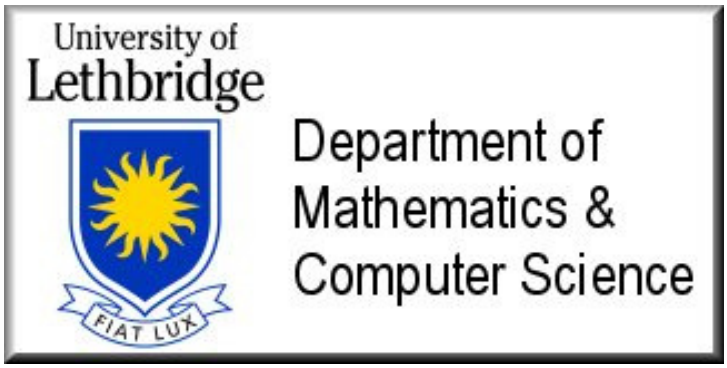

CPSC 1620 A – Fundamentals of Programming I – Fall 2021

Assignment 6 [40 points]

Due November 15th, 2021 at 11:59 PM

General Instructions

- Go to `Assignment 6 A` on `gitlab.cs.uleth.ca`.
- Fork `Assignment 6 A`.
- Clone it in Atom.
- Create a file `triangle.cc` that contains your program to the first problem
- Create a file `fraction.cc` that contains your program to the second problem.
- Work on your assignment. Each time you go back to work on your assignment, make sure to follow the standard: fetch/pull → work → stage all/commit/push procedure.
- Make sure to make the last push before the assignment deadline as the last push before the deadline will be graded.
- Once you are done:
  - Go to your assignment on Gitlab
  - Check if you are satisfied with your solutions
  - From the left sidebar choose `Project information - Members`
  - Switch from `Invite member` to `Invite group`,
  - Enter the group name `Team1620` in the `Select a group to invite` field,
  - Leave `Max role` as `Maintainer`,
  - Click the `Invite` button.

Problems

1. **[10 points]** Redo problem 2 of assignment 5 `triangle.cc` where you have to define and use the following functions:

   (a) `isTriangle` - takes 3 sides of a triangle and returns true if they form a triangle, false otherwise.

   (b) `isIsosceles` - takes 3 sides of a triangle and returns true if they form an isosceles triangle, false otherwise.

   (c) `isEquilateral` - takes 3 sides of a triangle and returns true if they form an equilateral triangle, false otherwise.

   (d) `isRight` - takes 3 sides of a triangle and returns true if they form a right triangle, false otherwise.

   You program should run repeatedly until the user wants to quit.

2. **[30 points]** Write a fraction calculator program that adds, subtracts, multiplies, and divides fractions. Your program should check for the division by 0, have and use the following functions:

   (a) `abs` - returns the absolute value of a given integer.

   (b) `min` - returns the smallest of two positive integers.

   (c) `gcd` - returns the greatest common divisor of two positive integers.

   (d) `reduce` - reduces a given fraction.

   (e) `flip` - reduces a given fraction and flips the sign if the denominator is negative.

   (f) `add` - finds the reduced sum of a pair of given fractions.

   (g) `subtract` - finds the reduced difference of a pair of given fractions, by making the second fraction negative then using the add function.

   (h) `multiply` - finds the reduced product of a pair of given fractions.

   (i) `divide` - finds the reduced quotient of a pair of given fractions by inverting the second fraction then using the multiply function.

   Sample Runs:

```
Fraction Calculator 1.0
Enter an arithmetic expression of the form a/b operator c/d,
replace operator by any one of +, -, *, or /
~$ 2/4 + 1/3
Solution: (1/2) + (1/3) = 5/6
Again (Y/N)? Y
```

```
~$ 1/-3 - 5/6
Solution: (-1/3) - (5/6) = -7/6
Again (Y/N)? Y
~$ 4/5 * -2/-10
Solution: (4/5) * (1/5) = 4/25
Again (Y/N)? Y
~$ 6/3 / 1/3
Solution: (2/1) / (1/3) = 6/1
Again (Y/N)? N
```