

# Cyclic Topsort

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            **3 seconds**  
Memory limit:         **256 megabytes**

You are given a directed graph with  $n$  vertices and  $m$  edges. Your task is to find the length of the longest sequence  $a$  of distinct integers from 1 to  $n$  such that the following condition holds:

- Let  $l$  be the length of  $a$ . Then for all integers  $i \in [2, l]$  and all vertices  $v$  such that there exists an edge  $(v, a_i)$ , there exists an index  $j < i$  such that  $a_j = v$ .

## Input

First line contains 2 integers  $n, m$  ( $2 \leq n \leq 3 \cdot 10^5, 0 \leq m \leq 3 \cdot 10^5$ ) — number of vertices and edges of the graph.

Next  $m$  lines contain pairs of integers  $u_i, v_i$  ( $1 \leq u_i, v_i \leq n$ ) — edges of the graph. The graph is allowed to have loops and multiple edges.

## Output

In the first line, output the maximal length of the correct sequence  $l$ .

## Examples

standard input	standard output
5 0	5
5 5 1 2 3 2 2 4 3 5 5 3	5
3 3 1 1 2 2 3 3	1

## Note

In the first sample case, one of the correct sequences could be  $\{1, 2, 3, 4, 5\}$ .

In the second sample case, one of the correct sequences could be  $\{3, 5, 1, 2, 4\}$ .

In the third sample case, one of the correct sequences could be  $\{1\}$ . Sequences  $\{2\}$  and  $\{3\}$  also satisfy the conditions of the problem.