Duck Hunt 5

Input file:	`standard input`
Output file:	`standard output`
Time limit:	0.5 seconds
Memory limit:	1024 megabytes

Brian Xiao the literal child, being a duck hunt addict, is wary about other peoples' duck hunt stats. Today, he will monitor the activity of users on the duck hunt channel. Initially, no one is online. N events will happen in total, of which there are 3 types:

- 1 x: A user with x points comes online.
- 2 x: A user with x points goes offline. It is guaranteed there is an online user with x points when this event happens.
- 3 x: Among all the online users' points, he wants to know the minimum points which are at least x, or if such a user does not exist.

Please help him with his queries!

Input

The first line of input contains one integer N.

N lines follow, with each line representing an event of the following types:

- 1 x
- 2 x
- 3 x

as stated above. x is guaranteed to be a positive integer.

Output

For each type 3 event, on a new line, output the minimum points among the online users that are at least x, or -1 if no such user exists.

Scoring

For all testcases, it is guaranteed that

- $1 \leq N \leq 2 \times 10^5$
- $1 \leq x \leq 10^9$
- All values in the inputs are integers.

Subtask	Score	Additional constraints
1	20	$1 \leq N \leq 10^3$
2	50	All users have distinct points
3	30	No additional constraints
4	0	Sample Testcases

Example

standard input	standard output
5 1 3 1 2 3 2 2 2 3 2	2 3

Note

For the sample testcase:

After the first event, the points of users online are (3).

After the first 2 events, the points of users online are $(2, 3)$.

The answer to the third event, which asked for the minimum points which are at least 2, is 2.

After the fourth event, the points of users online are (3).

The answer to the fifth event, which asked for the minimum points which are at least 2, is 3.