Carissa Ying Geok Teng (A0205190R/E0425113)

1)

True. In STRIPS, any state that contains all the literals in the goal is sad to satisfy it. This means that goal states contain the relevant ground literals and any other fluents. Hence, the goal describes this set of goal states.

2a)

Load(C_2, P_1, SFO), Load(C_2, P_2, SFO), Load(C_2, P_1, JFK), Load(C_2, P_2, JFK)

2b)

In(C_1, p) ^ At(p, JFK) ^ Cargo(C_1) ^ Plane(p) ^ Airport(JFK) ^ At(C_2, SFO)

3)

Dropping negative effects assumes that unlisted fluents are negative by default. This implies that variables are either only positive or negative. However, in less restricted problems, variables can be values such as unknown or some transition state. Hence, restricting variables to binary values relaxes the problem.

4)

The orders are comparable to cargo. Each order can be represented by C_i where $1 \leq i \leq m$ represents the order number. The homes, restaurants, and starting locations of each deliverer is similar to an airport. Each location can be represented by A_j where $1 \leq j \leq (n+m+d)$. Each driver is similar to a plane and can be represented by P_k where $1 \leq k \leq d$.

The goal is such that every delivery has been delivered to the right home. E.g. if there are 2 orders, C_1 and C_2, that need to be delivered to homes A_1 and A_2 respectively, the goal is described by:

At(C_1, A_1) ^ At(C_2, A_2)

The start state is where every food delivery is at their respective restaurants and every driver is at their starting locations. E.g. there are 2 orders, C_1 and C_2, that start at restaurants, A_3 and A_4, respectively. There are also 2 deliverers, P_1 and P_2 at A_5 and A_6 respectively. The initial state is:

At(C_1, A_3) ^ At(C_2, A_4) ^ At(P_1, A_5) ^ At(P_2, A_6) ^ Food(C_1) ^ Food(C_2) ^ Deliverer(P_1) ^ Deliverer(P2) ^ Location(A_3) ^ Location(A_4) ^ Location(A_5) ^ Location(A_6)

This is very reminiscent of the start state and goal of the cargo problem.

Similarly, at each step, drivers can load food from their location onto their vehicle. Then they can drive from one location to another. Finally, if they are carrying any food, they can unload it at the location they are at. This once again mirrors the cargo problem.

Overall, solving the cargo delivery problem also solves the delivery problem.