



The Magical 3

Three is a magic number.

Yes it is; it's a magic number.

Somewhere in the ancient, mystic trinity,

You get three as a magic number.

- Schoolhouse Rock

According to Pythagoras and the Pythagorean School, the number 3 - which they called *triad* - is the noblest of all digits, as it is the only positive integer to equal the sum of all of the positive integers below it ($1+2=3$), and it is the only positive integer whose sum with those below equals the product of them and itself ($1+2+3=1\times 2\times 3$).

Your task is to find the magic – the magic **3**, that is – when it can be the last digit in a representation of a positive integer in some base. Consider, for example, the number 11. It can be represented as *ONE-THREE* (13) in base 8 and as *TWO-THREE* (23) in base 4. You are to write a program that will find the smallest base for a given positive integer where the input number's representation in that base ends in 3. This is possible for all integers greater than 6.

Input

Each input will consist of a single test case. Note that your program may be run multiple times on different inputs. Each test case will consist of a single line with a single integer n ($7 \leq n < 2^{31}$).

Output

For each test case, output a single integer representing the smallest base in which the input n ends with a 3.

Sample Input	Sample Output
11	4
42	13
9876	9