

Dwarf

Description

As a friend of *Happy Tree*, ATP is given a tree with n nodes as a gift.

For each node, there is a dwarf on it. Now he wants to pick a node to bring them together. The cost of a node is the sum of distances of each dwarf moved. Can you help him to find out the cost for each node?

Input

The first line contains a integer T indicating the total number of test cases. Each test case begins with one integer n , denoting the number of the nodes. Following are $n - 1$ lines, each containing three integers a, b, c , indicating there is an edge between a and b with length c .

- $1 \leq T \leq 1000$
- $2 \leq n \leq 10^5$
- $1 \leq a, b \leq n$
- $1 \leq c \leq 1000$
- There are at most 5 test cases with $n > 1000$

Output

For each test case, output the n integer in a single line, where the i -th integer indicates the answer of i -th node.

Sample Input

```
2
6
1 3 3
2 3 5
3 4 7
4 5 10
4 6 2
2
1 2 514
```

Sample Output

```
53 61 41 41 81 49
514 514
```