Problem E: Mix and Build

Input: `mixbuild.in`
Output: `mixbuild.out`

In this problem, you are given a list of words (sequence of lower case letters). From this list, find the longest chain of words $w_1, ..., w_n$ such that w_i is a *mixed extension* of w_{i-1}. A word A is a mixed extension of another word B if A can be formed by adding one letter to B and permuting the result. For example, "ab", "bar", "crab", "cobra", and "carbon" form a chain of length 5.

Input

The input file contains at least two, but no more than 10000 lines. Each line contains a word. The length of each word is at least 1 and no more than 20. All words in the input are distinct.

Output

Write the longest chain that can be constructed from the given words. Output each word in the chain on a separate line, starting from the first one. If there are multiple longest chains, any longest chain is acceptable.

Sample input

```
ab
arc
arco
bar
bran
carbon
carbons
cobra
crab
crayon
narc
```

Output for sample input

```
ab
bar
crab
cobra
carbon
carbons
```