S
P(3)					M(3)
M(3)	P(1)	P(1)	M(3)	M(3)	
S		S			

Robot-free; Steps(36) Intermediate state 23

S M(3) M(2) S	S M(3) M(2) S	S M(3) M(2) S
M(2) M(3) M(1) R	M(2) M(3) M(1) P(3) M(1) S S	$\begin{array}{c ccccc} M(2) & M(3) & & M(1) \\ \hline P(3) & & M(1) & S & S \\ \hline \end{array}$
P(3) $M(1)$ S S	P(3) M(3)	S M(3)
P(3) M(3)	M(3) R S M(3) M(3)	M(3) S S M(3) M(3)
M(3) P(1) P(1) M(3) M(3) S S	S S S	R S S M(3) M(3)
Robot-free; Steps(40) Intermediate state 24	Robot-loaded(1); Steps(50) Intermediate state 30	Robot-free; Steps(53) Intermediate state 36
S M(3) M(2) S	$S \qquad M(3) \qquad M(2) \qquad S$	S M(3) M(2) S
M(2) M(3) M(1)	M(2) $M(3)$ $M(1)$	M(2) M(3) M(1)
P(3) R $M(1)$ S S	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	P(3) M(1) S S S M(3)
P(3) M(3)	M(2) R C M(2) M(2)	M(3) S S M(3) M(3)
M(3) P(1) P(1) M(3) M(3)	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	R
SSS	SSS	S S
Robot-loaded(1); Steps(40) Intermediate state 25	Robot-free; $Steps(50)$ Intermediate state 31	Robot-loaded(3); Steps(53) Intermediate state 37
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	S M(3) M(2) S	S M(3) M(2) S
M(2) M(3) M(1) P(3) M(1) S S	$egin{array}{ c c c c c c c c c c c c c c c c c c c$	M(2) M(3) M(1) R
P(3) M(3)	P(3) M(3)	P(3) $M(1)$ S S
M(3) $P(1)$ R $P(1)$ $M(3)$ $M(3)$	M(3) S S M(3) M(3)	S M(3) M(3) M(3)
S S	R S S M(0) M(0)	M(3) S S M(3) M(3) S S
Robot-loaded(1); Steps(43) Intermediate state 26	Robot-free; Steps(51) Intermediate state 32	Robot-loaded(3); Steps(55) Intermediate state 38
S M(3) M(2) S M(2) M(3) M(1)	S M(2) M(3) M(2) S M(2) M(3) M(1)	S M(3) M(2) S M(2) M(3) M(1)
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	P(3) M(1) S S	S
P(3) M(3)	P(3) M(3)	R $ M(1) $ $ S $ $ S $
$M(3)$ $P(1)$ $\frac{S}{R}$ $M(3)$ $M(3)$	$\begin{bmatrix} M(3) \\ R \end{bmatrix}$ S S $M(3)$ M(3)	S M(3) S S M(3) M(3)
S S	SSS	S S
Robot-free; Steps(43) Intermediate state 27	Robot-loaded(3); Steps(51) Intermediate state 33	Robot-free; Steps(55) Intermediate state 39
S M(3) M(2) S	S M(3) M(2) S	S M(3) M(2) S
M(2) M(3) M(1)	M(2) M(3) M(1)	M(2) $M(3)$ $M(1)$
$\begin{array}{c c} P(3) & \begin{array}{c c} R & \\ M(1) & S \end{array} & S$	P(3) M(1) S S N(2)	R M(3) M(1) S S
P(3) M(3)	R M(3)	S M(3)
M(3) P(1) S M(3) M(3)	M(3) S S M(3) M(3)	M(3) S S M(3) M(3)
Robot-free; Steps(46)	Robot-loaded(3); Steps(52)	Robot-free; Steps(56)
Intermediate state 28	Intermediate state 34	Final state

Robot-loaded(1); Steps(46) Intermediate state 29

S		M(3)		M(2)	S
M(2)	M(3)			M(1)	
P(3)			M(1)	S	S
S					M(3)
R					W(3)
M(3)	S	S	M(3)	M(3)	
S		S			
	S M(2) P(3) S R M(3)	P(3)	M(2) M(3) P(3) S	M(2) M(3) P(3) M(1) S	M(2) M(3) M(1) S S R

Robot-free; Steps(52) Intermediate state 35

S					S
R			Г		
S			Г	S	S
S					
	S	S	П		
S		S	Г		

 $Goal\ state$

Stack evolution

Served(o17)	Petition(o17,[n])
Served(o18)	Robot-loaded($[n]$)
Served(o6)	Robot-location(o17)
Served(o1)	$\{R(o 7), RL([n]), P(o 7,[n])\}$
Served(o31)	Serve(o17,[n])
Served(o33)	Served(o18)
Served(o27)	Served(o6)
Served(o26)	Served(o1)
Served(o19)	Served(o31)
Served(o13)	Served(o33)
Robot-location(o7)	
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)\}$	1), S(o6), S(o33), R(o7), S(o27)} Served(o26)
	Served(o19)
Stack #1	Served(o13)
	Robot-location(o7)
	$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6), S(o33), R(o7), S(o27)\}$
	22
	Stack #2

Robot-loaded(1)	{M(o16,1), R(o16), R	F} {R(o16)}
Robot-location(o17	Make(o16,1)	Move(o16,o17)
{R(o17), RL(1), P(o17	(1) Robot-location(o17)	{R(o17), RL(1), P(o17,1)}
Serve(o17,1)	{R(o17), RL(1), P(o17	(1) (1) (1) (1) (1)
Served(o18)	Serve(o17,1)	Served(o18)
Served(o6)	Served(o18)	Served(o6)
Served(o1)	Served(o6)	Served(o1)
Served(o31)	Served(o1)	Served(o31)
Served(o33)	Served(o31)	Served(o33)
Served(o27)	Served(o33)	Served(o27)
Served(o26)	Served(o27)	Served(o26)
Served(o19)	Served(o26)	Served(o19)
Served(o13)	Served(o19)	Served(o13)
Robot-location(o7)		Robot-location(o7)
		$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6), S(o17), S(o18), S(o18$
	$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3), S$	
Stack #3		Stack #11

Stack #7

		Stack #1	
Robot-free			Move(o16,o17)
Machine([o],1)		Make(o16,1)	$\{R(b17), RL(1), P(o17,1)\}$
Robot-location([o])	Ro	obot-location(o17	
{M([o],1), R([o]), RF		17), RL(1), P(o17	
Make([o],1)	,	Serve(o17,1)	Served(o6)
Robot-location(o17		Served(o18)	Served(o1)
{R(o17), RL(1), P(o17	.1)}	Served(o6)	Served(o31)
Serve(017,1)	,-/,	Served(o1)	Served(033)
Served(o18)		Served(o31)	Served(027)
Served(o6)		Served(o33)	Served(o26)
Served(o1)		Served(o27)	Served(019)
Served(o31)		Served(o26)	Served(o13)
Served(o33)		Served(o19)	Robot-location(o7)
Served(037)		Served(o13)	{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6)
Served(027)	D	Robot-location(o7)	
Served(020) Served(019)) 31), S(o6), S(o33), R(o7), S(o27)} Stack #12
Served(013)	(5(017), 5(018), 5(013), 5(019), 5	(020), 5(01), 5(03	51), 5(00), 5(055), 1t(01), 5(021)}
Robot-location(o7)		Stack #8	
(S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3	1) S(o6) S(o33) D(o7) S(o27)]	DIACK #0	
[] [] [] [] [] [] [] [] [] []	1), 5(00), 5(033), N(01), 5(021)}		$\{R(o17), RL(1), P(o17,1)\}$
Stack #4			Serve(o17,1)
Stack #4	Ro	obot-location(o17	
· ·		17), RL(1), P(o17	` '
	((Serve(o17,1)	Served(o1)
Machine([o],1)		Served(o18)	Served(o31)
Robot-location([o])		Served(o6)	Served(o33)
{M([o],1), R([o]), RF	1	Served(o1)	Served(027)
Make([o],1)	,	Served(o31)	Served(o26)
Robot-location(o17)	,	Served(o33)	Served(o19)
{R(o17), RL(1), P(o17)	1)}	Served(o27)	Served(o13)
Serve(017,1)	,1)]	Served(o26)	Robot-location(o7)
Served(o18)		Served(o19)	{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o60)
Served(o6)		Served(o13)	[5(611); 5(610); 5(610); 5(610); 5(62); 5(61); 5(601); 5(60
Served(o1)	R	Robot-location(o7)	Stack #13
Served(o31)			31), S(o6), S(o33), R(o7), S(o27)}
Served(o33)	[5(611); 5(616); 5(616); 5(616); 5	(020), 5(01), 5(00	71); 5(55); 5(55); 1(51); 5(521)]
Served(o27)		Stack #9	
Served(o26)		7,000	Serve(o17,1)
Served(o19)			Served(o18)
Served(o13)			Served(o6)
Robot-location(o7)	Ro	obot-location([o1]	Served(o1)
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3	1) S(o6) S(o33) B(o7) S(o27)}	{R([o1])}	Served(o31)
[=(==-), 5(515), 5(515), 5(515), 5(51), 5(61		Move([o1],o17)	Served(o33)
Stack #5	{R(o:	17), RL(1), P(o17	
Stack #6		Serve(o17,1)	Served(o26)
		Served(o18)	Served(o19)
		Served(o6)	Served(o13)
Robot-location(o16)		Served(o1)	Robot-location(o7)
{M(o16,1), R(o16), R	F}	Served(o31)	$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o60), S(o10), S(o1$
Make(o16,1)		Served(o33)	
Robot-location(o17		Served(o27)	Stack #14
{R(o17), RL(1), P(o17)	,1)}	Served(o26)	
Serve(017,1)		Served(o19)	
Served(o18)		Served(o13)	
Served(o6)	R	Robot-location(o7)	Served(o18)
Served(o1)			Served(o6)
Served(o31)		. ,, , ,, ,, ,, ,,	Served(o1)
Served(o33)		Stack #10	Served(o31)
Served(o27)		11	Served(o33)
Served(o26)			Served(o27)
Served(o19)			Served(o26)
Served(013)			Served(o19)
Robot-location(o7)			Served(o13)
	1) S(o6) S(o33) B(o7) S(o27)1		Robot-location(o7)
$\{S(017), S(018), S(013), S(019), S(026), S(01), S(03)\}$	1), $S(o6)$, $S(o33)$, $R(o7)$, $S(o27)$ }		$\begin{array}{c} \text{Robot-location}(o7) \\ \{\text{S}(o17), \text{S}(o18), \text{S}(o13), \text{S}(o19), \text{S}(o26), \text{S}(o1), \text{S}(o31), \text{S}(o618), \text{S}(o18), \text{S}(o18), $

Stack #6

Petition(o18,[n])]	Robot-location(o16	(N	(o16,1), R(o16), RF}
Robot-loaded($[n]$)	{ N	(o16,1), R(o16), R	F}	Make(o16,1)
Robot-location(o18		Make(o16,1)		Robot-location(o18)
{P(o18,[n]), RL([n]), R(Robot-location(o18		o18,1), RL(1), R(o18)}
Serve(o18,[n])	{P(o18,1), RL(1), R(o	[8)}	Serve(o18,1)
Served(o6)		Serve(o18,1)		Served(o6)
Served(o1)		Served(o6)		Served(o1)
Served(o31)		Served(o1)		Served(o31)
Served(o33)		Served(o31)		Served(o33)
Served(o27)		Served(o33)		Served(o27)
Served(o26)		Served(o27)		Served(o26)
Served(o19)		Served(o26)		Served(o19)
Served(o13)		Served(o19)		Served(o13)
Robot-location(o7)		Served(o13)		Robot-location(o7)
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)\}$				S(o26), S(o1), S(o31), S(o6), S
	$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)}	

Stack #16

Stack #20

Stack #24

Robot-loaded (1)			Make(o16,1)
Robot-location(o18)		Robot-location([o1])	Robot-location(o18)
{P(o18,1), RL(1), R(o1	.8)}	{R([o1])}	$\{P(b18,1), RL(1), R(o18)\}$
Serve(o18,1)		Move([o1],o16)	Serve(o18,1)
Served(o6)	{ N	I(o16,1), R(o16), R	
Served(o1)		Make(o16,1)	Served(o1)
Served(o31)		Robot-location(o18)	Served(o31)
Served(o33)	{P(o18,1), RL(1), R(o1	
Served(o27)		Serve(o18,1)	Served(o27)
Served(o26)		Served(o6)	Served(o26)
Served(o19)		Served(o1)	Served(o19)
Served(o13)		Served(o31)	Served(o13)
Robot-location(o7)		Served(o33)	Robot-location(o7)
S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)	1), $S(o6)$, $S(o33)$, $R(o7)$, $S(o27)$ }	Served(o27)	$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6), \}$
Ct. 1 //17		Served(o26)	St. 1 #05
Stack #17		Served(o19)	Stack #25
		Served(o13)	
		Robot-location(o7)	1) C/ C) C/ 22) D/ 7) C/ 27)
Robot-free	$\{S(o17), S(o18), S(o13), S(o19), \}$	5(020), 5(01), 5(03	1), S(o6), S(o33), R(o7), S(o27)} Robot-location(o18)
Machine([o],1)		Stools #91	{P(o18,1), RL(1), R(o18)}
Robot-location([o])		Stack #21	Serve(018,1)
{M([o],1), R([o]), RF	1	1	Served(o6)
$\{\Pi([0],1),\Pi([0]),\Pi($	<u>, </u>		Served(o1)
Robot-location(o18)	1	{R(o17)}	Served(o31)
{P(o18,1), RL(1), R(o		Move(o17,o16)	Served(o33)
Serve(018,1)		I(o16,1), R(o16), R	
Served(o6)	(Make(o16,1)	Served(o26)
Served(o1)	Ţ	Robot-location(o18)	Served(o19)
Served(o31)		o18,1), RL(1), R(o	
Served(o33)		Serve(o18,1)	Robot-location(o7)
Served(o27)		Served(o6)	$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6), \}$
Served(o26)		Served(o1)	, , , , , , , , , , , , , , , , , , , ,
Served(o19)		Served(o31)	Stack #26
Served(o13)		Served(o33)	"
Robot-location(o7)		Served(o27)	
(S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3))	1), S(o6), S(o33), R(o7), S(o27)}	Served(o26)	
		Served(o19)	Robot-location([o1])
Stack #18		Served(o13)	$\{R([o1])\}$
		Pohot logation(o7)	Move([o1],o18)
	{S(o17), S(o18), S(o13), S(o19),	$S(o26), S(o1), \dot{S}(o3)$	1), $S(o6)$, $S(o33)$, $R(o7)$, $S(o27)$ (018,1), $RL(1)$, $R(o18)$
		1	Serve(018,1)
Machine([o],1)		Stack #22	Served(o6)
		Double Was	
Robot-location([o])	3	Jouen 4-22	Served(o1)
$\{M([o],1), R([o]), RF\}$	·}		Served(o1) Served(o31)
$\{M([o],1), R([o]), RF \}$ $\{M([o],1), R([o]), RF \}$	<u>}</u>		Served(o1) Served(o31) Served(o33)
{M([o],1), R([o]), RF Make([o],1) Robot-location(018))	Move(o17,o16)	Served(o1) Served(o31) Served(o33) Served(o27)
$ \begin{cases} M([o],1), R([o]), RF \\ Make([o],1) \\ Robot-location(o18) \\ \{P(o18,1), RL(1), R(o)\} \end{cases} $)	Move(o17,o16) (o16,1), R(o16), R	Served(o1) Served(o31) Served(o33) Served(o27) F} Served(o26)
{M([o],1), R([o]), RF Make([o],1) Robot-location(018 {P(018,1), RL(1), R(o) Serve(018,1)	(N. (8))	Move(o17,o16) I(o16,1), R(o16), R Make(o16,1)	Served(o1) Served(o31) Served(o33) Served(o27) F} Served(o26) Served(o19)
$ \begin{cases} M([o],1), R([o]), RF \\ Make([o],1) \\ Robot-location(o18) \\ \{P(o18,1), RL(1), R(o18,1), RL(1), R(o18,1), Robot-location(o18), RL(1), R(o18,1), Robot-location(o18,1), Runder (o18,1), Rund$	(8)} {N	Move(o17,o16) I(o16,1), R(o16), R Make(o16,1) Robot-location(o18)	Served(o1) Served(o31) Served(o33) Served(o27) F} Served(o26) Served(o19) Served(o13)
{M([o],1), R([o]), RF Make([o],1) Robot-location(o18 {P(o18,1), RL(1), R(o Serve(o18,1) Served(o6) Served(o1)	(8)} {N	Move(o17,o16) [(o16,1), R(o16), R Make(o16,1) Robot-location(o18) o18,1), RL(1), R(o	Served(o1) Served(o31) Served(o33) Served(o27) F} Served(o26) Served(o19) Served(o13) Robot-location(o7)
\[\lambda([o],1), R([o]), RF \\ \text{Make}([o],1) \\ \text{Robot-location}(o18) \\ \lambda([o],1), RL(1), R(o1) \\ \text{Serve}(o18,1), RL(1), R(o1) \\ \text{Served}(o6) \\ \text{Served}(o1) \\ \text{Served}(o31) \end{array}	(8)} {N	Move(o17,o16) (o16,1), R(o16), R Make(o16,1) Robot-location(o18) o18,1), RL(1), R(o) Serve(o18,1)	Served(o1) Served(o31) Served(o33) Served(o27) F} Served(o26) Served(o19) Served(o13) Robot-location(o7)
{M([o],1), R([o]), RF	(8)} {N	Move(o17,o16) (o16,1), R(o16), R Make(o16,1) Robot-location(o18 o18,1), RL(1), R(o Serve(o18,1) Served(o6)	Served(o1) Served(o31) Served(o33) Served(o33) Served(o27) F} Served(o26) Served(o19) Served(o19) Served(o13) 8)} Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6)
\[\text{\(M([o],1), R([o]), RF\)} \] \[\text{Make([o],1)} \] \[\text{Robot-location(o18)} \] \[\{P(o18,1), RL(1), R(o)\)} \] \[\text{Serve(o18,1)} \] \[\text{Served(o6)} \] \[\text{Served(o6)} \] \[\text{Served(o31)} \] \[\text{Served(o33)} \] \[\text{Served(o27)} \]	(8)} {N	Move(o17,o16) (o16,1), R(o16), R Make(o16,1) Robot-location(o18 o18,1), RL(1), R(o Serve(o18,1) Served(o6) Served(o1)	Served(o1) Served(o31) Served(o33) Served(o27) F} Served(o26) Served(o19) Served(o13) Robot-location(o7)
\[\begin{align*} \lambda([o],1), R([o]), RF \\ \text{Make}([o],1) \\ \text{Robot-location}(o18) \\ \lambda([o],1), RL(1), RL(1)	(8)} {N	Move(o17,o16) [(o16,1), R(o16), R Make(o16,1) Robot-location(o18) o18,1), RL(1), R(o1) Serve(o18,1) Served(o6) Served(o1) Served(o31)	Served(o1) Served(o31) Served(o33) Served(o33) Served(o27) F} Served(o26) Served(o19) Served(o19) Served(o13) 8)} Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6)
\[\lambda([o],1), R([o]), RF \\ \text{Make}([o],1) \\ \text{Robot-location}(o18) \\ \lambda([o],1), RL(1), R(o) \\ \text{Serve}(o18,1), RL(1), R(o) \\ \text{Serve}(o18,1) \\ \text{Served}(o6) \\ \text{Served}(o1) \\ \text{Served}(o31) \\ \text{Served}(o33) \\ \text{Served}(o27) \\ \text{Served}(o26) \\ \text{Served}(o19) \end{array}	(8)} {N	Move(o17,o16) I(o16,1), R(o16), R Make(o16,1) Robot-location(o18) o18,1), RL(1), R(o Serve(o18,1) Served(o6) Served(o1) Served(o31) Served(o33)	Served(o1) Served(o31) Served(o33) Served(o33) Served(o27) F} Served(o26) Served(o19) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13)
\{M([o],1), R([o]), RF\) \text{Make([o],1)} \text{Robot-location(o18)} \{P(o18,1), RL(1), R(o)\} \text{Serve(o18,1)} \text{Served(o6)} \text{Served(o1)} \text{Served(o31)} \text{Served(o33)} \text{Served(o27)} \text{Served(o26)} \text{Served(o19)} \text{Served(o13)}	(8)} {N	Move(o17,o16) ((o16,1), R(o16), R Make(o16,1) Robot-location(o18) o18,1), RL(1), R(o Serve(o18,1) Served(o6) Served(o1) Served(o31) Served(o33) Served(o27)	Served(o1) Served(o31) Served(o33) Served(o33) Served(o27) F} Served(o26) Served(o19) Served(o13) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #27
\[\lambda([o],1), R([o]), RF \\ \text{Make}([o],1) \\ \text{Robot-location}(o18) \\ \lambda([o],1), RL(1),	(No. 1) (No. 1	Move(o17,o16) ((o16,1), R(o16), R Make(o16,1) Robot-location(o18) o18,1), RL(1), R(o Serve(o18,1) Served(o6) Served(o1) Served(o31) Served(o33) Served(o27) Served(o26)	Served(o1) Served(o31) Served(o33) Served(o33) Served(o27) F} Served(o26) Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6), S(o17), S(o18), S(o1
\[\text{\(M([o],1), R([o]), RF\) \\ \text{\(M([o],1), R([o]), RF\) \\ \text{\(M([o],1))} \\ \text{\(Robot-location(o18)} \] \\ \text{\(P(o18,1), RL(1), R(o)} \\ \text{\(Serve(o18,1))} \\ \text{\(Served(o6))} \\ \text{\(Served(o6))} \\ \text{\(Served(o31))} \\ \text{\(Served(o31))} \\ \text{\(Served(o33))} \\ \text{\(Served(o27))} \\ \text{\(Served(o26))} \\ \text{\(Served(o26))} \\ \text{\(Served(o13))} \\ \text{\(Served(o13))} \\ \text{\(Served(o13))} \\ \text{\(Served(o13))} \\ \text{\(Served(o13))} \\ \text{\(Served(o13))} \\ \text{\(Served(o15))} \\ \text{\(Served(o26))} \\ \text{\(Served(o13))} \\ \text{\(Served(o13))} \\ \text{\(Served(o26))} \\ \text{\(Served(o26))} \\ \text{\(Served(o26))} \\ \text{\(Served(o13))} \\ \text{\(Served(o13))} \\ \text{\(Served(o13))} \\ \text{\(Served(o13))} \\ \text{\(Served(o26))} \\ \(Se	(No. 1) (No. 1	Move(o17,o16) ((o16,1), R(o16), R Make(o16,1) Robot-location(o18) o18,1), RL(1), R(o Serve(o18,1) Served(o6) Served(o31) Served(o31) Served(o33) Served(o27) Served(o26) Served(o19)	Served(o1) Served(o31) Served(o33) Served(o33) Served(o27) F} Served(o26) Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6), S(o26), S(o2
\[\text{\{M([o],1), R([o]), RF} \] \[\text{\ti}\text{\texi\tint{\text{\tii}\tint{\ti}\text{\text{\text{\text{\text{\text{\text{\text{\text{\ti	1), S(o6), S(o33), R(o7), S(o27)}	Move(o17,o16) (o16,1), R(o16), R Make(o16,1) Robot-location(o18 o18,1), RL(1), R(o Served(o8) Served(o1) Served(o31) Served(o33) Served(o27) Served(o26) Served(o29) Served(o19) Served(o13)	Served(o1) Served(o31) Served(o33) Served(o23) Served(o27) F} Served(o26) Served(o19) Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #27
\[\text{\(M([o],1), R([o]), RF\) \\ \text{\(M([o],1), R([o]), RF\) \\ \text{\(M([o],1))} \\ \text{\(Robot-location(o18)} \] \\ \text{\(P(o18,1), RL(1), R(o)} \\ \text{\(Serve(o18,1))} \\ \text{\(Served(o6))} \\ \text{\(Served(o6))} \\ \text{\(Served(o31))} \\ \text{\(Served(o31))} \\ \text{\(Served(o33))} \\ \text{\(Served(o27))} \\ \text{\(Served(o26))} \\ \text{\(Served(o26))} \\ \text{\(Served(o13))} \\ \text{\(Served(o26))} \\ \text{\(Served(o13))} \\ \text{\(Served(o13))} \\ \text{\(Served(o26))} \\ \text{\(Served(o26))} \\ \text{\(Served(o26))} \\ \text{\(Served(o13))} \\ \text{\(Served(o13))} \\ \text{\(Served(o13))} \\ \text{\(Served(o13))} \\ \text{\(Served(o26))} \\ \(Se	1), S(o6), S(o33), R(o7), S(o27)}	Move(o17,o16) ((o16,1), R(o16), R Make(o16,1) Robot-location(o18) o18,1), RL(1), R(o Served(o8) Served(o6) Served(o31) Served(o31) Served(o27) Served(o26) Served(o19) Served(o19) Served(o19) Served(o13) Robot-location(o7)	Served(o1) Served(o31) Served(o33) Served(o33) Served(o33) Served(o27) Served(o27) Served(o26) Served(o19) Served(o19) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o14) Served(o15) Served(o16) Stack #27 Served(o16) Served(o16, o18) Served(o16, o18) Served(o16, o18) Served(o18, o18) Served(o18
\[\text{\{M([o],1), R([o]), RF} \] \[\text{Make([o],1)} \] \[\text{Robot-location(o18)} \] \[\text{Robot-location(o18)} \] \[\text{Robot-location(o18)} \] \[\text{Robot-location(o18)} \] \[\text{Served(o18,1)} \] \[\text{Served(o6)} \] \[\text{Served(o6)} \] \[\text{Served(o31)} \] \[\text{Served(o33)} \] \[\text{Served(o27)} \] \[\text{Served(o27)} \] \[\text{Served(o26)} \] \[\text{Served(o19)} \] \[\text{Served(o13)} \] \[\text{Robot-location(o7)} \] \[\text{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)} \]	1), S(o6), S(o33), R(o7), S(o27)}	Move(o17,o16) ((o16,1), R(o16), R Make(o16,1) Robot-location(o18) o18,1), RL(1), R(o Served(o8) Served(o6) Served(o31) Served(o31) Served(o27) Served(o26) Served(o19) Served(o19) Served(o19) Served(o13) Robot-location(o7)	Served(o1) Served(o3) Served(o3) Served(o3) Served(o3) Served(o27) Served(o26) Served(o26) Served(o19) Served(o13) Served(o14) Served(o15) Serve
\[\text{\{M([o],1), R([o]), RF} \] \[\text{Make([o],1)} \] \[\text{Robot-location(o18)} \] \[\text{Robot-location(o18)} \] \[\text{Robot-location(o18)} \] \[\text{Robot-location(o18)} \] \[\text{Served(o18,1)} \] \[\text{Served(o6)} \] \[\text{Served(o6)} \] \[\text{Served(o31)} \] \[\text{Served(o33)} \] \[\text{Served(o27)} \] \[\text{Served(o27)} \] \[\text{Served(o26)} \] \[\text{Served(o19)} \] \[\text{Served(o13)} \] \[\text{Robot-location(o7)} \] \[\text{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)} \]	1), S(o6), S(o33), R(o7), S(o27)}	Move(o17,o16) (o16,1), R(o16), R Make(o16,1) Robot-location(o18 o18,1), RL(1), R(o) Served(o8) Served(o9) Served(o31) Served(o31) Served(o27) Served(o26) Served(o29) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o3	Served(o1) Served(o31) Served(o33) Served(o33) Served(o27) Served(o26) Served(o26) Served(o19) Served(o19) Served(o13) Served(o13) Robot-location(o7) S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #27 R(o16) Move(o16,o18) Served(o18,1) Serve(o18,1) Served(o6) Served(o6) Served(o1) Served(o1) Served(o1) Served(o1) Served(o1) Served(o1) Served(o1) Served(o1) Served(o1) Se
\[\lambda([o],1), R([o]), RF \\ \text{Make}([o],1) \\ \text{Robot-location}(o18) \\ \lambda([o],1), RL(1), R(o) \\ \text{Robot-location}(o18) \\ \lambda([o],1), RL(1), R(o) \\ \text{Served}(o18,1), RL(1), R(o) \\ \text{Served}(o6) \\ \text{Served}(o6) \\ \text{Served}(o31) \\ \text{Served}(o31) \\ \text{Served}(o23) \\ \text{Served}(o27) \\ \text{Served}(o26) \\ \text{Served}(o26) \\ \text{Served}(o19) \\ \text{Served}(o13) \\ \text{Robot-location}(o7) \\ \text{Served}(o13), S(o19), S(o26), S(o1), S(o3) \end{array}	1), S(o6), S(o33), R(o7), S(o27)}	Move(o17,o16) ((o16,1), R(o16), R Make(o16,1) Robot-location(o18) o18,1), RL(1), R(o Served(o8) Served(o6) Served(o31) Served(o31) Served(o27) Served(o26) Served(o19) Served(o19) Served(o19) Served(o13) Robot-location(o7)	Served(o1) Served(o31) Served(o31) Served(o33) Served(o33) Served(o27) Served(o26) Served(o26) Served(o19) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o14) Served(o15) Served(o16) Served(o18,1) Served(o311) Served(o
\[\text{\{M([o],1), R([o]), RF} \] \[\text{\ti}\text{\texi\tint{\text{\tii}\tint{\ti}\text{\text{\text{\text{\text{\text{\text{\text{\text{\ti	1), S(o6), S(o33), R(o7), S(o27)}	Move(o17,o16) (o16,1), R(o16), R Make(o16,1) Robot-location(o18 o18,1), RL(1), R(o) Served(o8) Served(o9) Served(o31) Served(o31) Served(o27) Served(o26) Served(o29) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o3	Served(o1) Served(o31) Served(o33) Served(o33) Served(o27) Served(o26) Served(o19) Served(o19) Served(o19) Served(o13) Served(o13) Robot-location(o7) S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #27
\[\text{\{M([o],1), R([o]), RF} \] \[\text{\ti}\text{\texi\tint{\text{\tii}\tint{\ti}\text{\text{\text{\text{\text{\text{\text{\text{\text{\ti	1), S(o6), S(o33), R(o7), S(o27)}	Move(o17,o16) (o16,1), R(o16), R Make(o16,1) Robot-location(o18 o18,1), RL(1), R(o) Served(o8) Served(o9) Served(o31) Served(o31) Served(o27) Served(o26) Served(o29) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o3	Served(o1) Served(o31) Served(o33) Served(o33) Served(o27) Served(o26) Served(o26) Served(o19) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o14) Served(o15) Stack #27
\[\text{\{M([o],1), R([o]), RF} \] \[\text{\ti}\text{\texi\tint{\text{\tii}\tint{\ti}\text{\text{\text{\text{\text{\text{\text{\text{\text{\ti	1), S(o6), S(o33), R(o7), S(o27)}	Move(o17,o16) (o16,1), R(o16), R Make(o16,1) Robot-location(o18 o18,1), RL(1), R(o) Served(o8) Served(o9) Served(o31) Served(o31) Served(o27) Served(o26) Served(o29) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o3	Served(o1) Served(o31) Served(o33) Served(o33) Served(o27) Served(o26) Served(o26) Served(o26) Served(o13) Served(o14) Served(o15) Served(o16,o18) Served(o16,o18) Served(o18,1) Served(o16) Served(o16) Served(o17) Served(o27) Served(o27) Served(o26) Serve
\[\text{\{M([o],1), R([o]), RF} \] \[\text{\ti}\text{\texi\tint{\text{\tii}\tint{\ti}\text{\text{\text{\text{\text{\text{\text{\text{\text{\ti	1), S(o6), S(o33), R(o7), S(o27)}	Move(o17,o16) (o16,1), R(o16), R Make(o16,1) Robot-location(o18 o18,1), RL(1), R(o) Served(o8) Served(o9) Served(o31) Served(o31) Served(o27) Served(o26) Served(o27) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o3	Served(o1) Served(o31) Served(o33) Served(o33) Served(o27) F
\[\text{\{M([o],1), R([o]), RF} \] \[\text{\ti}\text{\texi\tint{\text{\tii}\tint{\ti}\text{\text{\text{\text{\text{\text{\text{\text{\text{\ti	1), S(o6), S(o33), R(o7), S(o27)}	Move(o17,o16) (o16,1), R(o16), R Make(o16,1) Robot-location(o18 o18,1), RL(1), R(o) Served(o8) Served(o9) Served(o31) Served(o31) Served(o27) Served(o26) Served(o27) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o3	Served(o1) Served(o3) Served(o3) Served(o3) Served(o3) Served(o27) Served(o26) Served(o19) Served(o19) Served(o19) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o14) Served(o15) Served(o16, o18) Served(o16, o18) Served(o16, o18) Served(o18, o18) Served(o18, o18) Served(o18, o18) Served(o18, o18) Served(o19) Served(o27) Served(o27) Served(o27) Served(o219) Served(o19) Served(o19) Served(o13) Served(o19) Served(o13) Served(o19) Served(o19) Served(o19) Served(o13) Served(o19) Served(o13) Served(o19) Served(o13) Served(o19) Served(o13) Served(o19) Served(o13)
\[\lambda([o],1), R([o]), RF \\ \text{Make}([o],1) \\ \text{Robot-location}(o18) \\ \lambda([o],1), RL(1), R(o) \\ \text{Robot-location}(o18) \\ \lambda([o],1), RL(1), R(o) \\ \text{Served}(o18,1), RL(1), R(o) \\ \text{Served}(o6) \\ \text{Served}(o6) \\ \text{Served}(o31) \\ \text{Served}(o31) \\ \text{Served}(o23) \\ \text{Served}(o27) \\ \text{Served}(o26) \\ \text{Served}(o26) \\ \text{Served}(o19) \\ \text{Served}(o13) \\ \text{Robot-location}(o7) \\ \text{Served}(o13), S(o19), S(o26), S(o1), S(o3) \end{array}	1), S(o6), S(o33), R(o7), S(o27)}	Move(o17,o16) (o16,1), R(o16), R Make(o16,1) Robot-location(o18 o18,1), RL(1), R(o) Served(o8) Served(o9) Served(o31) Served(o31) Served(o27) Served(o26) Served(o27) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o3	Served(o1) Served(o31) Served(o33) Served(o33) Served(o33) Served(o27) Served(o26) Served(o26) Served(o19) Served(o19) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o13) Served(o14) Served(o16,018) Served(o16,018) Served(o18,1) Served(o18,1) Served(o18,1) Served(o19) Served(o26) Served(o26) Served(o26) Served(o26) Served(o26) Served(o19) Served(o219) Served(o219) Served(o219) Served(o19)

Move(o16,o18)		Robot-loaded(2)		Robot-location([o1])
{P(o18,1), RL(1), R(o		Robot-location(o6))	{R([o1])}
Serve(o18,1)	{F	(06), $P(06,2)$, $RL(10,0)$		Move([o1],o5)
Served(o6)		Serve(o6,2)	{	R(o5), RF, M(o5,2)
Served(o1)		Served(o1)		Make(o5,2)
Served(o31)		Served(o31)		Robot-location(o6)
Served(o33)		Served(o33)	{F	(o6), P(o6,2), RL(2)}
Served(o27)		Served(o27)		Serve(o6,2)
Served(o26)		Served(o26)	1	Served(o1)
Served(o19)		Served(o19)		Served(o31)
Served(o13) Robot-location(o7)		Served(o13) Robot-location(o7)	N.	Served(o33) Served(o27)
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3	1156(4K) S(4K) B(673) S(6973)		(1) S(o6) S(o33) B(o7) S(o37)	Served(027)
[5(017), 5(010), 5(013), 5(013), 5(020), 5(01), 5(03	1155600), 5(600), 5(600), 5(600),	p(020), b(01), b(00	1), 5(00), 5(033), 11(01), 5(021)}	Served(020)
Stack #29		Stack #34		Served(o13)
,		0.0001 // 0.5		Robot-location(o7)
			{S(o17), S(o18), S(o13), S(o19),	
			77 (77 (77	7, 7, 7, 7, 7, 7,
{P(o18,1), RL(1), R(o	.8)}	Robot-free		Stack #38
Serve(o18,1)		Machine([o],2)		
Served(o6)		Robot-location([o])		
Served(o1)	1	R([o]), RF, M([o],2)}	(D(.10))
Served(o31) Served(o33)		Make([o],2) Robot-location(o6)	N .	{R(o18)} Move(o18,o5)
Served(o33) Served(o27)	LE	(06), $P(06,2)$, $RL(100,00)$	/ •\}	R(o5), RF, M(o5,2)}
Served(627) Served(626)	\\\\\\\\\	Serve(06,2), RL(" /J {	Make(05,2)
Served(626) Served(619)		Serve(oo,2)		Robot-location(o6)
Served(o13)		Served(o31)	1.	(o6), P(o6,2), RL(2)}
Robot-location(o7)		Served(o33)	(-	Serve(06,2)
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3	1), S(o6), S(o33), R(o7), S(o27)}	Served(o27)		Served(o1)
), = (==), = (==), = (==), = (==),	Served(o26)		Served(o31)
Stack #30		Served(o19)		Served(o33)
		Served(o13)		Served(o27)
		Robot-location(o7)		Served(o26)
C (101)	{S(o17), S(o18), S(o13), S(o19),	S(o26), S(o1), S(o3	31), S(o6), S(o33), R(o7), S(o27)}	Served(o19)
Serve(o18,1)		-		Served(o13)
Served(o6) Served(o1)		Stack #35		Robot-location(o7)
Served(o1)		-	$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), S(o1), S(o31), S(o6), S
Served(031)		-		G. 1 #00
Served(o27)		Machine([o],2)		Stack #39
Served(o26)		Robot-location([o]))	
Served(o19)	{	R([o]), RF, M([o],2		
Served(o13)		Make([o],2)	ĺ	Move(o18,o5)
Robot-location(o7)		Robot-location(o6)	{	R(o5), RF, M(o5,2)
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3	 S(o6), S(o33), R(o7), S(o27) 	(o6), P(o6,2), RL(2)}	Make(o5,2)
		Serve(o6,2)		Robot-location(o6)
Stack #31		Served(o1)	{F	(06), P(06,2), RL(2)
		Served(o31)		Serve(o6,2)
		Served(o33)		Served(o1)
Served(o6)		Served(o27)		Served(o31)
Served(o1)		Served(o26)		Served(o33)
Served(o31)		Served(o19) Served(o13)		Served(o27) Served(o26)
Served(o33)		Robot-location(o7)	N .	Served(o20) Served(o19)
Served(o27)	{S(o17) S(o18) S(o13) S(o10)		31), S(o6), S(o33), R(o7), S(o27)}	Served(619)
Served(o26)	[-(-1), -(-1), -(-1), -(-1), -(-1),	, , , , , , , , , , , , , , , , , , , ,	27, 5(00), 5(000), 11(01), 5(021)}	Robot-location(o7)
Served(o19)		Stack #36	{S(o17), S(o18), S(o13), S(o19),	
Served(o13)			(-,, -(,, -(), -(), -(), -(), -(), -(), -(), -(), -(), -(), -(), -(), -(), -(
Robot-location(o7)]		Stack #40
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)\}$				1
G. 1 "22		Robot-location(o5)		
Stack #32	{	R(o5), RF, M(o5,2)		D(-5) DE M(-5-0)
		Make(o5,2)	{	R(o5), RF, M(o5,2)}
		Robot-location(o6)	<u>/</u>	Make(o5,2)
Petition(o6,[n])	{ L	(o6), P(o6,2), RL(Serve(o6,2)		Robot-location(o6) (o6), P(o6,2), RL(2)}
Robot-loaded([n])		Serve(00,2)	1 T	Serve(06,2)
Robot-location(o6)		Served(01)		Serve(00,2) Served(01)
{R(o6), P(o6,[n]), RL(n])}	Served(o31)		Served(o1)
Serve(o6,[n])		Served(o27)		Served(o33)
Served(o1)		Served(o26)		Served(o27)
Served(o31)		Served(o19)		Served(o26)
Served(o33)		Served(o13)		Served(o19)
Served(o27)		Robot-location(o7)		Served(o13)
Served(o26)	{S(o17), S(o18), S(o13), S(o19),		31), S(o6), S(o33), R(o7), S(o27)}	
Served(o19)				
			$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), S(o1), S(o31), S(o6), S
Served(o13)		Stack #37	$\{S(o17), S(o18), S(o13), S(o19), \}$. , , , , , , , , , , , , , , , , , , ,
Served(013) Robot-location(07) {S(017), S(018), S(013), S(019), S(026), S(01), S(03)	1) S(o6) S(o22) D(-7) S(o27)	Stack #37	{S(o17), S(o18), S(o13), S(o19),	S(o26), S(o1), S(o31), S(o6), S Stack #41

Make(o5,2)	{R(06), P(06,2), RL(2	2)}	Robot-free
Robot-location(o6)	Serve(o6,2)		Machine([o],1)
{R(o6), P(o6,2), RL(2	Served(o1)		Robot-location([o])
Serve(o6,2)	Served(o31)	{1	M([o],1), R([o]), RF}
Served(o1)	Served(o33)		Make([o],1)
Served(o31)	Served(o27)		Robot-location(o1)
Served(o33)	Served(o26)	{P	(o1,1), RL(1), R(o1)}
Served(o27)	Served(o19)		Serve(o1,1)
Served(o26)	Served(o13)		Served(o31)
Served(o19)	Robot-location(o7)		Served(o33)
Served(o13)	{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3	1), S(o6), S(o33), R(o7), S(o27)}	Served(o27)
Robot-location(o7)		// // // // // //	Served(o26)
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3	1), S(o6), S(o33), R(o7), S(o27)} Stack #47		Served(o19)
	7, (), (), (),		Served(o13)
Stack #42			Robot-location(o7)
		{S(o17), S(o18), S(o13), S(o19),	S(o26), S(o1), S(o31), S(o6),
	Serve(o6,2)		7, (), (),
	Served(o1)		Stack #52
Robot-location(o6)	Served(o31)		
{R(o6), P(o6,2), RL(2			
Serve(o6,2)	Served(o27)		
Served(o1)	Served(o26)		Machine([o],1)
Served(o31)	Served(o19)		Robot-location([o])
Served(o33)	Served(o13)	{1	M([o],1), R([o]), RF
Served(o27)	Robot-location(o7)		Make([o],1)
Served(o26)	$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)\}$		
Served(o19)		{P	(o1,1), RL(1), R(o1)}
Served(o13)	Stack #48		Serve(o1,1)
Robot-location(o7)			Served(o31)
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)\}$	$1), S(o6), S(o33), R(o7), S(o27)\}$		Served(o33)
			Served(o27)
Stack #43	Served(o1)		Served(o26)
	Served(o31)		Served(o19)
	Served(o33)		Served(o13)
D 1 1 1 1 (5.11)	Served(o27)		Robot-location(o7)
Robot-location([o1]		{S(o17), S(o18), S(o13), S(o19),	S(o26), S(o1), S(o31), S(o6),
{R([o1])}	Served(o19)		
Move([o1],o6)	Served(o13)		Stack #53
$\{R(o6), P(o6,2), RL(2)\}$			
Serve(o6,2)	$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)\}$	1), $S(o6)$, $S(o33)$, $R(o7)$, $S(o27)$ }	
Served(o1)	G. 1 #40		
Served(o31)	Stack #49		Robot-location(o11)
Served(o33)		{ N	I(o11,1), R(o11), RF}
Served(o27)			Make(o11,1)
Served(o26)	Petition(o1,[n])		Robot-location(o1)
Served(o19)	Robot-loaded([n])	{P	(o1,1), RL(1), R(o1)}
Served(o13)	Robot-location(o1)		Serve(o1,1)
Robot-location(o7)	B(01 [n]) BL([n]) B	11)}	Served(o31)
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)\}$	1), S(o6), S(o33), R(o7), S(o27)(01,[n]), RL([n]), R(o5), S(o6),	7+/)	Served(o33)
Q. 1 "	Served(o31)		Served(o27)
Stack #44	Served(031)		Served(o26)
	Served(033)		Served(o19)
{R(o5)}	Convod(c26)		Served(o13)
	Served(o26)		Served (o13) Robot-location (o7)
C \ /3	Served(o19)	{S(o17), S(o18), S(o13), S(o19),	Served (o13) Robot-location (o7)
Move(05,06)	Served(o19) Served(o13)	{S(\(\omega17\), S(\(\omega18\), S(\(\omega13\), S(\(\omega19\)),	Served (o13) Robot-location (o7) S(o26), S(o1), S(o31), S(o6), S
Move(05,06) {R(06), P(06,2), RL(2	Served(019) Served(013) 2)} Robot-location(07)		Served (o13) Robot-location (o7)
Move(05,06) {R(06), P(06,2), RL(2 Serve(06,2)	Served(o19) Served(o13)		Served (o13) Robot-location (o7) S(o26), S(o1), S(o31), S(o6), S
Move(o5,o6) {R(o6), P(o6,2), RL(: Serve(o6,2) Served(o1)	Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)		Served (o13) Robot-location (o7) S(o26), S(o1), S(o31), S(o6),
Move(05,06) {R(06), P(06,2), RL(2) Serve(06,2) Served(01) Served(031)	Served(019) Served(013) 2)} Robot-location(07)	1), S(o6), S(o33), R(o7), S(o27)}	Served (013) Robot-location (07) S(026), S(01), S(031), S(06), Stack #54
Move(05,06) {R(06), P(06,2), RL(: Serve(06,2) Served(01) Served(031) Served(033)	Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)}	Served (o13) Robot-location (o7) S(o26), S(o1), S(o31), S(o6), S Stack #54 Robot-location ([o1])
Move(05,06) {R(06), P(06,2), RL(2 Serve(06,2) Served(01) Served(031) Served(033) Served(027)	Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)}	Served (o13) Robot-location (o7) S(o26), S(o1), S(o31), S(o6), Stack #54 Robot-location ([o1]) {R([o1])}
Move(o5,o6) R(o6), P(o6,2), RL(: Serve(o6,2) Served(o1) Served(o31) Served(o33) Served(o27) Served(o26)	Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3) Stack #50	1), S(o6), S(o33), R(o7), S(o27)}	Served (013) Robot-location(07) S(026), S(01), S(031), S(06), S(0
Move(05,66) R(06), P(06,2), RL(2 Serve(06,2) Served(01) Served(031) Served(033) Served(027) Served(026) Served(019)	Served(o19) Served(o13) Served(o13) Robot-location(o7) S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3) Stack #50	1), S(o6), S(o33), R(o7), S(o27)}	Served (o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), S Stack #54 Robot-location([o1]) {R([o1])} Move([o1],011) I(o11,1), R(o11), RF}
Move(o5,66) R(o6), P(o6,2), RL(: Serve(o6,2) Served(o1) Served(o31) Served(o33) Served(o27) Served(o26) Served(o19) Served(o13)	Served(o19) Served(o13) Served(o13) Robot-location(o7) Stack #50 Robot-loaded(1) Robot-location(o1)	1), S(o6), S(o33), R(o7), S(o27)} I	Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), S Stack #54 Robot-location([o1]) {R([o1])} Move([o1],011) I(o11,1), R(o11), RF} Make(o11,1)
Move(o5,66) R(o6), P(o6,2), RL(: Serve(o6,2) Served(o1) Served(o21) Served(o31) Served(o33) Served(o27) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7)	Served(o19) Served(o13) Served(o13) Robot-location(o7) Stack #50 Robot-loaded(1) Robot-location(o1) P(o1,1), RL(1), R(o	1), S(o6), S(o33), R(o7), S(o27)} I {N	Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), ; Stack #54 Robot-location([o1]) {R([o1])} Move([o1],o11) {(o11,1), R(o11), RF} Make(o11,1) Robot-location(o1)
Move(o5,66) R(o6), P(o6,2), RL(: Serve(o6,2) Served(o1) Served(o31) Served(o33) Served(o27) Served(o26) Served(o19) Served(o13)	Served(o19) Served(o19) Served(o13) Robot-location(o7) S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3) Stack #50 Robot-loaded(1) Robot-location(o1) (F(o1,1), RL(1), R(o.1) Serve(o1,1) Serve(o1,1)	1), S(o6), S(o33), R(o7), S(o27)} I {N	Served (013) Robot-location(07) S(026), S(01), S(031), S(06), S(026), S(01), S(031), S(06), S(026), S(
Move(o5,66)	Served(o19) Served(o19)	1), S(o6), S(o33), R(o7), S(o27)} I {N	Served (013) Robot-location(07) S(026), S(01), S(031), S(06), S(026), S(01), S(031), S(06), S
Move(o5,66) R(o6), P(o6,2), RL(: Serve(o6,2) Served(o1) Served(o21) Served(o31) Served(o33) Served(o27) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7)	Served(o19) Served(o19)	1), S(o6), S(o33), R(o7), S(o27)} I {N	Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Stack #54 Robot-location([01]) {R([01])} Move([01],011) f(011,1), R(011), RF} Make(01,1) Robot-location(01) (01,1), RL(1), R(01)} Serve(01,1) Served(031)
Move(o5,66)	Served(o19) Served(o19) Served(o13) Served(o13) Robot-location(o7) Stack #50 Robot-location(o1) Robot-location(o1) Fe(o1,1), RL(1), R(o1) Served(o1,1) Served(o31) Served(o33) Served(o27)	1), S(o6), S(o33), R(o7), S(o27)} I {N	Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), s Stack #54 Robot-location([o1]) {R([o1])} Move([o1],o11) {(o11,1), R(o11), RF} Make(o11,1) Robot-location(o1) (o1,1), RL(1), R(o1)} Served(o31) Served(o33)
Move(o5,66)	Served(o19) Served(o13)	1), S(o6), S(o33), R(o7), S(o27)} I {N	Served(013) Robot-location(07) S(026), S(01), S(031), S(06), Stack #54 Robot-location([01]) {R([01])} Move([01],011) I(011,1), R(011), RF} Make(011,1) Robot-location(01) (01,1), RL(1), R(01)} Served(031) Served(033) Served(027)
Move(o5,66)	Served(o19) Served(o19)	1), S(o6), S(o33), R(o7), S(o27)} I {N	Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(026), S(01), S(031), S(06), S(026), S(0
Move(o5,o6)	Served(o19) Served(o19)	1), S(o6), S(o33), R(o7), S(o27)} I {N	Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(026), S(01), S(031), S(06), S(026), S(0
Move(o5,o6)	Served(o19) Served(o19)	1), S(o6), S(o33), R(o7), S(o27)} I {N	Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(026), S(01), S(031), S(06), S(026), S(0
Move(o5,o6)	Served(o19) Served(o19)	1), S(o6), S(o33), R(o7), S(o27)} I {N {P {P 1), S(o6), S(o33), R(o7), S(o27)}	Served(013) Robot-location(07) S(o26), S(o1), S(o31), S(o6), S(o26), S(o1), S(o31), S(o6), S(o26), S(o
Move(o5,o6)	Served(o19) Served(o19)	1), S(o6), S(o33), R(o7), S(o27)} I {N	Served(013) Robot-location(07) S(o26), S(o1), S(o31), S(o6), S(o26), S(o1), S(o31), S(o6), S(o26), S(o
Move(o5,o6)	Served(o19) Served(o19)	1), S(o6), S(o33), R(o7), S(o27)} I {N {P {P 1), S(o6), S(o33), R(o7), S(o27)}	Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), s Stack #54 Robot-location([o1]) {R([o1])} Move([o1],o11) {(o1,1), R(o11), RF} Make(o11,1) Robot-location(o1) (o1,1), RL(1), R(o1)} Served(o1) Served(o31) Served(o26) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), s
Move(o5,o6)	Served(o19) Served(o19)	1), S(o6), S(o33), R(o7), S(o27)} I {N {P {P 1), S(o6), S(o33), R(o7), S(o27)}	Served(013) Robot-location(07) S(o26), S(o1), S(o31), S(o6), S(o26), S(o1), S(o31), S(o6), S(o26), S(o
Move(o5,o6)	Served(o19) Served(o19)	1), S(o6), S(o33), R(o7), S(o27)} I {N {P {P 1), S(o6), S(o33), R(o7), S(o27)}	Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), s Stack #54 Robot-location([o1]) {R([o1])} Move([o1],o11) {(o1,1), R(o11), RF} Make(o11,1) Robot-location(o1) (o1,1), RL(1), R(o1)} Served(o1) Served(o31) Served(o26) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), s
Move(o5,o6)	Served(o19) Served(o19)	1), S(o6), S(o33), R(o7), S(o27)} I {N {P {P 1), S(o6), S(o33), R(o7), S(o27)}	Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Stack #54 Robot-location([01]) {R([01])} Move([01],011) R(011,1), R(011), RF} Make(011,1) Robot-location(01) (01,1), RL(1), R(01)} Served(01,1) Served(031) Served(027) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S
Move(o5,o6)	Served(o19) Served(o19)	1), S(o6), S(o33), R(o7), S(o27)} I {N {P {P 1), S(o6), S(o33), R(o7), S(o27)}	Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Stack #54 Robot-location([01]) {R([01])} Move([01],011) R(011,1), R(011), RF} Make(011,1) Robot-location(01) (01,1), RL(1), R(01)} Served(01,1) Served(031) Served(027) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S
Move(o5,o6) R(o6), P(o6,2), RL(: Serve(o6,2) Served(o31) Served(o31) Served(o27) Served(o27) Served(o26) Served(o27) Served(o19) Served(o13) Robot-location(o7) S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3) Stack #45 Move(o5,o6) R(o6), P(o6,2), RL(: Served(o27) Served(o33) Served(o27) Served(o26) Served(o21) Served(o21) Served(o21) Served(o26) Served(o27) Served(o19) Served(o13) Served(o13)	Served(o19) Served(o19)	1), S(o6), S(o33), R(o7), S(o27)} I {N {P {P 1), S(o6), S(o33), R(o7), S(o27)}	Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), S Stack #54 Robot-location([o1]) {R([o1])} Move([o1],o11) {(o1,1), R(o11), RF} Make(o11,1) Robot-location(o1) (o1,1), RL(1), R(o1)} Served(o1) Served(o31) Served(o26) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7) Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), S
Move(o5,o6)	Served(o19) Served(o13)	1), S(o6), S(o33), R(o7), S(o27)} I {N {P {P 1), S(o6), S(o33), R(o7), S(o27)}	Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Stack #54 Robot-location([01]) {R([01])} Move([01],011) R(011,1), R(011), RF} Make(011,1) Robot-location(01) (01,1), RL(1), R(01)} Served(01,1) Served(031) Served(027) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S

Petition(o31,[n])

{R(o6)}

Robot-location([o1])

M(-6 -11)	+	(D([-1]))	
Move(06,011) $\{M(011,1), R(011), 1\}$	DIE1	{R([o1])} Move([o1],o1)	$ \begin{array}{c} \textbf{Robot-loaded}([n]) \\ \textbf{Robot-location}(031) \end{array} $
Make(o11,1)		P(o1,1), RL(1), R(o	
Robot-location(o1		Serve(o1,1)	$\frac{\{\text{RC}(\text{OSI}), \text{RE}([\text{II}]), \text{P}(\text{OSI}, [\text{II}])\}}{\text{Serve}(\text{OSI}, [\text{II}])}$
{P(01,1), RL(1), R(0		Serve(o1,1)	Serve(031,[n]) Served(033)
Serve(01,1)	<u>'+)'s</u>	Served(o31)	Served(033)
Served(o31)	+	Served(o27)	Served(021)
Served(o33)	+	Served(o26)	Served(020)
Served(033)	+	Served(o19)	Served(013)
Served(o2f)	+	Served(o13)	Robot-location(o7)
Served(020)	+		{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6)
Served(013)	[S(017) S(018) S(013) S(010)		(31), S(o6), S(o33), R(o7), S(o27)}
Robot-location(o7		5(020), 5(01), 5(03	Stack #67
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o		Stack #61	Stack #01
[5(017), 5(010), 5(010), 5(013), 5(020), 5(01), 5(0	51), 5(66), 5(668), 16(61), 5(621)]	J Brack #-01	
Stack #56			
Stack #00			Robot-loaded(1)
		{R(o11)}	Robot-location(o31)
		Move(o11,o1)	{R(o31), RL(1), P(o31,1)}
Move(o6,o11)	{P	(o1,1), RL(1), R(o))} Serve(o31,1)
{M(o11,1), R(o11), I	₹F}	Serve(o1,1)	Served(o33)
Make(o11,1)		Served(o31)	Served(o27)
Robot-location(o1		Served(o33)	Served(o26)
{P(o1,1), RL(1), R(o	· 1)}	Served(o27)	Served(o19)
Serve(o1,1)		Served(o26)	Served(o13)
Served(o31)		Served(o19)	Robot-location(o7)
Served(o33)		Served(o13)	$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o68), S(o17), S(o18), S(o1$
Served(o27)		Robot-location(o7)	
Served(o26)	$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), $S(o1)$, $S(o3)$	Stack #68
Served(o19)			
Served(o13)		Stack #62	
Robot-location(o7			Robot-free
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o2$	31), S(o6), S(o33), R(o7), S(o27)		
		Move(o11,o1)	
Stack #57	\[\sum_{\text{E}} \]	P(o1,1), RL(1), R(o	
	11	Serve(o1,1)	Make([o],1)
		Served(o31)	Robot-location(o31)
{M(o11,1), R(o11),	SEL	Served(o33)	{R(o31), RL(1), P(o31,1)}
Make(o11,1)	4 J	Served(o27)	Serve(031,1)
Robot-location(o1	7	Served(o26)	Served(033)
{P(o1,1), RL(1), R(o		Served(o19)	Served(o27)
Serve(01,1)	777	Served(o13)	Served(o26)
	+		
Served(031)		Robot-location(o7)	Served(o19)
Served(o31) Served(o33)	{S(o17), S(o18), S(o13), S(o19),	Robot-location(o7) S(o26), S(o1), S(o3)	Served(o19) (1), S(o6), S(o33), R(o7), S(o27)} Served(o13)
Served(o33)	{S(o17), S(o18), S(o13), S(o19),		1), S(o6), S(o33), R(o7), S(o27)} Served(o13)
	{S(o17), S(o18), S(o13), S(o19),		1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7)
Served(o33) Served(o27)	{S(o17), S(o18), S(o13), S(o19),	S(o26), S(o1), S(o3	1), S(o6), S(o33), R(o7), S(o27)} Served(o13)
Served(o33) Served(o27) Served(o26)	{S(o17), S(o18), S(o13), S(o19),	S(o26), S(o1), S(o3	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7)
Served(o33) Served(o27) Served(o26) Served(o19) Served(o13) Served(o13)		S(o26), S(o1), S(o3) Stack #63	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6)} Stack #69
Served(o33) Served(o27) Served(o26) Served(o19) Served(o13)		S(o26), S(o1), S(o3) Stack #63 P(o1,1), RL(1), R(o2)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6)} Stack #69
Served(o33) Served(o27) Served(o26) Served(o19) Served(o13) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o		Stack #63 (o1,1), RL(1), R(o) Serve(o1,1)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)}
Served(o33) Served(o27) Served(o26) Served(o19) Served(o13) Served(o13)		S(o26), S(o1), S(o3) Stack #63 (o1,1), RL(1), R(o Serve(o1,1) Served(o31)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1)
Served(o33) Served(o27) Served(o26) Served(o19) Served(o13) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o		Stack #63 Stack #63 (o1,1), RL(1), R(o Serve(01,1) Served(o31) Served(o33)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o])
Served(o33) Served(o27) Served(o26) Served(o19) Served(o13) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o		Stack #63 Stack #63 (o1,1), RL(1), R(o) Serve(o1,1) Served(o31) Served(o37)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M((o],1), R([o]), RF}
Served(o33) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o Stack #58		Stack #63 Stack #63 Ool,1), RL(1), R(o Serve(01,1) Served(031) Served(033) Served(027) Served(026)	$ \begin{array}{c c} 1), S(o6), S(o33), R(o7), S(o27)\} & Served(o13) \\ \hline & Robot-location(o7) \\ \{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) \\ \hline & Stack \ \#69 \\ \hline \\ 1)\} & \\ \hline & & \\ &$
Served(o33) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o Stack #58	31), S(o6), S(o33), R(o7), S(o27)	S(o26), S(o1), S(o3) Stack #63 S(o1,1), RL(1), R(o Serve(o1,1) Served(o31) Served(o27) Served(o26) Served(o19)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31)
Served(o33) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o Stack #58	31), S(o6), S(o33), R(o7), S(o27)	S(o26), S(o1), S(o3) Stack #63 P(o1,1), RL(1), R(o) Served(o,1) Served(o31) Served(o33) Served(o27) Served(o26) Served(o19) Served(o19)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(p31), RL(1), P(o31,1)}
Served(o33) Served(o23) Served(o27) Served(o26) Served(o26) Served(o19) Served(o13) Robot-location(o7) Served(o13), S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o11), S(o26), S) 3I), S(o6), S(o33), R(o7), S(o27) 0 1)	S(o26), S(o1), S(o3) Stack #63 (o1,1), RL(1), R(o.) Served(o1,1) Served(o31) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(o31), RL(1), P(o31,1)} Serve(o31,1)
Served(o33) Served(o27) Served(o26) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o Stack #58 Make(o11,1) Robot-location(o1) (P(o1,1), RL(1), R(o) Serve(o1,1)) 3I), S(o6), S(o33), R(o7), S(o27) 0 1)	S(o26), S(o1), S(o3) Stack #63 (o1,1), RL(1), R(o.) Served(o1,1) Served(o31) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7)	$ \begin{array}{c} 1), S(o6), S(o33), R(o7), S(o27)\} & Served(o13) \\ \hline & Robot-location(o7) \\ \{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) \\ \hline & Stack \ \#69 \\ \hline \\ 1)\} & \\ \hline & & \\ & &$
Served(o33) Served(o33) Served(o27) Served(o26) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o11), S(o26), S(o26)) 3I), S(o6), S(o33), R(o7), S(o27) 0 1)	S(o26), S(o1), S(o3) Stack #63 Stack #63 Serve(o1,1), RL(1), R(o) Served(o31) Served(o33) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(o31), RL(1), P(o31,1)} Served(o31,1) 1), S(o6), S(o33), R(o7), S(o27)} Served(o33) Served(o27)
Served(o33) Served(o27) Served(o26) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o Stack #58 Make(o11,1) Robot-location(o1) (P(o1,1), RL(1), R(o) Serve(o1,1)) 3I), S(o6), S(o33), R(o7), S(o27) 0 1)	S(o26), S(o1), S(o3) Stack #63 (o1,1), RL(1), R(o.) Served(o1,1) Served(o31) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7)	$ \begin{array}{c} 1), S(o6), S(o33), R(o7), S(o27)\} & Served(o13) \\ \hline & Robot-location(o7) \\ \{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) \\ \hline & Stack \ \#69 \\ \hline \\ 1)\} & \\ \hline & & \\ & &$
Served(o33) Served(o23) Served(o27) Served(o26) Served(o26) Served(o19) Served(o13) Robot-location(o7) Served(o13) Robot-location(o7) Served(o15) Served(o15) Served(o15) Served(o15) Served(o15) Served(o31) Served(o31) Served(o33) Served(o33) Served(o33) Served(o33) Served(o33) Served(o31) Served(o31) Served(o33) Served(o31) Served(o33) Served(o31) Served(o31) Served(o33) Served(o31)) 3I), S(o6), S(o33), R(o7), S(o27) 0 1)	S(o26), S(o1), S(o3) Stack #63 Stack #63 Serve(o1,1), RL(1), R(o) Served(o31) Served(o33) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(o31), RL(1), P(o31,1)} Served(o31), Served(o33) Served(o27) Served(o26)
Served(o33) Served(o27)) 3I), S(o6), S(o33), R(o7), S(o27) 0 1)	S(o26), S(o1), S(o3) Stack #63 P(o1,1), RL(1), R(o Serve(o1,1) Served(o31) Served(o33) Served(o27) Served(o26) Served(o19) Served(o19) Served(o103) Robot-location(o7) S(o26), S(o1), S(o3) Stack #64	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7)
Served(o33) Served(o27)) 3I), S(o6), S(o33), R(o7), S(o27) 0 1)	S(o26), S(o1), S(o3) Stack #63 (o1,1), RL(1), R(o.) Serve(o1,1) Served(o31) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o3) Stack #64 Serve(o1,1)	$ \begin{array}{c c} 1), S(o6), S(o33), R(o7), S(o27)\} & Served(o13) \\ \hline & Robot-location(o7) \\ \{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) \\ \hline & Stack \#69 \\ \\ 1)\} & \\ \hline & & \\ & &$
Served(o33) Served(o27)) 31), S(o6), S(o33), R(o7), S(o27) 9 1) 1) 1) 1) 1) 1) 1) 1) 1) 1) 1) 1) 1)	S(o26), S(o1), S(o3) Stack #63 Stack #63 Serve(o1,1), RL(1), R(o) Served(o31) Served(o33) Served(o26) Served(o19) Served(o19) Served(o19) Served(o10) Served(o10) Served(o11) Served(o11) Served(o11) Served(o11) Served(o11) Served(o11)	Served (o13)
Served(o33) Served(o27)), S(o6), S(o33), R(o7), S(o27)) (S(o27)) (S(o27	S(o26), S(o1), S(o3) Stack #63 P(o1,1), RL(1), R(o) Serve(o1,1) Served(o31) Served(o32) Served(o27) Served(o29) Served(o19) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o3) Stack #64 Serve(o1,1) Served(o31) Served(o33)	Served (o13)
Served(o33) Served(o27)), S(o6), S(o33), R(o7), S(o27)) (S(o27)) (S(o27	S(o26), S(o1), S(o3) Stack #63 Stack #63 Stack #63 Served(o1,1), RL(1), R(o Served(o31) Served(o33) Served(o27) Served(o26) Served(o19) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o3) Stack #64 Served(o1,1) Served(o31) Served(o33) Served(o27)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(b31), RL(1), P(o31,1)} Served(o31,1) 1), S(o6), S(o33), R(o7), S(o27)} Served(o33) Served(o27) Served(o27) Served(o26) Served(o19) Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o27)}
Served(o33) Served(o27)), S(o6), S(o33), R(o7), S(o27)) (S(o27)) (S(o27	Stack #63 Stack #63 Stack #63 Stack #63 Stack #63 Served(0.11) Served(0.33) Served(0.27) Served(0.26) Served(0.27) Served(0.27) Served(0.26) Serv	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(b31), RL(1), P(o31,1)} Served(o31,1) 1), S(o6), S(o33), R(o7), S(o27)} Served(o33) Served(o27) Served(o27) Served(o26) Served(o19) Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o27)}
Served(o33) Served(o27)), S(o6), S(o33), R(o7), S(o27)) (S(o27)) (S(o27	Stack #63	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(o31), RL(1), P(o31,1)} Served(o31,1) Served(o31,1) Served(o27) Served(o27) Served(o26) Served(o29) Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #70
Served(o33) Served(o27)) 3l), S(o6), S(o33), R(o7), S(o27) () () () () () () () () () (S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(o31), RL(1), P(o31,1)} Served(o31) 1), S(o6), S(o33), R(o7), S(o27)} Served(o33) Served(o27) Served(o26) Served(o26) Served(o19) Served(o13) Robot-location(o7) {S(a17), S(a18), S(a13), S(a19), S(o26), S(o1), S(o31), S(o6) Stack #70
Served(o33) Served(o27)) 3I), S(o6), S(o33), R(o7), S(o27) () 1) {S(o17), S(o18), S(o13), S(o19), () 31), S(o6), S(o33), R(o7), S(o27)}	S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(b31), RL(1), P(o31,1)} Served(o31,1) 1), S(o6), S(o33), R(o7), S(o27)} Served(o33) Served(o27) Served(o27) Served(o26) Served(o19) Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #70 Robot-location(o16) {N(o16,1), R(o16), RF}
Served(o33) Served(o27)); 31), S(o6), S(o33), R(o7), S(o27)); 01)); 15); 17]; 18]; 18]; 19]; 31), S(o6), S(o33), R(o7), S(o27); 19]; 19]; 19]; 19]; 19]; 19]; 19]; 19]	S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(b31), RL(1), P(o31,1)} Served(o31), Served(o31,1) 1), S(o6), S(o33), R(o7), S(o27)} Served(o27) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7) {Served(o13) Robot-location(o7) {Sexed(o13), S(o17), S(o18),
Served(o33) Served(o27)); 31), S(o6), S(o33), R(o7), S(o27)); 01)); 15); 17]; 18]; 18]; 19]; 31), S(o6), S(o33), R(o7), S(o27); 19]; 19]; 19]; 19]; 19]; 19]; 19]; 19]	S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(o31), RL(1), P(o31,1)} Served(o31,1) Served(o31,1) Served(o37) Served(o27) Served(o27) Served(o27) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #70 Robot-location(o16) {M(o16,1), R(o16), RF} 1), S(o6), S(o33), R(o7), S(o27)} Make(o16,1) Robot-location(o31)
Served(o33) Served(o27)); 31), S(o6), S(o33), R(o7), S(o27)); 01)); 15); 17]; 18]; 18]; 19]; 31), S(o6), S(o33), R(o7), S(o27); 19]; 19]; 19]; 19]; 19]; 19]; 19]; 19]	S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(o31), RL(1), P(o31,1)} Served(o31,1) 1), S(o6), S(o33), R(o7), S(o27)} Served(o33) Served(o27) Served(o27) Served(o19) Served(o19) Served(o13) Robot-location(o7) {S(a17), S(a18), S(a13), S(a19), S(o26), S(o1), S(o31), S(o6) Stack #70 Robot-location(o16) {M(o16,1), R(o16), RF} 1), S(o6), S(o33), R(o7), S(o27)} Make(o16,1) Robot-location(o31) {R(o31), RL(1), P(o31,1)}
Served(o33) Served(o27)); 31), S(o6), S(o33), R(o7), S(o27)); 01)); 15); 17]; 18]; 18]; 19]; 31), S(o6), S(o33), R(o7), S(o27); 19]; 19]; 19]; 19]; 19]; 19]; 19]; 19]	S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(o31), RL(1), P(o31,1)} Served(o31,1) 1), S(o6), S(o33), R(o7), S(o27)} Served(o27) Served(o27) Served(o26) Served(o13) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #70 Robot-location(o16) {M(o16,1), R(o16), RF} 1), S(o6), S(o33), R(o7), S(o27)} Make(o16,1) Robot-location(o31) (R(o31), RL(1), P(o31,1)) Serve(o31,1)
Served(o33) Served(o27)); 31), S(o6), S(o33), R(o7), S(o27)); 01)); 15); 17]; 18]; 18]; 19]; 31), S(o6), S(o33), R(o7), S(o27); 19]; 19]; 19]; 19]; 19]; 19]; 19]; 19]	S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(o31), RL(1), P(o31,1)} Served(o31,1) 1), S(o6), S(o33), R(o7), S(o27)} Served(o27) Served(o27) Served(o26) Served(o13) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #70 Robot-location(o16) {M(o16,1), R(o16), RF} 1), S(o6), S(o33), R(o7), S(o27)} Make(o16,1) Robot-location(o31) {R(o31), RL(1), P(o31,1)} Serve(o33,1) Serve(o33,1) Serve(o33,1) Serve(o33,1) Serve(o33,1) Serve(o33,1) Serve(o33,1)
Served(o33) Served(o27)); 31), S(o6), S(o33), R(o7), S(o27)); 01)); 15); 17]; 18]; 18]; 19]; 31), S(o6), S(o33), R(o7), S(o27); 19]; 19]; 19]; 19]; 19]; 19]; 19]; 19]	Stack #63	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(o31), RL(1), P(o31,1)} Served(o31,1) 1), S(o6), S(o33), R(o7), S(o27)} Served(o27) Served(o27) Served(o26) Served(o13) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #70 Robot-location(o16) {M(o16,1), R(o16), RF} 1), S(o6), S(o33), R(o7), S(o27)} Make(o16,1) Robot-location(o31) (R(o31), RL(1), P(o31,1)) Serve(o31,1)
Served(o33) Served(o27)); 31), S(o6), S(o33), R(o7), S(o27)); 01)); 15); 17]; 18]; 18]; 19]; 31), S(o6), S(o33), R(o7), S(o27); 19]; 19]; 19]; 19]; 19]; 19]; 19]; 19]	S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) R[o31), RL(1), P(o31,1)} Served(o31), Served(o33) Served(o27) Served(o26) Served(o27) Served(o13) Robot-location(o7) Served(o13) Robot-location(o7) Served(o13) Robot-location(o7) Served(o13) Robot-location(o7) Stack #70 Robot-location(o16) M(o16,1), R(o16), RF} Robot-location(o31) R(o31), RL(1), P(o31,1)} Served(o33) Served(o33) Served(o33) Served(o33) Served(o27)
Served(o33) Served(o27)); 31), S(o6), S(o33), R(o7), S(o27)); 01)); 15); 17]; 18]; 18]; 19]; 31), S(o6), S(o33), R(o7), S(o27); 19]; 19]; 19]; 19]; 19]; 19]; 19]; 19]	S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(b31), RL(1), P(o31,1)} Served(o31), Served(o33) Served(o27) Served(o26) Served(o19) Served(o20) Served(o20) Served(o20)
Served(o33) Served(o27)) 31), S(o6), S(o33), R(o7), S(o27))) (S(o17), S(o18), S(o13), S(o19),) (S(o17), S(o18), S(o13), S(o27)) (S(o17), S(o18), S(o13), S(o19), o1)	Scooling Scooling	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(b31), RL(1), P(o31,1)} Served(o31,1) 1), S(o6), S(o33), R(o7), S(o27)} Served(o27) Served(o27) Served(o28) Served(o19) Served(o20) Served(o13) Robot-location(o7)
Served(o33) Served(o27)) 31), S(o6), S(o33), R(o7), S(o27))) (S(o17), S(o18), S(o13), S(o19),) (S(o17), S(o18), S(o13), S(o27)) (S(o17), S(o18), S(o13), S(o19), o1)	Scooling Scooling	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R(o]), RF} Make([o],1) Robot-location(o31) {R(o31), RL(1), P(o31,1)} Served(o31,1) Served(o31,1) Served(o27) Served(o27) Served(o28) Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #70 Robot-location(o16) Robot-location(o31) Robot-location(o31) Robot-location(o31) Robot-location(o31) Served(o31,1) Served(o31,1) Served(o31,1) Served(o31,1) Served(o31) Served(o31) Served(o31) Served(o32) Served(o33) Served(o33) Served(o27) Served(o26) Served(o27) Served(o27) Served(o27) Served(o28) Served(o29) Served(o19) Served(o19) Served(o13)
Served(o33) Served(o27)), S(o6), S(o33), R(o7), S(o27)) (S(o17), S(o18), S(o13), S(o19), (S(o17), S(o18), S(o18), S(o13), S(o19), (S(o17), S(o18), S(o18), S(o18), S(o18), S(o18), (S(o17), S(o18), S(o18), S(o18), S(o18), S(o18), S(o18), (S(o17), S(o18), S	S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(o31), RL(1), P(o31,1)} Served(o31,1) Served(o27) Served(o27) Served(o28) Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Robot-location(o16) {M(o16,1), R(o16), RF} {M(o16,1), R(o16), RF
Served(o33) Served(o27)) 3I), S(o6), S(o33), R(o7), S(o27) (S(o17), S(o18), S(o13), S(o19), (S(o17), S(o18), S(o13), S(o19), (S(o17), S(o18), S(o13), S(o19), (S(o17), S(o18), S(o13), S(o19), (O11))	Stack #63	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(b31), RL(1), P(o31,1)} Served(o31) 1), S(o6), S(o33), R(o7), S(o27)} Served(o27) Served(o27) Served(o13) Served(o13) Robot-location(o7) {S(a17), S(a18), S(a13), S(a19), S(o26), S(o1), S(o31), S(o6) Robot-location(o31) Robot-location(o7) {Stack #70} Robot-location(o16) {M(o16,1), R(o16), RF} Robot-location(o31) Robot-location(o31) Robot-location(o31) Served(o33) Served(o34) Served(o36) Served(o37) Served(o37) Served(o38) Served(o39) Served(o39) Served(o39) Served(o31) Robot-location(o7) S(a17), S(a18), S(a13), S(a19), S(o26), S(o1), S(o31), S(o6) Stack #71
Served(o33) Served(o27)) 3I), S(o6), S(o33), R(o7), S(o27) (S(o17), S(o18), S(o13), S(o19), (S(o17), S(o18), S(o13), S(o19), (S(o17), S(o18), S(o13), S(o19), (S(o17), S(o18), S(o13), S(o19), (O11))	Stack #63	1), S(o6), S(o33), R(o7), S(o27)} Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Stack #69 1)} Machine([o],1) Robot-location([o]) {M([o],1), R([o]), RF} Make([o],1) Robot-location(o31) {R(o31), RL(1), P(o31,1)} Served(o31,1) Served(o27) Served(o27) Served(o28) Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6) Robot-location(o16) {M(o16,1), R(o16), RF} {M(o16,1), R(o16), RF

Robot-location([o1	1)	Robot-location(o	31)	Served(o33)
{R([o1])}	{R(o31), RL(1), P(o	31(1)}	Served(o27)
Move([o1],o16)	()	Serve(o31,1)	- / /)	Served(o26)
	DIE)			
$\{M(o16,1), R(o16), F(o16), F$	ΨF }	Served(o33)		Served(o19)
Make(o16,1)		Served(o27)		Served(o13)
Robot-location(o31	.)	Served(o26)		Robot-location(o7)
{R(o31), RL(1), P(o3)	1113	Served(o19)	{S(o17), S(o18), S(o13), S(o19),	S(o26) S(o1) S(o31) S(o6) S
	-,-/)		[5(011); 5(010); 5(010); 5(010);	5(020); 5(01); 5(001); 5(00); 5
Serve(o31,1)		Served(o13)		a. , ,,,,,
Served(o33)		Robot-location(o	7)	Stack #83
Served(o27)	{S(o17), S(o18), S(o13), S(o19),	S(o26), S(o1), S(o31), S(o6), S(o33), R(o7), S(o27)}	
Served(o26)		77 (77 (7, (), (), (),	4
		Stools #77		
Served(o19)		Stack #77		Petition(o33,[n])
Served(o13)]		
Robot-location(o7)	1		Robot-loaded([n])
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o26)	31) S(o6) S(o33) B(o7) S(o27)}	1		Robot-location(o33)
[5(517), 5(515), 5(615), 5(615), 5(625), 5(61), 5(61	7,, 2(13), 2(132), 14(21), 2(131)	Robot-location([o	1]) {P(o	33,[n]), R(o33), RL([n])}
G: 1 #F0		{R([o1])}		Serve(o33,[n])
Stack #72		Move([o1],o31)		
		(1 1/ /		Served(o27)
	{R((o31), RL(1), P(o	31,1)}	Served(o26)
		Serve(o31,1)		Served(o19)
{R(o1)}		Served(o33)		Served(o13)
Move(01,016)		Served(o27)		Robot-location(o7)
$\{M(o16,1), R(o16), F(o16), F$	(₱°}	Served(o26)	$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), S(o1), S(o31), S(o6), S(o6)
Make(o16,1)		Served(o19)		
Robot-location(o31	1	Served(o13)		Stack #84
{R(o31), RL(1), P(o3		Robot-location(o	7)	,, ,
				4
Serve(o31,1)	{S(017), S(018), S(013), S(019),	S(026), S(01), S(o31), $S(o6)$, $S(o33)$, $R(o7)$, $S(o27)$ }	
Served(o33)				
Served(o27)		Stack #78		Robot-loaded (2)
Served(o26)		1 """		Robot-location(o33)
		4	{P((o33,2), R(o33), RL(2)}
Served(o19)			(*)	
Served(o13)		(5(10))		Serve(o33,2)
Robot-location(o7		$\{R(o16)\}$		Served(o27)
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o26)		Move(o16,o31)		Served(o26)
$\{3(017), 3(018), 3(013), 3(019), 3(020), 3(01), 3(0.01)$	1, 3(00), 3(033), IL(01), 3(021);	o31), RL(1), P(o	31 1)}	Served(o19)
	[20]		02(1))	Served(o13)
Stack #73		Serve(o31,1)		
		Served(o33)		Robot-location(o7)
		Served(o27)	{S(o17), S(o18), S(o13), S(o19),	S(o26), S(o1), S(o31), S(o6), S
		Served(o26)		7. 7. 7. 7. 7. 7.
Move(o1,o16)		Served(o19)		Stack #85
	100	` ′		Stack #65
$\{M(o16,1), R(o16), F(o16), F$	(₱°}	Served(o13)		
Make(o16,1)		Robot-location(o	7)	
Robot-location(o31	\{S(\(\oldsymbol{o}\)\)\(S(\(\oldsymbol{o}\)\)\(S(\(\oldsymbol{o}\)\)\(S(\(\oldsymbol{o}\)\)\(S(\(\oldsymbol{o}\)\)\(S(\(\oldsymbol{o}\)\)\)	S(o26), S(o1), S($o31$), $S(o6)$, $S(o33)$, $R(o7)$, $S(o27)$ }	
{R(o31), RL(1), P(o3		(-=0), -(), -(7, 5 (5 5), 5 (5 5 7), 5 (5 5 7)	Robot-free
	1,1)}	Gr. 1 //70		Machine([o],2)
Serve(o31,1)		Stack #79		Robot-location([o])
Served(o33)				
Served(o27)		1	{	R([o]), RF, M([o],2)
Sarvad(o26)		1		Make([o],2)
Served(o26)		Move(o16 o31)		
Served(o26) Served(o19)	(D/	Move(o16,o31)		Robot-location(o33)
	{R(o31), RL(1), P(o		Robot-location(o33) o33,2), R(o33), RL(2)}
Served(019) Served(013)				Robot-location(o33)
Served (o19) Served (o13) Robot-location (o7		o31), RL(1), P(o Serve(o31,1)		Robot-location(o33) o33,2), R(o33), RL(2)} Serve(o33,2)
Served(019) Served(013)		o31), RL(1), P(o Serve(o31,1) Served(o33)		Robot-location(o33) o33,2), R(o33), RL(2)} Serve(o33,2) Served(o27)
Served (o19) Served (o13) Robot-location (o7		o31), RL(1), P(o Serve(o31,1) Served(o33) Served(o27)		Robot-location(033) 033,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026)
Served (o19) Served (o13) Served (o13) Robot-location (o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26)}		o31), RL(1), P(o Serve(o31,1) Served(o33)		Robot-location(o33) o33,2), R(o33), RL(2)} Serve(o33,2) Served(o27) Served(o26) Served(o19)
Served (o19) Served (o13) Robot-location (o7		o31), RL(1), P(o Serve(o31,1) Served(o33) Served(o27)		Robot-location(033) 033,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026)
Served (o19) Served (o13) Served (o13) Robot-location (o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26)}		031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019)		Robot-location(033) 033,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013)
Served (o19) Served (o13) Served (o13) Robot-location (o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26)}	31), S(o6), S(o33), R(o7), S(o27)}	o31), RL(1), P(o Serve(o31,1) Served(o33) Served(o27) Served(o26) Served(o19) Served(o13)	31,1)} {P(Robot-location(033) 033,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07)
Served (o19) Served (o13) Served (o13) Robot-location (o7 S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26) Stack #74	1), S(o6), S(o33), R(o7), S(o27)}	o31), RL(1), P(o Serve(o31,1) Served(o33) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o	31,1)} {P(Robot-location(033) 033,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07)
Served(019) Served(013) Robot-location(07) {S(017), S(018), S(013), S(019), S(026), S(01), S(026), S(01), S(026), S(02	1), S(o6), S(o33), R(o7), S(o27)}	o31), RL(1), P(o Serve(o31,1) Served(o33) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o	31,1)} {P(Robot-location(o33) o33,2), R(o33), RL(2)} Serve(o33,2) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), S
Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o	31), S(o6), S(o33), R(o7), S(o27)}	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(31,1)} {P(Robot-location(033) 033,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07)
Served(019) Served(013) Robot-location(07) {S(017), S(018), S(013), S(019), S(026), S(01), S(026), S(01), S(026), S(02	31), S(o6), S(o33), R(o7), S(o27)}	o31), RL(1), P(o Serve(o31,1) Served(o33) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o	31,1)} {P(Robot-location(o33) o33,2), R(o33), RL(2)} Serve(o33,2) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), S
Served(o19) Served(o19) Served(o13) Robot-location(o7) S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26),	\$1), S(o6), S(o33), R(o7), S(o27)} \$\text{F}\$S(o17), S(o18), S(o13), S(o19),	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(31,1)} {P(Robot-location(o33) o33,2), R(o33), RL(2)} Serve(o33,2) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), S
Served (o19) Served (o19) Served (o13) Robot-location (o7) S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26), S(o	\$1), S(o6), S(o33), R(o7), S(o27)} \$\text{F}\$S(o17), S(o18), S(o13), S(o19),	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(31,1)} {P(Robot-location(o33) o33,2), R(o33), RL(2)} Serve(o33,2) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), S
Served(o19) Served(o19) Served(o13) Served(o13) Robot-location(o7) S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26),	\$1), S(o6), S(o33), R(o7), S(o27)} \$\text{F}\$S(o17), S(o18), S(o13), S(o19),	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(31,1)} {P(Robot-location(033) 033,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Stack #86
Served(o19) Served(o19) Served(o13) Robot-location(o7) S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26),	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)}	Robot-location(033) 033,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Stack #86 Machine([0],2)
Served(o19) Served(o19) Served(o13) Served(o13) Robot-location(o7) S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26),	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(019) Served(010) (05(026), S(01), S(026), S(01), S(026), S(01), S(026), S(01), S(026), S(01), S(026), S(0	31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)}	Robot-location(033) 033,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Stack #86 Machine([0],2) Robot-location([0])
Served(o19) Served(o19) Served(o13) Robot-location(o7) S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26), S(o1), S(o26), S(o1), S(o26), S(o1), S(o26), S(\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)}	Robot-location(033) 033,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Stack #86 Machine([0],2)
Served(019) Served(019) Served(013) Served(013) Robot-location(07) Served(013) Robot-location(07) Served(013), Served(013), Served(014), Served(015) Ser	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(019) Served(010) (05(026), S(01), S(026), S(01), S(026), S(01), S(026), S(01), S(026), S(01), S(026), S(0	31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)}	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2)}
Served(o19) Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26),	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(033)	31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)}	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2)} Make([0],2)
Served(o19) Served(o19) Served(o13) Robot-location(o7) S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26),	R(s(o17), S(o18), S(o13), S(o19), S(o17), S(o18), S(o17), S(o18),	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(019) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(037)	31,1)} {P(7) {S(017), S(018), S(013), S(019), 031), S(06), S(033), R(07), S(027)}	Robot-location(033) 033,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2) Make([0],2) Robot-location(033)
Served(o19) Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26),	R(s(o17), S(o18), S(o13), S(o19), S(o17), S(o18), S(o17), S(o18),	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(010) Served(010) Served(010) Served(011) Served(011) Served(011) Served(033) Served(027) Served(026)	31,1)} {P(7) {S(017), S(018), S(013), S(019), 031), S(06), S(033), R(07), S(027)}	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2) Make([0],2) Robot-location(033) b33,2), R(033), RL(2)}
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), Served(o26) Served(o27) Served(o27) Served(o26) Served(o21) Served	R(031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(026)	31,1)} {P(7) {S(017), S(018), S(013), S(019), 031), S(06), S(033), R(07), S(027)}	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2)} Make([0],2) Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2)
Served(o19) Served(o19) Served(o13) Robot-location(o7) S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26),	R(031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(010) Served(010) Served(010) Served(011) Served(011) Served(011) Served(033) Served(027) Served(026)	31,1)} {P(7) {S(017), S(018), S(013), S(019), 031), S(06), S(033), R(07), S(027)}	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2) Make([0],2) Robot-location(033) b33,2), R(033), RL(2)}
Served(o19) Served(o19) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26),	(R(1), S(o6), S(o33), R(o7), S(o27)) (R(1), S(o18), S(o13), S(o19), S(o11), S(o11), S(o11), S(o11), S(o11), S(o11), S(o11), S(o21), S	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Served(031,1) Served(033) Served(027) Served(026) Served(029) Served(013)	31,1)} {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} 31,1)} { {P(Robot-location(033) 033,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2)} Make([0],2) Robot-location(033) 033,2), R(033), RL(2)} Served(027)
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), Served(o26) Served(o27) Served(o27) Served(o26) Served(o21) Served	R(031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(010) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(037) Served(027) Served(026) Served(019) Served(013) Robot-location(0)	31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)} 31,1)} { {P(Robot-location(033) 033,2), R(033), RL(2)} Serve(033,2) Serve(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2) Make([0],2) Robot-location(033) 033,2), R(033), RL(2)} Served(027) Served(027) Served(026)
Served(o19) Served(o19) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26),	R(031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(010) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(037) Served(027) Served(026) Served(019) Served(013) Robot-location(0)	31,1)} {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} 31,1)} { {P(Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2) Make([0],2) Robot-location(033) b33,2), R(033), RL(2)} Served(027) Served(026) Served(019)
Served(o19) Served(o19) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26),	R(031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(027) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019)	31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)} 31,1)} { {P(Robot-location(033) 033,2), R(033), RL(2)} Serve(033,2) Serve(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2) Make([0],2) Robot-location(033) 033,2), R(033), RL(2)} Served(027) Served(027) Served(026)
Served(o19) Served(o19) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26),	R(031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(027) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019)	31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)} 31,1)} { {P(Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2)} Make([0],2) Robot-location(033) b33,2), R(033), RL(2)} Served(027) Served(027) Served(026) Served(019) Served(013)
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o26)	R(031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(010) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(037) Served(027) Served(026) Served(019) Served(013) Robot-location(0)	31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)} 31,1)} {P(4P(7) o31), S(o6), S(o33), R(o7), S(o27)}	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2) Make([0],2) Robot-location(033) b33,2), R(033), RL(2)} Served(026) Served(027) Served(026) Served(013) Robot-location(07)
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o26)	\$\\ \text{F}\\$(\text{o17}), \text{S(\text{o18})}, \text{S(\text{o133})}, \text{R(\text{o7})}, \text{S(\text{o17})}, \text{S(\text{o18})}, \text{S(\text{o13})}, \text{S(\text{o19})}, \text{S(\text{o18})}, \text{S(\text{o18})}, \text{S(\text{o13})}, \text{S(\text{o17})}, \text{S(\text{o18})}, \text{S(\text{o17})}, \text{S(\text{o18})}, \text{S(\text{o19})}, S(\text{o1	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(027) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019)	31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)} 31,1)} { {P(Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2) Make([0],2) Robot-location(033) b33,2), R(033), RL(2)} Served(026) Served(027) Served(026) Served(013) Robot-location(07)
Served(o19) Served(o19) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o16), S(o26), S(o17), S(o18), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26), S(o11), S(o26), S(o11), S(o26),	\$R(so17), S(so18), S(so13), S(so19), S(so17), S(so18), S(so13), S(so19), S(so13), S(so13), S(so19), S(so13), S(so1	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(027) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019)	31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)} 31,1)} {P(4P(7) o31), S(o6), S(o33), R(o7), S(o27)}	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(04) Stack #86 Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2)} Make([0],2) Robot-location(033) b33,2), R(033), RL(2)} Served(027) Served(027) Served(027) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(026), S(01), S(031), S(06), S(031)
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o26)	\$R(so17), S(so18), S(so13), S(so19), S(so17), S(so18), S(so13), S(so19), S(so13), S(so13), S(so19), S(so13), S(so1	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(019) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Served(031,1) Served(031,1) Served(027) Served(027) Served(027) Served(019) Served(013) Robot-location(0 S(026), S(01), S(31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)} 31,1)} {P(4P(7) o31), S(o6), S(o33), R(o7), S(o27)}	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2) Make([0],2) Robot-location(033) b33,2), R(033), RL(2)} Served(026) Served(027) Served(026) Served(013) Robot-location(07)
Served(o19) Served(o19) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o16), S(o26), S(o17), S(o18), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26), S(o11), S(o26), S(o11), S(o26),	\$R(so17), S(so18), S(so13), S(so19), S(so17), S(so18), S(so13), S(so19), S(so13), S(so13), S(so19), S(so13), S(so1	031), RL(1), P(0 Serve(031,1) Served(033) Served(026) Served(027) Served(019) Served(019) Served(019) Served(010) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(019) Served(019) Served(019) Served(010) Served(010) Served(010) Served(010) Served(010) Served(010) Served(010) Served(010) Served(010) Served(011) Served(011) Served(011) Served(011) Served(011) Served(011)	31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)} 31,1)} {P(4P(7) o31), S(o6), S(o33), R(o7), S(o27)}	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(04) Stack #86 Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2)} Make([0],2) Robot-location(033) b33,2), R(033), RL(2)} Served(027) Served(027) Served(027) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(026), S(01), S(031), S(06), S(031)
Served(o19) Served(o19) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o26)	\$R(so17), S(so18), S(so13), S(so19), S(so17), S(so18), S(so13), S(so19), S(so13), S(so13), S(so19), S(so13), S(so1	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(019) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Served(031,1) Served(031,1) Served(027) Served(027) Served(027) Served(019) Served(013) Robot-location(0 S(026), S(01), S(31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)} 31,1)} {P(4P(7) o31), S(o6), S(o33), R(o7), S(o27)}	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(04) Stack #86 Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2)} Make([0],2) Robot-location(033) b33,2), R(033), RL(2)} Served(027) Served(027) Served(027) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(026), S(01), S(031), S(06), S(031)
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26),	\$R(so17), S(so18), S(so13), S(so19), S(so17), S(so18), S(so13), S(so19), S(so13), S(so13), S(so19), S(so13), S(so1	031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(019)	31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)} 31,1)} {P(4P(7) o31), S(o6), S(o33), R(o7), S(o27)}	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(04) Stack #86 Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2)} Make([0],2) Robot-location(033) b33,2), R(033), RL(2)} Served(027) Served(027) Served(027) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(026), S(01), S(031), S(06), S(031)
Served(o19) Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26), S(o1), S(o26), S(o1), S(o26) Stack #74 Make(o16,1) Robot-location(o31) {R(o31), RL(1), P(o3) Served(o21,1) Served(o33) Served(o27) Served(o27) Served(o27) Served(o26) Served(o19) Served(o19) Served(o13) Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26) Served(o27) Served(o33) Served(o33) Served(o331,1) Served(o33) Served(o27) Se	\$R(so17), S(so18), S(so13), S(so19), S(so17), S(so18), S(so13), S(so19), S(so13), S(so13), S(so19), S(so13), S(so1	031), RL(1), P(0 Serve(031,1) Served(023) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(013) Robot-location(0 S(026), S(01), S(Stack #81 Serve(031,1) Served(033) Served(033) Served(033) Served(033) Served(033) Served(033) Served(033) Served(033) Served(033)	31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)} 31,1)} {P(4P(7) o31), S(o6), S(o33), R(o7), S(o27)}	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2)} Make([0],2) Robot-location(033) b33,2), R(033), RL(2)} Served(027) Served(027) Served(027) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Stack #87
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26),	\$R(so17), S(so18), S(so13), S(so19), S(so17), S(so18), S(so13), S(so19), S(so13), S(so13), S(so19), S(so13), S(so1	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(019) Served(019) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Served(031,1) Served(027) Served(027) Served(027) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #81 Served(033) Served(037) Served(033) Served(027) Served(033) Served(027) Served(033) Served(027)	31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)} 31,1)} {P(7) (S(o17), S(o18), S(o13), R(o7), S(o27))} {P(07) (S(o17), S(o18), S(o13), S(o19), S(o17), S(o18), S(o13), S(o19), S(o18), S(o13), S(o19), S(o18),	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(031), S(06), S(031), S(06), S(031), S(06), S(0
Served(o19) Served(o13) Served(o13) Robot-location (o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), Served(o27) Served(o26) Served(o27) Served(o26) Served(o27) Served(o26) Served(o27) Served(o26) Served(\$R(so17), S(so18), S(so13), S(so19), S(so17), S(so18), S(so13), S(so19), S(so13), S(so13), S(so19), S(so13), S(so1	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #81 Served(031,1) Served(033) Served(035) Served(036) Served(036)	31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)} 31,1)} {P(7) (S(o17), S(o18), S(o13), R(o7), S(o27))} {P(07) (S(o17), S(o18), S(o13), S(o19), S(o17), S(o18), S(o13), S(o19), S(o18), S(o13), S(o19), S(o18),	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(04) Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2)} Make([0],2) Robot-location(033) b33,2), R(033), RL(2)} Served(027) Served(027) Served(027) Served(019) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(04) Served(05) Served(07) Served(07
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o26)	\$R(so17), S(so18), S(so13), S(so19), S(so17), S(so18), S(so13), S(so19), S(so13), S(so13), S(so19), S(so13), S(so1	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(019) Served(019) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Served(031,1) Served(027) Served(027) Served(027) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #81 Served(033) Served(037) Served(033) Served(027) Served(033) Served(027) Served(033) Served(027)	31,1)} {P(7) {S(o17), S(o18), S(o13), S(o19), o31), S(o6), S(o33), R(o7), S(o27)} 31,1)} {P(7) (S(o17), S(o18), S(o13), R(o7), S(o27))} {P(07) (S(o17), S(o18), S(o13), S(o19), S(o17), S(o18), S(o13), S(o19), S(o18), S(o13), S(o19), S(o18),	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(031), S(06), S(031), S(06), S(031), S(06), S(0
Served(o19) Served(o13) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26), S(o1), S(o26), S(o1), S(o26), S(o26), S(o26), S(o26), S(o26), S(o26), Served(o27) Served(o27) Served(o28) Served(o28) Served(o29) Served(o13) Served(o19) Served(o13) Served(o19) Served(o13) Served(o13) Served(o19) Served(o13) Served(\$\\ \text{R(o6)}, \text{S(o33)}, \text{R(o7)}, \text{S(o27)}\\ \text{R(S(o17)}, \text{S(o18)}, \text{S(o13)}, \text{S(o19)}, \text{S(o17)}, \text{S(o18)}, \text{S(o13)}, \text{S(o19)}, \text{S(o17)}, \text{S(o18)}, \text{S(o13)}, \text{S(o13)}, \text{S(o19)}, \text{S(o17)}, \text{S(o18)}, \text{S(o13)}, \text{S(o19)},	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(01) Served(013) Served(027) Served(031,1) Served(033) Served(027) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(027) Served(027) Served(033) Served(027) Served(027) Served(027) Served(026) Served(027) Served(026) Served(029) Served(019) Served(019)	31,1)} {P(77) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} 31,1)} { {P(77) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} {S(017), S(018), S(013), S(019), S(019)	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2)} Make([0],2) Robot-location(033) b33,2), R(033), RL(2)} Served(027) Served(027) Served(027) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Robot-location(07) S(026), S(01), S(031), S(06), S Stack #87 Robot-location(07) R(07), RF, M(07,2)} Make(07,2)
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o26)	\$\\ \text{S(o17), S(o18), S(o13), R(o7), S(o27)}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(019) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Served(031,1) Served(033) Served(027) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #81 Served(033) Served(027) Served(027) Served(026) Served(027) Served(027) Served(027) Served(028) Served(029) Served(019) Served(019) Served(019) Served(019) Served(019)	31,1)} {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} 31,1)} { {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} {S(017), S(018), S(013), S(019),	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(04) Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2) Make([0],2) Robot-location(033) b33,2), R(033), RL(2)} Served(027) Served(027) Served(026) Served(019)
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o26)	\$\\ \text{S(o17), S(o18), S(o13), R(o7), S(o27)}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(019) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Served(031,1) Served(033) Served(027) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #81 Served(033) Served(027) Served(027) Served(026) Served(027) Served(027) Served(027) Served(028) Served(029) Served(019) Served(019) Served(019) Served(019) Served(019)	31,1)} {P(77) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} 31,1)} { {P(77) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} {S(017), S(018), S(013), S(019), S(019)	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(01), S(031), S(06), S
Served(o19) Served(o13) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o1), S(o26), S(o1), S(o26), S(o1), S(o26), S(o26), S(o26), S(o26), S(o26), S(o26), Served(o27) Served(o27) Served(o28) Served(o28) Served(o29) Served(o13) Served(o19) Served(o13) Served(o19) Served(o13) Served(o13) Served(o19) Served(o13) Served(\$\\ \text{S(o17), S(o18), S(o13), R(o7), S(o27)}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(027) Served(027) Served(027) Served(027) Served(029) Served(031,1) Served(033) Served(039) Served(031,1) Served(033) Served(039) Served(031,1)	31,1)} {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} 31,1)} { {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} {S(017), S(018), S(013), S(019),	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(031), S(06), S(031), S(06), S(031), S(06), S(06)
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o26)	\$\\ \text{S(o17), S(o18), S(o13), R(o7), S(o27)}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	031), RL(1), P(0 Serve(031,1) Served(033) Served(027) Served(019) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Served(031,1) Served(033) Served(027) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #81 Served(033) Served(027) Served(027) Served(026) Served(027) Served(027) Served(027) Served(028) Served(029) Served(019) Served(019) Served(019) Served(019) Served(019)	31,1)} {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} 31,1)} { {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} {S(017), S(018), S(013), S(019),	Robot-location(o33) b33,2), R(o33), RL(2)} Serve(o33,2) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), S Machine([o],2) Robot-location([o]) R([o]), RF, M([o],2) Make([o],2) Robot-location(o33) b33,2), R(o33), RL(2)} Served(o27) Served(o26) Served(o19) Served(o19) Served(o19) Served(o19) Served(o19) Served(o26) Served(o27) Served(o27) Served(o28) Served(o29) Served(o19) Served(o19) Served(o19) Served(o19) Served(o20) Ser
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o26)	\$\\ \text{S(o17), S(o18), S(o13), R(o7), S(o27)}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(027) Served(027) Served(027) Served(027) Served(029) Served(031,1) Served(033) Served(039) Served(031,1) Served(033) Served(039) Served(031,1)	31,1)} {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} 31,1)} { {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} {S(017), S(018), S(013), S(019),	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2)} Make([0],2) Robot-location(033) b33,2), R(033), RL(2)} Served(027) Served(027) Served(027) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Stack #87 Robot-location(07) R(07), RF, M(07,2)} Make(07,2) Robot-location(033) b33,2), R(033), RL(2)} Served(027) Served(027) Served(027) Served(027) Served(027) Served(027) Served(027)
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o26)	\$\\ \text{S(o17), S(o18), S(o13), R(o7), S(o27)}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(027) Served(027) Served(027) Served(027) Served(029) Served(031,1) Served(033) Served(039) Served(031,1) Served(033) Served(039) Served(031,1)	31,1)} {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} 31,1)} { {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} {S(017), S(018), S(013), S(019),	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(06
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o26)	\$\\ \text{S(o17), S(o18), S(o13), R(o7), S(o27)}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(027) Served(027) Served(027) Served(027) Served(029) Served(031,1) Served(033) Served(039) Served(031,1) Served(033) Served(039) Served(031,1)	31,1)} {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} 31,1)} { {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} {S(017), S(018), S(013), S(019),	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S(01), S
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o26)	\$\\ \text{S(o17), S(o18), S(o13), R(o7), S(o27)}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(027) Served(027) Served(027) Served(027) Served(029) Served(031,1) Served(033) Served(039) Served(031,1) Served(033) Served(039) Served(031,1)	31,1)} {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} 31,1)} { {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} {S(017), S(018), S(013), S(019),	Robot-location(033) b33,2), R(033), RL(2)} Serve(033,2) Served(027) Served(026) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Machine([0],2) Robot-location([0]) R([0]), RF, M([0],2)} Make([0],2) Robot-location(033) b33,2), R(033), RL(2)} Served(027) Served(027) Served(027) Served(013) Robot-location(07) S(026), S(01), S(031), S(06), S Stack #87 Robot-location(07) R(07), RF, M(07,2)} Make(07,2) Robot-location(033) b33,2), R(033), RL(2)} Served(027) Served(029) Served(019) Served(019) Served(019) Served(019) Served(019)
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o26)	\$\\ \text{S(o17), S(o18), S(o13), R(o7), S(o27)}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(027) Served(027) Served(027) Served(027) Served(029) Served(031,1) Served(033) Served(039) Served(031,1) Served(033) Served(039) Served(031,1)	31,1)} {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} 31,1)} { {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} {S(017), S(018), S(013), S(019),	Robot-location(o33) b33,2), R(o33), RL(2)} Serve(o33,2) Served(o27) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), S Machine([o],2) Robot-location(o[o]) R([o]), RF, M([o],2) Make([o],2) Robot-location(o33) b33,2), R(o33), RL(2)} Served(o27) Served(o27) Served(o26) Served(o19) Served(o19) Served(o19) Served(o19) Served(o27) Served(o27) Served(o28) Served(o29)
Served(o19) Served(o13) Served(o13) Robot-location(o7 {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o26), S(o26)	\$\\ \text{S(o17), S(o18), S(o13), R(o7), S(o27)}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(026) Served(019) Served(013) Robot-location(0 S(026), S(01), S(Stack #80 031), RL(1), P(0 Serve(031,1) Served(027) Served(027) Served(019) Served(019) Served(019) Served(019) Served(019) Served(019) Served(027) Served(027) Served(027) Served(027) Served(029) Served(031,1) Served(033) Served(039) Served(031,1) Served(033) Served(039) Served(031,1)	31,1)} {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} 31,1)} { {P(7) {S(017), S(018), S(013), S(019), o31), S(06), S(033), R(07), S(027)} {S(017), S(018), S(013), S(019),	Robot-location(o33) b33,2), R(o33), RL(2)} Served(o33,2) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), S Machine([o],2) Robot-location([o]) R([o]), RF, M([o],2) Make([o],2) Robot-location(o33) b33,2), R(o33), RL(2)} Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), S Stack #87 Robot-location(o7) S(o26), S(o1), S(o31), S(o6), S Stack #87 Robot-location(o7) R(o7), RF, M(o7,2)} Make(o7,2) Robot-location(o33) b33,2), R(o33), RL(2)} Served(o26) Served(o27) Served(o27) Served(o27) Served(o26) Served(o27) Served(o26) Served(o27) Served(o26) Served(o27) Served(o26) Served(o26) Served(o213) Robot-location(o7)

Robot-location([o1]		Robot-location(o33)		Petition(o27,[n])
{R([o1])}	{P(o33,2), R(o33), RL	(2)}	Robot-loaded([n]) Robot-location(o27)
Move([o1],o7) {R(o7), RF, M(o7.2)	1	Serve(o33,2) Served(o27)	IB(a	27), $P(o27,[n])$, $RL([n])$
Make(07,2)	1	Served(o26)	11(0	Serve(o27,[n])
Robot-location(o33	0	Served(o19)		Served(o26)
{P(o33,2), R(o33), RL		Served(o13)		Served(o19)
Serve(o33,2)		Robot-location(o7)		Served(o13)
Served(o27)	{S(o17), S(o18), S(o13), S(o19),	S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)}	Robot-location(o7)
Served(o26)			$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), S(o1), S(o31), S(o6),
Served(o19)		Stack #94		
Served(o13)				Stack #101
Robot-location(o7)	1) ((a) ((aa) D(5) ((a5))			
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o36), S(o3$	$\{1, S(06), S(033), R(07), S(027)\}$	Robot-location([o1])	1
Ct1- #80		{R([o1])}	,	Robot-loaded(1)
Stack #89		Move([o1],o33)		Robot-location(o27)
	{P(o33,2), R(o33), RL	(2)} {R(o27), P(o27,1), RL(1)}
		Serve(o33,2)		Serve(o27,1)
$\{R(o31)\}$		Served(o27)		Served(o26)
Move(o31,o7)		Served(o26)		Served(o19)
$\{R(o7), RF, M(o7,2)\}$	}	Served(o19)		Served(o13)
Make(o7,2)		Served(o13)		Robot-location(o7)
Robot-location(o33			$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), S(o1), S(o31), S(o6),
	(20\$(o17), S(o18), S(o13), S(o19),	S(o26), S(o1), S(o3)	1), $S(o6)$, $S(o33)$, $R(o7)$, $S(o27)$ }]
Serve(033,2)		Gu. 1 1125		Stack #102
Served(o27)		Stack #95		
Served(o26)				
Served(o19)				Robot-free
Served(o13)		{R(o7)}		Machine([o],1)
Robot-location(07)	1) C(-6) C(-22) D(-7) C(-27)]	Move(o7,o33)		Robot-location([o])
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)\}$	$\{P(00), S(003), K(01), S(021)\}$	o33,2), R(o33), RL	(2)}	M([o],1), R([o]), RF}
Stack #90		Serve(o33,2)		Make([o],1)
Stack #30		Served(o27)		Robot-location(o27)
		Served(o26)	{R(o27), P(o27,1), RL(1)}
		Served(o19)		Serve(o27,1)
Move(o31,o7)		Served(o13)		Served(o26)
$\{R(o7), RF, M(o7,2)\}$	}	Robot-location(o7)		Served(o19)
Make(o7,2)		S(o26), S(o1), S(o3)	1), $S(o6)$, $S(o33)$, $R(o7)$, $S(o27)$ }	Served(o13)
Robot-location(o33				Robot-location(o7)
{P(o33,2), R(o33), RL	(2)}	Stack #96	$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), S(o1), S(o31), S(o6),
Serve(033,2)				G: 1 //100
Served(o27)				Stack #103
Served(o26)		Move(o7,o33)		1
Served(o19) Served(o13)	{P(o33,2), R(o33), RL	(2)}	1
Robot-location(o7)		Serve(o33,2)		Machine([o],1)
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3	1) S(o6) S(o33) B(o7) S(o27) l	Served(o27)		Robot-location([o])
[5(017), 5(010), 5(010), 5(010), 5(020), 5(01), 5(00		Served(o26)	{	M([o],1), R([o]), RF
Stack #91		Served(o19)	-	Make([o],1)
# T T T T T T T T T T T T T T T T T T T		Served(o13)		Robot-location(o27)
		Robot-location(o7)	{R(p27), P(o27,1), RL(1)}
	$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), S(o1), S(o3)	1), $S(o6)$, $S(o33)$, $R(o7)$, $S(o27)$ }	Serve(o27,1)
$\{R(o7), RF, M(o7,2)\}$	1}			Served(o26)
Make(o7,2)		Stack #97		Served(o19)
Robot-location(o33	,			Served(o13)
{P(o33,2), R(o33), RL	(2)}			Robot-location(o7)
Serve(o33,2)	f Pf	o33,2), R(o33), RL	$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), S(o1), S(o31), S(o6),
Served(o27)	[1]	Serve(033,2)	(2)]	d. 1 "104
Served(o26)		Served(o27)		Stack #104
Served(o19)		Served(o26)		1
Served(o13)				1
		f Served(o19)		
Robot-location(o7)	1) C(o6) C(c22) D(c7) C(07)	Served(o19) Served(o13)		Robot-location(o16)
	1), S(o6), S(o33), R(o7), S(o27)}	Served(o13)		
Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3		Served(o13) Robot-location(o7)	<i>I</i> }	(o16,1), R(o16), RF}
Robot-location(o7)	1), S(o6), S(o33), R(o7), S(o27)} {S(o17), S(o18), S(o13), S(o19),	Served(o13) Robot-location(o7)	{N 1), S(o6), S(o33), R(o7), S(o27)}	(o16,1), R(o16), RF} Make(o16,1)
Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3		Served(o13) Robot-location(o7)	[N] [N] (1), S(o6), S(o33), R(o7), S(o27)]	(o16,1), R(o16), RF}
Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3		Served (013) Robot-location (07) S(026), S(01), S(03)	[N] [N] (1), S(o6), S(o33), R(o7), S(o27)]	(o16,1), R(o16), RF} Make(o16,1) Robot-location(o27)
Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3		Served (013) Robot-location (07) S(026), S(01), S(03)	[N] [N] (1), S(o6), S(o33), R(o7), S(o27)]	(o16,1), R(o16), RF} Make(o16,1) Robot-location(o27) (o27), P(o27,1), RL(1)}
Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3) Stack #92	{S(o17), S(o18), S(o13), S(o19),	Served(013) Robot-location(07) S(026), S(01), S(03) Stack #98	[N] [N] (1), S(o6), S(o33), R(o7), S(o27)]	(o16,1), R(o16), RF} Make(o16,1) Robot-location(o27) o27), P(o27,1), RL(1)} Serve(o27,1)
Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3) Stack #92 Make(o7,2)	{S(o17), S(o18), S(o13), S(o19),	Served(013) Robot-location(07) S(026), S(01), S(03) Stack #98 Serve(033,2)	[N] [N] (1), S(o6), S(o33), R(o7), S(o27)]	(016,1), R(016), RF} Make(016,1) Robot-location(027) 027), P(027,1), RL(1)} Serve(027,1) Served(026) Served(019) Served(013)
Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3) Stack #92 Make(o7,2) Robot-location(o33)	{S(o17), S(o18), S(o13), S(o19),	Served(o13) Robot-location(o7) S(o26), S(o1), S(o3) Stack #98 Serve(o33,2) Served(o27)	{N 1), S(o6), S(o33), R(o7), S(o27)} {R((o16,1), R(o16), RF} Make(o16,1) Robot-location(o27) o27), P(o27,1), RL(1)} Serve(o27,1) Served(o26) Served(o19) Served(o13) Robot-location(o7)
Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3) Stack #92 Make(o7,2) Robot-location(o33) {P(o33,2), R(o33), R(o33), R(o33) Serve(o33,2) Served(o27)	{S(o17), S(o18), S(o13), S(o19),	Served(o13) Robot-location(o7) S(o26), S(o1), S(o3) Stack #98 Serve(o33,2) Served(o27) Served(o26)	[N] [N] (1), S(o6), S(o33), R(o7), S(o27)]	(o16,1), R(o16), RF} Make(o16,1) Robot-location(o27) o27), P(o27,1), RL(1)} Serve(o27,1) Served(o26) Served(o19) Served(o13) Robot-location(o7)
Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3) Stack #92 Make(o7,2) Robot-location(o33) {P(o33,2), R(o33), RL Served(o27) Served(o26)	{S(o17), S(o18), S(o13), S(o19),	Served(013) Robot-location(07) S(026), S(01), S(03) Stack #98 Serve(033,2) Served(027) Served(026) Served(019)	{N 1), S(o6), S(o33), R(o7), S(o27)} {R((o16,1), R(o16), RF} Make(o16,1) Robot-location(o27) o27), P(o27,1), RL(1)} Serve(o27,1) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6),
Robot-location(07) {S(017), S(018), S(013), S(019), S(026), S(01), S(03) Stack #92 Make(07,2) Robot-location(033) {P(033,2), R(033), RL Serve(037,2) Served(027) Served(026) Served(019)	{S(o17), S(o18), S(o13), S(o19),	Served(013) Robot-location(07) S(026), S(01), S(03) Stack #98 Serve(033,2) Served(027) Served(026) Served(019) Served(013)	{N 1), S(o6), S(o33), R(o7), S(o27)} {R((o16,1), R(o16), RF} Make(o16,1) Robot-location(o27) o27), P(o27,1), RL(1)} Serve(o27,1) Served(o26) Served(o19) Served(o13) Robot-location(o7)
Robot-location(07) {S(017), S(018), S(013), S(019), S(026), S(01), S(03) Stack #92 Make(07,2) Robot-location(033) {P(033,2), R(033), RL Serve(033,2) Served(027) Served(027) Served(026) Served(019) Served(013)	{S(o17), S(o18), S(o13), S(o19),	Served(013)	$\{S(o17), S(o18), S(o13), S(o13), S(o19), S(o17), S(o18), S(o13), S(o19), S(o18), S(o18), S(o19), S(o19), S(o18), S(o18), S(o18), S(o19), S(o18), S(o$	(o16,1), R(o16), RF} Make(o16,1) Robot-location(o27) o27), P(o27,1), RL(1)} Serve(o27,1) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6),
Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)	{S(o17), S(o18), S(o13), S(o19), 2)} 	Served(013)	$\{S(o17), S(o18), S(o13), S(o13), S(o19), S(o17), S(o18), S(o13), S(o19), S(o18), S(o18), S(o19), S(o19), S(o18), S(o18), S(o18), S(o19), S(o18), S(o$	(o16,1), R(o16), RF} Make(o16,1) Robot-location(o27) o27), P(o27,1), RL(1)} Served(o27,1) Served(o26) Served(o19) Served(o13) Robot-location(o7) S(o26), S(o1), S(o31), S(o6), S(o1), S(o26),
Robot-location(07) {S(017), S(018), S(013), S(019), S(026), S(01), S(03) Stack #92 Make(07,2) Robot-location(033) {P(033,2), R(033), RL Serve(033,2) Served(027) Served(027) Served(026) Served(019) Served(013)	{S(o17), S(o18), S(o13), S(o19), 2)} 	Served(013)	$\{S(o17), S(o18), S(o13), S(o13), S(o19), S(o17), S(o18), S(o13), S(o19), S(o18), S(o18), S(o19), S(o19), S(o18), S(o18), S(o18), S(o19), S(o18), S(o$	(016,1), R(016), RF} Make(016,1) Robot-location(027) 027), P(027,1), RL(1)} Serve(027,1) Served(026) Served(019) Served(013) Robot-location(07) S(026), S(01), S(031), S(06),

Stack #93

Served(o27)
Served(o26)
Served(o19)
Served(o13)
Robot-location(o7)
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6), S(o33), R(o7), S(o27)\}$

$ \begin{array}{c cccc} \{R([o1])\} & \{R([o1])\} & \\ Move([o1],o16) & Move([o1],o27) \\ \{M(o16,1), R(o16), RF\} & \{R(o27), P(o27,1), RL[1)\} \\ \hline & Make(o16,1) & Serve(o27,1) \\ Robot-location(o27) & Served(o26) \\ \{R(o27), P(o27,1), RL[1)\} & Served(o19) \\ \hline & Serve(o27,1) & Served(o19) \\ \hline & Served(o26) & Robot-location(o7) \\ \hline & Served(o29) & \{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6), S(o18), S(o26), S(o11), S(o31), S(o6), S(o18), S$	Robot-loaded(1)
$ \begin{array}{c cccc} \{M(o16,1),R(o16),RF\} & \{R(o27),P(o27,1),RL(1)\} \\ \hline & Make(o16,1) & Serve(o27,1) \\ \hline & Robot-location(o27) & Served(o26) \\ \hline & \{R(o27),P(o27,1),RL(1)\} & Served(o19) \\ \hline & Serve(o27,1) & Served(o13) & \{S(o17),S(o17)$	Robot-location(o26)
$\begin{array}{c cccc} & \operatorname{Make}(o16,1) & \operatorname{Serve}(o27,1) \\ & \operatorname{Robot-location}(o27) & \operatorname{Served}(o26) \\ & \left\{ R(o27), P(o27,1), \operatorname{RL}(1) \right\} & \operatorname{Served}(o19) \\ & \operatorname{Serve}(o27,1) & \operatorname{Served}(o13) & \left\{ S(o17), S(o$	$\{R(b26), P(o26,1), RL(1)\}\$ Serve(o26,1)
$ \begin{array}{c cccc} Robot-location(o27) & Served(o26) \\ \hline \{R(o27), P(o27,1), RL\{1\}\} & Served(o19) \\ \hline Serve(o27,1) & Served(o13) & \{S(o17), Served(o26)\} \\ \hline Served(o26) & Robot-location(o7) \\ \hline \end{array} $	Serve(020,1) Served(019)
$ \begin{array}{c cccc} Served(o27,1) & Served(o13) & \{S(o17), S\\ Served(o26) & Robot-location(o7) \end{array} $	Served(o13)
Served(o26) Robot-location(o7)	Robot-location(o7)
	S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6),
	S(o33), R(o7), S(o27)} Stack #119
Served(013)	,, ====================================
Robot-location(o7) Stack #112	
$ \left[\{ \text{S}(\text{o}17), \text{S}(\text{o}18), \text{S}(\text{o}13), \text{S}(\text{o}19), \text{S}(\text{o}26), \text{S}(\text{o}1), \text{S}(\text{o}31), \text{S}(\text{o}6), \text{S}(\text{o}33), \text{R}(\text{o}7), \text{S}(\text{o}27) \} \right] $	Robot-free
Stack #106	Machine([o],1)
$\{R(o16)\}$	Robot-location([o])
$ \begin{array}{c c} & \text{Move}(\text{o}16,\text{o}27) \\ \hline & \{\text{R}(\text{o}27),\text{P}(\text{o}27,1),\text{RL}(1)\} \end{array} $	$\{M([o],1), R([o]), RF\}$ $Make([o],1)$
$\{R(o33)\} \qquad \frac{\{R(o27,1),Ro17\}}{Serve(o27,1)}$	Robot-location(o26)
Move(o33,o16) Served(o26)	$\{R(o26), P(o26,1), RL(1)\}$
{M(o16,1), R(o16), RF} Served(o19)	Serve(026,1)
Make(o16,1) Served(o13) Robot-location(o27) Robot-location(o7)	Served(o19) Served(o13)
	S(o33), R(o7), S(o27) Robot-location(o7)
$Serve(o27,1) {Solve} (score) $	S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6),
Served(o26) Stack #113	Ct 1 //100
Served(o19) Served(o13)	Stack #120
Robot-location (o7)	
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6), S(o33), R(o7), S(o27)\}$ Move(o16,o27)	M. 1: ([11)
$ \frac{\{\Re(527), \Pr(o27,1), \Re L(1)\}}{\{\Re(o27,1), \Pr(o27,1), \Pr(o27,1)\}} $	$\begin{array}{c} \operatorname{Machine}([o],1) \\ \operatorname{Robot-location}([o]) \end{array}$
Stack #107 Serve(o27,1) Serve(o26)	{M([o],1), R([o]), RF}
Served(o19)	Make([o],1)
Served(o13)	Robot-location(o26)
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	$\{R(o26), P(o26,1), RL(1)\}\$ $\{S(o33), R(o7), S(o27)\}\}$ Serve $\{o26,1\}$
Make(o16,1)	Served(019)
Robot-location(o27) Stack #114	Served(o13)
$\{R(o27), P(o27,1), RL(1)\}$	Robot-location(o7)
	S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6),
$\frac{\{R(p27), P(o27,1), RL(1)\}}{\{R(p27), P(o27,1), RL(1)\}}$	Stack #121
Served(o13) Serve(o27,1)	
Robot-location(07) Served(026) [S(c17) S(c12) S(c12) S(c12) S(c21) S(c21) S(c21) S(c22) R(c7) S(c22) Served(019)	
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6), S(o33), R(o7), S(o27)\}\$	Robot-location(o16)
Stack #108 Robot-location(o7)	$\{M(o16,1), R(o16), RF\}$
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6), S(o1), S(o6), S(o1), S(o6), S(o1), S(o10), S($	
Stack #115	Robot-location(o26) $\{R(o26), P(o26,1), RL(1)\}$
{M(o16,1), R(o16), RF}	Serve(o26,1)
Make(o16,1)	Served(o19)
Robot-location(o27) [R(o27) P(o27 1) RI(1)] Serve(o27,1)	Served(o13)
(1027), $(027,1)$, $(027,1)$, $(027,1)$	Robot-location (o7) S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6),
Served(o26) Served(o19)	(616), 5(616), 5(601),
Served(o19) Served(o13)	Stack #122
	S(033) R(07) S(027)}
Robot-location(07) (Color), S(o13), S(o13), S(o17), S(o17), S(o18), S(o17), S(o18), S(o17), S(o18), S(5(656), 10(61), 5(621)]
[5(617), 5(616), 5(616), 5(617), 5(617), 5(617), 5(617), 5(617), 5(617), 5(617)] Stack #116	Robot-location([o1])
Stack #109	
	{M(o16,1), R(o16), RF}
Served(o26)	Make(o16,1)
Make(o16,1) Served(o19)	Robot-location(o26)
C	{R(o26), P(o26,1), RL(1)}
Robot-location (o27) Served (o13)	S(o33), R(o7), S(o27) Serve(o26,1) Served(o19)
Robot-location (o27) Served (o13)	Served(o13)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Robot-location(o7)
Robot-location(o27) Served(o13) {R(o27), P(o27,1), RL I1)} Robot-location(o7) Serve(o27,1) (S(o17), S(o18), S(o19), S(o26), S(o1), S(o3t), S(o6), S(o1), S(o26), S(o1), S(o3t), S(o26), S(o1), S(o26), S(o26	
Robot-location(o27) Served(o13)	S(o18), S(o13), S(o19), S(o26), S(o1), S(o31), S(o6),
Robot-location(o27)	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Stack #123
Robot-location(o27) {R(o27), P(o27,1), RL 1)} Served(o27,1) Serve(o27,1) Serve(o27,1) Serve(o27,1) Serve(o27,1) Served(o28) Served(o26) Served(o26) Served(o19) Served(o13) Robot-location(o7) (S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o34), S(o6), S(o19), S(o26), S(o17), S(o26), S(o17), S(o26), S(o17), S(o27), S(o	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Stack #123
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Stack #123 {R(027)} Move(027,016) {W(016,1), R(016), RF}
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Stack #123 {R(o27)} Move(o27,o16) {M(o16,1), R(o16), RF} Make(o16,1) Alaberta
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Stack #123 {R(o27)} Move(o27,o16) {M(o16,1), R(o16), RF} Make(o16,1) Alaberta
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Stack #123 {R(o27)} Move(o27,o16) {M(o16,1), R(o16), RF} Make(o16,1)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Stack #123 {R(o27)} Move(o27,o16) {M(o16,1), R(o16), RF} Make(o16,1) Robot-location(o26) S(o33), R(o7), S(o22) R(o26,1), RL(1)} Serve(o26,1) Served(o19)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	R(o27)} Move(o27,o16) M(o16,1), R(o16), RF} Make(o16,1) Robot-location(o26) Serve(o26,1), RL(1)} Serve(o26,1) Served(o19) Served(o13)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Stack #123 {R(o27)} Move(o27,o16) {M(o16,1), R(o16), RF} Make(o16,1) Robot-location(o26) \$(o33), R(o7), S(o22) R(o26), P(o26,1), RL(1)} Serve(o26,1) Served(o19)

Move(o27,o16)		(o26), P(o26,1), RL		Robot-location(o25)
$\{M(o16,1), R(o16), F(o16), F$	F}	Serve(o26,1)	{F	(o25), RF, M(o25,3)}
Make(o16,1)		Served(o19)		Make(o25,3)
Robot-location(o26		Served(o13)		Robot-location(o19)
{R(o26), P(o26,1), RL	4	Robot-location(o7)) IP(o19,3), RL(3), R(o19)}
Serve(o26,1)	{S(o17), S(o18), S(o13), S(o19),		31), S(o6), S(o33), R(o7), S(o27)}	Serve(o19,3)
	[[5(017), 5(010), 5(010), 5(010),	5(020), 5(01), 5(03	1), 5(00), 5(033), 11(01), 5(021)}	
Served(o19)		4		Served(o13)
Served(o13)		Stack #132		Robot-location(o7)
Robot-location(o7))		$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), S(o1), S(o31), S(o6), S(o31), S(o6), S(o31), S(o6), S(o
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3	(1), S(o6), S(o33), R(o7), S(o27)}	1		
				Stack #139
Stack #125		Serve(o26,1)]
7 ·		Served(o19)		
		Served(o13)		1
		Robot-location(o7)		Robot-location([o1])
[M(-16.1) D(-16) D	E00(-17) C(-10) C(-12) C(-10)			
	F(S(o17), S(o18), S(o13), S(o19),	5(026), 5(01), 5(03	S(0, S(0, S(0, S(0, S(0, S(0, S(0, S(0,	{R([o1])}
Make(o16,1)				Move([o1],o25)
Robot-location(o26)	Stack #133	{F	R(o25), RF, M(o25,3)}
{R(o26), P(o26,1), RL	(1)}	1		Make(o25,3)
Serve(o26,1)		1		Robot-location(o19)
Served(o19)		1		ρ19,3), RL(3), R(ο19)}
		Served(o19)	111	
Served(o13)		Served(o13)		Serve(o19,3)
Robot-location(o7)		Robot-location(o7)		Served(o13)
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o36), S(o3$	1) S(o6), S(o33), R(o7), S(o27)}	Robot-location(07))	Robot-location(o7)
	$\{S(o17), S(o18), S(o13), S(o19),$	-S(o26), S(o1), S(o3)	1) s?(v9), \$(873), \$(873), \$(873),	S(o26), S(o1), S(o31), S(o6),
Stack #126			(- () / - () / - () / - () /	
		Stack #134		Stack #140
				Stack #140
35.1 (10.1)		7		
Make(o16,1)		Petition(o19,[n])		1
Robot-location(o26				$\{R(o26)\}$
{R(o26), P(o26,1), RL	(1)}	Robot-loaded([n])		Move(o26,o25)
Serve(o26,1)	7,3	Robot-location(o19	(B	(o25), RF, M(o25,3)}
	{P(o	9,[n]), RL([n]), R((b19)}	
Served(o19)		Serve(o19,[n])	, , ,	Make(o25,3)
Served(o13)				Robot-location(o19)
Robot-location(o7)		Served(o13)	{P(619,3), RL(3), R(o19)}
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3	1), S(o6), S(o33), R(o7), S(o27)}	Robot-location(o7))	Serve(o19,3)
[-()/()/()/()/()/()/()/()/()/()/()/()/()/()/()/()/()/(\{\(\frac{17}{3}\), \(\frac{18}{3}\), \(\frac{13}{3}\), \(\frac{19}{3}\),	S(o26), S(o1), S(o3	$\{1, S(o6), S(o33), R(o7), S(o27)\}$	Served(o13)
Stools #127				
Stack #127		Stack #135	(0/ 15) 0/ 10) 0/ 10)	Robot-location(o7)
		,,	$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), S(o1), S(o31), S(o6), S(o6)
		_		Stack #141
Robot-location(o26)			· ·
{R(o26), P(o26,1), RL	(1)}	Robot-loaded(3)		
Serve(o26,1)	73	Robot-location(o19))	
Served(o19)	{P(o19,3), RL(3), R(o	19)}	Move(o26,o25)
		Serve(o19,3)		
Served(o13)			{ b	(o25), RF, M(o25,3)}
Robot-location(o7)		Served(o13)		Make(o25,3)
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3	1), S(o6), S(o33), R(o7), S(o27)}	Robot-location(o7))	Robot-location(o19)
	 {S(o17), S(o18), S(o13), S(o19),	-S(o26), S(o1), S(o3)	1), S(06), S(033), R(07), S(027)	619.3) BL(3) B(619)}
Stack #128			1. (Serve(o19,3)
Stack #128		Stack #136		
		**		Served(o13)
				Robot-location(o7)
		-	$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), S(o1), S(o31), S(o6), S
Robot-location([o1]	}	Robot-free		1
$\{R([o1])\}$				Stack #142
Move([o1],o26)		Machine([o],3)		J 5000H # 112
{R(o26), P(o26,1), RL	(1)}	Robot-location([o]))	
Serve(o26,1)	[']	R([o]), RF, M([o],3)	E)}	
		Make([o],3))(.05) DE M(.05.0)3
Served(o19)		Robot-location(o19	\ \{ \(\begin{align*}	(o25), RF, M(o25,3)}
Served(o13)	(D)			Make(o25,3)
Robot-location(o7)	{P(o19,3), RL(3), R(o	19)]	Robot-location(o19)
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3	1), S(o6), S(o33), B(o7), S(o27)}	Serve(o19,3)	(b)	o19,3), RL(3), R(o19)}
(// - (/) - (/) - (/)	Served(o13)		Serve(o19,3)
C41- //100		Robot-location(o7)		C 1/ 10)
Stack #129	{S(017) S(018) S(013) S(010)	S(o26) S(o1) S(o2	1), S(o6), S(o33), R(o7), S(o27)	Served(o13)
	[[[[]]]], [[]], [[]], [[]], [[]], [[]], [[]],	2(320), 2(01), 2(03		
		Q1. 1 // 0=	{S(o17), S(o18), S(o13), S(o19),	$S(o26), S(o1), \overline{S(o31)}, S(o6), S($
		Stack #137	· · · · · · · · · · · · · · · · · · ·	
$\{R(o16)\}$				Stack #143
Move(o16,o26)				
{R(o26), P(o26,1), RL	(1)}			_
Serve(o26,1)		Machine([o],3)		
		Robot-location([o])		Malan(agr g)
Served(o19)	r	R([o]), RF, M([o],3	h-	Make(o25,3)
Served(o13)			l'	Robot-location(o19)
Robot-location(o7)		Make([o],3)	{P(o19,3), RL(3), R(o19)}
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o36)	1), S(o6), S(o33), R(o7), S(o27)}	Kobot-location(o19))	Serve(o19,3)
	(F)	(19,3), RL(3), R(o	19)}	Served(o13)
Ct . 1 #100		Serve(o19,3)		` /
Stack #130		Served(o13)		Robot-location(o7)
			$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), S(o1), S(o31), S(o6), S(o6)
	(0/ 15) 0/ 10) 5/ 15	Robot-location(o7))	
	[S(o17), S(o18), S(o13), S(o19),	S(o26), S(o1), S(o3)	S(6), $S(6)$, $S(6)$, $S(6)$, $S(6)$, $S(6)$	Stack #144
Move(o16,o26)				
{R(o26), P(o26,1), RL	(1)}	Stack #138		
Serve(o26,1)		1 "		
		+		Dobot loant:/-10\
Served(o19)		4		Robot-location(o19)
Served(o13)		_	{P(o19,3), RL(3), R(o19)}
Robot-location(o7)				Serve(o19,3)
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3	(1), S(o6), S(o33), R(o7), S(o27)}	1		Served(o13)
	,, , , , , , , , , , , , , , , , , , ,	_		Robot-location(o7)
			1	

Robot-location([o1]	þ	Robot-free		Make(o25,3)
{R([o1])}		Machine([o],3) Robot-location([o])	(D/	Robot-location(o13)
Move([o1],o19) {P(o19,3), RL(3), R(o	[9)} {	R([o]), RF, $M([o],3]$		613,3), RL(3), R(613)} Serve(613,3)
Serve(o19,3)		Make([o],3)		Robot-location(o7)
Served(o13)				S(o26), S(o1), S(o31), S(o6), S(o6)
Robot-location(o7) {S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3), S(o3)		o13,3), RL(3), R(o Serve(o13,3)	13)}	Stack #161
[5(617), 5(616), 5(616), 5(617), 5(626), 5(61), 5(61	1), 5(60), 5(600), 11(61), 5(621)]	Robot-location(o7)		
Stack #146	$\{S(o17), S(o18), S(o13), S(o19),$	S(o26), S(o1), S(o3)	1), $S(o6)$, $S(o33)$, $R(o7)$, $S(o27)$ }]
		Stack #154		Robot-location(o13)
(7) (2)		1	{P((o13,3), RL(3), R(o13)}
${R(o25)}$ $Move(o25,o19)$		_		Serve(o13,3) Robot-location(o7)
{P(o19,3), RL(3), R(o	19)}	Machine([o],3)	{S(o17), S(o18), S(o13), S(o19),	
Serve(019,3)		Robot-location([o])		
Served(o13) Robot-location(o7)	{	R([o]), RF, M([o],3) $Make([o],3)$)}	Stack #162
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)})	-
		o13,3), RL(3), R(o		Robot-location([o1])
Stack #147		Serve(o13,3) Robot-location(o7)		{R([o1])}
	{S(o17), S(o18), S(o13), S(o19),		1), S(o6), S(o33), R(o7), S(o27)}	Move([o1],o13)
Move(o25,o19)	77 (77 (77 (77	1	(P)	513,3), RL(3), R(o13)}
{P(o19,3), RL(3), R(o	19)}	Stack #155		Serve(o13,3) Robot-location(o7)
Serve(o19,3)	73		{S(o17), S(o18), S(o13), S(o19),	
Served(o13)		D.1.4.1		Starl- #162
Robot-location(07) {S(017), S(018), S(013), S(019), S(026), S(01), S(03), S(03)	1), S(o6), S(o33), B(o7), S(o27)&	Robot-location(o25 (o25), RF, M(o25.	,	Stack #163
[=(==), =(===), =(===), =(===), =(===), =(==),	-/, = (==/, = (==/), = (==/)	Make(o25,3)	-/1	
Stack #148		Robot-location(o13		{R(o25)}
	{P(o13,3), RL(3), R(o Serve(o13,3)	[3)}	Move(o25,o13)
		Robot location(o7)		o13,3), RL(3), R(o13)}
{P(o19,3), RL(3), R(o Serve(o19,3)	9)3(o17), S(o18), S(o13), S(o19),	S(o26), S(o1), S(o3)	1), S(o6), S(o33), R(o7), S(o27)}	Serve(o13,3) Robot-location(o7)
Served(o13)		Stack #156	{S(o17), S(o18), S(o13), S(o19),	
Robot-location (07)]		G. 1 //104
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3)\}$	31), S(o6), S(o33), R(o7), S(o27)}			Stack #164
Stack #149		Robot-location([o1])	1
		{R([o1])}		Move(o25,o13)
	(E	Move([o1],o25) R(o25), RF, M(o25)	{P(o13,3), RL(3), R(o13)}
Serve(o19,3)	11	Make(o25,3)	7,3	Serve(o13,3)
Served(o13) Robot-location(o7)		Robot-location(o13	$\{S(017), S(018), S(013), S(019), \}$	Robot-location(07)
{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3	$\{P(1), S(06), S(033), R(07), S(027)\}$	513,3), RL(3), R(o) Serve(o13,3)	13)3(017), 5(010), 5(010), 5(010),	5(020), 5(01), 5(001), 5(00),
C 1 //150		Robot-location(o7)		Stack #165
Stack #150	$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), S(o1), S(o3)	1), $S(o6)$, $S(o33)$, $R(o7)$, $S(o27)$ }]
		Stack #157		10.0) DI (0) D(10)
Served(o13)		1	{P((o13,3), RL(3), R(o13)} Serve(o13,3)
Robot-location(o7)		-		Robot-location(o7)
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o36), S(o3$	1), $S(o6)$, $S(o33)$, $R(o7)$, $S(o27)$ }	{R(o19)}	$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), S(o1), S(o31), S(o6),
Stack #151		Move(o19,o25)		Stack #166
Stack #101	{F	R(o25), RF, M(o25,3 Make(o25,3)	3)}	Stack #100
		Robot-location(o13)	-
Petition(o13,[n])		p13,3), RL(3), R(o		Serve(o13,3)
Robot-loaded([n])		Serve(o13,3)		Robot-location(o7)
Robot-location(o13	$\{\S(917), S(018), S(013), S(019), \}$	S(o26), S(o1), S(o3)	$\{S(o17), S(o18), S(o13), S(o19), 1), S(o6), S(o33), R(o7), S(o27)\}$	S(o26), S(o1), S(o31), S(o6),
Serve(o13,[n])	UED/Y / / / / / /	1	,, ,, ,, ,, ,, ,, ,,	Stack #167
Robot-location(o7)		Stack #158		
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o3), S$	S(1), S(06), S(033), R(07), S(027)			
Stack #152		M. (.10 .05)		Robot-location(o7)
	{F	Move(o19,o25) R(o25), RF, M(o25,	$\{S(o17), S(o18), S(o13), S(o19), S(o$	S(o26), S(o1), S(o31), S(o6),
		Make(o25,3)		Stack #168
Robot-loaded(3)		Robot-location(o13		"
Robot-location(o13	-	513,3), RL(3), R(o. Serve(o13,3)	13)}	-
{P(o13,3), RL(3), R(o Serve(o13,3)		Robot-location(o7)		Robot-location([o1])
Robot-location(o7)	$\{S(o17), S(o18), S(o13), S(o19), \}$	S(o26), S(o1), S(o3)	1), $S(o6)$, $S(o33)$, $R(o7)$, $S(o27)$ }	R([o1])}
$\{S(o17), S(o18), S(o13), S(o19), S(o26), S(o1), S(o36), S(o3$	S(1), S(06), S(033), R(07), S(027)] Stack #159	{S(o17), S(o18), S(o13), S(o19),	Move([o1],o7) S(o26), S(o1), S(o31), S(o6),
Stack #153		,,		
, , , , , , , , , , , , , , , , , , ,				Stack #169
	[{F	R(o25), RF, M(o25,	3)}]
		Make(o25,3)		[D/-12)]
			D .	{R(o13)}
		Robot-location(o13		Move(o13.o7)
		(613,3), RL(3), R(0) Serve(013,3)		Move(o13,o7) S(o26), S(o1), S(o31), S(o6),
		o13,3), RL(3), R(o Serve(o13,3) Robot-location(o7)	3)} {S(o17), S(o18), S(o13), S(o19),	Move(o13,o7) S(o26), S(o1), S(o31), S(o6), S Stack #170

Stack #172

 $\frac{\text{Move}(\text{o}13,\text{o}7) \quad \left[\ \{\text{S}(\text{o}17), \ \text{S}(\text{o}18), \ \text{S}(\text{o}13), \ \text{S}(\text{o}19), \ \text{S}(\text{o}26), \ \text{S}(\text{o}1), \ \text{S}(\text{o}31), \ \text{S}(\text{o}6), \ \text{S}(\text{o}33), \ \text{R}(\text{o}7), \ \text{S}(\text{o}27) \right\} }{\{\text{S}(\text{o}17), \ \text{S}(\text{o}18), \ \text{S}(\text{o}13), \ \text{S}(\text{o}19), \ \text{S}(\text{o}26), \ \text{S}(\text{o}1), \ \text{S}(\text{o}31), \ \text{S}(\text{o}6), \ \text{S}(\text{o$

Stack #171

Case 3

Input File

```
InitialState=Machine(o31,3); Petition(o15,1); Robot-location(o35);
   Machine(o12,1); Petition(o3,2); Petition(o25,3); Machine(o24,2);
   Petition(o14,1); Petition(o32,2); Machine(o16,3); Machine(o28,3);

GoalState=Served(o3); Served(o15); Served(o14); Served(o25); Served(o32);
```

State evolution

		P(2)			
					M(1)
	P(1)	P(1)	M(3)		
					M(2)
P(3)			M(3)		
M(3)	P(2)			R	

Robot-free; Steps(0) Initial state

		P(2)			
					M(1)
	P(1)	P(1)	M(3)	Г	
				Г	M(2)
					R
P(3)			M(3)	Г	
M(3)	P(2)				

Robot-free; Steps(3) Intermediate state 1

		P(2)			
					M(1)
	P(1)	P(1)	M(3)	Г	
				Г	M(2)
					R
P(3)			M(3)		
M(3)	P(2)				

Robot-loaded(2); Steps(3) Intermediate state 2

		P(2)		
				M(1)
	P(1)	P(1)	M(3)	
				M(2)
P(3)			M(3)	
M(3)	P(2) R			

Robot-loaded(2); Steps(9) Intermediate state 3

				_	
		P(2)			
					M(1)
	P(1)	P(1)	M(3)	Г	
					M(2)
P(3)			M(3)		
M(3)	R				

Robot-free; Steps(9) Intermediate state 4

		P(2)			
					M(1)
	P(1)	P(1)	M(3)		
					M(2)
P(3)			M(3)	П	
M(3)	S				
R	5				

Robot-free; Steps(10) Intermediate state 5

		P(2)		Г	
					M(1)
	P(1)	P(1)	M(3)		
				Г	M(2)
P(3)			M(3)		
M(3)	S				

Robot-loaded(3); Steps(10) Intermediate state 6

		P(2)			
					M(1)
	P(1)	P(1)	M(3)	Г	
					M(2)
P(3)			M(3)		
R			101(3)		
M(3)	S				

Robot-loaded(3); Steps(11) Intermediate state 7

		P(2)			
					M(1)
	P(1)	P(1)	M(3)	Г	
					M(2)
R S			M(3)		
M(3)	S				

Robot-free; Steps(11) Intermediate state 8

		P(2)			
				Г	M(1)
					R
	P(1)	P(1)	M(3)		
				Г	M(2)
S			M(3)		
M(3)	S				

Robot-free; Steps(19) Intermediate state 9

		P(2)		
				M(1)
				R
	P(1)	P(1)	M(3)	
				M(2)
S			M(3)	
M(3)	S			

Robot-loaded(1); Steps(19) Intermediate state 10

		P(2)		
				M(1)
	P(1) R	P(1)	M(3)	
				M(2)
S			M(3)	
M(3)	S			

Robot-loaded(1); Steps(24) Intermediate state 11

		P(2)		
				M(1)
	R S	P(1)	M(3)	
				M(2)
S			M(3)	
M(3)	S			

Robot-free; Steps(24) Intermediate state 12

		P(2)			
					M(1) R
	S	P(1)	M(3)	_	11
					M(2)
S			M(3)		
M(3)	S				

Robot-free; Steps(29) Intermediate state 13

		P(2)		
				M(1) R
	S	P(1)	M(3)	ĸ
	0	F(1)	W1(3)	34(0)
- C	_		3.5(0)	M(2)
8			M(3)	
M(3)	S			

Robot-loaded(1); Steps(29) Intermediate state 14

		P(2)			
				Г	M(1)
	s	R P(1)	M(3)		
				Г	M(2)
S			M(3)		
M(3)	S				

Robot-loaded(1); Steps(33) Intermediate state 15

	_			_	
		P(2)			
					M(1)
	S	R S	M(3)		
					M(2)
S			M(3)		
M(3)	S			Г	

Robot-free; Steps(33) Intermediate state 16

		P(2)			
					M(1)
	S	S	M(3)		
				Г	M(2)
					R
S			M(3)		
M(3)	S				

Robot-free; Steps(37) Intermediate state 17

		P(2)		
				M(1)
	S	S	M(3)	
				M(2)
				R
S			M(3)	
M(3)	S			

Robot-loaded(2); Steps(37) Intermediate state 18

		R P(2)		
		P(2)		
				M(1)
	S	S	M(3)	
				M(2)
S			M(3)	
M(3)	S			

Robot-loaded(2); Steps(43) Intermediate state 19

		R S		
				M(1)
	S	S	M(3)	
				M(2)
S			M(3)	
M(3)	S			

Robot-free; Steps(43) Final state



Goal state

Stack evolution

Served(o32)
Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #1

Petition(o32,[n])
Robot-loaded([n])
Robot-location(o32)
{R(o32), RL([n]), P(o32,[n])}
Serve(o32,[n])
Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #2

Robot-loaded(2)
Robot-location(o32)
$\{R(o32), RL(2), P(o32,2)\}$
Serve(o32,2)
Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #3

Robot-free
Machine([o],2)
Robot-location([o])
$\{R([o]), RF, M([o],2)\}$
Make([o],2)
Robot-location(o32)
{R(o32), RL(2), P(o32,2)}
Serve(o32,2)
Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #4

Machine([o],2)
Robot-location([o])
$\{R([o]), RF, M([o],2)\}$
Make([o],2)
Robot-location(o32)
{R(o32), RL(2), P(o32,2)}
Serve(o32,2)
Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #5

Robot-location(o24)
$\{R(o24), RF, M(o24,2)\}$
Make(o24,2)
Robot-location(o32)
{R(o32), RL(2), P(o32,2)}
Serve(o32,2)
Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #6

Robot-location([o1])
{R([o1])}
Move([o1],o24)
$\{R(o24), RF, M(o24,2)\}$
Make(o24,2)
Robot-location(o32)
{R(o32), RL(2), P(o32,2)}
Serve(o32,2)
Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #7

{R(o35)}
Move(o35,o24)
{R(o24), RF, M(o24,2)}
Make(o24,2)
Robot-location(o32)
{R(o32), RL(2), P(o32,2)}
Serve(o32,2)
Served(o25)
Served(o14)
Served(o15)
Served(o3)
{S(o3), S(o25), S(o14), S(o32), S(o15)}

Stack #8

Move(o35,o24)
{R(o24), RF, M(o24,2)}
Make(o24,2)
Robot-location(o32)
{R(o32), RL(2), P(o32,2)}
Serve(o32,2)
Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #9

$\{R(o24), RF, M(o24,2)\}$
Make(o24,2)
Robot-location(o32)
{R(o32), RL(2), P(o32,2)}
Serve(o32,2)
Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #10

Make(o24,2)
Robot-location(o32)
{R(o32), RL(2), P(o32,2)}
Serve(o32,2)
Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #11

Robot-location(o32)
$\{R(o32), RL(2), P(o32,2)\}$
Serve(o32,2)
Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #12

Robot-location([o1])
{R([o1])}
Move([o1],o32)
{R(o32), RL(2), P(o32,2)}
Serve(o32,2)
Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #13

$\{R(o24)\}$
Move(o24,o32)
{R(o32), RL(2), P(o32,2)}
Serve(o32,2)
Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #14

Move(o24,o32)
{R(o32), RL(2), P(o32,2)}
Serve(o32,2)
Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #15

$\{R(o32), RL(2), P(o32,2)\}$
Serve(o32,2)
Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #16

Serve(o32,2)
Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #17

Served(o25)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #18

Petition(o25,[n])
Robot-loaded([n])
Robot-location(o25)
$\{R(o25), P(o25,[n]), RL([n])\}$
Serve(o25,[n])
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #19

Robot-loaded(3)
Robot-location(o25)
{R(o25), P(o25,3), RL(3)}
Serve(o25,3)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #20

Robot-free
Machine([o],3)
Robot-location([o])
$\{R([o]), RF, M([o],3)\}$
Make([o],3)
Robot-location(o25)
$\{R(o25), P(o25,3), RL(3)\}$
Serve(o25,3)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #21

Machine([o],3)
Robot-location([o])
$\{R([o]), RF, M([o],3)\}$
Make([o],3)
Robot-location(o25)
{R(o25), P(o25,3), RL(3)}
Serve(o25,3)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #22

Robot-location(o31)
{R(o31), RF, M(o31,3)}
Make(o31,3)
Robot-location(o25)
{R(o25), P(o25,3), RL(3)}
Serve(o25,3)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #23

Robot-location([o1])
{R([o1])}
Move([o1],o31)
$\{R(o31), RF, M(o31,3)\}$
Make(o31,3)
Robot-location(o25)
$\{R(o25), P(o25,3), RL(3)\}$
Serve(o25,3)
Served(o14)
Served(o15)
Served(o3)
{S(o3), S(o25), S(o14), S(o32), S(o15)}

Stack #24

{R(o32)}
Move(o32,o31)
$\{R(o31), RF, M(o31,3)\}$
Make(o31,3)
Robot-location(o25)
{R(o25), P(o25,3), RL(3)}
Serve(o25,3)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #25

Move(o32,o31)
$\{R(o31), RF, M(o31,3)\}$
Make(o31,3)
Robot-location(o25)
{R(o25), P(o25,3), RL(3)}
Serve(o25,3)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #26

{R(o31), RF, M(o31,3)}
Make(o31,3)
Robot-location(o25)
{R(o25), P(o25,3), RL(3)}
Serve(o25,3)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #27

Make(o31,3)
Robot-location(o25)
{R(o25), P(o25,3), RL(3)}
Serve(o25,3)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #28

Robot-location(o25)
{R(o25), P(o25,3), RL(3)}
Serve(o25,3)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #29

Robot-location([o1])
{R([o1])}
Move([o1],o25)
{R(o25), P(o25,3), RL(3)}
Serve(o25,3)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #30

{R(o31)}
Move(o31,o25)
{R(o25), P(o25,3), RL(3)}
Serve(o25,3)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #31

Move(o31,o25)
{R(o25), P(o25,3), RL(3)}
Serve(o25,3)
Served(o14)
Served(o15)
Served(o3)
{S(o3), S(o25), S(o14), S(o32), S(o15)}

Stack #32

{R(o25), P(o25,3), RL(3)}
Serve(o25,3)
Served(o14)
Served(o15)
Served(o3)
{S(o3), S(o25), S(o14), S(o32), S(o15)}

Stack #33

Serve(o25,3)
Served(o14)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #34

15)}

Stack #35

Petition(o14,[n])
Robot-loaded([n])
Robot-location(o14)
$\{R(o14), P(o14,[n]), RL([n])\}$
Serve(o14,[n])
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #36

Robot-loaded(1)
Robot-location(o14)
{R(o14), P(o14,1), RL(1)}
Serve(o14,1)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #37

Robot-free
Machine([o],1)
Robot-location([o])
$\{M([o],1), R([o]), RF\}$
Make([o],1)
Robot-location(o14)
{R(o14), P(o14,1), RL(1)}
Serve(o14,1)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #38

Machine([o],1)
Robot-location([o])
$\{M([o],1), R([o]), RF\}$
Make([o],1)
Robot-location(o14)
{R(o14), P(o14,1), RL(1)}
Serve(o14,1)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #39

Robot-location(o12)
$\{M(o12,1), R(o12), RF\}$
Make(o12,1)
Robot-location(o14)
$\{R(o14), P(o14,1), RL(1)\}$
Serve(o14,1)
Served(o15)
Served(o3)
{S(o3), S(o25), S(o14), S(o32), S(o15)}

Stack #40

Robot-location([o1])
{R([o1])}
Move([o1],o12)
{M(o12,1), R(o12), RF}
Make(o12,1)
Robot-location(o14)
{R(o14), P(o14,1), RL(1)}
Serve(o14,1)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #41

{R(o25)}
Move(o25,o12)
{M(o12,1), R(o12), RF}
Make(o12,1)
Robot-location(o14)
{R(o14), P(o14,1), RL(1)}
Serve(o14,1)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #42

Move(o25,o12)
{M(o12,1), R(o12), RF}
Make(o12,1)
Robot-location(o14)
{R(o14), P(o14,1), RL(1)}
Serve(o14,1)
Served(o15)
Served(o3)
{S(o3), S(o25), S(o14), S(o32), S(o15)}

Stack #43

$\{M(o12,1), R(o12), RF\}$
Make(o12,1)
Robot-location(o14)
{R(o14), P(o14,1), RL(1)}
Serve(o14,1)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #44

Make(o12,1)
Robot-location(o14)
{R(o14), P(o14,1), RL(1)}
Serve(o14,1)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #45

Robot-location(o14)
{R(o14), P(o14,1), RL(1)}
Serve(o14,1)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #46

Robot-location([o1])
{R([o1])}
Move([o1],o14)
{R(o14), P(o14,1), RL(1)}
Serve(o14,1)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #47

{R(o12)}
Move(o12,o14)
{R(o14), P(o14,1), RL(1)}
Serve(o14,1)
Served(o15)
Served(o3)
{S(o3) S(o25) S(o14) S(o32) S(o15)}

Stack #48

Move(o12,o14)
{R(o14), P(o14,1), RL(1)}
Serve(o14,1)
Served(o15)
Served(o3)
{S(o3), S(o25), S(o14), S(o32), S(o15)}

Stack #49

{R(o14), P(o14,1), RL(1)}
Serve(o14,1)
Served(o15)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #50

	Serve(o14,1)
ſ	Served(o15)
ſ	Served(o3)
Ī	$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #51

Served(o15	5)
Served(o3)	
{S(o3), S(o25), S(o14), S	S(o32), S(o15)

Stack #52

Petition(o15,[n])	
Robot-loaded([n])	
Robot-location(o15)	
{P(o15,[n]), R(o15), RL([n])}	
Serve(o15,[n])	
Served(o3)	
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$	

Stack #53

Robot-loaded(1)	
Robot-location(o15)	
{P(o15,1), R(o15), RL(1)}	
Serve(o15,1)	
Served(o3)	
(S(o3) S(o25) S(o14) S(o32) S(o15)}	

Stack #54

Robot-free
Machine([o],1)
Robot-location([o])
$\{M([o],1), R([o]), RF\}$
Make([o],1)
Robot-location(o15)
{P(o15,1), R(o15), RL(1)}
Serve(o15,1)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #55

Machine([o],1)
Robot-location([o])
$\{M([o],1), R([o]), RF\}$
Make([o],1)
Robot-location(o15)
$\{P(o15,1), R(o15), RL(1)\}$
Serve(o15,1)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #56

Robot-location(o12) {M(o12,1), R(o12), RF}
Make(o12,1)
Robot-location(o15)
$\{P(o15,1), R(o15), RL(1)\}$
Serve(o15,1)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #57

Robot-location([o1])
{R([o1])}
Move([o1],o12)
$\{M(o12,1), R(o12), RF\}$
Make(o12,1)
Robot-location(o15)
{P(o15,1), R(o15), RL(1)}
Serve(o15,1)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #58

{R(o14)}
Move(o14,o12)
$\{M(o12,1), R(o12), RF\}$
Make(o12,1)
Robot-location(o15)
{P(o15,1), R(o15), RL(1)}
Serve(o15,1)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #59

Move(o14,o12)
$\{M(o12,1), R(o12), RF\}$
Make(o12,1)
Robot-location(o15)
{P(o15,1), R(o15), RL(1)}
Serve(o15,1)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #60

$\{M(o12,1), R(o12), RF\}$
Make(o12,1)
Robot-location(o15)
$\{P(o15,1), R(o15), RL(1)\}$
Serve(o15,1)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #61

Make(o12,1)
Robot-location(o15)
{P(o15,1), R(o15), RL(1)}
Serve(o15,1)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #62

Robot-location(o15)	
$\{P(o15,1), R(o15), RL(1)\}$	
Serve(o15,1)	
Served(o3)	
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$	

Stack #63

Robot-location([o1])
$\{R([o1])\}$
Move([o1],o15)
{P(o15,1), R(o15), RL(1)}
Serve(o15,1)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #64

{R(o12)}
Move(o12,o15)
{P(o15,1), R(o15), RL(1)}
Serve(o15,1)
Served(o3)
{S(o3), S(o25), S(o14), S(o32), S(o15)}

Stack #65

Move(o12,o15)
{P(o15,1), R(o15), RL(1)}
Serve(o15,1)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #66

$\{P(o15,1), R(o15), RL(1)\}$
Serve(o15,1)
Served(o3)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #67

	S	erve(o15	(1,1)	
	٢	Gerved(o)	3)	
$\{S(o3)\}$	S(o25)	S(o14)	S(o32)	S(o15)}

Stack #68

١	Served(o3)
I	$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #69

Petition(o3,[n])
Robot-loaded([n])
Robot-location(o3)
$\{R(o3), RL([n]), P(o3,[n])\}$
Serve(o3,[n])
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #70

Robot-loaded(2)
Robot-location(o3)
{R(o3), RL(2), P(o3,2)}
Serve(o3,2)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #71

Robot-free
Machine([o],2)
Robot-location([o])
$\{R([o]), RF, M([o],2)\}$
Make([o],2)
Robot-location(o3)
{R(o3), RL(2), P(o3,2)}
Serve(o3,2)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #72

Machine([o],2)
Robot-location([o])
$\{R([o]), RF, M([o],2)\}$
Make([o],2)
Robot-location(o3)
{R(o3), RL(2), P(o3,2)}
Serve(o3,2)
{S(o3), S(o25), S(o14), S(o32), S(o15)}

Stack #73

Robot-location(o24)
{R(o24), RF, M(o24,2)}
Make(o24,2)
Robot-location(o3)
{R(o3), RL(2), P(o3,2)}
Serve(o3,2)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #74

Robot-location([o1])
{R([o1])}
Move([o1],o24)
{R(o24), RF, M(o24,2)}
Make(o24,2)
Robot-location(o3)
$\{R(o3), RL(2), P(o3,2)\}$
Serve(o3,2)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #75

{R(o15)}
Move(o15,o24)
$\{R(o24), RF, M(o24,2)\}$
Make(o24,2)
Robot-location(o3)
$\{R(o3), RL(2), P(o3,2)\}$
Serve(o3,2)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #76

Move(o15,o24)
$\{R(o24), RF, M(o24,2)\}$
Make(o24,2)
Robot-location(o3)
$\{R(o3), RL(2), P(o3,2)\}$
Serve(o3,2)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #77

$\{R(o24), RF, M(o24,2)\}$
Make(o24,2)
Robot-location(o3)
$\{R(o3), RL(2), P(o3,2)\}$
Serve(o3,2)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #78

Make(o24,2)
Robot-location(o3)
{R(o3), RL(2), P(o3,2)}
Serve(o3,2)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #79

Robot-location(o3)
{R(o3), RL(2), P(o3,2)}
Serve(o3,2)
{S(o3), S(o25), S(o14), S(o32), S(o15)}

Stack #80

Robot-location([o1])
${R([o1])}$
Move([o1],o3)
$\{R(o3), RL(2), P(o3,2)\}$
Serve(o3,2)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #81

{R(o24)}
Move(o24,o3)
{R(o3), RL(2), P(o3,2)}
Serve(o3,2)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #82

Move(o24,o3)
$\{R(o3), RL(2), P(o3,2)\}$
Serve(o3,2)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

Stack #83

	$\{R(o3), RL(2), P(o3,2)\}$
Serve(o3,2)	
	$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

Stack #84

Serve(o3,2)
$\{S(o3), S(o25), S(o14), S(o32), S(o15)\}\$

 $\{S(o3), S(o25), S(o14), S(o32), S(o15)\}$

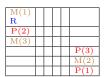
Stack #86

Case 4

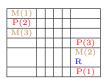
Input File

```
InitialState=Robot-location(o1); Machine(o1,1); Petition(o36,1);
   Machine(o30,2); Petition(o7,2); Machine(o13,3); Petition(o24,3);
GoalState=Served(o36); Served(o7); Served(o24); Robot-location(o24);
```

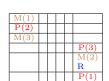
State evolution



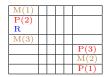
 $\begin{array}{c} {\rm Robot\text{-}free;\ Steps}(0) \\ {\rm Initial\ state} \end{array}$



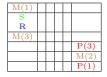
Robot-free; Steps(9) Intermediate state 1



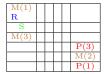
Robot-loaded(2); Steps(9) Intermediate state 2



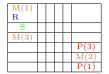
Robot-loaded(2); Steps(17) Intermediate state 3



Robot-free; Steps(17) Intermediate state 4



Robot-free; Steps(18) Intermediate state 5



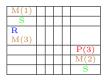
Robot-loaded(1); Steps(18) Intermediate state 6



Robot-loaded(1); Steps(28) Intermediate state 7



Robot-free; Steps(28) Intermediate state 8



Robot-free; Steps(36) Intermediate state 9



Robot-loaded(3); Steps(36) Intermediate state 10



Robot-loaded(3); Steps(42) Intermediate state 11



Robot-free; Steps(42) Final state



Goal state

Stack evolution

Γ	Served(o7)
Γ	Served(o36)
ľ	Served(o24)
Γ	Robot-location(o24)
Г	[S(-7) S(-26) S(-24) D(-24)]

Stack #1

Petition(o7,[n])
Robot-loaded([n])
Robot-location(o7)
$\{P(o7,[n]), RL([n]), R(o7)\}$
Serve(o7,[n])
Served(o36)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), B(o24)\}$

Stack #2

Robot-loaded(2)
Robot-location(o7)
$\{P(o7,2), RL(2), R(o7)\}$
Serve(o7,2)
Served(o36)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), B(o24)\}$

Stack #3

Robot-free
Machine([o],2)
Robot-location([o])
$\{R([o]), RF, M([o],2)\}$
Make([o],2)
Robot-location(o7)
{P(o7,2), RL(2), R(o7)}
Serve(o7,2)
Served(o36)
Served(o24)
Robot-location(o24)
{S(o7), S(o36), S(o24), R(o24)}

Stack #4

Machine([o],2)
Robot-location([o])
$\{R([o]), RF, M([o],2)\}$
Make([o],2)
Robot-location(o7)
{P(o7,2), RL(2), R(o7)}
Serve(o7,2)
Served(o36)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #5

Robot-location(o30)
{R(o30), RF, M(o30,2)}
Make(o30,2)
Robot-location(o7)
{P(o7,2), RL(2), R(o7)}
Serve(o7,2)
Served(o36)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #6

Robot-location([o1])
{R([o1])}
Move([o1],o30)
{R(o30), RF, M(o30,2)}
Make(o30,2)
Robot-location(o7)
{P(o7,2), RL(2), R(o7)}
Serve(o7,2)
Served(o36)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #7

{R(o1)}
Move(o1,o30)
{R(o30), RF, M(o30,2)}
Make(o30,2)
Robot-location(o7)
{P(o7,2), RL(2), R(o7)}
Serve(o7,2)
Served(o36)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}\$

Move(o1,o30)
{R(o30), RF, M(o30,2)}
Make(o30,2)
Robot-location(o7)
$\{P(o7,2), RL(2), R(o7)\}$
Serve(o7,2)
Served(o36)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}\$

Stack #9

{R(o30), RF, M(o30,2)}
Make(o30,2)
Robot-location(o7)
{P(o7,2), RL(2), R(o7)}
Serve(o7,2)
Served(o36)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #10

Make(o30,2)
Robot-location(o7)
{P(o7,2), RL(2), R(o7)}
Serve(o7,2)
Served(o36)
Served(o24)
Robot-location(o24)
{S(o7), S(o36), S(o24), R(o24)}

Stack #11

Robot-location(o7)
$\{P(o7,2), RL(2), R(o7)\}$
Serve(o7,2)
Served(o36)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}\$

Stack #12

Robot-location([o1])
{R([o1])}
Move([o1],o7)
{P(o7,2), RL(2), R(o7)}
Serve(o7,2)
Served(o36)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #13

C= (>>
{R(o30)}
Move(o30,o7)
{P(o7,2), RL(2), R(o7)}
Serve(o7,2)
Served(o36)
Served(o24)
Robot-location(o24)
{S(o7), S(o36), S(o24), R(o24)}

Stack #14

Move(o30,o7)
$\{P(o7,2), RL(2), R(o7)\}$
Serve(o7,2)
Served(o36)
Served(o24)
Robot-location(o24)
{S(o7), S(o36), S(o24), R(o24)}

Stack #15

{P(o7,2), RL(2), R(o7)}
Serve(o7,2)
Served(o36)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #16

Serve(o7,2)
Served(o36)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #17

Served(o36)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #18

Petition(o36,[n])
Robot-loaded($[n]$)
Robot-location(o36)
{R(o36), P(o36,[n]), RL([n])}
Serve(o36,[n])
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #19

Robot-loaded (1)
Robot-location(o36)
$\{R(o36), P(o36,1), RL(1)\}$
Serve(o36,1)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #20

Robot-free
Machine([o],1)
Robot-location([o])
$\{M([o],1), R([o]), RF\}$
Make([o],1)
Robot-location(o36)
{R(o36), P(o36,1), RL(1)}
Serve(o36,1)
Served(o24)
Robot-location(o24)
{S(o7), S(o36), S(o24), R(o24)}

Stack #21

Machine([o],1)
Robot-location([o])
$\{M([o],1), R([o]), RF\}$
Make([o],1)
Robot-location(o36)
{R(o36), P(o36,1), RL(1)}
Serve(o36,1)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #22

Robot-location(o1)
{M(o1,1), R(o1), RF}
Make(o1,1)
Robot-location(o36)
{R(o36), P(o36,1), RL(1)}
Serve(o36,1)
Served(o24)
Robot-location(o24)
{S(o7), S(o36), S(o24), R(o24)}

Stack #23

Robot-location([o1])
{R([o1])}
Move([o1],o1)
{M(o1,1), R(o1), RF}
Make(o1,1)
Robot-location(o36)
{R(o36), P(o36,1), RL(1)}
Serve(o36,1)
Served(o24)
Robot-location(o24)
{S(o7), S(o36), S(o24), R(o24)}

Stack #24

{R(o7)}
Move(o7,o1)
{M(o1,1), R(o1), RF}
Make(o1,1)
Robot-location(o36)
{R(o36), P(o36,1), RL(1)}
Serve(o36,1)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #25

Move(o7,o1)
$\{M(o1,1), R(o1), RF\}$
Make(o1,1)
Robot-location(o36)
{R(o36), P(o36,1), RL(1)}
Serve(o36,1)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #26

{M(o1,1), R(o1), RF}
Make(o1,1)
Robot-location(o36)
{R(o36), P(o36,1), RL(1)}
Serve(o36,1)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Make(o1,1)
Robot-location(o36)
{R(o36), P(o36,1), RL(1)}
Serve(o36,1)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}\$

Robot-location(o36)
{R(o36), P(o36,1), RL(1)}
Serve(o36,1)
Served(o24)
Robot-location(o24)
{S(o7), S(o36), S(o24), R(o24)}

Stack #29

Robot-location([o1])
{R([o1])}
Move([o1],o36)
{R(o36), P(o36,1), RL(1)}
Serve(o36,1)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #30

{R(o1)}
Move(o1,o36)
{R(o36), P(o36,1), RL(1)}
Serve(o36,1)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}\$

Stack #31

Move(o1,o36)
$\{R(o36), P(o36,1), RL(1)\}$
Serve(o36,1)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #32

{R(o36), P(o36,1), RL(1)}
Serve(o36,1)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}\$

Stack #33

Serve(o36,1)
Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #34

Served(o24)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #35

Petition(o24,[n])
Robot-loaded([n])
Robot-location(o24)
$\{P(o24,[n]), RL([n]), R(o24)\}$
Serve(o24,[n])
Robot-location(o24)
{S(o7), S(o36), S(o24), R(o24)}

Stack #36

Robot-loaded(3)
Robot-location(o24)
$\{P(o24,3), RL(3), R(o24)\}$
Serve(o24,3)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #37

Robot-free
Machine([o],3)
Robot-location([o])
$\{R([o]), RF, M([o],3)\}$
Make([o],3)
Robot-location(o24)
{P(o24,3), RL(3), R(o24)}
Serve(o24,3)
Robot-location(o24)
{S(o7), S(o36), S(o24), R(o24)}

Stack #38

Machine([o],3)
Robot-location([o])
$\{R([o]), RF, M([o],3)\}$
Make([o],3)
Robot-location(o24)
{P(o24,3), RL(3), R(o24)}
Serve(o24,3)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}\$

Stack #39

Robot-location(o13)
{R(o13), RF, M(o13,3)}
Make(o13,3)
Robot-location(o24)
{P(o24,3), RL(3), R(o24)}
Serve(o24,3)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #40

Robot-location([o1])
$\{R([o1])\}$
Move([o1],o13)
{R(o13), RF, M(o13,3)}
Make(o13,3)
Robot-location(o24)
$\{P(o24,3), RL(3), R(o24)\}$
Serve(o24,3)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}\$

Stack #41

{R(o36)}
Move(o36,o13)
{R(o13), RF, M(o13,3)}
Make(o13,3)
Robot-location(o24)
{P(o24,3), RL(3), R(o24)}
Serve(o24,3)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #42

Move(o36,o13)
{R(o13), RF, M(o13,3)}
Make(o13,3)
Robot-location(o24)
{P(o24,3), RL(3), R(o24)}
Serve(o24,3)
Robot-location(o24)
{S(o7), S(o36), S(o24), R(o24)}

Stack #43

$\{R(o13), RF, M(o13,3)\}$
Make(o13,3)
Robot-location(o24)
{P(o24,3), RL(3), R(o24)}
Serve(o24,3)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}\$

Stack #44

Make(o13,3)
Robot-location(o24)
$\{P(o24,3), RL(3), R(o24)\}$
Serve(o24,3)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}\$

Stack #45

Robot-location(o24)
$\{P(o24,3), RL(3), R(o24)\}$
Serve(o24,3)
Robot-location(o24)
{S(o7), S(o36), S(o24), R(o24)}

Stack #46

Robot-location([o1])
{R([o1])}
Move([o1],o24)
{P(o24,3), RL(3), R(o24)}
Serve(o24,3)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #47

{R(o13)}
Move(o13,o24)
{P(o24,3), RL(3), R(o24)}
Serve(o24,3)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #48

Move(o13,o24)
$\{P(o24,3), RL(3), R(o24)\}$
Serve(o24,3)
Robot-location(o24)
$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #49

	$\{P(o24,3), RL(3), R(o24)\}$
	Serve(o24,3)
	Robot-location(o24)
	$\{S(o7), S(o36), S(o24), R(o24)\}$

Stack #50

Serve(o24,3)							
Robot-location(o24)							
$\{S(o7), S(o36), S(o24), R(o24)\}\$							

Stack #51

R	obot-loc	ation(o2	24)
${S(o7)},$	S(o36),	S(o24),	R(o24)}

Stack #52

[S(o7), S(o36), S(o24), R(o24)]

Case 5

Input File

```
InitialState=Robot-location(o1); Petition(o1,1);
GoalState=Robot-location(o1); Served(o1);
```

Result

```
Error. Predicate "Machine([o],1)" cannot be instantiated in the
   state "Petition(o1,1);Steps(0);Robot-free;Robot-location(o1);"
```

Case 6

Input File

```
InitialState=Petition(o23,3); Petition(o25,3); Machine(o8,2); Machine(
    o34,3); Petition(o35,1); Petition(o21,2); Robot-location(o13);
    Petition(o26,1); Machine(o28,1); Petition(o31,1); Petition(o22,1);
    Petition(o6,2); Petition(o24,1); Petition(o11,2); Petition(o10,1);

GoalState=Served(o11); Served(o22); Served(o23); Served(o24); Served(
    o10); Served(o31); Served(o26); Robot-location(o23); Served(o6);
    Served(o25); Served(o35); Served(o21);
```

State evolution

					P(2)
	M(2)		P(1)	P(2)	
R					
		P(2)	P(1)	P(3)	P(1)
P(3)	P(1)		M(1)		
P(1)			M(3)	P(1)	

Robot-free; Steps(0) Initial state

					P(2)
	M(2)		P(1)	P(2)	
		P(2)	P(1)	P(3)	P(1)
P(3)	P(1)		M(1)		
P(1)			M(3) R	P(1)	

Robot-free; Steps(6) Intermediate state 1

					P(2)
	M(2)		P(1)	P(2)	
		P(2)	P(1)	P(3)	P(1)
P(3)	P(1)		M(1)		
P(1)			M(3)	P(1)	

Robot-loaded(3); Steps(6) Intermediate state 2

					P(2)
	M(2)		P(1)	P(2)	
		P(2)	P(1)	P(3)	P(1)
P(3) R	P(1)		M(1)		
P(1)			M(3)	P(1)	

Robot-loaded(3); Steps(10) Intermediate state 3

					P(2)
	M(2)		P(1)	P(2)	
		P(2)	P(1)	P(3)	P(1)
R S	P(1)		M(1)		
P(1)			M(3)	P(1)	

Robot-free; Steps(10) Intermediate state 4

					P(2)
	M(2)		P(1)	P(2)	
		P(2)	P(1)	P(3)	P(1)
S	P(1)		M(1)		
	1 (1)		R		
P(1)			M(3)	P(1)	

Robot-free; Steps(13) Intermediate state 5

					P(2)			
	M(2)		P(1)	P(2)				
		P(2)	P(1)	P(3)	P(1)			
S	P(1)		M(1) R					
P(1)			M(3)	P(1)				
	Inte	rmedia	ite stat	е 6				
					P(2)			
	M(2)		P(1)	P(2)				
		P(2)	P(1)	P(3)	P(1)			
S	R							
P(1) M(3) P(1)								
Robot-loaded(1); Steps(15) Intermediate state 7								

					P(2)
	M(2)		P(1)	P(2)	
		P(2)	P(1)	P(3)	P(1)
S	R S		M(1)		
P(1)			M(3)	P(1)	

Robot-free; Steps(15) Intermediate state 8

					P(2)
	M(2) R		P(1)	P(2)	
		P(2)	P(1)	P(3)	P(1)
S	S		M(1)		
P(1)			M(3)	P(1)	

Robot-free; Steps(18) Intermediate state 9

					P(2)
	M(2) R		P(1)	P(2)	
		P(2)	P(1)	P(3)	P(1)
S	S		M(1)		
P(1)			M(3)	P(1)	

 $\begin{array}{c} {\rm Robot\text{-}loaded}(2); \; {\rm Steps}(18) \\ {\rm Intermediate \; state} \; 10 \end{array}$

					P(2)
	M(2)		P(1)	P(2)	
		R P(2)	P(1)	P(3)	P(1)
S	S		M(1)		
P(1)			M(3)	P(1)	

Robot-loaded(2); Steps(21) Intermediate state 11

					P(2)
	M(2)		P(1)	P(2)	
		R S	P(1)	P(3)	P(1)
S	S		M(1)		
D(1)			1/1/2)	D(1)	

Robot-free; Steps(21) Intermediate state 12

					P(2)
	M(2)		P(1)	P(2)	
		S	P(1)	P(3)	P(1)
S	S		M(1)		
J	D		R		
P(1)			M(3)	P(1)	

Robot-free; Steps(23) Intermediate state 13

٠.			_			
						P(2)
		M(2)		P(1)	P(2)	
			S	P(1)	P(3)	P(1)
	S	S		M(1)		
l	5	D		R		
	P(1)			M(3)	P(1)	

 $\begin{array}{c} {\bf Robot\text{-}loaded(1);\ Steps(23)} \\ {\bf Intermediate\ state\ 14} \end{array}$

					P(2)
	M(2)		R P(1)	P(2)	
		S	P(1)	P(3)	P(1)
S	S		M(1)		
P(1)			M(3)	P(1)	

Robot-loaded(1); Steps(26) Intermediate state 15

					P(2)
	M(2)		R S	P(2)	
		S	P(1)	P(3)	P(1)
S	S		M(1)		
P(1)			M(3)	P(1)	

Robot-free; Steps(26) Intermediate state 16

					P(2)
	M(2) R		S	P(2)	
		S	P(1)	P(3)	P(1)
S	S		M(1)		
P(1)			M(3)	P(1)	

Robot-free; Steps(28) Intermediate state 17

					P(2)
	M(2) R		S	P(2)	
		S	P(1)	P(3)	P(1)
S	S		M(1)		
P(1)			M(3)	P(1)	

Robot-loaded(2); Steps(28) Intermediate state 18

ı						P(2)
		M(2)		S	P(2) R	
ı						
ı			S	P(1)	P(3)	P(1)
ı	S	S		M(1)		
1	P(1)			M(3)	P(1)	

Robot-loaded(2); Steps(31) Intermediate state 19

					P(2)
	M(2)		S	S R	
		S	P(1)	P(3)	P(1)
S	S		M(1)		
P(1)			M(3)	P(1)	

Robot-free; Steps(31) Intermediate state 20

					P(2)
	M(2) R		S	S	
		S	P(1)	P(3)	P(1)
S	S		M(1)		
P(1)			M(3)	P(1)	

Robot-free; Steps(34) Intermediate state 21

					P(2)
	M(2) R		S	S	
		S	P(1)	P(3)	P(1)
S	S		M(1)		
P(1)			M(3)	P(1)	

Robot-loaded(2); Steps(34) Intermediate state 22

					R
					P(2)
	M(2)		S	S	
		S	P(1)	P(3)	P(1)
S	S		M(1)		
P(1)			M(3)	P(1)	

Robot-loaded(2); Steps(39) Intermediate state 23

					R
					\mathbf{s}
	M(9)		-	- 0	
	101(2)		D.	٥	
		S	P(1)	P(3)	P(1)
S	S		M(1)		
D(1)			M(2)	D(1)	

Robot-free; Steps(39) Intermediate state 24

		_			_ ~
					8
	M(2)		S	S	
		S	P(1)	P(3)	P(1)
S	S		M(1)		
J			R		
P(1)			M(3)	P(1)	

Robot-free; Steps(45) Intermediate state 25

					S
	M(2)		S	S	
		S	P(1)	P(3)	P(1)
S	S		M(1)		
			R		
P(1)			M(3)	P(1)	

Robot-loaded(1); Steps(45) Intermediate state 26

M(2) S S S S S P(1) P(3) P(1)	M(2) S S	M(2) S S
	S P(1) P(3) P(1)	S S P(3) S
S S M(1) (1) M(3) P(1)	S S M(1) R S M(3) S	S S M(1) S R S R
Robot-loaded(1); Steps(49) Intermediate state 27	Robot-loaded(1); Steps(57) Intermediate state 34	Robot-free; Steps(66) Intermediate state 41
M(2) S S	M(2) S S	M(2) S S
S P(1) P(3) P(1) S S M(1) M(3) P(1)	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	S S M(1) S M(3) R S
Robot-free; Steps(49) Intermediate state 28	Robot-loaded(1); Steps(58) Intermediate state 35	Robot-loaded(3); Steps(66) Intermediate state 42
M(2) S S S S S S S S S S S S S S S S S S S	M(2) S S S S S S S S S	M(2) S S S S S S S S S S S S S M(1) S S M(3) S S S S S S S S S S S S S S S S S S S
Robot-free; Steps(53) Intermediate state 29	Robot-free; Steps(58) Intermediate state 36	Robot-loaded(3); Steps(69) Intermediate state 43
M(2) S S S S S S S S S	M(2) S S M(2) S S S S P(3) P(1) S S M(1) S M(3) S Robot-free; Steps(59) Intermediate state 37	M(2) S S S S R S S S M(1) S M(3) S Robot-free; Steps(69) Final state
S S M(1) P(3) P(1) S S M(1) R P(1) M(3) R P(1)	S S P(3) P(1) S S M(1) R S M(3) S	S S S S S S S S S S S S S S S S S S S
Robot-loaded(1); Steps(55) Intermediate state 31	Robot-loaded(1); Steps(59) Intermediate state 38	Goal state
M(2) S S S S S S S S S	S S P(3) P(1) S S M(1) S M(3) S Robot-loaded(1); Steps(62)	
Robot-free; Steps(55) Intermediate state 32	Intermediate state 39	

Stack evolution

 \mathbf{S}

Robot-free; Steps(57) Intermediate state 33 Robot-free; Steps(62) Intermediate state 40

Served(o2	M	achine([o]	,3) Move(o	13.034)
Served(o2		t-location		
Served(o2), RF, M		
Served(o1		Iake([o],3)		
Served(o1	l) Robo	t-location	$(o25)$ {R(o25), P(o3	25,3), RL(3)
Served(of) {R(o25)	P(o25,3)	, RL(3)} Serve((025,3)
Served(o3		erve(o25,		
	7			
Served(o3		erved(o26		
Served(o2	2) S	erved(o2)	1) Served	d(o10)
Served(o2	1) S	erved(o10	Served	d(o11)
Served(o2		erved(o1		
Robot-location		erved(o6)		
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o$	[10), $S(o31)$, $R(o23)$, $S(o6)$, $S(o22)$, $S(o11)$	erved(o3	1) Served	d(o35)
	S	erved(o3	Served	d(o22)
Stack #1		erved(o22		
		erved(o24)		
	S	erved(o2	3) Robot-loca	ation(o23)
	Robo	t-location	(626)23), S(o25), S(o24), S(o35), S(o26), S(o21),	, S(o10), S(o31)
Petition(o25	(o23), S(o25), S(o24), S(o35), S(o26), S(o26)	621) S(o	10) S(o31) B(o23) S(o6) S(o22) S(o11)}	, , , , ,
Robot-loaded	([n])	021), 5(0	(10), 5(001), 10(020), 5(00), 5(022), 5(011)]	- 40
Robot-location	(-0F)	1	Stack	K #9
		\$tack #5		
$\{R(o25), P(o25,[n])\}$				
Serve(o25,	n])			
Served(o2	3)	1 1	{R(o34), RF	F. M(o34.3)}
Served(o2		t-location		
Served(o1), RF, M		
Served(o1	1) N	lake(o34,	$\{R(o25), P(o25), P(o25), R(o25), P(o25), R(o25), R(o$	25,3), RL(3)
Served(of		t-location		
Served(o3		P(o25,3)		
Served(o3		erve(o25,		
Served(o2	È) S	erved(o26	Served	d(o10)
Served(o2		erved(o2		
Served(o2		erved(o10		
Robot-location	(o23) S	erved(o1) Served	d(o31)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o				
[5(525), 5(525), 5(524), 5(55), 5(520), 5(521), 5(6				
		Served(o3		
Stack #2	S	erved(o3	5) Served	d(o24)
		erved(o22		
		erved(o24		
T. 1 + 1 - 1	1(0)	erved(o23	S(023), $S(025)$, $S(024)$, $S(035)$, $S(026)$, $S(021)$,	, S(o10), S(o31)
Robot-loade		t-location	1(023)	
Robot-location	(p25)22) S(25) S(24) S(25) S(26) S((21) S(c	(1023) (10), S(o31), R(o23), S(o6), S(o22), S(o11)}Stack	#10
{R(o25), P(o25,3	$\{3,023\}, 3(023), 3(024), 3(033), 3(020), 3(024), 3(033), 3(020), 3(023), 3(0$	021), 5(0	10), 5(031), 1(023), 5(00), 5(022), 5(011) jo tack	#10
		4		
Serve(o25,		\$tack #6		
Served(o2	5)			
Served(o2	1)		Make((o34,3)
Served(o1))	1 i	Robot-loca	ation(o25)
		1 1 4 :		
Served(o1		t-location		
Served(of)	$\{R([o1])\}$	Serve((025,3)
Served(o3	M.	ve([o1],o	34) Served	d(o26)
Served(o2			(c3/13) Shrver	
Served(o3	(R(o34), RF, M		d(o21)
Served(o3 Served(o2	(R(o34			d(o21)
	(R(o34 2)), RF, M	3) Served	d(o21) d(o10)
Served(o2 Served(o2	(R(o34 2) N 1) Robo	RF, Mo lake(o34, t-location	3) Servec (o25) Servec	d(o21) d(o10) d(o11)
Served (o2 Served (o2 Served (o2 Served (o2 Served (o2 Served (o2 Served (o3 Served (o3 Served (o4 Ser	\$\)\text{\{R(o34\)}\}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\), RF, M(lake(o34, t-location , P(o25,3)	3) Served (o25) Served , RL(3)} Served	d(o21) d(o10) d(o11) ed(o6)
Served(o2 Served(o2 Served(o2 Robot-location	(c) \text{\{R(o34\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\}), RF, M (ake(o34, t-location , P(o25,3) erve(o25,	B) Servec 1(o25) Servec 1, RL(3)} Servec 3) Servec	d(o21) d(o10) d(o11) ed(o6) d(o31)
Served (o2 Served (o2 Served (o2 Served (o2 Served (o2 Served (o2 Served (o3 Served (o3 Served (o4 Ser	(c) \text{\{R(o34\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\} \text{\{R(o25\)}\}), RF, M (ake(o34, t-location , P(o25,3) erve(o25,	B) Servec 1(o25) Servec 1, RL(3)} Servec 3) Servec	d(o21) d(o10) d(o11) ed(o6) d(o31)
Served(o2 Served(o2 Served(o2 Robot-location	(R(o34)) {R(o34)} {R(o25)} {N(o23)} {R(o25)} {R(o25)} {R(o25)} {R(o25)} {R(o25)} {S(o11)} {S(o21)} {S(o22)} {S(o11)} {S(o21)} {S(o22)} {S(o21)} {S(o22)} {S(o21)} {S(o22)} {S(o21)} {S(o22)} {S(o22)} {S(o21)} {S(o22)} {S(), RF, M (ake(o34, t-location , P(o25,3) erve(o25,	Servec Servec	d(o21) d(o10) d(o11) ed(o6) d(o31) d(o35)
Served (o2 Served (o2 Served (o2 Served (o2 Robot-location {S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o21), S(5) {R(o34 2) M 4) Robo 3) {R(o25) 4(o23) S 10), S(o31), R(o23), S(o6), S(o22), S(o11)}), RF, M lake(034, t-location , P(025,3) erve(025, erved(026 erved(026	Servec	d(o21) d(o10) d(o11) ed(o6) d(o31) d(o35) d(o22)
Served(o2 Served(o2 Served(o2 Robot-location	\$\)\text{\{R(o34\)}\}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\), RF, M lake(034, t-location , P(025,3) erve(025, erved(026 erved(026erved(016	Servec	d(o21) d(o10) d(o11) d(o11) ed(o6) d(o31) d(o35) d(o22) d(o24)
Served (o2 Served (o2 Served (o2 Served (o2 Robot-location {S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o21), S(\$\)\text{\{R(o34\)}\}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	RF, M lake(034, c-location P(025,3) erve(025, erved(026) erved(026) erved(016) erved(016)	Servec	d(o21) d(o10) d(o11) ed(o6) d(o31) d(o35) d(o22) d(o24) d(o23)
Served (o2 Served (o2 Served (o2 Served (o2 Robot-location {S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o21), S(\$\)\tag{R(034}\$\) \$\)\tag{N}\$ \$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	, RF, M lake(034, -location , P(025,3) erve(025, erved(026 erved(026 erved(0166 erved(01666) erved(01666) erved(01666)	Servec	d(o21) d(o10) d(o11) d(o11) d(o6) d(o31) d(o35) d(o22) d(o24) d(o23) ation(o23)
Served o2 Served o2 Served o2 Served o2 Served o2 Robot-location Served o2 Robot-location Served o2 Served o2 Served o2 Robot-location Served o2 S	\$\)\text{\{R(o34\)}\}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	, RF, M lake(034, -location , P(025,3) erve(025, erved(026 erved(026 erved(0166 erved(01666) erved(01666) erved(01666)	Servec	d(o21) d(o10) d(o11) d(o11) d(o6) d(o31) d(o35) d(o22) d(o24) d(o23) ation(o23)
Served (o2 Served (o2 Served (o2 Served (o2 Robot-location {S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o21), S(5) {R(o34} 2) M 4) Robo 5) {R(o25) (o23) S 10), S(o31), R(o23), S(o6), S(o22), S(o11)} 5 5 6 7 8 8 8 8 8 8 8 8 8	RF, M lake(034, t-location P(025,3) erve(025, erved(02 erved(01 erved(01 served(06 erved(06 erved(06 erved(06 erved(06)	3) Servec (o25) Servec , RL(3)} Servec \$B Servec \$B Servec \$C S	d(o21) d(o10) d(o11) d(o11) d(o6) d(o31) d(o35) d(o22) d(o24) d(o23) ation(o23)
Served o2	\$\)\text{\{R(o34\)}\}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	, RF, M lake(034, t-location , P(025,3) erved(025, erved(020) erved(010) erved(010) erved(010) erved(030) erved(030) erved(030)	Servec	d(o21) d(o10) d(o11) d(o6) d(o31) d(o33) d(o32) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31)
Served (o2 Served (o2 Served (o2 Served (o2 Served (o2 Served (o2 Robot-location (S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o26)	\$\)\text{\{R(o34\)}\}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	, RF, M lake(034, t-location P(025,3) erve(025, erved(02 erved(01 ferved(01 Served(03 erved(03 erved(03 erved(03 erved(03	Servec Servec	d(o21) d(o10) d(o11) d(o6) d(o31) d(o33) d(o32) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31)
Served (o2 Robot-location (S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o21), S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o24), S(o25), S(o26), S	\$\begin{array}{c ccccccccccccccccccccccccccccccccccc	, RF, M lake(034, t-location , P(025,3) erved(025, erved(020) erved(010) erved(010) erved(010) erved(030) erved(030) erved(030)	Servec Servec	d(o21) d(o10) d(o11) d(o6) d(o31) d(o33) d(o32) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31)
Served (o2 Served (o2 Served (o2 Served (o2 Served (o2 Robot-location (Sco23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o26), S(o27), S(o27), S(o28), S(o	\$\)\text{\{R(o34\)}\}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	, RF, M lake(034, t-location P(025,3) erve(025, erved(02 erved(01 ferved(01 Served(03 erved(03 erved(03 erved(03 erved(03	Servec Servec	d(o21) d(o10) d(o11) d(o6) d(o31) d(o33) d(o32) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31)
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Served O2	\$\ \text{\{\text{R}\(\omega\)}\}\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	, RF, M fake(034, r-location, P(025,3) erve(025, erved(025, erved(025, erved(036, erved(04,0) erved(05,0) erved(06,0) erved(07,0) erved(07,0) erved(02,0) erved(03,0) erved(3) Servec (o25) Servec (o25) Servec (o25) Servec (o26) Servec (o27) Servec (o28) Servec (o29) Stack (o29) Servec (o29) Ser	d(o21) d(o10) d(o10) d(o11) dd(o6) d(o31) d(o33) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31) ##11 ation(o25) 25,3), RL(3)}
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Served O2	5) {R(o34} 2) M 4) Robo 5) {R(o25) 1(o23) S 10), S(o31), R(o23), S(o6), S(o22), S(o11)} 5 2 S 5 5 6 S 7 7 8 S 10 10 10 10 10 10 10 10 10 10 10 10 10	, RF, M fake(034, r-location, P(025,3) erve(025, erved(025, erved(025, erved(036, erved(04,0) erved(05,0) erved(06,0) erved(07,0) erved(07,0) erved(02,0) erved(03,0) erved(3) Servec (o25) Servec , RL(3)} Servec , RL(3)} Servec 3) Servec (o25) Servec (o26) Servec (o27) Servec (o28) Servec (o28) Servec (o28) Servec (o28) Servec (o29) Servec (o29) Servec (o29) Servec (o29) Servec	d(o21) d(o10) d(o10) d(o11) d(o6) d(o31) d(o32) d(o32) d(o22) d(o24) d(o23) , S(o10), S(o31) #11 ation(o25) 25,3), RL(3)} o(25,3) d(o26)
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Served (o2 Served (o2 Served (o2 Served (o2 Served (o2 Served (o2 Robot-location (S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o21), S(o26), S(o26), S(o26), S(o26), S(o26), Served (o2	[Rio34] [Rio34] [Rio34] [Rio34] [Rio25] [Rio23] [Rio23	, RF, M fake(o34, r-location P(o25,3) erve(o25, erved(o25, erved(o26, erved(o36, erved(o36, erved(o36, erved(o37, erved(o27, erved(o27, erved(o27, erved(o37, e	3) Servec (o25) Servec (, RL(3)} Servec (, RL(3)} Servec (, RL(3)) Servec (, Robot-loc; (, Robot-lo	ation(o25) ation(o25) ation(o25) ation(o25) ation(o25) ation(o25) ation(o25) ation(o25) ation(o25) ation(o26) ation(o27)
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Served (o2 Served (o2 Served (o2 Served (o2 Served (o2 Served (o2 Robot-location (S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o21), S(o26), S(o26), S(o26), S(o26), S(o26), Served (o2	\$\begin{array}{c ccccccccccccccccccccccccccccccccccc	, RF, M fake(o34, r-location P(o25,3) erve(o25, erved(o25, erved(o26, erved(o36, erved(o36, erved(o36, erved(o37, erved(o27, erved(o27, erved(o27, erved(o37, e	3) ((o25) Servec ((o25) Servec ((o25) Servec ((o25) Servec ((o26) Serve	d(o21) d(o10) d(o10) d(o11) d(o6) d(o31) d(o35) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31) #11 ation(o25) 25,3), RL(3)} o25,3) d(o26) d(o21) d(o10) d(o11) d(o10) d(o11) d(o10) d(o31)
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Served O2	[R(o34)] [R(o34)] [R(o23)] [R(RE, M Aake(034, r-location P(025,3) erve(025,3) erve(025,3) erve(025,3) erved(025,3) erved(036) erved(036) erved(037) erved(027) erved(027) erved(037) Aake(034, r-location P(025,3) erve(025,3) erve(025,3) erve(025,3) erve(026) erved(026)	3) Servec ((o25) Servec (1) Robot-loc: (1) (Ro23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o21)	ation(o21) ation(o22) ation(o23) ation(o23) ation(o25) ation(o25) ation(o25) ation(o25) ation(o25) ation(o25) ation(o25) ation(o26) ation(o27)
Served of Serv	\$\begin{array}{c ccccccccccccccccccccccccccccccccccc	, RF, M dake(034, t-location , P(025,3) erve(025, erved(026, erved(026, erved(036, erved(036, erved(036, erved(036, erved(036, erved(037, erved(026, erved(026, erved(026, erved(026, erved(037, erved	3) (o25) (servec (o25) (servec (o25) (servec (o25) (o26) (o27) (o28) (o28) (o29) (o2	d(o21) d(o10) d(o10) d(o10) d(o11) d(o6) d(o31) d(o35) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31) #11 ation(o25) 25,3), RL(3)} o25,3) d(o26) d(o21) d(o10) d(o11) d(o10) d(o11) d(o35) d(o21) d(o24) d(o23) ation(o23) , S(o10), S(o31)
Served O2	\$\begin{array}{c ccccccccccccccccccccccccccccccccccc	RE, M Aake(034, r-location P(025,3) erve(025,3) erve(025,3) erve(025,3) erved(025,3) erved(036) erved(036) erved(037) erved(027) erved(027) erved(037) Aake(034, r-location P(025,3) erve(025,3) erve(025,3) erve(025,3) erve(026) erved(026)	3) (o25) (servec (o25) (servec (o25) (servec (o25) (o26) (o27) (o28) (o28) (o29) (o2	d(o21) d(o10) d(o10) d(o10) d(o11) d(o6) d(o31) d(o35) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31) #11 ation(o25) 25,3), RL(3)} o25,3) d(o26) d(o21) d(o10) d(o11) d(o10) d(o11) d(o35) d(o21) d(o24) d(o23) ation(o23) , S(o10), S(o31)
Served of Serv	\$\begin{array}{c ccccccccccccccccccccccccccccccccccc	, RF, M dake(034, t-location , P(025,3) erve(025, erved(020,0) erved(010,0) erved(030,0) erved(030,0) erved(020,0) erved(020,0) erved(020,0) erved(020,0) erved(030,0) f(R(013)) erved(031,0) f(R(013)) erved(034,0) f(R(013),0) erve(025,3) erved(020,0) erved(020,0) erved(020,0) erved(020,0) erved(020,0) erved(020,0) erved(020,0) erved(020,0) erved(020,0) erved(020,0) erved(020,0) erved(020,0) erved(020,0)	3) (o25) (servec (o25) (servec (o25) (servec (o25) (o27) (o28) (o29) (o2	d(o21) d(o10) d(o10) d(o10) d(o11) d(o6) d(o31) d(o35) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31) #11 ation(o25) 25,3), RL(3)} o25,3) d(o26) d(o21) d(o10) d(o11) d(o10) d(o11) d(o35) d(o21) d(o24) d(o23) ation(o23) , S(o10), S(o31)
Served of Serv	\$\begin{array}{c ccccccccccccccccccccccccccccccccccc	, RF, M fake(o34, t-location P(o25,3) erve(o25, erved(o25, erved(o25, erved(o3) erved(o3) erved(o3) erved(o3) erved(o22, erved(o22, erved(o23, erved(o23, erved(o33, erved(o33, erved(o34, t-location P(o25,3) erved(o34, t-location P(o25,3) erved(o25, erved(o31, erve	3) (o25) (servec (o25) (servec (o25) (servec (o25) (servec (o25) (o26) (o27) (o28) (o28) (o28) (o29) (d(o21) d(o10) d(o10) d(o10) d(o11) d(o6) d(o31) d(o35) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31) #11 ation(o25) 25,3), RL(3)} o25,3) d(o26) d(o21) d(o10) d(o11) d(o10) d(o11) d(o35) d(o21) d(o24) d(o23) ation(o23) , S(o10), S(o31)
Served of Serv	[R(o34)] [R(o34)] [R(o25)] [R(o23)]	Ref. M fake(034, t-location P(025,3) erve(025, erved(025, erved(025, erved(036, erved(036, erved(036, erved(037, erved(037, erved(037, erved(037, fake(034, t-location P(025,3) erved(025, erved(026, erved(036, erved	3) ((o25) Servec	d(o21) d(o10) d(o10) d(o10) d(o11) d(o6) d(o31) d(o35) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31) #11 ation(o25) 25,3), RL(3)} o25,3) d(o26) d(o21) d(o10) d(o11) d(o10) d(o11) d(o35) d(o21) d(o24) d(o23) ation(o23) , S(o10), S(o31)
Served of Serv	[R(o34)] [R(o34)] [R(o25)] [R(o23)]	, RF, M fake(o34, t-location P(o25,3) erve(o25, erved(o25, erved(o25, erved(o3) erved(o3) erved(o3) erved(o3) erved(o22, erved(o22, erved(o23, erved(o23, erved(o33, erved(o33, erved(o34, t-location P(o25,3) erved(o34, t-location P(o25,3) erved(o25, erved(o31, erve	3) ((o25) Servec	d(o21) d(o10) d(o10) d(o10) d(o11) d(o6) d(o31) d(o35) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31) #11 ation(o25) 25,3), RL(3)} o25,3) d(o26) d(o21) d(o10) d(o11) d(o10) d(o11) d(o35) d(o21) d(o24) d(o23) ation(o23) , S(o10), S(o31)
Served of Serv	\$\begin{array}{c ccccccccccccccccccccccccccccccccccc	, RF, M dake(034, t-location , P(025,3) erved(025, erved(025,erved(026,erved(031,erved	3) (o25) (servec (o25) (servec (o25) (servec (o25) (o27) (o28) (o29) (o29) (o29) (o21) (o21) (o22) (o22) (o23) (o2	d(o21) d(o10) d(o10) d(o10) d(o11) d(o6) d(o31) d(o35) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31) #11 ation(o25) 25,3), RL(3)} o25,3) d(o26) d(o21) d(o10) d(o11) d(o10) d(o11) d(o35) d(o21) d(o24) d(o23) ation(o23) , S(o10), S(o31)
Served of Serv	\$\begin{array}{c ccccccccccccccccccccccccccccccccccc	, RF, M dake(o34, t-location P(o25,3) erve(o25, erved(o25, erved(o16) erved(o3) erved(o3) erved(o3) erved(o25, erved(o35, erved(o35, erved(o35, erved(o35, erved(o35, erved(o35, erved(o25, erved(o25, erved(o25, erved(o25, erved(o25, erved(o25, erved(o25, erved(o25, erved(o25, erved(o35,	3) (o25) (servec (o25) (servec (o25) (servec (o25) (o26) (o27) (o28) (o28) (o28) (o29) (o2	d(o21) d(o10) d(o10) d(o10) d(o11) d(o6) d(o31) d(o35) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31) #11 ation(o25) 25,3), RL(3)} o25,3) d(o26) d(o21) d(o10) d(o11) d(o10) d(o11) d(o35) d(o21) d(o24) d(o23) ation(o23) , S(o10), S(o31)
Served of Serv	\$\begin{array}{c ccccccccccccccccccccccccccccccccccc	Ref. M fake(034, r-location P(025,3) erve(025,5) erved(025,5) erved(025,5) erved(026,5) erved(036,5) erved(037,5) erved(037,5) erved(037,5) erved(037,5) fake(034,7) ref. (025,3) erved(025,5) erved(026,5) erved(027,5) erved(037,5) erved(037,5) erved(047,5) erved	3) Servec ((o25) Servec (1) Servec (1) Servec (1) Servec (1) Servec (2) Servec (3) Servec (4) Servec (5) Servec (6) Servec (7) Servec (8) Robot-loci (8) (o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o21), S(o23), S(o26), S(o21), S(o21), S(o23), S(o26), S(o22), S(o26), S(o21), S(o23), S(o26), S(o22), S(o26), S(o21), S(o23), S(o26), S(o22), S(o26), S(o21), S(o26), S(o26)	d(o21) d(o10) d(o10) d(o10) d(o11) d(o6) d(o31) d(o35) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31) #11 ation(o25) 25,3), RL(3)} o25,3) d(o26) d(o21) d(o10) d(o11) d(o10) d(o11) d(o35) d(o21) d(o24) d(o23) ation(o23) , S(o10), S(o31)
Served of Serv	\$\begin{array}{c ccccccccccccccccccccccccccccccccccc	, RF, M dake(o34, t-location P(o25,3) erve(o25, erved(o25, erved(o16) erved(o3) erved(o3) erved(o3) erved(o25, erved(o35, erved(o35, erved(o35, erved(o35, erved(o35, erved(o35, erved(o25, erved(o25, erved(o25, erved(o25, erved(o25, erved(o25, erved(o25, erved(o25, erved(o25, erved(o35,	3) Servec ((o25) Servec (1) Servec (1) Servec (1) Servec (1) Servec (2) Servec (3) Servec (4) Servec (5) Servec (6) Servec (7) Servec (8) Robot-loci (8) (o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o21), S(o23), S(o26), S(o21), S(o21), S(o23), S(o26), S(o22), S(o26), S(o21), S(o23), S(o26), S(o22), S(o26), S(o21), S(o23), S(o26), S(o22), S(o26), S(o21), S(o26), S(o26)	d(o21) d(o10) d(o10) d(o10) d(o6) d(o31) d(o35) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31) #11 ation(o25) 25,3), RL(3)} o25,3) d(o26) d(o21) d(o10) d(o11) d(o10) d(o11) d(o35) d(o21) d(o24) d(o23) ation(o23) , S(o10), S(o31)
Served of Serv	\$\begin{array}{c ccccccccccccccccccccccccccccccccccc	Ref. M fake(034, r-location P(025,3) erve(025, erved(025, erved(025, erved(025, erved(036, erved(031, erved(025, erved(025, erved(025, erved(025, erved(031, Ref. M fake(034, r-location P(025,3) erved(025, erved(025, erved(025, erved(031	3) (o25) (servec (o25) (servec (o25) (servec (o25) (o26) (o27) (o28) (o28) (o29) (o2	d(o21) d(o10) d(o10) d(o10) d(o11) d(o6) d(o31) d(o35) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31) #11 ation(o25) 25,3), RL(3)} o25,3) d(o26) d(o21) d(o10) d(o11) d(o10) d(o11) d(o35) d(o21) d(o24) d(o23) ation(o23) , S(o10), S(o31)
Served of Serv	5) {R(o34} 2) M 4) Robo 3) {R(o25) 3) {R(o25) 3} S 5 10), S(o31), R(o23), S(o6), S(o22), S(o11) 5 5 6 7 7 8 8 8 8 8 8 8 8 9 8 9 9 10 9 10 10 10 10 10 10 10 10 10 10 10 10 10	Ref. M fake(034, t-location P(025,3) erve(025,3) erve(025,3) erve(025,3) erve(025,3) erved(025,3) erved(031,0) erved(031,0) erved(022,0) erved(021,0) Stack #7 (R(013)) dve(013,0) RF, M fake(034,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1	3) (o25) (servec (o25) (servec (o25) (servec (o25) (o26) (o27) (o28) (o28) (o29) (o2	d(o21) d(o10) d(o10) d(o10) d(o11) d(o6) d(o31) d(o35) d(o22) d(o24) d(o23) ation(o23) , S(o10), S(o31) #11 ation(o25) 25,3), RL(3)} o25,3) d(o26) d(o21) d(o10) d(o11) d(o10) d(o11) d(o35) d(o21) d(o24) d(o23) ation(o23) , S(o10), S(o31)

Robot-location		
{R([o1])} Move([o1],o	Served(o26 25) Served(o2	
{R(o25), P(o25,3)		
Serve(o25,) Make([o],1)
Served(o26 Served(o2	,	
Served(02)		
Served(o1		
Served(o6) Served(o24	
Served(o3 Served(o3		
		10), S(o31), R(o23), S(o6), S(o22), S(o11) Served(o31)
Served(o24		Served(o35)
Served(o23 Robot-location		Served(o22) Served(o24)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o	. ,	Served(024)
		Robot-location (o23)
Stack #13	Served(02)	$S(\alpha_{23}), S(\alpha_{25}), S(\alpha_{24}), S(\alpha_{35}), S(\alpha_{26}), S(\alpha_{21}), S(\alpha_{10}), S(\alpha_{31})$
	Served(o10	
(D/ 04)3	Served(o11	.)
{R(o34)} Move(o34,o	Served(06 25) Served(031	
{R(o25), P(o25,3)		
Serve(o25,	Served(o2	Robot-location([o])
Served (o2)		
Served(o2 Served(o1	,	, , , , , , , , , , , , , , , , , , , ,
		10), S(o31), R(o23), S(o6), S(o22), SR(b26) , P(o26,1), RL(1)}
Served(o6		Serve(o26,1)
Served(o31 Served(o35		Served(o21) Served(o10)
Served(022		Served(011)
Served(o24	D. 14: (-26)	Served(o6)
Served(o2; Robot-location	(-22) Robot-loaded	([n]) C1(-25)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o	(023) 10), S(031), B(023), S(06), S(022), S(0Replot-location	$\frac{1}{(o26)}$ Served $\frac{1}{(o22)}$
	\frac{\frac{1}{\text{R(\o26)}, P(\o26, [n])}}{\text{Serve}(\o26, [n])}	361 ved(024)
Stack #14	Serve(020,[Served(o2	
	Served(o10	(S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31)
M / . 24	Served(011	.)
Move(o34,o) {R(o25), P(o25,3)		
Serve(025,		
Served(o26		
Served(o2 Served(o1		
Served(o1	,	
		10), S(o31), R(o23), S(o6), S(o22), S(oRbbot-location(o26)
Served(o31 Served(o35		$\{R(o26), P(o26,1), RL(1)\}\$ Serve $(o26,1)$
Served(o2	,	$\frac{\text{Serve}(020,1)}{\text{Served}(021)}$
Served(o24	,	Served(o10)
Served(o2; Robot-location		Served(011) (1) Served(06)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o	10) S(o31) B(o23) S(o6) S(o22) S(oRobot-location	(o26) Served(o31)
	$\{R(o26), P(o26,1)\}$	$\frac{RL(1)}{Served(o35)}$
Stack #15	Serve(o26, Served(o2	Ser ved (022)
	Served(o10	Served(024)
(D/ or) D/ or o	Served(o1	Pohot logation(c22)
{R(o25), P(o25,3) Serve(o25,	$\{RL(3)\}$ Served (of Served)	(S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31)
Served(o20	Served(o35	
Served(o2	Served (o22	β tack #25
Served(o1(Served(o1		
Served(61 Served(66	,	
	$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o$	
Served(o35 Served(o22		$\frac{\text{Move}([o1],o28)}{\{\text{M}(o28,1), \text{R}(o28), \text{RF}\}}$
Served(o22 Served(o24		$\{M(028,1), R(028), RF\}$ $Make(028,1)$
Served(o23		Robot-location(o26)
Robot-location	. ,	$\{R(o26), P(o26,1), RL(1)\}$
[Q(-99) Q(-9E) Q(-94) Q(-9E) Q(-96) Q(-91) Q(-	10), 5(031), R(023), 5(00), 5(022), 5(011)}	Serve(o26,1)
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o$	7, (), (), (), (),	Served(o21)
		Served(o21) Served(o10)
		Served (o10) Served (o11)
		Served(010) Served(011) Served(06)
		Served(o10) Served(o11)
		Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o22)
		Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o22) Served(o24)
		Served(010) Served(011) Served(06) Served(031) Served(035) Served(022) Served(024) Served(023)
		Served (010) Served (011) Served (06) Served (031) Served (035) Served (022) Served (024)

$\{R(o25)\}$		-location		(o26), P(o26,1), RL(1)}
Move(o25,o				Serve(o26,1)
$\{M(o28,1), R(o28,1), R(o$		rve(o26,		Served(o21)
Make(o28, Robot-location		rved(o21		Served(o10)
Robot-location $\{R(o26), P(o26,1)\}$		rved(o10 rved(o11		Served(o11) Served(o6)
Serve(026,		rved(o1 erved(o6		Served(ob)
Served(o2)	,	rved(o31	•	Served(o31)
Served(02		rved(o3		Served(o22)
Served(o1		rved(o22		Served(o24)
Served(o6) Se	rved(o24	2)	Served(o23)
Served(o3		rved(o23		Robot-location(o23)
Served(o3			$(\{223\}, S(o25), S(o24), S(o35), S(o24), S(o35), S(o25), S(o2$	
	2){S(o23), S(o25), S(o24), S(o35), S(o26), S(o	21), S(o	(10), $S(o31)$, $R(o23)$, $S(o6)$, $S(o22)$, $S(o23)$	
Served(o24 Served(o23		ack #29		Stack #33
Robot-location		ack #29		
S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o		-		
	, , , , , , , , , , , , , , , , , , , ,	, ,	(5.41)	Serve(o26,1)
Stack #25		location	([o1])	Served(o21)
		R([o1])	06)	Served(o10)
	Mov {R(o26), 1	re([o1],o		Served(o11) Served(o6)
Move(o25,o		rve(o26,1)		Served(ob)
{M(o28,1), R(o2		rved(o2)		Served(o35)
Make(o28,		rved(o10		Served(o22)
Robot-location	,	rved(o1	,	Served(o24)
$\{R(o26), P(o26,1)\}$, RL(1)}	erved(o6)	Served(o23)
Serve(o26,		rved(o3		Robot-location(o23)
Served(o2)			(S(o23), S(o25), S(o24), S(o35), S(o24))	6), $S(o21)$, $S(o10)$, $S(o31)$
Served(o1		rved(o22		Ct = =1= #10.4
Served(of		rved(o24		Stack #34
Served(06 Served(03		rved(o23 -location		
	S(S(o23), S(o25), S(o24), S(o35), S(o26), S(o			11)}
Served(02				Served(o21)
Served (624		ack #30		Served(o10)
Served(o23				Served(o11)
Robot-location				Served(o6)
S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o21)	10), $S(o31)$, $R(o23)$, $S(o6)$, $S(o22)$, $S(o11)$	R(o28)}		Served(o31) Served(o35)
a		re(o28)) re(o28,o	26)	Served(035)
Stack #26	$\{R(o26),$			Served(o24)
		rve(o26,		Served(o23)
	Se	rved(o2)	Robot-location(o23)
$\{M(o28,1), R(o28,1), R(o$			(S(o23), S(o25), S(o24), S(o35), S(o25))	6), S(o21), S(o10), S(o31
Make(o28,		rved(o11		
Robot-location		erved(o6		Stack #35
$\{R(o26), P(o26,1)\}$ Serve(o26,		rved(o31 rved(o35		
Serve(626, Served(62)		rved(o22		
Served(02)		rved(o24		Petition(o21,[n])
Served(o1		rved(o23		Robot-loaded([n])
Served (o6	Robot	location	(023)	Robot-location(o21)
	(S(o23), S(o25), S(o24), S(o35), S(o26), S(o	21), S(o	10), S(o31), R(o23), S(o6), S(o22), S((021,[n]), RL([n])
Served(o35	5)			Serve(o21,[n]) Served(o10)
Served(o22	,	ack #31		Served(010)
Served(o24		ŀ		Served(off)
Served(o23 Robot-location		ŀ		Served(o31)
S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26)	10), S(o31), R(o23), S(o6), S(o22), S(o11)	/e(o28,o	26)	Served(o35)
2(020), 3(020), 3(024), 5(030), 5(020), 5(021), 5(0	$\{\Pi(020),$	F(020,1)	, nL(1)}	Served(o22)
Stack #27		rve(o26,		Served(o24)
"		rved(o21	,	Served(o23)
		rved(o10		Robot-location(o23)
Mr.1. / 00			(S(o23), S(o25), S(o24), S(o35), S(o24))	o), S(021), S(010), S(03)
Make(o28, Robot-location		erved(o6) rved(o31		Stack #36
{R(o26), P(o26,1)	· /	rved(o35		Duack #50
Serve(o26,		rved(o22		
Served(o2)		rved(o24		
Served(o10)) Se	rved(o23	<u> </u>	Robot-loaded(2)
Served (o1	.) Robot	-location	(023)	Robot-location(o21)
	$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o$	21), S(o	10), S(o31), R(o23), S(o6), S(o22), S((021,2), KL(2)}
Served(o31	.)			Serve(o21,2) Served(o10)
Served(o35		ack #32		Served(o11)
Served(o22		ŀ		Served(off)
Served(o24		ł		Served(o31)
g. 1/ oc)	-		Served(o35)
Served 023	(022)			
Robot-location		ŀ		Served(o22)
		}		
Robot-location S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o	10), S(o31), R(o23), S(o6), S(o22), S(o11)}			Served(o22)
Robot-location	10), S(o31), R(o23), S(o6), S(o22), S(o11)}		{S(o23), S(o25), S(o24), S(o35), S(o24)	Served(o22) Served(o24) Served(o23) Robot-location(o23)

Robot-fre Machine([o]		$\{R(o26)\}$ ove $(o26,c)$	0)	Robot-location(o21) $\{R(o21), P(o21,2), RL(2)\}$
Robot-locatio		, RF, M		Serve(o21,2)
{R([o]), RF, M		Take(08,2		Served(o10)
Make([o],2		-location		Served(o11)
Robot-location	$(o21)$ {R(o21),	P(o21,2)	, RL(2)}	Served(o6)
$\{R(o21), P(o21,2)\}$		rve(o21,		Served(o31)
Serve(o21,		erved(o10		Served(o35)
Served(o10		erved(o1		Served(o22)
Served(o1		erved(o6		Served(o24)
Served(o6		erved(o3		Served(o23)
Served(o3		erved(o3		Robot-location(o23)
Served(o3 Served(o2		erved(o2/ erved(o2/		S(o35), S(o26), S(o21), S(o10), S(o33)
Served(02		erved(o2i		Stack #46
Served(o2		t-location		
	((628)23), S(o25), S(o24), S(o35), S(o26), S(o), S(o22), S(o11)}
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o$		// (7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7
	S	tack #42	<u> </u>	Robot-location([o1])
Stack #38				{R([o1])}
				Move([o1],o21)
	M	/ . 0.0	0)	$\{R(o21), P(o21,2), RL(2)\}$
Machine([o]		ove(o26,c		Serve(o21,2) Served(o10)
Robot-locatio		[, KF, MI]		Served(010)
{R([o]), RF, M		t-location		Served(011)
Make([o], 2]				Served(o31)
Robot-location		rve(o21,		Served(o35)
{R(o21), P(o21,2)	<u> </u>	erved(o10		Served(o22)
Serve(o21,		erved(o1		Served(o24)
Served(o1	S)	erved(o6		Served(o23)
Served(o1		erved(o3		Robot-location(o23)
Served(o6				S(o35), S(o26), S(o21), S(o10), S(o33)
Served(o3		erved(o22		G. 1
Served(o3		erved(o24		Stack #47
Served(o2		erved(o2		
Served (o2	S(S(o23), S(o25), S(o24), S(o35), S(o26), S(-location) S(o22) S(o11)}
Robot-location		021), 5(0	10), 3(031), R(023), 3(00	(R(08))
		l		Move(08,021)
	10), S(o31), B(o23), S(o6), S(o22), S(o11)}S	tack #43	}	Move(08,021)
(5(020), 5(020), 5(024), 5(000), 5(020), 5(021), 5(0	10), S(o31), R(o23), S(o6), S(o22), S(o11)}S	tack #43		$\{R(o21), P(o21,2), RL(2)\}$
Stack #39		tack #43		{R(o21), P(o21,2), RL(2)} Serve(o21,2)
		,		{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10)
	{R(08)), RF, M	(08,2)}	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11)
Stack #39	{R(o8)), RF, M Make(08,2	(08,2)}	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6)
Stack #38 Robot-locatio	{R(o8) N n(o8) Robot), RF, M Make(08,2 -locatior	(08,2)} }) (021)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31)
Stack #39 Robot-locatio {R(08), RF, M	$\begin{array}{c c} & & \{R(o8) \\ & & \Lambda \\ & & \\ n(o8) & & Robot \\ o8,2)\} & \{R(o21), \\ \end{array}$), RF, M) Make(08,2 -location P(021,2)	(o8,2)} (o21) (, RL(2)}	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35)
Stack #39 Robot-locatio {R(o8), RF, M Make(o8,2	{R(o8) n(o8) Robot o8,2)} {R(o21),) Sc), RF, M(Make(08,2); -location P(021,2); rve(021,:	(o8,2)} {) {(o21)} {, RL(2)} }	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o22)
Stack #39 Robot-locatio {R(08), RF, M	\tag{R(08)} \text{N} \text{1(08)} \text{Roboto} \text{08(21)} \text{S} \text{(o21)} \text{S} \text{(o21)} \text{S} \text{S}), RF, M) Make(08,2 -location P(021,2)	(08,2)} }) ((021) (, RL(2)} 2)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35)
Robot-locatio {R(o8), RF, M Make(o8,2 Robot-location	\text{\{R(08)} \\ \frac{\text{N}}{\text{N}}\text{\}} \\ \frac{\text{R(021)}}{\text{08}}\text{\}} \\ \text{\{R(021)}} \\ \text{\}} \\ \text{\{S(021)}} \\ \{S(021), RF, M Make(08,2 -location P(021,2) rve(021,: erved(010 erved(0100)	(08,2)} {) (021) (, RL(2)} 2) () ()	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o22) Served(o24) Served(o23) Robot-location(o23)
Stack #39 Robot-locatio {R(o8), RF, M Make(08,2 Robot-location {R(o21), P(o21,2)	\text{\{R(o8)} \\ \frac{\text{N}}{\text{N}}\text{\}} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\), RF, M Make(08,2 -location P(021,2) rve(021,: erved(010 erved(0100)	(08,2)} {) (021) (, RL(2)} 2) () ()	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o22) Served(o24) Served(o23) Robot-location(o23)
Robot-locatio Robot-locatio R(o8), RF, M Make(o8, 2 Robot-location R(o21), P(o21, 2 Serve(o21, Served(o1 Serve	{R(o8) n(o8) Robot o8,2)} {R(o21),) Sc (c21) Sc , RL(2)} Sc 2) Sc)) Sc	, RF, Mi lake(08,2 -location P(021,2) rve(021,2) rve(021,2) erved(011,2) erved(011,2) erved(031,2) erved(032,2) erved(033,2)	(o8,2)} (o8,2)} (o8,2)} (o21) (, RL(2)} (o)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o22) Served(o22) Served(o24) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o35)
Robot-locatio Robot-locatio R(o8), RF, M Make(o8,2 Robot-locatio R(o21), P(o21,2 Serve(o21, Served(o16 Ser	\text{\{R(08)} \\ \text{\{R(08)} \\ \text{\{R(021)}, \\ \text{\{R(021), \\ \}} \\ \text{\{R(021), \\ \}} \\ \text{\{S(021), \\ \}} \\ \\ \text{\{S(021), \\ \}} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	, RF, M Iake(08,2 -location P(021,2) rve(021, erved(01 erved(06 erved(03 erved(03 erved(02	(o8,2)} (o8,2)} (o8,2)} (o21) (RL(2)} (o21) (RL(2)} (o21) (RL(2)) (o21) (o21	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o22) Served(o24) Served(o23) Robot-location(o23)
Robot-locatio Robot-locatio R(o8), RF, M Make(o8,2 Robot-location R(o21), P(o21,2 Serve(o21, Served(o1 Served(o1 Served(o6 Served(o7 Served(\text{\{R(o8)} \\ \frac{\text{N}}{\text{N}}\text{\}} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\), RF, Mi Make(08,2 Llocation P(021,2) erved(01) erved(01 erved(06) erved(03) erved(03) erved(02)	(o8,2)} }) (o21) (p21) (p21) (p21) (p31) (p41) (p41) (p41) (p42) (p42) (p42) (p43)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o22) Served(o22) Served(o24) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o35)
Robot-locatio Robot-locatio R(o8), RF, M Make(o8,2 Robot-locatio R(o21), P(o21,2) Served(o21, Served(o1 Served(o1 Served(o6 Served(o3 Served(o4 Served	\text{\{R(08)} \\ \text{N} \\ \text{n(08)} \\ \text{n(08)} \\ \text{R(021),} \\ \text{S} \\ \text{(021)} \\ \text{S} \\ \text{(21)} \\ \text{S} \\ \text{S} \\ \text{(021)} \\ \text{(021)} \\ \text{S} \\ \text{(021)} \\ \text{S} \\ \text{(021)} \\ \text{S} \\ \text{(021)} \\ \text{S} \\ \text{(021)} \\ \text{(021)} \\ \text{S} \\ \text{(021)} \\ (021)), RF, Mi Make(08,2 -location P(021,2) erved(021, erved(01) erved(06) erved(03) erved(02) erved(02) erved(02)	(o8,2)} }) (o8,2)} (o21) ,, RL(2)} (o21) , RL(2) (o21) , R	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o22) Served(o22) Served(o24) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o35)
Robot-locatio Robot-locatio R(08), RF, M Make(08,2 Robot-location R(021), P(021,2 Serve(021, Served(01 Served(01 Served(01 Served(03 Served(\text{\{R(08)} \\ \frac{\text{N}}{\text{N}} \\ \text{\{R(021)}, \\ \text{\{R(021)}, \\ \text{\{R(021)}, \\ \text{\{R(021)}, \\ \text{\{R(021)}, \\ \text{\{S(021)}, \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	o), RF, Mi Make(08,2 -location P(021,2) rrve(021,2) rrved(01 erved(01 erved(03 erved(03 erved(02 erved(02 erved(02 erved(02	(o8,2)} (o8,2)} (o8) (o21) (, RL(2)) (o21) (, RL(2)) (o21) (o21) (o21) (o23) (o23)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o10) Served(o11) Served(o6) Served(o35) Served(o35) Served(o22) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o33) Stack #48
Robot-locatio Robot-locatio R(08), RF, M Make(08,2 Robot-location R(021), P(021,2 Serve(021, Served(01 Served(01 Served(01 Served(03 Served(03 Served(02 Served(R(o8) Robot	o), RF, Mi Make(08,2 -location P(021,2) rrve(021,2) rrved(01 erved(01 erved(03 erved(03 erved(02 erved(02 erved(02 erved(02	(o8,2)} (o8,2)} (o8) (o21) (, RL(2)) (o21) (, RL(2)) (o21) (o21) (o21) (o23) (o23)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o22) Served(o24) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3)
Robot-locatio	{R(o8)), RF, M, lake(08,2 location P(021,2 rve(021, rved(01 erved(06 erved(03 erved(03 erved(02 erved(02 erved(02 erved(02) erved(02) erved(02) erved(02)	(o8,2)} }) (o21) , RL(2)} p)) () (S(o23), S(o25), S(o24), (o23) (o23) (o23) (o23) (o23)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Serve(o10) Served(o10) Served(o6) Served(o31) Served(o35) Served(o22) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o32) Served(o24) Served(o25) Served(o26) Served(o27), S(o10), S(o32) Served(o27), S(o10), S(o32) Served(o27), S(o11) Prove(o8,o21) Serve(o21,2)
Robot-locatio Robot-locatio R(08), RF, M Make(08,2 Robot-location R(021), P(021,2 Serve(021, Served(01 Served(01 Served(01 Served(03 Served(03 Served(02 Served((R(o8) (a(o8) Robot o8,2)} (R(o21),) (a(o21) Sc (a(o21) Sc) (b(o21) Sc) (co21) Sc (co22) Sc (co21) Sc (co22) Sc (co22) Sc (co22) Sc (co23) S	o), RF, Mi Make(08,2 -location P(021,2) rrve(021,2) rrved(01 erved(01 erved(03 erved(03 erved(02 erved(02 erved(02 erved(02	(o8,2)} }) (o21) , RL(2)} p)) () (S(o23), S(o25), S(o24), (o23) (o23) (o23) (o23) (o23)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o35) Served(o35) Served(o22) Served(o24) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3) Stack #48
Robot-locatio R(o8), RF, M Make(o8,2 Robot-locatio R(o21), P(o21,2 Serve(o21, Serve(o21, Served(o1 Served(o1 Served(o2 Served(o3 Served(o3 Served(o2 Served(o2 Served(o2 Served(o2 Served(o2 Served(o2 Robot-location Robot-locat	(R(o8) (a(o8) Robot o8,2)} (R(o21),) (a(o21) Sc (a(o21) Sc) (b(o21) Sc) (co21) Sc (co22) Sc (co21) Sc (co22) Sc (co22) Sc (co22) Sc (co23) S), RF, M, lake(08,2 location P(021,2 rve(021, rved(01 erved(06 erved(03 erved(03 erved(02 erved(02 erved(02 erved(02) erved(02) erved(02) erved(02)	(o8,2)} }) (o21) , RL(2)} p)) () (S(o23), S(o25), S(o24), (o23) (o23) (o23) (o23) (o23)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o35) Served(o35) Served(o22) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o32) Stack #48
Robot-locatio R(o8), RF, M Make(o8,2 Robot-locatio R(o21), P(o21,2 Serve(o21, Serve(o21, Served(o1 Served(o1 Served(o2 Served(o3 Served(o3 Served(o2 Served(o2 Served(o2 Served(o2 Served(o2 Served(o2 Robot-location Robot-locat	{R(o8) n(o8) Robot o8,2)} {R(o21),) St (o21) S , RL(2)} S 2) S) S) S) S) S) S) S) S	Joseph Make (08,24) Alake (08,24)	(o8,2)} (1) (o21) (c21) (, RL(2)} (2) () () () () () () () () () () () () ()	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o22) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3) Stack #48
Robot-locatio R(o8), RF, M Make(o8,2 Robot-location R(o21), P(o21,2 Served(o1, Served(o1, Served(o1, Served(o1, Served(o2, Served(o3, Served(o3, Served(o3, Served(o2, Served(o2, Served(o2, Served(o2, Served(o2, Served(o2, Served(o2, Served(o2, Robot-location Served(o2, Served(o3, Served(o3, Served(o2, Se	{R(o8)	J, RF, M, Make(08,2 -location P(021,2) rrve(021, rrve(021,erved(01 erved(06 erved(06 erved(06) erved(02 erved(02 erved(02 erved(02 erved(02) Make(08,2	(o8,2)} (o8,2)} (o21) (RL(2)) (P) (o21) (RL(2)) (o21) (o21) (o21) (o23) (o23), S(o25), S(o24), S(o24), S(o24), S(o24), S(o25), S(o24), S(o25), S(o24), S(o25), S(o24), S(o24), S(o25), S(o25), S(o24), S(o25), S(o25), S(o24), S(o25), S(o25), S(o24), S(o25), S(o24), S(o25), S(o24), S(o25), S(o2	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o22) Served(o24) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3) Stack #48
Robot-locatio R(o8), RF, M Make(o8,2 Robot-location R(o21), P(o21,2 Served(o1, Served(o1, Served(o1, Served(o1, Served(o2, Served(o3, Served(o3, Served(o3, Served(o2, Served(o2, Served(o2, Served(o2, Served(o2, Served(o2, Served(o2, Served(o2, Robot-location Served(o2, Served(o3, Served(o3, Served(o2, Se	{R(o8)	n, RF, M, Make(08,2,1-location P(021,2) arve(021,2) arve(021,2) arve(021,2) arved(01,2) arved(03,2) arved(03,2) arved(02,2) ar	(o8,2)} (o8,2)} (o21) (p21) (p21) (p21) (p3) (p4) (p5) (p6) (p	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o22) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Stack #48
Robot-locatio R(o8), RF, M Make(o8,2 Robot-locatio R(o21), P(o21,2 Serve(o21, Serve(o21, Served(o1 Served(o1 Served(o1 Served(o3 Served(o3 Served(o2 Served(o2 Served(o2 Served(o2 Served(o2 Served(o2 Robot-location Robot-location Served(o2 Served(o3 Ser	(R(o8) (a(o8) Robot o8,2)} (R(o21),) (a(o21) Sc (a(o21) Sc) (b(o21) Sc) (co21) Sc (c	Ake(08,2 -location P(021,2) rrve(021,2) rrve(021,2) rrve(021,2) rrved(03.2) rrved(03.2) rrved(02.2) rrved(02.2) -location 021), S(0 tack #44 Ake(08,2 -location P(021,2)	(o8,2)} (o8,2)} (1) ((o21) (, RL(2)} () () () () () () () () () () () () ()	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Serve(o10) Served(o10) Served(o11) Served(o6) Served(o35) Served(o35) Served(o22) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3) Stack #48 Stack #48 Served(o21), S(o11) Flove(o8,o21) (R(o21), P(o21,2), RL(2)) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o35) Served(o35) Served(o35)
Robot-locatio R(o8), RF, M Make(o8,2	$ \begin{array}{c c} & \{R(o8) \\ & N\\ \\ n(o8) & Robot\\ o8,2)\} & \{R(o21),\\ \\ 08,2)\} & \{R(o21),\\ \\ \\ (o21) & Sc\\ \\ (o21) & Sc\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	Ake(08,2 Ake(08,2 Ake(08,2 Ake(08,2 Ake(021,2) Ake(021,2) Ake(021,2) Ake(03,2 Ake(08,2	(o8,2)} (o8,2)} (o21) (,RL(2)) (o21) (,RL(2)) (o21) (o23) (o23) (o23) (o23) (o23) (o23) (o23) (o23) (o21) (,RL(2)) (o21) (,RL(2)) (o21) (,RL(2))	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o35) Served(o35) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Stack #48 Served(o21) Served(o22) Served(o23) Served(o23) Served(o23) Served(o23) Served(o23) Served(o21), S(o10), S(o3) Served(o21), S(o10), S(o3) Served(o31) Served(o31) Served(o35) Served(o22) Served(o22) Served(o22) Served(o22) Served(o22) Served(o22) Served(o22)
Robot-locatio R(o8), RF, M Make(o8,2 Robot-location R(o21), P(o21,2 Served(o11 Served(o12 Served(o13 Served(o14 Served(o33 Served(o23 Served(o24 Served(o24 Served(o24 Served(o25 Served(o25 Robot-location R(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26 Stack #4(o26 Robot-location Robot-location Robot-location Robot-location Robot-location Robot-location Robot-location Robot-location R([o1]))	(R(o8) n(o8) Robot o8,2)} (R(o21),) (o21) S((o21) S() (o21) S() S()) S() S()) S() S() S() S() S(J. RF, M. Jake(08,2 Location P(021,2) rrve(021, rrve(021, rrve(021, rrved(01), rrved(01), rrved(03), rrved(03), rrved(02), rrved(02), rved(021), S(04) Jake(08,2 Location P(021,2) rrve(021, rrved(021, rrved(02	(08,2)} (08,2)} (1) (1021) (1) (1021) (1) (1021) (1) (1) (1) (1) (1) (1) (1) (1) (1) ({R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o22) Served(o22) Served(o23) Robot-location(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Stack #48
Robot-locatio R(o8), RF, M Make(o8,2	(R(o8) n(o8) Robot o8,2)} (R(o21),) Sc ((o21) Sc ((o23)	Ake(08,2 Ake(08	(o8,2)} (o8,2)} (o8,2)} (o8,2)} (o8,2)] (o21) (o8,2) (o8,2) (o9,2) (o9,2	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o35) Served(o35) Served(o22) Served(o23) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Stack #48 Served(o21), S(o11) P(o21,2), RL(2)} Served(o10) Served(o11) Served(o6) Served(o35) Served(o31) Served(o35) Served(o31) Served(o35) Served(o22) Served(o22) Served(o24) Served(o23) Robot-location(o23) Robot-location(o23)
Robot-locatio R(o8), RF, M Make(o8, Z Robot-location R(o21), P(o21,2) Serve(o21, Serve(o21, Served(o11 Served(o12 Served(o13 Served(o23 Served(o23 Served(o23 Served(o23 Served(o23 Served(o23 Served(o23 Served(o23 Served(o24 Served(o24 Served(o24 Served(o25 Serve	{R(o8)	Ake(08,2 Ake(08	(o8,2)})) (o21) (o21) (, RL(2)} 2))) (S(o23), S(o25), S(o24), 5) 2) (o23) (o23) (o23) (o23) (o23) (o24) (o21) (, RL(2)} 2) (o21) (, RL(2)} 2) (o3) (o4) (o5) (o5) (o5) (o5) (o6) (o5) (o6) (o7) (o7) (o7) (o7) (o7) (o7) (o7) (o7	{R(o21), P(o21,2), RL(2)}
Robot-locatio R(o8), RF, M Make(o8,2 Robot-location R(o21), P(o21,2 Served(o11, P(o21,2 Served(o12, Served(o13, Served(o23, Served(o23, Served(o33, Served(o33, Served(o23,	{R(o8)	Jake (08,2 Jake (08,2 Jake (08,2 Jave (021,2) Jave (021,2) Jave (021,2) Jave (03,2 Jave (03,2 Jave (03,2 Jave (03,2 Jave (02,2 Jave (02,2 Jave (02,2 Jave (03,2 Jave (03,2 Jave (03,2 Jave (04,2	(o8,2)} (o8,2)} (o8,2)} (o21) (, RL(2)} (o21) (, RL(2)} (o21) (o21) (o21) (o23) (o23) (o23) (o23) (o21) (o21) (, RL(2)} (o21) (, RL(2)} (o21) ({R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o35) Served(o35) Served(o22) Served(o23) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Stack #48 Served(o21), S(o11) P(o21,2), RL(2)} Served(o10) Served(o11) Served(o6) Served(o35) Served(o31) Served(o35) Served(o31) Served(o35) Served(o22) Served(o22) Served(o24) Served(o23) Robot-location(o23) Robot-location(o23)
Robot-locatio R(o8), RF, M Make(o8,2 Robot-locatio R(o21), P(o21,2 Serve(o21, Serve(o21, Served(o1 Served(o1 Served(o1 Served(o3 Served(o2 S	\text{\{\text{R(o8)}\}} \text{\{\text{n(o8)}\}} \text{\{\text{R(o21)}\}} \text{\{\text{S(o21)}\}} \text{\{\text{S(o21)}\}} \text{\{\text{S(o21)}\}} \text{\{\text{S(o21)}\}} \text{\{\text{S(o21)}\}} \text{\{\text{S(o21)}\}} \text{\{\text{S(o21)}\}} \text{\{\text{S(o21)}\}} \text{\{\text{S(o21)}\}} \text{\{\text{S(o23)}\}} \text{\{\text{S(o23)}\}} \text{\{\text{S(o25)}\}}, \text{\{\text{S(o24)}\}}, \text{\{\text{S(o35)}\}}, \text{\{\text{S(o26)}\}}, \text{\{\text{S(o11)}\}} \end{array} \text{\{\text{R(o21)}\}} \text{\{\text{R(o21)}\}} \text{\{\text{S(o21)}\}} \text{\{\text{S(o22)}\}} \text{\{\text{S(o21)}\}}	Ake(08,2 -location P(021,2) rrve(021,2) rrve(021,2) rrve(021,2) rrved(03 rrved(03) rrved(03) rrved(02) -location p(021,2) rrved(021,2) rrved(021,2) rrved(021,2) rrved(031,2) rrved(041,2) rrved(051,2) rrved(06	(o8,2)} (o8,2)} (1) ((o21) (1) (1) (1) (1) (1) (1) (1) (1) (1) ({R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o35) Served(o35) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Stack #48 Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o31) Served(o31) Served(o31) Served(o22) Served(o24) Served(o23) Served(o24) Served(o23) Served(o21), S(o35), S(o35), S(o26), S(o21), S(o31), S(o35), S(o3
Robot-locatio R(o8), RF, M Make(o8,2 Robot-locatior R(o21), P(o21,2 Served(o11 Served(o12 Served(o32 Served(o332 Served(o3332 Served(o3332 Served(o33332	{R(o8)	Make(08,2 -location P(021,2) rrve(021,2) rrve(021,2) rrve(021,2) rrve(021,2) rrved(03 rrved(03) rrved(03) rrved(02,2) -location p(021,2) rrve(021,2) rrve(021,2) rrve(031,2) rrved(04,3) rrved(05,2) rrved(06,3)	(o8,2)} (o8,2)} (o21) (c21) (RL(2)} (o8,2) (o21) (o21) (o21) (o23) (o23) (o23) (o23) (o23) (o23) (o23) (o21) (o	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o35) Served(o35) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Stack #48 Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o31) Served(o31) Served(o31) Served(o22) Served(o24) Served(o23) Served(o24) Served(o23) Served(o21), S(o35), S(o35), S(o26), S(o21), S(o31), S(o35), S(o3
Robot-locatio R(o8), RF, M Make(o8,2 Robot-locatior R(o21), P(o21,2 Served(o11 Served(o12 Served(o13 Served(o23 Served(o24 Served(o24 Served(o25 Ser	\text{\begin{array}{c ccccccccccccccccccccccccccccccccccc	Aake(08,2 Index #44 Aake(08,2	(o8,2)} (o8,2)} (o8,2)} (o21) (RL(2)} (o21) (RL(2)} (o21) (o23) (o23) (o23) (o23) (o23) (o21) (o21) (o21) (o21) (o21) (o21) (o23) (o23) (o24) (o25) (o24) (o25) (o24) (o21)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o35) Served(o35) Served(o22) Served(o23) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Stack #48 Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o31) Served(o31) Served(o31) Served(o31) Served(o31) Served(o31) Served(o31) Served(o35) Served(o22) Served(o22) Served(o24) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Stack #49
Robot-locatio R(o8), RF, M Make(o8,2 Robot-locatio R(o21), P(o21,2 Served(o11 Served(o12 Served(o23 Served(o33 Served(o34 Served(o24 Serv	\text{\begin{array}{c ccccccccccccccccccccccccccccccccccc	Alake(08,2 Alake((o8,2)} (o8,2)} (o8,2)} (o21) (,RL(2)} (o21) (,RL(2)} (o21) (o21) (o23) (o23) (o23) (o23) (o23) (o21) (,RL(2)} (o21) (,RL(2)} (o21) (,RL(2)} (o31) (o33) (o33) (o34) (o34) (o35) (o35) (o35) (o36) (o36) (o36) (o37) (o37) (o38)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o35) Served(o22) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o10) Served(o11) Served(o31) Served(o31) Served(o31) Served(o22) Served(o22) Served(o23) Served(o23) Served(o24) Served(o23) Served(o25) Served(o27) Served(o27) Served(o28) Served(o29) Served(o29) Served(o29) Served(o21) Served(o21) Served(o21) Served(o22) Served(o21)
Robot-locatio R(o8), RF, M Make(o8,2 Robot-locatio R(o21), P(o21,2 Served(o11 Served(o12 Served(o13 Served(o24 Served(o25 Served(o24 Served(o25 Served(o15 Serv	R(o8) Robot	Ake(08,2 Ake(08,2 Ake(08,2 Ake(08,2) Ake	(o8,2)} (o8,2)} (o8,2)} (o21) (,RL(2)} (o21) (,RL(2)} (o21) (o21) (o23) (o23) (o23) (o23) (o23) (o21) (,RL(2)} (o21) (,RL(2)} (o21) (,RL(2)} (o31) (o33) (o33) (o34) (o34) (o35) (o35) (o35) (o36) (o36) (o36) (o37) (o37) (o38)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o35) Served(o22) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o10) Served(o11) Served(o31) Served(o31) Served(o31) Served(o22) Served(o22) Served(o23) Served(o23) Served(o24) Served(o23) Served(o25) Served(o27) Served(o27) Served(o28) Served(o29) Served(o29) Served(o29) Served(o21) Served(o21) Served(o21) Served(o22) Served(o21)
Robot-locatio R(o8), RF, M Make(o8,2 Robot-locatior R(o21), P(o21,2 Served(o11 Served(o12 Served(o33 Served(o34 Served(o24 Served(o24 Served(o25 Served(o25 Served(o26 Served(o36 Ser	\text{\{R(08)} \\ \text{\{R(08)} \\ \text{\{R(08)} \\ \text{\{R(021)} \\ \text{\{R(023)} \\ \text{\{R(023)} \\ \text{\{R(023)} \\ \text{\{R(023)} \\ \text{\{R(021)} \\ \text{\{R(021)} \\ \text{\{R(021)} \\ \text{\{R(021)} \\ \text{\{R(021)} \\ \\ \text{\{R(021)} \\ \\ \text{\{R(021)} \\ \\ \text{\{R(021)} \\ \\ \\ \text{\{R(021)} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	Jake (08,2 Jake (08,2) Jake (0	(o8,2)} (o8,2)} (o8,2)} (o21) (RL(2)} (o21) (RL(2)} (o23) (o23) (o23) (o23) (o23) (o23) (o21) (o21) (c21) (c22) (c21) (c22) (c22) (c22) (c23) (c23) (c23) (c23) (c23) (c23) (c23) (c23)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o6) Served(o35) Served(o22) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Stack #48 Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o31) Served(o31) Served(o31) Served(o22) Served(o23) Served(o24) Served(o23) Served(o23) Served(o24) Served(o23) Served(o24) Served(o25) Served(o26) Served(o27) Served(o27) Served(o28) Served(o29) Served(o29) Served(o29) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o21) Served(o23) Served(o24) Served(o24) Served(o24) Served(o24) Served(o24) Served(o24) Served(o24) Served(o27) Served(o27) Served(o28) Served(o29) Served(o
Robot-locatio R(o8), RF, M Make(o8,2 Robot-location R(o21), P(o21,2 Served(o1) Served(o1) Served(o21, Served(o3) Served(o3) Served(o21, Served(o22, Served(o23) Served(o23) Served(o23) Served(o24, Served(o24, Served(o25, Served(o25, Served(o25, Served(o26, Served(o36,	(R(o8) n(o8) Robot o8,2)} (R(o21),) (S(o21) S(o21) S(o21) S(o22) S(o23) S(o2	Ake(08,2 Ake(08,2 Ake(08,2 Ake(08,2) Ake	(o8,2)} (o8,2)} (o8,2)} (o21) (RL(2)} (o21) (RL(2)} (o23) (o23) (o23) (o23) (o23) (o23) (o21) (o21) (c21) (c22) (c21) (c22) (c22) (c22) (c23) (c23) (c23) (c23) (c23) (c23) (c23) (c23)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o35) Served(o35) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o30) Served(o21), Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o30) Stack #48
Robot-locatio R(o8), RF, M Make(o8,2 Robot-locatio R(o21), P(o21,2 Serve(o21, Served(o11 Served(o12 Served(o13 Served(o23 Served(o24 Served(o25 Served(o24 Served(o25 Served(o26 Served(o36 Served	R(o8) Robot	Jake (08,2 Jake (08,2) Jake (0	(o8,2)} (o8,2)} (o8,2)} (o21) (RL(2)} (o21) (RL(2)} (o23) (o23) (o23) (o23) (o23) (o23) (o21) (o21) (c21) (c22) (c21) (c22) (c22) (c22) (c23) (c23) (c23) (c23) (c23) (c23) (c23) (c23)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o22) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Stack #48 Served(o21) Served(o11) Served(o11) Served(o11) Served(o11) Served(o35) Served(o21,2) Served(o31) Served(o31) Served(o31) Served(o35) Served(o31) Served(o35) Served(o22) Served(o22) Served(o23) Served(o33)
Robot-locatio R(o8), RF, M Make(o8,2 Robot-location R(o21), P(o21,2 Served(o11 Served(o12 Served(o32 Served(o332 Served(o2332 Served(o23332 Served(o23332 Served(o23332 Served(o233332 Served(o233332 Served(o233333 Served(o23333 Served(o23333 Served(o23333 Served(o23333 Served(o23333 Served(o23333 Served(o23333 Served(o23333 Served(o23333 Served(o2333 Served(o23333 Served(o23333 Served(o2333 Served(o2333 Served(o2333 Served(o2333 Served(o2333	\text{\begin{array}{c c c c c c c c c c c c c c c c c c c	Jake (08,2 Jake (08,2) Jake (0	(o8,2)} (o8,2)} (o8,2)} (o21) (RL(2)} (o21) (RL(2)} (o23) (o23) (o23) (o23) (o23) (o23) (o21) (o21) (c21) (c22) (c21) (c22) (c22) (c22) (c23) (c23) (c23) (c23) (c23) (c23) (c23) (c23)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o35) Served(o22) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Stack #48 New (o21), P(o21,2), RL(2)} Served(o10) Served(o11) Served(o6) Served(o21) Served(o21) Served(o21) Served(o31) Served(o31) Served(o35) Served(o22) Served(o24) Served(o23) Served(o23) Served(o23) Served(o23) Served(o23) Served(o23) Served(o24) Served(o25) Served(o27) Served(o28) Served(o29) Served(o29) Served(o29) Served(o21) Served(o29) Served(o21) Served(o21) Served(o21) Served(o21) Served(o31) Served(o35)
Robot-locatio R(o8), RF, M Make(o8,2 Robot-locatio R(o21), P(o21,2 Serve(o21, Served(o11 Served(o12 Served(o13 Served(o23 Served(o24 Served(o25 Served(o24 Served(o25 Served(o26 Served(o36 Served	\text{\begin{array}{c c c c c c c c c c c c c c c c c c c	Jake (08,2 Jake (08,2) Jake (0	(o8,2)} (o8,2)} (o8,2)} (o21) (RL(2)} (o21) (RL(2)} (o23) (o23) (o23) (o23) (o23) (o23) (o21) (o21) (c21) (c22) (c21) (c22) (c22) (c22) (c23) (c23) (c23) (c23) (c23) (c23) (c23) (c23)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o35) Served(o35) Served(o22) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Stack #48
Robot-locatio R(o8), RF, M Make(o8,2 Robot-locatio R(o21), P(o21,2 Serve(o21, Serve(o21, Served(o1 Served(o1 Served(o2 Served(o3 Served(o3 Served(o3 Served(o3 Served(o2 S	(R(o8) n(o8) Robot o8,2)} {R(o21), } (c21) Sc (c21) Sc , RL(2)} Sc) (c22) Sc) (c23) Sc) (c23) Sc) (c23) Robot o8,2)} Robot o8,2) (c23) Robot o8,2) (c23) Sc (c23) Sc (c24), S(o25), S(o24), S(o25), S(o21), S(o22), S(o21), S(o22), S(o22), S(o23), S(o23), S(o24), S(o35), S(o26), S(o23), S(o23), S(o25), S(o24), S(o35), S(o26), S(o23), S(o23)	Jake (08,2 Jake (08,2) Jake (0	(o8,2)} (o8,2)} (o8,2)} (o21) (RL(2)} (o21) (RL(2)} (o23) (o23) (o23) (o23) (o23) (o23) (o21) (o21) (c21) (c22) (c21) (c22) (c22) (c22) (c23) (c23) (c23) (c23) (c23) (c23) (c23) (c23)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o31) Served(o35) Served(o22) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Stack #48 Serve(o21,2) Served(o11) Served(o11) Served(o11) Served(o11) Served(o31) Served(o31) Served(o31) Served(o31) Served(o22) Served(o24) Served(o23) Served(o24) Served(o24) Served(o25) Served(o26) Served(o27) Served(o28) Served(o29) Served(o29) Served(o29) Served(o29) Served(o29) Served(o29) Served(o29) Served(o29) Served(o31) Served(o31) Served(o31) Served(o31) Served(o35) Served(o31) Served(o35) Served(o35) Served(o36) Served(o37) Served(o38) Served(o38) Served(o39) Served(o31) Served(o31) Served(o31) Served(o31) Served(o31) Served(o31) Served(o32) Served(o32) Served(o320) Served(o320) Served(o320) Served(o320)
Robot-locatio R(o8), RF, M Make(o8,2 Robot-locatio R(o21), P(o21,2 Served(o11 Served(o21 Served(o31 Served(o32 Served(o33 Served(o34 Serv	(R(o8) n(o8) Robot o8,2)} {R(o21), } (c21) Sc (c21) Sc , RL(2)} Sc) (c22) Sc) (c23) Sc) (c23) Sc) (c23) Robot o8,2)} Robot o8,2) (c23) Robot o8,2) (c23) Sc (c23) Sc (c24), S(o25), S(o24), S(o25), S(o21), S(o22), S(o21), S(o22), S(o22), S(o23), S(o23), S(o24), S(o35), S(o26), S(o23), S(o23), S(o25), S(o24), S(o35), S(o26), S(o23), S(o23)	Jake (08,2 Jake (08,2) Jake (0	(o8,2)} (o8,2)} (o8,2)} (o21) (RL(2)} (o21) (RL(2)} (o23) (o23) (o23) (o23) (o23) (o23) (o21) (o21) (c21) (c22) (c21) (c22) (c22) (c22) (c23) (c23) (c23) (c23) (c23) (c23) (c23) (c23)	{R(o21), P(o21,2), RL(2)} Serve(o21,2) Served(o10) Served(o11) Served(o6) Served(o35) Served(o35) Served(o22) Served(o22) Served(o23) Robot-location(o23) S(o35), S(o26), S(o21), S(o10), S(o3 Stack #48

Serve(o21, Served(o10		
Served(01)	(M([o],1), R([o), RF} Make(o28,1)
Served(o6) $Make([o],$	1) Robot-location(o10)
Served(o3 Served(o3		
Served(o2		1, ()
Served(o24		
Served(o2: Robot-location		
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o		
a. 1	Served(o2	
Stack #51	Served(o2 Served(o2	
ľ		1(52(2)23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31)
Served(o10	S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o21)	
Served(off		Stack #60
Served(o6		·
Served(o31 Served(o35		{M(o28,1), R(o28), RF}
Served(o2		
Served(o24	(M(o28,1), R(o28,1)	8), RF} Robot-location(o10)
Served(o2: Robot-location		
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o$		
[[-(), -(), -(), -(), -(), -(), -()	Serve(010	17 (73
Stack #52	Served(o1	
}	Served(of Served(o	
D (10	Served(o3	5) Served(o24)
Petition(o10 Robot-loaded	ZET VEG (02	
Robot-location	(o10) Served(o2	4) Robot-location (o23) 3)(S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31)
{P(o10,[n]), R(o10)	, RL([n])} Robot-locatio	023
Serve(o10, Served(o11	S(o23), $S(o25)$, $S(o24)$, $S(o35)$, $S(o26)$, $S(o21)$, $S(o25)$	610), S(o31), R(o23), S(o6), S(o22), S(o11)}Stack #61
Served(of	,	7
Served(o31		
Served(o35 Served(o22		Make(o28,1) Robot-location(o10)
Served(022		
Served(o23	,	Serve(o10,1)
Robot-location $\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o25), S(o26), S(o2$		
(5(020), 5(020), 5(024), 5(020), 5(020), 5(021), 5(0	Make(028)	
Stack #53	Robot-locatio	
	{P(o10,1), R(o10 Serve(o10	
	Served(o1	
Robot-loaded Robot-location	(10)	
{P(o10,1), R(o10)		$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o315)\}$
Serve(o10,	Served(o2	
Served(o1 Served(o6	Served(62	
Served(o3	Served(o2 Robot-locatio	
Served(o3	S(023) $S(025)$ $S(024)$ $S(035)$ $S(026)$ $S(021)$ $S(021)$	10), S(o31), B(o23), S(o6), S(o22), S(oPopot-location(o10)
Served(o2 ⁴ Served(o24		{P(o10,1), R(o10), RL(1)}
Served(023	Dtack #5	8 Serve(010,1) Served(011)
Robot-location	(023)	Served(o6)
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o$	$\frac{10), S(o31), R(o23), S(o6), S(o22), S(o11)}{\{R(o21)\}}$	Served(o31) Served(o35)
Stack #54	(R(021) Move(021,c	
"	$\{M(o28,1), R(o28,1), R(o$	28), RF} Served(o24)
	Make(o28	
Robot-fre		(010) Robot-location(023)],{BL(23}, S(025), S(024), S(035), S(026), S(021), S(010), S(031)
Machine([o]	Serve(o10	1)
Robot-locatio {M([o],1), R([o]	DEI Ved (OI	
Make([o],1)		
Robot-location	(o10) Served(o3	5)
{P(o10,1), R(o10) Serve(o10,	$\frac{RL(1)}{Served(o2)}$	Robot-location([o1])
Serve(610, Served(611		34 ([1] 10)
Served(o6	Bohot-locatio	(0.23) {P(010,1), R(010), RL(1)}
Served(o3	(S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26)	10), S(o31), B(o23), S(o6), S(o22), S(o11) Serve(o10,1)
Served(o3 Served(o22		Served(o11) Served(o6)
Served(022 Served(024		Served(00)
Served(o23		Served(o35)
Robot-location		Served(o22)
{S(023) S(025) S(024) S(035) S(026) S(021) S(0	10) S(o31) B(o23) S(o6) S(o22) S(o11)\	
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o$	$10), S(o31), R(o23), S(o6), S(o22), S(o11)\}$	Served(o24) Served(o23)

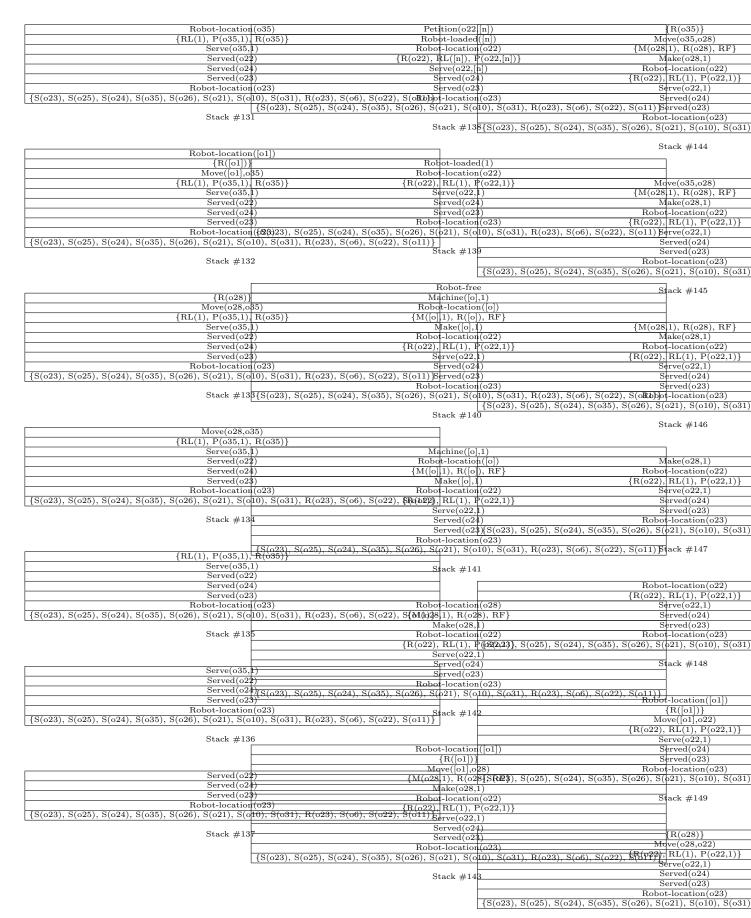
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	oot-location([o1])
	{R([o1])} Move([o1],o8)
Served (a11) Served (a11 [h])	o8), RF, M(o8,2)}
	Make(o8,2) oot-location(o11)
	1), RL(2), P(o11,2)}
Served (035) Served (035)	Serve(o11,2)
	Served(o6) Served(o31)
Served(02\$) Served(02\$)	Served(o35)
Robot-location (o23) Robot-location (o23)	Served(o22)
	Served(o24)
	oot-location(o23)
$\{S(o23), S(o25), S(o24), S(o35), S(o26), \}$	S(o21), S(o10), S(o31)
Move(o28,o10) Robot-loaded(2)	Stack #75
Move(028,000) Honder-location(011) P(010,1), RL(1) Robot-location(011) Robot-location(011)	
Serve(010,1) $\{R(011), RL(2), P(011,2)\}$	(D(10))
Served(011) Served(011,2)	{R(o10)} Move(o10,o8)
	o8), RF, M(o8,2)}
Served(03\$) Served(03\$) Served(02\$) Served(02\$) Rol	Make(o8,2) oot-location(o11)
	1), RL(2), P(o11,2)}
Served(o2\$) Served(o2\$)	Serve(o11,2)
Robot-location (o23) Robot-location (o23) [S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o25), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o25), S(o26), S(o26), S(o26), S(o27), S(o11), S(o10), S(o27), S(o11), S(o	Served(o6) Served(o31)
	Served(o35)
Stack #66 Stack #71	Served(o22) Served(o24)
	Served(o23)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	oot-location(o23)
Serve(010,1) Machine([0] ,2)	5(021), 5(010), 5(031)
	_Stack #76
Served(031) $(K(0), K(1), K(1))$	
Served(03\$) Robot-location(011)	M (10 0)
	Move(o10,o8) o8), RF, M(o8,2)}
Served(o23) Served(o6)	Make(o8,2)
Robot-location (o23) Served (o31) Rol	oot-location(o11)
Robot-location (o23) Served (o31) Rol [S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31), R(o23), S(o6), S(o22), S(o11)]Served (o35) [R(o1: Served (o22))]	oot-location(o11) 1), RL(2), P(o11,2)} Serve(o11,2)
Robot-location (o23) Served (o3) Rol	oot-location(o11) 1), RL(2), P(o11,2)} Serve(o11,2) Served(o6)
Robot-location (o23) Served (o31) Rol [S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31), R(o23), S(o6), S(o22), S(o11)]Served (o35) [R(o1: Served (o22))]	oot-location(o11) 1), RL(2), P(o11,2)} Serve(o11,2)
Robot-location (o23) Served (o34) Rol {S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31), R(o23), S(o6), S(o22), S(o11) Served (o35) { Served (o24) Served (o24) Served (o24) Served (o24) Served (o24) Served (o23) Robot-location (o23) { S(o23), S(o24), S(o24), S(o24), S(o26), S(o21), S(o22), S(o21), S(o22), S(o21), S(o22), S(o2	oot-location(o11) 1), RL(2), P(o11,2)} Serve(o11,2) Served(o6) Served(o31) Served(o35) Served(o22)
Robot-location (o23) Served (o31) Rol {S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31), R(o23), S(o6), S(o22), S(o11) Served (o24) Served (o24) Served (o24) Robot-location (o23) Robot-location (o23) Robot-location (o23) Served (o11) Served (o11) Served (o11)	oot-location(o11) 1), RL(2), P(o11,2)} Serve(o11,2) Served(o6) Served(o31) Served(o35) Served(o22) Served(o24)
Robot-location (o23) Served (o31) Rol {S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31), R(o23), S(o6), S(o22), S(o11) Served (o23) Served (o24) Served (o24) Served (o23) Robot-location (o23) (o23), S(o25), S(o25), S(o24), S(o25), S(o26), S(o21), S(o10), S(o31), R(o23), S(o25), S(o26), S(o26), S(o21), S(o10), S(o31), R(o23), S(o26), S(o21), S(o11) Served (o6) Rol Served (o6) Rol Robot-location (o23) (o24) Served (o25) (o25), S(o26),	oot-location(o11) 1), RL(2), P(o11,2)} Serve(o11,2) Served(o6) Served(o31) Served(o35) Served(o22) Served(o24) Served(o23) soot-location(o23)
Robot-location (o23) Served (o34) Rol {S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31), R(o23), S(o6), S(o22), S(o11) Served (o25) Served (o24) Stack #67 Served (o24) Served (o24) Served (o23) Robot-location (o23) {S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31), R(o23), S(o25), S(o11) Served (o11) Served (o11) Served (o11) Served (o27) S	oot-location(o11) 1), RL(2), P(o11,2)} Serve(o11,2) Served(o6) Served(o31) Served(o35) Served(o22) Served(o24) Served(o23) soot-location(o23)
Robot-location (o23) Served (o34) Rol (S(o23), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31), R(o23), S(o6), S(o22), S(o11) Served (o24) Served (o24) Served (o24) Served (o24) Served (o24) Served (o24) Served (o25) Served (o26) Served (o27) Ser	oot-location(o11) 1), RL(2), P(o11,2)} Serve(o11,2) Served(o6) Served(o31) Served(o35) Served(o22) Served(o24) Served(o23) soot-location(o23)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	oot-location(o11) 1), RL(2), P(o11,2)} Serve(o11,2) Served(o6) Served(o31) Served(o35) Served(o22) Served(o24) Served(o23) Served(o23) Served(o23) Sot-location(o23) S(o21), S(o10), S(o31)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	oot-location(o11) 1), RL(2), P(o11,2)} Serve(o11,2) Served(o6) Served(o6) Served(o31) Served(o23) Served(o22) Served(o24) Served(o23) oot-location(o23) S(o21), S(o10), S(o31) Stack #77
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	coc-location(o11) 1), RL(2), P(o11,2)} Serve(o11,2) Served(o6) Served(o31) Served(o35) Served(o22) Served(o24) Served(o23) Soct-location(o23) S(o21), S(o10), S(o31) Stack #77
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	oot-location(o11) 1), RL(2), P(o11,2)} Serve(o11,2) Served(o6) Served(o6) Served(o31) Served(o23) Served(o22) Served(o24) Served(o23) sot-location(o23) S(o21), S(o10), S(o31) Stack #77
Robot-location (o23) Served (o3 Rol Served (o3 Served (o2 Served (o3	Doc-location(o11) Doc-
Robot-location (o23) Served (o3 Served (o3 Served (o3 Served (o3 Served (o3 Served (o3 Served (o2 Served (o3 Served	oot-location(o11) 1), RL(2), P(o11,2)} Serve(o11,2) Served(o6) Served(o6) Served(o31) Served(o23) Served(o22) Served(o24) Served(o23) sot-location(o23) S(o21), S(o10), S(o31) Stack #77
Robot-location (o23)	ob-location(o11) 1), RL(2), P(o11,2)} Serve(o11,2) Serve(o11,2) Served(o6) Served(o31) Served(o35) Served(o22) Served(o24) Served(o23) obt-location(o23) S(o21), S(o10), S(o31) Stack #77 obs, RF, M(os,2)} Make(os,2) obt-location(o11) 1), RL(2), P(o11,2)} Served(o11,2) Served(o6) Served(o31)
Robot-location (023) Served (031) Rol	Doct-location(011) Doct-location(011) Doct-location(011) Doct-location(011) Doct-location(021) Served(060) Served(031) Served(023) Served(024) Served(023) Served(023) Served(023) Served(023) Served(023) Served(023) Served(023) Served(031) Served(031) Served(031) Served(031) Served(035) Served(
Robot-location (023) Served(031) Rolo (502), S(024), S(035), S(026), S(021), S(010), S(031), R(023), S(06), S(022), S(011) Served(035) (R(01.5))	Doct-location(o11) Doct-location(o11) Doct-location(o11) Doct-location(o11) Doct-location(o23) Doct-lo
Robot-location (o23) Served(o3 Served(o3 Served(o3 Served(o2 Served(o3 Served(o2 Served(o2 Served(o3 Served(o2 Served(o3 Served(o2 Served(o3 Served(o2 Served(o3 Served(o2 Served(o2 Served(o3 Serve	Doc-location(o11) Doc-location(o11) Doc-location(o11) Doc-location(o11) Doc-location(o23) Doc-
Robot-location (233) Served (331) Rol (5(023), S(024), S(035), S(026), S(021), S(011), S(031), R(023), S(06), S(022), S(011) Served (034) Served (024) Served (024) Served (024) Served (025) Robot-location (023) Robot-location (023) Robot-location (023) Served (024) Served (025) Robot-location (023) Robot-location (033) Robot-locatio	Deci-location(011) Deci-location(011) Deci-location(011) Deci-location(011) Deci-location(011) Deci-location(021) Deci-location(023) Deci-location(023) Deci-location(023) Deci-location(023) Deci-location(011) Deci-location(011) Deci-location(011) Deci-location(011) Deci-location(011) Deci-location(011) Deci-location(011) Deci-location(012) Deci-location(023) Deci-lo
Robot-location (23) Served(031) Rolo (23)	Doc-location Doc-
Robot-location (023) Served (031) Rol (5(023), S(024), S(035), S(026), S(021), S(010), S(031), R(023), S(06), S(022), S(011) Served (022)	Deci-location(011) Deci-location(011) Deci-location(011) Deci-location(011) Deci-location(011) Deci-location(021) Deci-location(023) Deci-location(023) Deci-location(023) Deci-location(023) Deci-location(011) Deci-location(011) Deci-location(011) Deci-location(011) Deci-location(011) Deci-location(011) Deci-location(011) Deci-location(012) Deci-location(023) Deci-lo
Robot-location (023)	Doc-location Doc-
Robot-location(c023)	Doc-location Doc-
Robot-location (023) Served(031) Ro (So23), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31), R(o23), S(o6), S(o22), S(o11) Served(022)	Doc-location (011) Doc-location (021) Doc-location (023) Doc-location (023) Doc-location (023) Doc-location (023) Doc-location (011) Doc-loc
Robot-location (023) Served(031) Ro (So23), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31), R(o23), S(o6), S(o22), S(o11) Served(022)	Doct-location(011)
Robot-location (623) Served(63) Served(63) Rolo (623), S(624), S(624), S(624), S(625),	Deci-location (011)
Robot-location (co23)	Doc-location(o11)
Robot-location (a23) Served(a21) Rolo (Sc23), S(a24), S(a24), S(a25), S(a26), S(a27), S(Deci-location (011)
Robot-location(023) Served(031) Rol	Doc-location(o11)
Robot-location (023) Served(031) Rol	Deci-location(011)

Stack #74 Stack #79

Robot-location		d(o6)	Robot-location(08)
{R(o11), RL(2), P	(o11,2)} Served(I(o31)	$\{R(08), RF, M(08,2)\}$
Serve(o11,2			
Served(o6)			
Served(o31			
Served(o35	Served(l(o23)	Serve $(06,2)$
Served(o22) Robot-locat	ation((o23) Served(o31)
Served(o24	(S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S	S(o1)	0), S(o31), R(o23), S(o6), S(o22), S(o11) Served(o35)
		5(01)	
Served(o23			Served(o22)
Robot-location	(o23) Stack #	#86	Served(o24)
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o12), S(o23), S(o$	0), S(o31), R(o23), S(o6), S(o22), S(o11)}		Served(o23)
	7, (), (), (), (),		Robot-location(o23)
Stack #80		-	$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31)\}$
Stack #80	Petition(c	(06 1	$\{3(023), 3(023), 3(024), 3(033), 3(020), 3(021), 3(010), 3(031), 3(0$
<u> </u>	Robot-load		r'ix
-			
	Robot-loca:		
Robot-location	([o1]) $\{R(o6), P(o6, [n$	[n]), F	RL([n])
$\{R([o1])\}$	Serve(of	06.[n])
Move([o1],o1			
$\{R(o11), RL(2), P\}$			
Serve(o11,2	Served(l(o22)	Move([o1],o8)
Served(o6)	Served(1(024)	$\{R(o8), RF, M(o8,2)\}$
Served(o31			
Served(o35			
Served(o22	(S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26))	S(o10	0), S(o31), R(o23), S(o6), S(o22), S(R(b6), P(o6,2), RL(2))
Served(o24			Serve(o6,2)
Served(o23		#8 +	Served(o31)
		<i></i> □	
Robot-location	(/	L	Served(o35)
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o13), S(o23), S(o$	(0), $S(o31)$, $R(o23)$, $S(o6)$, $S(o22)$, $S(o11)$		Served(o22)
	/· · · /· · · /· · · /· · /· · //	⊢	Served(o24)
Stack #8	Robot-loa	aded($\frac{(2)}{\text{Served}(023)}$
Stack #81	Robot-loca:		Served(023)
-	(D(c) D(c	COLT	Robot-location(o23)
	{R(00), P(00,	3,2), 1	15(622), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31)
	Serve(o	(06,2)	
{R(o8)}	Served(I(o31)) Charle #00
Move(08,01			
	,		,
$\{R(o11), RL(2), P$	(o11,2)} Served(l(o22)	
Serve(o11,2	Served(l(o24)	
Served(o6)			
· · ·			
Served(o31			
Served(o35	(S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26))	S(o10	0), S(o31), R(o23), S(o6), S(o22), S(\(\bar{\text{RI(o}} \bar{\text{RI(o}} \bar{\text{S}} \), RF, M(o8,2) \}
Served(o22			Make(o8,2)
Served(o24		#88	Robot-location(o6)
		#	
Served(o23		L	$\{R(o6), P(o6,2), RL(2)\}$
Robot-location	(o23)		Serve(06,2)
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o25), S(o$	0), S(o31), B(o23), S(o6), S(o22), S(o11)}		Served(o31)
	Robot-	t-free	Served(o35)
Ct1- #09	Machine(e([o].2	
Stack #82	Robot-locat		7f. 1) Bei ved(022)
	$\{R([o]), RF,$	', M(†	$\{0,2\}$ Served $\{0,23\}$
	Make([c	(0.2)	Robot-location(o23)
Move(08,01			
	(11.0)) (D(.c) D(.c	COL	(56) (523), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31)
$\{R(o11), RL(2), P\}$			
Serve(o11,2		(06,2)	Stack #93
Served(o6)	Served(l(o31)) "
Served(o31) Served($\frac{1(035)}{1}$	
Served(o35			
Served(o22) Served(I(o24)	Move(o11,o8)
Served(o24) Served(- +-	
		l(o23)	(R(o8), RF, M(o8 2))
Served(o23			
) Robot-locat	ation((o23) Make(o8,2)
Robot-location) Robot-locat	ation((o23) Make(08,2) (0), S(o31), R(o23), S(o6), S(o22), S(oR) d-location(o6)
	Robot-locat ((\$2(1)23), S(025), S(024), S(035), S(026), S(021), S(021)	ation((o23) Make(o8,2)
$\begin{array}{c} \text{Robot-location} \\ \{S(o23),S(o25),S(o24),S(o35),S(o26),S(o21),S(o12),S($	Robot-locat ({\$\mathbb{R}(\text{2})23}), S(\co25), S(\co24), S(\co35), S(\co26), S(\co21), S 	ation(o	$\begin{array}{c} (o23) & \text{Make}(o8,2) \\ 0), S(o31), R(o23), S(o6), S(o22), S(o\textbf{H}) \\ \hline \{R(o6), P(o6,2), RL(2)\} \end{array}$
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o16), S(o26), S(o27), S(o$	Robot-locat ((\$2(1)23), S(025), S(024), S(035), S(026), S(021), S(021)	ation(o	(o23) Make(o8,2) 0), S(o31), R(o23), S(o6), S(o22), S(oR) (-location(o6) {R(o6), P(o6,2), RL(2)} Serve(o6,2)
	Robot-locat ({\$\mathbb{R}(\text{2})23}), S(\co25), S(\co24), S(\co35), S(\co26), S(\co21), S 	ation(o	(o23) Make(o8,2) 0), S(o31), R(o23), S(o6), S(o22), S(oR) (c-location(o6)) {R(o6), P(o6,2), RL(2)} Serve(o6,2) Served(o31)
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o16), S(o26), S(o27), S(o$	Robot-locat ({\$\mathbb{R}(\text{2})23}), S(\co25), S(\co24), S(\co35), S(\co26), S(\co21), S 	ation(o	(o23) Make(o8,2) 0), S(o31), R(o23), S(o6), S(o22), S(oR) (-location(o6) {R(o6), P(o6,2), RL(2)} Serve(o6,2)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1	Robot-locat {\$2(3)23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o3), S(o31), R(o23), S(o6), S(o22), S(o11)} Stack #	#89	(o23) Make(08,2) 0), S(o31), R(o23), S(o6), S(o22), S(oR)) (of-location(o6) {R(o6), P(o6,2), RL(2)} Serve(06,2) Served(o31) Served(o35) Served(o22)
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o16), S(o26), S(o27), S(o$	Robot-locat ({\$\mathbb{R}(\text{2})23}), S(\co25), S(\co24), S(\co35), S(\co26), S(\co21), S 	#89	(o23) Make(o8,2) 0), S(o31), R(o23), S(o6), S(o22), S(oR) ct-location(o6) {R(o6), P(o6,2), RL(2)} Serve(o6,2) Served(o31) Served(o35) Served(o22)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1) Stack #83	Robot-locat {\$2(3)23)}, S(o25), S(o24), S(o35), S(o26), S(o21), S(o31), S(o31), R(o23), S(o6), S(o22), S(o11)} Stack #	#89 e([o],2	(o23) Make(o8,2) (0), S(o31), R(o23), S(o6), S(o22), S(oRt) ct-location(o6) (R(o6), P(o6,2), RL(2)) Serve(o6,2) Served(o31) Served(o35) Served(o22) Served(o24)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), Stack #83 {R(o11), RL(2), P	Robot-locat {82(3)23}, S(o25), S(o24), S(o35), S(o26), S(o21), S(o21), S(o31), R(o23), S(o6), S(o22), S(o11)} Stack # Machine((o11,2)) Robot-locat	#89 e([o],2	(5023) Make(08,2) 0), S(031), R(023), S(06), S(022), S(0R) (-1ocation(06)) {R(06), P(06,2), RL(2)} Serve(06,2) Served(031) Served(035) Served(022) 2) Served(024) ([0]) Served(023)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), Stack #83 {R(o11), RL(2), P Serve(o11, P	$\begin{array}{c} \text{Robot-locat} \\ \{\{\{323\}, 23\}, \ S(o25), \ S(o24), \ S(o35), \ S(o26), \ S(o21), \ S(o31), \ S(o31), \ R(o23), \ S(o6), \ S(o22), \ S(o11)\} \\ \end{array}$	#89 e([o],2	(o23) Make(o8,2) 0), S(o31), R(o23), S(o6), S(o22), S(oR) (-1-cation(o6))
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), Stack #83 {R(o11), RL(2), P	Robot-locat {\frac{12}{3}}(\frac{12}{3}), S(025), S(024), S(035), S(026), S(021), S(00), S(031), R(023), S(06), S(022), S(011)} \] Stack ## Machine((011,2)) Robot-locat {\frac{1}{3}}(\frac{1}{3}), R[\frac{1}{3}], R[\frac{1}{3}]	#89 e([o],2 ation((o23) Make(08,2) 0), S(o31), R(o23), S(o6), S(o22), S(oRo)bot-location(o6) {R(o6), P(o6,2), RL(2)} Serve(06,2) Served(031) Served(035) 2) Served(022) 2) Served(024) ((o)) Served(023)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), Stack #83 {R(o11), RL(2), P Serve(o11, P	$\begin{array}{c} \text{Robot-locat} \\ \{(323), \text{S}(025), \text{S}(024), \text{S}(035), \text{S}(026), \text{S}(021), \text{S}(026), \text{S}(021), \text{S}(026), \text{S}(021), \text{S}(026), \text{S}(021), \text{S}(026), \text$	#89 e([o],2 ation((o23) Make(08,2) 0), S(o31), R(o23), S(o6), S(o22), S(oRo)bot-location(o6) {R(o6), P(o6,2), RL(2)} Serve(06,2) Served(031) Served(035) 2) Served(022) 2) Served(024) ((o)) Served(023)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1) Stack #83 {R(o11), RL(2), P Serve(o11, Served(o5) Served(o3)	Robot-locat Robot-locat Robot-locat Robot-locat Robot-locat Robot-locat Machine Robot-locat Robot-locat Make([i]) RF([i]) RF([i]) RF([i]) RF([i]) RF([i]) Report-locat Robot-locat Robot-locat	ation (4, S(o)1(), S(o)1(), #89 e([o],2 cation (7, M([to],2)), cation (7, S(o),2), ca	$(o23) \qquad \text{Make}(o8,2) \\ 0), S(o31), R(o23), S(o6), S(o22), S(oR) - location(o6) \\ \{R(o6), P(o6,2), RL(2)\} \\ Serve(o6,2) \\ Served(o31) \\ Served(o35) \\ 2) \qquad \qquad Served(o22) \\ 2) \qquad \qquad Served(o24) \\ ([o]) \qquad \qquad Served(o23) \\ o[o22]) \qquad \qquad Served(o23) \\ o[o23], S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31) \\ (O31) \qquad \qquad Served(o23) \\ (O41) \qquad \qquad Served(o23) \\ (O52) \qquad \qquad Served(o23) \\ (O53) \qquad Served(o23) \\ (O54) \qquad \qquad Served(o23) \\ (O54) \qquad \qquad Served(o23) \\ (O55) \qquad \qquad Served(o23) \\ (O57) \qquad \qquad Served(o35) \\ (O57) \qquad \qquad S$
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o26), S(o21), S(o26), S(o21), S(o26), S(o26)	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	#89 e([0],2 ation([6,2), F	(o23) Make(08,2) (o), S(o31), R(o23), S(o6), S(o22), S(oRd)bot-location(o6) (R(o6), P(o6,2), RL(2)) (Served(o32) (Served(o35) (Served(o35) (Served(o22) (O) (O) (O) (O) (O) (O) (O) (O) (O) (O
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o26), S(o21), S(o26), S(o21), S(o26), S(o21), S(o26), S(o26)	$\begin{array}{c} \text{Robot-locat} \\ \{ \{ \{ \{ \{ \} \} \} \}, $	#89 e([o],2; ation(([o],2)); ation(([o],2)); (([o],2)); (([o],2));	(o23) Make(08,2) 0), S(o31), R(o23), S(o6), S(o22), S(oR) optic-location(o6)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o26), S(o21), S(o26), S(o21), S(o26), S(o26)	$\begin{array}{c} \text{Robot-locat} \\ \{ \{ \{ \{ \{ \} \} \} \}, $	#89 e([o],2; ation(([o],2)); ation(([o],2)); (([o],2)); (([o],2));	(o23) Make(08,2) 0), S(o31), R(o23), S(o6), S(o22), S(oR) optic-location(o6)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o26), S(o21), S(o26), S(o21), S(o26), S(o26)	Robot-locat {\frac{12}{32}}(\frac{12}{32}), S(\co25), S(\co24), S(\co25), S(\co26), S(\co21), S(\co26), S(\co27),	#89 e([o],2; ation(([o],2)); ation(([o],2)); ([o],2), F(([o],2)); ([o],2), F(([o],2));	(o23) Make(08,2) (0), S(o31), R(o23), S(o6), S(o22), S(oRo)bot-location(o6) (R(o6), P(o6,2), RL(2)) Served(o31) Served(o31) Served(o22) (o2) Served(o22) ((o1) Served(o23) (o1), Served(o23) (o2) Served(o23) (o3) (o4) (o5) (o6) (o6) (o7) (o8) (o8) (o8) (o9) (o9) (o9) (o9) (o9) (o9) (o9) (o9
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o26), S(o21), S(o1), S(o1), S(o26), S(o21), S(o1), S(o26), S(o21), S(o26), S	Robot-locat (152(3)23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o25), S(o24), S(o35), S(o26), S(o21), S(o21), S(o21), S(o31), R(o23), S(o6), S(o22), S(o11)	#89 e([0], 2 ation((#89 e([0], 2 ation(([0],2), [0],2), [0],2 [0],4 [0],4 [0],4 [0],4 [0],6 [0],6 [0],6 [0],6 [0],6 [0],6 [0],7	(5023) Make(08,2) 0), S(031), R(023), S(06), S(022), S(0R) (-1ocation(06))
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o26), S(o21), S(o1), S(o26), S(o21), S(o1), S(o26),	Robot-locat	#89 e([0],2 ation(((o23) Make(o8,2) (0), S(o31), R(o23), S(o6), S(o22), S(oR) (clocation(o6) (a), S(o6), S(o22), S(oR) (clocation(o6), S(o22), S(oR) (clocation(o6), Served(o52), Served(o31) (b), Served(o31) (clocation(o23), Served(o22) (clocation(o23), Served(o23), Served(o23) (clocation(o23), S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o10), S(o31) (clocation(o23), Stack #94
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o26), S(o21), S(o1), S(o26), S(o21), S(o1), S(o26),	Robot-locat	#89 e([0],2 ation(((o23) Make(08,2) (0), S(o31), R(o23), S(o6), S(o22), S(oRo)t-location(o6) (R(o6), P(o6,2), RL(2)) Served(o31) Served(o31) Served(o35) Served(o22) ([o]) Served(o24) ([o]) Served(o23) ([o]) Served(o23) (Served(o23) ([o]) Served(o23) ([o]) Served(o24) ([o]) Served(o24) ([o]) Served(o24) ([o]) Served(o25) ([o]) Served(o26) ([o]) Served(o27) ([o]) Served(o2
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o26), S(o21), S(o1), S(o1), S(o26), S(o21), S(o1), S(o26), S(o21), S(o26), S	Robot-locat	#89 e([0],2; ation(c, M)[[0],2); ation(6,2), F(6,2), F(6,2); I(035); I(035); I(024); I(024);	(o23) Make(o8,2) 0), S(o31), R(o23), S(o6), S(o22), S(oR) (clocation(o6)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o1), S(o26), S(o21), S(o1), S(o21), S(o1),	Robot-locat	#89 e([o],2; ation((C), M([o],2); ation((G),2); ation((G),	(a) Make(08,2) (b) S(031), R(023), S(06), S(022), S(0R0)(0t-location(06)) (a) R(06), P(06,2), RL(2)) (b) Served(031) (c) Served(035) (c) Served(022) (d) Served(022) (for Served(023) (or Serv
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o26), S(o21), S(o1), S(o26), S(o21), S(o1), S(o26),	Robot-locat	e([o],2; ation((, S(o)10)) #89 e([o],2; ation((, S(o),2)); ([o],2)	(o23) Make(o8,2) (O), S(o31), R(o23), S(o6), S(o22), S(oR) (clocation(o6)) (R(o6), P(o6,2), RL(2)) (Served(o51) (Served(o31)) (Served(o23) ([o])
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o1), S(o26), S(o21), S(o1), S(o21), S(o1),	Robot-locat	e([o],2; ation((, S(o)10)) #89 e([o],2; ation((, S(o),2)); ([o],2)	(o23) Make(o8,2) (O), S(o31), R(o23), S(o6), S(o22), S(oR) (clocation(o6)) (R(o6), P(o6,2), RL(2)) (Served(o51) (Served(o31)) (Served(o23) ([o])
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o1), S(o26), S(o21), S(o1), S(o21), S(o1),	Robot-locat	e([o],2; ation((, S(o)10)) #89 e([o],2; ation((, S(o),2)); ([o],2)	(o23) Make(o8,2) (0), S(o31), R(o23), S(o6), S(o22), S(oR) (clocation(o6)) (R(o6), P(o6,2), RL(2)) (Served(o31) (Served(o35) (Served(o22) (Served(o22) (Io) (Served(o24) (Io) (Io) (Served(o23) (Served(o24) (Served(o23) (Served(o24) (Served(o23) (Served(o24) (Served(o23) (Served(o24) (Served(
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o1), S(o26), S(o21), S(o1), S(o21), S(o1),	Robot-locat	e([o],2 ation((, S(oI(),2),2),3 ation((, S(oI(),2),3,3),3 (o6,2), F((o6,2),3 (i1(o31),1 (i1(o35),1 (i1(o24),1 (i1(o24),2 (i1(o24),3,3),3 (i1(o24),3),3 (i1(o24),3),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o2	$\begin{array}{c} (o23) & \text{Make}(o8,2) \\ 0), S(o31), R(o23), S(o6), S(o22), S(oR) - cotion(o6) \\ & \{R(o6), P(o6,2), RL(2)\} \\ & & \text{Serve}(o6,2) \\ & & \text{Serve}(o31) \\ & & \text{Serve}(o35) \\ & & \text{Serve}(o22) \\ 2) & & \text{Serve}(o22) \\ 2) & & \text{Serve}(o24) \\ ([o]) & & \text{Serve}(o23) \\ ([o]) & & \text{Serve}(o33) \\ ([o]) & & \text{Serve}(o33) \\ ([o]) & & \text{Serve}(o33) \\ ([o]) & & \text{Serve}(o31) \\ ([o]) & & \text{Serve}(o31$
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o1), S(o26), S(o21), S(o1), S(o26), S(o21), S(o1), S(o26), S(Robot-locat	e([o],2 ation((, S(oI(),2),2),3 ation((, S(oI(),2),3,3),3 (o6,2), F((o6,2),3 (i1(o31),1 (i1(o35),1 (i1(o24),1 (i1(o24),2 (i1(o24),3,3),3 (i1(o24),3),3 (i1(o24),3),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o2	(o23) Make(o8,2) (0), S(o31), R(o23), S(o6), S(o22), S(oR) (clocation(o6)) (R(o6), P(o6,2), RL(2)) (Served(o31) (Served(o35) (Served(o22) (Served(o22) (Io) (Served(o24) (Io) (Io) (Served(o23) (Served(o24) (Served(o23) (Served(o24) (Served(o23) (Served(o24) (Served(o23) (Served(o24) (Served(
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o21), S(o21), S(o22), S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o25), S(o26), S(o26	Robot-locat	e([o],2 ation((, S(oI(),2),2),3 ation((, S(oI(),2),3,3),3 (o6,2), F((o6,2),3 (i1(o31),1 (i1(o35),1 (i1(o24),1 (i1(o24),2 (i1(o24),3,3),3 (i1(o24),3),3 (i1(o24),3),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o2	(a) Make(08,2) (b) S(031), R(023), S(06), S(022), S(0R) (cl-location(06)) (cost) R(06), P(06,2), RL(2)} (cost) Served(031) (cost) Served(035) (cost) Served(022) (cost) Served(024) (f(0)) Served(023) (cost) Robot-location(023) (cost) Robot-location(023) (cost) Robot-location(023) (cost) Robot-location(023) (cost) Representation Represe
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o1), S(o26), S(o21), S(o1), S(o26), S(o21), S(o1), S(o26), S(Robot-locat	e([o],2 ation((, S(oI(),2),2),3 ation((, S(oI(),2),3,3),3 (o6,2), F((o6,2),3 (i1(o31),1 (i1(o35),1 (i1(o24),1 (i1(o24),2 (i1(o24),3,3),3 (i1(o24),3),3 (i1(o24),3),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o2	(o23) Make(o8,2) (0), S(o31), R(o23), S(o6), S(o22), S(oR) (clocation(o6) (a), S(o6), P(o6,2), RL(2)} (b) Served(o5,2) (clo) Served(o31) (clo) Served(o22) (clo) Served(o23) (clo) Served(o31) (clo) Served(o31) (clo) Served(o31) (clo) Served(o31) (clo) Served(o31) (clo) Served(o32) (clo) Served(o32) (clo) Served(o32) (clo) Served(o32) (clo) Served(o32)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o1), S(o26), S(o21), S(o1), S(o21), S(o1), S(o1), S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1),	Robot-locat	e([o],2 ation((, S(oI(),2),2),3 ation((, S(oI(),2),3,3),3 (o6,2), F((o6,2),3 (i1(o31),1 (i1(o35),1 (i1(o24),1 (i1(o24),2 (i1(o24),3,3),3 (i1(o24),3),3 (i1(o24),3),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o2	(o23) Make(o8,2) 0), S(o31), R(o23), S(o6), S(o22), S(oR) ct-location(o6)
\$\text{\(\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\colored}{\section{\colored}{\c	Robot-locat	e([o],2 ation((, S(oI(),2),2),3 ation((, S(oI(),2),3,3),3 (o6,2), F((o6,2),3 (i1(o31),1 (i1(o35),1 (i1(o24),1 (i1(o24),2 (i1(o24),3,3),3 (i1(o24),3),3 (i1(o24),3),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o2	(o23) Make(o8,2) (0), S(o31), R(o23), S(o6), S(o22), S(oR) t-location(o6) (R(o6), P(o6,2), RL(2)) Served(o5,2) Served(o31) Served(o35) Served(o22) ([o] Served(o24) ([o]) Served(o23) ([o]) Served(o24) ([o]) Served(o25) ([o]) Served(o26) ([o]) Served(o27) ([o]) Served(o28) ([o]) Served(o28) ([o]) Served(o31) ([o]) Served(o35) ([o]) Served(o35) ([o]) Served(o22)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o1), S(o26), S(o21), S(o1), S(o26), S(o26), S(o21), S(o1), S(o1	Robot-locat	e([o],2 ation((, S(oI(),2),2),3 ation((, S(oI(),2),3,3),3 (o6,2), F((o6,2),3 (i1(o31),1 (i1(o35),1 (i1(o24),1 (i1(o24),2 (i1(o24),3,3),3 (i1(o24),3),3 (i1(o24),3),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o24),3 (i1(o2	(a) (b) (a) (a) (a) (a) (a) (a) (a) (a) (a) (a
\$\text{\(\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\section{\colored}{\co	Robot-locat	#89 e([o],2); ([o],2); ([o],2)	(o23) Make(o8,2) (0), S(o31), R(o23), S(o6), S(o22), S(oR)Act-location(o6) (R(o6), P(o6,2), RL(2)) Served(o31) Served(o35) Served(o22) ([o]) Served(o24) ([o]) Served(o23) ([o]) Served(o23) (Served(o23) ([o]) Served(o23)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1), S(o1), S(o26), S(o21), S(o1), S(o21), S(o1),	Robot-locat (\$\frac{1}{2}	#89 e([o],2); ([o],2); ([o],2)	(o23) Make(o8,2) (0), S(o31), R(o23), S(o6), S(o22), S(oR) + ct-location(o6) (R(o6), P(o6,2), RL(2)) Served(o31) Served(o35) Served(o22) ([o]) Served(o24) ([o]) Served(o23)
\[\text{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1) \] \[\text{Stack \$#83} \] \[\text{R(o11), RL(2), P} \] \[\text{Served(o11, Served(o3)} \] \[\text{Served(o6)} \] \[\text{Served(o3)} \] \[\text{Served(o2)} \] \[\text{Served(o3)} \] \[\text{Served(o2)} \]	Robot-locat	#89 e([o],2); ([o],2); ([o],2)	(o23) Make(o8,2) (0), S(o31), R(o23), S(o6), S(o22), S(oR) + ct-location(o6) (R(o6), P(o6,2), RL(2)) Served(o31) Served(o35) Served(o22) ([o]) Served(o24) ([o]) Served(o23)
\$\text{\(\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\colored}{\section{\colored}{\col	Robot-locat	#89 e([o],2); ([o],2); ([o],2)	(a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c
\[\text{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o1) \] \[\text{Stack \$#83} \] \[\text{R(o11), RL(2), P} \] \[\text{Served(o11, Served(o3)} \] \[\text{Served(o6)} \] \[\text{Served(o3)} \] \[\text{Served(o2)} \] \[\text{Served(o3)} \] \[\text{Served(o2)} \]	Robot-locat	#89 e([o],2); ([o],2); ([o],2)	(o23) Make(o8,2) (0), S(o31), R(o23), S(o6), S(o22), S(oR) + ct-location(o6) (R(o6), P(o6,2), RL(2)) Served(o31) Served(o35) Served(o22) ([o]) Served(o24) ([o]) Served(o23)
\$\text{\(\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\colored}{\section{\colored}{\colored}{\colored}{\colored}{\section{\colored}{\col	Robot-locat (\$\frac{1}{2}	#89 e([o],2); ([o],2); ([o],2)	(o23)

Make(o8,2				ocation(o28)
Robot-locatio				, R(o28), RF}
$\{R(o6), P(o6,2),$				te(o28,1)
Serve(o6,2				ocation(o31)
Served(o3				L(1), P(o31,1)
Served(o3				re(o31,1)
Served(o2			()	ved(o35)
	$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), \}$	S(o1		
Served(o2				ved(o24)
Robot-location		#105		ved(o23)
[S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26)]	$10), S(o31), R(o23), S(o6), S(o22), S(o11)\}$	L		ocation(o23)
Ct1#04		L	$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o25)\}$	1), S(010), S(031
Stack #96	Served((o31)) Stor	ck #108
	Served	(o35)	K #106
	Served	(o22))	
Robot-locatio	n(o6) Served	(o24)		
$\{R(o6), P(o6,2),$	RL(2)} Served(l(o23)) Robot-le	ocation([o1])
Serve(o6,2				t([o1])}
	$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), \}$	S(o1		
Served(o3				, R(o28), RF}
Served(o2		#108		xe(o28,1)
Served(o2		L		ocation(o31)
Served(o2		L		L(1), P(o31,1)}
Robot-location $\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o2$	10) 9(-21) P(-22) 9(-2) 9(-22) 9(-1-Retition(c	o31 H	Serv	re(o31,1)
[20(020), 5(020), 5(024), 5(030), 5(020), 5(021), 5(0	(10), $S(631)$, $R(623)$, $S(66)$, $S(622)$, $S(617)$	ded	[n]) Serv	ved(o35) ved(o22)
Stack #9*	Robot-loca	tion ((031) Serv	ved(022)
Stack #3	$\{R(o31), RL([n])\}$		(031,[n])} Serv	ved(o23)
	Serve(o	31,[n	Bohot-le	ocation(o23)
	Served	l(o3 5)	S(023), S(025), S(024), S(035), S(026), S(02	1), S(o10), S(o31
Robot-location	([01]) Served	l(022)	.,,, ~(-31
{R([o1])}				k #109
Move([o1],				
$\{R(o6), P(o6,2), \}$				
	$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), \}$	S(o1		2(-6)1
Served(o3 Served(o3		#104		R(o6)} e(o6,o28)
Served(o2:		#10		i, R(o28), RF}
Served(o2		F		e(o28,1)
Served(o2		H		ocation(o31)
Robot-location	(o23) Robot-loa		(1) $\int \mathbb{R}(0.31) \mathbb{R}$	L(1), P(o31,1)}
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o	10), S(031), R(023), S(06), S(022), S(01000t-local	tion((o31) Serv	re(o31,1)
	[It(031), ItL(1	1), 1	(031,1)} Serv	ved(o35)
Stack #98	Serve(o		Serv	ved(o22)
	Served			ved(o24)
	Served			ved(o23)
{R(o8)}	Served	(o24	Robot-lo	ocation(o23)
Move(08,0	6) Robot-loca	tion	(S(o23), S(o25), S(o24), S(o35), S(o26), S(o26)	1), $S(o10)$, $S(o31)$
{B(o6) P(o6.2)	联岛(223) , S(o25), S(o24), S(o35), S(o26), S(o21),	S(o1	0) S(o31) B(o23) S(o6) S(o22) S(o11) by	1 //110
Serve(06,2		5(01	(011) 5	ck #110
Served(o3		#105		
Served(o3	5)			
Served(o2	2)		Move	e(o6,o28)
Served(o2	1)		{M(o28,1)	, R(o28), RF}
Served(o2				e(o28,1)
Robot-location	(n23) Machine			ocation(o31)
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o$	10), S(o31), R(o23), S(o6), S(o22), S(o4)9301-1004 {M([o],1), R	2([0])	$([0])$ $\{R(o31), R\}$	L(1), P(o31,1)
Cr. 1 #00	M-1/[Ser v	re(o31,1)
Stack #99	Robot-locat	tion	(-21)	ved(o35)
	{R(o31), RL(1		(01 1)]	ved(o22) ved(o24)
	Serve(o		,	ved(o24) ved(o23)
Move(o8,o	6) Served	(o35) Bahat k	ocation(o23)
{R(o6), P(o6,2),	RL(2)} Served((o22	(S(o23), S(o25), S(o24), S(o35), S(o26), S(o2	1) S(o10) S(o21
Serve(o6,2) Serveu	1(024)	-,, 5(010), 5(031
Served(o3				ck #111
Served(o3			(023)	**
	2)(S(o23), S(o25), S(o24), S(o35), S(o26), S(o21),	S(o1	(0) , $S(o31)$, $R(o23)$, $S(o6)$, $S(o22)$, $S(o\overline{11})$	
Served(o2		11 3 0 =		D(00) T=3
Served(o2		#106		, R(o28), RF}
Robot-location				ce(o28,1)
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o$	10), 5(031), K(023), S(00), S(022), S(011)}			ocation(o31)
Stack #10	Machine	e([o],		L(1), P(o31,1)} re(o31,1)
Stack #10	Robot-loca		(f-1) Sel v	ved(o35)
	$\{M([o],1), R\}$	₹([o])		ved(o22)
	Make([Seri	ved(022)
$\{R(o6), P(o6,2),$			(031) Serv	ved(o23)
Serve(o6,2) {R(o31), RL(1	1), P	(o31,1)}	cantion(c22)
Served(o3) Serve(o	o31, E	(S(o23), S(o25), S(o24), S(o35), S(o26), S(o2)	1), S(o10), S(o31
Served(o3	p) Served	1(035		,. (),, ()
Served(o2:				k #112
Served(o2				
Served(o2				
Robot-location				
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o$	1 M C			

				_
Make(o28,	1) Sei	rve(o31,		t-location(o28)
Robot-location		rved(o35		8(1), R(o28), RF}
{R(o31), RL(1), I		rved(o22		Aake(o28,1)
Serve(o31,		rved(o24		t-location(o35)
Served(o3) Se	rved(o23	$\{RL(1),$	P(o35,1), R(o35)}
Served(o2		-location		Serve(o35,1)
	1)(S(o23), S(o25), S(o24), S(o35), S(o26), S(o26)			
		·=+), O(O.		
Served(o23		L		Served(o24)
Robot-location	(o23) Sta	ack #11	9	Served(o23)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o	10), S(o31), B(o23), S(o6), S(o22), S(o11)}	İ	Robo	ot-location(o23)
[=(===); =(===); =(===); =(===); =(===); =(===);		ŀ	{S(o23), S(o25), S(o24), S(o35), S(o26), S	
Ct. 1 //11	0	L	{5(025), 5(025), 5(024), 5(035), 5(020), 5	(021), 5(010), 5(031
Stack #11	3	1/- 25	\	7
		rved(o35		stack #125
		rved(o22		
	Se	rved(o24		7
Robot-location	(o31) Sb	rved(o23	3)	-
{R(o31), RL(1), I		-location		ot-location([o1])
	1(S(o23), S(o25), S(o24), S(o35), S(o26), S(o26)	21), S(o		
Served(o35	5)		M	ove([o1],o28)
Served(o22	Sta	ack #12) {M(o28	8,1), R(o28), RF}
Served(o24		<i>"</i> }		Make(o28,1)
		-		
Served(o23		ļ		ot-location(o35)
Robot-location	(023)	(25	$\{RL(1),$	P(035,1), R(035)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o	10), S(o31), R(o23), S(o6), S(o22), S(o11) 11	tion(035)	[11])	erve(o35,1)
	Robo	t-loaded	([n])	Served(o22)
Stack #11	Robot-	-location		Served(o24)
Stack #11	{RL([n]), P		D/ 25/1	
			1)	Served(o23)
	Serv	ve(o35,[1]) Robo	t-location(o23)
	Se:	rved(o22	(S(o23) S(o25) S(o24) S(o35) S(o26) S	(621), S(610), S(631
Robot-location	([o1]) Se	rved(o24)	-,, =(=10), =(301
{R([o1])}		rved(o23	ń.	4100
Move([o1],o				stack #126
		-location		4
	P(GS(b,23), S(o25), S(o24), S(o35), S(o26), S(o25))	21), S(o	10), $S(o31)$, $R(o23)$, $S(o6)$, $S(o22)$, $S(o11)$	
Serve(o31,	1)	-		
Served(o3	() Str	ack #12		{R(o31)}
Served(o22		//		ove(o31,o28)
Served(o24		L		8,1), R(o28), RF}
Served(o23	3)		N	4ake(o28,1)
Robot location	(o23) Robo	ot-loadec		t-location(o35)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o	10) S(21) B(22) S(6) S(22) S(Report-	-location	(035)	P(o35,1), R(o35)}
[5(023), 5(023), 5(024), 5(033), 5(020), 5(021), 5(0	(RL(1), P	2(035.1)	B(035)}	
	a.			derve(o35,1)
Stack #11		rve(o35,		Served(o22)
		rved(o22		Served(o24)
	Se ⁻	rved(o24		Served(o23)
	Se	rved(o23		
[D(a29)]	Pohot	logation	7 KODO	t-location(o23)
11((028))	Robot- B(S(o23), S(o25), S(o24), S(o35), S(o26), S(o	-10Cat1011	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	(o21), S(o10), S(o31)
Move(o28,o	348(023), S(025), S(024), S(035), S(026), S(026)	21), S(o	$\{(0), S(031), R(023), S(06), S(022), S(011)\}$	
$\{R(o31), RL(1), F(o31), RL(o31), RL(o$	'(o31,1)}		S	Stack #127
Serve(o31,	Sta	ack #122	2	70ack #121
Served(o3		"		
Served(o22		_		
Served(o24	4)		M	ove(o31,o28)
Served(o2		obot-fre		1), R(o28), RF}
Pohot logation	(a22) Mac	chine([o]	,1)	4ake(o28,1)
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o$	to g(at) B(ap) g(a) g(ap) g(Bulyot	-location	([o])	
$\{S(023), S(025), S(024), S(035), S(026), S(021), S(0$	$\frac{10}{10}$, 1	1) D/[a]	\ DE) Kobo	t-location(o35)
	\[\frac{1}{1} \frac{1}{1} \]	1), 10([0]	RL(1).	P(o35,1), R(o35)}
Stack #11		ake([o], 1		erve(o35.1)
"	Robot-	-location		Served(o22)
	{RL(1), P	(o35,1).		
		rve(o35,		Served(o24)
34 / 00				Served(o23)
Move(o28,o		rved(o22		t-location(o23)
{R(o31), RL(1), I	'(o31,1)} Se	rved(o24	May 200 at 250 at 200 at 250 at 200 a	(01) (10) (01)
Serve(o31,	1) Se:	rved(o23	(0.20), (0.20) , (0.24) , (0.00) , (0.20) , (0.20)	(621), S(610), S(631)
Served(o3		-location	(-02)	1 // 100
	2)(S(o23), S(o25), S(o24), S(o35), S(o26), S(o26)			stack #128
		عرب, ۵(O.	10), 5(031), 11(023), 5(00), 5(022), 5(011)}	_
Served(o24				
Served(o23	Sta	ack #123	3	
Robot-location		Γ	{M(o28	8,1), R(o28), RF}
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o		}		Make(o28,1)
[] [] [[] [] [] [] [] [] [] [10), 5(031), 11(023), 5(00), 5(022), 5(011)}			
I	3.6.	chine([o]	1)	t-location(o35)
Stack #11				P(o35,1), R(o35)}
·	Robot	-location		berve(o35,1)
				Served(o22)
	{M([o],)	1), R([o]		DELVEULUZZI
(D/ 01) D7 (1) T	Ma	ake([o], 1)	Served(o24)
{R(o31), RL(1), I	M; P(o31,1)} Robot-	ake([o], 1] -location) (035)	
Serve(o31,	M; P(o31,1)} Robot- 1) {RL(1), P	ake([o], 1] -location $P(o35, 1)$,	(o35) R(o35)}	Served(o24) Served(o23)
Serve(o31,	M; P(o31,1)} Robot- 1) {RL(1), P	ake([o], 1] -location $P(o35, 1)$,	(o35) R(o35)}	Served(o24) Served(o23)
Serve(o31, Served(o3	$ \begin{array}{cccc} & & & M_1 \\ & & & & \\ P(031,1) \} & & & Robot \\ 1) & & & \{RL(1), P \\ b) & & & Sep \end{array} $	ake([o], 1] -location $(o35, 1)$, $rve(o35, 1)$) (955) (955) (965) (975	Served(o24) Served(o23)
Serve(031, Served(03 Served(02	Mi Robot 	ake([o], 1] -location $P(o35, 1),$ $rve(o35, 1)$ $erved(o22)$	(o35) S R(o35) Roba S(o23), S(o25), S(o24), S(o35), S(o26), S	erved(o24) erved(o23) d-location(o23) (o21), S(o10), S(o31)
Serve(o31, Served(o3 Served(o2 Served(o2	Mi Robot I) {RL(1), P Sept. Sept. Sept. Sept.	ake([o],1 -location P(o35,1), rve(o35,1 rved(o22 rved(o24	(035) (035) Rober (15(023), S(025), S(024), S(035), S(026), S(Served(o24) Served(o23)
Serve(031, Served(03 Served(02	Mi Robot I) {RL(1), P Sept. Sept. Sept. Sept.	ake([o], 1] -location $P(o35, 1),$ $rve(o35, 1)$ $erved(o22)$	(035) (035) Rober (15(023), S(025), S(024), S(035), S(026), S(erved(o24) erved(o23) d-location(o23) (o21), S(o10), S(o31)
Serve(031, Served(032 Served(022 Served(0222) Served(02222)	Mi Robot- I) RL(1), P Set Set Set Set Set Set	ake([o],1 -location (o35,1), rve(o35,1 rved(o22 rved(o24 rved(o23	(035) R(035) R(035)} R(035)} Robe (S(023), S(025), S(024), S(035), S(026), S (S(023), S(025), S(024), S(035), S(026), S (S(023), S(025), S(024), S(035), S(026), S	erved(o24) erved(o23) d-location(o23) (o21), S(o10), S(o31)
Serve(031, Served(03 Served(02 Served(02 Served(02 Robot-location	Minor Mino	ake([o], 1 -location P(o35,1), rve(o35,1 rved(o22 rved(o24 rved(o23 -location	(o35) S (o35) S (o35) S (o35) S (o26) S (o23), S(o25), S(o24), S(o35), S(o26), S (o23) S (o23)	erved(o24) erved(o23) d-location(o23) (o21), S(o10), S(o31)
Serve(o31, Served(o32 Served(o22 Served(o222) Served(o2322)	Minor Mino	ake([o], 1 -location P(o35,1), rve(o35,1 rved(o22 rved(o24 rved(o23 -location	(o35) S (o35) S (o35) S (o35) S (o35) S (o35) S (o24), S(o35), S(o26), S (o26), S (o26), S (o27) S (o2	erved(o24) Served(o23) z-location(o23) (o21), S(o10), S(o31) Stack #129
Serve(o31,	Miles	ake([o], 1-location (035,1), rve(035,1), rve(035,1), rved(022 rved(024 rved(023 -location (21), S(o	(o35)	Served(024) Served(023) r-location(023) (021), S(010), S(031) Stack #129 Make(028,1)
Serve(031, Served(03 Served(02 Served(02 Served(02 Robot-location	Miles	ake([o], 1 -location P(o35,1), rve(o35,1 rved(o22 rved(o24 rved(o23 -location	(o35)	erved(o24) Served(o23) z-location(o23) (o21), S(o10), S(o31) Stack #129
Serve(o31,	Miles	ake([o], 1-location (035,1), rve(035,1), rve(035,1), rved(022 rved(024 rved(023 -location (21), S(o	(o35) R(o35) R(o35)} R(o35)} Roba R(o35)} Roba Roba S(o23), S(o25), S(o24), S(o35), S(o26), S S(o23) Roba Roba	Served(024) Served(023) r-location(023) (021), S(010), S(031) Stack #129 Make(028,1)
Serve(o31,	Miles	ake([o], 1-location (035,1), rve(035,1), rve(035,1), rved(022 rved(024 rved(023 -location (21), S(o	(o35) (o36) (o35) (o36) (o36) (o37)	Served(o24) Served(o23) s-location(o23) (o21), S(o10), S(o31) stack #129 Make(o28,1) ot-location(o35) P(o35,1), R(o35)}
Serve(o31,	Miles	ake([o], 1-location (035,1), rve(035,1), rve(035,1), rved(022 rved(024 rved(023 -location (21), S(o	(o35) S Roboto (S) (o35) S Roboto (S) (o35) S Roboto (S) (o35) S (o25), S(o24), S(o35), S(o26), S (o25) S (o23) S (o23)	Served(o24) Served(o23) a-location(o23) (o21), S(o10), S(o31) Stack #129 Make(o28,1) ot-location(o35) P(o35,1), R(o35)} Serve(o35,1)
Serve(o31,	Minor Robot	ake([o], 1-location (035,1), rve(035,1), rve(035,1), rved(022 rved(024 rved(023 -location (21), S(o) (035) (035) (805	Served(024) Served(023) Served(023) Served(023) Served(023) Served(023) Served(024) Served(024) Served(025) Served(025)
Serve(o31,	Minor Robot	ake([o], 1-location (035,1), rve(035,1), rve(035,1), rved(022 rved(024 rved(023 -location (21), S(o	(o35) (o35) (o35) (o35) (o35) (o35) (o35) (o35) (o35) (o23) (o23) (o23) (o23) (o23) (o23) (o23) (o23) (o23) (o24), S(o24), S(o25), S(o26), S(o27) (o24) (o25) (o26) (o27) (o27) (o28) (o28) (o29) (o29	Arved(024) Served(023) Location(023) Location(023) Location(031) Location(031) Location(031) Location(035) Locatio
Serve(o31,	Minor Robot	ake([o], 1-location (035,1), rve(035,1), rve(035,1), rved(022 rved(024 rved(023 -location (21), S(o	(o35) (o35) (o35) (o35) (o35) (o35) (o35) (o35) (o35) (o23) (o23) (o23) (o23) (o23) (o23) (o23) (o23) (o23) (o24), S(o24), S(o25), S(o26), S(o27) (o24) (o25) (o26) (o27) (o27) (o28) (o28) (o29) (o29	Served(024) Served(023) Served(023) Served(023) Served(023) Served(023) Served(024) Served(024) Served(025) Served(025)
Serve(o31,	Minor Robot	ake([o], 1-location (035,1), rve(035,1), rve(035,1), rved(022 rved(024 rved(023 -location (21), S(o	(o35) S (o26), S (o35) S (o26), S (o26), S (o26) S (o27) S (o2	Arved(024) Served(023) Location(023) Location(023) Location(023) Location(031) Location(031) Location(035) Locatio
Serve(o31,	Minor Robot	ake([o], 1-location (035,1), rve(035,1), rve(035,1), rved(022 rved(024 rved(023 -location (21), S(o	(o35) S (o26), S (o35) S (o26), S (o26), S (o26) S (o27) S (o2	Served(024) Served(023) tr-location(023) (021), S(010), S(031) Stack #129 Make(028,1) tr-location(035) P(035,1), R(035)} Served(035,1) Served(022) Served(024) Served(023) tr-location(023)



Move(o28,o		achine([o]		Make(o28,1)
{R(o22), RL(1), I	P(o22.1)} Robo	t-locatio	n([o]) Robo	ot-location(o24)
Serve(o22,		1), R([o]		1), RL(1), R(o24)}
Served(o24,				
		Iake([o], 1		Serve(o24,1)
Served(o2		t-location		Served(o23)
Robot-location	$(o23)$ {P(o24,1	l), RL(1),	R(o24) Robo	ot-location(o23)
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o$	10), S(o31), R(o23), S(o6), S(o22), S(o11) §	erve(o24,	$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o$	(o21), S(o10), S(o31
	S	erved(o23	3)	
Stack #15		t-location		Stack #164
Stack #15				7 #104
	$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o$	o21), S(o	(510), (510) , (510) , (510) , (510) , (510) , (510)	
	S	tack #15	8	
$\{R(o22), RL(1), I\}$	P(o22,1)}		Robo	ot-location(o24)
Serve(o22,	1)	1 1	{P(o24,	1), RL(1), R(o24)}
Served(o2		1 1		Serve(o24,1)
Served(o2		t-location		Served(o23)
Robot-location		(1), R(o2		ot-location(o23)
$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o26), S(o$	10), $S(o31)$, $R(o23)$, $S(o6)$, $S(o22)$, $S(o11)$	¶ake(o28,	$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o$	(621), S(o10), S(o31)
	Robo	t-location	n(o24)	
Stack #15	P(o24.1)	l), RL(1),	. R(o24)}	Stack #165
"		erve(o24,		⊣ ″
		Served(o23		
G (. 00	Robo	t-location	n(o23)	([-1])
Serve(022,	1 {S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o	10), S(o31), R(o23), S(o6), S(o22), S(o19)	n-location([01])
Served(o2		7	,, ,, ,, ,, ,, ,, ,, ,,	-{R([o1])}
Served(o2	3)	tack #15	o M	ove([o1],o24)
Robot-location		Jack #15		1), RL(1), R(o24)}
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o		1		Serve(o24,1)
[[5(020), 5(020), 5(024), 5(030), 5(020), 5(021), 5(0	10), 5(001), 11(020), 5(00), 5(022), 5(011)}	_		
alan .				Served(o23)
Stack #15		t-location		ot-location(o23)
		{R([o1])}	$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o$	(o21), S(o10), S(o31
		ove([o1],o		77.2(1.2)
				741- #166
Served(o24		1,1), R(o2)		stack #166
	<u>, </u>	4ake(o28,		
Served(o2		t-location	n(o24)	
Robot-location	(023) {P(024.1), RL(1),	R(o24)}	7
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o	10), $S(o31)$, $R(o23)$, $S(o6)$, $S(o22)$, $S(o11)$	07770(024	1)	{R(o28)}
				ove(o28,o24)
Stack #15		erved(o23	(D/ 04)	t), RL(1), R(o24)}
Stack #15	* Robo	t-location		
	$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o$	o21), S(o	10), S(o31), R(o23), S(o6), S(o22), S(o11))	serve(024,1)
		, ,, ,	7, (), (), (), (),	Served(o23)
		+nalr #16	Robo	ot-location(o23)
Petition(o24	[n])	tack #16	$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o$	
Robot-loaded	([n])	1 '	[5(020), 5(020), 5(024), 5(000), 5(020), 5	(021), 5(010), 5(001
Robot-location		1		
		-	S	Stack #167
$\{P(o24,[n]), RL([n]$		$\{R(o22)\}$		
Serve(o24,[n]) Me	ve(o22,o	28)	
Served(o23		1), R(o2		-
Robot-location	(023)	1 1 (00	L C	ove(o28,o24)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o	10\ G(.21\ D(.22\ G(.6\ G(.22\ G(.11\)	1ake(o28,	(P/v94)	t), RL(1), R(o24)}
[5(023), 5(023), 5(024), 5(033), 5(020), 5(021), 5(0	10), 5(031), 1t(023), 5(00), 5(022), 5(0R5)	t-location	1(024)	
	{P(o24,1	l), RL(1),		erve(o24,1)
Stack #15		erve(o24,		Served(o23)
	Ċ	1/ 0/	k\(\cdot\) Robo	t-location(o23)
	, n	er ved (023	$\{(55,023), S(025), S(024), S(035), S(026), S$	(021) S(010) S(031)
	Robo	t-location	1(623)-07, 0(0-07, 0(0-07, 0(0-07, 0(0-07, 0	,, =(,, =(
Robot-loader	$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o$	p21), S(o	(10), S(o31), R(o23), S(o6), S(o22), S(o11)	1 //100
Robot-location	(24)		c	mack #168
		ack #16	1	
$\{P(o24,1), RL(1),$	11(024)	1 //		
Serve(o24,		1		
Served(o2		1	{P(o24,	1), RL(1), R(o24)}
Robot-location	(023)	ove(o22,o	20)	erve(o24,1)
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o	10), S(o31), B(o23), S(o6), S(o22), S(o11)}	ve(0∠2,0	(a) PP)	Served(o23)
[[-(-20), 5(020), 5(021), 5(050), 5(020), 5(021), 5(0	,, -(-0-1), 10(020), D(00), D(022), D[M(d28	ц1), R(o2	8), KF}	
				t-location(o23)
Stack #15	Robo	t-location	(55(923), S(025), S(024), S(035), S(026), S(026), S(026))	(021), $S(010)$, $S(031)$
		l), RL(1),	. R(o24)}	
		erve(o24,		tack #169
			1)	-
Robot-fre		erved(o23		4
Machine([o]	.1) Robo	t-location		
D-L-1 1	S(023), S(025), S(024), S(035), S(026), S(026)	o21), S(o	(10), $S(o31)$, $R(o23)$, $S(o6)$, $S(o22)$, $S(o11)$	Servo(o24.1)
		1 // \-		
$\{M([o],1), R([o],1), R([$		Jack #16		Served(o23)
Make([o],1	.)	tack #16	Robo	ot-location(o23)
Robot-location	(024)]	{S(o23), S(o25), S(o24), S(o35), S(o26), S(o26	(o21), S(o10). S(o31
{P(o24,1), RL(1),		┧ '		,,, (,, ()
Serve(o24,	1)			Hack #170
	7 3 WH 02C	1), R(o2	(8), RF}	Stack #170
Served(o2	3)	lake(o28,		7
Robot-location		t-location		┥
{S(o23), S(o25), S(o24), S(o35), S(o26), S(o21), S(o			-D(04))	
	11 (024)), RL(1),		Served(o23)
Ci. i nam		erve(o24,	Bobo	nt-location (o23)
Stack #15	S	erved(o23	(S(o23), S(o25), S(o24), S(o35), S(o26), S(o26)	(b21) S(c10) S(c21
	Robo	t-location	$\frac{1023}{1023}$	(D21), D(010), D(031
	[S(023) S(025) S(024) S(025) S(026) S((21) 8/-	(1023) (10), S(o31), R(o23), S(o6), S(o22), S(o11)	d
	[D(020), D(020), D(024), D(030), D(026), S(UZ1), D(O	(0.001), (0.001) , (0.002) , (0.001)	stack #171
	S	tack #16	3	
		••		
		1	D.,	tition(o23,[n])
				oot-loaded([n])
			Robo	ot-location(o23)
			{R(o23).	RL([n]), P(o23,[n])}
				erve(o23,[n])
				ot-location(o23)
			$\{S(o23), S(o25), S(o24), S(o35), S(o26), S(o$	(UZI), B(OIU), S(O31

