D. Number Of Permutations

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given a sequence of n pairs of integers: $(a_1, b_1), (a_2, b_2), \ldots, (a_n, b_n)$. This sequence is called bad if it is sorted in non-descending order by first elements or if it is sorted in non-descending order by second elements. Otherwise the sequence is good. There are examples of good and bad sequences:

- $s = [(1, 2), (3, 2), (3, 1)]$ is bad because the sequence of first elements is sorted: $[1, 3, 3]$;
- $s = [(1, 2), (3, 2), (1, 2)]$ is bad because the sequence of second elements is sorted: $[2, 2, 2]$;
- $s = [(1, 1), (2, 2), (3, 3)]$ is bad because both sequences (the sequence of first elements and the sequence of second elements) are sorted;
- $s = [(1, 3), (3, 3), (2, 2)]$ is good because neither the sequence of first elements $([1, 3, 2])$ nor the sequence of second elements $([3, 3, 2])$ is sorted.

Calculate the number of permutations of size n such that after applying this permutation to the sequence s it turns into a good sequence.

A permutation p of size n is a sequence $p_1, p_2, \ldots, p_n$ consisting of n distinct integers from 1 to n ($1 \le p_i \le n$). If you apply permutation $p_1, p_2, \ldots, p_n$ to the sequence $s_1, s_2, \ldots, s_n$ you get the sequence $s_{p_1}, s_{p_2}, \ldots, s_{p_n}$. For example, if $s = [(1, 2), (1, 3), (2, 3)]$ and $p = [2, 3, 1]$ then s turns into $[(1, 3), (2, 3), (1, 2)]$.

Input

The first line contains one integer n ($1 \le n \le 3 \cdot 10^5$).

The next n lines contains description of sequence s. The i-th line contains two integers a_i and b_i ($1 \le a_i, b_i \le n$) — the first and second elements of i-th pair in the sequence.

The sequence s may contain equal elements.

Output

Print the number of permutations of size n such that after applying this permutation to the sequence s it turns into a good sequence. Print the answer modulo 998244353 (a prime number).

Examples

input

```
3
1 1
2 2
3 1
```

output

```
3
```

input

```
4
2 3
2 2
2 1
2 4
```

output

```
0
```

input

```
3
1 1
1 1
2 3
```

output Copy

```
4
```

Note

In first test case there are six permutations of size 3:

1. if $p = [1, 2, 3]$, then $s = [(1, 1), (2, 2), (3, 1)]$ — bad sequence (sorted by first elements);
2. if $p = [1, 3, 2]$, then $s = [(1, 1), (3, 1), (2, 2)]$ — bad sequence (sorted by second elements);
3. if $p = [2, 1, 3]$, then $s = [(2, 2), (1, 1), (3, 1)]$ — good sequence;
4. if $p = [2, 3, 1]$, then $s = [(2, 2), (3, 1), (1, 1)]$ — good sequence;
5. if $p = [3, 1, 2]$, then $s = [(3, 1), (1, 1), (2, 2)]$ — bad sequence (sorted by second elements);
6. if $p = [3, 2, 1]$, then $s = [(3, 1), (2, 2), (1, 1)]$ — good sequence.