

Lab #3 Assignment**PROBLEM BP1:**

Define a class, which contains information about a mobile phone: model, manufacturer, price, owner, and features of the battery (model, idle time and hours talk) and features of the screen (size and colors).

PROBLEM BP3:

To the class of mobile phone in the previous two tasks, add a static field `nokiaN95`, which stores information about mobile phone model Nokia N95. Add a method to the same class, which displays information about this static field.

PROBLEM BP4:

Add an enumeration `BatteryType`, which contains the values for type of the battery (Li-Ion, NiMH, NiCd, ...) and use it as a new field for the class `Battery`.

PROBLEM BP5:

Add a method to the class `GSM`, which returns information about the object as a string.

PROBLEM BP6:

Define data members or attributes to encapsulate the data in classes `GSM`, `Battery` and `Display`.

```
using System;

namespace BP
{
    class Mobile{
        public string model;
        public string manufacturer;
        public double price;
        public string owner;
        public Mobile(){ }
        public static string[] NokiaN95={ "Nokia", "N95", "12000", "BL5F", "4",
"6", "1", "40 x 53 mm", "white" };
        public void StoreGeneralInformation(){
            Console.WriteLine("Enter Model:");
            model=Console.ReadLine();
            Console.WriteLine("Enter Manufacturer:");
            manufacturer=Console.ReadLine();
            Console.WriteLine("Enter Price:");
            price=Convert.ToInt32(Console.ReadLine());
            Console.WriteLine("Enter Owner Name:");
            owner=Console.ReadLine();
        }
    }
}
```

```

    }
    public void StoreOwnerInfo(){
        Console.WriteLine("Enter Owner Name");
        owner=Console.ReadLine();
    }
    public string MobileInfo(){
        return ("Manufacturer:"+manufacturer+"\nModel:"+model+"\nPrice:"+price+"\nOwner:"+owner);
    }
    public void NokiaInfo(){
        manufacturer=NokiaN95[0];
        model=NokiaN95[1];
        price=Convert.ToInt32(NokiaN95[2]);
    }
}
class GSM:Mobile{
    string connection_Provider;    //BSNL, AIRTEL, IDEA, JIO
    string connection_type;        //PREPAID, POSTPAID

    public Battery battery;
    public Screen screen;
    public void StoreGSMInformation(){
        Console.WriteLine("Enter Connection Provider:");
        connection_Provider=Console.ReadLine();
        Console.WriteLine("Enter Connection Type:");
        connection_type=Console.ReadLine();
    }
    public string NokiaDisplayInfo(){
        NokiaInfo();
        battery=new Battery(NokiaN95[3],Convert.ToInt32(NokiaN95[4]),Convert.ToInt32(NokiaN95[5]));
        screen=new Screen(NokiaN95[7],NokiaN95[8]);
        StoreOwnerInfo();
        StoreGSMInformation();
        Console.WriteLine("\n**INFORMATION**");
        string infoAboutPhone = MobileInfo()+"\n"+"Connection Provider: "+connection_Provider+
        "\nConnection Type: "+connection_type+"\n\n"+battery.GetInformationBattery() +
        "\nBatteryType: "+battery.GetBatteryType()+"\n\n"+
        screen.GetInformationScreen() ;
        return infoAboutPhone;
    }
}
class Battery{
    public string batteryModel;
    public int idle_time;
    public int hours_talk;

```

```
public enum BatteryType{LiIon=1,NiMH,NiCd};
public BatteryType batteryType=(BatteryType)1;
public Battery(){ }

public Battery(string batteryModel,int idle_time, int hours_talk){
    this.batteryModel=batteryModel;
    this.idle_time=idle_time;
    this.hours_talk=hours_talk;
}

public void StoreInformationBattery(){
    Console.WriteLine("Enter Battery Model:");
    batteryModel=Console.ReadLine();
    Console.WriteLine("Enter Idle Time:");
    idle_time=Convert.ToInt32(Console.ReadLine());
    Console.WriteLine("Enter Hours Talk:");
    hours_talk=Convert.ToInt32(Console.ReadLine());
    Console.WriteLine("Enter Choice for Battery Type:");
    Console.WriteLine("1.Li-Ion\n2.NiMH\n3.Nicd");
    batteryType=(BatteryType)Convert.ToInt32(Console.ReadLine());
}

public string GetInformationBattery(){
    return("BatteryModel: "+batteryModel+"\nIdleTime: "+idle_time+"\nHoursTalk: "+hours_talk);
}

public string GetBatteryType()
{
    switch (batteryType)
    {
        case BatteryType.LiIon:
            return "Li-Ion";
        case BatteryType.NiMH:
            return "NiMH";
        case BatteryType.NiCd:
            return "NiCd";
        default:
            return ("Unsupported battery type: " + batteryType);
    }
}

}

class Screen{
    public string size;
    public string color;
    public Screen(){ }
    public Screen(string size,string color){
        this.size=size;
        this.color=color;
    }
    public void StoreInformationScreen(){
```

```
        Console.WriteLine("Enter Size:");
        size=Console.ReadLine();
        Console.WriteLine("Enter Color:");
        color=Console.ReadLine();
    }
    public string GetInformationScreen(){
        return("Size: "+size+"\nColor: "+color);
    }
}
class Program
{
    static void Main(string[] args)
    {
        GSM gsm=new GSM();
        Console.WriteLine(gsm.NokiaDisplayInfo());
    }
}
```

OUTPUT

```
PS C:\Users\user\Desktop\SEM-3\C#\C-sharp programs\BP> dotnet run
Enter Owner Name
Nikita Kapoor
Enter Connection Provider:
Airtel
Enter Connection Type:
Prepaid

**INFORMATION**
Manufacturer:Nokia
Model:N95
Price:12000
Owner:Nikita Kapoor

Connection Provider: Airtel
Connection Type: Prepaid

BatteryModel: BL-5F
IdleTime: 4
HoursTalk: 6
BatteryType: Li-Ion

Size: 40 x 53 mm
Color: white
PS C:\Users\user\Desktop\SEM-3\C#\C-sharp programs\BP> █
```

PROBLEM BA1:

Recent events in the stock market may seem remote to you, but they underscore the uncertainty of planning for the future. People who had been thinking of retiring in the next year or so may have to rethink those plans, as the value of their 401K accounts drops noticeably. Although retirement may seem a long way off for you, we are going to explore some simple ideas in accruing funds. We are going to start with a simple model of saving for retirement. Many Departments will contribute the equivalent of 5% of your salary to a retirement fund, and then will match any contribution that you add, Rupees for Rupees, up to an additional 5%. Thus, you can salt away up to 15% of your salary into a retirement account (10% which comes as a bonus from your employer). We can model a retirement fund with some simple equations. Assume your starting salary is represented by salary; that the percentage of your salary you put into a retirement fund is save; and that the annual growth percentage of the retirement fund is growthRate i.e. 2% initial. Then your retirement fund, represented by the list F, should increase as follows:

Retirement Funds	
End of year 1	$F[0] = \text{salary} * \text{save} * 0.01$
End of year 2	$F[1] = F[0] * (1 + 0.01 * \text{growthRate}) + \text{salary} * \text{save} * 0.01$
End of year 3	$F[2] = F[1] * (1 + 0.01 * \text{growthRate}) + \text{salary} * \text{save} * 0.01$

Problem 1. This project may be used by Different Department of the Govt. Officials. So, we need to implement the Code in C# to evaluate the Retirement funds of the employees at the time of the retirement. Maximum retirement age of the Employee should be 60-65 Years as per Department requirement. Design and implement all the classes with full functionality to evaluate the retirement funds.

```
using System;

namespace BA
{
    class Employee{

        public int id;
        public string name;
        public int salary;
        public int contri;
        public int growthRate=2;
        public int age;
        public void setDetails(){
            Console.WriteLine("Enter Id");
            id=Convert.ToInt32(Console.ReadLine());
            Console.WriteLine("Enter Name");
            name=Console.ReadLine();
            Console.WriteLine("Enter Age");
            age=Convert.ToInt32(Console.ReadLine());
        }
    }
}
```

```
        Console.WriteLine("Enter Salary");
        salary=Convert.ToInt32(Console.ReadLine());
        Console.WriteLine("Enter Contribution %");
        contri=Convert.ToInt32(Console.ReadLine());
        Console.WriteLine("Enter Growth Rate %");
        growthRate=Convert.ToInt32(Console.ReadLine());
    }
    public void getDetails(){
        Console.WriteLine("Id"+id);
        Console.WriteLine("Name"+name);
        Console.WriteLine("Age"+age);
        Console.WriteLine("Salary"+salary);
        Console.WriteLine("Contribution %"+contri);
        Console.WriteLine("Growth Rate %"+growthRate);
    }
    public int getAge(){
        return age;
    }
    public double fundCalc(int currage,int retirementAge)
    {
        double F=0;
        int diff=retirementAge-currage;
        for (int i=0; i<diff; i++)
        {
            F+=(F*growthRate*0.01)+((salary)*(contri+contri+5)*0.01);
        }
        return F;
    }
}
class Deptt{
    public Employee e;
    public int retirementAge;
    public void setRetirementAge(){
        Console.WriteLine("Enter Retirement Age");
        retirementAge=Convert.ToInt32(Console.ReadLine());
    }
    public int getRetirementAge(){
        return retirementAge;
    }
}
class Program
{
    static void Main(string[] args)
    {
        Employee employee=new Employee();
        employee.setDetails();
        Deptt deptt=new Deptt();
        deptt.e=employee;
    }
}
```

```
        deptt.setRetirementAge();  
        Console.WriteLine("Retirement Fund:" + Math.Round(deptt.e.fundCalc(employee.getAge()  
,deptt.getRetirementAge()),2) + " Rs");  
    }  
}  
}
```

OUTPUT

```
PS C:\Users\user\Desktop\SEM-3\C#\C-sharp programs\BA> dotnet run  
Enter Id  
1  
Enter Name  
ABC  
Enter Age  
40  
Enter Salary  
100000  
Enter Contribution %  
0  
Enter Growth Rate %  
2  
Enter Retirement Age  
65  
Retirement Fund:160151.5 Rs  
PS C:\Users\user\Desktop\SEM-3\C#\C-sharp programs\BA> |
```