ECET11 – Object Oriented Programming LAB activity 5

Objective: Operator Overloading

Source: Deitel & Deitel Edition 5 – Chapter 11 Exercise

(Develop class Polynomial). The internal representation of a polynomial is an array of terms. Each term contains a coefficient and an exponent.

The term $2x^4$ has the coefficient 2 and the exponent 4.

Develop a complete class called *Polynomial* containing a constructor, a *set function,* a *get* function and a display function. Furthermore, the class provides the following overloaded operator capabilities:

a. Overload the addition operator (+) to add two Polynomials (P1 + P2)
b. Overload the subtraction operator (-) to subtract two Polynomials (P1 - P2)
c. Overload the multiplication operator (*) to multiply two binomials of the form $ax^0 + bx^1$(P1 * P2)
d. Overload the addition assignment operator (+=) (P1 = P1 + P2)

Requirements:

- The polynomial will comprise of no more than 5 terms including the constant term. For example, the general form of the polynomial is:

$$a + bx + cx^2 + dx^3 + ex^4$$

  a, b, c, d, e are integers each in ranging from 0 to 100.

- Polynomial coefficients are entered via the keyboard.

The driver program:

Enter First Polynomial: 1 0 3 4 5

P1: $x^{4} + 3x^{2} + 4x + 5$

Enter Second Polynomial: 5 4 3 2 1

P2: $5x^{4} + 4x^{3} + 3x^{2} + 2x + 1$

P1 + P2: 6 x^4 + 4 x^3 + 6 x^2 + 6 x + 6

P1 – P2: - 4 x^4 - 4 x^3 + 2 x + 4

P1 += P2: 6 x^4 + 4 x^3 + 6 x^2 + 6 x + 6

P1 * P2: P1 & P2 must be BINOMIALS

Enter First binomial: 4 5

P1: 4x + 5

Enter Second binomial: 2 1

P2: 2x + 1

P1 * P2: 8 x^2 + 14 x + 5

Grading:

1. Data members (10%)
2. Operator+ (10%)
3. Operator- (10%)
4. Operator* (10%)
5. Operator+= (10%)
6. On time Delivery (50%)