Capella

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	256 megabytes

A string S consisting only of lowercase English letters is called **Capella-like** if and only if it satisfies all of the following conditions:

- The number of letters that appear an odd number of times in S is odd;
- The number of letters that appear a non-zero even number of times in S is even.

It can be shown that the string "`capella`" is Capella-like. However, the string "`arcaea`" is not Capella-like since there are 4 letters that appear an odd number of times, and "`lowiro`" is not Capella-like either since there is 1 letter that appears a non-zero even number of times and 4 letters that appear an odd number of times.

Now Yuki has a string S of length n consisting only of lowercase English letters. Yuki performs q operations on the string S: the i-th operation gives a position p_i ($1 \leq p_i \leq n$) and a lowercase letter c_i, modifying the character at the p_i-th position of S, denoted as S_{p_i}, to c_i. You need to find the length of the longest substring* of S that is Capella-like before all the q operations and after each operation.

Input

The first line contains two integers n and q ($1 \leq n \leq 2 \cdot 10^5$, $1 \leq q \leq 2 \cdot 10^5$).

The second line contains a string S of length n consisting only of lowercase English letters.

Each of the next q lines contains an integer p_i ($1 \leq p_i \leq n$) and a lowercase English letter c_i, representing an operation.

Output

Output $q+1$ lines. Each line contains an integer representing the length of the longest substring of S that is Capella-like before all q operations and after each operation.

Example

standard input	standard output
6 4 ababab 3 c 6 a 4 c 2 a	1 5 5 5 1

Note

For the q operations in the sample:

- Before any operations, the initial value of string S is "`ababab`", and the longest Capella-like substring is "`a`" or "`b`", with a length of 1.
- After the first operation, the string S becomes "`abcbab`", and the longest Capella-like substring is "`abcba`" or "`bcbab`", with a length of 5.

*A string S' is a substring of S if and only if S' can be obtained by removing a possibly empty prefix and suffix from S.

- After the second operation, the string S becomes "`abcbaa`", and the longest Capella-like substring is "`abcba`" or "`bcbaa`", with a length of 5.
- After the third operation, the string S becomes "`abccaa`", and the longest Capella-like substring is "`abcca`" or "`bccaa`", with a length of 5.
- After the fourth operation, the string S becomes "`aaccaa`", and the longest Capella-like substring is "`a`" or "`c`", with a length of 1.