Problem E: Anagram

Source file: anagram.c / anagram.p
Input file: anagram.in
Output file: anagram.out

You are to write a program that has to generate all possible words from a given set of letters.

Example

Given the word "abc", your program should – by exploring all different combination of the three letters – output the words "abc", "acb", "bac", "bca", "cab" and "cba".

In the word taken from the input file, some letters may appear more than once. For a given word, your program should not produce the same word more than once, and the words should be output in alphabetically ascending order.

Input

The input file consists of several words. The first line contains a number giving the number of words to follow. Each following line contains one word. A word consists of uppercase or lowercase letters from A to Z. Uppercase and lowercase letters are to be considered different.

Output

For each word in the input file, the output file should contain all different words that can be generated with the letters of the given word. The words generated from the same input word should be output in alphabetically ascending order.

Example

Input

```
2
abc
acba
```

Output

```
abc
acb
bac
bca
cab
cba
aabc
aacb
abac
abca
acab
acba
baac
baca
bcaa
caab
caba
cbaa
```

Hint

The number of possible combinations raises very quickly with the number of given letters. Make sure you do not use long words for testing your program because the output file could become very big, waste a lot of space on the disk and degrade the performance of the network.