**Tutorial 7**

**Implement the following programs in C++ language**

1. Define a class Space which describes a point in 3-D plane using Rectangular coordinates. Use the overloaded unary minus (-) operator to display the mirror image of the point along origin.
2. Define a class Weight which describes weight in kg and gms. Use the overloaded binary plus (+) operator to add two object of class Weight.
3. Define a class Polar which describes a point in 2-D plane using polar coordinates radius and angle. Use the overloaded + operator to add two objects of Polar. Trigonometric formula for conversion of polar coordinates to rectangular coordinates and vice versa are given below:

Ploar to Rectangular

x = r \* cos(a)

y = r \* sin(a)

Rectangular to Polar

a = atan(y/x)

r = sqrt(x \* x + y \* y)

1. Define a class Vector which represent a vector (a series of integer values). Overload \* operator for scalar multiplication of a vector.
2. Define a class String. Use >> and << operator to input and output a string respectively.
3. Define a class String. Use overloaded == and + operator to compare two strings and add two strings respectively.
4. Create a class Account which stores account number, balance and customer name. Create a conversion function which converts Account type to double type to display the balance of the customer.
5. Define two classes Rectangular and Polar to represent points in the polar and rectangular systems. Use conversion routines to convert from one system to the other.