Assignment#2 (Friday 25, 2017)

Q1. Design a class called **Polynomial**, which models polynomials of degree-*n* (see equation)

ExerciseOOP_MyPolynomialEqn.png

The class should contain:

* A method **getDegree()** that returns the degree of the polynomial.
* A method **toString()** that returns "cnx^n+cn-1x^(n-1)+...+c1x+c0".
* A method **evaluate(double x)** that evaluate the polynomial for the given x, by substituting the given x into the polynomial expression.
* Methods **add( )** and multiply( ) that will add and multiply two polynomials.
* A method **Display( )** to display the polynomial equation.

Also write a test program (called TestPolynomial) to test all the methods defined in the class.

**Sparse Matrix**

A matrix in which number of zero entries are much higher than the number of non zero entries is called sparse matrix. Given Below matrix is an example of sparse matrix.

0 0 0 15

0 0 0 0

7 0 0 12

0 0 1 0

This matrix can be represented as a triplet vector (row, column, value) as given below

|  |  |  |
| --- | --- | --- |
| Row | Col | Val |
| 1 | 4 | 15 |
| 3 | 1 | 7 |
| 3 | 4 | 12 |
| 4 | 3 | 1 |

Q2. Design a class SparseMatrix with the following methods

* To convert any matrix of size M×N into a sparse matrix.
* To add two sparse matrices.
* To subtract a sparse matrix from other.
* To display a sparse matrix

Also write a test program to test all the methods defined in the class.