Escape Zombies

Problem Description

Daryl is stuck on an Island of size (N x M), which has Zombies who want to convert humans to Zombies. Daryl wants to leave the island as soon as possible. He has a shotgun with him with a limited number of bullets. So, he must find the path which is feasible in terms of number of bullets. Surrounding him are many Zombies. Daryl is represented by "0" in the island. He can move in all the 8 directions i.e., (North, East, West, South, North-East, North-West, South-East, South-West) from the current position. Each location represents the number of bullets required to kill the Zombies at that location.

Escaping the island means that Daryl must kill all the Zombies in all the cells in the path that he takes including the one at the corner. In doing so, he needs to have consumed minimum number of bullets.

For Better understanding refer the *Examples* Section

Constraints

3 <= N <= 25

3 <= M <= 25

0 <= Value of cell <= 10^4

Input

First line contains two integers denoting the size of island in the form of number of rows(N) and columns (M).

Next N lines contain M space separated values denoting bullets or the position of Daryl.

Output

Print the minimum number of bullets required by Daryl to escape the island.

Time Limit (secs)

1

Examples

Example 1

Input

4 4

1 2 3 4

4 5 6 7

8 8 0 7

9 8 9 9

Output

6

Explanation-

Given N = 4, M = 4 and Daryl is present at (2,2). If he chose the path (2,2) -> (1,1) -> (0,0), the number of bullets required to kill Zombies are 6 (5+1), where (0,0) is the left top cell of the matrix.

The number of bullets required is greater than 6 if he chooses any other path.

Example 2

Input

4 4

10 2 13 4

47 51 6 27

81 0 10 17

9 78 19 29

Output

8

Explanation-

Given M=4, N=4 and Daryl is present at (2,1). If he chose the path (2,1) -> (1,2) -> (0,1), the number of bullets required to kill Zombies are 8 (6+2), where (0,0) is the left top cell of the matrix.

The number of bullets required is greater than 8 if he chooses any other path.