3046   Shortest Prefixes

A prefix of a string is a substring starting at the beginning of the given string. The prefixes of "`carbon`" are: "`c`", "`ca`", "`car`", "`carb`", "`carbo`", and "`carbon`". Note that the empty string is not considered a prefix in this problem, but every non-empty string is considered to be a prefix of itself. In everyday language, we tend to abbreviate words by prefixes. For example, "carbohydrate" is commonly abbreviated by "carb". In this problem, given a set of words, you will find for each word the shortest prefix that uniquely identifies the word it represents.

In the sample input below, "`carbohydrate`" can be abbreviated to "`carboh`", but it cannot be abbreviated to "`carbo`" (or anything shorter) because there are other words in the list that begin with "`carbo`".

An exact match will override a prefix match. For example, the prefix "`car`" matches the given word "`car`" exactly. Therefore, it is understood without ambiguity that "`car`" is an abbreviation for "`car`", not for "`carriage`" or any of the other words in the list that begins with "`car`".

Input

The first line of the input indicates the number of datasets to process. **Dataesets are separated by a blank line**.

Each dataset contains at least two, but no more than 1000 lines. Each line contains one word consisting of 1 to 20 lower case letters.

Output

For each dataset, the output contains the same number of lines as the input.

Each line of the output contains the word from the corresponding line of the input, followed by one blank space, and the shortest prefix that uniquely (without ambiguity) identifies this word.

Print a blank line between consecutive datasets.

Sample Input

```
1

carbohydrate
cart
carburetor
caramel
caribou
carbonic
cartilage
carbon
carriage
carton
car
carbonate
```

Sample Output

```
carbohydrate carboh
cart cart
carburetor carbu
caramel cara
caribou cari
carbonic carboni
cartilage carti
carbon carbon
carriage carr
carton carto
car car
carbonate carbona
```