Problem E. Equivalence

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	512 megabytes

You are given two trees T_1, T_2, both with n vertices. The lengths of edges of T_1 are given. **The length of each edge is non-negative.**

A tree T with n vertices is good, if there is a way to assign each edge on T_2 with a length which satisfies the following condition:

- For each pair i, j satisfying $1 \le i < j \le n$, the distances of i and j on T and T_2 are the same.

You can perform the following operation on T_1: select an edge on T_1 and replace its length with any **non-negative** integer.

Find the minimum number of operations to make T_1 good.

Input

The first line of input contains a single integer T ($1 \le T \le 8600$), denoting the number of test cases.

For each test case, the first line contains one integer n ($2 \le n \le 10^6$).

The second line contains $n-1$ integers $p_2, p_3, \cdots, p_n$ ($1 \le p_i \le n$).

The third line contains $n-1$ integers $val_2, val_3, \cdots, val_n$ ($0 \le val_i \le 10^9$).

These two lines denotes $n-1$ edges (u, p_u) with weight val_u on T_1.

The fourth line contains $n-1$ integers $p'_2, p'_3, \cdots, p'_n$ ($1 \le p'_i \le n$), denoting $n-1$ edges (u, p'_u) on T_2.

It is guaranteed that $\sum n \le 1.1 \cdot 10^6$.

Output

For each test case, the only line contains one integer denoting the answer.

Example

standard input	standard output
1 5 1 5 2 2 0 2 3 1 5 5 5 1	1