

C. Registration system

time limit per test: 5 seconds
 memory limit per test: 64 megabytes
 input: standard input
 output: standard output

A new e-mail service "Berlandesk" is going to be opened in Berland in the near future. The site administration wants to launch their project as soon as possible, that's why they ask you to help. You're suggested to implement the prototype of site registration system. The system should work on the following principle.

Each time a new user wants to register, he sends to the system a request with his name. If such a name does not exist in the system database, it is inserted into the database, and the user gets the response OK, confirming the successful registration. If the name already exists in the system database, the system makes up a new user name, sends it to the user as a prompt and *also inserts the prompt into the database*. The new name is formed by the following rule. Numbers, starting with 1, are appended one after another to name (name1, name2, ...), among these numbers the least i is found so that name i does not yet exist in the database.

Input

The first line contains number n ($1 \leq n \leq 10^5$). The following n lines contain the requests to the system. Each request is a non-empty line, and consists of not more than 32 characters, which are all lowercase Latin letters.

Output

Print n lines, which are system responses to the requests: OK in case of successful registration, or a prompt with a new name, if the requested name is already taken.

Examples

input
4 abacaba acaba abacaba acab
output
OK OK abacaba1 OK

input
6 first first second second third third
output
OK first1 OK second1 OK third1

→ Attention

Package for this problem was not updated by the problem writer or Codeforces administration after we've upgraded the judging servers. To adjust the time limit constraint, solution execution time will be multiplied by 2. For example, if your solution works for 400 ms on judging servers, then value 800 ms will be displayed and used to determine the verdict.

Codeforces Beta Round #4 (Div. 2 Only)

Finished

→ Virtual participation





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Start virtual contest

→ Problem tags

data structures hashing implementation
 No tag edit access

→ Contest materials

- Announcement 
- Tutorial #1 
- Tutorial #2 
- Tutorial #3 

Server time: Nov/30/2016 19:21:49^{UTC+8} (c4).
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