Problem G

Electric Circuit

Time limit: 2 seconds
Memory limit: 512 megabytes

You are given an electric circuit consisting of a sequence of infinity switches, aligned in a row and labeled from left to right starting from 0.

Each switch can be in one of two states: **ON (closed)** or **OFF (open)**. All switches are initially OFF.

You are told the following rule of interaction between adjacent switches:

- If a switch transitions **from OFF to ON**, it has **no effect** on other switches.
- If a switch transitions **from ON to OFF**, it will **cause the switch immediately to its right** to toggle its current state (i.e., ON $\rightarrow$ OFF or OFF $\rightarrow$ ON).

You plan to perform m operations. The i-th operation toggles the state of switch a_i ($0 \le a_i \le n$):

- If it is ON, it becomes OFF (and may cause a chain reaction to the right, per the rule above).
- If it is OFF, it becomes ON.

Let the **cost** of an operation be defined as the **number of switches whose state was changed** (including both the directly toggled switch and any affected ones to the right via propagation).

However, each operation is **executed with a certain probability**:

- The i-th operation is executed with probability $p_i = \frac{u_i}{v_i}$.
- Otherwise, it is skipped with probability $1 - p_i$.

You are required to compute the **expected total cost** of all m operations.

Let the expected value be $E = \frac{P}{Q}$, where P and Q are coprime integers. Output the value:

$$(P \cdot Q^{-1}) \bmod 998244353$$

where Q^{-1} denotes the modular inverse of Q modulo 998244353.

Input

The first line contains two integers n, m ($1 \le n, m \le 2 \cdot 10^5$) - the upper bound of a_i and the number of operations.

The next m lines each contain three integers a_i, u_i, v_i ($0 \le a_i \le n$, $0 \le u_i < 998244353$, $1 \le v_i < 998244353, u_i \le v_i$) - the position of the switch, and the probability of executing the i-th operation as a rational fraction $p_i = \frac{u_i}{v_i}$.

Note

The number of switches is infinite, n is just the upper bound of a_i in the input.

Output

Print a single integer - the value of $P \cdot Q^{-1} \bmod 998244353$, where $\frac{P}{Q}$ is the expected total cost of all operations.

Sample Input	Sample Output
3 3 0 1 2 1 1 2 2 1 2	499122178
100 5 0 100 333 0 333 666 0 666 1234 1 1234 1235 2 1235 1236	610769569