A Game On Tree

Input file: `standard input`
Output file: `standard output`
Time limit: 2 seconds
Memory limit: 1024 megabytes

There is a tree (a connected undirected graph with n nodes and $n-1$ edges) consisting of n nodes, with nodes numbered from 1 to n. Clearly, there is a unique simple path between any two nodes in the tree.

Xiaohong and Xiaolan are playing a game on this tree. In each game, both players **independently and uniformly** select a random simple path from all $\frac{n(n-1)}{2}$ simple paths (regardless of direction) that exist in the tree. Note that they may choose the same path. Let X denote the number of edges that are common to both selected paths, and the score of the game is X^2.

Your task is to find the expected value of the score $E(X^2)$ when Xiaohong and Xiaolan play the game once, and output the result modulo 998244353 (see the output format for details).

Input

The first line contains a positive integer T ($1 \le T \le 10^4$), representing the number of test cases.

For each test case, the first line contains a positive integer n ($2 \le n \le 10^5$), representing the number of nodes in the tree.

The next $n-1$ lines each contain two positive integers u, v ($1 \le u, v \le n$), indicating that there is an edge between nodes u and v. The input is guaranteed to be a tree.

The sum of all n over all test cases does not exceed 10^6.

Output

For each test case, output a single integer, representing the answer modulo 998244353.

Formally, let $M = 998244353$. It can be shown that the answer can be expressed as an irreducible fraction $\frac{p}{q}$, where p and q are integers and $q \not\equiv 0 \pmod{M}$. Output the integer equal to $p \cdot q^{-1} \pmod{M}$, where q^{-1} denotes the modular multiplicative inverse of q modulo M. In other words, output such an integer x that $0 \le x < M$ and $x \cdot q \equiv p \pmod{M}$. It can be proved that there is exactly one x which meets the condition.

Example

standard input	standard output
2 3 1 2 2 3 5 1 2 1 5 3 2 4 2	443664158 918384806

Note

For the first test case in the example, the answer without taking the modulo is $\frac{10}{9}$.

Among the 9 possible cases:

- In 2 cases, the number of common edges between the two paths is 0;
- In 6 cases, the number of common edges between the two paths is 1;

- In 1 case, the number of common edges between the two paths is 2.

Therefore, the answer is $E(X^2) = \frac{2 \cdot 0^2 + 6 \cdot 1^2 + 1 \cdot 2^2}{9} = \frac{10}{9}$.