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Assignment 04

1). Find the remainder of: 1) 99/7 and 2) -51/6?

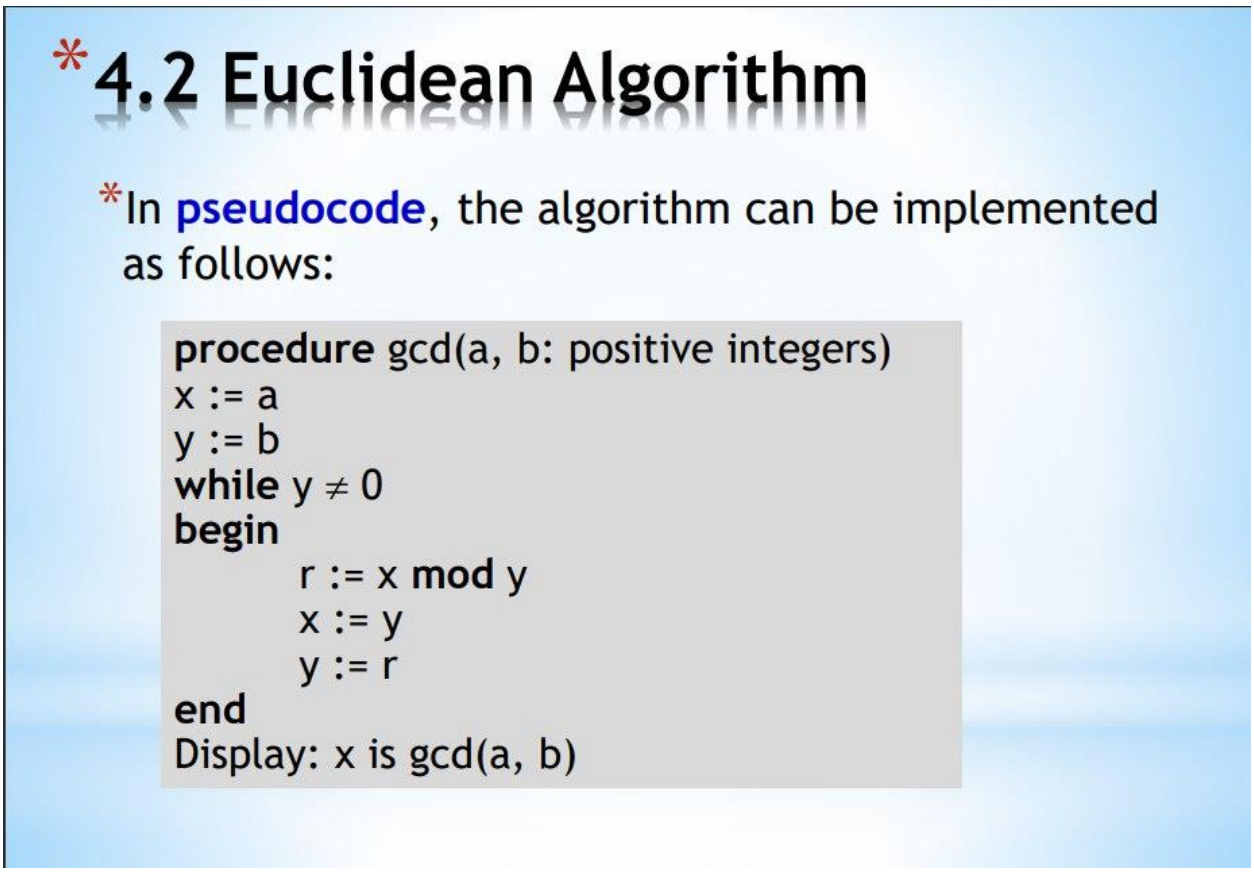
2). What is the GCD(105,28)? (write the solution each step!)

3). What is the GCD(308,42)? (write the solution each step!)

4). What is the LCM(105,28)? (write the solution each step!)

5). What is the LCM(308,42)? (write the solution each step!)

6). Explain the algorithm (in slide #20) line by line?



Answer

1. Find the remainder of:
    a. 99/7

    $99 = 14 \times 7 + 1$

    Thus, the remainder is 1.

    b. -51/6

    $-51 = (-8) \times 7 + 5$

    Thus, the remainder is 5.

2. GCD (105,28)
   $105 = 3 \times 5 \times 7$
   $28 = 2^2 \times 7$
    - GCD(105,28) = 7
3. GCD (308,42)
   $308 = 2^2 \times 7 \times 11$
   $42 = 2 \times 3 \times 7$
    - GCD(308,42) = 2 x 7 = 14
4. LCM (105,28)
   $105 = 3 \times 5 \times 7$
   $28 = 2^2 \times 7$
    - GCD(105,28) = $2^2 \times 3 \times 5 \times 7 = 420$
5. LCM (308,42)
   $308 = 2^2 \times 7 \times 11$
   $42 = 2 \times 3 \times 7$
    - LCM (308,42) = $2^2 \times 3 \times 7 \times 11 = 924$
6. Explain the algorithm (in slide #20) line by line?
    - Declares a procedure (or function) named gcd.
    - It takes two arguments, a and b, which are assumed to be positive integers.
    - The purpose is to find the greatest common divisor (GCD) of a and b.
    - Initiates a while loop that continues as long as the value of y is not equal to zero.
    - Marks the beginning of the code block that will be executed repeatedly within the while loop.
    - Calculates the remainder (r) when x is divided by y using the modulo operator (mod).
    - Swaps the values of x and y.
    - Assigns the previously calculated remainder (r) to y
    - End of the code block that is executed within the while loop.
    - Display the value of x after the loop terminates.