Homework #1: Chapters 3,4 and 5

The following exercises are due at the beginning of class on February 14.

1. Do exercise 3.3(e) from the book (p. 87).
2. Given the map in Figure 3.3 of the book (p. 62), use breadth-first search to find a path from Hirsova to Sibiu. Assume that when all else is equal, cities are chosen in alphabetical order and that you can ignore operators that will return you to the city you just came from. Show your search tree and number the nodes in order of expansion.
3. Same as the previous exercise, except this time use depth-first search. Did you find the solution faster using breadth-first or depth-first search?
4. Given the map in Figure 4.2 of the book (p. 95), use A* search to find a path from Hirsova to Sibiu. Use the straight-line distance from each node to Sibiu as your heuristic function, assuming these distances are given by the following table:

Arad	138
Bucharest	253
Craiova	196
Dobreta	183
Eforie	433
Fagaras	96
Giurgiu	272
Hirsova	385
Iasi	298
Lugoj	97
Mehadia	146
Neamt	237
Oradea	148
Pitesti	162
Rimnicu Vilcea	78
Sibiu	0
Timisoara	141
Urziceni	302
Vaslui	345
Zerind	146

   For each step of the algorithm, show the open list (with *f*-costs for each node on it) and the closed list.

5. Do exercise 5.1 from the book (p. 145).
6. Do exercise 5.8(a) from the book (p. 147). Provide a short explanation for your answer.