5 Ciara Counters Caesar Ciphers (CPU:1sec - RAM:256MB)

Ciara is the head of an elite decryption team, in charge of decoding foreign communications intercepted by her nation's intelligence agency. Due to recent heightened tensions in international relations, Ciara is currently working overtime, receiving thousands of messages to decrypt daily. To make matters worse, several key members of her team have recently taken untimely holidays, so she decides to ask you for your help. You are a bit concerned about the moral ramifications of eavesdropping on other people's secret conversations, but Ciara promises she will give you cookies when you are done, so you decide to accept. Ciara then gives you Klingalorian messages, which according to her are the easiest to decrypt.

Klingalorians come from Noth, a formerly cold planet that witnessed a significant increase in temperature because of global warming. They use the Caesar cipher encryption method, which simply consists in shifting each letter in the message down the alphabet by a given amount (the key). So if the key is 2 for example, A becomes C, B becomes D, C becomes E, and so on until Z which becomes B (when arriving at the end of the alphabet, the cipher loops back to the beginning). With a key of 2 the message CAESARCIPHER would become ECGUCTEKRJGT. With a key of 25 the same message would instead become BZDRZQBHOGDQ.

The reason Ciara and most people consider Caesar ciphers easy to decrypt is that basic properties of the message's original language can be exploited to determine the value of the key. What Ciara forgot when she gave you the assignment is that you have no knowledge whatsoever of the Klingalorian language. Fortunately for you Klingalorians are very religious and always mention one of their many deities when they communicate. Which one is referenced depends on a large number of factors, but that context is known by the decryption team, so for a given message Ciara can tell you the name of the deity who was mentioned, although she cannot tell you where exactly in the message it will appear.

While the Klingalorian language looks like complete gibberish to the uninitiated, at least it uses the same 26 letters as in the English alphabet, and the conventional ordering of these letters is also the same: A, B, C, D, E, F, G, H, I , J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z. For your convenience, all messages will be provided to you in capital letters, and every character in the messages will be one of these 26 letters (no space, punctuation or other special characters). For each message, the encryption key can be any integer between 1 and 25 inclusive (0 and 26 are never used, as they correspond to an unencrypted message).

Input The input consists of the following lines:

- A line containing a string of characters, corresponding to the name of the deity mentioned (possibly several times) in the messages (before encryption). The length L of the string is between 2 and 1000 inclusive, and only capital letters from the English alphabet can appear in the string.
- Followed by a line consisting of a single integer M, with $1 \leq M \leq 40000$, which indicates the number of messages.
- Followed by M lines, each containing one encrypted message. The length of each message is between L and N inclusive, with N such that $M \times N = 10000000$. The messages only contain capital letters from the English alphabet.

Output The output shall consist of M lines, each consisting of a single integer between 1 and 25 inclusive. The integer on line i shall be equal to the key used to encrypt the i^{th} message. You do not need to give the decrypted messages.

You can assume that there is no ambiguity in the input. In other words, there is for each message only one possible key that satisfies the description of the problem.

Sample Input 1

```
BBB
5
EEE
FFFFF
ABCCCBA
HYAAA
RRWWZZZAACC
```

Sample Input 2

```
UCC
3
FZHHY
UCCWEE
LEEMMAA
```

Sample Output 1

```
3
4
1
25
24
```

Sample Output 2

```
5
2
10
```