

CGPA Calculator**WEEK-2**

Create a class CGPA which takes name of the subject, credits, and marks gained. The class calculates the CGPA of the semester. Store the details in arrays.

Make it menu driven method involve the following methods:

1. Changing of details
2. Adding a course
3. Deleting a course
4. Percentage calculation

Print the table format of the details after each change.

Add various test cases to the grading method using j-unit. (+Use class level modularization)

Input format:

First line contains number of test cases 't' and 't' lines contains following details of a subject

-subject name → String type

-credits → Double type

-marks → Integer type

Output format:

-First column contains course name → String type

- Second column contains credits → Double type

-Third column contains marks → Integer type

-Fourth column contains points → Integer type

-Fifth column contains grade → Character type

-Last line contains end result (CGPA) → Double type

Input Constrains:

0 < Names <= 20 without white spaces

0 < credits <= 7

0 <= marks <= 100

Output Constrains:

Grades = {O,A,B,C,D,F}

90 <= Marks <= 100 → grades – 'O'

80<=Marks <90 → grades – ‘A’

70<=Marks <80 → grades – ‘B’

60<=Marks <70 → grades – ‘C’

50<=Marks <60 → grades – ‘D’

Less than 50 → grades – ‘F’

Sample Input:

2

Java

5

91

Oops

4

89

Sample Output:

Course credits marks points grade

Course	credits	marks	points	grade
--------	---------	-------	--------	-------

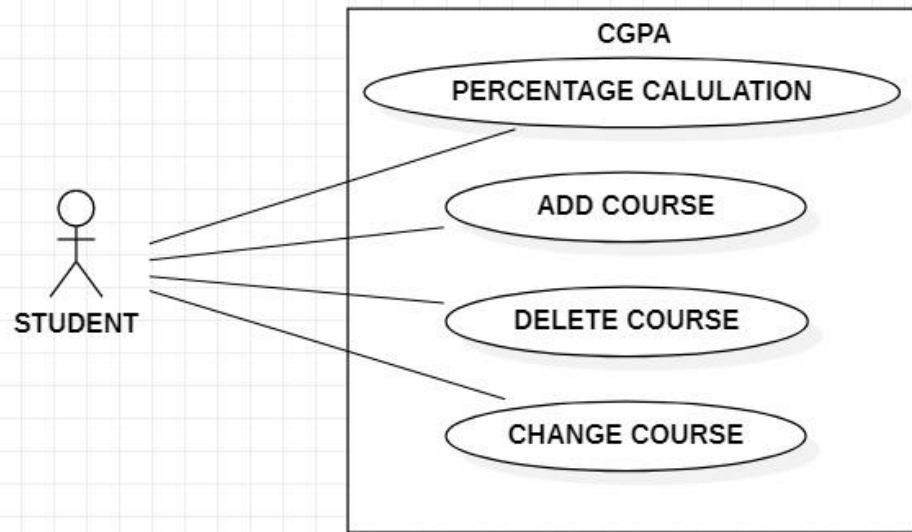
Java	5	91	10	O
------	---	----	----	---

Oops	4	89	9	A
------	---	----	---	---

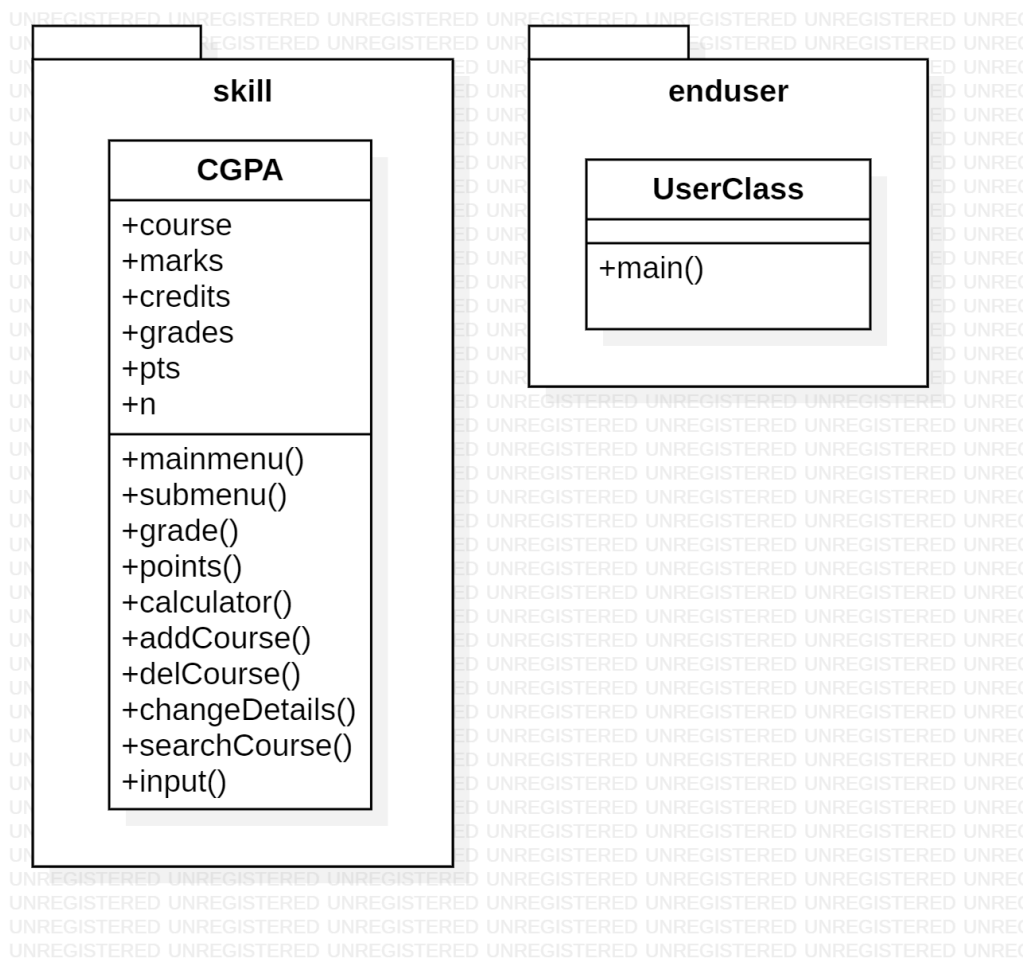
CGPA: 9.56

Note : The given below are make pdf as a single file upload it in a java pbl week-2 in LMS.

1. Draw the Use Case Diagrams



2. Draw the Class Diagrams.



3. Code of the project.

CGPA CLASS

```
//          190031134

package skill;

import java.util.*;

public class CGPA {
    Scanner s=new Scanner(System.in);
    private ArrayList<String> course;
    private ArrayList<Integer> marks;
    private ArrayList<Double> credits;
    private ArrayList<Character> grades;
    private ArrayList<Integer> pts;
    private int n;
    public CGPA() {
        this.course = new ArrayList<String>();
        this.marks = new ArrayList<Integer>();
        this.credits = new ArrayList<Double>();
        this.grades = new ArrayList<Character>();
        this.pts = new ArrayList<Integer>();
        this.n=0;
    }
    // public void input() {
    //     System.out.println("Enter number of subjects:");
    //     n= s.nextInt();
    //     for(int i=0;i<n;i++) {
    //         System.out.println("Enter course name");
    //         course.add(s.next());
    //         System.out.println("Enter course credits");
    //         credits.add(s.nextDouble());
    //         System.out.println("Enter marks obtained in that course");
    //         marks.add(s.nextInt());
    //         grades.add(grade(marks.get(i)));
    //         pts.add(points(grades.get(i)));
    //     }
    //     mainmenu(n);
    // }
    public void mainmenu() {
        boolean repeat=true;
        while(repeat) {
            switch(submenu()) {
                case 1:
                    addCourse(s.next(),s.nextDouble(),s.nextInt());
                    break;
                case 2:
                    delCourse(s.next());
                    break;
                case 3:
                    changeDetails(s.next(),s.next(),s.nextDouble(),s.nextInt());
                    break;
                case 4:
                    calculator();
                    break;
                default:
            }
        }
    }
}
```

```

        repeat=false;
    }
}

private int submenu() {
    System.out.println("Available operations:");
    System.out.println("1.Add a course");
    System.out.println("2.Delete a course");
    System.out.println("3.Change course Details");
    System.out.println("4.Percentage calculation");
    System.out.println("Enter any other number to exit");
    System.out.println("Choose your option:");
    return s.nextInt();
}

private char grade(int m) {
    char x=' ';
    if(m>=90 && m<=100) { x='O';}
    else if(m>=80 && m<90) { x='A';}
    else if(m>=70 && m<80) { x='B';}
    else if(m>=60 && m<70) { x='C';}
    else if(m>=50 && m<60) { x='D';}
    else if(m<=50) { x='F';}
    else {
//        System.out.println("Invalid Marks Try again From First!!");
    }
    return x;
}

private int points(char c) {
    int z=0;
    if(c=='O') {z= 10;}
    else if(c=='A') {z=9;}
    else if(c=='B') {z=8;}
    else if(c=='C') {z=7;}
    else if(c=='D') {z=6;}
    else if(c=='F') {z=5;}
    return z;
}

private void calculator() {
    float cgpa;
    float sum=0,total=0;
    for(int i=0;i<n;i++) {
        sum+=credits.get(i)*pts.get(i);
        total+=credits.get(i);
    }
    cgpa=sum/total;
    System.out.println("Course\t\tCredits\tMarks\tPoint\tGrades");
    for(int i=0;i<n;i++) {

        System.out.println(course.get(i)+"\t\t"+credits.get(i)+"\t"+marks.get(i)+"\t"+pts.get(i)+"\t"+grades.get(i));
    }
    System.out.printf("CGPA: %.2f\n",cgpa);
}

public void addCourse(String name,Double cdts,int mark) {
    n=n+1;
//    System.out.println("You are ready to add your course");
}

```

```
//      System.out.println("Enter course name");
//      course.add(name);
//      System.out.println("Enter course credits");
//      credits.add(cdts);
//      System.out.println("Enter marks obtained in that course");
//      marks.add(mark);
//      grades.add(grade(marks.get(n-1)));
//      pts.add(points(grades.get(n-1)));
//      calculator();
    }

    private int searchCourse(String name) {
        for(int i=0;i<n;i++) {
            if(course.get(i).equalsIgnoreCase(name)) {
                return i;
            }
        }
        return -1;
    }

    public boolean delCourse(String name) {
//      System.out.println("Enter course name you want to delete:");
        int j=searchCourse(name);
        if(j!=-1) {
            course.remove(j);
            credits.remove(j);
            marks.remove(j);
            grades.remove(j);
            pts.remove(j);
            n=n-1;
//      System.out.println("Deleted the course Successfully");
//      calculator();
            return true;
        }
//      System.out.println("No such course exists");
//      calculator();
        return false;
    }

    public boolean changeDetails(String name,String newname,Double newcdts,int
newmark) {
//      System.out.println("Enter course name you want to change details:");
        int j=searchCourse(name);
        if(j!=-1) {
            course.remove(j);
            credits.remove(j);
            marks.remove(j);
            grades.remove(j);
            pts.remove(j);
//      System.out.println("You are ready to change your course");
//      System.out.println("Enter course name");
            course.add(newname);
//      System.out.println("Enter course credits");
            credits.add(newcdts);
//      System.out.println("Enter marks obtained in that course");
            marks.add(newmark);
            grades.add(grade(marks.get(n-1)));
            pts.add(points(grades.get(n-1)));
//      System.out.println("Changes are done Successfully");
```

```

//                calculator();
//                return true;
//            }
//            System.out.println("No such course exists");
//            calculator();
//            return false;
//        }

        public double TestCGPACalculator() {
            double cgpa;
            double sum=0,total=0;
            for(int i=0;i<n;i++) {
                sum+=credits.get(i)*pts.get(i);
                total+=credits.get(i);
            }
            cgpa=sum/total;
            return cgpa;
        }
    }
}

```

ENDUSER CLASS

```

package enduser;

import skill.CGPA;

public class UserClass{

    public static void main(String[] args) {
        CGPA c= new CGPA();
//        c.input();
//        c.mainmenu();
    }
}

```

OUTPUT

```

<terminated> UserClass [Java Application] C:\Program Files\Java\jdk-13.0.2\bin\javaw.exe (13-Sep-2020, 11:02:30 AM)
Available operations:
1.Add a course
2.Delete a course
3.Change course Details
4.Percentage calculation
Enter any other number to exit
Choose your option:
1
Java
5
91
Course      Credits Marks   Point  Grades
Java        5.0     91      10     0
CGPA: 10.00
Available operations:
1.Add a course
2.Delete a course
3.Change course Details
4.Percentage calculation
Enter any other number to exit
Choose your option:
1
Oops
4
89
Course      Credits Marks   Point  Grades
Java        5.0     91      10     0
Oops        4.0     89       9     A
CGPA: 9.56

```



```
Available operations:
1.Add a course
2.Delete a course
3.Change course Details
4.Percentage calculation
Enter any other number to exit
Choose your option:
2
Java
Course          Credits Marks   Point  Grades
Oops            4.0     89      9      A
CGPA: 9.00
Available operations:
1.Add a course
2.Delete a course
3.Change course Details
4.Percentage calculation
Enter any other number to exit
Choose your option:
3
Oops
Maths
3
91
Course          Credits Marks   Point  Grades
Maths           3.0     91     10     0
CGPA: 10.00
Available operations:
1.Add a course
2.Delete a course
3.Change course Details
4.Percentage calculation
Enter any other number to exit
Choose your option:
4
Course          Credits Marks   Point  Grades
Maths           3.0     91     10     0
CGPA: 10.00
Available operations:
1.Add a course
2.Delete a course
3.Change course Details
4.Percentage calculation
Enter any other number to exit
Choose your option:
5
```

JUNIT TEST

```
package test;
import org.junit.*;
import skill.CGPA;
public class TestCalculator {

    CGPA c=new CGPA();
    @Before
    public void addCourseTest() {
        c.addCourse("Java",5.0,91);
    }

    // @SuppressWarnings("deprecation")
    @Test
    public void TestCal() {
        double expresult=10.0;
        double actresult=c.TestCGPACalculator();
        Assert.assertEquals(expresult, actresult, 0.0);
    }

}
```

JUNIT OUTPUT

