

Problem 21: Broken Clock¹

Source filename: led. (cpp|java)
 Input filename: led.in
 Output filename: led.out



Steve has a problem with his bed-side alarm clock. Some of the LED components work only intermittently. He would like for you to write a program that, given which LED components are not working, outputs which digits may be confused with others.

Here is a display that illustrates how the clock uses the 7 LED components to display the 10 decimal digits:

```

  _ _ _ _ _ _ _ _ _ _
 | | | | | | | | | |
 | | | | | | | | | |
  _ _ _ _ _ _ _ _ _ _

```

We'll number the 7 LED components in the following order:

```

      1
  2  4  3
  5  6
      7

```

For example, if component number 1 is not working, the display for digits 4 and 9 will look identical; and Steve will not be able to tell the difference between the two. Notice that digits 1 and 7 will also look identical (but different from the display for digits 4 & 9).

Input File (led.in)

The input file contains several test cases. The input for each test case consists of 1 or more single digit integers separated by a single space all on one line. The end of each line is marked with a single '0'. Each non-zero digit represents a LED component that isn't working. After all of the test cases, the last line contains a single zero '0'.

Output File (led.out)

For each test case there should be one line of output. The first text on each line should be the string: "Case <list>:", where *list* is a comma-delimited list of the broken component(s). There is 1 space between the letter 'e' and the left angle bracket '<'. A comma should be not displayed before the first component nor after the last component in the list.

If there are clock digits that will be confused due to the broken component(s), display a single space after the colon followed by the set (or sets) of confused digits. If more than one set of clock digits will be confused, the sets should be separated by a single space. The format of each set should appear as "{set}" where *set* is a comma-delimited list of the clock digits that would be confused.

No line of output should begin or end with a space character. There should never be 2 consecutive spaces in the output file.

Example Input

```

1 0
2 0
3 0
1 3 0
1 2 3 4 5 6 0
0

```

Corresponding Output

```

Case <1>: {1,7} {4,9}
Case <2>:
Case <3>: {6,8}
Case <1,3>: {1,7} {4,9} {6,8}
Case <1,2,3,4,5,6>: {0,2,3,5,6,8} {1,4,7,9}

```

¹ This problem appeared at the CCSC:MidSouth Student Programming Contest April 4, 2008.