

C. Cyclical Quest

time limit per test: 3 seconds

memory limit per test: 512 megabytes

input: standard input

output: standard output

Some days ago, WJMZBMR learned how to answer the query "how many times does a string x occur in a string s " quickly by preprocessing the string s . But now he wants to make it harder.

So he wants to ask "how many consecutive substrings of s are cyclical isomorphic to a given string x ". You are given string s and n strings x_i , for each string x_i find, how many consecutive substrings of s are cyclical isomorphic to x_i .

Two strings are called *cyclical isomorphic* if one can rotate one string to get the other one. 'Rotate' here means 'to take some consecutive chars (maybe none) from the beginning of a string and put them back at the end of the string in the same order'. For example, string "abcde" can be rotated to string "deabc". We can take characters "abc" from the beginning and put them at the end of "de".

Input

The first line contains a non-empty string s . The length of string s is not greater than 10^6 characters.

The second line contains an integer n ($1 \leq n \leq 10^5$) — the number of queries. Then n lines follow: the i -th line contains the string x_i — the string for the i -th query. The total length of x_i is less than or equal to 10^6 characters.

In this problem, strings only consist of lowercase English letters.

Output

For each query x_i print a single integer that shows how many consecutive substrings of s are cyclical isomorphic to x_i . Print the answers to the queries in the order they are given in the input.

Examples

input
baabaabaaa 5 a ba baa aabaa aaba
output
7 5 7 3 5

input
aabbbaa 3 aa aabb abba
output
2 3 3