Southeastern European Regional Programming Contest
Bucharest, Romania – Vinnytsya, Ukraine
October 20, 2018

Problem C

Tree

Input File: standard input
Output File: standard output
Time Limit: 0.1 seconds (C/C++)
Memory Limit: 256 megabytes

You are given a tree of n vertices, each with a unique number from 1 to n. A vertex has a color, black or white. Choose exactly m black vertices so that the length of the longest path between any of them is minimal.

Input

The first line contains two integers n and m $(1 \leq m \leq n \leq 100)$ — the number of vertices and the number of black vertices you have to choose.

The fourth line contains n integers $p_1, p_2, \ldots, p_n$ $(0 \leq p_i \leq 1)$. If the $p_i = 1$, then the i-th vertex is black; otherwise, it is white. It is guaranteed that the number of black vertices is at least m.

Each of the next $n - 1$ lines contains two integers v_i and u_i $(1 \leq v_i, u_i \leq n)$ meaning that there is an edge between v_i and u_i.

It is guaranteed that the input graph is a tree.

Output

Print a single integer — the answer to the task.

Sample input	Sample output

6 3
1 1 0 1 1 1
1 2
1 3
1 4
3 5
3 6
	2

9 4
1 0 1 0 1 0 0 1 1
1 2
2 4
2 3
4 5
1 6
6 7
6 8
7 9
	5

Note

In the first example, the only option is to choose 1, 2, and 4. The maximum distance will be 2.

In the second example, you can choose 1, 3, 8, and 9. The maximum distance will be between 3 and 9.