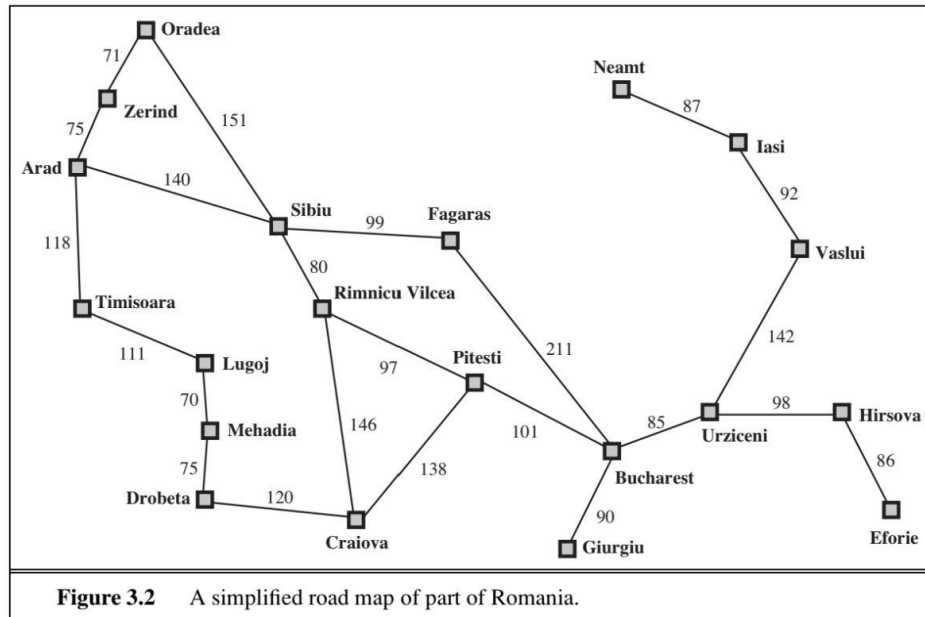


CSE422 Practice Sheet

A* Search and Greedy Best Search



Arad	366	Mehadia	241
Bucharest	0	Neamt	234
Craiova	160	Oradea	380
Drobeta	242	Pitesti	100
Eforie	161	Rimnicu Vilcea	193
Fagaras	176	Sibiu	253
Giurgiu	77	Timisoara	329
Hirsova	151	Urziceni	80
Iasi	226	Vaslui	199
Lugoj	244	Zerind	374

Figure 3.22 Values of h_{SLD} —straight-line distances to Bucharest.

CSE422 Practice Sheet

A* Search and Greedy Best Search

In the above simplified map (Fig: 3.2) you are given all edge costs from one node to another. The Heuristics for each node are give in Fig: 3.22. You want to go to Bucharest from Arad.

1. For A* search

- a. Sequentially write all nodes that will be added to the Frontier, update the parent and $g(n)$ for the nodes.

Frontier	$g(n)$	$f(n)$	n.parent
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.....
....

- b. Sequentially list all nodes in the explored list.

Explored

.....
.....

- c. Finally write down the solution path to reach Bucharest from Arad.

2. For Greedy Best Search

- a. Sequentially write all nodes that will be added to the Frontier, update the parent for the nodes.
 - b. Sequentially write all nodes in the explored list.
 - c. Finally write down the solution path to reach Bucharest from Arad.
3. Based on the concept of evaluation function, describe for which algorithm(/s) we will need to change the information of the nodes already in the explored list. Why and why not? For such algorithms, which information of the nodes needs to be updated?
 4. Explain why Greedy Best Search is cost-efficient but does not provide optimal solutions.
 5. What are the conditions on heuristics so the optimal solutions are found by the algorithms?
 - a. Do the given heuristics satisfy these conditions?
 - b. If you were given another set of heuristics, how would you decide which heuristic to choose?
 6. Write down the problem formulation to go from Arad to Bucharest.