Planning Review

Artificial Intelligence

1. What is the closed world assumption?

   Solution: Any fluents not mentioned are false.

2. What are the two main limitations of atomic state-space search for planning?

   Solution: Requires ad-hoc heuristics and explicit representation of exponentially large state space.

3. How does Planning Domain Definition Language (PDDL) planning address the limitations of atomic state-space search?

   Solution: Planning Domain Definition Language addresses the limitations of atomic state-space search by using a factored representation based on first-order logic.

4. Is $At(Truck_1, Melbourne)$ a ground atomic fluent? Why, or why not?

   Solution: Yes, because At is a single predicate and $Truck_1$ and $Melbourne$ are not variables.

5. Is $At(t_1, from)$ a ground atomic fluent? Why, or why not?

   Solution: No, because $from$ is a variable. (t_1 could also be considered a variable.)

6. Assuming the following action schema:

   $$\begin{aligned} &Action(Fly(p, from, to),\\ &\quad PRECOND : At(p, from) \land Plane(p) \land Airport(from) \land Airport(to)\\ &\quad EFFECT : \neg At(p, from) \land At(p, to)) \end{aligned}$$

   after $Fly(P_1, SFO, JFK)$, what is true about P_1?

   Solution: $At(P_1, JFK)$