ECE4010 Homework 1

Part I: Programming [75 points]

Visit the blackboard page and download the zip archive.

You need to have Python 3.6 or above installed on your machine

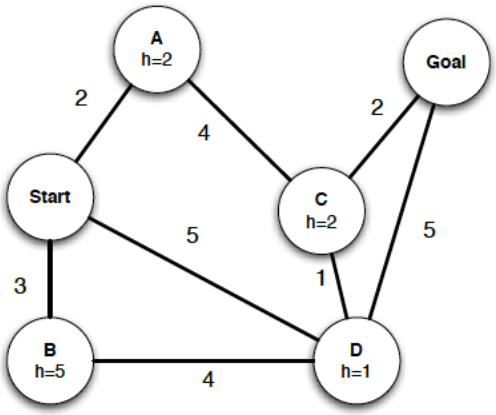
This assignment requires you to complete the implementations of

1. Class **StackFrontier**
2. Class **QueueFrontier**
3. **solve** function defined in Class **Maze**

Once you've complete all the required functions, should be able to run python maze.py mazeN.txt, where N denote the index of maze in the folder.

For each maze, run your code based on DFS and BFS, respectively. And posted the solution that is stored in maze.png.

Part II: Written Problem [25 points]



Q1. [20 pts] For each of the following graph search strategies, work out the order in which states are expanded, as well as the path returned by graph search. In all cases, assume ties resolve in such a way that states with earlier alphabetical order are expanded first. The start and goal state are S and G, respectively. Remember that in graph search, a state is expanded only once.

(a)[5pts] Depth-first search

(b) [5pts] Breadth-first search

(c)[5pts] Greedy best-first search with the same heuristic *h* shown on the graph

(c) [5pts] A* search with the same heuristic *h* shown on the graph

Q2. [5 pts] The following question will ask you about the Expectimax tree below, where the green up arrows indicate the MAX node and blue dots indicate the chance node. The leaf nodes are each labelled with their value and their corresponding probabilities are labelled with their edge.

If you are the MAX player, what is your best action (left, center, or right) based on the below figure and why?