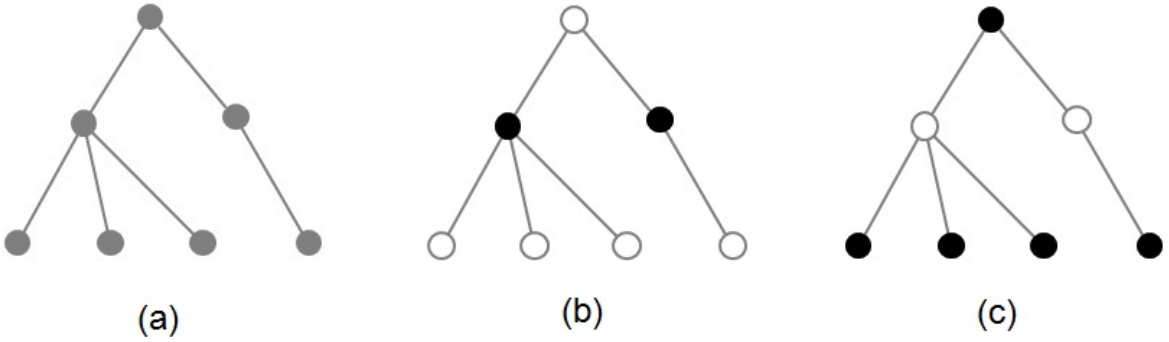
聖誕樹著色問題

Time limit: 1 second / Memory Limit: 256 MB

Problem Description

Christmas is approaching, and your're given a tree $T = (V, E)$ to be decorated, where V is the set of vertices and E is the set of edges connecting the vertices. Since T is a tree, you know that $|E| = |V| - 1$ and T is guaranteed to be connected, i.e., for each pair of vertices $u, v \in V$, there exists a path between u and v.

In the land far far away, people use two colors, black and white, to decorate their Christmas tree, and it is required that adjacent vertices must not share the same color. (相鄰的點不能著相同的顏色) For example, `Figure (b)` and `Figure (c)` below are two valid colorings for the tree given in `Figure (a)`.



Please write a program that produces a valid coloring for the tree T you're given.

Technical Specification

- $1 \leq |V| \leq 10^5$
- The vertices are numbered using integers from 1 to $|V|$.

Input

The first line contains an integer N, the number of vertices in the tree T. Each of the next $N - 1$ lines contains two integers u_i and v_i, which means that there is an edge connecting vertex u_i and vertex v_i in the tree.

Output

Output a valid coloring of the tree. In the first line print the vertices that are to be colored black. In the second line print the vertices that are to be colored white.

Print -1 if there exists no valid colorings. If there are multiple answers, print any of them.

Sample Input	Sample Output
7 1 2 1 3 2 4 2 5 2 6 3 7	1 4 5 6 7