```
//Student's Full name: Tasfique Enam
//Student's ID: 5886429
//Modification Date: 16/05/17
//Purpose of this file: driver class.
package assignment2;
/**
 *
 * @author Tasfique
 */
import java.io.*;
import java.util.Scanner;


public class driver {

    private static int size; //size is the static variable used for counter loop...

    public static void main(String args[])throws IOException{

        int i;
        int choiceentry;
        Student [] students = new Student[30]; //creating an array of 30 objects.
        Scanner read = new Scanner(System.in);
        for(i= 0;i<30;i++){
            students[i] = new Student();//the objects
        }
        do{
```

```
    System.out.println();        //display of menu
    System.out.println("1. Read data from the file ");
    System.out.println("2. Write data to the file ");
    System.out.println("3. Display all student's information ");
    System.out.println("4. Change student's data ");
    System.out.println("5. Display student with the highest and the lowest nark
");
    System.out.println("6. Display all the grades. ");
    System.out.println("7. Display the average mark for the subject ");
    System.out.println("0. To exit the program ");
    System.out.println();
    System.out.println("Please enter the number from your selection ");
    choiceentry = read.nextInt();
    switch(choiceentry){ //switch statement is used for the selection of the menu,
to know which method to execute.
        case 1: ReadFile(students);
        break;
            case 2: WriteFile(students);
            break;
            case 3: DisplayAll(students);
            break;
            case 4: ChangeData(students);
            break;
            case 5: DisplayHighLow(students);
            break;
            case 6: DisplayAllGrades(students);
            break;
            case 7: DisplayAvgMark(students);
```

```
            break;
        }


    }while(choiceentry!=0);
  }
    public static int ReadFile(Student[]students)throws IOException{ //it is used to read student data from the text file.
        String student_name;
        int i = 0;
        int student_id;
        double practicalmark,exammark,assignmentmark;


        File creating = new File("data.txt"); //filewriter avoids erasing a file that already exist.
        Scanner read = new Scanner(creating); //creating is the file data.txt, it is directing to the txt file
        while(read.hasNext()){
            student_name = read.next(); //reading text as name
            student_id = read.nextInt();//reading the text as id
            students[i].setDetails(student_name, student_id);


            practicalmark = read.nextDouble();
            students[i].setPractical(practicalmark);


            for(int y=0; y<4; y++){
                assignmentmark = read.nextDouble();
                students[i].setAssignment(assignmentmark, y); //it will read the next 4 lines as assignments marks
            }
```

```
            exammark = read.nextDouble(); //reading text for exam mark
            students[i].setExam(exammark);
            i++;
            size++; //counter
        }
        System.out.println();
        System.out.println("Your files has been read.");
        System.out.println();
        return size;

    }

    public static void WriteFile(Student[]array) throws IOException{ //void is used for not returning any values.
        PrintWriter pw = new PrintWriter("data.txt"); // it writes new data to the txt file, and also overwrites.
        for(int x=0; x<size; x++){
            pw.println(array[x].getName());
            pw.println(array[x].getID());
            pw.println(array[x].getPracticalMark());
            for(int y = 0; y<4; y++){
                pw.println(y);
                pw.println(array[x].getAsgMark(y)); //print writer for the new assignment mark
            }

            pw.println(array[x].getExamMark()); //print writer for the new exam mark
```

```
        }
        System.out.println();
        System.out.println("Your data has been written ");
        System.out.println();
    }

    public static void DisplayAll(Student[]array)throws IOException{ //to
display all the student's data
        for(int j=0;j<size;j++){
            System.out.println();
            System.out.println("Student name: "+array[j].getName());
            System.out.println("Student ID: "+array[j].getID());
            System.out.println("Practical Marks: "+array[j].getPracticalMark());
            for(int i=0;i<4;i++){ //for loop for 4 different assignments.
                System.out.println("Assignment mark " + (i+1) + " :
"+array[j].getAsgMark(i));
            }
                System.out.println("Total Assignment Marks: " +
array[j].getTotalAsgMark());
                System.out.println("Exam mark: " + array[j].getExamMark());
                System.out.println("Overall mark: " + array[j].getOvarallMark());
                System.out.println("The Grade is : " + array[j].getGrade());
                if(array[j].isTechnicalFail()){ //to check if the student has technically
failed or not?
                    System.out.println("This student has Technically Failed. ");
                }else{
                    System.out.println("This Student has passed. ");
                }
```

```
        }
    }
     public static void ChangeData(Student[]array){ //method for changing the data for students data
         String student;
        int option,assignment_num;
        double practical_mark,assignment_mark,exam_mark;
        Scanner read = new Scanner(System.in);
        System.out.println("Enter name of the student, whose data you would like to change? ");
        student = read.next();
        for(int x=0;x<size;x++){
            if(student.equals(array[x].getName())){
                System.out.println("Which data would you like to change? "); //asking for which mark the user likes to change
                System.out.println("1. Practical Mark ");
                System.out.println("2. Assignment Mark ");
                System.out.println("3. Exam Mark ");
                System.out.println("0. Exit");
                option = read.nextInt();
                switch(option){ //switch statement for excuteting the option the user selected.
                    case 1:
                        System.out.println("Enter the new practical mark you like to change: ");
                        practical_mark = read.nextDouble();
                        array[x].setPractical(practical_mark);
                        break;
```

```
                case 2:
                    System.out.println("Enter assignment number you would like to change: ");
                    assignment_num = read.nextInt();
                    assignment_num = assignment_num - 1;
                    System.out.println("Enter the Assignment " + assignment_num + " mark you would like to change: ");
                    assignment_mark = read.nextDouble();
                    array[x].setAssignment(assignment_mark, assignment_num);
                    break;
                case 3:
                    System.out.println("Please enter the new exam marks: ");
                    exam_mark = read.nextDouble();
                    array[x].setExam(exam_mark);
                    break;
                case 0:
                    return;
            }
        }else{
            System.out.println("New data successfully written ");
            return;
        }
    }
}

    public static void DisplayHighLow(Student[]array){ //method for displaying high and low
```

```
    double low = 1000;
    double high = 0;
    String namelow = null;
    String namehigh = null;
    for(int i=0;i<size;i++){
       if( array[i].getOvarallMark()<array[i+1].getOvarallMark()){
         if(array[i].getOvarallMark()<(low-array[i].getOvarallMark())){
            low = array[i].getOvarallMark();
            namelow = array[i].getName();
         }
       }

    }
    for(int j=0;j<size;j++){
       if( array[j].getOvarallMark()>array[j+1].getOvarallMark()){
         if(array[j].getOvarallMark()-high>0){
            high = array[j].getOvarallMark();
            namehigh = array[j].getName();
         }
       }

    }System.out.println("The lowest mark is "+ namelow +" "+ low );
    System.out.println("The highest mark is "+ namehigh +" "+ high );

  }

   public static void DisplayAllGrades(Student[]array){ //displaying all the
grades for the student
```

```
        for(int i=0;i<size; i++){
            array[i].getOvarallMark();//get ovarallmark for students, it is connected to each other because the grades needs ovarall mark.
            System.out.println("The Grade for the Students " + array[i].getName()+ " are " + array[i].getGrade());
        }
    }

     public static void DisplayAvgMark(Student[]array){ //displaying avg marks for the students.
        double average;
        double total=0;
        for(int y=0;y<size;y++){
            total = total + array[y].getOvarallMark(); //for loop for checkiong the overall mark.
        }
        average = total/size;
        System.out.println("The average mark for all the students is " + average);//displays out the avg mark
    }

}
```

```
//Student's Full name: Tasfique Enam
//Student's ID: 5886429
//Modification Date:
//Purpose of this file: Student class
package assignment2;
/**
 *
 * @author Tasfique
 */
public class Student {
    //declaring attributes.
    private String name;
    private int id;
    private double practical_mark, exam_mark;
    private double [] assignment_mark = new double [4];
    double total_assignment;
```

```
    //default constructor for setting default values.
    public Student(){
        name = "";
        id = 0;
        practical_mark = 0;
        assignment_mark[0]=0;
        assignment_mark[1]=0;
        assignment_mark[2]=0;
        assignment_mark[3]=0;
        exam_mark = 0;
    }
    //accessor methods
    public void setDetails(String name, int id){
        this.name = name;
        this.id = id;
    }



    public void setPractical(double practical_mark){
  this.practical_mark = practical_mark; //assigning practical marks.
        while (practical_mark>10){ // if the mark is greater than 10, it will set the
mark to 0
            this.practical_mark = 0;
        }


    }
```

```
    public void setAssignment(double assignment_mark, int
assignment_number){//assignment method
      this.assignment_mark[assignment_number] = assignment_mark;
      if(this.assignment_mark[assignment_number]>10 ||
this.assignment_mark[assignment_number]<1){
        this.assignment_mark[assignment_number] = 0;
    }



    }
    public void setExam(double exam_mark){ //set exam method
        this.exam_mark = exam_mark;
        if(exam_mark>100 || exam_mark <0){
            this.exam_mark = 0;
        }

    } //mutator methods.
    String getName(){ //get name method
        return name;
    }

    int getID(){ //get ID method
        return id;
    }

    double getPracticalMark(){ //get practical method
        return practical_mark;
    }
```

```
    double getAsgMark(int i){ //get assignment mark method
        return this.assignment_mark[i];
    }

    double getTotalAsgMark(){ //total assignment mark method
       double total_assignment = 0;
        for(int y=0;y<4;y++){
            total_assignment = total_assignment + this.assignment_mark[y];
       }
       return total_assignment;
    }

    double getExamMark(){ //get exam mark method
        return exam_mark;
    }

    double getOvarallMark(){ //get overall mark method
       double ovarall = practical_mark + getTotalAsgMark() +
(exam_mark*(0.5));
        return ovarall;
    }

    String getGrade(){ //get grade method
        String grade = null; //followed UOW grading scheme.
        if(getOvarallMark()>=85 && getOvarallMark()<=100){
            grade = "HD";
        }
```

```
        else if(getOvarallMark()>=75 && getOvarallMark()<=84){
            grade = "D";
        }
        else if(getOvarallMark()>=65 && getOvarallMark()<=74){
            grade = "C";
        }
        else if(getOvarallMark()>=50 && getOvarallMark()<=64){
            grade = "P";
        }
        else if(getOvarallMark()<=49){
            grade = "F";
        }
        return grade;
    }
    boolean isTechnicalFail(){ //technical fail method.
        if(getOvarallMark()>=50 && exam_mark<40){ //if the overall mark is
greater than 50 but exam is less than 40
            return true;
        }
        else{
            return false;
        }
    }
}
```

```
1. Read data from the file
2. Write data to the file
3. Display all student's information
4. Change student's data
5. Display student with the highest and the lowest nark
6. Display all the grades.
7. Display the average mark for the subject
0. To exit the program

Please enter the number from your selection
```

```
Please enter the number from your selection
1

Your files has been read.


1. Read data from the file
2. Write data to the file
3. Display all student's information
4. Change student's data
5. Display student with the highest and the lowest nark
6. Display all the grades.
7. Display the average mark for the subject
0. To exit the program
```

```
Please enter the number from your selection
2

Your data has been written


1. Read data from the file
2. Write data to the file
3. Display all student's information
4. Change student's data
5. Display student with the highest and the lowest nark
6. Display all the grades.
7. Display the average mark for the subject
0. To exit the program
```

```
 Please enter the number from your selection
 3

 Student name: chi
 Student ID: 1000
 Practical Marks: 9.0
 Assignment mark 1 : 8.0
 Assignment mark 2 : 9.0
 Assignment mark 3 : 7.0
 Assignment mark 4 : 6.0
 Total Assignment Marks: 30.0
 Exam mark: 88.0
 Overall mark: 83.0
 The Grade is : D
 This Student has passed.

 Student name: hong
 Student ID: 2000
 Practical Marks: 9.0
 Assignment mark 1 : 8.0
 Assignment mark 2 : 3.0
 Assignment mark 3 : 3.0
 Assignment mark 4 : 6.0
 Total Assignment Marks: 20.0
 Exam mark: 90.0
 Overall mark: 74.0
 The Grade is : C
 This Student has passed.
```

```
Please enter the number from your selection
4
Enter name of the student, whose data you would like to change?
chi
Which data would you like to change?
1. Practical Mark
2. Assignment Mark
3. Exam Mark
0. Exit
1
Enter the new practical mark you like to change:
8
New data successfully written
```

```
Please enter the number from your selection
5
The lowest mark is hong 74.0
The highest mark is chi 83.0
```

```
Please enter the number from your selection
6
The Grade for the Students chi are D
The Grade for the Students hong are C
The Grade for the Students long are D
The Grade for the Students cong are P
The Grade for the Students tong are C
```

```
Please enter the number from your selection
7
The average mark for all the students is 72.4
```