Artificial Intelligence

Lab Assignment #1

Due Date: April,20,2024

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Attention:

- Individual Lab Assignment
- You must record a video while working.
- Your all works should be in video, if you submit the code and your activity is not in video then marks will be zero. Because we must check so many things, how you are searching on the internet, how you install a new library, how you learn and follow a new library.
- After completing all tasks while recording video, then upload to YouTube channel and upload your code on GitHub.
- You must submit a YouTube link, GitHub link and. IPYNB file.

Task 1 [30 points]

Apply BFS and DFS on trees and graphs. You can use simple examples for your practice. For graph editor you can use this:
https://csacademy.com/app/graph_editor/

Task 2[30 points]

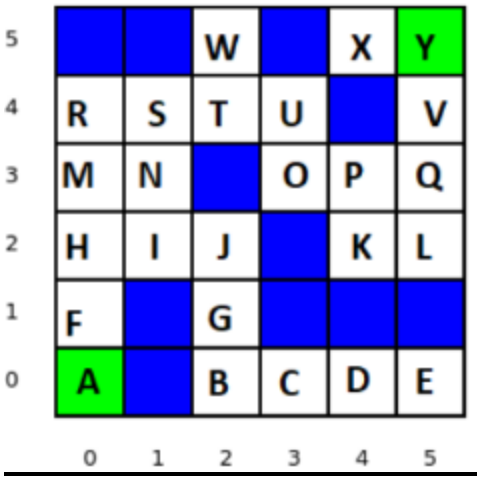
1. Generate random and unique numbers of ranges 1000,40,000,80,000,200,000 and 1,000,000. So now you have 5 sets of inputs, build the tree for each sets (each set has a its own list)
2. Apply BFS and DFS on each sets and calculate the time taken for the execution to find that goal through BFS and DFS.
3. Goal should be lis[total_len – 220]
4. Make a data frame for your results as shown below.

Tree Size	BFS Time	DFS Time
1000		
40,000		
80,000		
200,000		
1,000,000		

5. Finally plot the bar chart of the time taken by each search for example (on X-axis the data will be 1000,40,000,80,000,200,000 and 1,000,000.) and on the Y axis the data will be the seconds it took while searching.

Task 3[20 points]

Consider a maze as shown below. Each empty tile represents a separate node in the graph, while the walls are represented by blue tiles. Your starting node is A, and the goal is to reach Y. Implement an A* search to find the resulting path.



Task 4[20 points]

Implement Alpha-Beta Pruning using python.

Best Luck