Ticket to Ride

by zemen

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Simon received the board game Ticket to Ride as a birthday present. After playing it with his friends, he decides to come up with a strategy for the game.

There are n cities on the map and $n-1$ road plans. Each road plan consists of the following:

- Two cities which can be directly connected by a road.
- The length of the proposed road.

The entire road plan is designed in such a way that if one builds all the roads, it will be possible to travel between any pair of cities.

A ticket enables you to travel between two different cities. There are m tickets, and each ticket has a cost associated with it. A ticket is considered to be *useful* if there is a path between those cities.

Simon wants to choose two cities, u and v, and build a *minimal* number of roads so that they form a simple path between them. Let s_t be the sum of costs of all *useful* tickets and s_r be the sum of lengths of all the roads Simon builds. The profit for pair (u, v) is defined as $s_t - s_r$. Note that u and v are not necessarily unique and may be the same cities.

Given n road plans and m ticket prices, help Simon by printing the value of his maximum possible profit on a new line.

Input Format

The first line contains single positive integer, n, denoting the number of cities.
Each of the $n-1$ subsequent lines contains three space-separated integers describing the respective values of u, v, and l for a road plan, where $1 \leq u, v \leq n$, and $u \neq v$. Here, u and v are two cities that the road plan proposes to connect and l is the length of the proposed road.
The next line contains a single positive integer, m, denoting the number of tickets.
Each of the m subsequent lines contains three space-separated integers describing the respective values of u, v, and c for a ticket from city u to city v (where c is the cost of the ticket).

Constraints

- $1 \leq n \leq 2 \times 10^5$
- $1 \leq m \leq 10^5$
- $1 \leq l, c \leq 10^9$

Output Format

Print a single integer denoting the the maximum profit Simon can make.

Time Limits

- 6 seconds for Java and C#.
- Please refer to our Environment page to see time limits for other languages.

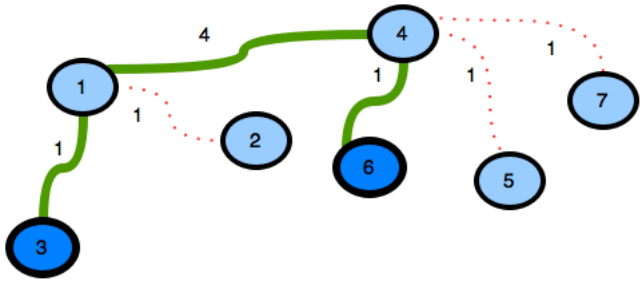
Sample Input

```
7
1 2 1
1 3 1
1 4 4
4 5 1
4 6 1
4 7 1
5
5 7 3
3 6 2
3 4 10
2 7 15
1 6 7
```

Sample Output

```
13
```

Explanation



Simon can maximize his profit by choosing the pair $(3, 6)$.

The roads on the path between them are $(3, 1)$, $(1, 4)$, and $(4, 6)$. The total road length is $s_r = 1 + 4 + 1 = 6$.

The useful tickets are $(3, 6)$, $(3, 4)$, and $(1, 6)$. The total ticket cost is $s_t = 2 + 10 + 7 = 19$.

The profit is $s_t - s_r = 19 - 6 = 13$.

Submissions:42

Max Score:100
Difficulty: Expert

Rate This Challenge:

More

Current Buffer (saved locally, editable) Java 7

```
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 }
13
```

Line: 1 Col: 1

Upload Code as File Test against custom input Run Code Submit Code