

## Duplicated Usernames (usernames2)

Valerio wants to compete in the IIOT Online Mirror, but first he has to create an account. Valerio usually uses the username  $S$  on the various websites he visits, but this username is very common, and sometimes he cannot use it because it was already taken by another user.

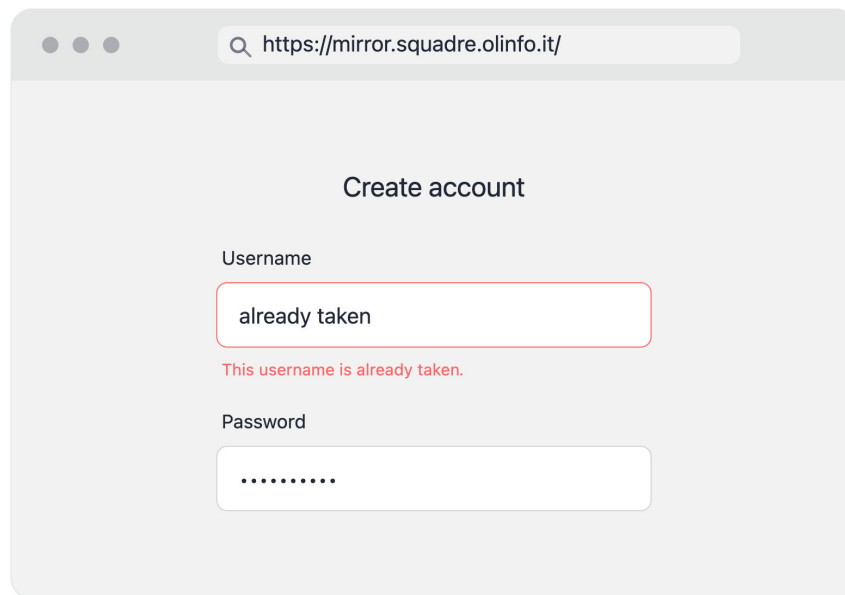



Figure 1: Valerio is trying to register on the IIOT mirror site. You should laugh now.

In this case, Valerio will add a number at the end of his username. For example, if his username is “thescrasse” and the username is not available, then he will try to use “thescrasse1”.

Valerio will first try with the number 1, and if the new username is still not available, he will increment the number until he finds an available username. For example, if “thescrasse1” is not available, he will try “thescrasse2”, then “thescrasse3”, and so on.

You know that the IIOT mirror already has  $N$  users, and you know the usernames  $U_i$  of all of them. Find the username  $T$  that Valerio will use.

 Among the attachments of this task you may find a template file `usernames2.*` with a sample incomplete implementation.

### Input

The input file consists of:

- a line containing string  $S$ , Valerio’s usual username.
- a line containing integer  $N$ , the number of registered users.
- $N$  lines, the  $i$ -th of which consisting of string  $U_i$ .

### Output

The output file must contain a single line consisting of string  $T$ , the username Valerio will use.

## Constraints

- $1 \leq N \leq 200\,000$ .
- Each username  $U_i$  consists only of lowercase letters and digits, and is at most 20 characters long.
- Each username  $U_i$  is unique.
- $S$  consists only of lowercase letters **without** any digits, and is at most 20 characters long.

## Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

- **Subtask 1** (0 points)      Examples.
- **Subtask 2** (20 points)       $N = 1$ .
- **Subtask 3** (40 points)       $N \leq 100$ .
- **Subtask 4** (40 points)      No additional limitations.

## Examples

input	output
thescrasse 3 harniver edomora97 thescrasse42	thescrasse
fve 10 fve4 doxeno fve1 virv12 carloccc fve3 fve davibart fve2 bortoz	fve5

## Explanation

In the **first sample case**, Valerio’s username is “thescrasse”. This username is not already taken, so Valerio can use it without adding any number.

In the **second sample case**, Valerio’s username is “fve”. There are already users with usernames “fve”, “fve1”, “fve2”, “fve3” and “fve4”, so Valerio has to choose “fve5”.