## Extra Programs – Week 7 [INHERITANCE PRACTICE]

**1.Develop a Java program to create a class Student whose variables are usn, name and sem.Derive a class Test from Student to include an array of cie marks of each course and their corresponding credits in another array. Derive a class Exam from Test which includes an array of see marks. Derive a class Result which calculates the grade for each course and the SGPA. Create n student objects and displays all the above details.**

```
import java.util.*;
class Student {
        String usn;
        String name;
        int sem;
        void details()
        {
                Scanner z=new Scanner(System.in);
                System.out.println("Enter student details");
                System.out.println("Enter USN:");
                usn=z.next();
                System.out.println("Enter name:");
                name=z.next();
                System.out.println("Enter semester:");
                sem=z.nextInt();
        }
}
class Test extends Student {
         int credits[];
```

```
    int cie[];
  int t;


    void accept()
    {
        Scanner s=new Scanner(System.in);
        System.out.println("Enter the number of subjects:");
        t=s.nextInt();
        credits=new int[t];
        cie=new int[t];
        System.out.println("Enter credits and cie marks (out of 50)
attained by the student in each subject");
        for(int i=0;i<t;i++)
        {
            credits[i]=s.nextInt();
            cie[i]=s.nextInt();
        }
    }
}
class Exam extends Test {
    int see[];
    void read()
    {
        Scanner a=new Scanner(System.in);
        see=new int[t];
        System.out.println("Enter SEE marks of student in each
subject(Out of 100)");
```

```
            for(int i=0;i<t;i++)
            {
                see[i]=a.nextInt();
            }
        }
}
class Result extends Exam {
        int marks[];
        double calculate()
        {
            marks=new int[t];
            int tcp=0,tc=0;
            for(int i=0;i<t;i++)
            {
                tc=tc+credits[i];
                marks[i]=cie[i]+see[i]/2;
                if(marks[i]>=50)
                {
                tcp=tcp+(((marks[i]/10)+1)*credits[i]);
                }
                else if(marks[i]>=40 && marks[i]<50)
                {
                    tcp=tcp+(4*credits[i]);
                }
            }
            return (double)tcp/tc;
```

```
        }
}

class Main {
        public static void main(String args[])
        {
                Scanner ss=new Scanner(System.in);
                System.out.println("Enter the number of students:");
                int n=ss.nextInt();
                Student a[] = new Student[n];
                Test b[]=new Test[n];
                Exam c[]=new Exam[n];
                Result d[]=new Result[n];
                for(int i=0;i<n;i++)
                {
                        a[i]=new Student();
                        a[i].details();
                        b[i]=new Test();
                        b[i].accept();
                        c[i]=new Exam();
                        c[i].read();
                        d[i]=new Result();
                        System.out.println("SGPA of Student "+(i+1)+" is
:"+d[i].calculate());
                }
        }
}
```

**2.Develop a Java program to create a class PLAYER with member variables name, matches_played and average. This class has an abstract method cal_average(String,int,int). Derive two classes BATSMAN and BOWLER from PLAYER. Class BATSMAN has a member variable runs_scored. Class BOWLER has a member variable runs_given. Create m BATSMAN objects and n BOWLER objects. Calculate and display the average runs scored by each BATSMAN and average runs given by each BOWLER.**

```
import java.util.*;
abstract class PLAYER
{
String name;
int matches_played;
double average;
abstract void cal_average(String l,int m,int n);
}
class BATSMAN extends PLAYER
{
int runs_scored;
void cal_average(String x,int y,int z)
{
name=x;
matches_played=y;
runs_scored=z;
average=(double)runs_scored/matches_played;
System.out.println("The averge runs scored by "+name+" is "+average);
}
```

```
}
class BOWLER extends PLAYER
{
int runs_given;
void cal_average(String a,int b,int c)
{
name=a;
matches_played=b;
runs_given=c;
average=(double)runs_given/matches_played;
System.out.println("The average runs given by "+name+" is "+average);
}
}
class PLAYERMAIN1
{
public static void main(String args[])
{
int m,n,i;
Scanner ss=new Scanner(System.in);
System.out.println("Enter the number of Batsman and bowlers respectively");
m=ss.nextInt();
n=ss.nextInt();
BATSMAN BA[]=new BATSMAN[m];
for(i=0;i<m;i++)
{
BA[i]=new BATSMAN();
```

```
System.out.println("Enter name,number of matches played,and number of runs scored by Batsman "+(i+1)+":");
BA[i].name=ss.next();
BA[i].matches_played=ss.nextInt();
BA[i].runs_scored=ss.nextInt();
}
BOWLER BO[]=new BOWLER[n];
for(i=0;i<n;i++)
{
BO[i]=new BOWLER();
System.out.println("Enter name,number of matches played,and number of runs given by Bowler "+(i+1)+":");
BO[i].name=ss.next();
BO[i].matches_played=ss.nextInt();
BO[i].runs_given=ss.nextInt();
}
for(i=0;i<m;i++)
{
BA[i].cal_average(BA[i].name ,BA[i].matches_played,BA[i].runs_scored);
}
for(i=0;i<n;i++)
{
BO[i].cal_average(BO[i].name ,BO[i].matches_played,BO[i].runs_given);
}
}
}
```