

Problem D. Interval

Input file: *standard input*
Output file: *standard output*
Time limit: 4 seconds
Memory limit: 512 mebibytes

You are given n intervals, the j -th of which is $I_j = [l_j, r_j]$.

Define the beauty of $[L, R]$ as the length covered by $\bigcup_{i=L}^R [l_i, r_i]$.

You are given m queries, the i -th of which is $[A_i, B_i]$, and you need to answer:

If we uniformly sample $[L_i, R_i]$ from all possible integer pairs such that $A_i \leq L_i \leq R_i \leq B_i$, what is the expected value of the beauty of $[L_i, R_i]$?

Find the answers modulo 998 244 353.

Input

The first line contains two integers n and m ($1 \leq n, m \leq 2 \cdot 10^5$).

Each of the following n lines contains two integers l_j and r_j ($0 \leq l_j < r_j \leq 10^8$).

Each of the following m lines contains two integers A_i and B_i ($1 \leq A_i \leq B_i \leq n$).

Output

Output m lines, each of which contains the answer for a query modulo 998 244 353.

Formally, it can be shown that the expected beauty can be represented as a fraction p/q for some coprime non-negative integers p and q . You have to print the value $p \cdot q^{-1} \bmod 998\,244\,353$.

Example

standard input	standard output
2 1 1 5 4 8 1 2	5

Note

The size of input and output is large. Remember to use fast input and output methods to avoid getting a “Time Limit Exceeded”.