

Homework 7

Smart Text Input

(Due:2022/1/14)

Background

Texting on cellphone is never easy. The keys are compacted on a tiny screen, and we are often in a hurry and have little time doing all the key punches. As an engineer working for a phone manufacturer, you are asked to design a smart text input system. When typing, the user can ignore the spaces in a sentence.

For instance, when the user types

iamintheclassroom

The input system will automatically recognize it as

i am in the classroom

Design

The input system follows two simple design principles:

1. Each word in the output sentence has to be a valid dictionary word.
2. The number of words in the output sentence is minimized (based on the assumption that text message tends to be short).

For instance, let's say we have a dictionary of 8 words: {"i", "a", "am", "in", "the", "class", "room", "classroom"}.

Now, for the input "iamintheclassroom", the following output would violate principle 1 because *theclassroom* is not a dictionary word.

i am in theclassroom

And the following output would violate principle 2, because it contains 6 words,

which is one more than the minimum of 5 words.

i am in the class room

Input.txt

The input begins with an integer N, indicating the number of the testcases following. The first line of each testcase is an integer M, and the following M lines are the words in the dictionary. Each testcase ends with a string, which is the sentence that need to be parsed.

Output.txt

The output of each testcase is the number of words in a sentence. If there does not exist a valid output sentence, then output -1.

Sample Input

```
3
8
i
a
am
in
the
class
room
classroom
iamintheclassroom
7
a
ash
shop
opine
in
europe
rope
ashopineurope
```

1
a
as

Sample Output

5
4
-1

Constrains

$N \leq 128$

$M \leq 1024$

The length of each word is less than 128.

The length of each sentence is less than 32768.

All letters are lower case.

Preload Input Data

```
struct singleTestCase{
    int M;
    char word[1024][128];
    char sentence[32768];
};
struct tTestData {
    int N;
    struct singleTestCase data[128];
};
```