

## 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”.