



# Problem G

## Shortest Missing Subsequences

Time Limit: 8 Second(s)

Given a string  $s$  we say that string  $t$  is a *Subsequence* of  $s$  if  $t$  can be obtained from  $s$  by deleting zero or more characters of  $s$ . Note that  $t$  is not necessarily a substring of  $s$ —that is,  $t$  is not necessarily contiguous in  $s$ , but the characters of  $t$  appear in the same order as they do in  $s$ .

For a given subset,  $v$ , of the lowercase English alphabet characters from 'a' to 'z', we say that string  $u$  is a *Missing Subsequence* of another string  $s$  if  $u$  is not a *Subsequence* of  $s$ , but all characters in  $u$  and all the characters of  $s$  are in the set  $v$ . A *Shortest Missing Subsequence* of  $s$  is a *Missing Subsequence* of  $s$  with the smallest length among all *Missing Subsequences* of  $s$ .

Given a set of English alphabetic characters, a target string made up of characters from that set, and a list of query strings made up of characters from that set, determine if each of the query strings is a *Shortest Missing Subsequence* of the target string.

### Input

The first line of input contains a string  $v$  ( $1 \leq |v| \leq 26$ ) of lowercase letters, in lexicographical order. Each letter appears at most once. This is the set of alphabetic characters.

The next line of input contains a string  $s$  ( $1 \leq |s| \leq 10^6$ ,  $s$  only contains letters from  $v$ ). This is the target string to be queried.

The next line contains an integer  $n$  ( $1 \leq n \leq 10^6$ ). This is the number of queries.

Each of the next  $n$  lines contains a string  $q$  ( $1 \leq |q| \leq 10^6$ ,  $q$  only contains letters from  $v$ ). These are the query strings. The sum of the lengths of all query strings will not exceed  $10^6$ .

### Output

Output  $n$  lines, one for each query. On each line, output either 1 if the query string is a *Shortest Missing Subsequence* of the target string, or 0 if it is not. The outputs must be in the order of the input queries.



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**Sample Input 1**

**Sample Output 1**

abc	1
abcccabac	0
3	0
cbb	
cbba	
cba	