

BST Problem

time limit per test: 2 seconds
memory limit per test: 488.3 megabytes
input: standard input
output: standard output
points: 1 · problem code: bstproblem

Problem Statement

You are given n queries, each of the following form, either:

- SEARCH x where x is some integer, or
- INSERT x where x is some integer. Imagine you start with an empty collection of numbers. When you see INSERT x you should add x to your collection of numbers. Every time you see SEARCH x you should determine the first thing less than or equal to x in your collection of numbers.

Input Format

Your first line will contain n . Your next n lines will contain one query each.

Output Format

For each SEARCH x query you should output the first thing less than or equal to x in your current collection of numbers. If there is nothing less than or equal to x , output -1 .

Constraints

- $1 \leq n \leq 10^5$
- $-10^9 \leq a_i \leq 10^9$

Sample Cases

Input 1

```
7
INSERT 10
SEARCH 9
INSERT 3
INSERT 4
INSERT 8
SEARCH 3
SEARCH 7
```

Output 1

```
-1
3
4
```