

Computer Programming/Object Oriented Programming

Assignment # 3

Due: April 14, 2019

1. (***RationalNumber Class***) Create a class Rational Number (fractions) with the following capabilities:
 - a) Create a constructor that prevents a 0 denominator in a fraction, reduces or simplifies fractions that are not in reduced form and avoids negative denominators.
 - b) Overload the addition, subtraction, multiplication and division operators for this class.
 - c) Overload the relational and equality operators for this class.
2. (***Polynomial Class***) Develop class Polynomial. The internal representation of a Polynomial is an array of terms. Each term contains a coefficient and an exponent, e.g., the term $2x^4$ has the coefficient 2 and the exponent 4. Develop a complete class containing proper constructor and destructor functions as well as *set* and *get* functions. The class should also provide the following overloaded operator capabilities:
 - a) Overload the addition operator (+) to add two Polynomials.
 - b) Overload the subtraction operator (-) to subtract two Polynomials.
 - c) Overload the assignment operator to assign one Polynomial to another.
 - d) Overload the multiplication operator (*) to multiply two Polynomials.
 - e) Overload the addition assignment operator (+=), subtraction assignment operator (-=), and multiplication assignment operator (*=).
3. (***Complex Class***) Implement a class that represents complex numbers, overloads +,-,*,/ to support complex arithmetic and overloads equal (==) and not equal (!=) operator to support complex number comparison.
4. (***Array Class***) Develop a class to implement a class for Array with following functionalities
 - a) Range checking
 - b) Array assignment
 - c) Arrays that know their size
 - d) Outputting/inputting entire arrays with << and >>
5. (***Calendar Class***) Defining Operator (+=) and Operator (-=) to Add or Subtract Days in the Calendar Given an Integer Input.