

Problem 1—Digit Square Sums

Jaime Escalante loves number games. One game he likes is finding the sum of the squares of all the digits of a number. If you do this repeatedly, you will ultimately get to either one or four. For example, 16 becomes 37 ($1^2 + 6^2$) which becomes 58 ($3^2 + 7^2$) which becomes 89 ($5^2 + 8^2$), becoming 145, 42, 20, and 4, in succession.

Given a positive number, you are to print the sequence of digit square sums starting with that number and ending with 1 or 4. (If the number is either 1 or 4, you should apply the pattern at least once.)

INPUT SPECIFICATION. You will be given a set of input cases, each of which will be an unsigned decimal integer less than 10000000. The last input case will be followed by -1. There may be any number of spaces and <EOLN>'s before, after, and between the input cases and the terminating -1.

OUTPUT SPECIFICATION. The output cases should appear in the same order as the input cases. Each output case will be of the form “Case c ” (where c is the number of the input case) followed by <EOLN> followed by the sequence of digit square sums beginning with the input case and ending with 1 or 4. Each number is followed by <EOLN> and an extra <EOLN> follows the output case.

SAMPLE INPUT.

```
1<EOLN>
4194304<EOLN>
-1<EOLN>
<EOF>
```

SAMPLE OUTPUT.

```
Case • 1<EOLN>
1<EOLN>
1<EOLN>
<EOLN>
Case • 2<EOLN>
4194304<EOLN>
139<EOLN>
91<EOLN>
82<EOLN>
68<EOLN>
100<EOLN>
1<EOLN>
<EOLN>
<EOF>
```