

Problem H: Hansel and Gretel

Time limit: 2 seconds



HANSEL and Gretel's parents are very poor. One night, Gretel overheard their parents discuss that they lack the money to feed their children. Reluctantly, they decide to abandon Hansel and Gretel in the nearby forest, which can be described as an undirected graph. Each vertex in the graph represents a clearing in the forest, whereas each edge represents a pathway that connects exactly two clearings. The graph is not necessarily connected.

To foil their parents' plan, Hansel and Gretel decide to chop down some trees to form a new clearing that serves as a point of orientation, so that they can find the way back to their parents house. In order to find this newly created clearing more easily, Hansel and Gretel may also create new pathways connecting the newly created clearing to some previously existing clearings. However, they cannot create pathways between two previously existing clearings.

After walking for a few hours inside the forest, Hansel and Gretel cannot tell the clearings apart anymore – they only know which pairs of clearings are connected by a pathway. In graph theoretic terms, they forgot the initial vertex labels and now they can only work with an isomorphic copy of the former graph.

Hansel and Gretel need your help to identify the clearing created by them, so that they can escape the forest and find back to their parents' house.



While the forest is a beautiful piece of nature, it is easy to get lost. Public Domain on [Art Institute of Chicago](#)

Input

This is a multi-pass problem. The submitted program will be invoked two times. The time limit is enforced separately for each pass. In the first pass, the input is a graph representing the initial layout of the forest. The program must decide which clearings should be connected by pathways to the new clearing created by Hansel and Gretel. In the second pass, the input is a graph representing the forest layout after creating a new clearing and connecting it to the other clearings according to the output of the first pass. In particular, the input of the second pass depends on the output of the first pass.

The input consists of:

- One line with an integer which is either 1 or 2, indicating the current pass.
- One line with two integers n and m , the number of clearings and the number of pathways.
- m lines with two integers u and v ($1 \leq u, v \leq n$, $u \neq v$), representing the pathways.

In the first pass, the bounds for n and m are $2 \leq n \leq 10^5$ and $0 \leq m \leq 2 \cdot 10^5$. In the second pass, a new clearing is added along with the d pathways from the program's output. If n' and m' were the values of n and m in the first pass, then in the second pass it holds that $n = n' + 1$ and $m = m' + d$.

It is guaranteed that each pair of clearings is connected by at most one pathway and that no clearing is connected to itself.

Output

In the first pass, output the number of clearings d ($0 \leq d \leq n$) to which the newly created clearing should be connected by a pathway, followed by d distinct integers v_1, \dots, v_d ($1 \leq v_i \leq n$ for each i), the labels of the clearings connected to the new clearing.

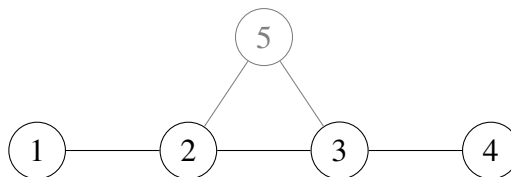
You may create at most one pathway between the new clearing and each other clearing. Furthermore, the newly created clearing can not be connected to itself.

In the second pass, output the label of the clearing that has been added in the first pass.

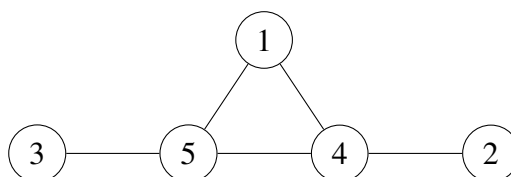
A testing tool is provided to help you develop your solution.

Sample Input 1 (Pass 1)	Sample Output 1 (Pass 1)
1	2
4 3	3 2
1 2	
2 3	
4 3	
Sample Input 1 (Pass 2)	Sample Output 1 (Pass 2)
2	1
5 5	
4 1	
2 4	
3 5	
5 1	
4 5	

Consider the first pass of the sample. Initially, the forest consists of four clearings connected by three pathways. Hansel and Gretel add a new clearing and connect it to the clearings labelled 2 and 3. In the following visualization, this new clearing is labelled 5:



The input to the second pass describes the forest layout after adding the new clearing and the new pathways. However, the clearings are labelled differently:



From the graph structure, it can be inferred that the clearing with label 1 is the clearing which Hansel and Gretel added in pass 1.