WaNjayDing

Time Limit: 0.3s
Memory Limit: 48MB

Description

The village of AnjayNgobar is a unique village. As the name implies, the villagers are very fond of doing (Ngoding) ~~Ngopi~~ together. But unfortunately, the village does not have proper internet facilities for its people. For this reason, Brembo wants to develop the internet in AnjayNgobar village by building an internet rental facility for the people. Brembo called it **"Warnet Anjay Ngoding (WaNjayDing)"**.

Now he is just looking for people to lead and manage the *warnet*. He gives a challenge to all AnjayNgobar Village people, and for anyone who succeeded correctly and quickly answered the challenge, then he/she could take the position. Brembo will hold the game **"Mabar String Anjay"** as a challenge. Brembo has prepared a lots of strings S consisting of digits (0-9) and lowercase letters (a-z). From the string S, there are two stages of the game that participants must pass. The main goal of this game is to calculate R :

$$R = (P - Q)\ mod\ \left((P + Q)\ mod\ 10^9 + 7\right)$$

The value of P can be achieved by answering the first stage of the game. P is how many substrings from string S meet the following criteria.

- The substring forms an integer x such that $x = 3n$, where n is some positive integer.
- Substring x may have leading-zero and the value is equal to x when it has no leading-zero.

Then, the second stage of the game is to determine Q. Participants must extract all digit character from string S (discarding all lowercase character) into an array. Let's call it array A. The order of extraction is started from the left to the right, filling the array A sequentially. After array A is formed, participants should perform arithmetic operation in the following.

- Let's define N as the length of array A and a_i is i-th element of the array $(1 \leq i \leq N)$.
- If a_m $(1 \leq m \leq N)$ is non-zero number, perform $a_m - 1$. Then, perform $a_k + 1$ for all k $(1 \leq k < m)$.
- Do the previous step until all of a_i become 0.
- Determine Q, which is the total number of times $a_m - 1$ operation is performed in modulo $10^9 + 7$.

You are one of the people of the AnjayNgobar Village, and wish to join the challenge. For this reason, you will create a program that will help you solve the intended challenges.

Format Input

Input consists of several test cases. The first line is T, the number of test cases. The next T line is a string S. String S consists of digits (0-9) and lowercase letters (a-z).

Format Output

Each test cases consists of two lines. The first line is the string "**Case #i:**", where i is the i-th case. The second line consists of three numbers P, the number of substrings based on the criteria that have been explained, Q is the result of the second stage of game, and value of R (separated by space).

Sample

Input

```
2
dasp3rog
888
```

Ouput

```
Case #1:
1 3 2
Case #2:
1 56 2
```

Constraint

- $1 \leq T \leq 20$
- $1 \leq |S| \leq 5 \times 10^7$ (Length of string)