Problem I
Interval Cover

Time limit: 1 second

Memory limit: 2048 megabytes

Problem Description

Ian has a multiset S of intervals on the number axis, i-th of which is $[l_i, r_i]$. Surprisingly, he found that every interval is within the $[0, l]$ range, where l is Ian's favorite positive integer.

As Ian thinks everything should be perfectly balanced, he wants to add the minimum number of intervals to S, so that the same number of intervals cover every non-integer coordinate between 0 and l. The newly added intervals should also be within the $[0, l]$ range. Let $f(S)$ be the minimum number of intervals to be added. Note that S is not changed after calculating $f(S)$.

For example, consider the case that S contains intervals $[0, 3], [2, 8], [7, 10]$ and $l = 10$. Then Ian can add 3 intervals $[0, 2], [3, 7], [8, 10]$ to S, and then every non-integer coordinate between 0 and 10 are covered by 2 intervals. Therefore $f(S) = 3$ in this case.

Due to the instability of S, Ian observes that S is prone to change. He wonders if the value of $f(S)$ can be changed. More formally, there are q queries of three types:

1. 1 ql_i qr_i —Add an interval $[ql_i, qr_i]$ to S.
2. 2 ql_i qr_i —Remove an occurrence of $[ql_i, qr_i]$ from S. It is guaranteed that $[ql_i, qr_i]$ appears in S at lease once.
3. 3 —Ian wants to know the value of $f(S)$.

Can you help Ian answer all the queries?

Input Format

The first line of the input contains two integers n, l. The i-th of the following n lines contains two integers l_i, r_i.

The following line contains an integer q. The i-th of the following q lines contains the i-th query in the format as in the problem description.

Output Format

For each query of type 3, print the value of $f(S)$ in one line.

Technical Specification

- $1 \leq n, l \leq 2 \times 10^5$
- $0 \leq l_i < r_i \leq l$ for $i = 1, 2, \ldots, n$
- $1 \leq q \leq 2 \times 10^5$
- $0 \leq ql_i < qr_i \leq l$ for $i = 1, 2, \ldots, q$ of query type $1, 2$
- It is guaranteed that there is at least one query of type 3 in the input.

Sample Input 1

```
5 10
0 3
3 4
4 10
0 7
7 10
7
3
1 1 6
3
1 0 1
3
2 4 10
3
```

Sample Output 1

```
0
2
1
2
```