

Misc [II]

time limit per test: 1 second (5 seconds for Python)
memory limit per test: 384 megabytes
input: standard input
output: standard output
points: 100 · problem code: misc2 · author: glipR

Treetown is a town of various suburbs connected by main roads. The roads have been constructed in such a way that:

- Every suburb can be reached by taking these roads from suburb to suburb
- Between any two suburbs, there is only a single path connecting the two
- All roads are bidirectional

The nature of this construction means that a single road failure leads to a disconnection of the town, causing major delays. You'd like to analyse the possible impact of removing a road from Treetown.

Every road in Treetown has a distance d_j . For any pair of suburbs a, b in Treetown, we compute the contribution to the Treetown economy as

$$\sum_{i \in R} d_i$$

Where R is the collection of roads on the path from a to b . For example, take the following graph, with 4 suburbs, a, b, c, d and 3 roads from a to b , b to c and c to d , of lengths 1, 3 and 4.

Then for the suburb pairing a and c , the contribution to productivity is

$$1 + 3 = 4,$$

summing the roads from a to b and b to c .

In this problem, we want you to assess the reduction in productivity after removing a single road (in other words, summing the productivity contribution of suburb pairings that are connected via the removed road.)

For example, removing the edge b to c would remove pairings ac, ad, bc, bd , which contribute $4 + 8 + 3 + 7 = 22$ productivity.

Input

Input will begin with a single integer N , representing the number of suburbs. $N - 1$ lines will follow. Each line will contain 3 space separated integers, i j and d . This means there is a road from i to j of distance d .

Finally, a single integer x will follow. This represents a (1-indexed) index of one of the roads just inputted.

Output

Output should contain a single integer - the hit to productivity removing road x would cause.

Constraints

- $1 \leq N \leq 2 \times 10^5$
- $1 \leq d \leq 10^3$

Example

Input

Taking the example in the statement, this can be written as:

```
4
1 2 1
2 3 3
3 4 4
2
```

Output

For which the output should be

22

as discussed previously.