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Description

Solution

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Java

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317. Shortest Distance from All Buildings

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You are given an $m \times n$ grid `grid` of values `0`, `1`, or `2`, where:

- each `0` marks an **empty land** that you can pass by freely,
- each `1` marks a **building** that you cannot pass through, and
- each `2` marks an **obstacle** that you cannot pass through.

You want to build a house on an empty land that reaches all buildings in the **shortest total travel** distance. You can only move up, down, left, and right.

Return the **shortest travel distance** for such a house. If it is not possible to build such a house according to the above rules, return `-1`.

The **total travel distance** is the sum of the distances between the houses of the friends and the meeting point.

The distance is calculated using Manhattan Distance, where $distance(p1, p2) = |p2.x - p1.x| + |p2.y - p1.y|$.

Example 1:

1	0	2	0	1
0	0	0	0	0
0	0	1	0	0

Input: `grid = [[1,0,2,0,1],[0,0,0,0,0],[0,0,1,0,0]]`
Output: 7
Explanation: Given three buildings at $(0,0)$, $(0,4)$, $(2,2)$, and an obstacle at $(0,2)$. The point $(1,2)$ is an ideal empty land to build a house, as the total travel distance of $3+3+1=7$ is minimal. So return 7.

Example 2:

Input: `grid = [[1,0]]`
Output: 1

Example 3:

Input: `grid = [[1]]`
Output: -1

Constraints:

- $m == grid.length$
- $n == grid[i].length$
- $1 \leq m, n \leq 50$
- `grid[i][j]` is either `0`, `1`, or `2`.
- There will be **at least one** building in the `grid`.

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```
class Solution {
    public int shortestDistance(int[][] grid) {
    }
}
```

Problems

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Console

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