Round A 2022 - Kick Start 2022

Challenge Nine

PROBLEM ANALYSIS

Problem

Ada gives John a positive integer N N. She challenges him to construct a new number (without leading zeros), that is a multiple of 99, by inserting *exactly* one digit (`0` … … `9`) anywhere in the given number N N. It is guaranteed that N N does not have any leading zeros.

As John prefers smaller numbers, he wants to construct the *smallest* such number possible. Can you help John?

Input

The first line of the input gives the number of test cases, T T. T T test cases follow.

Each test case has a single line containing a positive integer N N: the number Ada gives John.

Output

For each test case, output one line containing `Case #xx:` yy, where `xx` is the test case number (starting from 1) and yy is the new number constructed by John. As mentioned earlier, yy cannot have leading zeros.

Limits

Memory limit: 1 GB.
$1 \leq T \leq 100$ 1≤T≤100.

Test Set 1

Time limit: 20 seconds.
$1 \leq N \leq 10^5$ 1≤N≤105.

Test Set 2

Time limit: 40 seconds.
For at most 10 cases:
$1 \leq N \leq 10^{123456}$ 1≤N≤10123456.
For the remaining cases:
$1 \leq N \leq 10^5$ 1≤N≤105.

Sample

Sample Input	save_alt content_copy
3 5 33 12121	

Sample Output	save_alt content_copy
Case #1: 45 Case #2: 333 Case #3: 121212	

In Sample Case #1, there are only two numbers that can be constructed satisfying the divisibility constraint: 4545 and 5454. John chooses the smaller number.

In Sample Case #2, 333333 is the only number possible.

In Sample Case #3, there are four possible options - 212121212121, 122121122121, 121221121221 and 121212121212 - out of which the smallest number is 121212121212.