

# The Next Number

## Problem

You are writing out a list of numbers. Your list contains all numbers with exactly  $D_i$  digits in its decimal representation which are equal to  $i$ , for each  $i$  between 1 and 9, inclusive. You are writing them out in ascending order.

For example, you might be writing every number with two '1's and one '5'. Your list would begin 115, 151, 511, 1015, 1051.

Given  $N$ , the last number you wrote, compute what the next number in the list will be.

## Input

The first line of input contains an integer  $T$ , the number of test cases in the input.  $T$  lines follow, one for each test case, each containing a single integer  $N$ .

## Output

For each test case, output

Case # $X$ :  $K$

where  $X$  is the test case number, starting from 1, and  $K$  is the next integer in the list.

## Limits

Memory limit: 1 GB.

## Small dataset

Time limit: 20 seconds.

$$1 \leq T \leq 50$$

$$1 \leq N \leq 10^6$$

## Large dataset

Time limit: 30 seconds.

$$1 \leq T \leq 500$$

$$1 \leq N \leq 10^{20}$$

## Sample

Sample Input

Sample Output

3  
115  
1051  
6233

Case #1: 151  
Case #2: 1105  
Case #3: 6323