

Matching Substrings

Input file: *standard input*
Output file: *standard output*
Time limit: 4 seconds
Memory limit: 1024 mebibytes

You are given two strings a and b .

String s is a *substring* of string t if s can be obtained from t by deleting some (possibly zero) characters from the beginning and some (possibly zero) characters from the end. In particular, the empty string is a substring of every string.

You are given q query strings. For a query string c of length m and for every k from 1 to m , count the distinct strings x such that

- x is a substring of a ;
- $xc_1c_2 \dots c_k$ is a substring of b .

The string x may be empty. Two strings x are considered the same if they are equal as strings, no matter where they occur in a .

Input

The first line contains a single integer t ($1 \leq t \leq 10^4$): the number of test cases.

The first line of each test case contains the string a ($1 \leq |a| \leq 150\,000$).

The second line contains the string b ($1 \leq |b| \leq 150\,000$).

The third line contains a single integer q ($1 \leq q \leq 150\,000$): the number of queries.

Each of the next q lines contains one query string c ($1 \leq |c| \leq 150\,000$).

All strings consist of lowercase English letters.

It is guaranteed that the sum of $|a|$ over all test cases does not exceed 150 000, the sum of $|b|$ over all test cases does not exceed 150 000, and the sum of $|c|$ over all query strings of all test cases does not exceed 150 000.

Output

For each query, print $|c|$ integers: the k -th of them must be the number of distinct strings x that are substrings of a and for which $xc_1c_2 \dots c_k$ is a substring of b .

Examples

<i>standard input</i>	<i>standard output</i>
4 ab cababa	3 2 3 3
5 a b ab ba c aaa aaaaa	2 2 1 4 4 4 4 4 3 4 4 3 2 0 1 1
4 a aa aaa aaaa abc xyz 4 a xy z abc banana anaban	1 0 0 0 4 3 2 4 2 4 4 4 3
5 a na an ban n	
1 ab aaba 1 ab	4 2

Note

In the second example, for the prefix **a**, the four valid strings x are the empty string, **a**, **b**, and **ab**. In particular, **a** and **b** must both be counted even though they have the same length. For the full query string **ab**, only the empty string and **a** are valid.