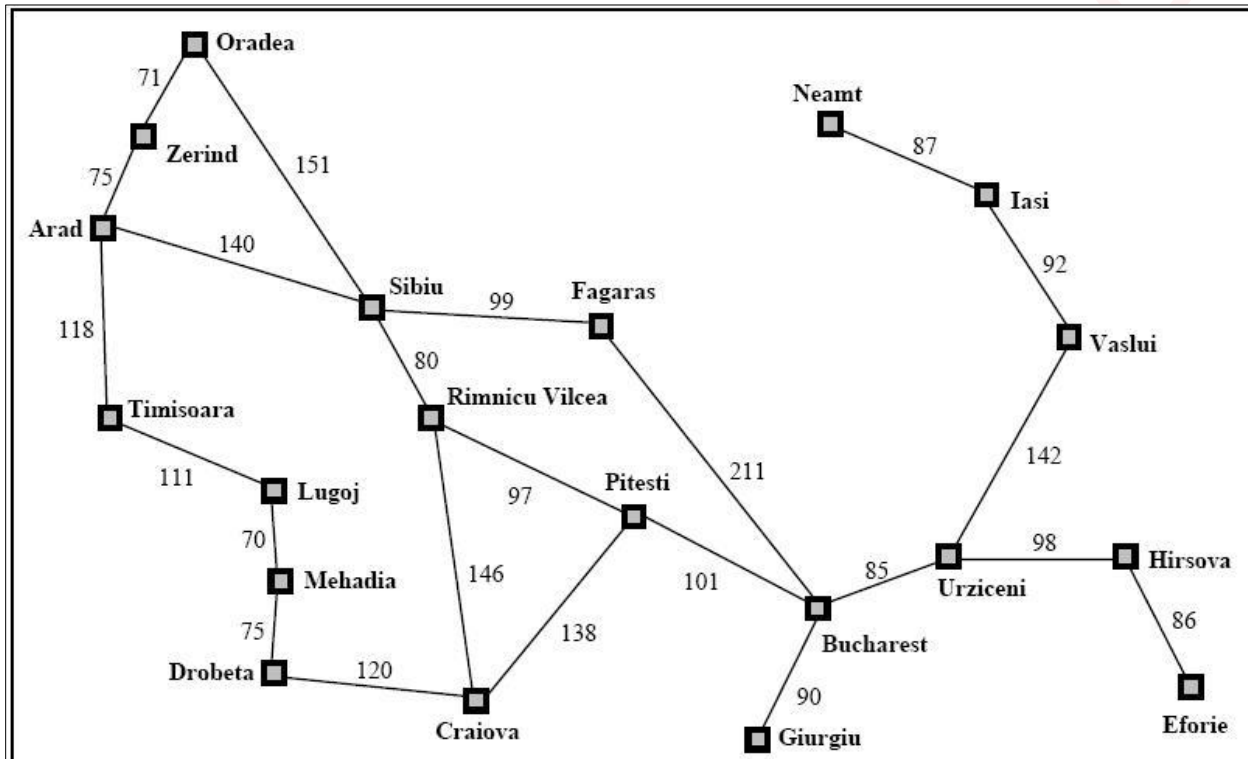


Artificial Intelligence (CPCS-431)

Exercises on Heuristic 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

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

Greedy best-first and A* search algorithms

- (1) Trace the operation of the Greedy best-first and A* search algorithms applied to the problem of getting to **Bucharest** from **Oradea**, using the above map. Use the straight-line-distance heuristic values given in the figure.

Greedy best-first algorithm

Step	Expand (Pop)	City	h_{SLD}
0	...	Oradea	380
1	oradea	sibiu	253
2	sibiu	fagaras	176
3	fagaras	bucharash	0

...

A* search algorithm

Step	Expand (Pop)	City	g	h	F
0	...	Oradea	0	380	380
1	oredea	sibiu	151	253	404
2	sibiu	rim	80	193	424
3	rim	pitest	97	100	428

...

- (2) Which algorithm gives better results?

A* search

Admissible vs. consistent Heuristic

- (3) Is the A* heuristic given in the problem above admissible? Explain.

yes , because $h(n) < h^*(n)$

- (4) Is the A* heuristic given in the problem above consistent? Explain.

yes , because $h(n) < h+c(n)$

