

The highest total point

Given a rooted tree with each node has a “point” value. Find a path that has total points of all nodes in the path is highest.

Input

The first line contains two integer n and m which are the number of nodes in the tree and the root of the given tree. Nodes are numbered from 0 to $n - 1$ ($0 \leq m < n \leq 10^5$)

The second line contains n integers which are points of all nodes, respectively.

Each line in the next $(n - 1)$ lines contains two integers a, b which represent an edge in the tree.

Output

An integer representing the highest total point.

Sample

Input

5 0

3 2 4 1 5

0 1

0 2

1 3

1 4

Output

10