Problem H
Ornaments on a Tree
Time Limit: 4 Seconds, Memory Limit: 2G

You're helping your friend decorate their Christmas tree! Funnily enough, the places to put your ornaments on their Christmas tree can be represented by a (graph-theoretic) tree with nodes labeled 1 to N, with node 1 being the root of the tree and other nodes numbered arbitrarily. You have an infinite supply of ornaments of every non-negative integer weight (including 0), and you must place exactly one ornament on each node of the tree.

However, your friend has some restrictions on how they want their tree decorated. First, they have strong opinions about which ornament must go on some of the tree nodes; you are only allowed to choose decorations on the other nodes. Second, each region of their tree can support only so much weight: if the sum of the weights of the ornaments on a node and all of its immediate children exceeds a constant K, the whole tree will come crashing down!

Your friend wants to know the largest possible total weight of ornaments on their tree, given the above restrictions. Can you help them find out?

Input

The first line of input has two space-separated integers N and K ($1 \leq N \leq 2 \cdot 10^5, 0 \leq K \leq 10^9$), the number of nodes in the tree and the weight constant, respectively.

The next line contains N space-separated integers. The i^{th} integer (starting at $i = 1$) is either -1 or a non-negative integer. If it is -1, you are free to choose any ornament for node i. If it is a non-negative integer w_i ($0 \leq w_i \leq 10^9$), your friend insists you place an ornament with weight w_i on node i.

The next $N - 1$ lines each contain two space-separated integers a and b ($1 \leq a, b \leq N$), indicating that nodes a and b are connected by an edge. The input graph is guaranteed to be a tree: there is a unique path of edges between every pair of nodes in the graph.

Output

If it is impossible to place ornaments on the tree in a way that satisfies all of the constraints described above, print -1. Otherwise, print the maximum possible total weight of the ornaments on the tree, subject to the constraints.

Sample Input 1

```
5 10
-1 2 3 -1 -1
1 2
1 3
2 4
2 5
```

Sample Output 1

```
18
```

Sample Input 2

```
1 5
-1
```

Sample Output 2

```
5
```

Sample Input 3

```
2 5
5 5
1 2
```

Sample Output 3

```
-1
```