# Task: WYS
# Auto racing

Byteasar is spending yet another Saturday morning watching one of multitude of sports channels on cable TV. Today he will be watching the grand finale of the Byteotia Cup Auto Race, where $n$ drivers compete. Each driver has earned some number of points already, but the last race might change the standings significantly, so Byteasar will be watching the race on the edge of his seat. The scores in the final race are awarded as follows: the first to cross the finish line receives $n$ points, the second $n-1$ points, the third $n-2$ points, and so forth till the last to finish who receives a face-saving (one) point — we assume that there are no ties at the finish line. Next, these points are added to those previously earned by each contender, and all who then have the maximum number of points are named winners, earning the Byteotia Cup.

To keep things interesting, the organizers adjust the scores before the final race by meting out bonuses and/or penalties to contestants. These adjustments are revealed over time, adding to everyone's excitement. Particularly excited is our friend Byteasar, who asks you to write a program that would keep track of how many drivers can become winners in the overall standings as the score revisions are being announced. Specifically, your program should handle three types of queries:

- B $x$ $y$ (bonus) – each driver who currently has at least $x$ points receives additional $y$ points;
- K $x$ $y$ (penalty) – each driver who currently has at most $x$ points, loses $y$ points (notice that some drivers might end up with negative points);
- Z – query for the number of drivers who could possibly win the Bytotia Cup if there were no further changes of scores before the final race.

Write a program that will read in the numbers of points earned by each contender so far, apply the bonuses and penalties announced by the organizers, answer Byteasar's questions, and print the results to the standard output.

## Input

In the first line of the standard input there are two integers $n$ and $q$, separated by a single space, specifying the number of drivers in the race and the number of queries (i.e., total number of organizer's announcements and Byteasar's questions) respectively.

In the second line of input there is a sequence of $n$ integers $p_1, p_2, \ldots, p_n$ ($0 \le p_i \le 2 \cdot 10^6$), separated by single spaces, which specify the initial number of points of each driver.

Each of the $q$ lines that follow encodes a single query in aforementioned format. Namely, it contains a single character B, K or Z and (in case of B and K queries) two integers $x$, $y$ ($-10^{18} \le x \le 10^{18}$, $0 \le y \le 10^6$), all separated by single spaces.

It is guaranteed that there will be at least one query of type Z.

## Output

For each successive type Z query, the answer to it should be printed to a new line on the standard output.

## Example

| For the input data: | the correct result is: |
|---|---|
| 4 3 | 3 |
| 10 8 4 8 | 1 |
| Z | |
| B 9 5 | |
| Z | |

**Explanation for the example:** Before the bonus is awarded, the first driver has the largest number of points, so he is certain to win the cup if he wins the final race. Either of the second and the fourth driver will win the cup if they win the final race and the first driver finishes third or fourth. The third driver cannot win the cup, regardless of the outcome of the final race. After the bonus is applied, only the first driver, who is the only one to have received 5 points, can win the cup.

**Sample grading tests:**

**1ocen:** $n = 8$, one type Z query, $p_i = 2i - 2$ for $1 \le i \le n$.

**2ocen:** $n = 1000$, one type Z query, $1 \le p_i \le n + 5$, five contestants have no chance of winning the cup.

**3ocen:** $n = 300\,000$ and $q = 50\,000$, $p_i = n + 1 - i$ for $1 \le i \le n$, queries cycle through these four (in what follows $0 \le i < \frac{q}{4}$ is the cycle number):

- Z
- K $2i$ 1
- Z
- B $i + 1$ 1

# Grading

The set of tests consists of the following subsets. Within each subset, there may be several tests. The conditions $3 \le n \le 300\,000$, $1 \le q \le 500\,000$ hold in all tests.

Time limits for particular subsets are published in SIO.

| Subset | Conditions | Score |
|:---:|:---|:---:|
| 1 | $n \le 10$, $q = 1$ | 5 |
| 2 | $q = 1$ | 15 |
| 3 | $n \le 1000$, $q \le 2000$ | 10 |
| 4 | $q \le 50\,000$ | 35 |
| 5 | no further conditions | 35 |