

Slothful Secretary

Input file: **standard input**
Output file: **standard output**
Time limit: 5 seconds
Memory limit: 256 megabytes

A school has n classrooms, labeled 1 to n . Each pair of rooms has exactly one corridor directly connecting them, but for ease of traffic, these corridors are one-way for students.

The school's secretary has to deliver a memo to the class president of each classroom (each classroom has exactly one). He has a brilliant idea that helps him avoid work—he can give multiple memos to some class president, and task that class president with doing the delivery for him. A class president can deliver a memo to some other classroom if they can walk through the corridors to reach that other classroom and then walk through the corridors to return to their original classroom. A class president is willing to do as many deliveries as is requested of them—again, so long as it is possible for them to return to their original classroom when all is done.

A set of class presidents is called complete if the secretary can distribute the memos among the class presidents in this set, and task them with deliveries such that every classroom can receive a memo. Find the minimum possible size of a complete set of class presidents.

Actually, you must process q updates. In the initial setup, for each pair (i, j) such that $1 \leq i < j \leq n$, the one-way corridor connecting classrooms i and j is oriented from i to j (that is, you can travel from the lower-numbered room to the higher one). Then, for each update, the direction of a one-way corridor is reversed—give the minimum possible size of a complete set of class presidents after each update.

Input

The first line contains two integers n and q .

The k th of the next q lines contains two integers u_k and v_k . The k th update reverses the direction of the one-way corridor connecting u_k and v_k .

- $1 \leq n, q \leq 5 \cdot 10^5$
- $1 \leq u_k < v_k \leq n$

Output

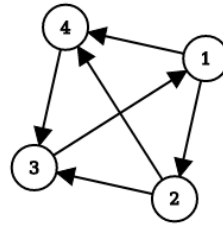
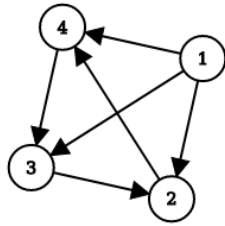
For each update, print one line containing a single integer denoting the answer right after the update.

Example

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

Note

Please refer following images to see how the classroom pathway looks like after second and fourth updates, respectively:



- After the second update, the secretary can deliver 3 memos to the president of class 3, and 1 memo to the president of class 1. The president of class 3 can deliver memos to the presidents of classes 2 and 4 and then come back to class 3.
- After the fourth update, the secretary can deliver 4 memos to the president of class 4. The president of class 4 can deliver memos to all the other presidents and then come back to class 4.