Class: K18FG Roll No.: A07 Regd. No.: 11804985 Subject: Java Programming Subject Code: CSE 310

Evaluation 3 (Assignment)

Q1. Write a java program to implement "Student Management System". In which you have to include at least three from the given topics as required: Inheritance, Overriding Methods, Polymorphism, Abstract Classes, Nested Classes, Interfaces, Lambda Expressions, Exceptional Handling and I/O Fundamentals.

//for scanner class

## **Solution:**

import java.util.\*;

```
import java.io.*;
                             //for bufferedReader class
       class Details
                     //parent class
       {
               int rno;
               String name;
               Details(int r, String n) //Constructor of super class
                       rno=r;
                       name=n;
               }
               void putDetails()
                                       //Displaying basic details which will be overridden
               {
                       System.out.println("\n**************The student details are:****************);
                       System.out.println("\n\n\tRoll Number:"+rno);
                       System.out.println("\n\tName:"+name);
               }
       }
       class PersonalInfo extends Details
                                               //Personal information inherits from details
       {
               String gender, phno, mail;
               PersonalInfo(int r, String n, String g, String ph, String m) //Constructor of subclass Personal
information
               {
                                       //calling the super class constructor
                       super(r,n);
                       gender=g;
                       phno=ph;
```

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```
mail=m;
       }
       void putDetails()
                              //Displaying personal information by overriding the base class method
       {
               super.putDetails();
                                      //Using parent class method to display basic details
               System.out.println("\n*******The personal information of the student:*******");
               System.out.println("\n\n\tGender:"+gender);
               System.out.println("\n\tPhone Number:"+phno);
               System.out.println("\n\tEmail Id:"+mail);
       }
}
class AcademicDetails extends Details //Academic details inheriting from details
{
       String dept, grade;
       int sem;
       float m1, m2, m3, avg;
       AcademicDetails(int r, String n, String d,int s, float mrk1, float mrk2, float mrk3) //constructor
       {
               super(r,n);
                             //calling parent class constructor
               dept=d;
               sem=s;
               m1=mrk1;
               m2=mrk2;
               m3=mrk3;
       }
void calc grade()
                       //Calculating grade
{
       avg=(m1+m2+m3)/3;
       if(avg >= 90)
               grade="A";
```

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Evaluation 3 (Assignment)

```
else if(avg>=75)
                     grade="B";
              else if(avg>=60)
                     grade="C";
              else if(avg>=40)
                     grade="D";
              else
                     grade="Fail";
       }
       void putDetails()
                            //displaying academic details which overrides the base class method
       {
              super.putDetails();
              System.out.println("\n\n*******The academic information of the student:*******");
              System.out.println("\n\n\tDepartment:"+dept);
              System.out.println("\n\tSemester:"+sem);
              System.out.println("\n\tMarks in three Subjects
System.out.println("\n\tAverage:"+avg);
              System.out.println("\n\tGrade:"+grade);
       }
       }
       class RollnoException extends Exception
                                                  //User defined exception which raises if roll number is not
found
       {
              int rno;
              RollnoException(int r)
                     rno=r;
              public String toString()
```

Class: K18FG Roll No.: A07 Regd. No.: 11804985

Subject: Java Programming Subject Code: CSE 310 Evaluation 3 (Assignment)

```
{
                      return("The entered roll number "+rno+" is not present");
              }
       }
       class stud
                      //class with main method
       {
              public static void main(String args[]) throws IOException
              {
                      int i,n,choice,rollno;
                      char cont='y';
                      Scanner sc= new Scanner(System.in);
                      System.out.println("\n\n\t\t\t*****WELCOME TO STUDENT MANAGEMENT
SYSTEM*****");
                      System.out.println("-----");
                      BufferedReader br= new BufferedReader(new InputStreamReader(System.in));
                      System.out.println("\n**Enter the total number of students you want to have:**");
                      n=sc.nextInt();
                      PersonalInfo pi[]= new PersonalInfo[n]; //creating an array of objects of type
PersonalInfo
                      AcademicDetails ad[]= new AcademicDetails[n]; //creating an array of objects of type
AcademicDetails
                      for(i=0;i<n;i++) //Taking the details of n students
                      {
                             System.out.println("\n\tLets have entries of the details of the Student "+(i+1));
                             System.out.println("\n# Enter the Roll Number: #");
                             int rno=sc.nextInt();
                             System.out.println("\n# Enter the Name: #");
                             String name=br.readLine();
                             System.out.println("\n# Enter the Gender (Male/Female): #");
                             String gender=br.readLine();
                             System.out.println("\n# Enter the Phone Number: #");
```

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```
String phno=br.readLine();
                               System.out.println("\n# Enter the Email Id: #");
                               String mail=br.readLine();
                               System.out.println("\n# Enter the Department: #");
                               String dept=br.readLine();
                               System.out.println("\n# Enter the Semester: #");
                               int sem=sc.nextInt();
                               System.out.println("\n# Enter the marks obtained in THREE subjects: #");
                               float m1=sc.nextFloat();
                               float m2=sc.nextFloat();
                               float m3=sc.nextFloat();
                               pi[i]= new PersonalInfo(rno, name, gender, phno, mail);
                               ad[i]= new AcademicDetails(rno, name, gender, sem, m1, m2, m3);
                       }
               while(cont=='y' | | cont=='Y') //displaying required info
                               System.out.println("\n\n**********Enter your
                               System.out.println("\n# 1.Print PERSONAL INFORMATION of a student. #\n \n#
2.Print ACADEMIC DETAILS of a student #\n\n# 3.Exit #");
                               choice=sc.nextInt();
                               if(choice==1 | | choice==2)
                                       System.out.println("\n\n# Enter the Roll number of the student /( PLEASE
ENTER A VALID ONE /): # ");
                                       rollno=sc.nextInt();
                               try
                               {
                                       display(n,choice,rollno,pi,ad);
                               }
                               catch(RollnoException rne)
```

```
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                                               Subject Code: CSE 310
                                             Evaluation 3 (Assignment)
                                {
                                        System.out.println("\n\n\t.....Exception Handled...."+rne);
                                        System.out.print("\n**");
                               }
                        }
                        else if(choice==2)
                        {
                                System.out.println("\n\n# Enter the Roll number of the student /( PLEASE ENTER A
VALID ONE /): #");
                                rollno=sc.nextInt();
                                try
                                {
                                        display(n,choice,rollno,pi,ad);
                                catch(RollnoException rne)
                                        System.out.println("\n\n\t.....Exception Handled...."+rne);
                               }
                        }
                        else if(choice==3)
                                break;
                        else
                                System.out.println("\n\n# Please enter a VALID choice #");
                                System.out.println("\n\n**Do you want to continue Y/N ??:**");
                                cont=sc.next().charAt(0);
                        }
               }
        public static void display(int n,int choice, int rollno, PersonalInfo pi[], AcademicDetails ad[]) throws
RollnoException
                        //Raising Exception
       {
```

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Subject Code: CSE 310 Evaluation 3 (Assignment)

```
if(search_rno(rollno,n,pi))
                         throw new RollnoException(rollno);
                         if(choice==1)
                         {
                                 for(int i=0;i<n;i++)
                                 {
                                          if(pi[i].rno==rollno)
                                          pi[i].putDetails();
                                 }
                         }
                         else if(choice==2)
                         {
                                 for(int i=0;i<n;i++)
                                 {
                                          if(ad[i].rno==rollno)
                                          {
                                                   ad[i].calc_grade();
                                                   ad[i].putDetails();
                                          }
                                 }
                         }
                static boolean search_rno(int r,int n, PersonalInfo pi[]) //Checks if the given roll number is present
in the input array
                {
                         int count=0;
                         for(int i=0;i<n;i++)
                         {
                                 if(pi[i].rno==r)
```

Roll No.: A07 Regd. No.: 11804985 Subject: Java Programming

Subject Code: CSE 310 Evaluation 3 (Assignment)

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```
count++;
break;
}

if(count==0)
return true;
else
return false;
}
```

}

Roll No.: A07 Regd. No.: 11804985 Subject: Java Programming Subject Code: CSE 310

Evaluation 3 (Assignment)

## **Console Screen:**

C:\Users\abhis\OneDrive\Desktop\stud.java - Sublime Text (UNREGISTERED)

```
File Edit Selection Find View Goto Tools Project Preferences Help
           stud.java
           import java.util.*; //for scanner class
import java.io.*; //for bufferedReader class
class Details //parent class
                 int rno;
                String name;
                Details(int r, String n) //Constructor of super class
                      rno=r;
                     name=n;
                void putDetails() //Displaying basic details which will be overridden
                      System.out.println("\n***********The student details are:***************);
System.out.println("\n\tRoll Number:"+rno);
System.out.println("\n\tName:"+name);
                String gender,phno,mail;
                PersonalInfo(int r, String n, String g, String ph, String m) //Constructor of subclass Personal information
                           er(r,n); //calling the super class constructor
                      gender=g;
   28
29
                     phno=ph;
                      mail=m;
                 void putDetails() //Displaying personal information by overriding the base class method
                     super.putDetails(); //Using parent class method to display basic details
System.out.println("\n*******The personal information of the student:*******");
System.out.println("\n\tGender:"+gender);
System.out.println("\n\tPhone Number:"+phno);
System.out.println("\n\tEmail Id:"+mail);
           class AcademicDetails extends Details  //Academic details inheriting from details
                 String dept, grade;
                int sem;
 Line 154, Column 48
```

Class: K18FG Roll No.: A07 Regd. No.: 11804985 Subject: Java Programming

Subject Code: CSE 310 Evaluation 3 (Assignment)

C:\Users\abhis\OneDrive\Desktop\stud.java - Sublime Text (UNREGISTERED)

```
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stud.java ×
```

```
44
                   int sem;
                   float m1, m2, m3, avg;
AcademicDetails(int r, String n, String d,int s, float mrk1, float mrk2, float mrk3)
                          super(r,n); //calling parent class constructor
                          dept=d;
                         sem=s;
m1=mrk1;
                         m2=mrk2;
                         m3=mrk3;
                  void calc_grade() //Calculating grade
                          avg=(m1+m2+m3)/3;
                          if(avg>=90)
grade="A";
                                e if(avg>=75)
grade="B";
                              se if(avg>=60)
grade="C";
se if(avg>=40)
grade="D";
                                grade="Fail";
                   void putDetails()
                         super.putDetails();
System.out.println("\n\n\tDepartment:"+dept);
System.out.println("\n\tDepartment:"+dept);
System.out.println("\n\tSemester:"+sem);
System.out.println("\n\tMarks in three Subjects are:\n\t\t\t\t\t"+m1+"\n\t\t\t\t\t"+m2+"\n\t\t\t\t\t"+m3);
System.out.println("\n\tAverage:"+avg);
System.out.println("\n\tGrade:"+grade);
                   int rno;
                   RollnoException(int r)
                          rno=r;
Line 154, Column 48
```

Class: K18FG Roll No.: A07 Regd. No.: 11804985 Subject: Java Programming Subject Code: CSE 310 Evaluation 3 (Assignment)

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```
C:\Users\abhis\OneDrive\Desktop\stud.java - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
```

Line 154, Column 48

```
public String toString()
             return("The entered roll number "+rno+" is not present");
class stud //class with main method
       public static void main(String args[]) throws IOException
            int i,n,choice,rollno;
            char cont='y';
Scanner sc= new
            n=sc.nextInt();
            PersonalInfo pi[] = new PersonalInfo[n]; //creating
AcademicDetails ad[] = new AcademicDetails[n]; //cr
for(i=0;i<n;i++) //Taking the details of n students
                   System.out.println("\n\n\tLets have entries of the details of the Student "+(i+1));
System.out.println("\n# Enter the Roll Number: #");
int rno=sc.nextInt();
System.out.println("\n# Enter the Name: #");
String name=br.readLine();
System.out.println("\n# Enter the Gender (Male/Semple), #");
                   System.out.println("\n# Enter the Gender (Male/Female): #");
                   String gender=br.readLine();
System.out.println("\n# Enter the Phone Number: #");
                  System.out.println( \n# Enter the Phone Number: #
String phno=br.readLine();
System.out.println("\n# Enter the Email Id: #");
String mail=br.readLine();
System.out.println("\n# Enter the Department: #");
                   System.out.println("\n# Enter the Semester: #");
                   int sem=sc.nextInt();
System.out.println("\n# Enter the marks obtained in THREE subjects: #");
                   float m1=sc.nextFloat();
                   float m2=sc.nextFloat();
float m3=sc.nextFloat();
                   pi[1]= new PersonalInfo(rno, name, gender, phno, mail);
ad[i]= new AcademicDetails(rno, name, gender, sem, m1, m2, m3);
```

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Subject Code: CSE 310 Evaluation 3 (Assignment)

Roll No.: A07 Regd. No.: 11804985 Subject: Java Programming

Subject Code: CSE 310 Evaluation 3 (Assignment)

Roll No.: A07 Regd. No.: 11804985 Subject: Java Programming

Subject Code: CSE 310 Evaluation 3 (Assignment)

## **Output Screens:**

```
C:\Windows\system32\cmd.exe - java stud
C:\Users\abhis\OneDrive\Desktop>javac stud.java
C:\Users\abhis\OneDrive\Desktop>java stud
                        *****WELCOME TO STUDENT MANAGEMENT SYSTEM*****
**Enter the total number of students you want to have:**
        Lets have entries of the details of the Student 1
# Enter the Roll Number: #
# Enter the Name: #
Abhishek Kumar Gupta
# Enter the Gender (Male/Female): #
Male
# Enter the Phone Number: #
9876543210
# Enter the Email Id: #
abc@xyz.com
# Enter the Department: #
cse
# Enter the Semester: #
# Enter the marks obtained in THREE subjects: #
65
76
        Lets have entries of the details of the Student 2
# Enter the Roll Number: #
```

Roll No.: A07 Regd. No.: 11804985 Subject: Java Programming Subject Code: CSE 310

Evaluation 3 (Assignment)

```
C:\Windows\system32\cmd.exe - java stud
# Enter the Semester: #
# Enter the marks obtained in THREE subjects: #
65
76
        Lets have entries of the details of the Student 2
# Enter the Roll Number: #
# Enter the Name: #
Rahul Singh
# Enter the Gender (Male/Female): #
Male
# Enter the Phone Number: #
8765432109
# Enter the Email Id: #
qwe@xyz.com
# Enter the Department: #
mech
# Enter the Semester: #
# Enter the marks obtained in THREE subjects: #
56
76
67
***************Enter your choice:************
# 1.Print PERSONAL INFORMATION of a student. #
# 2.Print ACADEMIC DETAILS of a student #
# 3.Exit #
```

<sup>\*</sup>Entries of details

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Subject: Java Programming Subject Code: CSE 310 Evaluation 3 (Assignment)

```
C:\Windows\system32\cmd.exe - java stud
76
67
# 1.Print PERSONAL INFORMATION of a student. #
# 2.Print ACADEMIC DETAILS of a student #
# 3.Exit #
 Enter the Roll number of the student /( PLEASE ENTER A VALID ONE /): #
***************The student details are:***********
      Roll Number:1
      Name: Abhishek Kumar Gupta
********The personal information of the student:*******
      Gender:Male
      Phone Number:9876543210
      Email Id:abc@xyz.com
**Do you want to continue Y/N ??:**
# 1.Print PERSONAL INFORMATION of a student. #
# 2.Print ACADEMIC DETAILS of a student #
# 3.Exit #
```

Roll No.: A07 Regd. No.: 11804985 Subject: Java Programming

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```
C:\Windows\system32\cmd.exe - java stud
**Do you want to continue Y/N ??:**
***************Enter your choice:************
# 1.Print PERSONAL INFORMATION of a student. #
# 2.Print ACADEMIC DETAILS of a student #
 3.Exit #
# Enter the Roll number of the student /( PLEASE ENTER A VALID ONE /): #
****** are:******** The student details are:********
       Roll Number:2
       Name:Rahul Singh
*******The personal information of the student:*******
       Gender:Male
       Phone Number: 8765432109
       Email Id:qwe@xyz.com
**Do you want to continue Y/N ??:**
***************Enter your choice:************
# 1.Print PERSONAL INFORMATION of a student. #
# 2.Print ACADEMIC DETAILS of a student #
 3.Exit #
```

<sup>\*</sup>Personal Information.

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```
C:\Windows\system32\cmd.exe - java stud
***************Enter your choice:*********
# 1.Print PERSONAL INFORMATION of a student. #
# 2.Print ACADEMIC DETAILS of a student #
# 3.Exit #
# Enter the Roll number of the student /( PLEASE ENTER A VALID ONE /): #
***************The student details are:**********
       Roll Number:1
       Name:Abhishek Kumar Gupta
********The academic information of the student:*******
       Department:Male
       Semester:3
       Marks in three Subjects are:
                                      65.0
                                      65.0
                                      76.0
       Average:68.666664
       Grade:C
**Do you want to continue Y/N ??:**
***************Enter your choice:************
```

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```
C:\Windows\system32\cmd.exe - java stud
**************Enter your choice:************
# 1.Print PERSONAL INFORMATION of a student. #
 2.Print ACADEMIC DETAILS of a student #
# 3.Exit #
 Enter the Roll number of the student /( PLEASE ENTER A VALID ONE /): #
****************The student details are:***********
       Roll Number:2
       Name:Rahul Singh
*******The academic information of the student:*******
       Department:Male
       Semester:5
       Marks in three Subjects are:
                                       56.0
                                       76.0
                                       67.0
       Average:66.333336
       Grade:C
**Do you want to continue Y/N ??:**
```

\*Academic Informations.

Roll No.: A07 Regd. No.: 11804985 Subject: Java Programming

Subject Code: CSE 310 Evaluation 3 (Assignment)

```
C:\Windows\system32\cmd.exe - java stud
**************Enter your choice:********
# 1.Print PERSONAL INFORMATION of a student. #
 2.Print ACADEMIC DETAILS of a student #
# 3.Exit #
# Please enter a VALID choice #
**Do you want to continue Y/N ??:**
***************Enter your choice:************
# 1.Print PERSONAL INFORMATION of a student. #
 2.Print ACADEMIC DETAILS of a student #
 3.Exit #
# Enter the Roll number of the student /( PLEASE ENTER A VALID ONE /): #
       .....Exception Handled....The entered roll number 5 is not present
**Do you want to continue Y/N ??:**
****************Enter your choice:***********
# 1.Print PERSONAL INFORMATION of a student. #
 2.Print ACADEMIC DETAILS of a student #
```

<sup>\*</sup>Exception handled.