Divisible Tree

Input file:	standard input
Output file:	standard output
Time limit:	2 seconds
Memory limit:	256 megabytes

Today is Frikha's birthday , so we all decided to gift him an undirected tree , but not a usual tree , it's tree consisting of n nodes and $n-1$ edges , (a tree is a connected graph which contains no cycle and no loops) , the node 1 is the root of the tree and it's represented by $n-1$ integers which represetns the parents of the nodes 2 , 3 , ... and n (each node and his parent are connected by one edge , and for simplicity $parent[i] \leq i-1$ for all i from 2 to n).

A connected components of the tree , is a set S of nodes of the tree , such for every x , y in S , there exists p nodes in S n_1 , n_2 ... n_p for some p such that there are edges between x and n_1 , n_1 and n_2 .... n_p and y .

Let's suppose the i'th node in the tree has value a_i .

We call a connected components set S is divisble by x if for each node i in the set S we have a_i is divisible by x .

To have more fun in the birthday party , Mtaylor challenged Frikha to find the maximum size of a connected components divisible by some x $(2 \leq x)$, if there are many that have the same size you have to print minimum x possible and the size of the set .

Input

The first line contains one integer n $(1 \leq n \leq 3500)$.

The second line contains n integers a_i $(2 \leq a_i \leq 20000)$.

The third line contains $n-1$ integers p_i $(1 \leq p_i \leq i)$, the i'th integer represents the parents of the node $i+1$.

Output

Print two integers in one line , the minmum x which has the maximum size of connected components divisible by x and the size of such a set .

Examples

standard input	standard output
4 2 3 2 3 1 2 3	2 1
4 2 3 3 3 1 2 3	3 3