PDDL Exercises

Dra. Mª Dolores Rodríguez Moreno

Exercise (I): Rockets …

- A rocket can mean a type of engine or a vehicle that uses that engine
- Most rocket engines turn the fuel into hot gas
- A rocket engine doesn't need air, it carries with it everything it needs
- NASA uses:
  - Rockets to launch satellites and send probes to other worlds: the Atlas V, the Delta II, the Pegasus and Taurus.
  - Smaller "sounding rockets" for scientific research.
  - Working on a powerful new rocket called a heavy lift vehicle that will be able to take big loads into space

Source

Exercise (I): Rockets

- We have rockets to load and unload things or astronauts and send them back and forth space/Earth. They can fly from a start location to a destination but only once (they run out of fuel).
- Actions:
    - Load: cargo or astronauts in the rocket (infinite capacity)
    - Unload: things or astronauts from the rocket (one by one)
    - Fly: between 2 places
  - Initial state: (at carol mars) (at beth earth) (at roc2 earth) (at roc3 mars)
  - Goal: (at carol mars) (at beth moon)

Exercise (II): Ferry

- Let's consider a ferry that move between two ports
  - Actions:
    - Board: a car in a place
    - Sail: a ferry between 2 different places
    - Debark: a car in a place
  - Initial state: 2 cars are in Barcelona and the ferry is empty. There is only the ferry (modelled as a constant).
  - Goal: the 2 cars are in Rome

Conclusions…

- We have modelled our first PDDL domains
- Use the same name problem and domain for naming the files
- Use the extension .pddl for your files
- Use the *requirements* list to specify the type of problem

  (:requirements :strips :typing :equality :fluents :conditional-effects)
- Use *type* for creating a hierarchy of objects (*recommended*)

  (:types truck car - vehicle)
- Use *either* for more than one type → (in ?x - (either thing person) ?h - house)

… Conclusions

- Action effects can be more complicated than seen so far
  - They can be **universally quantified**

    (forall (?v1 … ?vn)
    <effect>)
  - They can be **conditional**

    (when <condition>
    <effect>)