UCF "Practice" Local Contest — Aug 29, 2015

Star-Belly Sneetches

filename: `sneetches`
(*Difficulty Level:* `Hard`)

Now, the Star-Belly Sneetches had bellies with stars.
The Plain-Belly Sneetches had none upon thars.
Those stars weren't so big. They were really so small.
You might think such a thing wouldn't matter at all.

"My friends", he announced in a voice clear and clean,
"My name is Sylvester McMonkey McBean.
And I've heard of Your troubles. I've heard you're unhappy.
But I can fix that, I'm the Fix-It-Up Chappie.

Then, quickly, Sylvester McMonkey McBean
Put together a very peculiar machine.
And he said, "You want stars like a Star-Belly Sneetch?
My friends, you can have them for three dollars each!"

Then, of course, those with stars got all frightfully mad.
To be wearing a star was frightfully bad.
Then, of course, old Sylvester McMonkey McBean
invited THEM into his Star-Off Machine.

Then, of course from THEN on, as you probably guess,
Things really got into a horrible mess.

Now Sylvester McMonkey McBean is using his Star-Swapping machine to add and remove stars from Sneetches that want them or don't want them. The Sneetches keep wanting to either add a star to their belly or remove the star from their belly. Sylvester now wants to keep track of which sneetches on the beaches are most likely to want their star swapped next.

He does this by observing that the sneetches are lined up on the beaches in order from left to right. He can label the sneetches using the numbers 1 to ***n***, where ***n*** is the number of sneetches. Sylvester knows that each Sneetch is more likely to swap stars if those around him are the same type of sneetch. The Sneetches want to be different! That is why he wants to know the longest contiguous block of Star-Bellied Sneetches and the longest contiguous block of Plain-Bellied Sneetches. As the swapping happens things may change. That is why he needs to know these values when some range of consecutive sneetches choose to swap their stars.

The Input:

The first line contains a positive integer t ($t \leq 50$), representing the number of beaches with Sneetches to consider.

For each town, the first line contains two positive integers n and s, ($1 \leq n, s \leq 10^5$) representing the number of Sneetches on the beaches and the number of star swapping operations to perform.

The following line is a string of n characters. Each character is either 'S' or 'P', representing if the i^{th} sneetch on the beach is a Star-Bellied Sneetch or a Plain-Bellied Sneetch.

The next line s lines contain two integers each a and b, ($1 \leq a \leq b \leq n$) representing the interval of sneetches on which to perform the star swapping. The range [a, b] is inclusive.

The Output:

For each star swapping, output two integers on a line by themselves. The first represents the largest consecutive group of star-bellied sneetches and the second represents the largest consecutive group of plain-bellied sneetches.

Sample Input:	**Sample Output:**
3 4 2 SSSS 2 3 3 4 4 1 SPPP 2 4 6 5 PPPPPP 1 3 2 4 3 5 4 4 6 6	1 2 1 1 4 0 3 3 1 2 1 1 3 1 4 1

The annotations below show how the sneetches change after each swap operation.
Case 1: SSSS -> SPPS -> SPSP
Case 2: SPPP -> SSSS
Case 3: PPPPPP -> SSSPPP -> SPPSPP -> SPSPSP -> SPSSSP -> SPSSSS