2257. Count Unguarded cells in the Grid

Medium

Topics

Companies

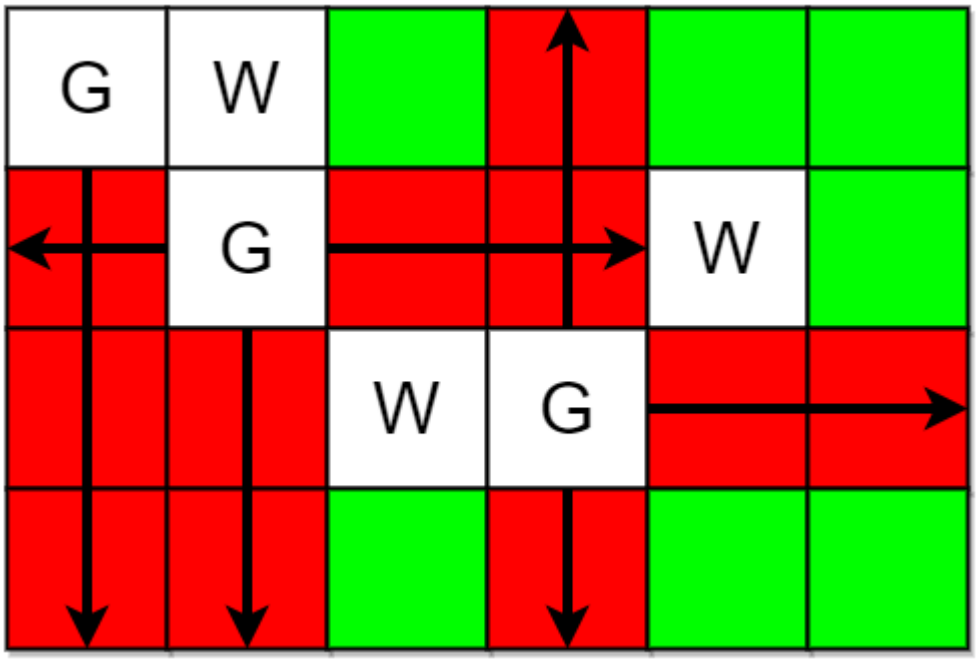
Hint

You are given two integers `m` and `n` representing a **0-indexed** `m x n` grid. You are also given two 2D integer arrays `guards` and `walls` where `guards[i] = [rowi, coli]` and `walls[j] = [rowj, colj]` represent the positions of the `ith` guard and `jth` wall respectively.

A guard can see **every** cell in the four cardinal directions (north, east, south, or west) starting from their position unless **obstructed** by a wall or another guard. A cell is **guarded** if there is **at least** one guard that can see it.

Return *the number of unoccupied cells that are **not** guarded*.

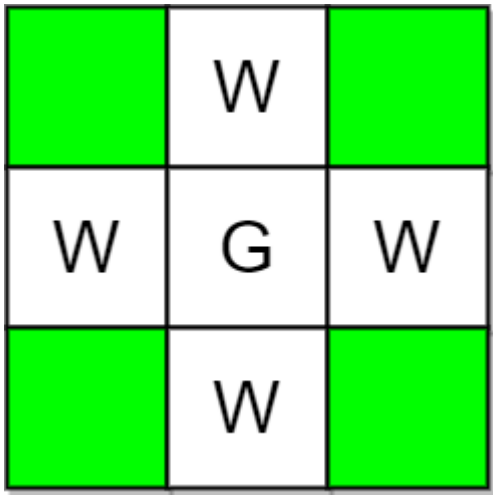
Example 1:



Input: m = 4, n = 6, guards = [0,0],[1,1],[2,3, walls = [0,1],[2,2],[1,4
Output: 7
Explanation: The guarded and unguarded cells are shown in red and

green respectively in the above diagram.
There are a total of 7 unguarded cells, so we return 7.

Example 2:



Input: m = 3, n = 3, guards = [[1,1]], walls = [[0,1],[1,0],[2,1],[1,2]]
Output: 4
Explanation: The unguarded cells are shown in green in the above diagram.
There are a total of 4 unguarded cells, so we return 4.

Constraints:

- `1 <= m, n <= 105`
- `2 <= m * n <= 105`
- `1 <= guards.length, walls.length <= 5 * 104`
- `2 <= guards.length + walls.length <= m * n`
- `guards[i].length == walls[j].length == 2`
- `0 <= rowi, rowj < m`
- `0 <= coli, colj < n`
- All the positions in `guards` and `walls` are **unique**.

Solution:

```java
class Solution {
    public int countUnguarded(int m, int n, int[][] guards, int[][] walls) {

        // Initialize grid with zeros
        int[][] g = new int[m][n];

        // Mark guards and walls as 2
        for (int[] e : guards) {
            g[e[0]][e[1]] = 2;
        }
```

```java
        for (int[] e : walls) {
            g[e[0]][e[1]] = 2;
        }

        // Directions: up, right, down, left
        int[] dirs = {-1, 0, 1, 0, -1};

        // Process each guard's line of sight
        for (int[] e : guards) {

            for (int k = 0; k < 4; ++k) {
                int x = e[0], y = e[1];
                int dx = dirs[k], dy = dirs[k + 1];
                // Check cells in current direction until hitting boundary
or obstacle
                while (x + dx >= 0 && x + dx < m && y + dy >= 0 && y + dy <
n && g[x + dx][y + dy] < 2) {
                    x += dx;
                    y += dy;
                    g[x][y] = 1;
                }
            }
        }

        // Count unguarded cells (cells with value 0)
        int unguardedCount = 0;
        for (int i = 0; i < m; i++) {
            for (int j = 0; j < n; j++) {
                if (g[i][j] == 0) {
                    unguardedCount++;
                }
            }
        }

        return unguardedCount;
    }
}
```