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| **Problem D: Smith Numbers** |

**Background**

While skimming his phone directory in 1982, Albert Wilansky, a mathematician of Lehigh University , noticed that the telephone number of his brother-in-law H. Smith had the following peculiar property: The sum of the digits of that number was equal to the sum of the digits of the prime factors of that number. Got it? Smith's telephone number was 493-7775. This number can be written as the product of its prime factors in the following way:

\begin{displaymath}4937775 = 3\cdot 5\cdot 5\cdot 65837\end{displaymath}

The sum of all digits of the telephone number is 4+9+3+7+7+7+5=42, and the sum of the digits of its prime factors is equally 3+5+5+6+5+8+3+7=42. Wilansky was so amazed by his discovery that he named this type of numbers after his brother-in-law: Smith numbers.

As this observation is also true for every prime number, Wilansky decided later that a (simple and unsophisticated) prime number is not worth being a Smith number and he excluded them from the definition.

**Problem**

Wilansky published an article about Smith numbers in the *Two Year College Mathematics Journal* and was able to present a whole collection of different Smith numbers: For example, 9985 is a Smith number and so is 6036. However, Wilansky was not able to give a Smith number which was larger than the telephone number of his brother-in-law. It is your task to find Smith numbers which are larger than 4937775.

**Input**

The input consists of several test cases, the number of which you are given in the first line of the input.

Each test case consists of one line containing a single positive integer smaller than 109.

**Output**

For every input value *n*, you are to compute the smallest Smith number which is larger than *n* and print each number on a single line. You can assume that such a number exists.

**Sample Input**

1

4937774

**Sample Output**

4937775