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 ($1 \le n \le 10\,000$) — 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 ($1 \le m \le 100\,000$) — 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 ($|w_i| \le 1\,000$) 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

output

```
Kira is childish and he hates losing
```

input

```
12
iherehtolleh
5
HI
Ho
there
HeLLo
hello
```

output

```
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.

22057825	Nov/05/2016 17:03	Runtime error on test 10
22057700	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