北京大学 PEKING UNIVERSITY

JUDGE ONLINE FOR ACM/ICPC



Language: Default

# Corral the Cows

**Time Limit:** 1000MS **Memory Limit:** 65536K

**Total Submissions:** 1067 **Accepted:** 468

## Description

Farmer John wishes to build a corral for his cows. Being finicky beasts, they demand that the corral be square and that the corral contain at least C (1 <= C <= 500) clover fields for afternoon treats. The corral's edges must be parallel to the X,Y axes.

FJ's land contains a total of N (C <= N <= 500) clover fields, each a block of size 1 x 1 and located at with its lower left corner at integer X and Y coordinates each in the range 1..10,000. Sometimes more than one clover field grows at the same location; such a field would have its location appear twice (or more) in the input. A corral surrounds a clover field if the field is entirely located inside the corral's borders.

Help FJ by telling him the side length of the smallest square containing C clover fields.

## Input

Line 1: Two space-separated integers: C and N

Lines 2..N+1: Each line contains two space-separated integers that are the X,Y coordinates of a clover field.

## Output

Line 1: A single line with a single integer that is length of one edge of the minimum size square that contains at least C clover fields.

## Sample Input

```
3 4
1 2
2 1
4 1
5 2
```

## Sample Output

```
4
```

## Hint

Explanation of the sample:

```
|*   *
| * *
+------
```

Below is one 4x4 solution (C's show most of the corral's area); many others exist.

```
|CCCC
|CCCC
|*CCC*
|C*C*
+------
```

## Source

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