Student Class :

```
package project;


public class Student {


    String name;
   int matric;
   String program;
   double coursework;
   double exam;


   public Student (String n, int m, String p, double c, double e){
      name = n;
      matric = m;
      program = p;
      coursework = c;
      exam = e;


}


   public String computeGrade(){
      double totalmark;
      String grade;


       totalmark = (coursework*0.6) + (exam*0.4);


       if(totalmark>= 90){
          grade = "A+";
       }
      else if(totalmark>= 80){
          grade = "A";
```

```
}
else if(totalmark>= 75){
   grade = "A-";
}
else if(totalmark>= 70){
   grade = "B+";
}
else if(totalmark>= 65){
   grade = "B";
}
else if(totalmark>= 60){
   grade = "B-";
}
else if(totalmark>= 55){
   grade = "C+";
}
else if(totalmark>= 50){
   grade = "C";
}
else if(totalmark>= 45){
   grade = "C-";
}
else if(totalmark>= 40){
   grade = "D+";
}
else if(totalmark>= 35){
   grade = "D";
}
else{
   grade = "F";
}
```

```
        return grade;
    }


    public String getStudent(){
        return name;
    }

    public int getMatric(){
        return matric;
    }

    public double getCoursework(){
        return coursework;
    }

    public double getExam(){
        return exam;
    }

    public String getProgram(){
        return program;
    }
}
```

Application Student info system GUI :

```
package project;

import javax.swing.JOptionPane;



public class StudentInfoSys extends javax.swing.JFrame {

    private Student [] studentArray = new Student [1000];
    private int studentIndex = 0;

    public StudentInfoSys() {
        initComponents();
    }

    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">
    private void initComponents() {

        buttonGroup1 = new javax.swing.ButtonGroup();
        jOptionPane1 = new javax.swing.JOptionPane();
        jScrollPane2 = new javax.swing.JScrollPane();
        jTable1 = new javax.swing.JTable();
        jOptionPane2 = new javax.swing.JOptionPane();
        jOptionPane3 = new javax.swing.JOptionPane();
        jOptionPane4 = new javax.swing.JOptionPane();
        jOptionPane5 = new javax.swing.JOptionPane();
        jLabel1 = new javax.swing.JLabel();
        jLabel2 = new javax.swing.JLabel();
        jLabel3 = new javax.swing.JLabel();
        jLabel4 = new javax.swing.JLabel();
```

```
jLabel5 = new javax.swing.JLabel();
mathRB = new javax.swing.JRadioButton();
multiRB = new javax.swing.JRadioButton();
indRB = new javax.swing.JRadioButton();
nameTF = new javax.swing.JTextField();
matricTF = new javax.swing.JTextField();
courseworkTF = new javax.swing.JTextField();
examTF = new javax.swing.JTextField();
displayBTN = new javax.swing.JButton();
resetBTN = new javax.swing.JButton();
addBTN = new javax.swing.JButton();
jScrollPane1 = new javax.swing.JScrollPane();
outputTA = new javax.swing.JTextArea();
searchBTN = new javax.swing.JButton();
showBTN = new javax.swing.JButton();
exitBTN = new javax.swing.JButton();

jTable1.setModel(new javax.swing.table.DefaultTableModel(
    new Object [][] {
        {null, null, null, null},
        {null, null, null, null},
        {null, null, null, null},
        {null, null, null, null}
    },
    new String [] {
        "Title 1", "Title 2", "Title 3", "Title 4"
    }
));
jScrollPane2.setViewportView(jTable1);

jOptionPane2.setName(""); // NOI18N
jOptionPane2.getAccessibleContext().setAccessibleName("");
```

```
jOptionPane2.getAccessibleContext().setAccessibleDescription("");

setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);
setTitle("Student Infomation System");

jLabel1.setText("Name :");

jLabel2.setText("Matric. No :");

jLabel3.setText("Program :");

jLabel4.setText("Total Course Work Mark : ");

jLabel5.setText("Final Exam Mark : ");

buttonGroup1.add(mathRB);
mathRB.setText("B.Sc.Math");
mathRB.addActionListener(new java.awt.event.ActionListener() {
   public void actionPerformed(java.awt.event.ActionEvent evt) {
      mathRBActionPerformed(evt);
   }
});

buttonGroup1.add(multiRB);
multiRB.setText("B.Sc.Multimedia");

buttonGroup1.add(indRB);
indRB.setText("B.Sc.Ind");

nameTF.addActionListener(new java.awt.event.ActionListener() {
   public void actionPerformed(java.awt.event.ActionEvent evt) {
      nameTFActionPerformed(evt);
```

```
    }
});

displayBTN.setText("Display");
displayBTN.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        displayBTNActionPerformed(evt);
    }
});

resetBTN.setText("Reset");
resetBTN.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        resetBTNActionPerformed(evt);
    }
});

addBTN.setText("Add");
addBTN.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        addBTNActionPerformed(evt);
    }
});

outputTA.setColumns(20);
outputTA.setRows(5);
jScrollPane1.setViewportView(outputTA);

searchBTN.setText("Search");
searchBTN.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        searchBTNActionPerformed(evt);
```

```
        }
    });

    showBTN.setText("Show");
    showBTN.addActionListener(new java.awt.event.ActionListener() {
        public void actionPerformed(java.awt.event.ActionEvent evt) {
            showBTNActionPerformed(evt);
        }
    });

    exitBTN.setText("Exit");
    exitBTN.addActionListener(new java.awt.event.ActionListener() {
        public void actionPerformed(java.awt.event.ActionEvent evt) {
            exitBTNActionPerformed(evt);
        }
    });

    javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());
    getContentPane().setLayout(layout);
    layout.setHorizontalGroup(
        layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(layout.createSequentialGroup()
            .addGap(42, 42, 42)
            .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                .addGroup(layout.createSequentialGroup()
                    .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING,
false)
                        .addComponent(jLabel1, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addComponent(jLabel2, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addComponent(jLabel3, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
```

```
                    .addComponent(jLabel4, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                    .addComponent(jLabel5, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addComponent(nameTF)
                    .addComponent(matricTF)
                    .addComponent(courseworkTF)
                    .addGroup(layout.createSequentialGroup()
                        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG)
                            .addComponent(indRB)
                            .addComponent(multiRB)
                            .addComponent(mathRB))
                        .addGap(0, 0, Short.MAX_VALUE))
                    .addComponent(examTF))
                .addGap(76, 76, 76))
            .addGroup(layout.createSequentialGroup()
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)
                    .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 402,
javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addGroup(javax.swing.GroupLayout.Alignment.LEADING,
layout.createSequentialGroup()
                        .addComponent(addBTN, javax.swing.GroupLayout.PREFERRED_SIZE, 76,
javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(displayBTN, javax.swing.GroupLayout.PREFERRED_SIZE, 80,
javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(resetBTN, javax.swing.GroupLayout.PREFERRED_SIZE, 76,
javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(searchBTN, javax.swing.GroupLayout.PREFERRED_SIZE, 73,
javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
```

```
                    .addComponent(showBTN, javax.swing.GroupLayout.PREFERRED_SIZE, 73,
javax.swing.GroupLayout.PREFERRED_SIZE))

                .addComponent(exitBTN, javax.swing.GroupLayout.PREFERRED_SIZE, 73,
javax.swing.GroupLayout.PREFERRED_SIZE))

            .addGap(42, 42, 42))))

    );

    layout.setVerticalGroup(

      layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

      .addGroup(layout.createSequentialGroup()

        .addContainerGap(34, Short.MAX_VALUE)

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)

          .addComponent(jLabel1)

          .addComponent(nameTF, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE))

        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)

          .addComponent(jLabel2)

          .addComponent(matricTF, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE))

        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)

          .addComponent(jLabel3)

          .addComponent(mathRB))

        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)

        .addComponent(multiRB)

        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)

        .addComponent(indRB)

        .addGap(14, 14, 14)

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)

          .addComponent(courseworkTF, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)

          .addComponent(jLabel4))

        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
```

```
                .addComponent(jLabel5)
                .addComponent(examTF, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE))
            .addGap(26, 26, 26)
            .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                .addComponent(displayBTN)
                .addComponent(resetBTN)
                .addComponent(addBTN)
                .addComponent(searchBTN)
                .addComponent(showBTN))
            .addGap(18, 18, 18)
            .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 153,
javax.swing.GroupLayout.PREFERRED_SIZE)
            .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
            .addComponent(exitBTN)
            .addGap(18, 18, 18))
        );

        pack();
    }// </editor-fold>

    private void mathRBActionPerformed(java.awt.event.ActionEvent evt) {

    }

    private void nameTFActionPerformed(java.awt.event.ActionEvent evt) {

    }

    private void resetBTNActionPerformed(java.awt.event.ActionEvent evt) {

        studentIndex = 0;
        JOptionPane.showMessageDialog(null, "The data is reset.");
```

```
    outputTA.setText("");

}

private void addBTNActionPerformed(java.awt.event.ActionEvent evt) {
    String name = nameTF.getText();
    int matric = Integer.parseInt(matricTF.getText());
    double coursework = Double.parseDouble(courseworkTF.getText());
    double exam = Double.parseDouble(examTF.getText());
    boolean result = true;
    String program = "";

    if((coursework < 0) || (coursework > 100)){
        JOptionPane.showMessageDialog(null,"Please enter a valid coursework marks. ");
        result = false;
    }

    if((exam < 0) || (exam > 100)){
        JOptionPane.showMessageDialog(null,"Please enter a valid exam marks. ");
        result = false;
    }

    if(mathRB.isSelected() == true){
        program = "B.Sc.Math";
    }
    else if(multiRB.isSelected() == true){
        program = "B.Sc.Multimedia";
    }
    else if(indRB.isSelected() == true){
        program = "B.Sc. Ind";
    }
```

```
    else {
        JOptionPane.showMessageDialog(null, "Please select the course");
        result = false;
    }

    if(result == true){
        outputTA.setText("One student infomation is successfully added.\n");
        studentArray[studentIndex] = new Student(name, matric, program, coursework, exam);
        studentIndex++;
    }else{
        outputTA.setText("The student data is not created. \n");
    }

    nameTF.setText("");
    matricTF.setText("");
    courseworkTF.setText("");
    examTF.setText("");
    buttonGroup1.clearSelection();
    outputTA.append("Number of student data added = " + studentIndex );

}


private void displayBTNActionPerformed(java.awt.event.ActionEvent evt) {

    outputTA.setText("Displaying student data: \n \n");

    for (int i = 0; i< studentIndex; i++ ){
        outputTA.append("Name : " + studentArray[i].getStudent() + "\n");
        outputTA.append("Matric No. : " + studentArray[i].getMatric() + "\n");
        outputTA.append("Program : " + studentArray[i].getProgram() + "\n");
        outputTA.append("Total Course work mark : " + studentArray[i].getCoursework() + "\n");
```

```
        outputTA.append("Final exam mark : " + studentArray[i].getExam() + "\n");
        outputTA.append("Grade : " + studentArray[i].computeGrade() + "\n");
        outputTA.append("================================================ \n");
    }
}

private void searchBTNActionPerformed(java.awt.event.ActionEvent evt) {
    int matric = Integer.parseInt(JOptionPane.showInputDialog("Please enter the Matric No."));

    for (int i = 0; i < studentIndex; i++) {
        if (matric == studentArray[i].getMatric()) {
            outputTA.setText("Name : " + studentArray[i].getStudent() + "\n");
            outputTA.append("Matric No. : " + studentArray[i].getMatric() + "\n");
            outputTA.append("Program : " + studentArray[i].getProgram() + "\n");
            outputTA.append("Total Course work mark : " + studentArray[i].getCoursework() + "\n");
            outputTA.append("Final exam mark : " + studentArray[i].getExam() + "\n");
            outputTA.append("Grade : " + studentArray[i].computeGrade() + "\n");
        }
    }


}

private void showBTNActionPerformed(java.awt.event.ActionEvent evt) {
    outputTA.setText("The distribution is as follow: \n \n");

    int aPlus = 0;
    int a = 0;
    int aMinus = 0;
    int bPlus = 0;
    int b = 0;
    int bMinus = 0;
```

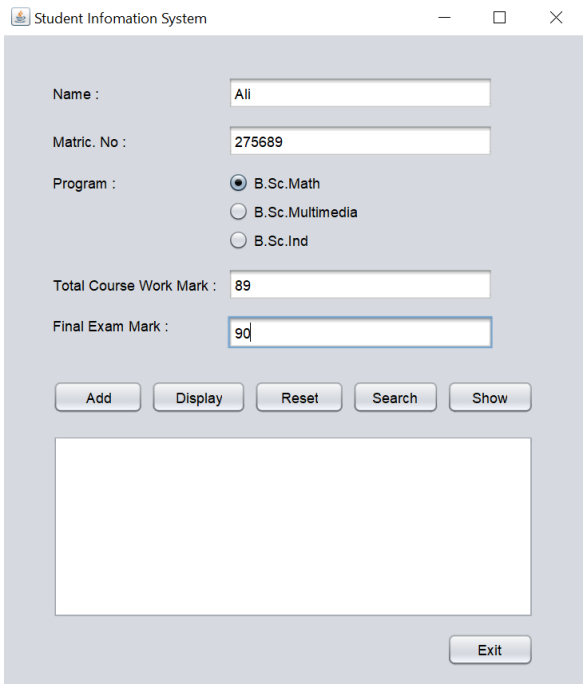
```
int cPlus = 0;
int c = 0;
int cMinus = 0;
int dPlus = 0;
int d = 0;
int f = 0;

for (int i = 0; i< studentIndex; i++ ){
   switch(studentArray[i].computeGrade()){
      case "A+" : aPlus++; break;
      case "A" : a++; break;
      case "A-" : aMinus++; break;
      case "B+" : bPlus++; break;
      case "B" : b++; break;
      case "B-" : bMinus++; break;
      case "C+" : cPlus++; break;
      case "C" : c++; break;
      case "C-" : cMinus++; break;
      case "D+" : dPlus++; break;
      case "D" : d++; break;
      default : f++; break;
   }
}

   outputTA.append("The total number of Grade A+ is " + aPlus + "\n");
   outputTA.append("The total number of Grade A is " + a + "\n");
   outputTA.append("The total number of Grade A- is " + aMinus + "\n");
   outputTA.append("The total number of Grade B+ is " + bPlus + "\n");
   outputTA.append("The total number of Grade B is " + b + "\n");
   outputTA.append("The total number of Grade B- is " + bMinus + "\n");
   outputTA.append("The total number of Grade C+ is " + cPlus + "\n");
   outputTA.append("The total number of Grade C is " + c + "\n");
```

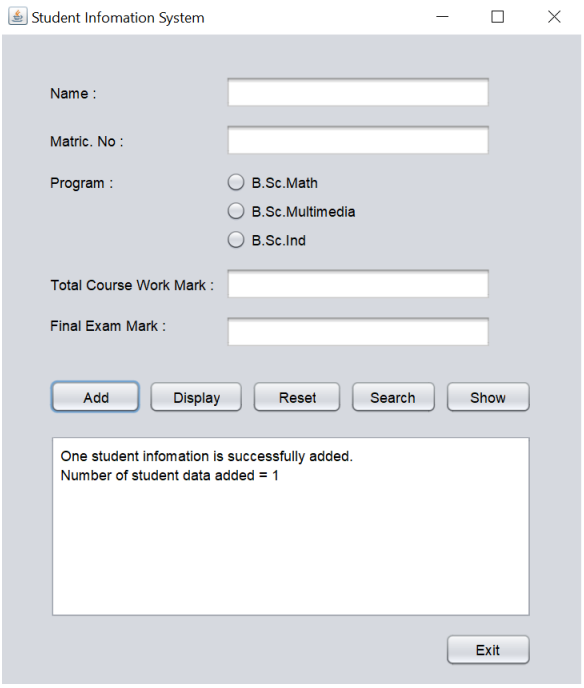
```
        outputTA.append("The total number of Grade C- is " + cMinus + "\n");
        outputTA.append("The total number of Grade D+ is " + dPlus + "\n");
        outputTA.append("The total number of Grade D is " + d + "\n");
        outputTA.append("The total number of Grade F is " + f + "\n");
    }

    private void exitBTNActionPerformed(java.awt.event.ActionEvent evt) {
        System.exit(1);

    }



    public static void main(String args[]) {
        /* Set the Nimbus look and feel */
        //<editor-fold defaultstate="collapsed" desc=" Look and feel setting code (optional) ">
        /* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.
         * For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html
         */
        try {
            for (javax.swing.UIManager.LookAndFeelInfo info :
javax.swing.UIManager.getInstalledLookAndFeels()) {
                if ("Nimbus".equals(info.getName())) {
                    javax.swing.UIManager.setLookAndFeel(info.getClassName());
                    break;
                }
            }
        } catch (ClassNotFoundException ex) {

java.util.logging.Logger.getLogger(StudentInfoSys.class.getName()).log(java.util.logging.Level.SEVERE
, null, ex);
        } catch (InstantiationException ex) {

java.util.logging.Logger.getLogger(StudentInfoSys.class.getName()).log(java.util.logging.Level.SEVERE
, null, ex);
```

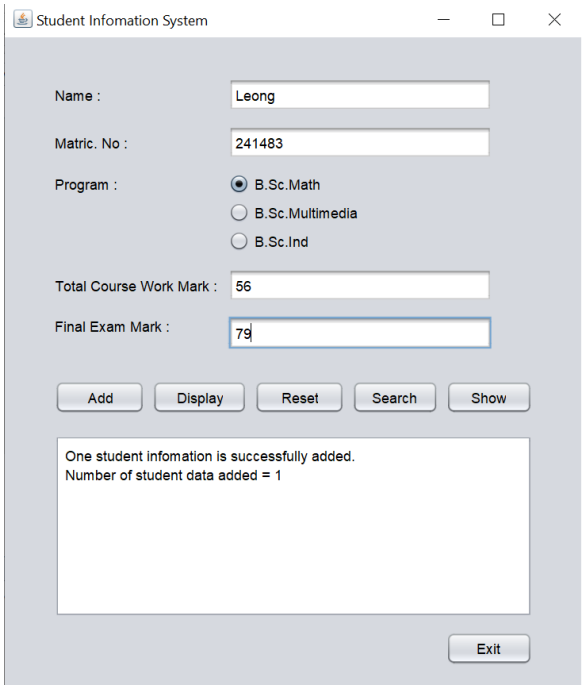
```
        } catch (IllegalAccessException ex) {
java.util.logging.Logger.getLogger(StudentInfoSys.class.getName()).log(java.util.logging.Level.SEVERE
, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {
java.util.logging.Logger.getLogger(StudentInfoSys.class.getName()).log(java.util.logging.Level.SEVERE
, null, ex);
        }
        //</editor-fold>

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(() -> {
            new StudentInfoSys().setVisible(true);
        });
    }

    // Variables declaration - do not modify
    private javax.swing.JButton addBTN;
    private javax.swing.ButtonGroup buttonGroup1;
    private javax.swing.JTextField courseworkTF;
    private javax.swing.JButton displayBTN;
    private javax.swing.JTextField examTF;
    private javax.swing.JButton exitBTN;
    private javax.swing.JRadioButton indRB;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JLabel jLabel3;
    private javax.swing.JLabel jLabel4;
    private javax.swing.JLabel jLabel5;
    private javax.swing.JOptionPane jOptionPane1;
    private javax.swing.JOptionPane jOptionPane2;
    private javax.swing.JOptionPane jOptionPane3;
    private javax.swing.JOptionPane jOptionPane4;
```

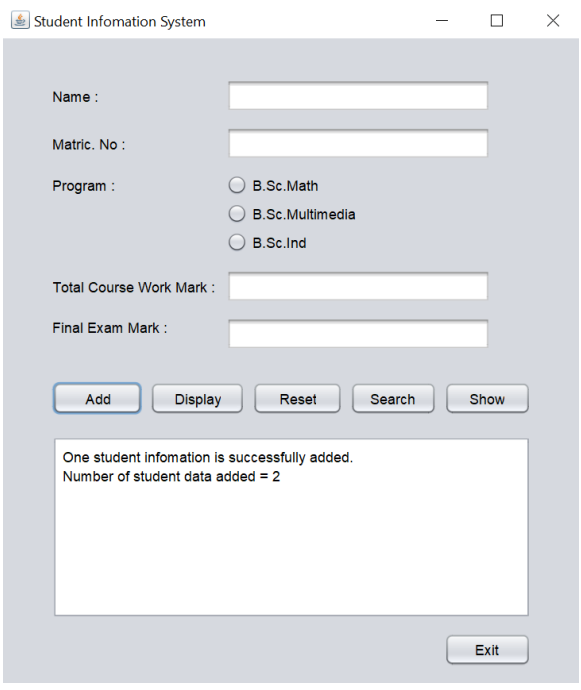
```
    private javax.swing.JOptionPane jOptionPane5;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JScrollPane jScrollPane2;
    private javax.swing.JTable jTable1;
    private javax.swing.JRadioButton mathRB;
    private javax.swing.JTextField matricTF;
    private javax.swing.JRadioButton multiRB;
    private javax.swing.JTextField nameTF;
    private javax.swing.JTextArea outputTA;
    private javax.swing.JButton resetBTN;
    private javax.swing.JButton searchBTN;
    private javax.swing.JButton showBTN;
    // End of variables declaration
}
```

When adding the student information:

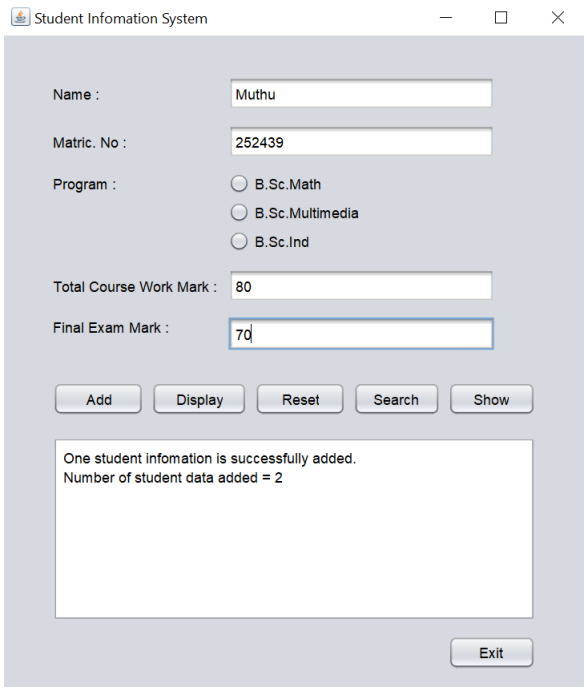


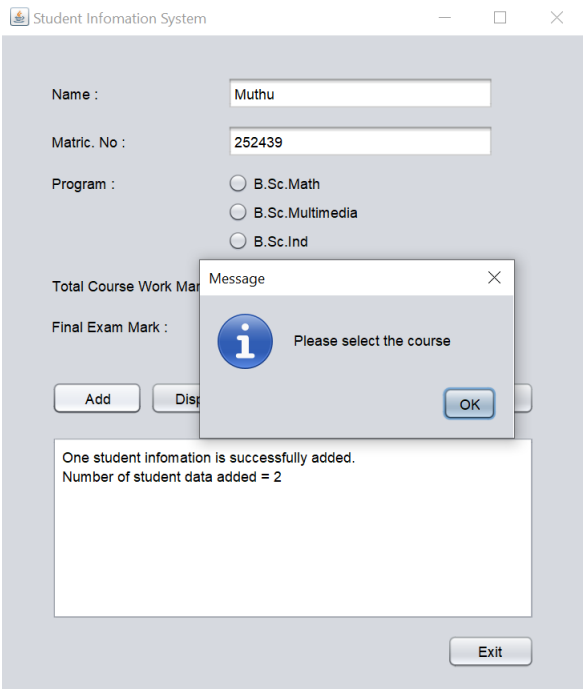


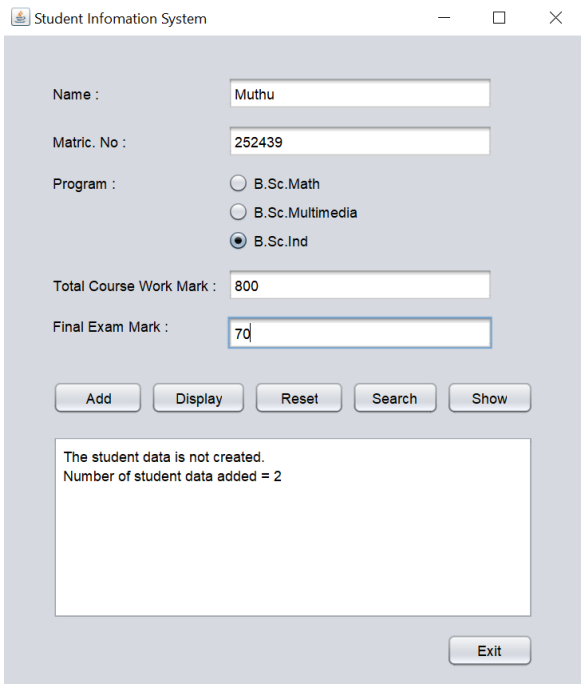


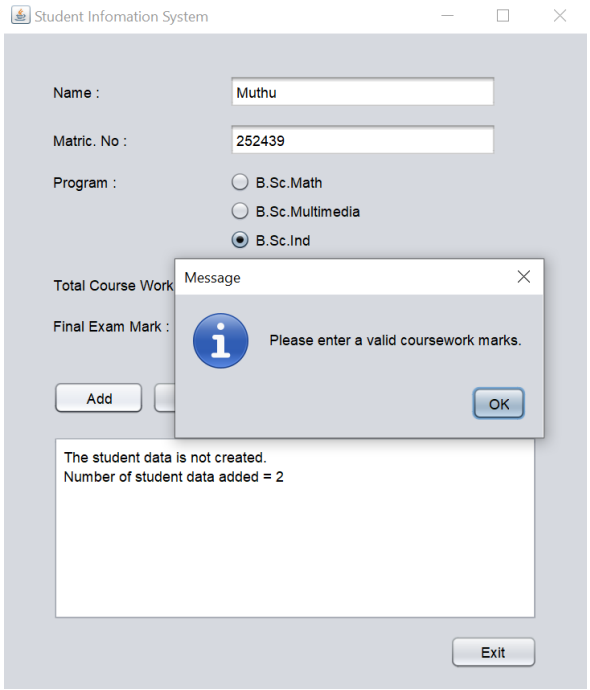


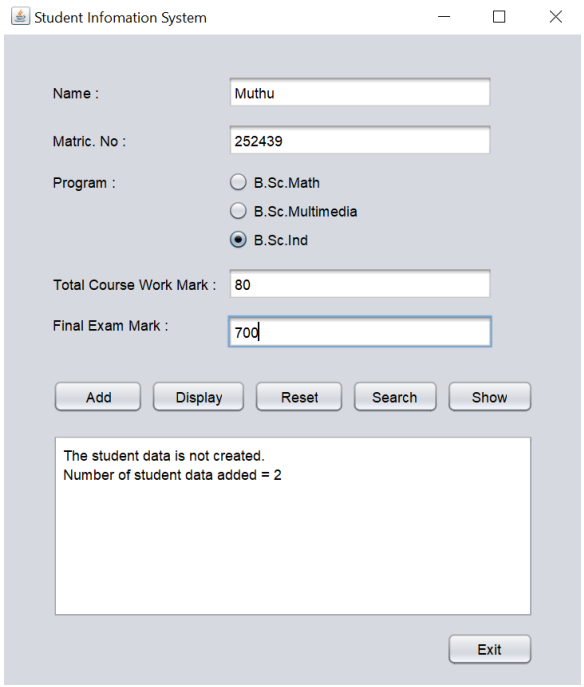
When adding an invalid information:

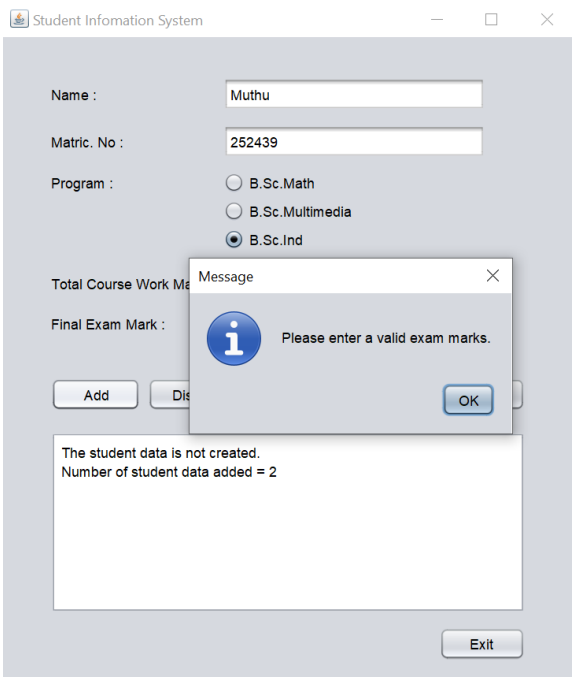




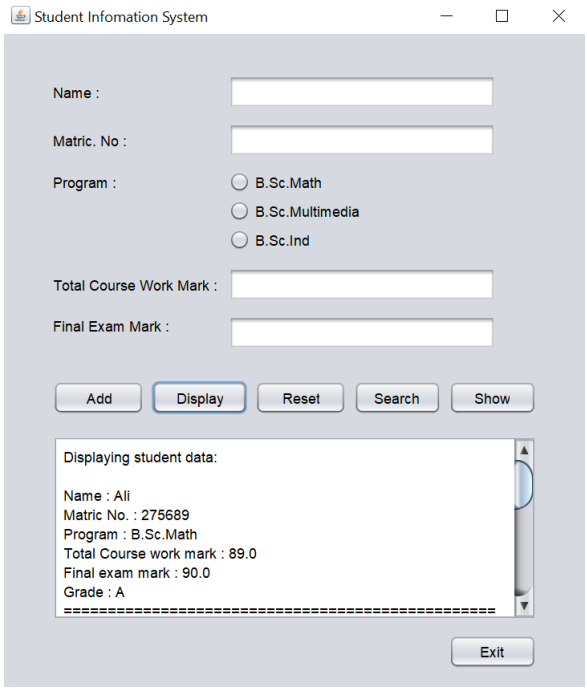


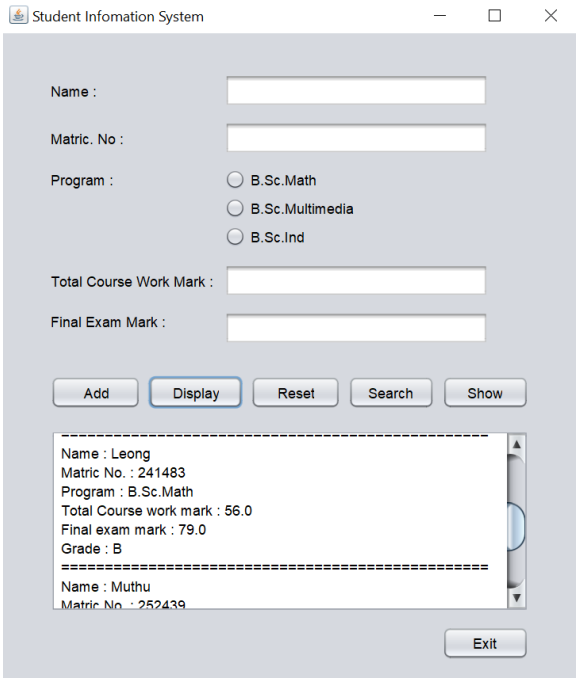


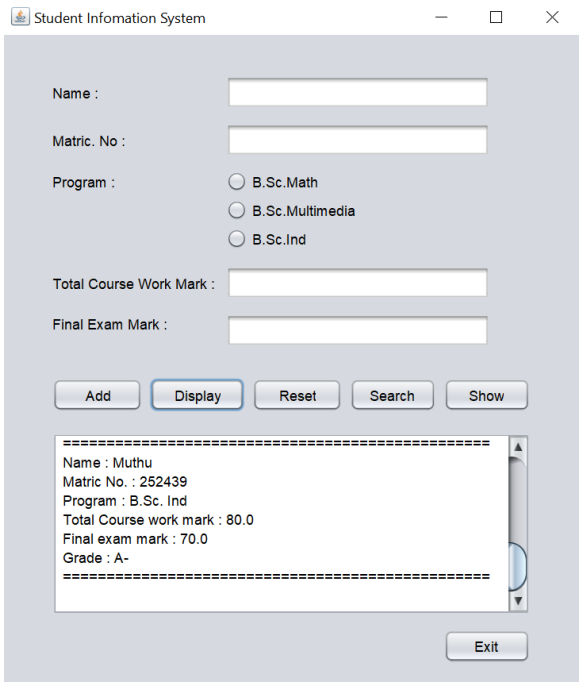

Student Infomation System
Name :
Muthu
Matric. No :
252439
Program :
B.Sc.Math
B.Sc.Multimedia
B.Sc.Ind
Total Course Work Mark :
80
Final Exam Mark :
700
Add
Display
Reset
Search
Show
The student data is not created.
Number of student data added = 2
Exit


Student Infomation System
Name :
Muthu
Matric. No :
252439
Program :
B.Sc.Math
B.Sc.Multimedia
B.Sc.Ind
Message
Please enter a valid exam marks.
OK
Add
The student data is not created.
Number of student data added = 2
Exit

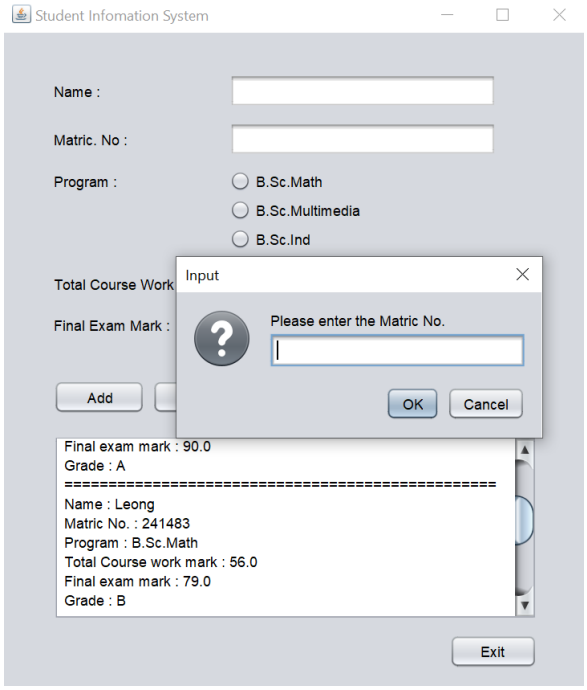
When Displaying the student information:

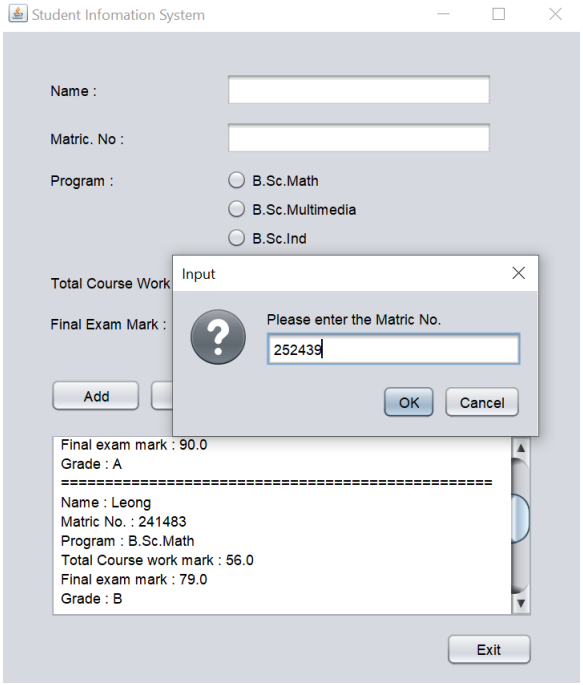


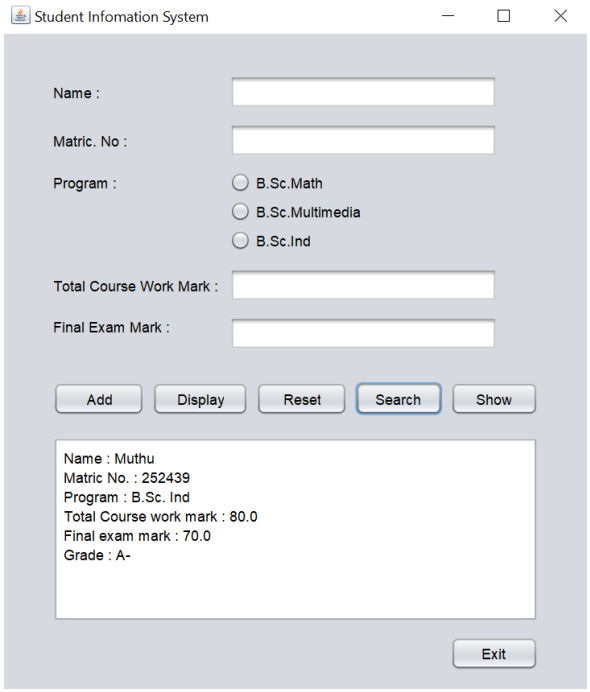




When searching a student based on matric number :







When showing the grade distribution :