Google Code Jam '22 Round 1A Problem A - Double or One Thing

Time limit: 2.0s **Memory limit:** 1G

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 `L`s and the last `O` to obtain `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 Specification

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

Output Specification

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 S by the process described above.

Limits

Time limit: 2 seconds.

Memory limit: 1 GB.

$1 \leq T \leq 100$.

Each character of S is an uppercase letter from the English alphabet.

Test Set 1

$1 \leq \text{length of } S \leq 10$.

Test Set 2

$1 \leq \text{length of } S \leq 100$.

Sample Input

```
3
PEEL
AAAAAAAAAA
CODEJAMDAY
```

Sample Output

```
Case #1: PEEEEL
Case #2: AAAAAAAAAA
Case #3: CCODDEEJAAMDAAY
```

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 `A`s. 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.