

**Coding Arena**

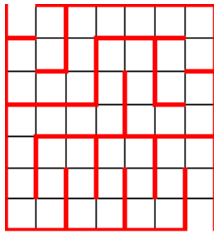
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**Problem : Shortest Path in a Maze**

In the fairground of Dizzyville there is an interesting maze. It is square, and its walls are made of wood, with identical locks on them. You are given one key, so that one wall can be unlocked, but the key gets stuck in the lock, and so cannot be removed. Hence only one wall can be eliminated, but you can choose which wall.



You need to determine the length of the shortest path out of the maze (number of squares visited), with perhaps unlocking one door. The positions of the doors will be given with the coordinates of the start and end points.

The start will always be the top left corner of the maze, and the end, the bottom right corner of the maze.

The wall position will be based on the starting and ending points, which is based on the origin of the point coordinate system. This is defined as the lowest left corner of the maze, with the positive X axis along the horizontal line to the right.

**Input Format:**

The first line consists of two space separated positive integers, giving the size of the maze (N) and the number of interior walls (k).

There will be k lines with four space separated numbers being the starting x and y coordinates, and the ending x and y coordinates of the door. Note that this will be in the coordinates using the point coordinate system defined above.

**Output Format:**

The output will be single line with the number of squares visited in the minimum path, after perhaps unlocking one wall.

**Constraints:**
 $N \leq 20$ 
 $K \leq 50$ 
**Example 1**

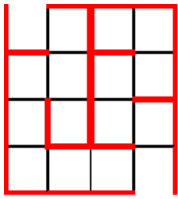
Input

 4,6  
 0,3,1,3  
 2,4,2,1  
 1,1,2,1  
 1,2,1,1  
 2,1,3,1  
 2,3,3,3
Output  
7

Explanation

There are 4 squares in each row of the maze and 6 walls. A picture of the maze is given below. The walls are shown in red lines

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The shortest path to the destination from the starting point is 9 squares. If the wall (0,3), (1,3) is opened, the distance will be 7 squares. Hence the output is 7.

### Example 2

Input

```
7,18
0,6,1,6
1,5,2,5
2,7,2,5
0,4,3,4
3,6,3,4
3,6,6,6
6,5,7,5
5,6,5,4
5,4,6,4
4,5,4,3
1,3,7,3
1,3,1,2
1,2,1,1
2,2,2,0
3,3,3,1
4,2,4,0
5,3,5,1
6,2,6,0
```

Output

21

Explanation

There are 7 squares a side in the maze. There 18 walls, which are listed. The picture of the maze is the 7 x 7 maze listed at the top. The length of the path without unlocking any walls is 49 squares. If the wall segment between corners (3,6) and (3,7) is unlocked, the length of the shortest path reduces to 21 squares.

### Note:

Please do not use package and namespace in your code. For object oriented languages your code should be written in one class.

### Note:

Participants submitting solutions in C language should not use functions from <conio.h> / <process.h> as these files do not exist in gcc

### Note:

For C and C++, return type of main() function should be int.

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