



# Tree Flow

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Problem

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Recall that a tree is an undirected, connected acyclic graph. We have a weighted tree,  $T$ , with  $n$  vertices; let  $dist_{u,v}$  be the total sum of edge weights on the path between nodes  $u$  and  $v$ .

Let's consider all the matrices,  $A_{u,v}$ , such that:

- $A_{u,v} = -A_{v,u}$
- $0 \leq |A_{u,v}| \leq dist_{u,v}$
- $\sum_{i=1}^n A_{u,i} = 0$  for each  $u \neq 1$  and  $u \neq n$

We consider the *total value* of matrix  $A$  to be:

$$\sum_{i=1}^n A_{1,i}$$

Calculate and print the maximum total value of  $A$  for a given tree,  $T$ .

## Input Format

The first line contains a single positive integer,  $n$ , denoting the number of vertices in tree  $T$ .

Each line  $i$  of the  $n - 1$  subsequent lines contains three space-separated positive integers denoting the respective  $a_i$ ,  $b_i$ , and  $c_i$  values defining an edge connecting nodes  $a_i$  and  $b_i$  (where  $1 \leq a_i, b_i \leq n$ ) with edge weight  $c_i$ .

## Constraints

- $2 \leq n \leq 500000$
- $1 \leq c_i \leq 10^4$
- Test cases with  $n \leq 10$  have **30%** of total score
- Test cases with  $n \leq 500$  have **60%** of total score

## Output Format

Print a single integer denoting the maximum total value of matrix  $A$  satisfying the properties specified in the *Problem Statement* above.

## Sample Input

```
3
1 2 2
1 3 1
```

## Sample Output

```
3
```

**Explanation**

In the sample case, matrix  $A$  is:

$$A = \begin{pmatrix} 0 & 2 & 1 \\ -2 & 0 & 2 \\ -1 & -2 & 0 \end{pmatrix}$$

The sum of the elements of the first row is equal to **3**.



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Max Score: 80

Difficulty: Hard

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```
1 import java.io.*;
2 import java.util.*;
3 import java.text.*;
4 import java.math.*;
5 import java.util.regex.*;
6
7 public class Solution {
8
9     public static void main(String[] args) {
10         /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution. */
11     }
12 }
```

Line: 1 Col: 1

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