

## C. Spy Syndrome 2

time limit per test: 2 seconds  
 memory limit per test: 256 megabytes  
 input: standard input  
 output: standard output

After observing the results of Spy Syndrome, Yash realised the errors of his ways. He now believes that a super spy such as Siddhant can't use a cipher as basic and ancient as Caesar cipher. After many weeks of observation of Siddhant's sentences, Yash determined a new cipher technique.

For a given sentence, the cipher is processed as:

1. Convert all letters of the sentence to lowercase.
2. Reverse each of the words of the sentence individually.
3. Remove all the spaces in the sentence.

For example, when this cipher is applied to the sentence

Kira is childish and he hates losing

the resulting string is

ariksihsidlihcdnaehsetahgnisol

Now Yash is given some ciphered string and a list of words. Help him to find out any original sentence composed using only words from the list. Note, that any of the given words could be used in the sentence multiple times.

### Input

The first line of the input contains a single integer  $n$  ( $1 \leq n \leq 10\,000$ ) — the length of the ciphered text. The second line consists of  $n$  lowercase English letters — the ciphered text  $t$ .

The third line contains a single integer  $m$  ( $1 \leq m \leq 100\,000$ ) — the number of words which will be considered while deciphering the text. Each of the next  $m$  lines contains a non-empty word  $w_i$  ( $|w_i| \leq 1\,000$ ) consisting of uppercase and lowercase English letters only. It's guaranteed that the total length of all words doesn't exceed  $1\,000\,000$ .

### Output

Print one line — the original sentence. It is guaranteed that at least one solution exists. If there are multiple solutions, you may output any of those.

### Examples

input
30 ariksihsidlihcdnaehsetahgnisol 10 Kira hates is he losing death childish L and Note

### Manthan, Codefest 16

Finished

Practice



### → Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ACM-ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

### → Practice

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

### → Submit?

Language: GNU G++ 5.1.0

Choose file:  No file chosen

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.

Submit

### → Last submissions

Submission	Time	Verdict
<a href="#">22057978</a>	Nov/05/2016 17:13	Runtime error on test 10
<a href="#">22057967</a>	Nov/05/2016 17:12	Memory limit exceeded on test 1
<a href="#">22057944</a>	Nov/05/2016 17:11	Runtime error on test 10
<a href="#">22057901</a>	Nov/05/2016 17:08	Wrong answer on test 1
<a href="#">22057836</a>	Nov/05/2016 17:04	Runtime error on test 10

<b>output</b>
Kira is childish and he hates losing
<b>input</b>
12 iherehtolleh 5 HI Ho there HeLlO hello
<b>output</b>
HI there HeLlO

**Note**  
In sample case 2 there may be multiple accepted outputs, "HI there HeLlO" and "HI there hello" you may output any of them.

<a href="#">22057825</a>	Nov/05/2016 17:03	Runtime error on test 10
<a href="#">22057700</a>	Nov/05/2016 16:56	Wrong answer on test 1

→ Problem tags

data structures

dp

hashing

implementation

sortings

string suffix structures

strings

No tag edit access

→ Contest materials

Announcement

Tutorial