

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 . . . 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, \mathbf{T} . \mathbf{T} test cases follow.

Each test case has a single line containing a positive integer \mathbf{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.

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

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:

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

For the remaining cases:

$$1 \leq N \leq 10^5.$$

Sample

Sample Input	 	Sample Output	 
3 5 33 12121		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: 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.