D. Tree and Queries

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

You have a rooted tree consisting of n vertices. Each vertex of the tree has some color. We will assume that the tree vertices are numbered by integers from 1 to n. Then we represent the color of vertex v as c_v. The tree root is a vertex with number 1.

In this problem you need to answer to m queries. Each query is described by two integers v_j, k_j. The answer to query v_j, k_j is the number of such colors of vertices x, that the subtree of vertex v_j contains at least k_j vertices of color x.

You can find the definition of a rooted tree by the following link: `http://en.wikipedia.org/wiki/Tree_(graph_theory)`.

Input

The first line contains two integers n and m ($2 \le n \le 10^5$; $1 \le m \le 10^5$). The next line contains a sequence of integers $c_1, c_2, ..., c_n$ ($1 \le c_i \le 10^5$). The next $n - 1$ lines contain the edges of the tree. The i-th line contains the numbers a_i, b_i ($1 \le a_i, b_i \le n$; $a_i \ne b_i$) — the vertices connected by an edge of the tree.

Next m lines contain the queries. The j-th line contains two integers v_j, k_j ($1 \le v_j \le n$; $1 \le k_j \le 10^5$).

Output

Print m integers — the answers to the queries in the order the queries appear in the input.

Examples

input Copy

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

output Copy

```
2
2
1
0
1
```

input Copy

```
4 1
1 2 3 4
1 2
2 3
3 4
1 1
```

output Copy

```
4
```

Note

A subtree of vertex v in a rooted tree with root r is a set of vertices $\{u : dist(r, v) + dist(v, u) = dist(r, u)\}$. Where $dist(x, y)$ is the length (in edges) of the shortest path between vertices x and y.

- Announcement (en)
- Statements #1 (pl)
- Statements #2 (ko)
- Tutorial (en)