

# C. NP-Hard Problem

time limit per test: 2 seconds  
memory limit per test: 256 megabytes  
input: standard input  
output: standard output

Recently, Pari and Arya did some research about NP-Hard problems and they found the minimum vertex cover problem very interesting.

Suppose the graph  $G$  is given. Subset  $A$  of its vertices is called a vertex cover of this graph, if for each edge  $uv$  there is at least one endpoint of it in this set, i.e.  $u \in A$  or  $v \in A$  (or both).

Pari and Arya have won a great undirected graph as an award in a team contest. Now they have to split it in two parts, but both of them want their parts of the graph to be a vertex cover.

They have agreed to give you their graph and you need to find two **disjoint** subsets of its vertices  $A$  and  $B$ , such that both  $A$  and  $B$  are vertex cover or claim it's impossible. Each vertex should be given to no more than one of the friends (or you can even keep it for yourself).

## Input

The first line of the input contains two integers  $n$  and  $m$  ( $2 \leq n \leq 100\,000$ ,  $1 \leq m \leq 100\,000$ ) — the number of vertices and the number of edges in the prize graph, respectively.

Each of the next  $m$  lines contains a pair of integers  $u_i$  and  $v_i$  ( $1 \leq u_i, v_i \leq n$ ), denoting an undirected edge between  $u_i$  and  $v_i$ . It's guaranteed the graph won't contain any self-loops or multiple edges.

## Output

If it's impossible to split the graph between Pari and Arya as they expect, print "-1" (without quotes).

If there are two disjoint sets of vertices, such that both sets are vertex cover, print their descriptions. Each description must contain two lines. The first line contains a single integer  $k$  denoting the number of vertices in that vertex cover, and the second line contains  $k$  integers — the indices of vertices. Note that because of  $m \geq 1$ , vertex cover cannot be empty.

## Examples

input
4 2 1 2 2 3
output
1 2 2 1 3

input
3 3 1 2 2 3 1 3
output
-1

## Note

In the first sample, you can give the vertex number 2 to Arya and vertices numbered 1 and 3 to Pari and keep vertex number 4 for yourself (or give it someone, if you wish).

In the second sample, there is no way to satisfy both Pari and Arya.