Shri Dharmasthala Manjunatheshwara College of Engineering, Dharwad
Department of Computer Science & Engineering

OOP Activities Submission Report

[Submitted as part of CTA Activity No-1]

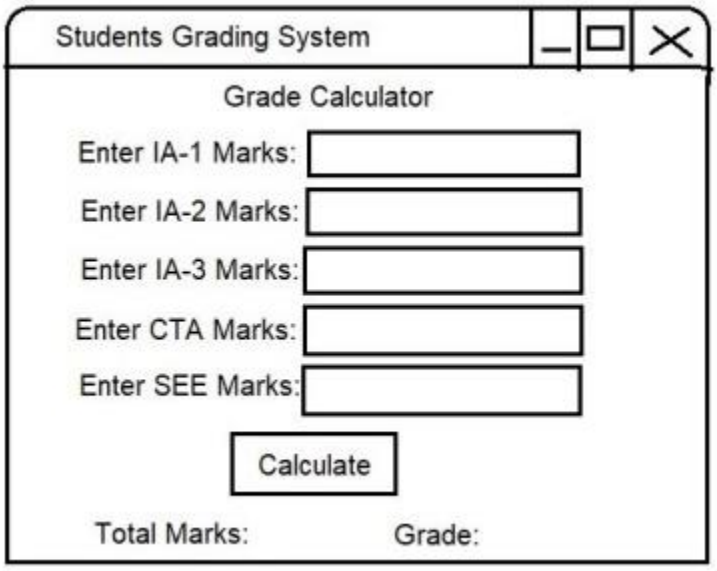
Course:	**Object-Oriented Programming**	**Course Code:**	**21UCSC401**
Semester& Division:	**IV& A**	**Academic Year:**	**2022-23**

Report submitted by:

USN:	**2SD21CS098**	**Name:**	**Soniya Ravikumar Nidagundi**

1. PROBLEM DEFINITION:

You are hired as an Associate Software Engineer in a reputed Multi-National Company (MNC). Your company has received a software requirement from Shri Dharmasthala Manjunatheshwara College of Engineering and Technology, Dharwad, software that computes and publishes the examination results. You are assigned to work on Students' Grading System project. As part of this project, you are asked by your team lead to write a GUI based Java program to compute the grade obtained by a student in a single course. Sample GUI design template for your assigned task is given below: Page 2 of 2 The project must provide the following features: 1) Provide GUI components to read IA–1, IA–2, IA–3, CTA & SEE marks scored by a student



The project must provide the following features:

1) Provide GUI components to read IA–1, IA–2, IA–3, CTA & SEE marks scored by a student in a single course.

2) Proper error messages should be displayed if marks entered is invalid. i.e., IA marks should be between 0 – 20, CTA between 0 – 10 and SEE between 0 – 100. Incase of absentees, marks should be entered as 0.

3) CIE marks is the sum of best 2 marks of IA–1, IA–2 and IA–3 + CTA.

4) If CIE < 20, then the program should display a message "Student is detained from taking SEE" and the program should not display the grade.

5) If SEE marks is 38 or 39, then it should be upgraded to 40.

6) If SEE marks is < 38, then the message F Grade should be printed.

7) Total marks is to be calculated using the formula: $Total\ marks = CIE + SEE\ 2\ SEE\ 2/$ is to be rounded-off to next number if the fraction is ≥ 0.5, otherwise, it should be truncated

$SEE\ 2/$ is to be rounded-off to next number if the fraction is ≥ 0.5, otherwise, it should be truncated. For example: If $SEE\ 2/ = 42.5$, then it should be converted to 43. 8) Grade is to be computed and displayed using the following table:

Total marks	Grade
100 – 90	S
89 – 80	A
79 – 70	B
69 – 60	C
59 – 50	D
49 – 40	E
39 – 0	F

As a beginner in Java programming, you are required to incorporate the following in your program:

• Use of object-oriented style of programming

• Use of inheritance and interfaces

• Exception handling mechanism

• Use of dynamic method dispatch feature

Note: The sample GUI provided is for REFERENCE ONLY. You are required to provide professional look-and-feel to your application.

SOLUTION:

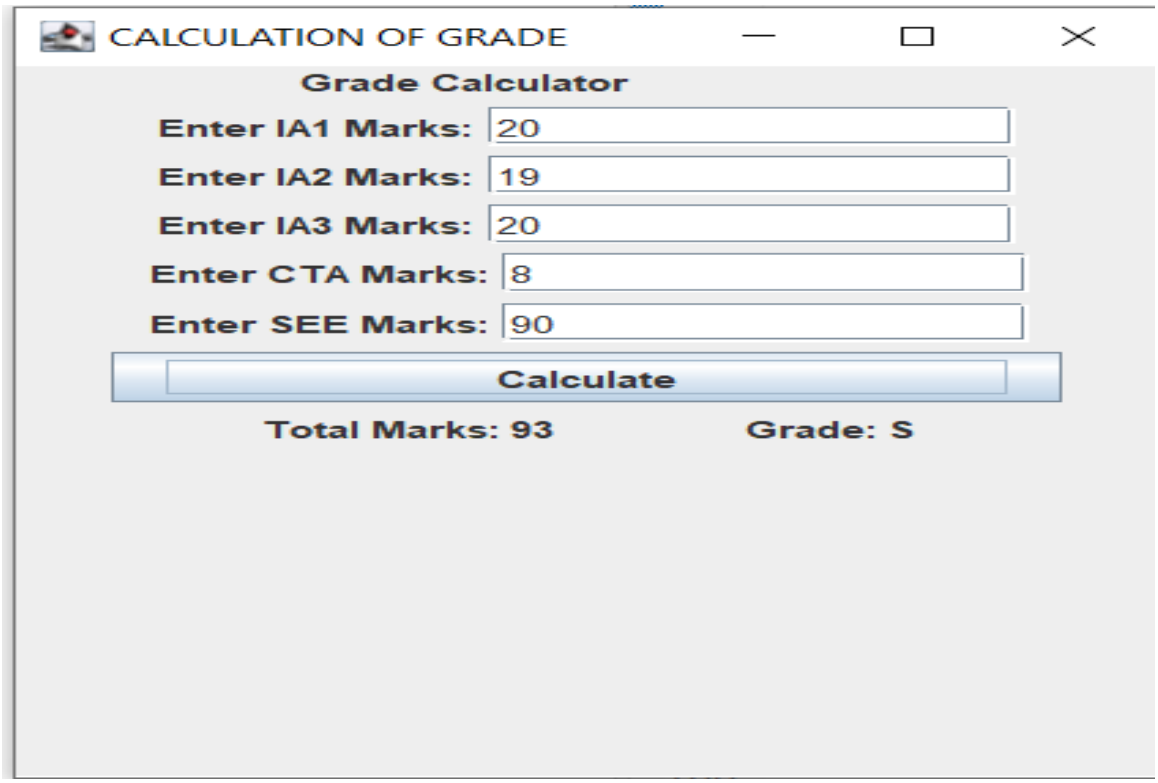
```
package sdmcet.cse.oop;

import java.awt.*;

import javax.swing.*;

import java.awt.event.*;


class Grade extends JFrame implements ActionListener {

        JFrame f;

        JButton b;

        Container contentPane;

        JPanel p;

        JLabel l1, l2, l3, l4, l5, l6,l7, l8, l9, l10, l11, l12;

        JTextField t1, t2, t3, t4, t5;


        Grade(String title) {

                super(title);


                b = new JButton("                    Calculate                    ");

                b.addActionListener(this);


                l1 = new JLabel("                    Grade Calculator");

                l2 = new JLabel("Enter IA1 Marks:");

                l3 = new JLabel("Enter IA2 Marks:");

                l4 = new JLabel("Enter IA3 Marks:");

                l5 = new JLabel("Enter CTA Marks:");

                l6 = new JLabel("Enter SEE Marks:");

                l7 = new JLabel();
```

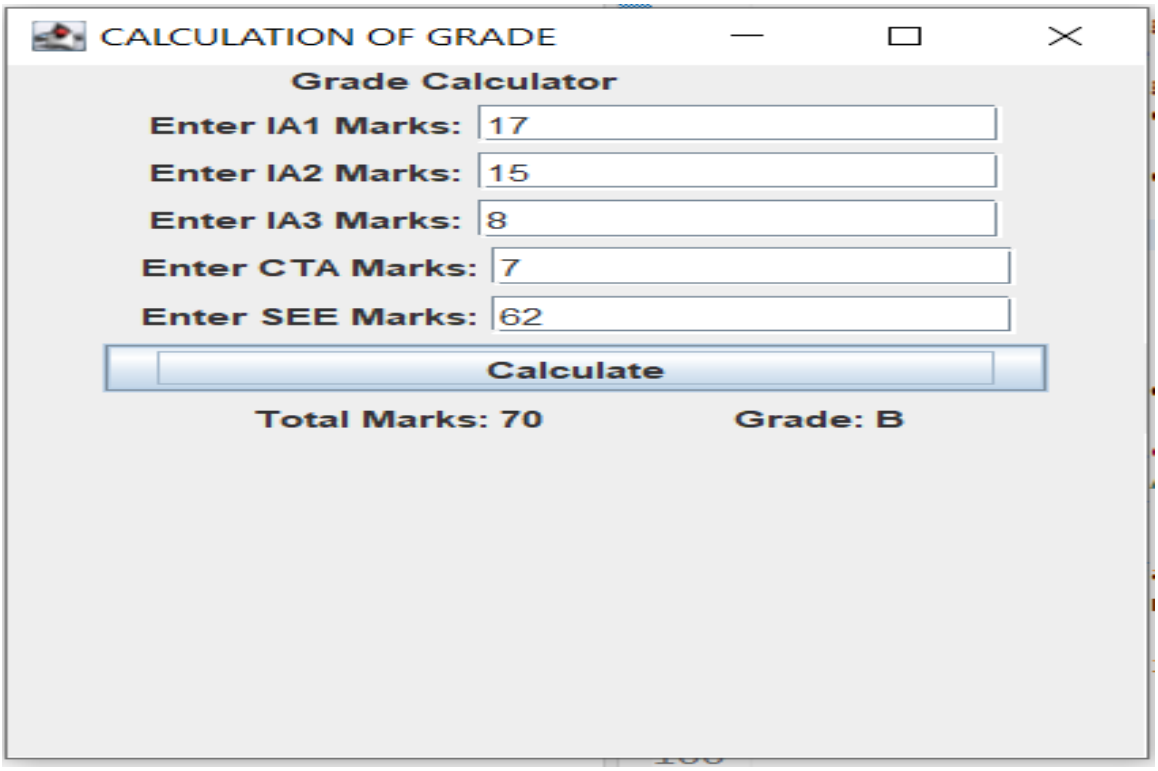
```
l8 = new JLabel();
t1 = new JTextField(15);
t2 = new JTextField(15);
t3 = new JTextField(15);
t4 = new JTextField(15);
t5 = new JTextField(15);
p = new JPanel();

p.add(l1);

p.add(l2);
p.add(t1);
p.add(l3);
p.add(t2);
p.add(l4);
p.add(t3);
p.add(l5);
p.add(t4);
p.add(l6);
p.add(t5);

p.add(b);
p.add(l7);
p.add(l8);
add(p);

contentPane = this.getContentPane(); // Instantiate content pane
contentPane.add(p, BorderLayout.CENTER);
```

```
                contentPane.add(l1, BorderLayout.NORTH);
        }
        @Override
        public void actionPerformed(ActionEvent e) {
                if (e.getSource() == b) {
                        int cta = Integer.parseInt(t4.getText());
                        int ia1 = Integer.parseInt(t1.getText());
                        int ia2 = Integer.parseInt(t2.getText());
                        int ia3 = Integer.parseInt(t3.getText());
                        int see = Integer.parseInt(t5.getText());
                        int cie,total = 0;
                try{
                                if (ia1>20 || ia2>20 || ia3>20 || cta>10 || see>100) {
                                        throw new ArithmeticException();
                                }
                        }catch (ArithmeticException ae) {
                                JOptionPane.showMessageDialog(f, l9, "Enter the marks within
the range",
                                                JOptionPane.ERROR_MESSAGE);
                                return;
                        }
                        if( ia1>=ia2 ) {
                                if(ia2>ia3) {
                                        cie = ia1 +ia2 + cta;
                                }
                                else {
                                        cie= ia1 +ia3 +cta;
                                }
```

```
                }
                else if (ia2>=ia3) {
                        cie = ia2 + ia3+cta ;
                }
                else {
                        cie = ia1 + ia3+ cta  ;
                } if(cie <20) {
                        JOptionPane.showMessageDialog(this, "Student is Detained from
taking SEE", "message",
                                        JOptionPane.PLAIN_MESSAGE);
                        System.exit(0);
                        ;
                }
                if (see == 38 || see== 39) {
                        see = 40;
                }
                if(see <38) {
                        JOptionPane.showMessageDialog(this, "Student has failed in SEE
exam and hence the grade is F", "message",
                                        JOptionPane.PLAIN_MESSAGE);
                        System.exit(0);
                        ;
                }
                if((see%2 )!=0 ) {
                        see= see+1;
                }
                total = cie + (see/2);
                String grade;
```

```
                        if (total <= 100 && total>= 90)
                                grade = "S";
                        else if (total < 90 && total >= 80)
                                grade = "A";
                        else if (total < 80 && total >= 70)
                                grade = "B";
                        else if (total < 70 && total >= 60)
                                grade = "C";
                        else if (total < 60 && total >= 50)
                                grade = "D";
                        else if (total < 50 && total>= 40)
                                grade = "E";
                        else
                                grade = "F";
                        l7.setText("Total Marks: " + total + "               ");
                        l8.setText("Grade: " + grade);
                }
        }
}
public class GradeCalculationDemo {
        public static void main(String[] args) {s
                // TODO Auto-generated method stub
                JFrame f = new Grade("CALCULATION OF GRADE");
                f.setDefaultCloseOperation(WindowConstants.EXIT_ON_CLOSE);
                f.setBounds(200, 200, 350, 400);
                f.setVisible(true);
        }
}
```


CALCULATION OF GRADE
Grade Calculator
Enter IA1 Marks: 20
Enter IA2 Marks: 19
Enter IA3 Marks: 20
Enter CTA Marks: 8
Enter SEE Marks: 90
Calculate
Total Marks: 93
Grade: S


CALCULATION OF GRADE
Grade Calculator
Enter IA1 Marks: 17
Enter IA2 Marks: 15
Enter IA3 Marks: 8
Enter CTA Marks: 7
Enter SEE Marks: 62
Calculate
Total Marks: 70
Grade: B