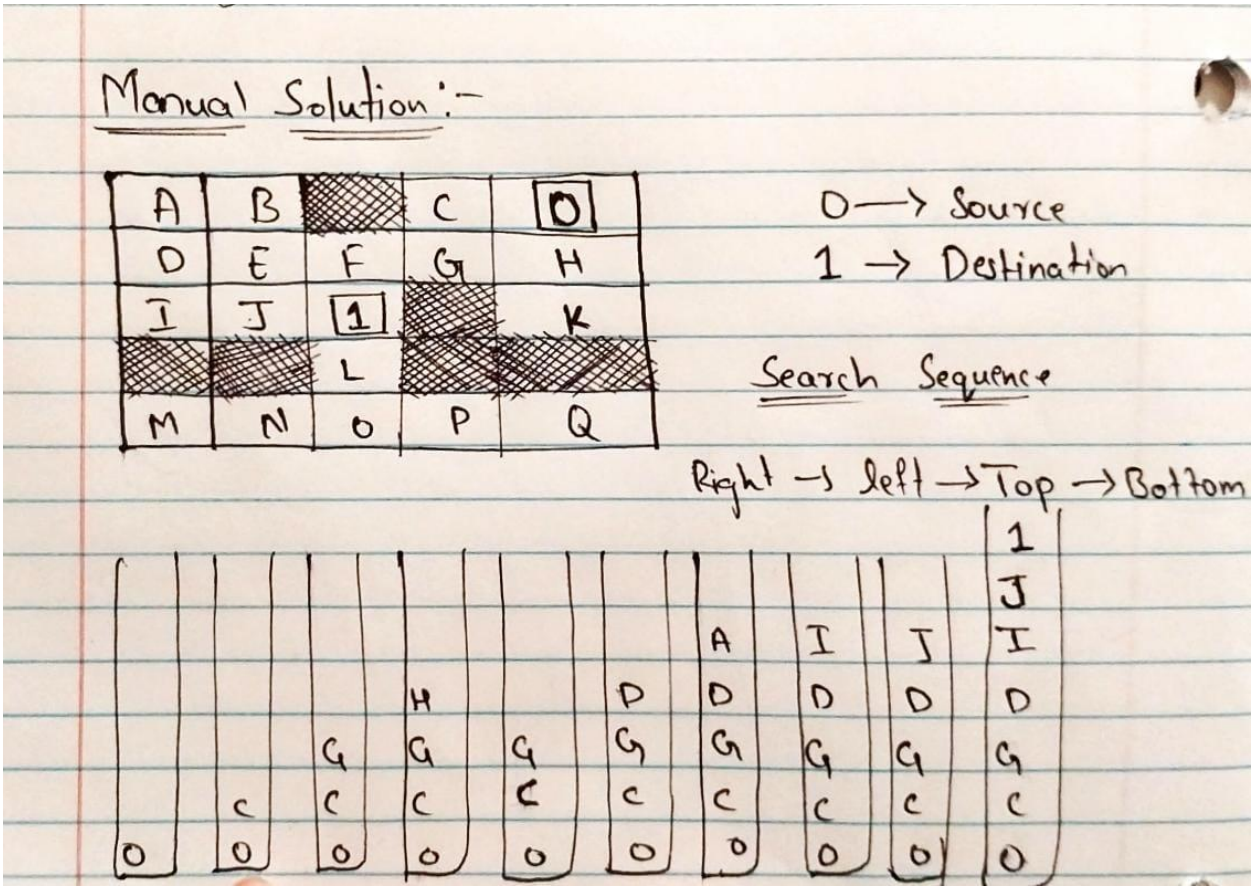
Week 11: Homework 3: Project: Depth-First Traversal: The Maze

Manual code:



Code for Project: Depth-First Traversal: The Maze

```
def hasPath(maze, start, destination):
    m, n = len(maze), len(maze[0])
    visited = [[False for _ in range(n)] for _ in range(m)]
```

```
    def dfs(x, y):
        if visited[x][y]:
            return False

        visited[x][y] = True
        if [x, y] == destination:
            return True

        directions = [(0, 1), (0, -1), (1, 0), (-1, 0)]
        for dx, dy in directions:
            newX, newY = x, y
            while 0 <= newX + dx < m and 0 <= newY + dy < n and maze[newX + dx][newY + dy] != 1:
                newX += dx
                newY += dy
            if dfs(newX, newY):
                return True

        return False

    return dfs(start[0], start[1])

# Test the function with the provided input
maze = [[0, 0, 1, 0, 0],
        [0, 0, 0, 0, 0],
```

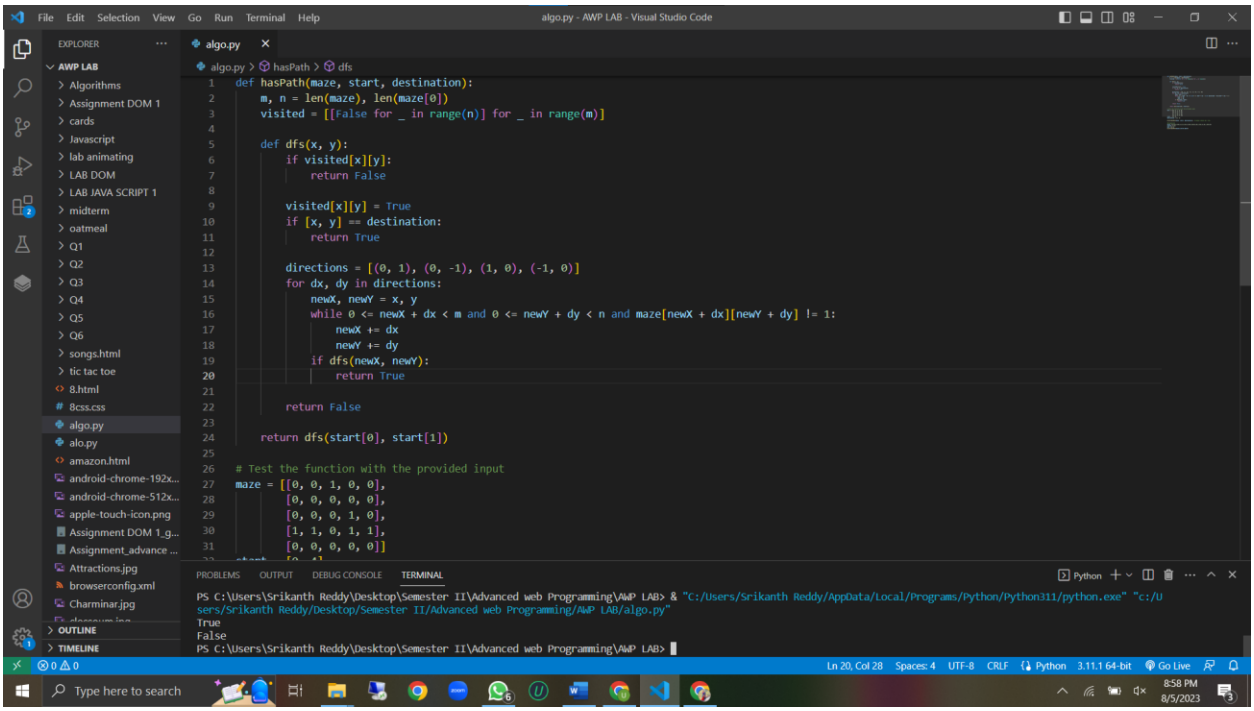
```
    [0, 0, 0, 1, 0],
    [1, 1, 0, 1, 1],
    [0, 0, 0, 0, 0]]
start = [0, 4]
destination = [4, 4]

print(hasPath(maze, start, destination))  # Output should be: True

#Assumption2
maze3 =[[0,0,0,0,0],[1,1,0,0,1],[0,0,0,0,0],[0,1,0,0,1],[0,1,0,0,0]]
start3= [4,3]
des3 =[0,1]
print(hasPath(maze3,start3,des3))
```

output:

True

False

Screen Shot:


File Edit Selection View Go Run Terminal Help
algo.py - AWP LAB - Visual Studio Code
EXPLORER
AWP LAB
Algorithms
Assignment DOM 1
cards
Javascript
lab animating
LAB DOM
LAB JAVA SCRIPT 1
midterm
oatmeal
Q1
Q2
Q3
Q4
Q5
Q6
songs.html
tic tac toe
8.html
8css.css
algo.py
alo.py
amazon.html
android-chrome-192x...
android-chrome-512x...
apple-touch-icon.png
Assignment DOM 1_g...
Assignment_advance ...
Attractions.jpg
browserconfig.xml
Charminar.jpg
OUTLINE
TIMELINE
algo.py
algo.py > hasPath > dfs
def hasPath(maze, start, destination):
m, n = len(maze), len(maze[0])
visited = [[False for _ in range(n)] for _ in range(m)]
def dfs(x, y):
if visited[x][y]:
return False
visited[x][y] = True
if [x, y] == destination:
return True
directions = [(0, 1), (0, -1), (1, 0), (-1, 0)]
for dx, dy in directions:
newX, newY = x, y
while 0 <= newX + dx < m and 0 <= newY + dy < n and maze[newX + dx][newY + dy] != 1:
newX += dx
newY += dy
if dfs(newX, newY):
return True
return False
return dfs(start[0], start[1])
# Test the function with the provided input
maze = [[0, 0, 1, 0, 0],
[0, 0, 0, 0, 0],
[0, 0, 0, 1, 0],
[1, 1, 0, 1, 1],
[0, 0, 0, 0, 0]]
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
Python
PS C:\Users\Srikanth Reddy\Desktop\Semester II\Advanced web Programming\AWP LAB> & "C:/Users/Srikanth Reddy/AppData/Local/Programs/Python/Python311/python.exe" "c:/Users/Srikanth Reddy/Desktop/Semester II/Advanced web Programming/AWP LAB/algo.py"
True
False
PS C:\Users\Srikanth Reddy\Desktop\Semester II\Advanced web Programming\AWP LAB>
Ln 20, Col 28 Spaces: 4 UTF-8 CRLF Python 3.11.1 64-bit Go Live
Type here to search
8:58 PM
8/5/2023