

Problem L. Link Cut Digraph

Input file: *standard input*
Output file: *standard output*
Time limit: 3 seconds
Memory limit: 512 mebibytes

After reading the paper *Incremental Topological Ordering and Strong Component Maintenance*, you came up with the following problem.

You are given a graph with n vertices. There are no edges initially. There are m operations. Each operation is first to add a given directed edge to the graph, and then to output the number of pairs (u, v) ($1 \leq u < v \leq n$) such that u is reachable from v and v is reachable from u .

Can you implement the algorithm described in the paper in an ICPC contest?

Input

The first line contains two integers n and m ($1 \leq n \leq 10^5$, $1 \leq m \leq 2.5 \cdot 10^5$).

Each of the following m lines contains two integers u and v ($1 \leq u, v \leq n$) indicating a newly added directed edge. Parallel edges and self-loops are allowed.

Output

Output m integers, one per line: the requested number of pairs after adding each given edge.

Example

standard input	standard output
4 6	0
1 2	0
2 3	1
2 1	1
3 4	2
4 3	6
3 2	