Task «Binary search tree?»

Given a binary tree of n vertices, numbered from 1 to n. Each vertex contains a key. Check if the given tree is a binary search tree.

Input format

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

The second line contains n non-negative integers separated by spaces – the keys written in the vertices (first the key of the first vertex, then the key of the second, and so on). Numbers do not exceed 10^9.

Each of the next n lines contains two integers l_i and r_i are 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 has no corresponding son.

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

Output format

Print YES if the tree is a binary search tree and NO if not.

Sample input 1:

```
8
3 10 15 11 7 4 18 1
8 6
5 3
4 7
0 0
1 0
0 0
0 0
0 0
```

Sample output 1:

```
YES
```

Sample input 2:

```
8
1 2 3 4 5 6 7 8
8 6
5 3
4 7
0 0
1 0
0 0
0 0
0 0
```

Sample output 2:

```
NO
```