Problem 1

Optimal Path:

Load(C1, P1, SFO)

Load(C2, P2, JFK)

Fly(P2, JFK, SFO)

Unload(C2, P2, SFO)

Fly(P1, SFO, JFK)

Unload(C1, P1, JFK)

Breadth First Search

Expansions Goal Tests New Nodes

43 56 180

Plan length: 6 Time elapsed in seconds: 0.02210709159086675

Solution is optimal

Depth First Tree Search:

Expansions Goal Tests New Nodes

21 22 84

Plan length: 20 Time elapsed in seconds: 0.010629834632535345

The solution is not optimal

Uniform\_cost\_search

Expansions Goal Tests New Nodes

55 57 224

Plan length: 6 Time elapsed in seconds: 0.027921747857102518

A\* ignore precondiction

Expansions Goal Tests New Nodes

41 43 170

Plan length: 6 Time elapsed in seconds: 0.02728362555688757

A\* level sum

Expansions Goal Tests New Nodes

11 13 50

Plan length: 6 Time elapsed in seconds: 0.5614947241826885

astar\_search h\_1:

Expansions Goal Tests New Nodes

55 57 224

Plan length: 6 Time elapsed in seconds: 0.028161970108685236

Solution is optimal

Problem2

Optimal Path:

Load(C1, P1, SFO)

Load(C2, P2, JFK)

Load(C3, P3, ATL)

Fly(P1, SFO, JFK)

Unload(C1, P1, JFK)

Fly(P2, JFK, SFO)

Unload(C2, P2, SFO)

Fly(P3, ATL, SFO)

Unload(C3, P3, SFO)

Breadth First Search

Expansions Goal Tests New Nodes

3346 4612 30534

Plan length: 9 Time elapsed in seconds: 10.038129915

Solution is optimal

Depth First Tree Search:

Expansions Goal Tests New Nodes

107 108 959

Plan length: 105 Time elapsed in seconds: 0.24059331

The solution is not optimal

Uniform cost search

Expansions Goal Tests New Nodes

4853 4855 44041

Plan length: 9 Time elapsed in seconds: 8.90001719889099

A\* ignore precondition

Expansions Goal Tests New Nodes

1450 1452 13303

Plan length: 9 Time elapsed in seconds: 3.1478440180698244

A\* level sum

Expansions Goal Tests New Nodes

86 88 841

Plan length: 9 Time elapsed in seconds: 96.06445699676696

astar\_search h\_1:

Expansions Goal Tests New Nodes

4853 4855 44041

Plan length: 9 Time elapsed in seconds: 8.8617554164

Solution is optimal

Problem3

Optimal Path:

Load(C1, P1, SFO)

Load(C2, P2, JFK)

Fly(P2, JFK, ORD)

Load(C4, P2, ORD)

Fly(P1, SFO, ATL)

Load(C3, P1, ATL)

Fly(P1, ATL, JFK)

Unload(C1, P1, JFK)

Unload(C3, P1, JFK)

Fly(P2, ORD, SFO)

Unload(C2, P2, SFO)

Unload(C4, P2, SFO)

Breadth First Search

Expansions Goal Tests New Nodes

14663 18098 129631

Plan length: 12 Time elapsed in seconds: 69.50336042818849

Solution is optimal

Depth First Tree Search:

Expansions Goal Tests New Nodes

408 409 3364

Plan length: 392 Time elapsed in seconds: 1.1771682549872313

The solution is not optimal

Uniform cost search

Expansions Goal Tests New Nodes

18235 18237 159716

A\* ignore precondition

Plan length: 12 Time elapsed in seconds: 39.438466942479295

Expansions Goal Tests New Nodes

5040 5042 44944

Plan length: 12 Time elapsed in seconds: 12.491569348969588

A\* level sum

Expansions Goal Tests New Nodes

316 318 2912

Plan length: 12 Time elapsed in seconds: 574.1419595951284

astar\_search h\_1:

Expansions Goal Tests New Nodes

18235 18237 159716

Plan length: 12 Time elapsed in seconds: 33.875107940290974

Solution is optimal