Christmas Concert

Description

Nozomi will hold a concert on Christmas Eve. The audiences will come from n cities. More specifically, they know that there will be w_i audiences coming from the i-th city.

$n-1$ two-way roads connect these n cities in form of a binary tree. It takes one unit time to travel from one city to another city if they are directly connected by a road.

As an assistant, Kyaru is asked to choose the best city to hold the concert, where the sum of time that it takes for each audience to get to the concert is minimized.

Input

The first line contains an integer n, indicating the number of cities.

Assume the first city to be the root of the tree, the i-th line of the following n lines contains three integers w_i, l_i, r_i , where l_i, r_i represents the indices of the two cities which are the two children of i-th city in this binary tree. Specially, $l_i = 0$ or $r_i = 0$ means the i-th city doesn't have the corresponding child.

Output

One integer indicating the minimum sum of time.

Sample Input/Output

Input

```
5
13 2 3
4 0 0
12 4 5
20 0 0
40 0 0
```

Output

```
81
```

Constraint

$1 \leq n \leq 5000, 0 \leq w_i \leq 10^5$.