

## Problem C. Unseen Segments

Input file: *standard input*  
Output file: *standard output*  
Time limit: 2 seconds  
Memory limit: 256 mebibytes

Consider a two-dimensional grid with  $n$  vertical segments on it. There are two observers, one on the west and one on the east, standing at points on the X axis which are infinitely far from the segments.

Each observer has an x-ray vision of some non-negative integer power that allows him to look through segments. A point of a segment can be seen with vision of power  $p$  if there are no more than  $p$  other segments crossing the straight line between the observer and this point. We say that a part of a segment is *invisible* if it is not seen by any of the observers.

You are given  $q$  queries. Each query contains two integers: the power of vision of the west and the east observer, respectively. For each query, you need to determine the total length of the invisible parts over all segments.

### Input

The first line contains one integer  $n$  ( $1 \leq n \leq 10^5$ ), the number of segments.

The  $i$ -th of the following  $n$  lines contains three integers  $x_i$ ,  $a_i$ , and  $b_i$  ( $1 \leq x \leq 10^9$ ,  $1 \leq a_i < b_i \leq 10^9$ ), which describe placement of the  $i$ -th segment: its endpoints have coordinates  $(x_i, a_i)$  and  $(x_i, b_i)$ . It is guaranteed that each segment has positive length and no two segments share a common point.

The next line contains one integer  $q$  ( $1 \leq q \leq 10^5$ ), the number of queries.

Each of the following  $q$  lines contains two integers  $l$  and  $r$  ( $0 \leq l \leq r \leq 10^5$ ), the power of vision of the west and the east observer in this query, respectively.

### Output

Output  $q$  lines, one integer per line: the answers for the corresponding queries.

### Example

standard input	standard output
6	4
1 1 5	0
2 1 2	0
3 1 3	0
4 2 6	
5 3 4	
6 4 7	
4	
0 0	
1 1	
0 1	
1 0	

## Note

In the first query, the western observer fully sees the first segment, the part of the fourth segment at Y-coordinates  $[5, 6]$ , and the part of the sixth one at Y-coordinates  $[6, 7]$ .

The eastern observer fully sees the fifth and the sixth segments, the part of the fourth segment at Y-coordinates  $[2, 3]$ , and the part of the third one at Y-coordinates  $[1, 2]$ .

The parts that remain invisible: the complete second segment, the part of the third one at Y-coordinates  $[2, 3]$ , and the part of the fourth one at Y-coordinates  $[3, 5]$ . Their total length is  $1 + 1 + 2 = 4$ .

In all other queries, there are no invisible parts.

