

Cyclic Topsort

Input file: **standard input**
Output file: **standard output**
Time limit: 1.5 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.