Problem A. Graph Partitioning

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	1024 megabytes

Little Cyan Fish and Xiao Qing Yu are two good friends. Each of them has a rooted tree with n vertices. Each vertex is labeled from 1 to n. Recall that a tree is an undirected graph in which any two vertices are connected by exactly one path, or equivalently, a connected acyclic undirected graph. Let's denote $par_T(x)$ as the parent vertex of x in the tree T.

The tree owned by Little Cyan Fish is called T_1. It has the following properties:

- $T_1(V_1, E_1)$ is a tree rooted at vertex 1.
- $\forall 2 \le x \le n$, the index of the parent of x should be less than x.
  - Formally, $par_{T_1}(x) < x$ for all $2 \le x \le n$.

The tree owned by Xiao Qing Yu is called T_2. It has the following properties:

- $T_2(V_2, E_2)$ is a tree rooted at vertex n.
- $\forall 1 \le x < n$, the index of the parent of x should be greater than x.
  - Formally, $par_{T_2}(x) > x$ for all $1 \le x < n$.

Since they are good friends, they want to merge their own trees into a larger graph. Suppose $G = (V, E)$ is the new graph merged by their trees:

- V is the same as V_1 and V_2. In other words, the new graph also contains n vertices, and each vertex is labeled from 1 to n.
- E is the union of E_1 and E_2. If some edge appears in E_1 and E_2 simultaneously, it will appear in E twice.

Now you are given all the edges in G. Your task is to calculate how many different pairs of trees (T_1, T_2) could generate such a graph G. Two trees are considered different if and only if there exists an edge e that appears in one of the trees but not in the other one. Note that edges in G may appear more than once, and multiple edges are treated as different edges.

Since the answer can be quite large, you only need to output it modulo 998 244 353.

Input

The first line of the input contains a single integer n ($1 \le n \le 5 \times 10^5$).

The next $2n - 2$ lines of the input describe the edges in E. The i-th line contains two integers u_i and v_i, indicating an edge $(u_i, v_i) \in E$. Note that if some edge appears in E_1 and E_2 simultaneously, it will appear in E twice.

Note that there might be multiple edges or self-loops in the graph. And it is possible that there's no valid pair of (T_1, T_2).

Output

Print a single line contains a single integer, indicating the answer modulo 998 244 353.

Examples

standard input	standard output
2 1 2 1 2	2
1	1
3 1 2 2 3 1 3 2 2	0
6 3 4 1 3 3 5 1 6 6 5 4 2 5 4 1 2 4 1 5 3	2

Note

In the first test case, note that multiple edges might exist. Since the two edges are different, so there are two possible pairs of (T_1, T_2).

In the second test case, it is possible that the graph is empty. In this case, making both G_1 and G_2 empty is a possible choice.

In the third test case, note that there might be self-loops.