**Assignment 04**

**First Project:**

* Define 3D Point Class and the basic Constructors (use chaining in constructors).
* Override the ToString Function to produce this output:

Point3D P = new Point3D (10,10,10);

Console. WriteLine (P. ToString( ));

Output: “Point Coordinates: (10, 10, 10)”.

* Read from the User the Coordinates for 2 points P1, P2 (Check the input using try Pares, Parse, Convert).
* Try to use ==

If (P1 == P2) Does it work properly?

* Define an array of points and sort this array based on X & Y coordinates.
* Implement ICloneable interface to be able to clone the object.

To implement more than one interface.

class Point3D:IComparable ,ICloneable

**Second Project:**

Define an interface named IShape with a property Area and a method DisplayShapeInfo. Create two interfaces, ICircle and IRectangle, that inherit from IShape. Implement these interfaces in classes Circle and Rectangle. Test your implementation by creating instances of both classes and displaying their shape information.

**Third Project:**

* Define Class Duration To include Three Attributes Hours, Minutes and Seconds.
* Override All System.Object Members (ToString, Equals,GetHasCode) .
* Define All Required Constructors to Produce this output:

Duration D1 =new Duration (1,10,15);

D1.ToString();

**Output**: Hours: 1, Minutes :10, Seconds :15

Duration D1 =new Duration (3600);

D1.ToString();

**Output**: Hours: 1, Minutes :0, Seconds :0

Duration D2 =new Duration (7800);

D2.ToString();

**Output**: Hours: 2, Minutes :10, Seconds :0

Duration D3 =new Duration (666);

D3.ToString();

**Output**: Minutes :11, Seconds :6

* Implement All required Operators overloading to enable this Code:
* D3=D1+D2
* D3=D1 + 7800
* D3=666+D3
* D3= ++D1 (Increase One Minute)
* D3 = --D2 (Decrease One Minute)
* D1= D1 -D2
* If (D1>D2)
* If (D1<=D2)
* If (D1)
* DateTime Obj = (DateTime) D1