# 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,  ${f T}$ .  ${f T}$  test cases follow.

Each test case has a single line containing a positive integer  ${f N}$ : 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.

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

### Test Set 2

Time limit: 40 seconds.

For at most 10 cases:

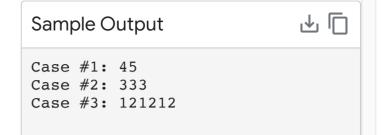
 $1 \le \mathbf{N} \le 10^{123456}$ .

For the remaining cases:

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

## Sample

Sample Input	<b>♣</b> □
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.