Problem B: Bright Beacons
Time limit: 1 second

In honour of the Olympic ethos, an archer is faced with a revered task: to light a series of bonfires leading to the Olympic Torch. The archer must establish a network of bonfires, across a grid of hills with heights between 0 and 9, such that they may light the Olympic Torch in the south-east corner of the grid. Bound by ancient tradition, the archer may only shoot in straight lines that follow the cardinal directions of north-south or east-west. You must find the smallest number of additional bonfires needed to create an unbroken chain of bonfires between the starting point and the Olympic Torch.

The rules for establishing visibility between bonfires are:

- Bonfires can be lit when they are within a direct line of sight of another bonfire that is already burning (even if archers may shoot in a parabola, assume that if they cannot see the bonfire, they cannot hit it).
- A mountain is considered to block the line of sight between two bonfires if its peak lies strictly above the straight line between the two peaks of the bonfires in question. When determining if there is a line of sight, assume that each grid cell's terrain height is a peak of zero width in the middle of the cell.
- An archer can only shoot north, west, east or south in a single shot. Shooting in a combination of these directions is not allowed due to the Olympic traditions.

For instance, consider an example with terrain heights in a line like "`124`":

- A bonfire placed on terrain height 1 can see a bonfire placed on terrain height 4 because the terrain with height 2 is not tall enough to obstruct the view.
- However, if the terrain heights were "`134`", a bonfire on height 1 would not see a bonfire on height 4 due to the peak of height 3 blocking the line of sight.
- In cases such as "`222`" or "`123`", bonfires at the first and last point can see each other since the intermediate heights are not obstructing the direct view.

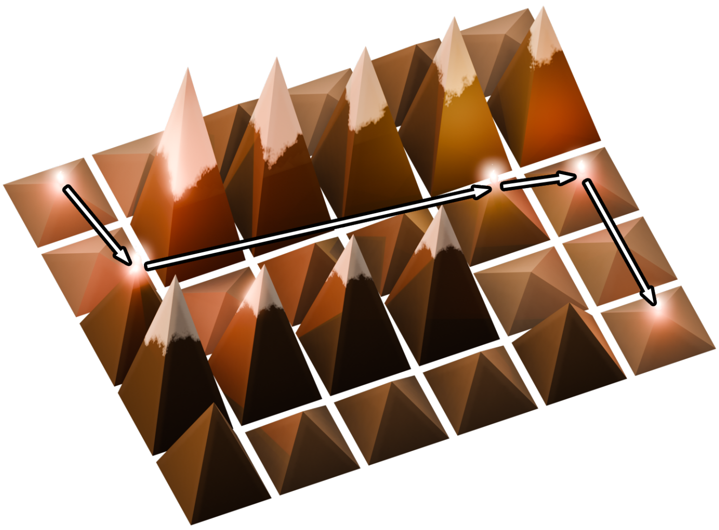

Figure B.1: Path of arrows and lit bonfires in Sample 1.

What is the minimum number of additional bonfires you need to place in order to enable signalling from the bonfire at the north-west to the Olympic Torch at the south-east? Assume that the initial bonfire and the Olympic Torch have already been placed.

Input

The input consists of:

- One line with two integers r and c ($2 \leq r, c \leq 100$), the number of rows and the number of columns in the terrain, respectively.
- Then r lines follow, each with c digits. The digits signify the height h ($0 \leq h \leq 9$) of each mountain.

Output

Output the minimum number of additional bonfires needed in order to enable signalling from the bonfire at the north-west corner to the Olympic Torch at the south-east corner.

Sample Input 1	Sample Output 1
5 6 112121 198776 412221 766611 422231	3

Sample Input 2	Sample Output 2
5 5 25688 59998 69996 89995 88653	5

Sample Input 3	Sample Output 3
2 18 011222222322222110 011222222322222110	6