Round A 2022 - Kick Start 2022

Challenge Nine

PROBLEM ANALYSIS

Problem

Ada gives John a positive integer \mathbf{N} . She challenges him to construct a new number (without leading zeros), that is a multiple of 9, by inserting *exactly* one digit $(0 \dots 9)$ anywhere in the given number \mathbf{N} . It is guaranteed that \mathbf{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 test cases follow.

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

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 new number constructed by John. As mentioned earlier, y cannot have leading zeros.

Limits

Memory limit: 1 GB.

 $1 \le \mathbf{T} \le 100.$

Test Set 1

Time limit: 20 seconds.

 $1 \le \mathbf{N} \le 10^5$.

Test Set 2

Time limit: 40 seconds.

For at most 10 cases:

 $1 < \mathbf{N} < 10^{123456}$.

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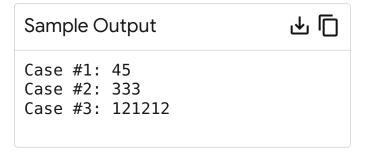
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For the remaining cases:

$$1 \le \mathbf{N} \le 10^5$$
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Sample

Sample Input	♣ [
3 5 33 12121	



In Sample Case #1, there are only two numbers that can be constructed satisfying the divisibility constraint: 45 and 54. John chooses the smaller number.

In Sample Case #2, 333 is the only number possible.

In Sample Case #3, there are four possible options - 212121, 122121, 121221 and 121212 - out of which the smallest number is 121212.

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