NOI '16 P1 - Good Partitions

Time limit: 1.5s **Memory limit:** 512M

If a string can be written in the form of AABB where A and B are arbitrary **non-empty** strings, then we say this is a *good* partition. For example, it is possible to write the string aabaabaa in the form of AABB by letting A = aab and B = a.

Some strings do not admit a good partition, while some strings admit multiple good partitions. For example, for the above string aabaabaa, it is also possible to write it in the form of AABB by letting A = a and B = baa. The string abaabaa does not admit good partitions.

Given a string S of length n, compute the sum, over all its substrings, of the number of good partitions of those substrings. Here, *substring* refers to a contiguous part of the string.

Please pay attention to the following details:

- The same string appearing at different locations are considered distinct. All good partitions corresponding to the same string should count towards the answer.
- It is possible to have A = B in a good partition. For example, the string ccc admits good partition A = B = c.
- The string *S* itself is one of its substrings.

Input Specification

Each input file has several test cases.

The first line of the input file contains one integer T denoting the number of test cases in the file.

In the following T lines, each line contains a string S consisting of lower-case English letters.

Output Specification

Output T lines: each line consists of an integer denoting the total number of good partitions among all possible partitions of substrings of S.

Sample Input 1

4

aabbbb

ccccc

aabaabaabaa

bbaabaababaaba

Sample Output 1

3 5 4 7

Explanation for Sample 1

Let S[i,j] denote the substring of S consisting of the i-th character to the j-th character of S, with index starting from 1.

In the first test case, there are three substrings admitting good partitions: $S[1,4]=\mathtt{aabb}$ with $\mathtt{A}=\mathtt{a},\mathtt{B}=\mathtt{b}$, $S[3,6]=\mathtt{bbbb}$ with $\mathtt{A}=\mathtt{b},\mathtt{B}=\mathtt{b}$, and $S[1,6]=\mathtt{aabbbb}$ with $\mathtt{A}=\mathtt{a},\mathtt{B}=\mathtt{bb}$. Other substrings of S do not admit good partitions, so the answer shall be S.

In the second test case, $S[1,4]=S[2,5]=S[3,6]=\csc c$ admit good partition $\mathbf{A}=\mathbf{c},\mathbf{B}=\mathbf{c}$, so the total contribution to the final answer is $\mathbf{3}$. For string $S[1,6]=\csc \mathbf{c}$, it admits two good partitions ($\mathbf{A}=\mathbf{c},\mathbf{B}=\mathbf{c}$) or $\mathbf{A}=\mathbf{c}\mathbf{c},\mathbf{B}=\mathbf{c}$). The different good partitions corresponding to the same substring should all count towards the final answer, so the final answer to the second test case is $\mathbf{3}+\mathbf{2}=\mathbf{5}$.

In the third test case, S[1,8] and S[4,11] admit two good partitions respectively. S[1,8] is the example described in the problem description. The answer should be 2+2=4.

In the fourth test case, each of S[1,4], S[6,11], S[7,12], S[2,11], S[1,8] admits one good partition, and S[3,14] admits two good partitions, so the answer should be 5+2=7.

Attachment Package

The samples are available here.

Sample 2

See [ex_excellent2.in] and [ex_excellent2.ans].

Sample 3

See [ex_excellent3.in] and [ex_excellent3.ans].

Constraints

For all test cases, $1 \le T \le 10$, $n \le 30000$.



1,2	300	All characters of S are same.
3,4	2 000	
5,6	10	No additional constraints.
7,8	20	
9,10	30	
11,12	50	
13,14	100	
15	200	
16	300	
17	500	
18	1 000	
19	2 000	
20	30 000	