Problem 3

Telegrams are gone nowadays but they were once very popular. With them you were able to send short messages much faster than with snail mails. The charging scheme was very simple: the longer you write, the more you pay. Therefore it is evident that you would like to write your message as short as possible.

If the sender and the receiver know the set of possible messages in advance, they can label each message and send just labels instead of messages. However, both party should agree with the labeling scheme.

Given a set of strings, the essential substring of a string is its substring such that it is not included in any other substrings and has the shortest length. So once we are given a set of messages and find an essential substring for each message, we can reduce the total amount of messages with no confusion.

For example, assume that we have three messages {apple, apps, please}. Then the essential substrings are as follows. Note that the third message 'please' has another essential substring 'as' whose length is also two.

apple

apps

please

[Input]

Te first line has the number N which is the number of the strings in the set. It is assumed that $2 \le N \le 1{,}000$. For each given number a solution is guaranteed to exist. The following N lines contain N strings in the English lower case, one string for each line. The maximal length of a string is 100. Also, no string is a substring of another.

[Output]

You should print N lines. Each line contains the length of the essential substring. The ordering is the same with the input.

[I/O Example]

Input

```
3
apple
apps
please
```

Output

```
3
2
2
```