

Problem 5: Rat in a Maze

Consider a rat placed at (0, 0) in a square matrix of order $N * N$. It has to reach the destination at ($N - 1$, $N - 1$). Find all possible paths that the rat can take to reach from source to destination. The directions in which the rat can move are 'U'(up), 'D'(down), 'L' (left), 'R' (right). Value 0 at a cell in the matrix represents that it is blocked and the rat cannot move to it while value 1 at a cell in the matrix represents that rat can travel through it.

```
def findPaths(maze, row, col, path, paths):
```

```
    N = len(maze)
```

```
    if row == N - 1 and col == N - 1:
```

```
        paths.append(path)
```

```
    return
```

```
    if (
```

```
        row < 0
```

```
        or col < 0
```

```
        or row >= N
```

```
        or col >= N
```

```
        or maze[row][col] == 0
```

```
    ):
```

```
        return
```

```
    maze[row][col] = 0
```

```
    findPaths(maze, row - 1, col, path + "U", paths)
```

```
    findPaths(maze, row + 1, col, path + "D", paths)
```

```
    findPaths(maze, row, col - 1, path + "L", paths)
```

```
    findPaths(maze, row, col + 1, path + "R", paths)
```

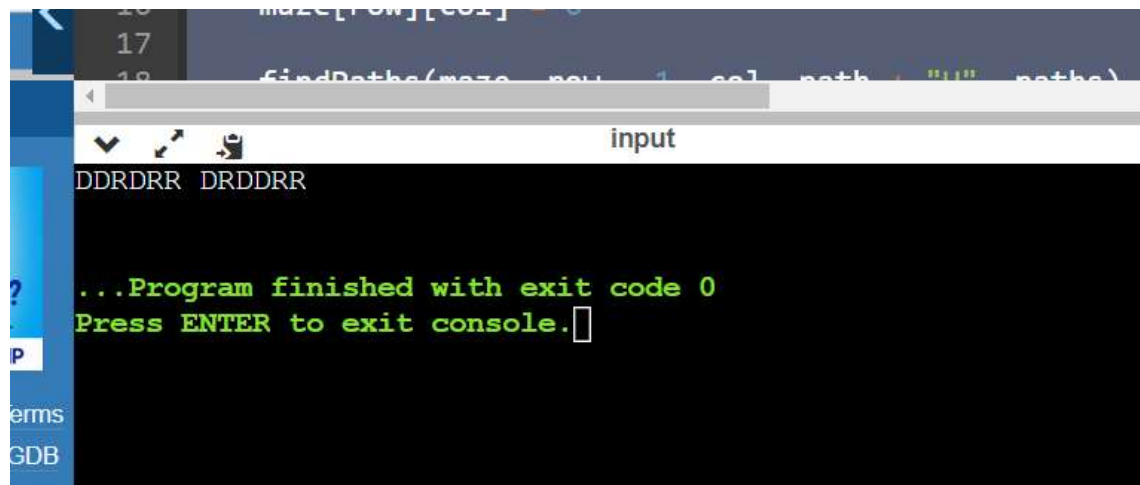
```
    maze[row][col] = 1
```

```
def findMazePaths(N, m):
```

```
paths = []  
findPaths(m, 0, 0, "", paths)  
paths.sort()  
return paths
```

N = 4

```
m = [  
    [1, 0, 0, 0],  
    [1, 1, 0, 1],  
    [1, 1, 0, 0],  
    [0, 1, 1, 1],  
]  
result = findMazePaths(N, m)  
print(" ".join(result))
```



```
16 maze[row][col] = 0  
17  
18 findPaths(maze, row, col, path, paths)  
input  
DDRDRR DRDDRR  
...Program finished with exit code 0  
Press ENTER to exit console.  
P  
Terms  
GDB
```