

G53KRR Answer to the 5th formal/assessed exercise ex5.

1. Give a PDDL description (fluents and action schemas) of the following planning domain:

- a delivery robot can move between rooms
- it can pick up a package from a room if it is in that room and if it is not carrying any other package
- it can deliver a package to a room if it is carrying that package and is in that room

Answer (one of many possible). Fluents: $In(x)$ (the robot is in room x), $Located(x, y)$ (parcel x is in room y), $Free$ (the robot is not carrying anything), $Carry(x)$ (the robot is carrying parcel x).

Action schemas:

ACTION: $move(x, y)$

PRECONDITION: $In(x), x \neq y$

EFFECT: $In(y), \neg In(x)$

ACTION: $pickup(x, y)$ (pick up parcel x from room y)

PRECONDITION: $Located(x, y), In(y), Free$

EFFECT: $\neg Free, Carry(x), \neg Located(x, y)$

ACTION: $deliver(x, y)$ (deliver parcel x to room y)

PRECONDITION: $In(y), Carry(x)$

EFFECT: $Free, \neg Carry(x), Located(x, y)$

2. Suppose there are three rooms, A , B and C . A package P is in room B . The robot is in room A and is not carrying anything. The goal is that P is in room C . State the planning problem: list the objects involved, give the description of the initial state, and give the goal description.

Answer Objects: rooms A , B , C , parcel P

Initial state: $In(A), Located(P, B), Free$

Goal: $Located(P, C)$