Planning Non-heuristic Search Results for Cargo Problem

All three of the cargo planning problems were attempted to be solved using the following non-heuristic search methods:

- breadth_first_search - type 1
- depth_first_graph_search - type 3
- uniform_cost_search - type 5

Metric summary

Problem #	Search Type	Length	Time	Expansions	Goal Tests	New Nodes
1	1	6	.33 sec	43	56	180
1	3	12	.01 sec	12	13	48
1	5	6	.04 sec	55	57	224
2	1	9	13.09 sec	3343	4609	30509
2	3	575	2.89 sec	582	583	5211
2	5	9	11.25 sec	4852	4854	44030
3	1	12	98.91 sec	14663	18098	129631

3	3	596	3.21 sec	627	628	5176
3	5	12	50.17 sec	18235	18237	159716

Optimal result summary

Action #	Problem 1	Problem 2	Problem 3
1	Load(C1, P1, SFO)	Load(C2, P2, JFK)	Load(C2, P2, JFK)
2	Load(C2, P2, JFK)	Load(C1, P1, SFO)	Load(C1, P1, SFO)
3	Fly(P1, SFO, JFK)	Load(C3, P3, ATL)	Fly(P2, JFK, ORD)
4	Fly(P2, JFK, SFO)	Fly(P2, JFK, SFO)	Load(C4, P2, ORD)
5	Unload(C1, P1, JFK)	Unload(C2, P2, SFO)	Fly(P1, SFO, ATL)
6	Unload(C2, P2, SFO)	Fly(P1, SFO, JFK)	Load(C3, P1, ATL)
7		Unload(C1, P1, JFK)	Fly(P1, ATL, JFK)
8		Fly(P3, ATL, SFO)	Unload(C1, P1, JFK)
9		Unload(C3, P3, SFO)	Unload(C3, P1, JFK)
10			Fly(P2, ORD, SFO)
11			Unload(C2, P2, SFO)

12	Unload(C4, P2, SFO)

Result Analysis

Here some interesting observations:

- breadth_first_search and uniform_cost_search returned optimal result
- depth_first_graph_search consistently returned not optimal result
- I was able to search and find solution for all three problems running on my mac within reasonable time
- There was a significant jump in time taken with very small increases in size of problem
- Although some searches returned is faster time, they did not always yield the optimal results
- I tried some other non-heuristic searches which did not yield a result in reasonable time
- It makes sense that BFS would be more optimal than DFS since BFS test bad path and good path early vs going deep into a bad path if it was the first one selected