Just Half is Enough

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

Jacob is studying graph theory. Today he learned that a *topological ordering* of a directed graph is a linear ordering of its vertices such that for every directed edge (u, v) from vertex u to vertex v, u comes before v in the ordering.

It is well-known that topological orderings exist only for graphs without cycles. But how do we generalize this concept for arbitrary graphs?

Jacob came up with the concept of a *half-topological ordering*: a linear ordering of the graph's vertices such that **for at least half** of all directed edges (u, v) in the graph, u comes before v in the ordering.

In other words, if the graph has m edges, and for a particular ordering, k of them satisfy the condition above, then the ordering is called *half-topological* if $k \geq \lceil \frac{m}{2} \rceil$.

Help Jacob find any half-topological ordering of the given graph, or report that none exist.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \leq t \leq 10^4$). The description of the test cases follows.

The first line of each test case contains two integers n and m, denoting the number of vertices and the number of edges in the graph ($2 \leq n \leq 10^5$; $1 \leq m \leq 2 \cdot 10^5$).

The i-th of the following m lines contains two integers u_i and v_i, describing an edge from vertex u_i to vertex v_i ($1 \leq u_i, v_i \leq n$; $u_i \neq v_i$). The graph does not contain multiple edges: each directed edge (u, v) appears at most once. However, having both edges (u, v) and (v, u) is allowed.

It is guaranteed that the sum of n over all test cases does not exceed 10^5, and the sum of m over all test cases does not exceed $2 \cdot 10^5$.

Output

For each test case, print a single integer -1 if the required half-topological ordering does not exist.

Otherwise, print n distinct integers $p_1, p_2, \ldots, p_n$, describing the ordering of the given graph ($1 \leq p_i \leq n$). For at least $\lceil \frac{m}{2} \rceil$ of the edges (u_i, v_i), integer u_i must come before integer v_i in this list. If there are multiple answers, print any of them.

Example

standard input	standard output
2 3 3 1 2 2 3 3 1 5 6 4 2 2 1 4 3 1 4 3 2 3 5	1 2 3 3 1 5 4 2