

Land

Problem Description

Medan was once an area full of forest, but it can't be proud of them anymore. The mayor in that area has put a huge effort in preventing trees from being unnecessarily cut down. A local rich newcomer plans to buy a relatively large piece of square-shaped land and he wants to build a house on it. He also wants to make the house as large as possible and square-shaped.

The land in Medan is divided into little 1x1 squares. One tree occupies exactly one square. Since the land is big, it's very hard to find the largest square with its sides parallel to the sides of the land and with no trees on it. For a given map of the land that describes the position of all the trees, you must find the square with the largest sides and with no trees on it. The length of the square's side is the number of 1x1 squares along its side.

Input

The first line contains one integer N ($1 \leq N \leq 80$), where $N \times N$ is the size of the grid. The second line contains one integer M ($1 \leq M \leq 500$), where M is the number of trees in Medan. The next M lines contain two numbers that represent the coordinate of a tree.

Output

Output the length of the side of the largest square with no trees in it.

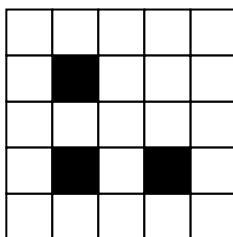
Sample Input

5
3
4 4
4 2
2 2

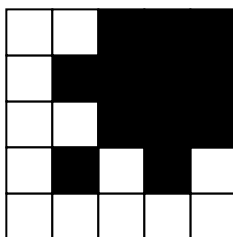
Sample Output

3

Explanation



The black cells are the trees.



The rich newcomer can buy a square-shaped land at index (1, 3) with size 3.

Note

The main Java class must be called Land, and be in the source file Land.java.