

## Purpose

The purpose of this assignment is to give you practice with writing functions and for loops

## Problem

In Mathematics, the **greatest common divisor (GCD)** of two or more integers, when at least one of them is not zero, is the largest positive integer that divides the numbers without a remainder. For example, the **GCD** of 8 and 12 is 4.

In arithmetic and number theory, the **least common multiple**, of two integers  $a$  and  $b$ , usually denoted by **LCM**( $a, b$ ), is the smallest positive integer that is divisible by both  $a$  and  $b$

Example of LCM:

*What is the LCM of 4 and 6?*

Multiples of 4 are: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, ...

Multiples of 6 are: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, ...

Common multiples of 4 and 6 are simply the numbers that are in both lists:

12, 24, 36, 48, 60, 72, ....

So, from this list of the first few common multiples of the numbers 4 and 6, their **LCM** is 12.

Write a program that accepts 2 integers from the user in the main function and calls a function to compute the GCD of the two numbers. The parameters to the function are the two integers. The result (GCD) is returned as a function return value. After printing the GCD, a function is called to compute the LCM of the two numbers and the result (LCM) is returned as a function return value of the second function.

The main function prompts the user to enter 2 positive integers. If anything other than positive integers are entered, display an error message and ask them to re-enter 2 numbers (you **MUST** use a while loop to keep accept input if they are invalid). If a set of inputs are valid, call the function to compute GCD first (pass the two integers as arguments), print the GCD result, call the second function to compute LCM next (pass the two integers as arguments), and print the LCM result, and stop the program (there is no need to continuously accept numbers).

Your functions **MUST** use a **for** loop to compute the GCD of the two numbers and return the result as a function return value. You can use any kind of logic you want to compute the LCM of two numbers.

The results of the computation needs to be printed in the main function.

**There is a starter file that shows you how to create function definitions and prototypes for computing GCD, make sure you understand what's being done before duplicating it for LCM.**

## Inputs

Only one set of inputs are sufficient for program completion as long as they are valid inputs, meaning that you do not have to keep looping once a set of inputs have been processed.

## Outputs

A message indicating the input numbers along with the GCD and LCM results should be printed. Any invalid inputs must be indicated with a proper error message (sample output is available in the public folder).