

Problem A: Alien Attack

Time limit: 3 seconds

The Trisolaran¹ fleet has arrived and is about to conquer every major city on earth. Two dozen droplet shaped strong interaction probes rest in orbit and make sure that no human escapes into space. The only unsuspecting means of transport for humans are groundcars and thus cities are solely connected by streets.

Nevertheless, there remains one slight glimmer of hope for humanity: Trisolarans cannot lie and thus their strategy is obvious. Analysts of the Planetary Defence Council (PDC) in New York discovered the following. Every day Trisolaris targets a city and uses its strong interaction droplets to wipe it out along with all the streets that are incident. To inflict maximal damage, they will always target the city with the most connecting streets. Moreover, if the Trisolarans have to choose between multiple equally well connected cities, they (like any civilized society) prefer smaller indices. To graciously grant the PDC more time to surrender, New York will be targeted last (no matter its number of streets). If at any time, a city cannot reach New York, the Earth-Trisolaris Organization (ETO) will erase them on the same day and the city is lost as well.

You are asked by the rotating chair of the PDC how much time they have left. The invasion starts tomorrow. Hesitation will inevitably lead to the extinction of humanity.

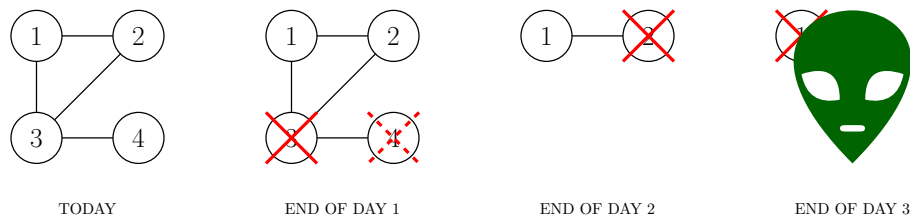


Figure A.1: Visualization of Sample Input 2. A red mark indicates that a city was erased on this day and a dashed red mark indicates cities that are lost to the ETO.

Input

The input consists of:

- One line containing two integers n and m ($1 \leq n \leq 2 \cdot 10^5$ and $n - 1 \leq m \leq 5 \cdot 10^5$), the number of cities and streets, respectively.
- m lines, each with two integers u and v ($1 \leq u, v \leq n$ and $u \neq v$) indicating a street between cities u and v .

It is guaranteed that the street network is connected, simple, and without self-loops. New York is the city number one.

Output

Print the number of days until New York is targeted by a strong interaction droplet.

¹Trisolarans are a species native to Trisolaris, the only planet in the Alpha Centauri System.

Sample Input 1**Sample Output 1**

1 0	1
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Sample Input 2**Sample Output 2**

4 4 1 2 2 3 1 3 3 4	3
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Sample Input 3**Sample Output 3**

10 18 2 3 7 2 10 2 8 2 4 5 9 4 6 5 6 9 7 9 6 4 3 6 9 8 10 3 1 10 3 1 6 7 5 8 7 5	5
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