

Problem A

Given a text, we want to perform a statistical analysis—we are interested in frequency of certain words or phrases.

Input and output

The first line contains a string S of length at most 1 000 000 consisting only of lowercase letters. Each of the following lines contains a string of lowercase letters; the total length of these strings is at most 1 000 000. For each of the strings, perform the following procedure: Let z be the previous number you output (for the first string, $z = 0$). For $i = 1, 2, \dots$, cyclically shift the i -th letter of the string in the alphabet by $z \text{ xor } i$; i.e.,

```
for (int i = 0; i < input_string_length; i++)
{
    int c = input_string[i] - 'a';

    c = (c + ((i + 1) ^ z)) % 26;

    input_string[i] = c + 'a';
}
```

Then, output the number of appearances of this modified input string as a substring of S .

Example

Input:

```
abcabcd
zzz
zaaww
aa
```

Note the queries decode to “abc”, “cabcd”, and “ad”.

Output:

```
2
1
0
```