

**Bronx Community College**  
**Department of Mathematics and Computer Science**  
**CSI33 Fall 2019**  
**Programming Assignment 5: worth 30 points**  
**Assigned on November 13, 2019**  
**Due on November 20, 2019**

**Assignment 5**

Complete the implementation of the Rational class by implementing the modifications and additions listed.

1. Modify the set method to ensure that if a Rational object represents a negative ration number, then the denominator is positive, and the numerator is negative.
2. Overload the remaining mathematical operators -, \* and / for subtraction, multiplication and division. (Addition + was discussed in class.) Overload these operators as member methods of the class.
3. Overload the comparison operators <, <=, >, >=, ==, and !=. Overload these operators as stand-alone functions. One approach is to write the implementations of < and of ==, and then define the other operators using <, ==, and the logical operators || (logical or) and ! (logical not).
4. Include the input (>>) and output (<<) operators in your class implementation. These were also discussed in class.
5. Add a method reduce to your class that converts a Rational object to lowest terms as a fraction. Use Euclid's algorithm.

Submit the files Rational.h and Rational.cpp to me by email at [sharon.persinger@bcc.cuny.edu](mailto:sharon.persinger@bcc.cuny.edu) by the end of the day on 11/20/2019. Be sure to include your name in both files as a comment. Include CSI33 in the subject line of your email.