Problem F. Find the Maximum

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

A tree with n vertices is a connected undirected graph with n vertices and $n-1$ edges.

You are given a tree with n vertices. Each vertex has a value b_i. Note that for any two vertices there is exactly one single path between them, whereas a simple path doesn't contain any edge more than once. The length of a simple path is considered as the number of edges in it.

You need to pick up a simple path whose length is not smaller than 1 and select a real number x. Let V be the set of vertices in the simple path. You need to calculate the maximum of $\frac{\sum_{u\in V}(-x^2+b_u x)}{|V|}$.

Input

The first line contains a single integer n ($2 \le n \le 10^5$), indicating the number of vertices in the tree.

The second line contains n integers $b_1, b_2, \cdots, b_n$ ($-10^5 \le b_i \le 10^5$), indicating the values of each vertex.

Each line in the next $n-1$ lines contains two integers u, v, indicating an edge in the tree.

Output

The output contains a single real number, indicating the answer.

Your answer will be accepted if and only if the absolute error between your answer and the correct answer is not greater than 10^{-4}.

Example

standard input	standard output
2 3 2 1 2	1.562500