

Autocomplete

Since you crave state-of-the-art technology, you've just purchased a phone with a great new feature: autocomplete! Your phone's version of autocomplete has some pros and cons. On the one hand, it's very cautious. It only autocompletes a word when it knows exactly what you're trying to write. On the other hand, you have to teach it every word you want to use.

You have N distinct words that you'd like to send in a text message in order. Before sending each word, you add it to your phone's dictionary. Then, you write the smallest non-empty prefix of the word necessary for your phone to autocomplete the word. This prefix must either be the whole word, or a prefix which is not a prefix of any other word yet in the dictionary.

What's the minimum number of letters you must type to send all N words?

Input

Input begins with an integer T , the number of test cases. For each test case, there is first a line containing the integer N . Then, N lines follow, each containing a word to send in the order you wish to send them.

Output

For the i th test case, print a line containing "Case # i :" followed by the minimum number of characters you need to type in your text message.

Constraints

$$1 \leq T \leq 100$$

$$1 \leq N \leq 100,000$$

The N words will have a total length of no more than 1,000,000 characters.

The words are made up of only lower-case alphabetic characters.

The words are pairwise distinct.

NOTE: The input file is about 10-20MB.

Explanation of Sample

In the first test case, you will write "h", "he", "l", "hil", "hill", for a total of $1 + 2 + 1 + 3 + 4 = 11$ characters.

Sample Input

```
5
5
hi
hello
lol
hills
hill
5
```

a
aa
aaa
aaaa
aaaaa
5
aaaaa
aaaa
aaa
aa
a
6
to
be
or
not
two
bee
3
having
fun
yet

Sample Output

Case #1: 11
Case #2: 15
Case #3: 11
Case #4: 9
Case #5: 3



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