

Task «Tree walks»

Given a binary tree of n vertices, numbered from 1 to n . For each vertex, you are given the numbers of its left and right sons. Print preorder, inorder, and postorder traversals for the given tree.

Input format

The first line of the input contains an integer n – the number of vertices in the tree ($1 \leq n \leq 100'000$).

Each of the next n lines contains two integers l_i and r_i – the numbers of the left and right sons of the vertex numbered i ($0 \leq l_i, r_i \leq n$). The number 0 means that the given vertex does not have a corresponding son.

It is guaranteed that the input describes a valid binary tree.

Output format

Output three lines. On the first line print the preorder traversal, on the second line the inorder traversal, and on the third line the postorder traversal of the given tree.

Sample input:

```
8
8 6
5 3
4 7
0 0
1 0
0 0
0 0
0 0
```

Sample output:

```
2 5 1 8 6 3 4 7
8 1 6 5 2 4 3 7
8 6 1 5 4 7 3 2
```