Artificial and Computational Intelligence

Assignment 1

Travelling Agent

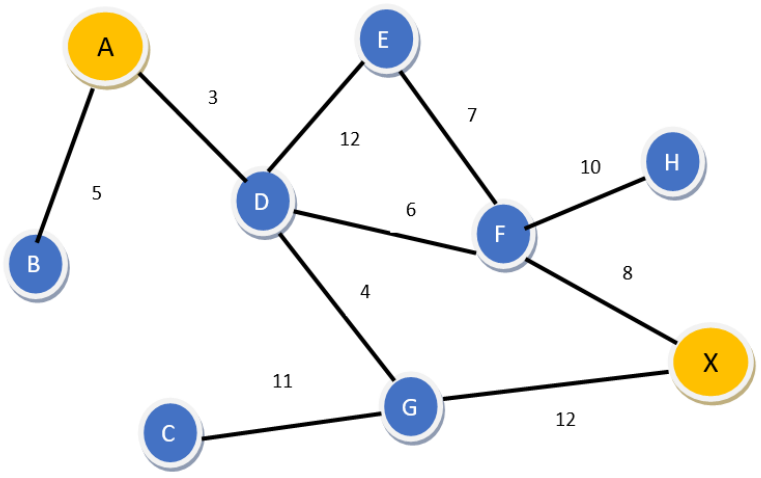
Problem Statement:

The diagram given depicts various cities between Chennai to Hyderabad. A student has to reach Hyderabad to get admission at Bits Pilani. Due to unavoidable situation, he starts late for a day. If he travels in shortest path only, he can reach the college on the admission date. He gets help from a Travelling agent to assist to reach the place in time. The edge costs depicted below is an approximation towards the travelling time between any pair of nodes. For heuristic design, consider all the possible paths between the node Chennai (A) to the goal node Hyderabad(X). The average of the total travelling hours across all these paths is the heuristic value h(n).

Use the following algorithms to solve the problem:

1. **IDA***
2. **Hill climbing**

Graph representation



Answer the following:

1. Explain the environment of the agent [20% weightage]
2. Define the heuristic and or fitness function for the given algorithms and the given problem. [20% weightage]
3. Use appropriate data structures and implement given informed and local search algorithm and Print the path taken by the agent. [40% weightage]
4. Find and print space and time complexity using code in your implementation. [20% weightage]

NOTE:

- You are provided with the python notebook template which stipulates the structure of code and documentation. Use well intended python code.
- Use separate MS word document for explaining the theory part [PEAS]. Do not include theory part in the Python notebook except Python comments.
- The implementation code must be completely original and executable.
- Please keep your work (code, documentation) confidential. If your code is found to be plagiarized, you will be penalized severely. Parties involved in the copy will be considered equal partners and will be penalized severely.