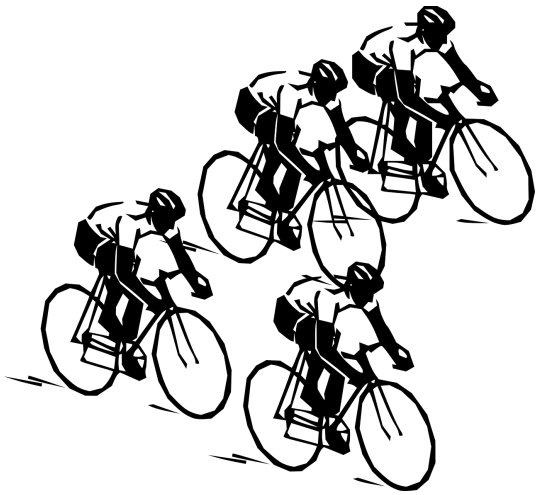
Tour de Treeland (tourdetree)

In the distant future the organizers of Tour de France have relocated the competition to Treeland. Treeland consists of N cities, numbered from 1 to N, and $N-1$ bidirectional roads numbered from 1 to $N-1$. Road i connects city a_i to city b_i and has length c_i. It's possible to reach every city from every other city using these roads. Due to strange socio-economical factors the cities with only one road adjacent to them have become *metropolises*.



The rules of the competition are the following:

1. The cyclists start from a *metropolis* chosen by the organizers.
2. They visit *all cities* using the roads in some way. They may visit the same city and use the same road multiple times.
3. They finish in a *metropolis* chosen by the organizers.

The organizers choose K metropolises, where K is either 1 or 2. If $K = 1$, then the chosen metropolis is used to start as well as to finish the race. If $K = 2$, then two different metropolises are chosen, one of them serving as the start, the other as the finish of the race.

Given the map of Treeland and the value of K, what is the minimum total length of the roads the cyclists have to cycle through from start to finish, if both the organizers and the cyclists want to minimize this sum?

> ☞ Among the attachments of this task you may find a template file `tourdetree.*` with a sample incomplete implementation.

Input

The first line contains two integers N and K. The next $N-1$ lines contains three integers each, the numbers a_i, b_i and c_i for road i.

Output

You need to write a single line with an integer: the minimal sum of road lengths that the cyclists need to traverse.

Constraints

- $2 \leq N \leq 100\,000$.
- $1 \leq K \leq 2$.
- $1 \leq a_i \neq b_i \leq N$ for each $i = 1 \ldots N - 1$.
- $1 \leq c_i \leq 1\,000\,000\,000$ for each $i = 1 \ldots N - 1$.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

– **Subtask 1** (0 points) Examples.

– **Subtask 2** (20 points) $N \leq 300$ and $c_i \leq 10^6$.

– **Subtask 3** (30 points) $N \leq 2000$ and $c_i \leq 10^6$.

– **Subtask 4** (50 points) No additional limitations.

Examples

input	output
3 1 1 2 4 2 3 5	18
4 2 1 2 10 2 3 10 2 4 11	41

Explanation

In the **first sample case** the value of K is 1. Choosing the metropolis with index 1 results in the cyclists taking the path $1 \to 2 \to 3 \to 2 \to 1$ which has a length of $4 + 5 + 5 + 4 = 18$.

In the **second sample case** $K = 2$, and it is optimal to choose metropolises 1 and 4.