Problem L
Directed Hanoi

The 3rd Universal Cup, Stage 40: Potyczki. Limits: 1024 MB, 2 s. *21.06.2025*

The game board for the game of Directed Hanoi consists of N pegs numbered from 1 to N. Between some pairs of pegs there are directed edges, always leading from a peg with a lower number to a peg with a higher number. Initially, on peg 1 there are K disks sized from 1 to K, arranged (from bottom to top) from largest to smallest. The goal of the game is to move all the disks onto peg number N.

In a single move, you can take the disk that is on the top of some peg A and place it on the top of any other peg B, to which there exists a path from peg A (not necessarily a single edge), provided that peg B is either empty, or the disk currently on top of peg B is larger than the disk being moved. It does not matter what disks are on the pegs along the path from A to B.

Your task is, given a Directed Hanoi board, to determine the largest K for which there exists a way to achieve the game's goal (i.e., to move all K disks onto peg N). It can be proven that the maximum number of disks is always finite.

Input

The first line of input contains two integers: N ($2 \le N \le 500$) and M ($0 \le M \le N(N-1)/2$), representing the number of pegs and the number of edges, respectively.

Each of the next M lines describes one edge, consisting of two integers, a_i and b_i ($1 \le a_i < b_i \le N$), meaning that pegs a_i and b_i are connected by a directed edge. Each pair of pegs appears at most once in the input.

Output

Output a single integer — the largest possible K such that when playing Directed Hanoi on the pegs described in the input, it is possible to move K disks from peg 1 to peg N.

Example

For the input:
```
5 4
1 2
2 3
3 4
4 5
```
the correct output is:
```
5
```

For the input:
```
6 8
1 2
2 3
3 6
1 4
4 5
5 6
2 5
1 6
```
the correct output is:
```
5
```

For the input:
```
2 0
```
the correct output is:
```
0
```

Explanation of examples:

In the first example, a sample sequence of moves transferring 5 disks from peg 1 to peg 5 looks like this:

Peg 1	54321	5432	543	543	54	5						
Peg 2		1	1		3	3	3	3	3			
Peg 3			2	21	21	21	21	21	2	2		
Peg 4					4	4		1	1	1		
Peg 5						5	54	54	543	5432	54321

In the third example, there are no edges, so it is not possible to move any disk.