

There is a piece of grids land of size $n \times m$. Chandler and his team take responsibility to guard it. There are some searchlights on some pieces and each of them has a capability to lighten a distance towards four directions: north, south, east and west. Different searchlight has different lightening capability shown in levels. Searchlight with level k means that it can lighten k grids (including the grid that the searchlight stands in) along any of the four directions. Shown in following figure, there is a searchlight of level 3 and the shadow grids are ones that can be lightened by it. Particularly, searchlight of level 1 means that it can only lighten the grid in which the searchlight stands.

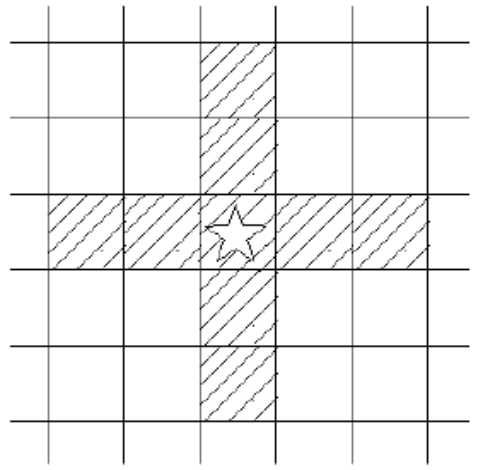


Figure: A searchlight of Level 3

Each searchlight has a maximum level. You can decrease a searchlight's level to save the energy. A searchlight whose maximum level is k can be turned to level $k, k - 1, k - 2, \dots, 1$ and 0. Level 0 means turning off the searchlight.

A grid is well-guarded if and only if **at least** one of the following two conditions is satisfied:

1. There is a searchlight in this grid, and it is not switched to level 0 (the light is on).
2. The grid is lightened by **at least** two searchlights. One lightens it in horizontal direction (east or west), and another lightens it in vertical direction (north or south).

Chandler asks you to help finding a solution that he can turn on some of the searchlights so that:

1. All the grids are well-guarded.
2. All the searchlights turned on are in a same level.
3. That same level mentioned above is as small as possible.

More specifically, if you choose a same level Q , then all the searchlights whose maximum level are less than Q have to be turned off. Please help him to find a solution with the minimum same level.

Input

The input file contains several test cases.

For each test case, the first line is two integers n and m , representing a grids land of size $n \times m$. ($0 < n \leq 100, 0 < m \leq 10000$). Following n lines describe an $n \times m$ matrix in which $a_{i,j}$ means the maximum level of the searchlight in grid (i, j) . $a_{i,j}$ can be zero, which means there is no searchlight on that grid. For all the cases, $a_{i,j} \leq 10000$.

The input file ends with a line containing two zeros.

Output

For each test case, output a single line with an integer, representing the minimum level you have found. If there is no such a solution, output 'NO ANSWER!'

Sample Input

```
2 2
0 2
3 0
2 2
0 2
1 0
0 0
```

Sample Output

```
2
NO ANSWER!
```