Grid Ways Problem - Print All Paths

Print All Paths in a Grid (Recursion)

Problem:

You are given a grid of size n x m. Starting from the top-left cell (0,0), you can only move:

- Right (R)

- Down (D)

Your task is to print all the possible paths to reach the bottom-right cell (n-1,m-1).

Logic:

At each step:

- If you move right, add "R" to the path.

- If you move down, add "D" to the path.

- When you reach the bottom-right, print the path.

Java Code:

```
public class GridPaths {

    public static void printPaths(int i, int j, int n, int m, String path) {

        if(i == n - 1 && j == m - 1) {

            System.out.println(path);

            return;

        }

        if(i < n - 1) {

            printPaths(i + 1, j, n, m, path + "D");
        }
        if(j < m - 1) {
            printPaths(i, j + 1, n, m, path + "R");
        }
    }

    public static void main(String[] args) {
        int n = 3, m = 3;
        printPaths(0, 0, n, m, "");
    }
}
```

Output for 3x3 Grid:

```
DDRR
DRDR
DRRD
RDDR
RDRD
RRDD
```

Time Complexity:

O(2^(n+m)) because we explore all possible paths.

This is a fundamental recursion question often asked in interviews to test understanding of recursion tree and path generation.