Problem L

Tiles

Avelino has a mosaic on one wall of his home. It is a very old mosaic, composed of small colored tiles. As it is old some tiles fell off over the years forming holes.

Avelino wants to restore the mosaic covering the holes with new tiles. However, to save some money, Avelino wants to buy tiles of a single color to fill the holes. He wants to buy tiles of the original color or a color that is not in the mosaic.

Being a mosaic, it is not desired to have large areas with the same color. Avelino decided that he will choose the color of the tiles trying to make the size of the smallest monochromatic area as small as possible, so it has more details. Note that there may be more than a possible color. A monochromatic area is an area that all the tiles in it are of the same color. Two adjacent tiles belonging to the same area will have the same color, two tiles are adjacent if they share one side.

See the first example, there are three areas of color 1 (one of size 3 and two of size 2), one area of color 2 (size 3) and one area of color 3 (size 7). The possible answer would be to choose color 2, this way the smallest monochromatic area size is 2. If we choose color 1 the smallest monochromatic area would be 3.

Create a program that prints the size of the smallest possible monochromatic area.

Input

The first line of input contains two numbers H and L, the height and length of the mosaic, respectively $1 \leq H \leq 200$ and $1 \leq L \leq 200$. Next H lines contains each L numbers, separated by a wihte space, the color of each tile. A value of 0 represents a hole in the mosaic and a value $i \neq 0$ represents a tile with i color $1 \leq i \leq 40000$

Output

Your program should pring a single line with an integer representing the size of the smallest possible monochromatic area.

Examples

Input	Output
3 8	2
3 3 3 1 1 0 0 0	3
3 1 1 0 2 2 0 1	1
3 3 3 0 0 2 1 1	
3 7	
1 1 0 2 2 1 1	
1 1 0 2 2 1 1	
1 1 0 0 3 3 3	
3 6	
2 2 2 2 0 2	
2 2 2 0 2 2	
2 2 2 2 0 2	