CSCI 201 – Computer Science 1

Lab 10: Creating a fraction class.

Due date: Tuesday April 2

Objective. *Design and implement a class, that requires some mathematical operations, for a library package.*

Question 1. *Creating a fraction class.*
We have to design a class fraction, that can be used to read and write fractions in the format a/b, and also check if two fractions are equal (Note that two fractions are equal if the product of the first numerator and second denominator equals the product of the second numerator and first denominator.)
(a) what data fields will the class have?
(b) what methods (member functions) will the class have? Write the header for each.
(c) create a UML diagram for the fraction class (see Section 13.15 in textbook).

Question 2. Write the code for fraction class.

Question 3. Write a program that tests all the features of the class. In a script session `cat` the `.h, .cpp` files and the main program, compile the `.cpp` file for the fraction class using the -c option, compile the main program with the object code (.o file), and run the program. Upload the script file.

Extra Credit. Write a method `simplify()` that simplifies a fraction so that it is in the lowest form, i.e., the numerator and denominator have no common factors. This will require computing the Greatest Common Divisor (GCD). The strategy for finding the GCD of two positive integers, a and b, *($a > b$),* is as follows: if b divides a, exit and return b; otherwise continue with the *new* a = *old* b, and `new b = (old a) % (old b)`. This feature should be tested separately in a script session, and uploaded to CourseFiles.