Questions

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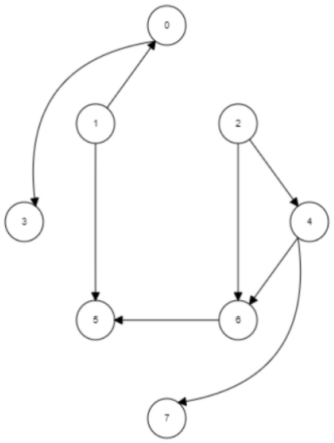
Question 1

a) What are the sensors and actuators in case of an intelligent agent in a self driving car? Also what could be the elements of the environment in which self driving cars drive themselves? **[2.5]**

Question 2

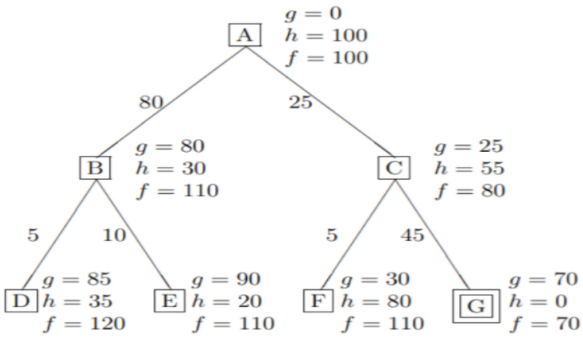


a) Refer to the figure given above and write the nodes which will be visited if 1 is considered as the starting vertex in DFS. **[2]**

a) For branching factor 3 and depth 5, find out the order of space and time complexity for each of BFS, DFS and IDDFS *(or IDS)* **[3]**

Question 3

a) Which is better? Informed or uninformed search? Give your reasons. **[1]**



b) Refer to the figure above and tell the order of the nodes that are expanded for

i) UCS

ii) Greedy best first search

iii) A* search

iv) IDS.

G is the goal node. Here g = cost of path so far, h = estimate of remaining cost to goal, f = estimate of total path cost. **[4]**

Question 4

a) Suppose you are stuck in local maxima and are implementing two versions of the Simulated Annealing algorithm for the same problem.

Version 01:
Tmax = 100, Tmin = 0
In the first iteration you see T = 100 and in the second iteration T = 95

Version 2:
Tmax = 100, Tmin = 0
In the first iteration you see T = 100 and in the second iteration T = 50
Now compare the effectiveness of these two versions and discuss the effectiveness in finding the global maxima. **[1.5]**

b) Define local maxima with a figure in your own words. **[1]**

Question 5

Suppose a genetic algorithm uses chromosomes with a fixed length of eight genes. Each gene can be any digit between 0 and 9. We need to maximize the number of even numbers in the chromosome. (Note 0 is an even number). Consider the following 4 individuals:

X1 = 12235698
X2 = 34798721
X3 = 46398821
X4 = 48023881

a) Compute fitness function for each individual. Arrange them in an order to highest to least fit. Perform crossover of fittest individuals at middle point. Recompute fitness functions. **[5]**

Submission Link

Answer the questions in your script and scan it into a PDF file (You can use camscanner or simply make PDF with screenshots). Once you are done, rename the file as **YourSection_YourName_YourID**. For example if a guy from section 4 named Peter Parker has a ID of 14101061, his filename should be **4_Peter Parker_14101061**

Then, submit the PDF file in the follwing link. Make sure that all the information you provide in the form are correct. **You get only once chance to submit. Therefore, double check everything before clicking the submit button.**

https://forms.gle/1xjH61xSKrGAhwyTA

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