CS 410: Homework 3

Due: Friday, Nov. 10, 2020 at 9:30am **50 pts**

Instructions:

YOU WILL SUBMIT **MULTIPLE FILES** FOR THIS PROGRAMMING PROJECT.

Create a subdirectory named "hw3" in your cs410 directory. Use that subdirectory for all your file submissions on this assignment. At the end of the homework assignment, as a minimum, these files should be found in your hw3 directory:

- **hw3_calculator.cpp** (function definitions)
- **hw3_calculator.h** (class/function prototypes)
- **hw3.cpp** (main)
- a "typescript" file demonstating program compilation, execution and testing

You may include other source/header files if you please.

In this homework, you will implement your own calculator for fractions. No need to worry about any GUI.

You will implement the fraction class that was discussed in class and overload the following methods operators:

- Addition (+): Adds 2 fractions and returns a fraction. Overload this operator as a member function.
- Subtraction (–): Subtracts a fraction from another fraction and returns a fraction. Overload this operator as a non-member function.
- Division (/): Performs division on 2 fractions and returns a fraction. Overload this operator as a non-member function.
- Multiplication (*): Multiplies 2 fractions and returns a fraction. Overload this operator as a member function.

In addition, you will implement a template for a queue with the following functions as a minimum:

enqueue() that appends the latest item to the end of the queue.

dequeue() that deletes the first item from the queue.

peek() that returns the first item in the queue.

empty() that checks whether the queue is empty or not.

Details:

Your calculator should keep prompting for new entries to calculate until the user decides to quit. After each calculation, you have to enqueue the result onto the queue. Once the user is done calculating, you will go through the queue and display all items in the queue one after the other.

After displaying an item from the queue, it should be deleted from the queue. This means that after displaying the last item in the queue, the queue has to be empty.

TESTING YOUR CODE:

Run the following tests on your code:
(3/4)+(7/4) = (10/4) or (5/2)
(3/4)/(7/4) = (3/7) or (12/28)
(3/4)-(7/4) = (-4/4) or (-1/1) or (4/-4) or (1/-1)
(3/4)*(7/4) = (21/16)

And, as always, let your TAs or instructor know if you need any help.