

6439 Pasti Pas!

Pertamina is an Indonesian government-owned oil and gas corporation based on Jakarta. It has by far the largest distribution network of petroleum products compared to other oil companies in Indonesia. When several foreign oil companies like Shell (Dutch) and Petronas (Malaysia) expanded their business to Indonesia, Pertamina was faced with a great challenge to improve their service quality and strengthen its consumer's trust, especially on their gas stations. At that time, Pertamina started a campaign called "Pasti Pas!" to inform consumers that Pertamina will satisfy them by providing an accurate measurement when they buy oil/gas at their gas stations. "Pasti Pas!" itself means "absolutely accurate". Despite of what happened out there, we will focus our attention to the phrase "Pasti Pas!" in this problem.

"Pasti Pas!" is an interesting phrase. Most of you must already know what a palindrome is, i.e. a word or phrase which can be read the same way in either forward or backward direction, e.g., MADAM, AMOREROMA, etc. Of course "Pasti Pas!" is not a palindrome by this definition; however, if we replace one or more substring into another symbol, we will get a palindrome! For convenience, let's remove all non alphabetical characters from the phrase. Let $\alpha = \text{'PAS'}$ and $\beta = \text{'TI'}$, then the phrase 'PASTIPAS' will become ' $\alpha\beta\alpha$ ' which is a palindrome.

Now we are interested in what the palindrome value of a string S is. Palindrome value of a string S is defined as the length of the longest palindrome string S' where S' is derived from S by replacing one or more substring by some symbols. As for the previous example, PASTIPAS has a palindrome value of 3. Note that when deriving string S , each unique substring can only be mapped into a unique symbol.

Here is another example. Let $S = \text{'ABCADDABCA'}$. There are several derivations of S , e.g.:

- Let $\alpha = \text{'ABCA'}$, $\beta = \text{'DD'}$, then $S' = \alpha\beta\alpha$ which has a length of 3.
- Let $\alpha = \text{'ABCA'}$, $\beta = \text{'D'}$, then $S' = \alpha\beta\beta\alpha$ which has a length of 4.
- Let $\alpha = \text{'A'}$, $\beta = \text{'BC'}$, $\gamma = \text{'D'}$, then $S' = \alpha\beta\alpha\gamma\gamma\alpha\beta\alpha$ which has a length of 8.

Among all possible derivations of S , the longest palindrome can be formed has the length of 8.

Input

The first line of input contains an integer T ($T \leq 100$) denoting the number of cases. Each case contains a string S ($1 \leq |S| \leq 50,000$; $S \in \{\text{'A' ... 'Z'}\}$) in a line.

Output

For each case, output 'Case # X : Y ', where X is the case number starts from 1 and Y is the palindrome value of S for each case.

Sample Input

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4
PASTIPAS
ABCADDABCA
MADAMIAMADAM
ACMICPCJAKARTASITE
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Sample Output

Case #1: 3

Case #2: 8

Case #3: 11

Case #4: 1