

Tutorial - Week 4

Informed Search

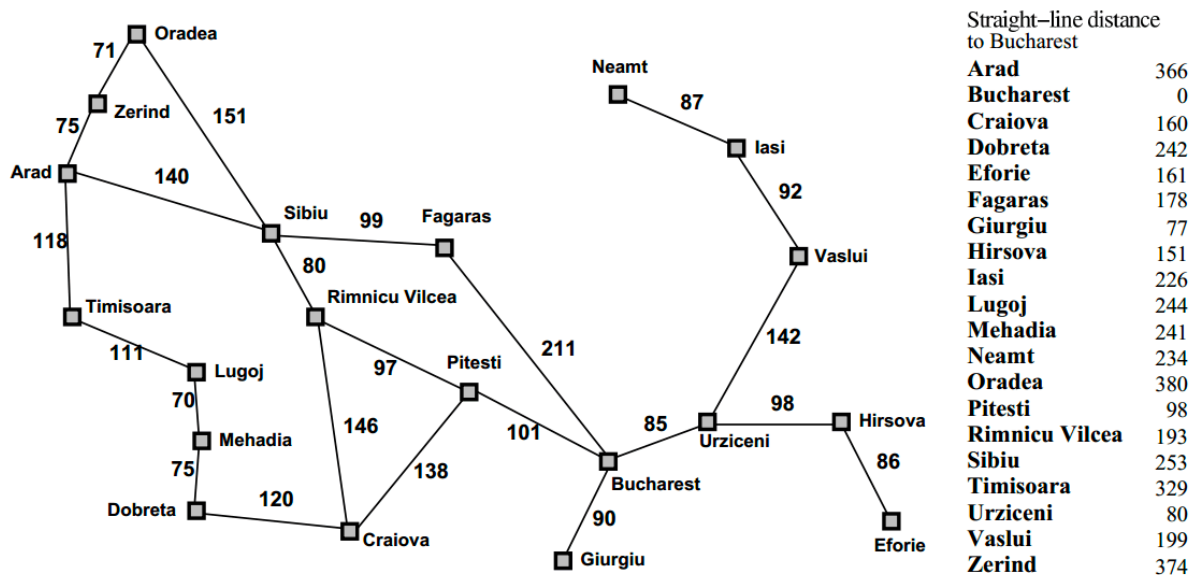
Activity 1

For the route from Arad to Bucharest, what order are nodes in the state space expanded for each of the following algorithms when searching for the shortest path between Arad and Bucharest? Where there is a choice of nodes, take the first one by alphabetical ordering. Make sure you understand the key properties of the different algorithms, as listed below.

(v) Greedy:

(vi) A*

Romania with step costs in km



Activity 2

- Breadth First Search is a special case of Uniform Cost Search.
- Breadth First Search, Depth First Search and Uniform Cost Search are special cases of best-first search.
- Uniform Cost Search is a special case of A* Search.

Activity 3

The heuristic path algorithm is a best-first search in which the objective function is:

$$f(n) = (2-w)g(n) + wh(n)$$

What kind of search does this perform when $w=0$? when $w=1$? when $w=2$?

Activity 4

Suppose a manufacturing robot needs to schedule a set of activities: casting, drilling, bolting, to take place in an afternoon (from 1pm to 5pm). Each activity takes an hour. The process requires drilling before bolting. Casting and drilling cannot happen at the same time, but bolting must happen exactly two hours after casting ends.

Find a legal assignment using the basic Backtracking search algorithm if there is one.