# D. Alyona and a tree

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Alyona has a tree with $n$ vertices. The root of the tree is the vertex $1$. In each vertex Alyona wrote an positive integer, in the vertex $i$ she wrote $a_i$. Moreover, the girl wrote a positive integer to every edge of the tree (possibly, different integers on different edges).

Let's define $dist(v, u)$ as the sum of the integers written on the edges of the simple path from $v$ to $u$.

The vertex $v$ controls the vertex $u$ ($v \neq u$) if and only if $u$ is in the subtree of $v$ and $dist(v, u) \leq a_u$.

Alyona wants to settle in some vertex. In order to do this, she wants to know for each vertex $v$ what is the number of vertices $u$ such that $v$ controls $u$.

## Input

The first line contains single integer $n$ ($1 \leq n \leq 2 \cdot 10^5$).

The second line contains $n$ integers $a_1, a_2, ..., a_n$ ($1 \leq a_i \leq 10^9$) — the integers written in the vertices.

The next $(n - 1)$ lines contain two integers each. The $i$-th of these lines contains integers $p_i$ and $w_i$ ($1 \leq p_i \leq n$, $1 \leq w_i \leq 10^9$) — the parent of the $(i + 1)$-th vertex in the tree and the number written on the edge between $p_i$ and $(i + 1)$.

It is guaranteed that the given graph is a tree.

## Output

Print $n$ integers — the $i$-th of these numbers should be equal to the number of vertices that the $i$-th vertex controls.

### Examples

| input |
| --- |
| 5<br>2 5 1 4 6<br>1 7<br>1 1<br>3 5<br>3 6 |

| output |
| --- |
| 1 0 1 0 0 |

| input |
| --- |
| 5<br>9 7 8 6 5<br>1 1<br>2 1<br>3 1<br>4 1 |

| output |
| --- |
| 4 3 2 1 0 |

## Note

In the example test case the vertex $1$ controls the vertex $3$, the vertex $3$ controls the vertex $5$ (note that is doesn't mean the vertex $1$ controls the vertex $5$).