1. The following is an incomplete table of the first twenty whole numbers in decimal and their ternary equivalents. Your task is to complete this table.

Decimal	Ternary
0	0
1	1
2	2
3	10
4	11
5	12
6	20
7	21
8	22
9	100

Decimal	Ternary
10	101
11	102
12	110
13	111
14	112
15	120
16	121
17	122
18	200
19	201

2. Based on what you see in this table, what can you say about the last digit of the ternary equivalent of a decimal number n? In other words, make a precise observation about what the last digit of the ternary equivalent of the decimal number n is, as a function of the value of n. Answer in one sentence.

Answer: The last digit of the ternary equivalent of the decimal number n is equal to the remainder of n divided by 3.

3. The above observation helps you get the last digit of the ternary equivalent of a number n. To get the rest of the digits observe a relationship between the ternary equivalent of a decimal number n and the ternary equivalent of a number roughly one-third of n. State this observation precisely. Answer in 1-2 sentences.

Answer: Suppose the ternary equivalent ends with x (0, 1 and 2), to get the rest of n's ternary equivalent, we need to "consult" (n-x)/3.

4. Use the above two observations to derive an algorithm to compute the ternary equivalent of a given, nonnegative decimal integer n. Write this algorithm in pseudocode similar to the one used in class to describe the algorithm for translating a decimal number into its binary equivalent.

Answer:

1) Read the number n given as input.
2) If n is a multiple of three, output 0. Replace n by n/3.
3) If n is indivisible by three, output the remainder x. Replace n by (n-x)/3.
4) If n is zero, stop. Otherwise go to Line 2.

6. As a way of testing your program, use it to turn your birthdate into equivalent ternary representation. More precisely, write down your birthdate in the form yyyymmdd. For example, if you were born on June 9th 1995 you would write down 19950609. Use your birthdate as input to your program and find its ternary equivalent. To answer this question writes down your birthdate and its ternary equivalent.

Answer:

Decimal Number	Ternary equivalent
19920718	1101111002002101