Homework

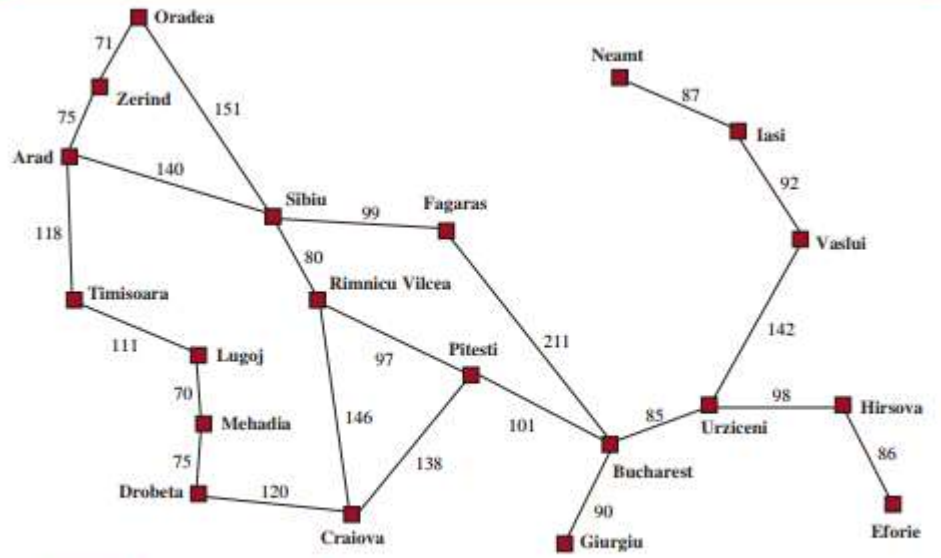

Figure 3.1 A simplified road map of part of Romania, with road distances in miles.

The assignments 1 and 2 uses the above map and we assume that weights of edges are the same and equal to 1. (We don't care the number on each edge)

Assignment 1 Please traverse the above graph by using

a. DFS pre-order
b. BFS

Assignment 2 Build a representation for the graph. From this representation, write a function to find and print a route from a source to destination using

a. DFS pre-order
b. BFS

Test your functions by using inputs: source= Arab, destination= Bucharest

Now we take care the weights of edges

Assignment 3 Dijkstra's algorithm

a. Show step-by-step finding a shortest path from Arab to Bucharest
b. Build a representation for the graph. From this representation, write a function to find and print a route from a source to destination using Dijkstra's algorithm

Assignment 4 A* algorithm

Given the admissible heuristic function h() of a node to Bucharest as following:

H(Arad, Bucharest) = 366,	h(Bucharest, Bucharest) = 0,	h(Craiova, Bucharest) = 160,
h(Dobreta, Bucharest)=242,	h(Eforie, Bucharest)=161,	h(Fagaras, Bucharest)=178,
h(Giurgiu, Bucharest)=77,	h(Hirsova, Bucharest)=151,	h(Iasi, Bucharest)=226,
h(Lugoj, Bucharest)= 244,	h(Mehadia, Bucharest)=241,	h(Neamt, Bucharest)=234,
h(Oradea, Bucharest)=380,	h(Pitesti, Bucharest)=98,	h(Rimnicu Vilcea, Bucharest)=193,
h(Sibiu, Bucharest)=253,	h(Timisoara, Bucharest)=329,	h(Urziceni, Bucharest)=80,
h(Vaslui, Bucharest)=199,	h(Zerind, Bucharest)=374	

a. Show step-by-step finding a shortest path from Arab to Bucharest by using A*.
b. Build a representation for the graph. From this representation, write a function to find and print a route from a source to destination using A*