

Potato Factory

Time limit: 1s

Welcome to the potato factory!

You have to implement a few functions:

- **SetHealthy X**: Set that potato numbered **X** is healthy and is put into the healthy sack.
- **CheckHealthy X**: Check if potato numbered **X** is present in the healthy sack. Print “YES” if present, “NO” else(quotes for clarity).
- **Healthy X**: If potatoes in healthy sack are put in sorted order according to their numbers print the number of **Xth** potato in such order. If no such potato exists output “NONE”(quotes for clarity).
- **RottenBefore X**: Print the count of elements in healthy sack with numbers strictly less than **X**.

Input

- Each line contains queries.
- Stop processing queries when “Quit” is input.

Output

For each query of any type except “SetHealthy” output the required answer.

Constraints

- Total queries $\leq 2 \cdot 10^5$
- $1 \leq X \leq 10^9$

Example

Input:

```
CheckHealthy 1
SetHealthy 1
SetHealthy 5
SetHealthy 3
SetHealthy 6
CheckHealthy 1
CheckHealthy 3
Healthy 3
Healthy 6
RottenBefore 3
RottenBefore 6
RottenBefore 9
Quit
```

Output:

```
NO
YES
YES
5
NONE
1
3
4
```