
Problem A. QueryreuQ

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 1024 megabytes

A string is **palindrome**, if the string reads the same backward and forward. For example, strings like "a", "aa", "appa", "queryreuq" are all palindromes.

For given empty string S , you should process following two queries :

1. Add a lower case alphabet at the back of S .
2. Remove a character at the back of S .

After processing a query, you should count the number of **palindrome substring** in S . For string S and integers i, j ($1 \leq i \leq j \leq |S|$), $S[i, j]$ represents a substring from i th to j th character of S . You should print out the number of integer pairs (i, j) where $S[i, j]$ is palindrome.

Input

Input consists of two lines.

In the first line, Q , the number of queries is given. ($1 \leq Q \leq 10,000$)

In the second line, the query is given as string of length Q . i th character K_i denotes the i th query.

K_i is '-' or lower case alphabet ('a', 'b', ..., 'z') (without quotes).

If the character is '-', you should remove a character at the back of S . If the character is lower case alphabet, you should add a character K_i at the back of S .

It is guaranteed that length of S is always positive after the query.

Output

Print out Q space-separated integers in the first line. i -th integer should be the answer of the i th query.

Example

standard input	standard output
17 qu-uer-ryr-reu-uq	1 2 1 2 3 4 3 4 5 7 5 7 9 11 9 11 13