

2812. Find the Safest Path in a Grid

Description

You are given a **0-indexed** 2D matrix `grid` of size `n x n`, where `(r, c)` represents:

- A cell containing a thief if `grid[r][c] = 1`
- An empty cell if `grid[r][c] = 0`

You are initially positioned at cell `(0, 0)`. In one move, you can move to any adjacent cell in the grid, including cells containing thieves.

The **safeness factor** of a path on the grid is defined as the **minimum** manhattan distance from any cell in the path to any thief in the grid.

Return *the maximum safeness factor of all paths leading to cell* `(n - 1, n - 1)`.

An **adjacent** cell of cell `(r, c)`, is one of the cells `(r, c + 1)`, `(r, c - 1)`, `(r + 1, c)` and `(r - 1, c)` if it exists.

The **Manhattan distance** between two cells `(a, b)` and `(x, y)` is equal to `|a - x| + |b - y|`, where `|val|` denotes the absolute value of val.

Example 1:

1	0	0
0	0	0
0	0	1

Input: `grid = [[1,0,0],[0,0,0],[0,0,1]]`
Output: `0`
Explanation: All paths from `(0, 0)` to `(n - 1, n - 1)` go through the thieves in cells `(0, 0)` and `(n - 1, n - 1)`.

Example 2:

0	0	1
0	0	0
0	0	0

Input: `grid = [[0,0,1],[0,0,0],[0,0,0]]`
Output: `2`
Explanation: The path depicted in the picture above has a safeness factor of 2 since:
– The closest cell of the path to the thief at cell `(0, 2)` is cell `(0, 0)`. The distance between them is `|0 - 0| + |0 - 2| = 2`.
It can be shown that there are no other paths with a higher safeness factor.

Example 3:

0	0	0	1
0	0	0	0
0	0	0	0
1	0	0	0

Input: `grid = [[0,0,0,1],[0,0,0,0],[0,0,0,0],[1,0,0,0]]`
Output: `2`
Explanation: The path depicted in the picture above has a safeness factor of 2 since:
– The closest cell of the path to the thief at cell `(0, 3)` is cell `(1, 2)`. The distance between them is `|0 - 1| + |3 - 2| = 2`.
– The closest cell of the path to the thief at cell `(3, 0)` is cell `(3, 2)`. The distance between them is `|3 - 3| + |0 - 2| = 2`.
It can be shown that there are no other paths with a higher safeness factor.

Constraints:

- `1 <= grid.length == n <= 400`
- `grid[i].length == n`
- `grid[i][j]` is either `0` or `1`.
- There is at least one thief in the `grid`.

