

Kick Start 2017 - Round E

Copy & Paste

Problem

You want to create a certain target string **S**, which consists only of lowercase English letters. You start with an empty string, and you are allowed to perform the following operations:

- Add any single lowercase letter to the end of your string.
- Copy any substring of your string (that is, all of the characters between some start point in your string and some end point in your string) to the clipboard. Doing this overwrites whatever was in the clipboard before. The clipboard starts off empty.
- Add the *entire* contents of the clipboard to the end of your string. (The contents of the clipboard do not change.)

What is the smallest number of operations needed to create your target string? Note that you must create exactly the target string, with no additional letters.

Input

The first line of the input gives the number of test cases, **T**. **T** lines follow. Each line contains the target string **S**.

Output

For each test case, output one line containing `Case #x: y`, where *x* is the test case number (starting from 1) and *y* is the minimum number of operations (as described in the problem statement) needed to create the target string.

Limits

Time limit: 40 seconds per test set.

Memory limit: 1GB.

S consists only of lowercase English letters in the range *a* through *z*.

Small dataset (Test set 1 - Visible)

$1 \leq T \leq 100$.

$1 \leq \text{length of } S \leq 6$.

Large dataset (Test set 2 - Hidden)

$1 \leq T \leq 100$.

$1 \leq \text{length of } S \leq 300$.

Sample

Sample Input

Sample Output

```
3
abcbab
aaaaaaaaaaa
vnsdmvnsnsdmkvdmkvnsdmk
```

```
Case #1: 6
Case #2: 7
Case #3: 15
```

The optimal solution for Sample Case #1 is:

1. Type a.
2. Type b.
3. Type c.
4. Copy ab to the clipboard.
5. Paste ab at the end of the string.
6. Paste ab at the end of the string.

The optimal solution for Sample Case #2 is:

1. Type a.
2. Type a.
3. Type a.
4. Copy aaa to the clipboard.
5. Paste aaa at the end of the string.
6. Copy aaaaa to the clipboard.
7. Paste aaaaa at the end of the string.