



## Problem E Endless Journey

Time limit: 6 seconds

Memory limit: 2048 megabytes

### Problem Description

Tommy, a young boy living in a quaint countryside, often travels between his house and his grandpa's house via a winding country road. This road, illuminated by streetlights, serves as his lifeline during nighttime journeys. However, Tommy harbors a deep fear of the dark, making his nighttime travels daunting.

The road is adorned with  $N$  streetlights, each casting its glow to push back the darkness. Each streetlight can be in one of two states: illuminated (0) or extinguished (1). Tommy's unease intensifies when he realizes that any streetlight, at any moment, can flicker from brightness to darkness, or vice versa.

Determined to ease his fear, Tommy seeks a solution. He devises a plan to gauge the darkness along specific segments of the road. He wishes to know the longest stretch of consecutive darkened streetlights between any two points. Armed with this knowledge, Tommy hopes to navigate the road more confidently, avoiding the shadows that fuel his apprehension.

### Input Format

The first line contains two integers,  $N$  and  $K$ , denoting the number of streetlights on the road and the number of operations Tommy undertakes, respectively.

The second line comprises  $N$  integers separated by spaces, representing the initial states of the streetlights. Each integer is either 0 (illuminated) or 1 (extinguished).

Following this, the subsequent  $K$  lines describe Tommy's operations. Each operation can either be a query or a command:

- "Q L R" denotes a query where Tommy seeks the longest sequential dark stretch between the L-th and R-th streetlights.
- "C x" signifies a command where Tommy toggles the state of the x-th streetlight.

### Output Format

For each query operation "Q L R," Tommy desires to know the length of the longest consecutive darkened segment between the L-th and R-th streetlights, considering all operations executed up to that point.

### Technical Specification

- $1 \leq N \leq 2 \times 10^6$
- $1 \leq K \leq 2 \times 10^6$



- $1 \leq L \leq R \leq N$
- $1 \leq x \leq N$

### Sample Input 1

```
10 5
0 1 1 0 1 1 0 0 1 1
Q 2 8
C 4
C 5
Q 1 5
Q 4 10
```

### Sample Output 1

```
2
3
2
```