

Problem G. Critical Vertex

Input file: *standard input*
Output file: *standard output*
Time limit: 4 seconds
Memory limit: 1024 mebibytes

You are given a connected undirected graph G with N vertices and M edges where vertices are numbered from 1 to N and edges are numbered from 1 to M .

For each vertex v , if the graph is disconnected after the vertex v is removed, we call v a *critical* vertex. Note that the original connectedness of the graph does not matter.

For each i ($1 \leq i \leq M$), please compute the number of critical vertices in G when edge i is removed. Note that the removal is only temporary, and **does not** affect other queries.

Input

The first line contains two integers N and M ($2 \leq N \leq 250\,000$, $1 \leq M \leq 1\,000\,000$).

In the next M lines, edges of the graph will be given. The i -th line contains two integers x_i and y_i , denoting the edge i connecting vertex x_i and vertex y_i ($1 \leq x_i, y_i \leq N, x_i \neq y_i$). The graph **may have** multiple edges. The graph is connected.

Output

Output M lines. On the i -th line, output a single integer denoting the number of critical vertices in G when edge i is removed.

Example

<i>standard input</i>	<i>standard output</i>
5 5	4
1 5	2
5 2	4
2 3	4
2 4	2
2 5	