

Double or One Thing

Attempts	Penalties	Penalty Time	Points	Points
3	1	00:36:24	✓	✓
	PROBLEM		ANALYSIS	

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.

HELLOWORLD → HHELLOWOORLLD

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 ⇒ HHELLOWOORLLD. Similarly, if you highlight nothing, you obtain HELLOWORLD, and if you highlight all of the letters, you obtain HHEELLLLOOWWOORRLDD. 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, **T**. **T** test cases follow. Each test case is described in a single line containing a single string **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 **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 (Visible Verdict)

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

Test Set 2 (Hidden Verdict)

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

Sample

Sample Input	Sample Output
3 PEEL AAAAAAAAA CODEJAMDAY	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, PEEEEELL, 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.