

Instructions

Please develop class "Polynomial". The internal representation of a polynomial is an array of terms. Each term contains a coefficient and an exponent. For example, 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 (*=)
- f) Overload the output operator (<<) so that it can display the polynomials. For example, if in the main function we have:

```
Polynomial poly1;  
//more code  
cout<<poly1;
```

It would print out the polynomial (for example: $2x^2 + 3x^3$).

Please use 3 files for this assignment. The header file that contains the class declaration (.h file) should be named "Polynomial_YourName.h". The class definition file (.cpp file) should be named "Polynomial_YourName.cpp" and the class implementation should be named "Main_YourName.cpp" file.

A sample output of the program:

```
Enter the number of polynomial terms: 2  
Enter coefficient and exponent : 2 2  
Enter coefficient and exponent: 3 3
```

```
Enter number of polynomial terms 3:  
Enter coefficient and exponent : 1 1  
Enter coefficient and exponent : 2 2  
Enter coefficient and exponent : 3 3
```

(please print out the polynomial in the following two lines out using the overloaded output operator)
First Polynomial is : $2x^2 + 3x^3$
Second Polynomial is : $1x + 2x^2 + 3x^3$

Adding polynomial yields: $1x + 4x^2 + 6x^3$
+= the polynomial yields: $1x + 4x^2 + 6x^3$

Subtracting the polynomial yield : $-1x$
- = the polynomials yields : $-1x$

Multiplying the polynomials yields: $2x^3 + 7x^4 + 12x^5 + 9x^6$
* = the polynomial yields: $2x^3 + 7x^4 + 12x^5 + 9x^6$

Assume that the greatest degree of an input polynomial will be 6 so that you can use a fixed size for the arrays. **Make sure to take into account the size of an array necessary when you multiply two polynomials.**