Tutorial – 4

1 . The employee list for a company contains employee code, name, designation and basic pay. The employee is given a house rent allowance (HRA) of 10% of the basic pay and dearness allowance (DA) of 45% of the basic pay. The total pay of the employee is calculated as Basic Pay + HRA + DA. Write a class to define the details of the employee. Write a constructor to assign the required initial values. Add a method to calculate HRA, DA and total pay and print them. Write another class with main method. Create objects for three different employees and calculate HRA, DA and total pay.

```csharp
using System;
namespace _24SOECE13043_Dharmraj_sodha.LAB4
{
    class Employee
    {
        public int EmpCode { get; set; }
        public string Name { get; set; }
        public string Designation { get; set; }
        public double BasicPay { get; set; }

        public Employee(int empCode, string name, string designation,
double basicPay)
        {
            EmpCode = empCode;
            Name = name;
            Designation = designation;
            BasicPay = basicPay;
        }

        public void CalculatePay()
        {
            double hra = 0.10 * BasicPay;
            double da = 0.45 * BasicPay;
            double totalPay = BasicPay + hra + da;
```

```csharp
            Console.WriteLine("Employee Code : " + EmpCode);
            Console.WriteLine("Name          : " + Name);
            Console.WriteLine("Designation   : " + Designation);
            Console.WriteLine("Basic Pay     : " + BasicPay);
            Console.WriteLine("HRA (10%)     : " + hra);
            Console.WriteLine("DA (45%)      : " + da);
            Console.WriteLine("Total Pay     : " + totalPay);
            Console.WriteLine("-------------------------------");
        }
    }
    class Q1
    {
        static void Main(string[] args)
        {
            Employee e1 = new Employee(101, "Rahul", "Manager",
50000);
            Employee e2 = new Employee(102, "Priya", "Engineer",
30000);
            Employee e3 = new Employee(103, "Amit Patel", "Clerk",
20000);
            e1.CalculatePay();
            e2.CalculatePay();
            e3.CalculatePay();
        }
    }
}
```

Output :

```
C:\Users\Shadowheart\source\repos\S-hadowHeart\24SOECE13043_Dharmraj_sodha\LAB4>Q1
Employee Code : 101
Name           : Rahul
Designation    : Manager
Basic Pay      : 50000
HRA (10%)      : 5000
DA (45%)       : 22500
Total Pay      : 77500
---------------------------------
Employee Code : 102
Name           : Priya
Designation    : Engineer
Basic Pay      : 30000
HRA (10%)      : 3000
DA (45%)       : 13500
Total Pay      : 46500
---------------------------------
Employee Code : 103
Name           : Amit Patel
Designation    : Clerk
Basic Pay      : 20000
HRA (10%)      : 2000
DA (45%)       : 9000
Total Pay      : 31000
---------------------------------
```

2 : From the following code and given output, complete missing statements and find out error code and correct it.
using System;

```csharp
namespace _24SOECE13043_Dharmraj_sodha.LAB4
{
    class Shape
    {
        public double Width;
        public double Height;

        public void ShowDim()
        {
            Console.WriteLine("Width and height are " + Width + " and
" + Height);
        }
    }

    class Triangle : Shape
```

```csharp
{
    public string Style;

    public double Area()
    {
        return Width * Height / 2;
    }

    public void ShowStyle()
    {
        Console.WriteLine("Triangle is " + Style);
    }
}

class Q2
{
    static void Main()
    {
        Triangle t1 = new Triangle();
        Triangle t2 = new Triangle();

        t1.Width = 4.0;
        t1.Height = 4.0;
        t1.Style = "isosceles";

        t2.Width = 8.0;
        t2.Height = 12.0;
        t2.Style = "right";

        Console.WriteLine("Info for t1: ");
        t1.ShowStyle();
        t1.ShowDim();
        Console.WriteLine("Area is " + t1.Area());

        Console.WriteLine();
```

```
            Console.WriteLine("Info for t2: ");
            t2.ShowStyle();
            t2.ShowDim();
            Console.WriteLine("Area is " + t2.Area());
        }
    }
}
```

Output:

```
C:\Users\Shadowheart\source\repos\S-hadowHeart\24SOECE13043_Dharmraj_sodha\LAB4>Q2
Info for t1:
Triangle is isosceles
Width and height are 4 and 4
Area is 8

Info for t2:
Triangle is right
Width and height are 8 and 12
Area is 48
```

3: Draw a real picture for single level inheritance.

```
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB4
{
    class Person
    {
        private int age;
        protected string address;
        public string name;

        public void SetDetails(string n, int a, string addr)
        {
            name = n;
            age = a;
            address = addr;
        }

        public void ShowDetails()
```

```csharp
    {
        Console.WriteLine("Name: " + name);
        Console.WriteLine("Age: " + age);
        Console.WriteLine("Address: " + address);
    }
}

class Employee : Person
{
    private double salary;
    protected string department;
    public int empId;

    public void SetEmployee(int id, double sal, string dept)
    {
        empId = id;
        salary = sal;
        department = dept;
    }

    public void ShowEmployee()
    {
        Console.WriteLine("Employee ID: " + empId);
        Console.WriteLine("Department: " + department);
        Console.WriteLine("Salary: " + salary);
    }
}

class Q3
{
    static void Main()
    {
        Employee e1 = new Employee();
        Employee e2 = new Employee();

        e1.SetDetails("Rahul Mehta", 30, "Ahmedabad");
```

```csharp
            e1.SetEmployee(101, 50000, "IT");

            e2.SetDetails("Priya Shah", 28, "Surat");
            e2.SetEmployee(102, 45000, "HR");

            Console.WriteLine("Employee 1 Information:");
            e1.ShowDetails();
            e1.ShowEmployee();

            Console.WriteLine();

            Console.WriteLine("Employee 2 Information:");
            e2.ShowDetails();
            e2.ShowEmployee();
        }
    }
}
```

Output:

```
C:\Users\Shadowheart\source\repos\S-hadowHeart\24SOECE13043_Dharmraj_sodha\LAB4>Q3
Employee 1 Information:
Name: Rahul Mehta
Age: 30
Address: Ahmedabad
Employee ID: 101
Department: IT
Salary: 50000

Employee 2 Information:
Name: Priya Shah
Age: 28
Address: Surat
Employee ID: 102
Department: HR
Salary: 45000
```

4. From the following code and given output complete missing statements and find out error code and correct it.

using System;

```csharp
namespace _24SOECE13043_Dharmraj_sodha.LAB4
{
    class StaticVar
    {
        public static int num;

        public StaticVar()
        {
            num++;
        }

        public void count()
        {
            num++;
        }

        public static int getNum()
        {
            return num;
        }
    }

    class Q4
    {
        static void Main(string[] args)
        {
            StaticVar s = new StaticVar();

            s.count();
            s.count();
            s.count();
```

```
            Console.WriteLine("Variable num: {0}",
    StaticVar.getNum());

            Console.ReadKey();
        }
    }
}
```

Output :

Q5.Find out error code and correct it. Print appropriate output as desired.

```csharp
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB4
{
    public class A
    {
        public A(int value)
        {
            Console.WriteLine("Base constructor A()");
        }
    }

    public class B : A
    {
        public B(int value) : base(value)
        {
            Console.WriteLine("Derived constructor B()");
        }
    }

    class Q5
    {
        static void Main()
```

```csharp
        {
            A a = new A(0);
            B b = new B(1);
        }
    }
}
```

Output :

```
C:\Users\Shadowheart\source\repos\S-hadowHeart\24SOECE13043_Dharmraj_sodha\LAB4>Q5
Base constructor A()
Base constructor A()
Derived constructor B()
```

6 . **Find out error code and correct it. Print appropriate output as desired.**

```csharp
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB4
{
    abstract class Test
    {
        protected int a;
        public abstract void A();
    }

    class Example1 : Test
    {
        public override void A()
        {
            Console.WriteLine("Example1.A");
            a++;
        }
    }

    class Example2 : Test
    {
        public override void A()
        {
```

```csharp
            Console.WriteLine("Example2.A");
            a--;
        }
    }

    class Q6
    {
        static void Main()
        {
            Test test1 = new Example1();
            test1.A();

            Test test2 = new Example2();
            test2.A();
        }
    }
}
```

Output:

```
C:\Users\Shadowheart\source\repos\S-hadowHeart\24SOECE13043_Dharmraj_sodha\LAB4>Q6
Example1.A
Example2.A
```

7. Refer given output and find out error code and correct it.

```csharp
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB4
{
    sealed class A
    {
        public int x;
        public int y;
    }

    class SealedTest2
    {
        static void Main()
```

```
        {
            A sc = new A();
            sc.x = 110;
            sc.y = 150;

            Console.WriteLine("x = {0}, y = {1}", sc.x, sc.y);
        }
    }
}
```

Output:

```
C:\Users\Shadowheart\source\repos\S-hadowHeart\24SOECE13043_Dharmraj_sodha\LAB4>Q7
x = 110, y = 150
```

8 : Find out error code and correct it. Print appropriate output as desired.

```csharp
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB4
{
    class X
    {
        public virtual void F() { Console.WriteLine("X.F"); }
        public virtual void F2() { Console.WriteLine("X.F2"); }
    }

    class Y : X
    {
        public sealed override void F() { Console.WriteLine("Y.F"); }
        public override void F2() { Console.WriteLine("Y.F2"); }
    }

    class Z : Y
    {
        // Cannot override F() because it is sealed in Y
        public override void F2() { Console.WriteLine("Z.F2"); }
    }
```

```csharp
class SealedMethodTest
{
    static void Main()
    {
        X Obj1 = new X();
        Obj1.F();
        Obj1.F2();

        Y Obj2 = new Y();
        Obj2.F();
        Obj2.F2();

        Z Obj3 = new Z();
        Obj3.F();   // calls Y.F (sealed)
        Obj3.F2();  // calls Z.F2
    }
}
```

Output :

```
C:\Users\Shadowheart\source\repos\S-hadowHeart\24SOECE13043_Dharmraj_sodha\LAB4>Q8
X.F
X.F2
Y.F
Y.F2
Y.F
Z.F2
```

9 : This program will throw an exception. Add try, catch and finally blocks to handle this exception

```csharp
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB4
{
    class MyClient
    {
        public static void Main()
        {
            int x = 0;
            try
            {
                int div = 100 / x;
                Console.WriteLine(div);
            }
            catch (DivideByZeroException e)
            {
                Console.WriteLine("Exception caught: " + e.Message);
            }
            finally
            {
                Console.WriteLine("Finally block executed.");
            }
        }
    }
}
```

Output :

```
C:\Users\Shadowheart\source\repos\S-hadowHeart\24SOECE13043_Dharmraj_sodha\LAB4>Q9
Exception caught: Attempted to divide by zero.
Finally block executed.
```

10: Arrange the code to get desirable output

```csharp
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB4
{
    // User-defined exception
    class MyException : Exception
    {
        public MyException(string str) : base(str)
        {
            Console.WriteLine("User defined exception");
        }
    }

    class MyClient
    {
        public static void Main()
        {
            try
            {
                throw new MyException("my exception generated.");
            }
            catch (Exception e)
            {
                Console.WriteLine("Exception caught here: " +
e.Message);
            }
            Console.WriteLine("LAST STATEMENT");
        }
    }
}
```

Output:

```
C:\Users\Shadowheart\source\repos\S-hadowHeart\24SOECE13043_Dharmraj_sodha\LAB4>Q10
User defined exception
Exception caught here: my exception generated.
LAST STATEMENT
```