Facebook Hacker Cup '15 Round 1 P2 - Autocomplete

Time limit: 25.0s **Memory limit:** 1G

Facebook Hacker Cup 2015 Round 1

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
```