NOIP '20 P2 - String Matching

Time limit: 1.0s **Memory limit:** 512M

Little C has just finished learning about string matching, and he is practicing now.

For a string S, the question asks him to find the number of ways to split S in the following form:

$S = ABC$, $S = ABABC$, $S = ABAB \ldots ABC$, where A, B, C are all non-empty strings. The number of characters appearing an odd number of times in A will not be more than the number of characters appearing an odd number of times in C.

More specifically, we can define AB to represent the concatenation of two strings A and B. For example $A = \texttt{aab}$, $B = \texttt{ab}$, then $AB = \texttt{aabab}$.

We also recursively define $A^1 = A$, $A^n = A^{n-1}A$ ($n \geq 2$ and is a positive integer). For example, $A = \texttt{abb}$, then $A^3 = \texttt{abbabbabb}$.

Little C's problem is asking to find the number of ways of $S = (AB)^iC$, where $F(A) \leq F(C)$; $F(S)$ represents the number of characters that appear an odd number of times in S. Two ways are considered different if and only if at least one string in the split A, B and C is different.

Little C doesn't know how to solve this problem, so he asked you for help.

Input Specification

A positive integer T in the first line of the input file represents the number of data sets in the input.

The next T lines contain a string S for each data set on each line. S consisting of lowercase letters only.

Output Specification

For each data set, output a line with one integer indicating the answer.

Sample Input 1

```
3
nnrnnr
zzzaab
mmlmmlo
```

Sample Output 1

```
8
9
16
```

Explanation for Sample 1

All possible ways are

1. $A = \mathtt{n}$, $B = \mathtt{nr}$, $C = \mathtt{nnr}$.
2. $A = \mathtt{n}$, $B = \mathtt{nrn}$, $C = \mathtt{nr}$.
3. $A = \mathtt{n}$, $B = \mathtt{nrnn}$, $C = \mathtt{r}$.
4. $A = \mathtt{nn}$, $B = \mathtt{r}$, $C = \mathtt{nnr}$.
5. $A = \mathtt{nn}$, $B = \mathtt{rn}$, $C = \mathtt{nr}$.
6. $A = \mathtt{nn}$, $B = \mathtt{rnn}$, $C = \mathtt{r}$.
7. $A = \mathtt{nnr}$, $B = \mathtt{n}$, $C = \mathtt{nr}$.
8. $A = \mathtt{nnr}$, $B = \mathtt{nn}$, $C = \mathtt{r}$.

Sample Input 2

```
5
kkkkkkkkkkkkkkkkkkkk
lllllllllllllrrlllrr
ccccccccccccxcxxxcc
ccccccccccccaababa
gggggggggggggbaabab
```

Sample Output 2

```
156
138
138
147
194
```

Additional Samples

Additional samples can be found here.

- Sample 3 (`string3.in` and `string3.ans`).
- Sample 4 (`string4.in` and `string4.ans`).

Constraints

Test Case	$\lvert S\rvert \le$	Additional Constraints
$1 \sim 4$	10	None
$5 \sim 8$	100	None
$9 \sim 12$	$1\,000$	None
$13 \sim 14$	2^{15}	S contains only one character
$15 \sim 17$	2^{16}	S contains only two characters
$18 \sim 21$	2^{17}	None
$22 \sim 25$	2^{20}	None

For all test cases, $1 \le T \le 5$, $1 \le \lvert S\rvert \le 2^{20}$.

Problem translated to English by **Tommy_Shan**.