**Total Distance in a Tree**

(Time Limit: 2 seconds)

**Problem Description**

In this problem, you are asked to find the total distance in a tree network. Each edge is associated with a positive edge length, and the distance from a node to the other is the sum of lengths of the edges in the path. The total distance of a network is the total distance summed over all pairs of nodes. The total distance does not exceed 2^32.

**Input Format**

The first line has an integer which indicates the number of test cases. The first line of each test case is an integer *n*, 1 < *n ≤* 5000, which is the number of nodes in this case. The tree is given by a rooted manner. The root is of label 1. The second line of each case consists of *n*-1 integers which are the parents of nodes 2,3,…, and *n* respectively. The third line also consists of *n*-1 integers which are the lengths of the edge between node *i* and its parent for *i* from 2 to *n*. The edge lengths are positive integers at most 100.

**Output Format**

For each case, output the total distance of the tree network in one line.

**Example**

|  |  |
| --- | --- |
| **Sample Input:** | **Sample Output:** |
| 2  4  1 2 3  10 20 30  5  1 1 1 2  20 20 30 30 | 400  880 |