

## Object Oriented PROGRAMMING (CS217)

### ASSIGNMENT-5

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#### Instructions

Write complete programs for the following. You are free to consult each other for verbal help. However **copying or sharing the code with each other will not only result into the cancellation of the current assignment, it may impact your grade in all the assignments and exams as well.**

**Due: May 03, 2020**

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1. (***RationalNumbers***) 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***) 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 assignment operator to assign one Polynomial to another.
  - b) Overload the multiplication operator (\*) to multiply two Polynomials.
  - c) Overload the addition assignment operator (+=), subtraction assignment operator (-=), and multiplication assignment operator (\*=).
3. (***Complex number***) 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. (***Arrays***) 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.