Sum Tree

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

You are given a tree with N nodes. Each node has a values assigned to it, $value_i$. You must calculate the sum of costs for every pair of nodes (u, v), where $gcd(value_u, value_v) > 1$ and $u \neq v$. For a pair of nodes (u, v), we define the cost of that pair to be the sum of value of all the nodes that lie inside the (u, v) path.

Input

The first line of the input will contain N ($1 \leq N \leq 100000$), the number of nodes. The second line will contain N numbers, the i-th number, representing the $value_i$ ($1 \leq value_i \leq 30000$). Each of the next $N - 1$ lines will contain a pair of nodes, (u, v), each representing an edge of the tree.
For tests worth 20 points, ($1 \leq N \leq 1000$).
For tests worth 20 more points, $value_i = value_1$ for $i = 1, 2, ...n$.

Output

The output will contain the sum of costs over all pairs of nodes (u, v), such that $gcd(value_u, value_v) > 1$ and $u \neq v$.

Example

standard input	standard output
5 2 7 14 22 77 1 2 1 3 2 4 4 5	442