Planet Battles: A New Land

Time limit	Memory limit
1 second	256 MB

Statement

You are an engineer working for a large interstellar mining company. Imperial officials have contracted your company to fabricate a large siliconite ventilation shaft for use in their newest superweapon, the *Unalive Star*. To produce enough raw materials, your scanners have brought you to a flat area of land where it detects vast siliconite deposits. The land can be modelled as a grid of N rows and N columns, where the cell on the c-th column and r-th row is written as (r, c). Exactly S of the squares in the grid are considered *siliconite-rich*.

Your mining tool of choice is the *parsec*[1], which can excavate an area of land as long as:

1. All squares being mined are siliconite-rich.
2. At every column, the cells mined have to form a contiguous range. That is, if cells (c_1, r_1) and cells (c_1, r_2) are mined, then all cells (c_1, r_3) have to be mined, for all $r_1 \leq r_3 \leq r_2$.
3. The cells mined at every column have to either contain or be completely contained by the cells mined in adjacent columns. That is, if cells (c_1, r_1) to cells (c_1, r_2) are the lowest and highest cells being mined in column c_1, and cells $(c_1 + 1, r_3)$ to $(c_1 + 1, r_4)$ are the lowest and highest cells being mined in column $c_1 + 1$, then either $r_1 \leq r_3 \leq r_4 \leq r_2$ or $r_3 \leq r_1 \leq r_2 \leq r_4$.
4. The number of cells mined in each column must be non-decreasing, then non-increasing.

Here are some examples of areas of land that are mine-able using the parsec:

```
.....    XXX..    .....    ..X..
.XXX.    .XX..    .....    .XXX.
.XXX.    ..XXX    ..X..    XXXXX
.XXX.    ..XXX    .....    .XXX.
.....    ..XX.    .....    ..X..
```

Here are some examples of areas of land that are not mine-able using the parsec:

```
.....    X...X    X.X.X    .X.X.
.X...    XX.XX    .....    XXXXX
.XXX.    XXXXX    X.X.X    XXXXX
...X.    XX.XX    .....    .XXX.
.....    X...X    X.X.X    ..X..
```

[1] Contrary to popular belief, parsecs are not units of length or units of time, but are in fact mining tools.

With your parsec, you want to determine the maximum number of squares you can excavate at once. Write a program that calculates this for you.

Input

The first line of input will contain two integers: N and S. The following S lines each contain 2 integers r_i c_i, the position of the ith siliconite rich square. Each square is listed at most once.

Output

Output 1 integer, the maximum number of squares.

Sample Input 1

```
5 18
1 1
1 2
1 4
1 5
2 1
2 2
2 4
2 5
3 1
3 2
3 3
3 5
4 1
4 4
4 5
5 2
5 5
5 4
```

Sample Output 1

```
8
```

Sample Input 2

```
4 11
1 1
2 1
2 3
2 4
3 1
3 3
3 4
4 1
4 2
4 3
4 4
```

Sample Output 2

```
8
```

Sample Input 3

```
1 1
1 1
```

Sample Output 3

```
1
```

Explanation

The below diagrams for sample input 1,2 and 3 respectively. `O` denotes a siliconite-rich square, and `X` denotes a mined square.

```
XX.OO
XX.OO
XXX.O
X..OO
.O.OO
```

```
O...
O.XX
O.XX
XXXX
```

```
X
```

Constraints

- $1 \leq N \leq 10^6$
- $1 \leq S \leq 10^6$
- $1 \leq r_i, c_i \leq N$ for all i

Subtasks

Number	Points	Constraints
1	16	$N, S \leq 200$
2	24	$N, S \leq 2000$
3	21	$N \leq 2000$ and $S \leq 10^5$
4	25	$N, S \leq 10^5$
5	14	None