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Heuristic Analysis

Air Cargo Problem 1

This simple problem can be managed by any search function and produces the result in a reasonable time.

- Optimal plan length : 6
- Optimal plan path sample:
 2017-12-18 02:42:22,010 INFO - Load(C1, P1, SFO)
 2017-12-18 02:42:22,010 INFO - Load(C2, P2, JFK)
 2017-12-18 02:42:22,011 INFO - Fly(P2, JFK, SFO)
 2017-12-18 02:42:22,011 INFO - Unload(C2, P2, SFO)
 2017-12-18 02:42:22,011 INFO - Fly(P1, SFO, JFK)
 2017-12-18 02:42:22,011 INFO - Unload(C1, P1, JFK)

Search function	Heuristic	Expansions	Goal Tests	New Nodes	Plan length	Time elapsed in seconds	Is Optimal ?
breadth_first_search	NO	43	56	180	6	0.036	YES
breadth_first_tree_search	NO	1458	1459	5960	6	1.132	YES
depth_first_graph_search	NO	21	22	84	20	0.016	NO
depth_limited_search	NO	101	271	414	50	0.108	NO
uniform_cost_search	NO	55	57	224	6	0.045	YES
recursive_best_first_search with h_1	NO	4229	4230	17023	6	3.266	YES
greedy_best_first_graph_search with h_1	NO	7	9	28	6	0.005	YES
astar_search with h_1	YES	55	57	224	6	0.045	YES
astar_search with h_ignore_preconditions	YES	41	43	170	6	0.043	YES
astar_search with h_pg_levelsum	YES	11	13	50	6	0.798	YES

[Note: all results are in annex](#)

Air Cargo Problem 2

- Optimal plan length : 9
- Optimal plan path sample:
 2017-12-18 02:44:14,672 INFO - Load(C3, P3, ATL)
 2017-12-18 02:44:14,672 INFO - Fly(P3, ATL, SFO)
 2017-12-18 02:44:14,672 INFO - Unload(C3, P3, SFO)
 2017-12-18 02:44:14,672 INFO - Load(C2, P2, JFK)
 2017-12-18 02:44:14,672 INFO - Fly(P2, JFK, SFO)
 2017-12-18 02:44:14,672 INFO - Unload(C2, P2, SFO)
 2017-12-18 02:44:14,672 INFO - Load(C1, P1, SFO)
 2017-12-18 02:44:14,673 INFO - Fly(P1, SFO, JFK)
 2017-12-18 02:44:14,673 INFO - Unload(C1, P1, JFK)

Search function	Heuristic	Expansions	Goal Tests	New Nodes	Plan length	Time elapsed in seconds	Is Optimal ?
breadth_first_search	NO	3343	4609	30509	9	9.857	YES
breadth_first_tree_search							
depth_first_graph_search	NO	624	625	5602	619	4.198	NO
depth_limited_search							
uniform_cost_search							
recursive_best_first_search with h_1							
greedy_best_first_graph_search with h_1	NO	998	1000	8982	15	2.897	NO
astar_search with h_1	YES	4853	4855	44041	9	14.189	YES
astar_search with h_ignore_preconditions	YES	1450	1452	13303	9	5.099	YES
astar_search with h_pg_levelsum	YES	86	88	841	9	72.6	YES

[Note: all results are in annex](#)

Air Cargo Problem 3

- Optimal plan length : 12
- Optimal plan path sample:

2017-12-18 02:53:01,409 INFO - Load(C2, P2, JFK)
 2017-12-18 02:53:01,409 INFO - Fly(P2, JFK, ORD)
 2017-12-18 02:53:01,410 INFO - Load(C4, P2, ORD)
 2017-12-18 02:53:01,410 INFO - Fly(P2, ORD, SFO)
 2017-12-18 02:53:01,410 INFO - Load(C1, P1, SFO)
 2017-12-18 02:53:01,410 INFO - Fly(P1, SFO, ATL)
 2017-12-18 02:53:01,410 INFO - Load(C3, P1, ATL)
 2017-12-18 02:53:01,411 INFO - Fly(P1, ATL, JFK)
 2017-12-18 02:53:01,411 INFO - Unload(C4, P2, SFO)
 2017-12-18 02:53:01,411 INFO - Unload(C3, P1, JFK)
 2017-12-18 02:53:01,411 INFO - Unload(C2, P2, SFO)
 2017-12-18 02:53:01,411 INFO - Unload(C1, P1, JFK)

Search function	Heuristic	Expansions	Goal Tests	New Nodes	Plan length	Time elapsed in seconds	Is Optimal ?
breadth_first_search	NO	14663	18098	129631	12	50.642	YES
breadth_first_tree_search							
depth_first_graph_search	NO	408	409	3364	392	2.142	NO
depth_limited_search							
uniform_cost_search							
recursive_best_first_search with h_1							
greedy_best_first_graph_search with h_1	NO	5578	5580	49150	22	19.232	NO
astar_search with h_1	YES	18223	18225	159618	12	62.677	YES
astar_search with h_ignore_preconditions	YES	5040	5042	44944	12	20.047	YES
astar_search with h_pg_levelsum	YES	325	327	3002	12	357.647	YES

[Note: all results are in annex](#)

Non Heuristic results review.

We are only considering functions that can handle each problem, `breadth_first_search`, `depth_first_graph_search` and `greedy_best_first_graph_search`.

The best of the three is clearly the `breadth_first_search` function that succeed to find an optimal plan for all problems moving to the shortest path at each iteration, this come with an high memory consumption represented by the `expansions` field and a relative slow execution time.

Nevertheless we recommend the use of this function in case you do not want to use a heuristic.

Heuristic results review.

All the astar heuristics are handling the results of the problems in the best possible way by finding the right solution.

However there are differences in regard of memory consumption (`expansions`) and execution time between these astar heuristics.

The least memory-intensive function is `astar_h_pg_levelsum` and will be recommended to save memory but has a negative effect on obtaining a longer computing time.

If execution is a determining factor, then the appropriate heuristic to use is `astar_h_ignore_preconditions` which, by ignoring the prerequisites, speeds up computation time and is always accurate in a "relaxed problem solving method".

Recommandation:

I recommend to use the `astar_h_ignore_preconditions` as it give the optimal path solution with the best computation time and a better memory usage in comparison of the non heuristic function .

Annex

Air Cargo Problem 1

```

2017-12-18 02:42:21,905 INFO - Run Output:
2017-12-18 02:42:21,970 INFO -
2017-12-18 02:42:21,970 INFO - Solving Air Cargo Problem 1 using breadth_first_search...
2017-12-18 02:42:22,009 INFO -
2017-12-18 02:42:22,010 INFO - Expansions  Goal Tests  New Nodes
2017-12-18 02:42:22,010 INFO - 43      56      180
2017-12-18 02:42:22,010 INFO -
2017-12-18 02:42:22,010 INFO - Plan length: 6  Time elapsed in seconds: 0.03633368699956918
2017-12-18 02:42:22,010 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:22,010 INFO - Load(C2, P2, JFK)
2017-12-18 02:42:22,011 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:42:22,011 INFO - Unload(C2, P2, SFO)
2017-12-18 02:42:22,011 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:42:22,011 INFO - Unload(C1, P1, JFK)
2017-12-18 02:42:22,011 INFO -
2017-12-18 02:42:22,011 INFO - Solving Air Cargo Problem 1 using breadth_first_tree_search...
2017-12-18 02:42:23,146 INFO -
2017-12-18 02:42:23,146 INFO - Expansions  Goal Tests  New Nodes
2017-12-18 02:42:23,146 INFO - 1458      1459      5960
2017-12-18 02:42:23,147 INFO -
2017-12-18 02:42:23,147 INFO - Plan length: 6  Time elapsed in seconds: 1.132217470993055
2017-12-18 02:42:23,147 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,147 INFO - Load(C2, P2, JFK)
2017-12-18 02:42:23,147 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:42:23,147 INFO - Unload(C2, P2, SFO)
2017-12-18 02:42:23,148 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:42:23,148 INFO - Unload(C1, P1, JFK)
2017-12-18 02:42:23,148 INFO -
2017-12-18 02:42:23,148 INFO - Solving Air Cargo Problem 1 using depth_first_graph_search...
2017-12-18 02:42:23,166 INFO -
2017-12-18 02:42:23,166 INFO - Expansions  Goal Tests  New Nodes
2017-12-18 02:42:23,166 INFO - 21      22      84
2017-12-18 02:42:23,167 INFO -

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2017-12-18 02:42:23,167 INFO - Plan length: 20 Time elapsed in seconds: 0.01656674799596658
2017-12-18 02:42:23,167 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:42:23,167 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:42:23,167 INFO - Load(C2, P1, JFK)
2017-12-18 02:42:23,167 INFO - Fly(P1, JFK, SFO)
2017-12-18 02:42:23,167 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:42:23,168 INFO - Unload(C2, P1, SFO)
2017-12-18 02:42:23,168 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:42:23,168 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:42:23,168 INFO - Load(C2, P2, SFO)
2017-12-18 02:42:23,168 INFO - Fly(P1, JFK, SFO)
2017-12-18 02:42:23,168 INFO - Load(C1, P2, SFO)
2017-12-18 02:42:23,169 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:42:23,169 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:42:23,169 INFO - Unload(C2, P2, JFK)
2017-12-18 02:42:23,169 INFO - Unload(C1, P2, JFK)
2017-12-18 02:42:23,169 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:42:23,169 INFO - Load(C2, P1, JFK)
2017-12-18 02:42:23,169 INFO - Fly(P1, JFK, SFO)
2017-12-18 02:42:23,170 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:42:23,170 INFO - Unload(C2, P1, SFO)
2017-12-18 02:42:23,170 INFO -
2017-12-18 02:42:23,170 INFO - Solving Air Cargo Problem 1 using depth_limited_search...
2017-12-18 02:42:23,280 INFO -
2017-12-18 02:42:23,280 INFO - Expansions Goal Tests New Nodes
2017-12-18 02:42:23,280 INFO - 101 271 414
2017-12-18 02:42:23,280 INFO -
2017-12-18 02:42:23,281 INFO - Plan length: 50 Time elapsed in seconds: 0.10893767100060359
2017-12-18 02:42:23,281 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,281 INFO - Load(C2, P2, JFK)
2017-12-18 02:42:23,281 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,281 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,281 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,282 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,282 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,282 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,282 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,282 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,282 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,283 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,283 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,283 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,283 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,283 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,283 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,284 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,284 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,284 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,284 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,284 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,285 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,285 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,285 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,285 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,285 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,285 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,285 INFO - Unload(C1, P1, SFO)

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2017-12-18 02:42:23,285 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,286 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,286 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,286 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,286 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,286 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,286 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,286 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,287 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,287 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,287 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,287 INFO - Unload(C1, P1, SFO)
2017-12-18 02:42:23,287 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,287 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:42:23,287 INFO - Unload(C2, P2, SFO)
2017-12-18 02:42:23,287 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:42:23,288 INFO - Unload(C1, P1, JFK)
2017-12-18 02:42:23,288 INFO -
2017-12-18 02:42:23,288 INFO -
2017-12-18 02:42:23,288 INFO - Solving Air Cargo Problem 1 using uniform_cost_search...
2017-12-18 02:42:23,330 INFO -
2017-12-18 02:42:23,330 INFO - Expansions Goal Tests New Nodes
2017-12-18 02:42:23,331 INFO - 55 57 224
2017-12-18 02:42:23,331 INFO -
2017-12-18 02:42:23,331 INFO - Plan length: 6 Time elapsed in seconds: 0.04557108000153676
2017-12-18 02:42:23,331 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:23,331 INFO - Load(C2, P2, JFK)
2017-12-18 02:42:23,331 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:42:23,331 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:42:23,332 INFO - Unload(C1, P1, JFK)
2017-12-18 02:42:23,332 INFO - Unload(C2, P2, SFO)
2017-12-18 02:42:23,332 INFO -
2017-12-18 02:42:23,332 INFO -
2017-12-18 02:42:23,332 INFO - Solving Air Cargo Problem 1 using recursive_best_first_search with h_1...
2017-12-18 02:42:26,601 INFO -
2017-12-18 02:42:26,601 INFO - Expansions Goal Tests New Nodes
2017-12-18 02:42:26,602 INFO - 4229 4230 17023
2017-12-18 02:42:26,602 INFO -
2017-12-18 02:42:26,602 INFO - Plan length: 6 Time elapsed in seconds: 3.2662931400045636
2017-12-18 02:42:26,602 INFO - Load(C2, P2, JFK)
2017-12-18 02:42:26,602 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:26,602 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:42:26,602 INFO - Unload(C2, P2, SFO)
2017-12-18 02:42:26,603 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:42:26,603 INFO - Unload(C1, P1, JFK)
2017-12-18 02:42:26,603 INFO -
2017-12-18 02:42:26,603 INFO -
2017-12-18 02:42:26,603 INFO - Solving Air Cargo Problem 1 using greedy_best_first_graph_search with h_1...
2017-12-18 02:42:26,610 INFO -
2017-12-18 02:42:26,610 INFO - Expansions Goal Tests New Nodes
2017-12-18 02:42:26,610 INFO - 7 9 28
2017-12-18 02:42:26,611 INFO -
2017-12-18 02:42:26,611 INFO - Plan length: 6 Time elapsed in seconds: 0.00595855600113282
2017-12-18 02:42:26,611 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:26,611 INFO - Load(C2, P2, JFK)
2017-12-18 02:42:26,611 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:42:26,611 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:42:26,611 INFO - Unload(C1, P1, JFK)
2017-12-18 02:42:26,612 INFO - Unload(C2, P2, SFO)
2017-12-18 02:42:26,612 INFO -
2017-12-18 02:42:26,612 INFO -
2017-12-18 02:42:26,612 INFO - Solving Air Cargo Problem 1 using astar_search with h_1...

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2017-12-18 02:42:26,659 INFO -
2017-12-18 02:42:26,660 INFO - Expansions  Goal Tests  New Nodes
2017-12-18 02:42:26,660 INFO - 55      57      224
2017-12-18 02:42:26,660 INFO -
2017-12-18 02:42:26,660 INFO - Plan length: 6  Time elapsed in seconds: 0.0458764790018904
2017-12-18 02:42:26,661 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:26,661 INFO - Load(C2, P2, JFK)
2017-12-18 02:42:26,661 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:42:26,661 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:42:26,661 INFO - Unload(C1, P1, JFK)
2017-12-18 02:42:26,661 INFO - Unload(C2, P2, SFO)
2017-12-18 02:42:26,661 INFO -
2017-12-18 02:42:26,662 INFO -
2017-12-18 02:42:26,662 INFO - Solving Air Cargo Problem 1 using astar_search with h_ignore_preconditions...
2017-12-18 02:42:26,707 INFO -
2017-12-18 02:42:26,707 INFO - Expansions  Goal Tests  New Nodes
2017-12-18 02:42:26,707 INFO - 41      43      170
2017-12-18 02:42:26,707 INFO -
2017-12-18 02:42:26,707 INFO - Plan length: 6  Time elapsed in seconds: 0.043764660993474536
2017-12-18 02:42:26,707 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:26,708 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:42:26,708 INFO - Unload(C1, P1, JFK)
2017-12-18 02:42:26,708 INFO - Load(C2, P2, JFK)
2017-12-18 02:42:26,708 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:42:26,708 INFO - Unload(C2, P2, SFO)
2017-12-18 02:42:26,709 INFO -
2017-12-18 02:42:26,709 INFO -
2017-12-18 02:42:26,709 INFO - Solving Air Cargo Problem 1 using astar_search with h_pg_levelsum...
2017-12-18 02:42:27,510 INFO -
2017-12-18 02:42:27,511 INFO - Expansions  Goal Tests  New Nodes
2017-12-18 02:42:27,511 INFO - 11      13      50
2017-12-18 02:42:27,511 INFO -
2017-12-18 02:42:27,511 INFO - Plan length: 6  Time elapsed in seconds: 0.7987790999977733
2017-12-18 02:42:27,511 INFO - Load(C1, P1, SFO)
2017-12-18 02:42:27,512 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:42:27,512 INFO - Load(C2, P2, JFK)
2017-12-18 02:42:27,512 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:42:27,512 INFO - Unload(C1, P1, JFK)
2017-12-18 02:42:27,512 INFO - Unload(C2, P2, SFO)
2017-12-18 02:42:27,512 INFO -
2017-12-18 02:42:27,557 INFO -
```

Air Cargo Problem 2

```
2017-12-18 02:43:38,351 INFO - Solving Air Cargo Problem 2 using breadth_first_search...
2017-12-18 02:43:48,219 INFO -
2017-12-18 02:43:48,222 INFO - Expansions  Goal Tests  New Nodes
2017-12-18 02:43:48,222 INFO - 3343      4609      30509
2017-12-18 02:43:48,222 INFO -
2017-12-18 02:43:48,222 INFO - Plan length: 9  Time elapsed in seconds: 9.857282432996726
2017-12-18 02:43:48,222 INFO - Load(C1, P1, SFO)
2017-12-18 02:43:48,223 INFO - Load(C2, P2, JFK)
2017-12-18 02:43:48,223 INFO - Load(C3, P3, ATL)
2017-12-18 02:43:48,223 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:43:48,223 INFO - Unload(C2, P2, SFO)
2017-12-18 02:43:48,223 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:48,223 INFO - Unload(C1, P1, JFK)
2017-12-18 02:43:48,223 INFO - Fly(P3, ATL, SFO)
```

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```
2017-12-18 02:43:48,224 INFO - Unload(C3, P3, SFO)
2017-12-18 02:43:48,224 INFO -
2017-12-18 02:43:48,224 INFO -
2017-12-18 02:43:48,224 INFO - Solving Air Cargo Problem 2 using
depth_first_graph_search...
2017-12-18 02:43:52,427 INFO -
2017-12-18 02:43:52,434 INFO - Expansions      Goal Tests      New Nodes
2017-12-18 02:43:52,434 INFO - 624              625              5602
2017-12-18 02:43:52,435 INFO -
2017-12-18 02:43:52,435 INFO - Plan length: 619   Time elapsed in seconds: 4.198069588004728
2017-12-18 02:43:52,436 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,436 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,436 INFO - Fly(P3, SFO, JFK)
2017-12-18 02:43:52,436 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,437 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,438 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,439 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,439 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,439 INFO - Load(C2, P1, JFK)
2017-12-18 02:43:52,439 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,440 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,440 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,440 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,440 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,440 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,441 INFO - Load(C3, P3, ATL)
2017-12-18 02:43:52,441 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,441 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,441 INFO - Fly(P3, SFO, JFK)
2017-12-18 02:43:52,441 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,442 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,442 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:43:52,442 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,442 INFO - Unload(C3, P3, JFK)
2017-12-18 02:43:52,442 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,442 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,443 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,443 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,443 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,443 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,443 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,444 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,444 INFO - Unload(C2, P1, SFO)
2017-12-18 02:43:52,444 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,444 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,444 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,445 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,445 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,445 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,445 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,446 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,446 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,446 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,446 INFO - Load(C3, P3, JFK)
2017-12-18 02:43:52,446 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,447 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,447 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,447 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,447 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,448 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,448 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,448 INFO - Fly(P1, ATL, JFK)
```

Trebuchet clement AIND-Planning - Heuristic Analysis

```
2017-12-18 02:43:52,448 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,448 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,448 INFO - Unload(C3, P3, ATL)
2017-12-18 02:43:52,448 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,449 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,449 INFO - Fly(P3, SFO, JFK)
2017-12-18 02:43:52,449 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,449 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,449 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,449 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,449 INFO - Load(C3, P2, ATL)
2017-12-18 02:43:52,450 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,450 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,450 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,450 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,450 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:43:52,450 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,450 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,451 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:43:52,451 INFO - Unload(C3, P2, SFO)
2017-12-18 02:43:52,451 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,451 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,451 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,451 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,451 INFO - Load(C2, P3, SFO)
2017-12-18 02:43:52,451 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,452 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,452 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,452 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,452 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,452 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:43:52,452 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,452 INFO - Unload(C2, P3, JFK)
2017-12-18 02:43:52,453 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,453 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,453 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,453 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,453 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,453 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,453 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,453 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,454 INFO - Load(C3, P2, SFO)
2017-12-18 02:43:52,454 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,454 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,454 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,454 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,454 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,454 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,455 INFO - Load(C2, P2, JFK)
2017-12-18 02:43:52,455 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,455 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,455 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,455 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,455 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,455 INFO - Unload(C3, P2, SFO)
2017-12-18 02:43:52,455 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,455 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,456 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,456 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,456 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,456 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,456 INFO - Fly(P1, SFO, JFK)
```

Trebuchet clement AIND-Planning - Heuristic Analysis

```
2017-12-18 02:43:52,456 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,456 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,456 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,456 INFO - Load(C1, P2, SFO)
2017-12-18 02:43:52,457 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,457 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,457 INFO - Fly(P3, SFO, JFK)
2017-12-18 02:43:52,457 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,457 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,457 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,457 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,457 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,457 INFO - Unload(C2, P2, JFK)
2017-12-18 02:43:52,458 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,458 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,458 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,458 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,458 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,458 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,458 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,458 INFO - Load(C3, P2, SFO)
2017-12-18 02:43:52,458 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,459 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,459 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,459 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,459 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,459 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,459 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,459 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,459 INFO - Unload(C3, P2, JFK)
2017-12-18 02:43:52,459 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,460 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,460 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,460 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,460 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,460 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:43:52,460 INFO - Unload(C1, P2, JFK)
2017-12-18 02:43:52,460 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,460 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,461 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,461 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,461 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,461 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:43:52,461 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,461 INFO - Load(C3, P2, JFK)
2017-12-18 02:43:52,461 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,461 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,461 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,462 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,462 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,462 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,462 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,462 INFO - Unload(C3, P2, ATL)
2017-12-18 02:43:52,462 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,462 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,462 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:43:52,462 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,463 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,463 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:43:52,463 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,463 INFO - Load(C2, P1, JFK)
2017-12-18 02:43:52,463 INFO - Fly(P2, SFO, ATL)
```

Trebuchet clement AIND-Planning - Heuristic Analysis

```
2017-12-18 02:43:52,463 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,463 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,463 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,463 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,463 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,464 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,464 INFO - Unload(C2, P1, SFO)
2017-12-18 02:43:52,464 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,464 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,464 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,464 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,464 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,464 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,465 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,465 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,465 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,465 INFO - Load(C2, P3, SFO)
2017-12-18 02:43:52,465 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,465 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,465 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,465 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,465 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,466 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,466 INFO - Load(C1, P3, JFK)
2017-12-18 02:43:52,466 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:43:52,466 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,466 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,466 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,466 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,466 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,466 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,467 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,467 INFO - Unload(C2, P3, ATL)
2017-12-18 02:43:52,467 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,467 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,467 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,467 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,467 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,467 INFO - Fly(P3, SFO, JFK)
2017-12-18 02:43:52,467 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,468 INFO - Unload(C1, P3, JFK)
2017-12-18 02:43:52,468 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,468 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,468 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:43:52,468 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,468 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,468 INFO - Fly(P3, SFO, JFK)
2017-12-18 02:43:52,468 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,468 INFO - Load(C1, P2, JFK)
2017-12-18 02:43:52,469 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,469 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,469 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,469 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,469 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,469 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,469 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,469 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,469 INFO - Unload(C1, P2, ATL)
2017-12-18 02:43:52,470 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,470 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,470 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,470 INFO - Fly(P1, ATL, JFK)
```

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```
2017-12-18 02:43:52,470 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,470 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:43:52,470 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,470 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,470 INFO - Load(C3, P2, ATL)
2017-12-18 02:43:52,471 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,471 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,471 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:43:52,471 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,471 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,471 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,471 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,471 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,471 INFO - Unload(C3, P2, SFO)
2017-12-18 02:43:52,472 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,472 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,472 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,472 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,472 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,472 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,472 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,473 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,473 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,473 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,473 INFO - Load(C3, P3, SFO)
2017-12-18 02:43:52,473 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,473 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,473 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,473 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,473 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,474 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,474 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,474 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,474 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,474 INFO - Load(C2, P3, ATL)
2017-12-18 02:43:52,474 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,474 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,474 INFO - Fly(P3, SFO, JFK)
2017-12-18 02:43:52,474 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,475 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,475 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:43:52,475 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,475 INFO - Unload(C3, P3, JFK)
2017-12-18 02:43:52,475 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,475 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,475 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,475 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,475 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,476 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,476 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,476 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,476 INFO - Unload(C2, P3, ATL)
2017-12-18 02:43:52,476 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,476 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,476 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,476 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,476 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,477 INFO - Load(C3, P1, JFK)
2017-12-18 02:43:52,477 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,477 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,477 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,477 INFO - Fly(P2, ATL, SFO)
```

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```
2017-12-18 02:43:52,477 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,477 INFO - Load(C2, P1, ATL)
2017-12-18 02:43:52,477 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,477 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,478 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,478 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,478 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,478 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,478 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,478 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,478 INFO - Unload(C3, P1, SFO)
2017-12-18 02:43:52,478 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,478 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,479 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,479 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,479 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,479 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,479 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,479 INFO - Load(C3, P2, SFO)
2017-12-18 02:43:52,479 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,479 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,479 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,480 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,480 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,480 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,480 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,480 INFO - Unload(C3, P2, JFK)
2017-12-18 02:43:52,480 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,480 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,480 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,480 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,481 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,481 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,481 INFO - Load(C1, P1, ATL)
2017-12-18 02:43:52,481 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,481 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,481 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,481 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,481 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,481 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,482 INFO - Load(C3, P2, JFK)
2017-12-18 02:43:52,482 INFO - Fly(P3, SFO, JFK)
2017-12-18 02:43:52,482 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,482 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,482 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,482 INFO - Fly(P1, JFK, SFO)
2017-12-18 02:43:52,482 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,482 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,482 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,483 INFO - Unload(C3, P2, ATL)
2017-12-18 02:43:52,483 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,483 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,483 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,483 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,483 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,483 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,483 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,483 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,484 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,484 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,484 INFO - Unload(C2, P1, JFK)
2017-12-18 02:43:52,484 INFO - Fly(P2, JFK, ATL)
```

Trebuchet clement AIND-Planning - Heuristic Analysis

```
2017-12-18 02:43:52,484 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,484 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,484 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,484 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,484 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,485 INFO - Fly(P3, SFO, JFK)
2017-12-18 02:43:52,485 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,485 INFO - Load(C3, P2, ATL)
2017-12-18 02:43:52,485 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,485 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,485 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:43:52,485 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,485 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,485 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,486 INFO - Unload(C3, P2, JFK)
2017-12-18 02:43:52,486 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,486 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,486 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,486 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,486 INFO - Load(C3, P1, JFK)
2017-12-18 02:43:52,486 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,486 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,486 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,487 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,487 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,487 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,487 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,487 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,487 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,487 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,487 INFO - Unload(C1, P1, ATL)
2017-12-18 02:43:52,487 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,488 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,488 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,488 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,488 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,488 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,488 INFO - Unload(C3, P1, SFO)
2017-12-18 02:43:52,488 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,488 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,488 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,489 INFO - Load(C1, P3, ATL)
2017-12-18 02:43:52,489 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,489 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,489 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,489 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,489 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:43:52,489 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,489 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,489 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:43:52,490 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,490 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,490 INFO - Unload(C1, P3, JFK)
2017-12-18 02:43:52,490 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,490 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,490 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,490 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,490 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,490 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,491 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,491 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,491 INFO - Load(C3, P1, SFO)
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```
2017-12-18 02:43:52,491 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,491 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,491 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,491 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,491 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,491 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,492 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,492 INFO - Load(C2, P2, JFK)
2017-12-18 02:43:52,492 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,492 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,492 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,492 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,492 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,492 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,492 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,493 INFO - Unload(C3, P1, SFO)
2017-12-18 02:43:52,493 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,493 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,493 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,493 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,493 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,493 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,493 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,494 INFO - Unload(C2, P2, ATL)
2017-12-18 02:43:52,494 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,494 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,494 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:43:52,494 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,494 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,494 INFO - Fly(P3, JFK, SFO)
2017-12-18 02:43:52,494 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,494 INFO - Load(C3, P3, SFO)
2017-12-18 02:43:52,495 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,495 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,495 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,495 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,495 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,495 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,495 INFO - Load(C2, P3, ATL)
2017-12-18 02:43:52,495 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,496 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,496 INFO - Fly(P3, SFO, JFK)
2017-12-18 02:43:52,496 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:43:52,496 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,496 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,496 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,496 INFO - Load(C1, P3, JFK)
2017-12-18 02:43:52,496 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,496 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,497 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,497 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,497 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,497 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,497 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,497 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,497 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,497 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,497 INFO - Unload(C2, P3, ATL)
2017-12-18 02:43:52,498 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,498 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,498 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,498 INFO - Fly(P1, ATL, JFK)
```

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```
2017-12-18 02:43:52,498 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,498 INFO - Fly(P3, SFO, JFK)
2017-12-18 02:43:52,498 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,498 INFO - Unload(C3, P3, JFK)
2017-12-18 02:43:52,498 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,499 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,499 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,499 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,499 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,499 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,499 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,499 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,499 INFO - Unload(C1, P3, SFO)
2017-12-18 02:43:52,499 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,500 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,500 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,500 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,500 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,500 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,500 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,500 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,500 INFO - Load(C3, P1, JFK)
2017-12-18 02:43:52,500 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,501 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,501 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,501 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,501 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,501 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,501 INFO - Load(C2, P3, ATL)
2017-12-18 02:43:52,501 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,501 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,501 INFO - Fly(P3, SFO, JFK)
2017-12-18 02:43:52,502 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,502 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,502 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,502 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,502 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,502 INFO - Unload(C3, P1, SFO)
2017-12-18 02:43:52,502 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,502 INFO - Unload(C2, P3, SFO)
2017-12-18 02:43:52,502 INFO - Load(C3, P1, SFO)
2017-12-18 02:43:52,503 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,503 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,503 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:43:52,503 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,503 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,503 INFO - Fly(P3, JFK, SFO)
2017-12-18 02:43:52,503 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,503 INFO - Load(C2, P2, SFO)
2017-12-18 02:43:52,503 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,504 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,504 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,504 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,504 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,504 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,504 INFO - Unload(C3, P1, ATL)
2017-12-18 02:43:52,504 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,504 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,504 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,505 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,505 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,505 INFO - Fly(P1, ATL, SFO)
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2017-12-18 02:43:52,505 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,505 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,505 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,505 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,505 INFO - Load(C1, P1, SFO)
2017-12-18 02:43:52,505 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,506 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,506 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,506 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,506 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,506 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,506 INFO - Fly(P3, SFO, JFK)
2017-12-18 02:43:52,506 INFO - Unload(C2, P2, SFO)
2017-12-18 02:43:52,506 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,506 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,507 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,507 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,507 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,507 INFO - Unload(C1, P1, ATL)
2017-12-18 02:43:52,507 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,507 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,508 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,508 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,508 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,508 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,508 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,508 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,508 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,509 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,509 INFO - Load(C3, P2, ATL)
2017-12-18 02:43:52,509 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,509 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,509 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:43:52,509 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,509 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,509 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,510 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,510 INFO - Load(C1, P3, ATL)
2017-12-18 02:43:52,510 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,510 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,510 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,510 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,510 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,510 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,510 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,511 INFO - Fly(P3, JFK, SFO)
2017-12-18 02:43:52,511 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,511 INFO - Unload(C3, P2, JFK)
2017-12-18 02:43:52,511 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,511 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,511 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,511 INFO - Fly(P3, ATL, JFK)
2017-12-18 02:43:52,511 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,511 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:43:52,512 INFO - Unload(C1, P3, JFK)
2017-12-18 02:43:52,512 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:52,512 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:43:52,512 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:43:52,512 INFO - Fly(P3, JFK, ATL)
2017-12-18 02:43:52,512 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:52,512 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,512 INFO - Fly(P1, ATL, SFO)
```

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```
2017-12-18 02:43:52,512 INFO - Load(C3, P2, JFK)
2017-12-18 02:43:52,513 INFO - Fly(P3, SFO, ATL)
2017-12-18 02:43:52,513 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:52,513 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:52,513 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:52,513 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:52,513 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:52,513 INFO - Fly(P3, SFO, JFK)
2017-12-18 02:43:52,513 INFO - Unload(C3, P2, SFO)
2017-12-18 02:43:52,513 INFO -
2017-12-18 02:43:52,514 INFO -
2017-12-18 02:43:52,514 INFO - Solving Air Cargo Problem 2 using
greedy_best_first_graph_search with h_1...
2017-12-18 02:43:55,358 INFO -
2017-12-18 02:43:55,358 INFO - Expansions    Goal Tests    New Nodes
2017-12-18 02:43:55,358 INFO - 998          1000          8982
2017-12-18 02:43:55,358 INFO -
2017-12-18 02:43:55,359 INFO - Plan length: 15   Time elapsed in seconds: 2.8979216250008903
2017-12-18 02:43:55,359 INFO - Load(C1, P1, SFO)
2017-12-18 02:43:55,359 INFO - Load(C2, P2, JFK)
2017-12-18 02:43:55,359 INFO - Load(C3, P3, ATL)
2017-12-18 02:43:55,359 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:43:55,359 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:43:55,360 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:43:55,360 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:43:55,360 INFO - Unload(C2, P2, SFO)
2017-12-18 02:43:55,360 INFO - Load(C2, P3, SFO)
2017-12-18 02:43:55,360 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:43:55,360 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:43:55,360 INFO - Unload(C1, P1, JFK)
2017-12-18 02:43:55,361 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:43:55,361 INFO - Unload(C3, P3, SFO)
2017-12-18 02:43:55,361 INFO - Unload(C2, P3, SFO)
2017-12-18 02:43:55,361 INFO -
2017-12-18 02:43:55,361 INFO -
2017-12-18 02:43:55,361 INFO - Solving Air Cargo Problem 2 using astar_search with h_1...
2017-12-18 02:44:09,558 INFO -
2017-12-18 02:44:09,561 INFO - Expansions    Goal Tests    New Nodes
2017-12-18 02:44:09,561 INFO - 4853          4855          44041
2017-12-18 02:44:09,561 INFO -
2017-12-18 02:44:09,561 INFO - Plan length: 9   Time elapsed in seconds: 14.189547975998721
2017-12-18 02:44:09,561 INFO - Load(C1, P1, SFO)
2017-12-18 02:44:09,561 INFO - Load(C2, P2, JFK)
2017-12-18 02:44:09,562 INFO - Load(C3, P3, ATL)
2017-12-18 02:44:09,562 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:44:09,562 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:44:09,562 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:44:09,562 INFO - Unload(C3, P3, SFO)
2017-12-18 02:44:09,562 INFO - Unload(C2, P2, SFO)
2017-12-18 02:44:09,562 INFO - Unload(C1, P1, JFK)
2017-12-18 02:44:09,563 INFO -
2017-12-18 02:44:09,563 INFO -
2017-12-18 02:44:09,563 INFO - Solving Air Cargo Problem 2 using astar_search with
h_ignore_preconditions...
2017-12-18 02:44:14,668 INFO -
2017-12-18 02:44:14,671 INFO - Expansions    Goal Tests    New Nodes
2017-12-18 02:44:14,671 INFO - 1450          1452          13303
2017-12-18 02:44:14,671 INFO -
2017-12-18 02:44:14,671 INFO - Plan length: 9   Time elapsed in seconds: 5.099470488996303
2017-12-18 02:44:14,672 INFO - Load(C3, P3, ATL)
2017-12-18 02:44:14,672 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:44:14,672 INFO - Unload(C3, P3, SFO)
```

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```
2017-12-18 02:44:14,672 INFO - Load(C2, P2, JFK)
2017-12-18 02:44:14,672 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:44:14,672 INFO - Unload(C2, P2, SFO)
2017-12-18 02:44:14,672 INFO - Load(C1, P1, SFO)
2017-12-18 02:44:14,673 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:44:14,673 INFO - Unload(C1, P1, JFK)
2017-12-18 02:44:14,673 INFO -
2017-12-18 02:44:14,673 INFO -
2017-12-18 02:44:14,673 INFO - Solving Air Cargo Problem 2 using astar_search with
h_pg_levelsum...
2017-12-18 02:45:27,358 INFO -
2017-12-18 02:45:27,361 INFO - Expansions    Goal Tests    New Nodes
2017-12-18 02:45:27,361 INFO - 86          88          841
2017-12-18 02:45:27,361 INFO -
2017-12-18 02:45:27,361 INFO - Plan length: 9   Time elapsed in seconds: 72.68042751799658
2017-12-18 02:45:27,361 INFO - Load(C1, P1, SFO)
2017-12-18 02:45:27,362 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:45:27,362 INFO - Load(C2, P2, JFK)
2017-12-18 02:45:27,362 INFO - Fly(P2, JFK, SFO)
2017-12-18 02:45:27,362 INFO - Load(C3, P3, ATL)
2017-12-18 02:45:27,362 INFO - Fly(P3, ATL, SFO)
2017-12-18 02:45:27,362 INFO - Unload(C3, P3, SFO)
2017-12-18 02:45:27,362 INFO - Unload(C2, P2, SFO)
2017-12-18 02:45:27,363 INFO - Unload(C1, P1, JFK)
2017-12-18 02:45:27,363 INFO -
2017-12-18 02:45:27,423 INFO -
```

Air Cargo Problem 3

```
s2017-12-18 02:44:28,932 INFO - Solving Air Cargo Problem 3 using breadth_first_search...
2017-12-18 02:45:19,587 INFO -
2017-12-18 02:45:19,590 INFO - Expansions    Goal Tests    New Nodes
2017-12-18 02:45:19,590 INFO - 14663        18098        129631
2017-12-18 02:45:19,590 INFO -
2017-12-18 02:45:19,590 INFO - Plan length: 12   Time elapsed in seconds: 50.642563474999974
2017-12-18 02:45:19,590 INFO - Load(C1, P1, SFO)
2017-12-18 02:45:19,590 INFO - Load(C2, P2, JFK)
2017-12-18 02:45:19,591 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:19,591 INFO - Load(C4, P2, ORD)
2017-12-18 02:45:19,591 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:45:19,591 INFO - Load(C3, P1, ATL)
2017-12-18 02:45:19,591 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:19,591 INFO - Unload(C1, P1, JFK)
2017-12-18 02:45:19,591 INFO - Unload(C3, P1, JFK)
2017-12-18 02:45:19,592 INFO - Fly(P2, ORD, SFO)
2017-12-18 02:45:19,592 INFO - Unload(C2, P2, SFO)
2017-12-18 02:45:19,592 INFO - Unload(C4, P2, SFO)
2017-12-18 02:45:19,592 INFO -
2017-12-18 02:45:19,592 INFO -
2017-12-18 02:45:19,592 INFO - Solving Air Cargo Problem 3 using depth_first_graph_search...
2017-12-18 02:45:21,747 INFO -
2017-12-18 02:45:21,749 INFO - Expansions    Goal Tests    New Nodes
2017-12-18 02:45:21,750 INFO - 408          409          3364
2017-12-18 02:45:21,750 INFO -
2017-12-18 02:45:21,750 INFO - Plan length: 392   Time elapsed in seconds: 2.142463164999981
2017-12-18 02:45:21,751 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,751 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,751 INFO - Fly(P1, ORD, ATL)
```

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2017-12-18 02:45:21,752 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,752 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,752 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,753 INFO - Load(C2, P1, JFK)
2017-12-18 02:45:21,753 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,753 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,754 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,754 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,754 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,754 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,755 INFO - Unload(C2, P1, SFO)
2017-12-18 02:45:21,755 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,755 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,756 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,756 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,756 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,757 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,757 INFO - Load(C2, P2, SFO)
2017-12-18 02:45:21,757 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,758 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,758 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,758 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,758 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,759 INFO - Load(C3, P1, ATL)
2017-12-18 02:45:21,759 INFO - Fly(P1, ATL, ORD)
2017-12-18 02:45:21,759 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,759 INFO - Fly(P1, ORD, SFO)
2017-12-18 02:45:21,760 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,760 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:45:21,760 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,760 INFO - Unload(C3, P1, JFK)
2017-12-18 02:45:21,761 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,761 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,761 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,761 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,762 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,762 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,762 INFO - Unload(C2, P2, JFK)
2017-12-18 02:45:21,762 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,763 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,763 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,763 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,763 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,763 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,764 INFO - Load(C3, P1, JFK)
2017-12-18 02:45:21,764 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,764 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,764 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,765 INFO - Fly(P1, ORD, SFO)
2017-12-18 02:45:21,765 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,765 INFO - Unload(C3, P1, SFO)
2017-12-18 02:45:21,765 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,765 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,765 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,766 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,766 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,766 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,766 INFO - Load(C3, P2, SFO)
2017-12-18 02:45:21,766 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,766 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,766 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,766 INFO - Fly(P1, ORD, SFO)

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2017-12-18 02:45:21,766 INFO - Load(C1, P1, SFO)
2017-12-18 02:45:21,767 INFO - Fly(P2, ATL, ORD)
2017-12-18 02:45:21,767 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,767 INFO - Fly(P2, ORD, SFO)
2017-12-18 02:45:21,767 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,767 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:45:21,767 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,767 INFO - Unload(C3, P2, JFK)
2017-12-18 02:45:21,767 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,767 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,768 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,768 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,768 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,768 INFO - Unload(C1, P1, ATL)
2017-12-18 02:45:21,768 INFO - Fly(P1, ATL, ORD)
2017-12-18 02:45:21,768 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,768 INFO - Fly(P1, ORD, SFO)
2017-12-18 02:45:21,768 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,769 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:45:21,769 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,769 INFO - Load(C3, P2, JFK)
2017-12-18 02:45:21,769 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,769 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,769 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,769 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,769 INFO - Unload(C3, P2, ATL)
2017-12-18 02:45:21,769 INFO - Fly(P2, ATL, ORD)
2017-12-18 02:45:21,770 INFO - Fly(P1, ATL, ORD)
2017-12-18 02:45:21,770 INFO - Fly(P2, ORD, SFO)
2017-12-18 02:45:21,770 INFO - Fly(P1, ORD, SFO)
2017-12-18 02:45:21,770 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:45:21,770 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:45:21,770 INFO - Load(C2, P2, JFK)
2017-12-18 02:45:21,770 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,770 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,770 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,771 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,771 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,771 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,771 INFO - Unload(C2, P2, SFO)
2017-12-18 02:45:21,771 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,771 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,771 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,771 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,771 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,772 INFO - Load(C3, P1, ATL)
2017-12-18 02:45:21,772 INFO - Fly(P1, ATL, ORD)
2017-12-18 02:45:21,772 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,772 INFO - Fly(P1, ORD, SFO)
2017-12-18 02:45:21,772 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,772 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:45:21,772 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,772 INFO - Unload(C3, P1, JFK)
2017-12-18 02:45:21,772 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,773 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,773 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,773 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,773 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,773 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,773 INFO - Load(C3, P2, JFK)
2017-12-18 02:45:21,773 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,773 INFO - Fly(P2, JFK, ORD)

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2017-12-18 02:45:21,773 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,774 INFO - Fly(P2, ORD, SFO)
2017-12-18 02:45:21,774 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,774 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:45:21,774 INFO - Load(C1, P2, ATL)
2017-12-18 02:45:21,774 INFO - Fly(P2, ATL, ORD)
2017-12-18 02:45:21,774 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,774 INFO - Fly(P2, ORD, SFO)
2017-12-18 02:45:21,774 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,774 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:45:21,775 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,775 INFO - Unload(C3, P2, JFK)
2017-12-18 02:45:21,775 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,775 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,775 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,775 INFO - Fly(P2, ORD, SFO)
2017-12-18 02:45:21,775 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,775 INFO - Load(C3, P1, JFK)
2017-12-18 02:45:21,775 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,776 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,776 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,776 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,776 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,776 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,776 INFO - Unload(C3, P1, SFO)
2017-12-18 02:45:21,776 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,776 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,776 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,777 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,777 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,777 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,777 INFO - Unload(C1, P2, SFO)
2017-12-18 02:45:21,777 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,777 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,777 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,777 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,777 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,778 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,778 INFO - Load(C3, P1, SFO)
2017-12-18 02:45:21,778 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,778 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,778 INFO - Fly(P1, ORD, JFK)
2017-12-18 02:45:21,778 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,778 INFO - Unload(C3, P1, JFK)
2017-12-18 02:45:21,778 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,778 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,779 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,779 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,779 INFO - Load(C4, P2, ORD)
2017-12-18 02:45:21,779 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,779 INFO - Fly(P1, ATL, ORD)
2017-12-18 02:45:21,779 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,779 INFO - Fly(P1, ORD, SFO)
2017-12-18 02:45:21,779 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:45:21,779 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:45:21,780 INFO - Unload(C4, P2, JFK)
2017-12-18 02:45:21,780 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,780 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,780 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,780 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,780 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,780 INFO - Fly(P1, ATL, SFO)

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2017-12-18 02:45:21,780 INFO - Load(C2, P2, SFO)
2017-12-18 02:45:21,780 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,781 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,781 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,781 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,781 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,781 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,781 INFO - Unload(C2, P2, JFK)
2017-12-18 02:45:21,781 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,781 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,781 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,782 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,782 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,782 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,782 INFO - Load(C1, P2, SFO)
2017-12-18 02:45:21,782 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,782 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,782 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,782 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,782 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,783 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,783 INFO - Unload(C1, P2, JFK)
2017-12-18 02:45:21,783 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,783 INFO - Load(C4, P1, JFK)
2017-12-18 02:45:21,783 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,783 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,783 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,783 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,783 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:45:21,784 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,784 INFO - Unload(C4, P1, SFO)
2017-12-18 02:45:21,784 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,784 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,784 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,784 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,784 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,784 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,784 INFO - Load(C4, P2, SFO)
2017-12-18 02:45:21,785 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,785 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,785 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,785 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,785 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,785 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,785 INFO - Load(C3, P2, JFK)
2017-12-18 02:45:21,785 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,785 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,786 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,786 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,786 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,786 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,786 INFO - Unload(C4, P2, SFO)
2017-12-18 02:45:21,786 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,786 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,786 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,786 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,787 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,787 INFO - Load(C2, P2, JFK)
2017-12-18 02:45:21,787 INFO - Fly(P1, ATL, ORD)
2017-12-18 02:45:21,787 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,787 INFO - Fly(P1, ORD, SFO)
2017-12-18 02:45:21,787 INFO - Fly(P2, ORD, ATL)

Trebuchet clement AIND-Planning - Heuristic Analysis

2017-12-18 02:45:21,787 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:45:21,787 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,787 INFO - Unload(C3, P2, SFO)
2017-12-18 02:45:21,788 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,788 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,788 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,788 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,788 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,788 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,788 INFO - Unload(C2, P2, JFK)
2017-12-18 02:45:21,788 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,789 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,789 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,789 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,789 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,789 INFO - Load(C2, P1, JFK)
2017-12-18 02:45:21,789 INFO - Fly(P2, ATL, ORD)
2017-12-18 02:45:21,789 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,789 INFO - Fly(P2, ORD, SFO)
2017-12-18 02:45:21,789 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,790 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:45:21,790 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,790 INFO - Unload(C2, P1, SFO)
2017-12-18 02:45:21,790 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,790 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,790 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,790 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,790 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,790 INFO - Load(C1, P1, JFK)
2017-12-18 02:45:21,791 INFO - Fly(P2, ATL, ORD)
2017-12-18 02:45:21,791 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,791 INFO - Fly(P2, ORD, SFO)
2017-12-18 02:45:21,791 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,791 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:45:21,791 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,791 INFO - Unload(C1, P1, SFO)
2017-12-18 02:45:21,791 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,791 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,792 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,792 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,792 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,792 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,792 INFO - Load(C4, P2, SFO)
2017-12-18 02:45:21,792 INFO - Fly(P2, SFO, ATL)
2017-12-18 02:45:21,792 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,792 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,792 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,793 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,793 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,793 INFO - Load(C3, P1, SFO)
2017-12-18 02:45:21,793 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,793 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,793 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,793 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,793 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:45:21,793 INFO - Unload(C4, P2, JFK)
2017-12-18 02:45:21,794 INFO - Fly(P1, ATL, ORD)
2017-12-18 02:45:21,794 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,794 INFO - Fly(P1, ORD, SFO)
2017-12-18 02:45:21,794 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,794 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:45:21,794 INFO - Fly(P2, ATL, SFO)

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2017-12-18 02:45:21,794 INFO - Load(C4, P1, JFK)
2017-12-18 02:45:21,794 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,794 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:45:21,795 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,795 INFO - Fly(P1, ATL, ORD)
2017-12-18 02:45:21,795 INFO - Unload(C3, P1, ORD)
2017-12-18 02:45:21,795 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,795 INFO - Fly(P2, ATL, ORD)
2017-12-18 02:45:21,795 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,795 INFO - Fly(P2, ORD, SFO)
2017-12-18 02:45:21,795 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:45:21,795 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:45:21,796 INFO - Unload(C4, P1, JFK)
2017-12-18 02:45:21,796 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,796 INFO - Fly(P1, JFK, ATL)
2017-12-18 02:45:21,796 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,796 INFO - Fly(P1, ATL, ORD)
2017-12-18 02:45:21,796 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,796 INFO - Fly(P1, ORD, SFO)
2017-12-18 02:45:21,796 INFO - Load(C2, P2, SFO)
2017-12-18 02:45:21,796 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,797 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,797 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,797 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,797 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,797 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,797 INFO - Unload(C2, P2, JFK)
2017-12-18 02:45:21,797 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,797 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,797 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,798 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,798 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,798 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,798 INFO - Load(C1, P2, SFO)
2017-12-18 02:45:21,798 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,798 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,798 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,798 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,798 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,799 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,799 INFO - Unload(C1, P2, JFK)
2017-12-18 02:45:21,799 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,799 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,799 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,799 INFO - Load(C3, P1, ORD)
2017-12-18 02:45:21,799 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,799 INFO - Fly(P2, ATL, ORD)
2017-12-18 02:45:21,799 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,800 INFO - Fly(P2, ORD, SFO)
2017-12-18 02:45:21,800 INFO - Fly(P1, SFO, JFK)
2017-12-18 02:45:21,800 INFO - Load(C4, P1, JFK)
2017-12-18 02:45:21,800 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:45:21,800 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,800 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,800 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,800 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,800 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,801 INFO - Unload(C4, P1, SFO)
2017-12-18 02:45:21,801 INFO - Fly(P2, ATL, ORD)
2017-12-18 02:45:21,801 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,801 INFO - Fly(P2, ORD, SFO)
2017-12-18 02:45:21,801 INFO - Fly(P1, ORD, ATL)

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2017-12-18 02:45:21,801 INFO - Fly(P2, SFO, JFK)
2017-12-18 02:45:21,801 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,801 INFO - Load(C2, P2, JFK)
2017-12-18 02:45:21,802 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:45:21,802 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:21,802 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,802 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,802 INFO - Fly(P2, ATL, SFO)
2017-12-18 02:45:21,802 INFO - Fly(P1, ATL, SFO)
2017-12-18 02:45:21,802 INFO - Unload(C2, P2, SFO)
2017-12-18 02:45:21,802 INFO - Fly(P2, SFO, ORD)
2017-12-18 02:45:21,802 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:21,803 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:21,803 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:21,803 INFO - Fly(P2, ATL, JFK)
2017-12-18 02:45:21,803 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:45:21,803 INFO - Unload(C3, P1, JFK)
2017-12-18 02:45:21,803 INFO -
2017-12-18 02:45:21,803 INFO -
2017-12-18 02:45:21,803 INFO - Solving Air Cargo Problem 3 using greedy_best_first_graph_search with h_1...
2017-12-18 02:45:40,995 INFO -
2017-12-18 02:45:40,997 INFO - Expansions Goal Tests New Nodes
2017-12-18 02:45:40,997 INFO - 5578 5580 49150
2017-12-18 02:45:40,997 INFO -
2017-12-18 02:45:40,997 INFO - Plan length: 22 Time elapsed in seconds: 19.2328345279999
2017-12-18 02:45:40,997 INFO - Load(C1, P1, SFO)
2017-12-18 02:45:40,998 INFO - Load(C2, P2, JFK)
2017-12-18 02:45:40,998 INFO - Fly(P1, SFO, ORD)
2017-12-18 02:45:40,998 INFO - Load(C4, P1, ORD)
2017-12-18 02:45:40,998 INFO - Fly(P2, JFK, ATL)
2017-12-18 02:45:40,998 INFO - Load(C3, P2, ATL)
2017-12-18 02:45:40,998 INFO - Fly(P2, ATL, ORD)
2017-12-18 02:45:40,998 INFO - Fly(P1, ORD, ATL)
2017-12-18 02:45:40,998 INFO - Unload(C4, P1, ATL)
2017-12-18 02:45:40,999 INFO - Fly(P1, ATL, ORD)
2017-12-18 02:45:40,999 INFO - Fly(P2, ORD, ATL)
2017-12-18 02:45:40,999 INFO - Load(C4, P2, ATL)
2017-12-18 02:45:40,999 INFO - Fly(P2, ATL, ORD)
2017-12-18 02:45:40,999 INFO - Unload(C3, P2, ORD)
2017-12-18 02:45:40,999 INFO - Load(C3, P1, ORD)
2017-12-18 02:45:40,999 INFO - Fly(P1, ORD, JFK)
2017-12-18 02:45:41,000 INFO - Unload(C3, P1, JFK)
2017-12-18 02:45:41,000 INFO - Unload(C1, P1, JFK)
2017-12-18 02:45:41,000 INFO - Fly(P1, JFK, ORD)
2017-12-18 02:45:41,000 INFO - Fly(P2, ORD, SFO)
2017-12-18 02:45:41,000 INFO - Unload(C4, P2, SFO)
2017-12-18 02:45:41,000 INFO - Unload(C2, P2, SFO)
2017-12-18 02:45:41,000 INFO -
2017-12-18 02:45:41,001 INFO -
2017-12-18 02:45:41,001 INFO - Solving Air Cargo Problem 3 using astar_search with h_1...
2017-12-18 02:46:43,685 INFO -
2017-12-18 02:46:43,687 INFO - Expansions Goal Tests New Nodes
2017-12-18 02:46:43,687 INFO - 18223 18225 159618
2017-12-18 02:46:43,687 INFO -
2017-12-18 02:46:43,687 INFO - Plan length: 12 Time elapsed in seconds: 62.6773941539999
2017-12-18 02:46:43,688 INFO - Load(C1, P1, SFO)
2017-12-18 02:46:43,688 INFO - Load(C2, P2, JFK)
2017-12-18 02:46:43,688 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:46:43,688 INFO - Load(C3, P1, ATL)
2017-12-18 02:46:43,688 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:46:43,688 INFO - Load(C4, P2, ORD)
2017-12-18 02:46:43,689 INFO - Fly(P2, ORD, SFO)

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2017-12-18 02:46:43,689 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:46:43,689 INFO - Unload(C4, P2, SFO)
2017-12-18 02:46:43,689 INFO - Unload(C3, P1, JFK)
2017-12-18 02:46:43,689 INFO - Unload(C2, P2, SFO)
2017-12-18 02:46:43,689 INFO - Unload(C1, P1, JFK)
2017-12-18 02:46:43,689 INFO -
2017-12-18 02:46:43,690 INFO -
2017-12-18 02:46:43,690 INFO - Solving Air Cargo Problem 3 using astar_search with h_ignore_preconditions...
2017-12-18 02:47:03,746 INFO -
2017-12-18 02:47:03,748 INFO - Expansions Goal Tests New Nodes
2017-12-18 02:47:03,748 INFO - 5040 5042 44944
2017-12-18 02:47:03,748 INFO -
2017-12-18 02:47:03,749 INFO - Plan length: 12 Time elapsed in seconds: 20.047913685000026
2017-12-18 02:47:03,749 INFO - Load(C2, P2, JFK)
2017-12-18 02:47:03,749 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:47:03,749 INFO - Load(C4, P2, ORD)
2017-12-18 02:47:03,749 INFO - Fly(P2, ORD, SFO)
2017-12-18 02:47:03,749 INFO - Unload(C4, P2, SFO)
2017-12-18 02:47:03,750 INFO - Load(C1, P1, SFO)
2017-12-18 02:47:03,750 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:47:03,750 INFO - Load(C3, P1, ATL)
2017-12-18 02:47:03,750 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:47:03,750 INFO - Unload(C3, P1, JFK)
2017-12-18 02:47:03,750 INFO - Unload(C2, P2, SFO)
2017-12-18 02:47:03,750 INFO - Unload(C1, P1, JFK)
2017-12-18 02:47:03,751 INFO -
2017-12-18 02:47:03,751 INFO -
2017-12-18 02:47:03,751 INFO - Solving Air Cargo Problem 3 using astar_search with h_pg_levelsum...
2017-12-18 02:53:01,406 INFO -
2017-12-18 02:53:01,408 INFO - Expansions Goal Tests New Nodes
2017-12-18 02:53:01,409 INFO - 325 327 3002
2017-12-18 02:53:01,409 INFO -
2017-12-18 02:53:01,409 INFO - Plan length: 12 Time elapsed in seconds: 357.647079856
2017-12-18 02:53:01,409 INFO - Load(C2, P2, JFK)
2017-12-18 02:53:01,409 INFO - Fly(P2, JFK, ORD)
2017-12-18 02:53:01,410 INFO - Load(C4, P2, ORD)
2017-12-18 02:53:01,410 INFO - Fly(P2, ORD, SFO)
2017-12-18 02:53:01,410 INFO - Load(C1, P1, SFO)
2017-12-18 02:53:01,410 INFO - Fly(P1, SFO, ATL)
2017-12-18 02:53:01,410 INFO - Load(C3, P1, ATL)
2017-12-18 02:53:01,411 INFO - Fly(P1, ATL, JFK)
2017-12-18 02:53:01,411 INFO - Unload(C4, P2, SFO)
2017-12-18 02:53:01,411 INFO - Unload(C3, P1, JFK)
2017-12-18 02:53:01,411 INFO - Unload(C2, P2, SFO)
2017-12-18 02:53:01,411 INFO - Unload(C1, P1, JFK)
2017-12-18 02:53:01,412 INFO -
2017-12-18 02:53:01,477 INFO -

