D. Many-hued Tree

Problem ID: D

There is a tree with N nodes numbered from 1 to N. For each $i = 1, \ldots, N-1$, the i-th edge connects node u_i and node v_i.

You are going to paint all nodes in distinct colors. Colors are represented by integers between 1 and N. The assignment of colors on the tree is called good, if it is possible to complete the following operation $N-1$ times repeatedly.

- Select a pair of colors (A, B) which satisfies the following two conditions.
  - $|A - B| = 1$.
  - There exists an edge which connects a node painted in color A and a node painted in color B.
- Change the color of all nodes currently painted in color A to color B.

Your task is to count the number of good assignments of colors on the tree modulo $998,244,353$.

Input

The input consists of a single test case of the following format.

$$
\begin{aligned}
&N \\
&u_1\ v_1 \\
&u_2\ v_2 \\
&\vdots \\
&u_{N-1}\ v_{N-1}
\end{aligned}
$$

The first line consists of an integer N. Each of the $N-1$ lines consists of two integers u_i, v_i represent the edges of the tree.

- $1 \leq N \leq 2000$
- $1 \leq u_i, v_i \leq N$
- The given graph is guaranteed to be a tree.

Output

Output in a line the number of assignments of colors on the given tree modulo $998,244,353$.

Sample Input 1	Sample Output 1
4 1 2 2 3 3 4	16

Sample Input 2	Sample Output 2
4 1 2 1 3 1 4	24