

# Vertex Cover

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            1 second  
Memory limit:         512 megabytes

You are given a tree with  $n$  vertices. Initially all vertices are white. You're going to perform the following operation for several times:

- Choose a vertex at random, and paint it black.

Note that you may paint a vertex black for more than once.

Your process ends when the black vertices forms a **vertex cover**. A vertex cover of a graph  $\langle V, E \rangle$  is a set of vertices  $S$  such that  $\forall (u_i, v_i) \in E, u_i \in S$  or  $v_i \in S$ .

You want to know the expected number of operations you will do.

## Input

The first line contains one integer  $n$  ( $2 \leq n \leq 5000$ ), represent the number of vertices of the tree.

The following  $n - 1$  lines, each line contains two integers  $u, v$ , represents an edge of the tree.

## Output

One integer, output the expected number of operations you will do, module 998244353.

Formally, it can be proven that the answer is a rational number  $\frac{P}{Q}$ , where  $\gcd(P, Q) = 1$ . You need to output  $P \cdot Q^{-1} \bmod 998244353$

## Examples

standard input	standard output
5 1 2 1 3 2 4 2 5	83187034
2 1 2	1

## Note

For the second example, whichever vertex we choose for the first time, it will absolutely form a vertex cover. So the answer is 1.