

Introduction

Your task is to model different problems in PDDL and solve them using a planner. For modelling the problem, two files must be provided: a domain file and a problem file. Once you have modelled the problem, you can solve it by using one of the state-of-the-art planners that already exist. You can either install Fast Downward (<http://www.fast-downward.org/>), or use the online editor (<http://editor.planning.domains/>).

Exercise 1 : Hamiltonian Path Problem

A Hamiltonian path is a path in an undirected or directed graph that visits each vertex exactly once.

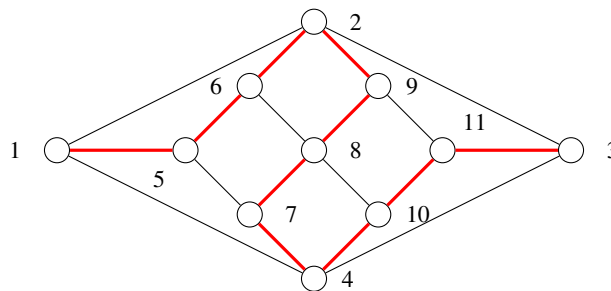


Figure 1: Hamiltonian Path Example

- (i) Encode the problem of finding a Hamiltonian path in the graph of Figure 1 in PDDL. Ignore the a Note that may there be possible solutions of the problem.
- (ii) Modify the encoding of (i) so that the path starts at vertex 1 and ends at vertex 3.
- (iii) Consider now that each path has a different cost (see Figure 2). Encode the problem of finding the minimum-cost Hamiltonian path in PDDL.

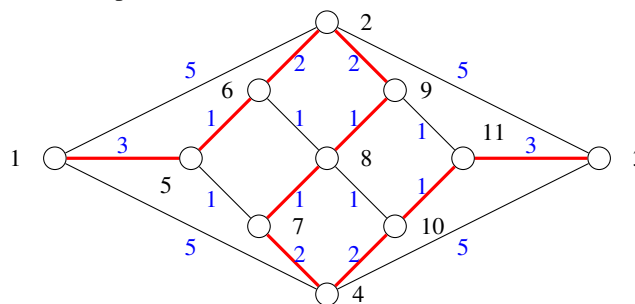


Figure 2: Hamiltonian path with costs for part (iii).

Exercise 2 : Steffi

Encode the problem of Steffi, the owl (from the previous exercise sheet) in PDDL. In this case, we consider four locations: Cassiopeia, Novi, the rectorate, and the student council. Steffi wants to deliver 20 voting slips in their individual letters. Unfortunately Steffi can only carry up to 2 letters at a time. Students could vote either in the Student Council or in Cassiopeia building. 11 students voted in Cassiopeia, while 9 voted in the Student Council. Vote slips must be carried to the rectorate building for counting them. Steffi is now at Novi, and after the hard job, she wants to go back to her nest in the student council. She can fly between any two locations.