Output:

For each query, output a single integer which is the answer to the corresponding query.

Constraints:

$1 <= N, Q <= 10^6$

$1 <= S <= N$

Sample Input	Sample Output
4 1 1 0 3 Q 1 U Q 2	3 2

Time Limit: 2

Memory Limit: 256

Source Limit:

Explanation

There are 4 bars on the road, located at 1, 2, 3 and 4 respectively.
The initial configuration of the roads is: 1 -> 2 -> 3 <- 4
You can reach bars 1, 2 and 3 from location 1.
After the update, the new configuration is: 1 <- 2 <- 3 -> 4
Now, you can reach bars 1 and 2 from location 2.

There are *N* bars (numbered from 1 to *N*) located in a straight line. The i^{th} is located at point *i* on the line. Apart from this, there are *N-1* roads, the i^{th} of which connects the i^{th} and $i+1^{th}$ bars. Note that the roads are unidirectional. You are given the initial orientation of each road.

On celebratory occasions such as these, there are a lot of people on the streets. Hence, the police have to take special measures to combat traffic congestion. Periodically, they issue a directive to reverse the direction of **all** the roads. What this means is that, if there was a road directed from bar numbered *i* to bar *i+1*, after the update, it will be directed from *i+1* to *i*.

You are given a set of operations. Each operation can be either an update or a query. Update is the one described above. In each query, you are given the location of the bar the two partyers are located at currently. You have to count the number of bars (including the current location) that are reachable from their current location.

Input:

The first line contains a single integer **N** denoting the number of bars on the road.

The second line contains **N-1** integers denoting the directions of the roads. The i^{th} integer is 1 if the i^{th} road is directed from *i* to *i+1* and 0 if directed from *i+1* to *i*.

The third line contains a single integer **Q** denoting the number of operations.

Each of the next **Q** lines is either an update or a query.

An update is given by a single character *U*.

A query is given in the form of the character *Q* followed by an integer **S** denoting