

---

## Problem A. Inner Product

Input file:            **standard input**  
Output file:         **standard output**  
Time limit:          3 seconds  
Memory limit:       256 megabytes

Chiaki has two trees and each tree has  $n$  vertices, labeled by  $1, 2, \dots, n$ . Consider the following two arrays

$$A = [d_1(1, 1), d_1(1, 2), \dots, d_1(1, n), d_1(2, 1), d_1(2, 2), \dots, d_1(2, n), \dots, d_1(n, 1), d_1(n, 2), \dots, d_1(n, n)],$$
$$B = [d_2(1, 1), d_2(1, 2), \dots, d_2(1, n), d_2(2, 1), d_2(2, 2), \dots, d_2(2, n), \dots, d_2(n, 1), d_2(n, 2), \dots, d_2(n, n)],$$

where  $d_1(i, j)$  is the distance between  $i$  and  $j$  on the first tree, and  $d_2(i, j)$  is the distance between  $i$  and  $j$  on the second tree.

Chiaki would like to know the inner product of  $A$  and  $B$ . By the way, the inner product of two arrays  $a = [a_1, a_2, \dots, a_m]$  and  $b = [b_1, b_2, \dots, b_m]$  is defined as  $\sum_{k=1}^m a_k b_k$ .

### Input

There are multiple test cases. The first line of the input contains an integer  $T$ , indicating the number of test cases. For each test case:

The first line contains an integer  $n$  ( $1 \leq n \leq 10^5$ ) — the number of vertices in each tree.

Each of the next  $(n - 1)$  lines contains three integers  $u_i$ ,  $v_i$  and  $w_i$  ( $1 \leq u_i, v_i \leq n$ ,  $1 \leq w_i \leq 10^9$ ) — an edge of length  $w_i$  between vertices  $u_i$  and  $v_i$  on the first tree.

Each of the next  $(n - 1)$  lines contains three integers  $u_i$ ,  $v_i$  and  $w_i$  ( $1 \leq u_i, v_i \leq n$ ,  $1 \leq w_i \leq 10^9$ ) — an edge of length  $w_i$  between vertices  $u_i$  and  $v_i$  on the second tree.

It is guaranteed that the sum of  $n$  in all test cases will not exceed  $10^5$ .

### Output

For each test case, output an integer in a single line, denoting the inner product of  $A$  and  $B$  modulo  $(10^9 + 7)$ .

### Example

standard input	standard output
1 2 1 2 3 1 2 4	24