Problem E - Apple Engine

Daniel is still making deliveries of apples. He stops at Lucca's place every now and then to chat, and sometimes refills on gas there, since his truck runs on the highest grade biofuel, apple juice!

All of Lucca's apple juice is strored in a row of storage tanks with each labeled from 1 to n from left to right. Some of the tanks are empty, Lucca just hasn't gotten around to filling them. Furthermore, Lucca tells Daniel that he can only fill up on apple juice from the tanks labeled from ℓ to r inclusive.

Daniel's truck is big, so it can hold many many tanks of apple juice. Daniel is lazy, so he's only willing to fill up his truck with a contiguous interval of tanks that are filled with apple juice.

Help Daniel figure out the maximum number of tanks of apple juice he can use to fill up his truck for each time he visits Lucca.

Input

The first line contains a single integer T denoting the number of test cases.

Each test case begins with two integers n ($1 \leq n \leq 200,000$) representing the number of tanks that Lucca has, and q $\leq (1 \leq q \leq 200,000)$ representing the number of events that happened.

The next line contains a string of 0's and 1s indicating the initial state of Lucca's tanks. A 1 at position i denotes that the tank labeled i is filled; a 0 indicates that the tank is empty.

Each of the following q lines contains a capital letter followed by one or two letters describing an event of the following types:

- $S\ x$ ($1 \leq x \leq n$) This indicates that the tank labeled x was emptied by Lucca.
- $R\ x$ ($1 \leq x \leq n$) This indicates that the tank labeled x was filled by Lucca.
- $Q\ a\ b$ ($1 \leq a \leq b \leq n$) This indicates that Daniel has arrived at Lucca's place and Lucca tells Daniel that he can only fill up on tanks labeled between the a and b inclusive.

  (**Daniel doesn't actually fill up on gas because he's lazy, and his truck is pretty fuel efficient**)

Output

Output for every query of type $Q\ a\ b$ what the maximum number of contiguous filled tanks are in the range $[a, b]$.

Sample Input

```
1
12 16
001111110101
Q 1 12
Q 2 6
Q 7 12
Q 10 12
Q 11 11
R 1
S 4
S 6
Q 3 7
Q 3 8
S 7
R 4
S 8
Q 3 7
Q 1 4
Q 1 12
```

Sample Output

```
6
4
2
1
0
1
2
3
2
3
```