

Problem F. Milk Tea



Ballon:
Time limit: 1 seconds
Memory limit: 512 megabytes

Suika is a big fan of Taiwanese milk tea, she can even drink a big glass of this beverage every single day, sometimes two. After the last academic year, she is awarded as the highest-performing student of the whole school. To celebrate this achievement, her parrents decide to give her a trip to Taiwan so that she can joyfully relax and prepare for the next year.

Suika of course plans to drink as much milk tea as she can while she is in Taiwan. However, if just trying some milk tea is not enough for her. After a long time thinking, she tells her parrents that she will try milk tea in every town she travel. She also has a very clear plan for the towns she will visit. But she is only a little girl and this is the first time she travels to a foreign country without her parrents, so **Suika** just keeps a shortest list of roads to travel between those towns. Suppose there are N cities she wishes to visit, she only know $N - 1$ bidirectional roads for simplicity (poor little girl). She numbers those towns from 1 to N and decide that she will visit those in order (from 1 to N). It means, she will visit town 1 and drink a glass of milk tea, go for sightseeing, then visit town 2, drink milk tea again.

To traverse a specific road, she will need to have a valid train ticket. There are 2 types of ticket for travelling, in the i -th train route, single-pass ticket which costs C_{i_1} Taiwan dollar, and multi-pass ticket which costs C_{i_2} dollar. For each train route, she can decide to buy a single-pass ticket each time she needs to get in, or she might buy a multi-pass ticket once.

Let's help **Suika** to find the smallest amount for Taiwan dollars she will have to spend so that she can fully enjoy her trip.

Input

The first line contains and integer N ($2 \leq N \leq 10^5$) for task description.

In the next $N - 1$ lines: there are 4 integer number $A_i, B_i, C_{i_1}, C_{i_2}$ which represents that towns A_i and B_i are connected with a train route, with ticket prices C_{i_1} and C_{i_2} . Data safety ($1 \leq A_i, B_i \leq N, 1 \leq C_{i_1}, C_{i_2} \leq 100000$).

Output

A single line output the smallest cost of her travel.

Examples

standard input	standard output
5 1 2 1 3 1 3 1 4 2 4 2 3 3 5 2 3	11
5 1 2 3 5 1 3 2 3 1 4 1 3 1 5 2 3	12

Note

in Testcase1, this sample is straightforward, **Suika** needs to travel 4 routes with 4, 3, 2, 1 times in order.

Thus, she will buy multi-pass for route 1 and 3, single-pass for route 2 and 4.

Cost: $3 + 3 \times 1 + 3 + 1 \times 2 = 11$