# C. The Bottom of a Graph

Time limit: 0.254s Memory limit: 1536 MB

We will use the following (standard) definitions from graph theory. Let $V$ be a nonempty and finite set, its elements being called vertices (or nodes). Let $E$ be a subset of the Cartesian product $V \times V$, its elements being called edges. Then $G=(V,E)$ is called a directed graph.

Let $n$ be a positive integer, and let $p=(e_1,...,e_n)$ be a sequence of length $n$ of edges $e_i \in E$ such that $e_i=(v_i,v_{i+1})$ for a sequence of vertices $(v_1,...,v_{n+1})$. Then $p$ is called a path from vertex $v_1$ to vertex $v_{n+1}$ in $G$ and we say that $v_{n+1}$ is reachable from $v_1$, writing $(v_1 \to v_{n+1})$.

Here are some new definitions. A node $v$ in a graph $G=(V,E)$ is called a sink, if for every node $w$ in $G$ that is reachable from $v$, $v$ is also reachable from $w$. The bottom of a graph is the subset of all nodes that are sinks, i.e., $bottom(G)=\{v \in V | \forall w \in V:(v \to w) \Rightarrow (w \to v)\}$. You have to calculate the bottom of certain graphs.

## Input Specification

The input contains several test cases, each of which corresponds to a directed graph $G$. Each test case starts with an integer number $v$, denoting the number of vertices of $G=(V,E)$, where the vertices will be identified by the integer numbers in the set $V=\{1,...,v\}$. You may assume that $1 <= v <= 5000$. That is followed by a non-negative integer $e$ and, thereafter, $e$ pairs of vertex identifiers $v_1,w_1,...,v_e,w_e$ with the meaning that $(v_i,w_i) \in E$. There are no edges other than specified by these pairs. The last test case is followed by a zero.

## Output Specification

For each test case output the bottom of the specified graph on a single line. To this end, print the numbers of all nodes that are sinks in sorted order separated by a single space character. If the bottom is empty, print an empty line.

## Sample Input

```
3 3
1 3 2 3 3 1
2 1
1 2
0
```

## Sample Output

```
1 3
2
```

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