# HW1

## Problem Description

You are given a grid maze where you can move up, down, left, and right. The numbers in the grid have the following meanings:  
- 0: Walkable cell  
- 1: Blocked cell  
- 2: Start point  
- 3: End point  
  
Your task is to compute both the shortest path length from the start to the end and the number of different shortest paths that achieve this length. If the end point is unreachable, output according to the specified format.

## Input Format

• The first line contains two integers R C, representing the number of rows and columns of the maze.  
• The next R lines each contain C integers, representing the maze layout.

## Output Format

Output two integers X Y:  
• X = the length of the shortest path  
• Y = the number of different shortest paths of length X  
  
If the end point cannot be reached, output:  
-1 0

## Execution Method

Compile your code with the following commands:  
  
For C:  
 gcc main.c -o main.exe  
  
For C++:  
 g++ main.cpp -o main.exe  
  
The TA will test your program using:  
 main.exe < input.txt

## Example 1

Input

5 5  
0 0 0 0 0  
0 1 0 1 0  
0 0 0 1 3  
0 2 0 0 1  
0 0 0 0 0

Output

8 2

## Example 2

Input

8 8  
1 0 0 0 0 0 0 0  
3 1 0 0 1 0 0 1  
1 0 0 0 0 1 0 0  
0 1 0 0 0 1 0 0  
1 0 0 0 0 0 1 1  
0 1 0 0 0 1 0 0  
1 1 0 2 0 0 0 0  
0 0 1 0 1 0 1 0

Output

-1 0

## Submission Format

Submit a single compressed file containing:  
• studentID\_hw1.cpp (or .c)  
• studentID\_hw1.exe

## Compilation Environment

Compiler versions:  
• gcc (Ubuntu 13.3.0-6ubuntu2~24.04) 13.3.0  
• g++ (Ubuntu 13.3.0-6ubuntu2~24.04) 13.3.0

**Grading**

Public case: 70%

Private case:30%