



Course: Artificial Intelligence	Assignment 01	DUE DATE: 22/02/2025
Course Code: Ai2001		Total Questions: 5

Instructions:

1. Attempt all questions.
2. Submit a pdf for the written assignments and python (or any language or your choosing) code file for Question 5

Question 1:

Read Turing's original paper on AI, (A. M. Turing (1950) Computing Machinery and Intelligence. Mind 49: 433-460.). In the paper, he discusses several potential objections to his proposed enterprise and his test for intelligence. Write an essay in which you discuss the following questions: -

- Which objections still carry some weight?
- Are his refutations valid?
- Since he wrote the paper, can you think of new objections arising from developments? •

In the paper, he predicts that by the year 2000, a computer will have a 30% chance of passing a five-minute Turing Test with an unskilled interrogator. Do you think this is reasonable?

(NOTE: Finding the paper is part of the task)

Question 2:

Examine the AI literature to discover whether or not the following tasks can currently be solved by computers.

1. Playing a decent game of table tennis (ping-pong).
2. Playing a decent game of bridge at a competitive level.
3. Writing an intentionally funny story.
4. Giving competent legal advice in a specialized area of law.
5. Discover and prove a new mathematical theorem?
6. Perform a surgical operation?
7. Unload any dishwasher in any home?
8. Construct a building?

For the currently infeasible tasks, try to find out what the difficulties are?

Question 3

Choose a domain that you are familiar with, and write a description of an agent for the environment. Characterize the environment as being accessible, deterministic, episodic, static, and continuous or not. What agent architecture is best for this domain?



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Question 4

For each of the following assertions, say whether it is true or false and support your answer with examples or counter examples where appropriate.

1. An agent that senses only partial information about the state cannot be perfectly rational.
2. There exist task environments in which no pure reflex agent can behave rationally.
3. There exists a task environment in which every agent is rational.
4. The input to an agent program is the same as the input to the agent function.
5. Every agent function is implementable by some program/machine combination.
6. Suppose an agent selects its action uniformly at random from the set of possible actions. There exists a deterministic task environment in which this agent is rational.
7. It is possible for a given agent to be perfectly rational in two distinct task environments.



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Question 5

You are clear about uninformed and informed strategies now. The example discussed in the class regarding the Romania map has to get implemented in this exercise.

The map is directly taken up from your book together with the heuristics table. The task is to reach from a particular source to destination using different strategies. This means that users will be facilitated with the option of choosing any random source and destination point at run time. Following are the strategies to be implemented.

- 1) Breadth first search
- 2) Uniform cost search
- 3) Greedy best first search
- 4) Iterative deepening depth first search

A comparison of these four needs to be done. Complete list of pathway and path cost of each algorithm has to be calculated so that it shows clearly which algorithm is best out of all in ascending order.

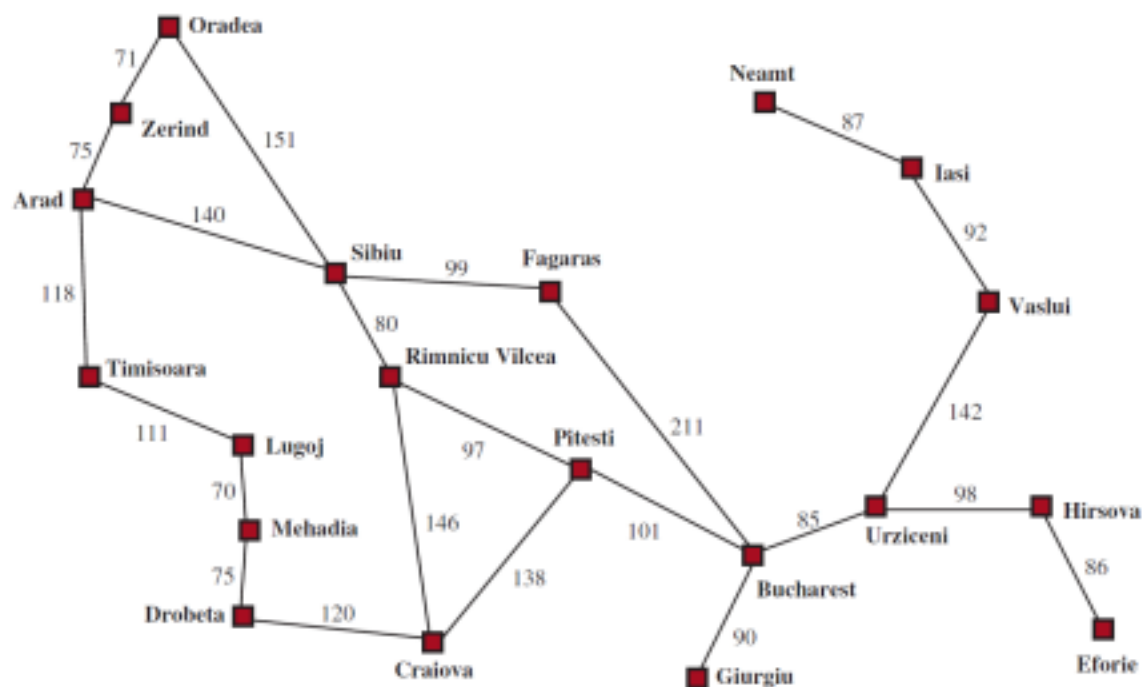


Figure 3.1 A simplified road map of part of Romania, with road distances in miles.

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