Assignment AI 1

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General Data structure:

Entry Class :

Node class for storing the path and heuristic cost and total cost

General Functions :

getNeighbor:

to get the adjacent of current state (up,down,left,right)

For DFS :

Stack for keeping nodes

Hash set to keep visited nodes

Algorithm : DFS

Path to goal: Stack to save depth of nodes and pop it when dfs stack not pushing

Cost of Path : Path Size -1

Node expanded : size of visited nodes

Running time : O(4 ^ m)

For BFS :

Queue for keeping nodes

Hash set to keep visited nodes

Algorithm : BFS

Path to goal: Store previous path at node class and add new state path to it

Cost of Path : store cost using node

Node expanded : size of visited nodes

Running time : O(4 ^ s)

For A* :

Priority queue for keeping nodes

Linked Hash set to keep explored nodes

Entry Class :

Node class for storing the path and heuristic cost and total cost

Algorithm : A* search
Path to goal: Store previous path at node class called entry
Cost of Path : Stored at node
Node expanded : size of visited nodes
Running time : O(4^d)

Functions :

- A_StarManhattanDistance:
  Input : initial and goal states
  Output: boolean to check if got the goal or not
  Details :
  to use A* with Manhattan Distance as Heuristic function

- A_StarEuclideanDistance:
  Input : initial and goal states
  Output: boolean to check if got the goal or not
  Details :
  to use A* with Euclidean Distance as Heuristic function

-a_star :
Input : explored , initial and goal states, boolean MD to check if it Manhattan or Euclidean Distance
Output: Entry node class
Details:
Use A* Algorithm

-calcH:
Input: state and goal states, boolean MD to check if it Manhattan or Euclidean Distance
Output: Float
Details: Calc Heuristic function