Problem 4—Invertible Years

As a crusading journalist, Clark Kent has been to nearly every nation on earth. During his travels, Clark has encountered many different cultures, languages, alphabets, and number systems. After encountering a strange system of numbers and letters that somewhat but not completely resembles English, Clark began thinking of invertible years. An invertible year is a year that reads the same upside down as right side up. The most recent invertible year was 1961. The next will be 6009. (Though fonts vary, we assume that "1","0", and "8" invert as themselves and that "6" and "9" invert as each other.) Leading zeroes are unacceptable in invertible years. Even though 110 could be written as "0110," 110 is *not* an invertible year.

Clark is superb at mental arithmetic; however, most of us appreciate a little help from the computer. For any given year, you are to compute the first invertible year following the given year.

INPUT SPECIFICATION. Each data case consists of a single unsigned decimal integer no greater than 99999 representing the input year. Each input year is followed by exactly one **<EOLN>**. The last data case is followed by "0<**EOLN**>". This merely signifies the end of the input and should not be processed.

OUTPUT SPECIFICATION. The output cases should appear in the same order as their respective input cases. The output should be in the format "Case c: The first invertible year after i is y." C is the case number; i is the input year; y is the desired output year. Each output case should be followed by exactly one **<EOLN>**.

SAMPLE INPUT.

```
1800<EOLN>
1900<EOLN>
1961<EOLN>
0<EOLN>
<EOF>
```

SAMPLE OUTPUT.

```
Case·1:·The·first·invertible·year·after·1800·is·1881.<EOLN>
Case·2:·The·first·invertible·year·after·1900·is·1961.<EOLN>
Case·3:·The·first·invertible·year·after·1961·is·6009.<EOLN>
<EOF>
```