

God created only two kinds of people: the 1-kind and the 89-kind. To understand this phenomenon, you must understand the concept of number chains.

A number chain can be created by continuously adding the square of the digits in a number to form a new number until it has been seen before.

For example, the number chain for 44 looks as follows:

44 - 32 - 13 - 10 - 1 - 1

Try starting with 85. We get the following number chain:

85 - 89 - 145 - 42 - 20 - 4 - 16 - 37 - 58 - 89

Therefore, any chain that arrives at 1 or 89 will become stuck in an endless loop.

The most amazing fact is that every starting number will eventually arrive at 1 or 89.

Use the lucky number (refer assignment 2) of a person to identify whether the person is of 1-kind or the 89-kind. If a chain that starts with the person's lucky number ends in 1, he/she belongs to the 1-kind, else, he/she belongs to the 89-kind.

Write a C program that answers the following questions:

- (1) Given any name, have your program output whether the person belongs to the 1-kind or the 89-kind.
- (2) How many numbers between 1 and n both inclusive will lead to a number chain ending at 1? Assume that we stop the chain on the first occurrence of 1 or 89. If the number itself is 1 or 89, we declare it to be of the same kind.

First, take a name as input. Print the lucky number and the person's kind. Next, take a number n as input. This number could be as big as ten million. Print how many of the numbers between 1 and n both inclusive lead to a number chain ending in 1. Also, print those numbers. Given below is an example.

Expected Input and Output

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Please enter your name: Anu
Anu, your lucky number is 4.
Anu, you belong to the 89-kind.
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Please enter a number: 10
Following 3 numbers between 1 and 10 end in 1:
1, 7, 10.
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