Mock CCC '20 S4 - Valentine's Day Shopping

Time limit: 2.0s **Memory limit:** 256M

Valentine's day is coming up, and Larry is shopping for a gift to impress his crush!

In the gifts store, there are N gifts lined up in a row, each with sizes $s_1, s_2, \ldots, s_N$ respectively, and Larry only has boxes of size B (a box of size B can fit any number of gifts as long as their total size is $\leq B$). As he is very stingy and wants to use as few boxes as possible, he wants you to help him minimize the number of boxes. Additionally, Q times during his shopping trip, one of the two following events will happen:

- `Q l_i r_i`: Larry will look at the subarray of gifts $s_{l_i}, s_{l_i+1}, \ldots, s_{r_i}$ and consider them for purchase (he doesn't actually buy them). He would like to group the gifts into x contiguous groups such that the sum of all gift sizes in each group is $\leq B$. Your job is to tell him the minimum possible x, or to tell him `-1` if it's impossible.
- `U x_i v_i`: The gift at index x undergoes spontaneous molecular restructuring and changes size to v.

Constraints

$1 \leq N, Q \leq 10^5$

$1 \leq l_i \leq r_i \leq N$

$1 \leq x_i \leq N$

$1 \leq B, s_i, v_i \leq 10^9$

For 3 of 15 available marks, $1 \leq N, Q \leq 100$.

Input Specification

The first line of input will contain N, Q, and B.

The second line of input will contain the initial values of $s_1, s_2, \ldots, s_N$.

The next Q lines will contain an event in one of the above specified forms.

Output Specification

Output the answer to each type `Q` event, each on its own line.

Sample Input

```
8 6 4
3 2 3 3 3 1 1 99
Q 1 3
U 2 1
Q 1 3
Q 4 6
Q 1 7
Q 1 8
```

Sample Output

```
3
2
2
5
-1
```

Sample Explanation

Here are the groups for each query:

- `[[3], [2], [3]]` for `Q 1 3`
- `[[3, 1], [3]]` for `Q 1 3` (second time)
- `[[3], [3, 1]]` for `Q 4 6`
- `[[3, 1], [3], [3], [3, 1], [1]]` for `Q 1 7`
- `Q 1 8` is impossible