DMOPC '15 Contest 6 P3 - Harvest

Time limit: 1.0s **Memory limit:** 128M

FatalEagle is a diligent farmer who owns an $N \times M$ potato field with exactly one potato on each unit square. Unfortunately, life isn't easy for **FatalEagle**: while he was away trading on the market, some farmers who were jealous of his bountiful land came and destroyed some of his potatoes. These mysterious foes worked in a methodical manner, destroying some potatoes from every column of the farm. In the i^{th} column $(1 \leq i \leq M)$, the jealous farmers destroyed all the potatoes from row a_i to row b_i $(1 \leq a_i \leq b_i \leq N)$, inclusive.

When the time came for the annual harvest, **FatalEagle** found that he was too busy plotting his revenge. However, he still needs to harvest at least K potatoes to feed his family. So he decided that he would buy a tractor of width W, drive it through his field horizontally exactly once, and collect any of the remaining potatoes from W consecutive rows.

FatalEagle doesn't have a lot of money to spend on a tractor, so he would like to know the minimal W so that he can harvest at least K potatoes.

Constraints

Subtask 1 [20%]

$1 \leq N, M \leq 100$

$0 \leq K \leq 10\,000$

Subtask 2 [30%]

$1 \leq N, M \leq 3\,000$

$0 \leq K \leq 9\,000\,000$

Subtask 3 [50%]

$1 \leq N, M \leq 200\,000$

$0 \leq K \leq 4 \times 10^{10}$

Input Specification

The first line of input will contain three space-separated integers, N, M, and K.

The next M lines will each contain two space-separated integers, a_i and b_i.

Output Specification

Output one integer, the minimal W such that **FatalEagle** can still harvest at least K potatoes. If it is impossible, output `-1`.

Sample Input 1

```
5 5 6
2 5
1 3
4 5
3 3
1 2
```

Sample Output 1

```
2
```

Explanation for Sample Output 1

The field looks like this, where `P` represents a potato:

```
P.PP.
..PP.
..P.P
.P.PP
.P.PP
```

With a tractor of width 2, **FatalEagle** can harvest the last two rows for exactly 6 potatoes.

Sample Input 2

```
3 4 7
2 3
1 2
1 3
2 2
```

Sample Output 2

```
-1
```

Explanation for Sample Output 2

Poor **FatalEagle** only has 4 potatoes left, and therefore cannot feed his family.