C. Cyclic Coloring

time limit per test: 4 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given a **directed** graph G with n vertices and m arcs (**multiple arcs and self-loops** are allowed). You have to paint each vertex of the graph into one of the k $(k \le n)$ colors in such way that for all arcs of the graph leading from a vertex u to vertex v, vertex v is painted with the *next color* of the color used to paint vertex u.

The colors are numbered cyclically 1 through k. This means that for each color i $(i < k)$ its next color is color $i+1$. In addition, the next color of color k is color 1. Note, that if $k = 1$, then the next color for color 1 is again color 1.

Your task is to find and print the largest possible value of k $(k \le n)$ such that it's possible to color G as described above with k colors. Note that you don't necessarily use all the k colors (that is, for each color i there does not necessarily exist a vertex that is colored with color i).

Input

The first line contains two space-separated integers n and m $(1 \le n, m \le 10^5)$, denoting the number of vertices and the number of arcs of the given digraph, respectively.

Then m lines follow, each line will contain two space-separated integers a_i and b_i $(1 \le a_i, b_i \le n)$, which means that the i-th arc goes from vertex a_i to vertex b_i.

Multiple arcs and self-loops are allowed.

Output

Print a single integer — the maximum possible number of the colors that can be used to paint the digraph (i.e. k, as described in the problem statement). Note that the desired value of k must satisfy the inequality $1 \le k \le n$.

Examples

input

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

output

```
2
```

input

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

output

```
5
```

input

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

output

```
3
```

input

```
4 4
1 1
1 2
2 1
1 2
```

output

```
1
```

Note

For the first example, with $k=2$, this picture depicts the two colors (arrows denote the next color of that color).

With $k=2$ a possible way to paint the graph is as follows.

It can be proven that no larger value for k exists for this test case.

For the second example, here's the picture of the $k=5$ colors.

A possible coloring of the graph is:

For the third example, here's the picture of the $k=3$ colors.

A possible coloring of the graph is: