

2037 Digital Rivers

A digital river is a sequence of numbers where the number following n is n plus the sum of its digits. For example, 12345 is followed by 12360, since $1 + 2 + 3 + 4 + 5 = 15$. If the first number of a digital river is k we will call it river k .

For example, river 480 is the sequence beginning $\{480, 492, 507, 519, \dots\}$ and river 483 is the sequence beginning $\{483, 498, 519, \dots\}$.

Normal streams and rivers can meet, and the same is true for digital rivers. This happens when two digital rivers share some of the same values. For example: river 480 meets river 483 at 519, meets river 507 at 507, and never meets river 481.

Every digital river will eventually meet river 1, river 3 or river 9. Write a program that can determine for a given integer n the value where river n first meets one of these three rivers.

Input

The input may contain multiple test cases. Each test case occupies a separate line and contains an integer n ($1 \leq n \leq 16384$). A test case with value of '0' for n terminates the input and this test case must not be processed.

Output

For each test case in the input first output the test case number (starting from 1) as shown in the sample output. Then on a separate line output the line 'first meets river x at y '. Here y is the lowest value where river n first meets river x ($x = 1$ or 3 or 9). If river n meets river x at y for more than one value of x , output the lowest value.

Print a blank line between two consecutive test cases.

Sample Input

```
86
12345
0
```

Sample Output

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Case #1
first meets river 1 at 101

Case #2
first meets river 3 at 12423
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