

# Sushi Belt Lab

time limit per test: 1 second (5 seconds for Python)  
memory limit per test: 976.6 megabytes  
input: standard input  
output: standard output  
points: 100 · problem code: sushibeltlab

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At the Sushi Belt Lab, plates move on a circular belt. Each plate has an integer flavor value.

You need to process events on the current belt order.

- **SHIFT**  $k$  : rotate the belt by  $k$  positions to the right (if  $k$  is negative, rotate left).
- **REVERSE** : reverse the order of all sushi on the belt. After this operation, what was previously the right endpoint becomes the left endpoint, and what was previously the left endpoint becomes the right endpoint.
- **SEASON**  $d$  : add  $d$  to every plate's flavor value.
- **TAKE**  $c$  : remove one plate from an endpoint and print its current value.
  - $c = L$  means the left endpoint.
  - $c = R$  means the right endpoint.

It is guaranteed that every **TAKE** operation is valid.

## Input

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The first line contains two integers  $N$  and  $Q$ , the initial number of plates and the number of operations.

The second line contains  $N$  integers  $v_1, v_2, \dots, v_N$ , the initial flavor values from left to right.

Each of the next  $Q$  lines is one operation in one of the following formats:

- **SHIFT**  $k$
- **REVERSE**
- **SEASON**  $d$
- **TAKE**  $c$

## Output

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For each **TAKE** operation, print one line with the removed plate's current flavor value.

## Constraints

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- $1 \leq N \leq 10^5$
- $1 \leq Q \leq 4 \cdot 10^4$
- $-10^9 \leq v_i \leq 10^9$
- $-10^9 \leq d \leq 10^9$
- $-10^9 \leq k \leq 10^9$
- Throughout all operations, every plate value fits in signed 64-bit integer range.

## Example 1

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### Input

```
5 8
3 1 4 1 5
TAKE L
SEASON 2
SHIFT 1
TAKE R
REVERSE
TAKE L
SHIFT -2
TAKE R
```

### Output

```
3
3
6
7
```

### Explanation

The belt evolves as:

- Start: [3, 1, 4, 1, 5]
- TAKE L : print 3, belt [1, 4, 1, 5]
- SEASON 2 : [3, 6, 3, 7]
- SHIFT 1 : [7, 3, 6, 3]
- TAKE R : print 3, belt [7, 3, 6]
- REVERSE : [6, 3, 7]
- TAKE L : print 6, belt [3, 7]
- SHIFT -2 : unchanged (size 2)
- TAKE R : print 7