## Query on a tree III

You are given a node-labeled rooted tree with $n$ nodes.
Define the query $(x, k)$ : Find the node whose label is $k$-th largest in the subtree of the node $x$. Assume no two nodes have the same labels.

## Input

The first line contains one integer $n\left(1<=n<=10^{5}\right)$. The next line contains $n$ integers $I_{i}\left(0<=I_{i}<=\right.$ $10^{9}$ ) which denotes the label of the $i$-th node.

Each line of the following $n-1$ lines contains two integers $u, v$. They denote there is an edge between node $u$ and node $v$. Node 1 is the root of the tree.

The next line contains one integer $m\left(1<=m<=10^{4}\right)$ which denotes the number of the queries. Each line of the next $m$ contains two integers $x, k$. $k<=$ the total node number in the subtree of $x$ )

## Output

For each query $(x, k)$, output the index of the node whose label is the $k$-th largest in the subtree of the node $x$.

## Example

## Input:

5
13527
12
23
14
35
4
23
41
32
32

## Output:

5
4
5
5

