

# Tree Shuffling

Input file:            **standard input**  
Output file:         **standard output**  
Time limit:          3 seconds  
Memory limit:       256 megabytes

Froggy has an unrooted tree  $T$  with  $n$  vertices, where each vertex has an initial weight. Initially, the weight of vertex  $i$  is  $i$ .

Froggy can perform at most 1 operation sequentially as follows:

- Select several distinct vertices  $x_1, x_2, \dots, x_k$ , such that for  $i = 1, 2, \dots, k - 1$ , there exists an edge in tree  $T$  connecting vertex  $x_i$  and vertex  $x_{i+1}$ .
- From the set  $x_1, x_2, \dots, x_k$ , choose an even number of vertices  $u_1, u_2, \dots, u_{2l}$  (vertices can be chosen repeatedly). For  $i = 1, 2, \dots, l$ , sequentially swap the weights of vertex  $u_{2i-1}$  and vertex  $u_{2i}$ .

Let  $a_i$  denote the weight of vertex  $i$  after all operations. How many distinct sequences  $a_1, a_2, \dots, a_n$  can Froggy obtain? Output the answer modulo 998244353.

## Input

The first line contains a positive integer  $T$  ( $1 \leq T \leq 10^3$ ), indicating the number of test cases.

For each test case, the first line contains an integer  $n$  ( $1 \leq n \leq 3000$ ), representing the number of vertices in the tree.

The next  $n - 1$  lines each contain two positive integers  $x, y$  ( $1 \leq x, y \leq n, x \neq y$ ), representing the two endpoints of an edge in tree  $T$ .

It is guaranteed that the sum of  $n$  over all test cases in a single test point does not exceed  $1.5 \times 10^4$ .

## Output

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

## Example

standard input	standard output
3	23
5	80
1 2	155
1 3	
1 4	
1 5	
6	
1 2	
1 3	
1 4	
2 5	
2 6	
6	
1 2	
2 3	
2 4	
3 5	
4 6	