Competitive Programming SS23

Submit until end of contest

Problem: fences (3.0 second timelimit)

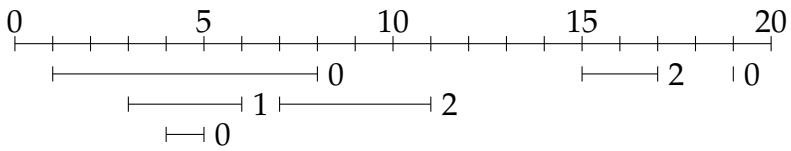
Note: This is a problem that is harder to solve than usual. Solve the other problems first before spending too much time on this one.

Alice is famous in Byteland for her creative fence paintings. Even the King, Giga Byte II, has heard of her paintings. Since the king has the biggest (height 1m, width 10^{12}m) and most precious fence of them all, he has hired Alice to paint it.

The King gave Alice the start and end position of a segment of the fence, along with a color to paint it in. However, since he didn't like the painted result, he gave Alice another such paint order, and another one, ...(he is not a very decisive king). Till, one day he shouted "This is it! It's a true masterpiece now!".

Giga Byte now wants to find out how much area of the fence is occupied by each color, so he can remember what mixture satisfies him. Note that a color that is placed on top of another color will cover the underlying color completely. Since Alice is too exhausted from all this painting, she wants you to help her determine the areas.

The following picture illustrates the sample input.



Input The first line of the input contains two integers n ($1 \leq n \leq 10^5$), the number of available colors and m ($1 \leq m \leq 10^5$), the number of paint orders.

The next m lines each describe a paint order using three integers: the start position l and end position r in meters ($1 \leq l \leq r \leq 10^{12}$) as well as a color c ($0 \leq c < n$). Such an order means that Alice is supposed to paint the closed interval $[l, r]$ using color c.

Output The output consists of n lines, containing the integers $a_0, a_1, \ldots, a_{n-1}$, where a_i is the area of fence that is occupied by color i after Alice has executed all the paint orders.

Sample input

```
3 6
1 8 0
3 6 1
4 5 0
7 11 2
15 17 2
19 19 0
```

Sample output

```
4
2
6
```