Double or One Thing

Problem

You are given a string of uppercase English letters. You can highlight any number of the letters (possibly all or none of them). The highlighted letters do not need to be consecutive. Then, a new string is produced by processing the letters from left to right: non-highlighted letters are appended once to the new string, while highlighted letters are appended twice.

For example, if the initial string is HELLOWORLD, you could highlight the H, the first and last Ls and the last O to obtain
HELLOWORLD ⟹ HHELLLOWOORLLD. Similarly, if you highlight nothing, you obtain HELLOWORLD, and if you highlight all of the letters, you obtain HHEELLLLOOWWOORRLLDD. Notice how each occurrence of the same letter can be highlighted independently.

Given a string, there are multiple strings that can be obtained as a result of this process, depending on the highlighting choices. Among all of those strings, output the one that appears first in alphabetical (also known as lexicographical) order.

Note: A string s appears before a different string t in alphabetical order if s is a prefix of t or if at the first place s and t differ, the letter in s is earlier in the alphabet than the letter in t. For example, these strings are in alphabetical order: CODE, HELLO, HI, HIM, HOME, JAM.

Input

The first line of the input gives the number of test cases, $\mathbf{T}$. $\mathbf{T}$ test cases follow. Each test case is described in a single line containing a single string $\mathbf{S}$.

Output

For each test case, output one line containing Case #x: y, where x is the test case number (starting from 1) and y is the string that comes first alphabetically from the set of strings that can be produced from $\mathbf{S}$ by the process described above.

Limits

Time limit: 2 seconds.
Memory limit: 1 GB.
$1 \leq \mathbf{T} \leq 100$.
Each character of $\mathbf{S}$ is an uppercase letter from the English alphabet.

Test Set 1 (Visible Verdict)

$1 \leq$ the length of $\mathbf{S} \leq 10$.

Test Set 2 (Hidden Verdict)

$1 \leq$ the length of $\mathbf{S} \leq 100$.

Sample

In Sample Case #1, these are all the strings that can be obtained, in alphabetical order: PEEEEL, PEEEELL, PEEEL, PEEELL, PEEL, PEELL, PPEEEEL, PPEEEELL, PPEEEL, PPEEELL, PPEEL, and PPEELL.

In Sample Case #2, every string that can be obtained contains only As. The shortest of those is alphabetically first, because it is a prefix of all others.

In Sample Case #3, there are 1024 possible strings which can be generated from CODEJAMDAY out of which CCODDEEJAAMDAAY is the lexicographically smallest one.