**Happy People**

You’ve recently stumbled across a previously undiscovered indigenous tribe of 1000 people on a remote island location. Interestingly, each of these 1000 people wears a shirt with a unique integer between 1 and 1000, inclusive, written on it. Your job, as an anthropologist, is to communicate with these people and learn about their culture. Unfortunately, not all these people are willing to talk to you, as many are fearful of outsiders. The only indigenous people that will speak with you are those that consider themselves “happy.”

A person considers himself or herself “happy” if all three of the following criteria are met:

1. Repeatedly summing the square of the digits of the integer the person is wearing results in an infinite series of the integer 1. For example, the person wearing the integer 7 meets this first criteria because

72 = 49

42 + 92 = 97

92 + 72 = 130

12 + 32 + 02 = 10

12 + 02 = 1

12 = 1

12 = 1

…

This procedure results in an infinite series of the integer 1, so this first criteria is met.

1. The integer the person is wearing does not contain the digit ‘0’ anywhere in it (these indigenous people appreciate appearance more than anything, and nobody wants to wear a ‘0’).
2. The integer **k** the person is wearing is not an anagram of a different integer **c < k** that another “happy” person is wearing. For example, if the person wearing the integer 56 is “happy,” the person wearing the integer 65 cannot be “happy” (once again proving that appearance is everything).

Your job is to take a subset, size **n**, of the people wearing the integers **1..n** and determine how many of these people will speak to you (that is, how many people in this subset are “happy”).

**Input**

The input will consist of one of more strings, one per line. Each string will consist of an integer **q**, where **1<=q<=1000**. The last line of input will be a line with string 0, and should not be processed.

**Output**

For each line of input generate an output line in the format below. This output line consists of the input string followed by a :, a blank space, and the amount of “happy” people in the subset of people wearing the integers **1..q**.

**Sample Input**

7

67

0

**Output Corresponding to Sample Input**

7: 2

67: 8