

Problem A. Automorphism

Input file: *standard input*
Output file: *standard output*
Time limit: 8 seconds
Memory limit: 512 mebibytes

You are given a rooted tree. Initially, it contains one vertex labeled as 1.

Your task is to process m operations of two types:

- Add a new vertex to the tree.
- Calculate the number of automorphisms of the subtree rooted at vertex u .

As the numbers can be very large, find them modulo 998 244 353.

For a rooted tree, whose root is r and vertex set is S , the automorphism is a bijection $f : S \rightarrow S$ such that $f(r) = r$ and $\forall u, v \in S$, $f(u)$ is the parent of $f(v)$ if and only if u is the parent of v .

Input

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

In the following m lines, each line indicates an operation. Each of these lines contains two integers t and x ($0 \leq t \leq 1$).

If $t = 0$, add a new vertex labeled by the current maximum label plus 1. Add an edge between this new vertex and the vertex x .

If $t = 1$, calculate the number of automorphisms of the subtree of vertex x .

It is guaranteed that, for each operation, the value of x is between 1 and the current maximum label.

Output

For each calculate operation, print a single line with the number of automorphisms modulo 998 244 353.

Example

standard input	standard output
10	2
0 1	2
0 1	6
1 1	6
0 2	
0 3	
1 1	
0 3	
0 3	
1 3	
1 1	