Heuristic Analysis of Planning Search Algorithms for Air Cargo Transport System

The heuristic analysis for various search algorithms in the planning domain is being done for Air Cargo transport System. Three planning problems are being explored for the analysis.

1. **Problem1**

**Initial and Goal state:**

Init(At(C1, SFO) ∧ At(C2, JFK)

∧ At(P1, SFO) ∧ At(P2, JFK)

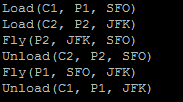
∧ Cargo(C1) ∧ Cargo(C2)

∧ Plane(P1) ∧ Plane(P2)

∧ Airport(JFK) ∧ Airport(SFO))

Goal(At(C1, JFK) ∧ At(C2, SFO))

**Optimal solution:**



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| **Search Method** | **Expansions** | **Goal Tests** | **New nodes** | **Plan Length** | **Time elapsed** |
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**Analysis:**

1. **Problem 2**

**Initial and goal state:**

Init(At(C1, SFO) ∧ At(C2, JFK) ∧ At(C3, ATL)

∧ At(P1, SFO) ∧ At(P2, JFK) ∧ At(P3, ATL)

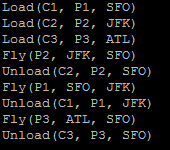
∧ Cargo(C1) ∧ Cargo(C2) ∧ Cargo(C3)

∧ Plane(P1) ∧ Plane(P2) ∧ Plane(P3)

∧ Airport(JFK) ∧ Airport(SFO) ∧ Airport(ATL))

Goal(At(C1, JFK) ∧ At(C2, SFO) ∧ At(C3, SFO))

**Optimal solution:**



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| **Search Method** | **Expansions** | **Goal Tests** | **New nodes** | **Plan Length** | **Time elapsed** |
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**Solution:**

1. **Problem 3**

**Initial and goal state**

Init(At(C1, SFO) ∧ At(C2, JFK) ∧ At(C3, ATL) ∧ At(C4, ORD)

∧ At(P1, SFO) ∧ At(P2, JFK)

∧ Cargo(C1) ∧ Cargo(C2) ∧ Cargo(C3) ∧ Cargo(C4)

∧ Plane(P1) ∧ Plane(P2)

∧ Airport(JFK) ∧ Airport(SFO) ∧ Airport(ATL) ∧ Airport(ORD))

Goal(At(C1, JFK) ∧ At(C3, JFK) ∧ At(C2, SFO) ∧ At(C4, SFO))

**Optimal solution:**

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| **Search Method** | **Expansions** | **Goal Tests** | **New nodes** | **Plan Length** | **Time elapsed** |
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**Solution:**