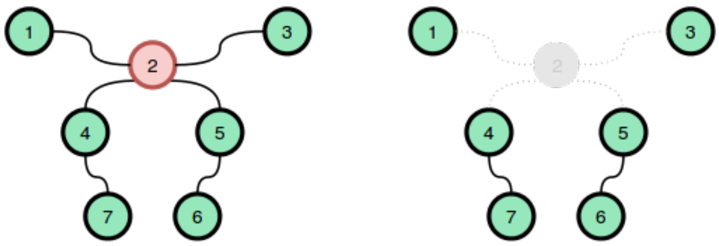
Magic Number Tree

James has a tree with n nodes $n-1$ edges where the i^{th} edge has a length, w_i. He wants to play a game involving n moves. During each move, he performs the following steps:

- Randomly chooses some node x_i from the tree. Each node has an equal probability of being chosen.
- Calculates the distance from node x_i to each node reachable from x_i using one or more edges.
- Deletes node x_i.

For example, the diagram below shows what happens when we choose a random node and delete it from the tree:



After n moves, the tree is empty and the game ends.

James defines the magic number, m, as the sum of all numbers calculated in step 2 of each move. Let E_m be the expected value of m.

Give the tree's edges and their respective lengths, calculate and the print the value of $(E_m \times n!) \bmod (10^9+9)$. It is guaranteed that $E_m \times n!$ is an integer.

Input Format

The first line contains an integer, n, denoting the number of nodes.
Each of the $n-1$ subsequent lines contains three space-separated integers describing the respective values of u_i, v_i, and w_i, meaning that there is an edge of length w_i connecting nodes u_i and v_i.

Constraints

- $1 \le n \le 5000$
- $1 \le u_i, v_i \le n$
- $1 \le w_i \le 10^9$

Subtasks

- For 30% of the max score $n \le 10$
- For 60% of the max score $n \le 400$

Output Format

Print a single integer denoting the value of $(E_m \times n!) \bmod (10^9+9)$.

Sample Input

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3
2 1 2
3 2 3
```

Sample Output

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50
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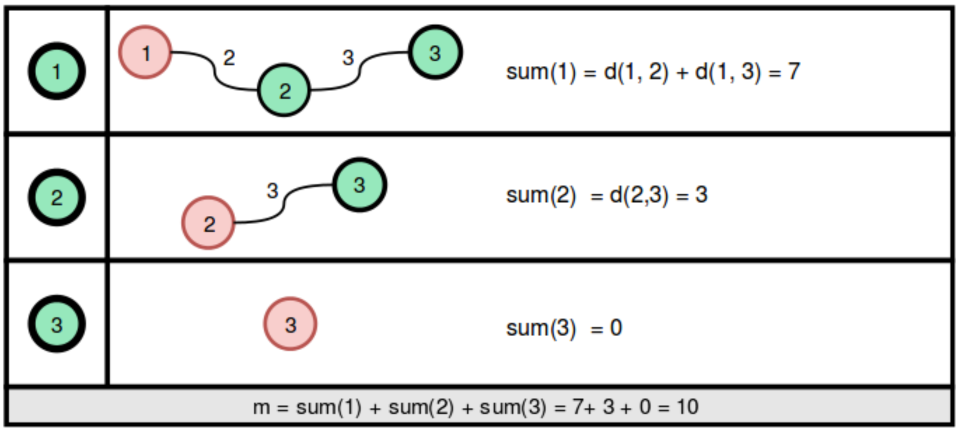
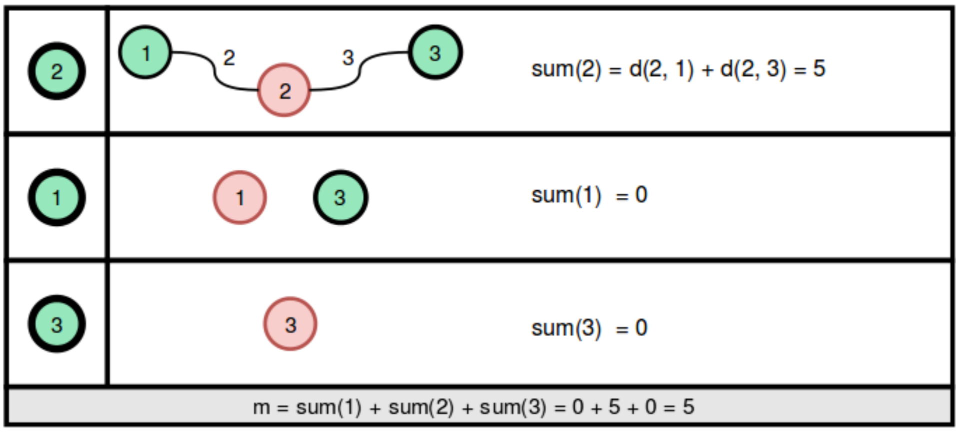
Explanation

Let $d(u, v)$ be the distance between node u and node v. Here are the 6 different variants:

1. $(x_1, x_2, x_3) = (1, 2, 3)$



2. $(x_1, x_2, x_3) = (2, 1, 3)$



3. $(x_1, x_2, x_3) = (1, 3, 2)$. $m = 7 + 3 + 0 = 10$
4. $(x_1, x_2, x_3) = (2, 3, 1)$. $m = 0 + 5 + 0 = 5$
5. $(x_1, x_2, x_3) = (3, 1, 2)$. $m = 2 + 0 + 8 = 10$
6. $(x_1, x_2, x_3) = (3, 2, 1)$. $m = 0 + 2 + 8 = 10$

The expected value of the magic number is $E_m = \frac{50}{6}$. We then print the value of $(E_m \times n!) \bmod (10^9 + 9) = (\frac{50}{6} \times 3!) \bmod (10^9 + 9) = 50$.