F. MEX Queries

time limit per test: 2 seconds
memory limit per test: 256 megabytes

You are given a set of integer numbers, initially it is empty. You should perform n queries.

There are three different types of queries:

- `1` l r — Add all missing numbers from the interval $[l, r]$
- `2` l r — Remove all present numbers from the interval $[l, r]$
- `3` l r — Invert the interval $[l, r]$ — add all missing and remove all present numbers from the interval $[l, r]$

After each query you should output *MEX* of the set — the smallest positive (*MEX* ≥ 1) integer number which is not presented in the set.

Input

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

Next n lines contain three integer numbers t, l, r ($1 \leq t \leq 3, 1 \leq l \leq r \leq 10^{18}$) — type of the query, left and right bounds.

Output

Print *MEX* of the set after each query.

Examples

input Copy

```
3
1 3 4
3 1 6
2 1 3
```

output Copy

```
1
3
1
```

input Copy

```
4
1 1 3
3 5 6
2 4 4
3 1 6
```

output Copy

```
4
4
4
1
```

Note

Here are contents of the set after each query in the first example:

1. $\{3, 4\}$ — the interval $[3, 4]$ is added
2. $\{1, 2, 5, 6\}$ — numbers $\{3, 4\}$ from the interval $[1, 6]$ got deleted and all the others are added
3. $\{5, 6\}$ — numbers $\{1, 2\}$ got deleted

→ **Last submissions**

Submission	Time	Verdict
311466591	Mar/20/2025 03:55	Accepted
311465785	Mar/20/2025 03:35	Accepted
311459471	Mar/20/2025 00:52	Wrong answer on test 5
311426377	Mar/19/2025 18:37	Wrong answer on test 7
311425023	Mar/19/2025 18:25	Wrong answer on test 7
311420802	Mar/19/2025 17:48	Wrong answer on test 7
311419666	Mar/19/2025 17:39	Wrong answer on test 7
311419401	Mar/19/2025 17:37	Wrong answer on test 1
311416341	Mar/19/2025 17:13	Wrong answer on test 7
311415618	Mar/19/2025 17:08	Wrong answer on test 7

→ **Problem tags**

binary search | data structures | trees | *2300

No tag edit access

→ **Contest materials**

- Announcement
- Tutorial