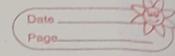


Q.

Guddu Byhaia and Enchanted Maze of Mirzapur



* Problem:

- Grid $N \times M$
- 'O' → Open
- 'X' → Close.
- Start $\rightarrow (0,0)$ → reach $\rightarrow (N-1, M-1)$
- Only move → right and down
- Print all valid paths.

* Pseudocode :

function findpath (maze, i, j, path, N, M) :

if i or j out of bound OR $\text{maze}[i][j] = 'X'$

return

or add (i, j) to path

if $i == N-1$ and $j == M-1$:

print path

return

findpath (maze, i , $j+1$, path)

findpath (maze, $i+1$, j , path)

remove (i, j) from path. // backtrack

Dry run:

Input: 3 4

$$\begin{bmatrix} 0 & 0 & \times & 0 \\ 0 & 0 & 0 & \times \\ \times & 0 & 0 & 0 \end{bmatrix}$$

1- Start at (0,0)

Right \rightarrow (0,1)

Down \rightarrow (1,1)

Right \rightarrow (1,2) Down (2,2) Right \rightarrow (2,3)

(0,0) (0,1) (1,1) (1,2) (2,2) (2,3)

2- Backtrack and try other path

From (0,0) \rightarrow Down (1,0) \rightarrow Right (1,1)

\rightarrow Right (1,2) \rightarrow Down \rightarrow (2,2) \rightarrow Right \rightarrow (2,

(0,0) (1,0) (1,1) (1,2) (2,2) (2,3)

Q. String Reversal Magic by sage Vishwakarma.

Input: $s = "abcdefg"$

Output: $s = "gfedcba"$

* Approach: (Recursive).

- If string is 1 → return as is.

- Otherwise:

1. Split into left and right halves:

2. Recurse on each half.

3. Swap them and return rightHalf + leftHalf.

* Pseudocode:

```
function reverseMagic(s):
```

```
    if s.length == 1;
```

```
        return s.
```

```
mid = s.length / 2
```

```
left = s[0:mid]
```

```
right = s[mid:]
```

```
processedLeft = reverseMagic(left)
```

```
processedRight = reverseMagic(right)
```

```
return (processedLeft + processedRight)
```

* Day 1 run:

$s = "abcdefg"$

$\text{reverseMagic}("abcdefg")$

$\rightarrow \text{reverse Magic}("abcd") + \text{reverse Magic}("efgh")$

$\rightarrow \text{reverse Magic}("ab") + \text{reverse Magic}("cd")$

$\rightarrow "b" + "a" = "ba"$

$\rightarrow "d" + "c" = "dc"$

$\rightarrow "dc" + "ba" = "badc"$

$\rightarrow \text{reverse Magic}("ef") + \text{reverse Magic}("gh")$

$\rightarrow "f" + "e" = "fe"$

$\rightarrow "h" + "g" = "hg"$

$\rightarrow "hg" + "fe" = "fehg"$

$\rightarrow \text{final} \rightarrow "fehg" + "badc"$

$\rightarrow "badcfehg"$