Assignment will use the AIMA code (http://aima.cs.berkeley.edu/). You need to read the AIMA source code and access the references (aima/doc/overview-SEARCH.html).

#1. Uninformed search on Missionaries and Cannibals Problem. Perform each of the following types of search on the Missionary and Cannibals problem. Use COMPARE-SEARCH-ALGORITHMS to run these algorithms and to generate data. Try 3 Missionaries and 3 Cannibals.

BREADTH-FIRST-SEARCH

UNIFORM-COST-SEARCH

NO-RETURNS-BREADTH-FIRST-SEARCH

NO-DUPLICATES-BREADTH-FIRST-SEARCH

NO-CYCLES-DEPTH-FIRST-SEARCH

How many steps does the optimal solution contain?

Which search method expanded the fewest nodes? How many?

Which search method expanded the most nodes? How many?

Why is there a significant difference in the number of node expanded by the most efficient search method versus the least efficient? Please explain.

#2. Perform heuristic search on the route-finding problem on the Romanian Map from Arad to Bucharest, using the following heuristic algorithms:

GREEDY-SEARCH

A\*-SEARCH

TREE-A\*-SEARCH

TREE-IDA\*-SEARCH

What is the route discovered by the A\* algorithm?

What is the route discovered by the GREEDY-SEARCH algorithm?

Explain why these two routes are same or different.

What is the shortest path to a solution, i.e., what was the fewest cities visited?

What is the cost of the optimal solution?

Which heuristic search algorithm expanded the fewest nodes?

Which heuristic search algorithm expanded the most nodes?

