

Palindrome

Input file: **standard input**
Output file: **standard output**
Time limit: 5 seconds
Memory limit: 1024 megabytes

As a magician and a palindrome lover, you want to make strings become palindromes through magic operation.

In one magic operation, you can erase $S[l..r]$ of a string S and concatenate the rest of S to get the target string, which costs $r - l + 1$ units of magic potion.

You are given a string str , consisting of n lowercase Latin letters, and there are m magic tests.

For each one, you are given two integers l, r , denoting S as $str[l..r]$.

You should use **at most one** magic operation, report the minimal cost of magic potion to make S become palindrome, and the number of ways to achieve the target with the previous minimized cost.

Specifically, if S is already a palindrome, just output '0 0'.

NOTE:

- A palindrome is a string that reads the same from left to right as from right to left. For example, 'aba', 'ccpcc', 'qaq' are palindromes, while 'ccpc' and 'qhd' are not.
- $S[l..r]$ means the substring of S which starts from the l -th character and ends with the r -th character.

Input

The first line contains an integer n and a string str ($1 \leq n = |str| \leq 5 \times 10^5$) of lowercase English letters.

The second line contains an integer m ($1 \leq m \leq 4 \times 10^5$) representing the number of magic tests.

The following m lines describe the tests.

In each line, there are two integers l, r ($1 \leq l \leq r \leq n$), you should take the $str[l..r]$ as the problem.

Output

For each tests, output one line consisting two integers - the minimal cost and the number of ways to achieve it, separated by one space.

Examples

standard input	standard output
5 abcca	1 1
3	0 0
1 5	1 1
3 4	
3 5	
5 babdb	1 1
2	1 2
1 4	
3 4	