Computer Science

22.2

Module code: SE101.3

Module name: Object Oriented Programming in Java

Assignment: General Assignment

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(01)

```java
public class Assingment {


    public static void main(String[] args) {

            System.out.println("My Name is K.A.S.Nirmana" );

    }

}
```

(02)

```java
import java.util.Scanner;

public class Assingment {


    public static void main(String[] args) {

        int n1;

        int n2;

        int n3;

        Scanner scanner = new Scanner(System.in);

        System.out.println("Enter First Integer :");

        int n1  =  scanner.nextInt();

        System.out.println("Enter Second Integer :");

        int n2  =  scanner.nextInt();

        System.out.println("Enter Third Integer :");

        int n3  =  scanner.nextInt();


        int product = n1*n2*n3;

        System.out.println("The Product is : "+ product);

        scanner.close();

    }

}
```

(03)

```
import java.util.Scanner;

public class Assingment {


    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);


        System.out.print("Enter the Fahrenheit value : ");

        double fahrenheit = scanner.nextDouble();


        double celsius = (fahrenheit - 32) * 5 / 9;


        System.out.println("The Celsius equivalent is: " + celsius + " degrees Celsius");

        scanner.close();

    }

}
```

(04)

```java
import java.util.Scanner;

public class Assingment {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);

        int n1;

        int n2;
        int n3;

        System.out.println("Enter three integers: ");

                int n1 = scanner.nextInt();

                int n2 = scanner.nextInt();

                int n3 = scanner.nextInt();

        int sum = n1 + n2 + n3;

        double average = (double) sum / 3;

        int product = n1 * n2 * n3;


        int smallest;

        if (num1 <= n2 && n1 <= n3) {

                smallest = n1;

            } else if (num2 <= n1 && n2 <= n3) {

                smallest = n2;

            } else {

                smallest = n3;

        }

        int largest;

        if (num1 >= n2 && n1 >= n3) {

            largest = n1;

        } else if (n2 >= n1 && n2 >= n3) {

            largest = n2;

        } else {
```

```java
        System.out.println("Sum: " + sum);

        System.out.println("Average: " + average);

        System.out.println("Product: " + product);

        System.out.println("Smallest: " + smallest);

        System.out.println("Largest: " + largest);


        scanner.close();

    }

}
```

(05)

```java
import java.util.Scanner;
public class Assingment {
    public static void main(String[] args) {
        int marks = 0;
        int total = 0;
        int increment = 0;
        int count = 0;
        int[] array = new int[20];
      float average;


      Scanner obj = new Scanner(System.in);
      while (marks != -1 && increment < 20) {
        m = obj.nextInt();
        if (marks != -1) {
           array[increment] = marks;
           increment ++;
           count = increment;
        }
      }
   for (int x = 0; x < count; x++) {
        total = total + array[x];
     }


     average =  total / count;
     System.out.println("Average: " +average );
  }
}
```

(**06)**

```java
public class Date {

    private int month;

    private int day;

    private int year;


    public Date(int month, int day, int year) {

        this.month = month;

        this.day = day;

        this.year = year;

    }


    public int getMonth() {

        return month;

    }


    public void setMonth(int month) {

        this.month = month;

    }


    public int getDay() {

        return day;

    }


    public void setDay(int day) {

        this.day = day;

    }
```

```java
    public int getYear() {

        return year;

    }


    public void setYear(int year) {

        this.year = year;

    }


    public void displayDate() {

        System.out.println(month + "/" + day + "/" +
year);

    }
}
```

```java
public class DateTest {

    public static void main(String[] args) {

        Date date = new Date(7, 30, 2023);

        System.out.print("Initial date: ");
        date.displayDate();

        date.setMonth(9);
        date.setDay(15);
        date.setYear(2023);

        System.out.print("Updated date: ");
        date.displayDate();
    }
}
```

public static void main(String[] args) {

(07)

```java
public class Item {

    private int location;

    private String description;


    public Item(int location, String description) {

        this.location = location;

        this.description = description;

    }


    public int getLocation() {

        return location;

    }


    public void setLocation(int location) {

        this.location = location;

    }


    public String getDescription() {

        return description;

    }


    public void setDescription(String description) {

        this.description = description;

    }

}
```

```java
public class Monster extends Item {

    public Monster(int location, String description) {

        super(location, description);

    }

}
```

```java
public class Main {

    public static void main(String[] args) {

        Item item = new Item(1, "Potion");

        System.out.println("Item description: " + item.getDescription());

        System.out.println("Item location: " + item.getLocation());


        item.setLocation(2);

        item.setDescription("Health Kit");

        System.out.println("Updated item description: " + item.getDescription());

        System.out.println("Updated item location: " + item.getLocation());


        Monster monster = new Monster(3, "Dragon");

        System.out.println("Monster description: " + monster.getDescription());

        System.out.println("Monster location: " + monster.getLocation());


        monster.setLocation(4);

        monster.setDescription("Giant Spider");

        System.out.println("Updated monster description: " + monster.getDescription());

        System.out.println("Updated monster location: " + monster.getLocation());
    }

}
```

(08)

```java
public class SavingsAccount {

    private static double annualInterestRate;

    private double savingsBalance;


    public SavingsAccount(double savingsBalance) {

        this.savingsBalance = savingsBalance;

    }


    public double getSavingsBalance() {

        return savingsBalance;

    }


    public void calculateMonthlyInterest() {

        double monthlyInterest = (savingsBalance * annualInterestRate) / 12;

        savingsBalance += monthlyInterest;

    }


    public static void modifyInterestRate(double newInterestRate) {

        annualInterestRate = newInterestRate;

    }

}
```

```java
public class SavingsAccountTest {

  public static void main(String[] args) {

    SavingsAccount saver1 = new SavingsAccount(2000.0);

    SavingsAccount saver2 = new SavingsAccount(3000.0);


    SavingsAccount.modifyInterestRate(0.04);



    saver1.calculateMonthlyInterest();

    saver2.calculateMonthlyInterest();

    System.out.println("Month 1 - Saver1 Balance: $" + saver1.getSavingsBalance());

    System.out.println("Month 1 - Saver2 Balance: $" + saver2.getSavingsBalance());


    SavingsAccount.modifyInterestRate(0.05);


    saver1.calculateMonthlyInterest();

    saver2.calculateMonthlyInterest();

    System.out.println("Month 2 - Saver1 Balance: $" + saver1.getSavingsBalance());

    System.out.println("Month 2 - Saver2 Balance: $" + saver2.getSavingsBalance());

  }

}
```

(09)

```java
class Car {

   int speed;

   double regularPrice;

   String color;


   public Car(int speed, double regularPrice, String color) {

      this.speed = speed;

      this.regularPrice = regularPrice;

      this.color = color;

   }


   double getSalePrice() {

      return regularPrice;

   }

}


class Truck extends Car {

   int weight;


   public Truck(int speed, double regularPrice, String color, int weight) {

      super(speed, regularPrice, color);

      this.weight = weight;

   }
```

```java
    double getSalePrice() {

        if (weight > 2000) {

            return regularPrice * 0.9;

        } else {

            return regularPrice * 0.8;

        }

    }

}


class Ford extends Car {

    int year;

    int manufacturerDiscount;


    public Ford(int speed, double regularPrice, String color, int year, int manufacturerDiscount) {

        super(speed, regularPrice, color);

        this.year = year;

        this.manufacturerDiscount = manufacturerDiscount;

    }


    double getSalePrice() {

        return super.getSalePrice() - manufacturerDiscount;

    }

}
```

```java
class Sedan extends Car {

    int length;


    public Sedan(int speed, double regularPrice, String color, int length) {

        super(speed, regularPrice, color);

        this.length = length;

    }


    double getSalePrice() {

        if (length > 20) {

            return super.getSalePrice() * 0.95;

        } else {

            return super.getSalePrice() * 0.9;

        }

    }

}


public class MyOwnAutoShop {

    public static void main(String[] args) {


        Sedan sedan = new Sedan(150, 20000, "Red", 18);


        Ford ford1 = new Ford(180, 25000, "Blue", 2019, 2000);

        Ford ford2 = new Ford(200, 30000, "Silver", 2020, 2500);


        Car car = new Car(120, 15000, "Green");
```

```java
    System.out.println("Sedan sale price: $" + sedan.getSalePrice());

    System.out.println("Ford 1 sale price: $" + ford1.getSalePrice());

    System.out.println("Ford 2 sale price: $" + ford2.getSalePrice());

    System.out.println("Car sale price: $" + car.getSalePrice());
  }
}
```

(10)

```
class Shape {

   void draw() {

      System.out.println("Drawing a shape");

   }


   void erase() {

      System.out.println("Erasing a shape");

   }

}


class Circle extends Shape {


   void draw() {

      System.out.println("Drawing a circle");

   }


   void erase() {

      System.out.println("Erasing a circle");

   }

}


class Triangle extends Shape {


   void draw() {

      System.out.println("Drawing a triangle");

   }
```

```java
  void erase() {

    System.out.println("Erasing a triangle");

  }

}


class Square extends Shape {

  void draw() {

    System.out.println("Drawing a square");

  }


  void erase() {

    System.out.println("Erasing a square");

  }

}


public class PolymorphismExample {
  public static void main(String[] args) {

    Shape circle = new Circle();

    Shape triangle = new Triangle();

    Shape square = new Square();


    drawAndErase(circle);

    drawAndErase(triangle);

    drawAndErase(square);

  }
```

```
    static void drawAndErase(Shape shape) {

        shape.draw();

        shape.erase();

    }

}
```

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```
interface A {

  void meth1();

  void meth2();

}


class MyClass implements A {


  public void meth1() {

    System.out.println("Method 1 implementation in MyClass.");

  }


  public void meth2() {

    System.out.println("Method 2 implementation in MyClass.");

  }

}
```

```java
interface B {

  void methodB();

}


interface C {

  void methodC();

}


class MyClass2 implements B, C {


  public void methodB() {

    System.out.println("Method B implementation in MyClass2.");

  }


  public void methodC() {

    System.out.println("Method C implementation in MyClass2.");

  }

}
```

```java
interface Test {

   int square(int num);

}


class Arithmetic implements Test {


   public int square(int num) {

     return num * num;

   }

}
```

```java
class ToTestInt {

   public static void main(String[] args) {

     Arithmetic arithmeticObj = new Arithmetic();

     int number = 5;

     int result = arithmeticObj.square(number);

     System.out.println("Square of " + number + " is: " + result);

   }

}
```

(12)

```java
import java.util.Scanner;

public class NegativeArraySizeCheck {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        try {
            System.out.print("Enter the size of the array: ");
            int size = scanner.nextInt();

            if (size < 0) {
                throw new NegativeArraySizeException();
            }

            int[] array = new int[size];
            System.out.println("Array of size " + size + " created successfully.");
        } catch (NegativeArraySizeException ex) {
            System.out.println("Error: Array size cannot be negative.");
        } catch (Exception ex) {
            System.out.println("An unexpected error occurred.");
        } finally {
            scanner.close();
        }
    }

    static class NegativeArraySizeException extends Exception {

    }
}
```

```java
import java.util.Scanner;

public class MultipleCatchExample {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        try {
            System.out.print("Enter a number: ");
            int num = Integer.parseInt(scanner.nextLine());

            int result = 10 / num;
            System.out.println("Result: " + result);
        } catch (ArithmeticException ex) {
            System.out.println("Error: Cannot divide by zero.");
        } catch (NumberFormatException ex) {
            System.out.println("Error: Invalid number format.");
        } catch (Exception ex) {
            System.out.println("An unexpected error occurred.");
        } finally {
            scanner.close();
        }
    }
}
```

```java
public class ExceptionPrecedenceExample {

    public static void main(String[] args) {

        try {

            throw new DerivedException();

        } catch (DerivedException ex) {

            System.out.println("Caught DerivedException: " + ex.getMessage());

        } catch (BaseException ex) {

            System.out.println("Caught BaseException: " + ex.getMessage());

        }

    }


    static class BaseException extends Exception {

        @Override

        public String getMessage() {

            return "This is a BaseException.";

        }

    }


    static class DerivedException extends BaseException {

        @Override

        public String getMessage() {

            return "This is a DerivedException.";

        }

    }

}
```

```java
import java.io.FileReader;

import java.io.IOException;


public class TryCatchFinallyExample {

    public static void main(String[] args) {

        try {

            FileReader fileReader = new FileReader("example.txt");

            int data = fileReader.read();

            System.out.println("Read data: " + data);

        } catch (IOException ex) {

            System.out.println("Error reading file: " + ex.getMessage());

        } finally {

            System.out.println("Finally block executed.");

        }

    }

}
```

```java
import java.io.FileNotFoundException;

import java.io.FileReader;


public class ThrowsExample {

    public static void main(String[] args) {

        try {

            readDataFromFile("example.txt");

        } catch (FileNotFoundException ex) {

            System.out.println("File not found: " + ex.getMessage());

        }

    }


    static void readDataFromFile(String filename) throws FileNotFoundException {

        FileReader fileReader = new FileReader(filename);


    }
}
```

```java
public class CustomExceptionExample {

    public static void main(String[] args) {

        try {

            validateAge(15);

        } catch (InvalidAgeException ex) {

            System.out.println("Invalid Age: " + ex.getMessage());

        }

    }


    static void validateAge(int age) throws InvalidAgeException {

        if (age < 18) {

            throw new InvalidAgeException("Age must be at least 18 years.");

        }

        System.out.println("Valid Age: " + age);

    }


    static class InvalidAgeException extends Exception {

        public InvalidAgeException(String message) {

            super(message);

        }

    }

}
```

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```java
class MyRunnable implements Runnable {

    public void run() {

        try {

            for (int i = 1; i <= 5; i++) {

                System.out.println("Child Thread: " + i);

                Thread.sleep(500);

            }

        } catch (InterruptedException e) {

            System.out.println("Child Thread interrupted.");

        }

    }

}


public class ThreadCreationUsingRunnable {

    public static void main(String[] args) {

        MyRunnable runnable = new MyRunnable();

        Thread thread = new Thread(runnable);

        thread.start();


        try {

            for (int i = 1; i <= 5; i++) {

                System.out.println("Main Thread: " + i);

                Thread.sleep(500);

            }

        } catch (InterruptedException e) {

            System.out.println("Main Thread interrupted.");

        }

    }

}
```

```java
class MyThread extends Thread {

  public MyThread() {

    super();

    start();

  }


  public void run() {

    try {

      for (int i = 1; i <= 5; i++) {

        System.out.println("Child Thread: " + i);

        Thread.sleep(500);

      }

    } catch (InterruptedException e) {

      System.out.println("Child Thread interrupted.");

    }

  }

}

public class ThreadCreationUsingMyThread {

  public static void main(String[] args) {

    new MyThread();


    try {

      for (int i = 1; i <= 5; i++) {

        System.out.println("Main Thread: " + i);

        Thread.sleep(500);

      }

    } catch (InterruptedException e) {

      System.out.println("Main Thread interrupted.");

    }

  }

}
```

(14)

Frame

```java
package com.mycompany.fram01;


public class Fram01 {


    public static void main(String[] args)
    {
        JQ14 c = new JQ14();
        c.show();
    }
}
```

Form

```xml
<?xml version="1.0" encoding="UTF-8" ?>

<Form version="1.3" maxVersion="1.9" type="org.netbeans.modules.form.forminfo.JFrameFormInfo">
  <Properties>
    <Property name="defaultCloseOperation" type="int" value="3"/>
  </Properties>
  <SyntheticProperties>
    <SyntheticProperty name="formSizePolicy" type="int" value="1"/>
    <SyntheticProperty name="generateCenter" type="boolean" value="false"/>
  </SyntheticProperties>
  <AuxValues>
    <AuxValue name="FormSettings_autoResourcing" type="java.lang.Integer" value="0"/>
    <AuxValue name="FormSettings_autoSetComponentName" type="java.lang.Boolean" value="false"/>
    <AuxValue name="FormSettings_generateFQN" type="java.lang.Boolean" value="true"/>
    <AuxValue name="FormSettings_generateMnemonicsCode" type="java.lang.Boolean" value="false"/>
    <AuxValue name="FormSettings_i18nAutoMode" type="java.lang.Boolean" value="false"/>
    <AuxValue name="FormSettings_layoutCodeTarget" type="java.lang.Integer" value="1"/>
    <AuxValue name="FormSettings_listenerGenerationStyle" type="java.lang.Integer" value="0"/>
    <AuxValue name="FormSettings_variablesLocal" type="java.lang.Boolean" value="false"/>
    <AuxValue name="FormSettings_variablesModifier" type="java.lang.Integer" value="2"/>
  </AuxValues>
```

```xml
<Layout>
  <DimensionLayout dim="0">
    <Group type="103" groupAlignment="0" attributes="0">
      <Group type="102" attributes="0">
        <Group type="103" groupAlignment="0" attributes="0">
          <Group type="102" attributes="0">
            <EmptySpace min="-2" pref="17" max="-2" attributes="0"/>
            <Group type="103" groupAlignment="0" attributes="0">
              <Component id="jLabel1" min="-2" max="-2" attributes="0"/>
              <Group type="102" alignment="0" attributes="0">
                <EmptySpace min="-2" pref="11" max="-2" attributes="0"/>
                <Component id="jTextField1" min="-2" pref="130" max="-2" attributes="0"/>
                <EmptySpace min="-2" pref="31" max="-2" attributes="0"/>
                <Component id="jRadioButton1" min="-2" pref="85" max="-2" attributes="0"/>
                <EmptySpace type="separate" max="-2" attributes="0"/>
                <Component id="jRadioButton2" min="-2" max="-2" attributes="0"/>
                <EmptySpace max="32767" attributes="0"/>
                <Component id="jButton1" min="-2" pref="110" max="-2" attributes="0"/>
              </Group>
            </Group>
          </Group>
        </Group>
        <Group type="102" alignment="0" attributes="0">
          <EmptySpace min="-2" pref="120" max="-2" attributes="0"/>
          <Group type="103" groupAlignment="0" attributes="0">
            <Component id="jLabel2" min="-2" pref="401" max="-2" attributes="0"/>
            <Component id="jLayeredPane1" min="-2" max="-2" attributes="0"/>
          </Group>
          <EmptySpace min="0" pref="106" max="32767" attributes="0"/>
        </Group>
      </Group>
```

```xml
            <EmptySpace min="-2" pref="36" max="-2" attributes="0"/>
        </Group>
      </Group>
  </DimensionLayout>
  <DimensionLayout dim="1">
    <Group type="103" groupAlignment="0" attributes="0">
      <Group type="102" alignment="0" attributes="0">
        <EmptySpace min="-2" pref="17" max="-2" attributes="0"/>
        <Component id="jLabel1" min="-2" max="-2" attributes="0"/>
        <Group type="103" groupAlignment="0" attributes="0">
          <Group type="102" attributes="0">
            <EmptySpace min="-2" pref="39" max="-2" attributes="0"/>
            <Group type="103" groupAlignment="3" attributes="0">
              <Component id="jTextField1" alignment="3" min="-2" pref="33" max="-2" attributes="0"/>
              <Component id="jRadioButton1" alignment="3" min="-2" max="-2" attributes="0"/>
              <Component id="jRadioButton2" alignment="3" min="-2" max="-2" attributes="0"/>
              <Component id="jButton1" alignment="3" min="-2" pref="33" max="-2" attributes="0"/>
            </Group>
          </Group>
          <Group type="102" alignment="0" attributes="0">
            <EmptySpace max="-2" attributes="0"/>
            <Component id="jLayeredPane1" min="-2" max="-2" attributes="0"/>
          </Group>
        </Group>
        <EmptySpace type="unrelated" max="-2" attributes="0"/>
        <Component id="jLabel2" min="-2" max="-2" attributes="0"/>
        <EmptySpace pref="66" max="32767" attributes="0"/>
      </Group>
    </Group>
  </DimensionLayout>
```

```xml
    </Layout>

    <SubComponents>

      <Component class="javax.swing.JLabel" name="jLabel1">

        <Properties>

          <Property name="font" type="java.awt.Font" editor="org.netbeans.beaninfo.editors.FontEditor">

            <Font name="Segoe UI" size="14" style="0"/>

          </Property>

          <Property name="text" type="java.lang.String" value="Applet"/>

        </Properties>

      </Component>

      <Component class="javax.swing.JTextField" name="jTextField1">

        <Events>

          <EventHandler event="actionPerformed" listener="java.awt.event.ActionListener"
parameters="java.awt.event.ActionEvent" handler="jTextField1ActionPerformed"/>

        </Events>

      </Component>

      <Component class="javax.swing.JRadioButton" name="jRadioButton1">

        <Properties>

          <Property name="text" type="java.lang.String" value="to Celcius"/>

        </Properties>

        <Events>

          <EventHandler event="actionPerformed" listener="java.awt.event.ActionListener"
parameters="java.awt.event.ActionEvent" handler="jRadioButton1ActionPerformed"/>

        </Events>

      </Component>

      <Component class="javax.swing.JRadioButton" name="jRadioButton2">

        <Properties>

          <Property name="text" type="java.lang.String" value="to Kelvin"/>

        </Properties>

      </Component>

      <Component class="javax.swing.JButton" name="jButton1">
```

```xml
    <Properties>
      <Property name="text" type="java.lang.String" value="Show Result"/>
    </Properties>
    <Events>
      <EventHandler event="actionPerformed" listener="java.awt.event.ActionListener"
parameters="java.awt.event.ActionEvent" handler="jButton1ActionPerformed"/>
    </Events>
  </Component>
  <Component class="javax.swing.JLabel" name="jLabel2">
    <Properties>
      <Property name="font" type="java.awt.Font" editor="org.netbeans.beaninfo.editors.FontEditor">
        <Font name="Segoe UI" size="13" style="0"/>
      </Property>
      <Property name="text" type="java.lang.String" value="Enter Farenhiet, Choos an option to convert and click
show reuslt"/>
    </Properties>
  </Component>
  <Container class="javax.swing.JLayeredPane" name="jLayeredPane1">

    <Layout>
      <DimensionLayout dim="0">
        <Group type="103" groupAlignment="0" attributes="0">
          <EmptySpace min="0" pref="100" max="32767" attributes="0"/>
        </Group>
      </DimensionLayout>
      <DimensionLayout dim="1">
        <Group type="103" groupAlignment="0" attributes="0">
          <EmptySpace min="0" pref="100" max="32767" attributes="0"/>
        </Group>
      </DimensionLayout>
    </Layout>
```

```
      </Container>

   </SubComponents>

</Form>
```

Java

```java
package com.mycompany.fram01;

public class JQ14 extends javax.swing.JFrame {


    public JQ14() {

        initComponents();

    }


    @SuppressWarnings("unchecked")

    GEN-BEGIN:initComponents

    private void initComponents() {


        jLabel1 = new javax.swing.JLabel();

        jTextField1 = new javax.swing.JTextField();

        jRadioButton1 = new javax.swing.JRadioButton();

        jRadioButton2 = new javax.swing.JRadioButton();

        jButton1 = new javax.swing.JButton();

        jLabel2 = new javax.swing.JLabel();

        jLayeredPane1 = new javax.swing.JLayeredPane();


        setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);


        jLabel1.setFont(new java.awt.Font("Segoe UI", 0, 14));

        jLabel1.setText("Applet");


        jTextField1.addActionListener(new java.awt.event.ActionListener() {

            public void actionPerformed(java.awt.event.ActionEvent evt) {

                jTextField1ActionPerformed(evt);

            }

        });
```

```java
jRadioButton1.setText("to Celcius");

jRadioButton1.addActionListener(new java.awt.event.ActionListener() {

    public void actionPerformed(java.awt.event.ActionEvent evt) {

        jRadioButton1ActionPerformed(evt);

    }

});


jRadioButton2.setText("to Kelvin");


jButton1.setText("Show Result");

jButton1.addActionListener(new java.awt.event.ActionListener() {

    public void actionPerformed(java.awt.event.ActionEvent evt) {

        jButton1ActionPerformed(evt);

    }

});


jLabel2.setFont(new java.awt.Font("Segoe UI", 0, 13));

jLabel2.setText("Enter Farenhiet, Choos an option to convert and click show reuslt");


javax.swing.GroupLayout jLayeredPane1Layout = new javax.swing.GroupLayout(jLayeredPane1);

jLayeredPane1.setLayout(jLayeredPane1Layout);

jLayeredPane1Layout.setHorizontalGroup(

    jLayeredPane1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

    .addGap(0, 100, Short.MAX_VALUE)

);

jLayeredPane1Layout.setVerticalGroup(

    jLayeredPane1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

    .addGap(0, 100, Short.MAX_VALUE)

);
```

```java
javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());

getContentPane().setLayout(layout);

layout.setHorizontalGroup(

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

    .addGroup(layout.createSequentialGroup()

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

            .addGroup(layout.createSequentialGroup()

                .addGap(17, 17, 17)

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

                    .addComponent(jLabel1)

                    .addGroup(layout.createSequentialGroup()

                        .addGap(11, 11, 11)

                        .addComponent(jTextField1, javax.swing.GroupLayout.PREFERRED_SIZE, 130, javax.swing.GroupLayout.PREFERRED_SIZE)

                        .addGap(31, 31, 31)

                        .addComponent(jRadioButton1, javax.swing.GroupLayout.PREFERRED_SIZE, 85, javax.swing.GroupLayout.PREFERRED_SIZE)

                        .addGap(18, 18, 18)

                        .addComponent(jRadioButton2)

                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)

                        .addComponent(jButton1, javax.swing.GroupLayout.PREFERRED_SIZE, 110, javax.swing.GroupLayout.PREFERRED_SIZE))))

            .addGroup(layout.createSequentialGroup()

                .addGap(120, 120, 120)

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

                    .addComponent(jLabel2, javax.swing.GroupLayout.PREFERRED_SIZE, 401, javax.swing.GroupLayout.PREFERRED_SIZE)

                    .addComponent(jLayeredPane1, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE))
```

```
                    .addGap(0, 106, Short.MAX_VALUE)))
            .addGap(36, 36, 36))
    );
    layout.setVerticalGroup(
        layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(layout.createSequentialGroup()
            .addGap(17, 17, 17)
            .addComponent(jLabel1)
            .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                .addGroup(layout.createSequentialGroup()
                    .addGap(39, 39, 39)
                    .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                        .addComponent(jTextField1, javax.swing.GroupLayout.PREFERRED_SIZE, 33,
javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addComponent(jRadioButton1)
                        .addComponent(jRadioButton2)
                        .addComponent(jButton1, javax.swing.GroupLayout.PREFERRED_SIZE, 33,
javax.swing.GroupLayout.PREFERRED_SIZE)))
                .addGroup(layout.createSequentialGroup()
                    .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                    .addComponent(jLayeredPane1, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)))
            .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
            .addComponent(jLabel2)
            .addContainerGap(66, Short.MAX_VALUE))
    );

    pack();
}
```

```java
private void jTextField1ActionPerformed(java.awt.event.ActionEvent evt) {


}


private void jRadioButton1ActionPerformed(java.awt.event.ActionEvent evt) {


}


private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {
    if (!(jRadioButton1.isSelected()) && !(jRadioButton2.isSelected()))
  {
     jTextField1.setText("Select C or K");
  }
  if(jRadioButton1.isSelected())
        jRadioButton2.setEnabled(false);
  if(jRadioButton2.isSelected())
        jRadioButton1.setEnabled(false);
  try
  {
     float num = Float.parseFloat(jTextField1.getText());
     float r;
     if(jRadioButton1.isSelected())
     {
        r = ((num-32)*5)/9;
        String result = String.format("%.2f",r);
        jTextField1.setText(result);
     }
     if(jRadioButton2.isSelected())
     {
```

```java
private void jTextField1ActionPerformed(java.awt.event.ActionEvent evt) {



}


private void jRadioButton1ActionPerformed(java.awt.event.ActionEvent evt) {



}


private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {
    if (!(jRadioButton1.isSelected()) && !(jRadioButton2.isSelected()))
  {
      jTextField1.setText("Select C or K");
  }
  if(jRadioButton1.isSelected())
        jRadioButton2.setEnabled(false);
  if(jRadioButton2.isSelected())
        jRadioButton1.setEnabled(false);
  try
  {
      float num = Float.parseFloat(jTextField1.getText());
      float r;
      if(jRadioButton1.isSelected())
    {
        r = ((num-32)*5)/9;
        String result = String.format("%.2f",r);
        jTextField1.setText(result);
    }
      if(jRadioButton2.isSelected())
    {
```

```java
        java.awt.EventQueue.invokeLater(new Runnable() {

            public void run() {

                new JQ14().setVisible(true);

            }

        });

    }


    private javax.swing.JButton jButton1;

    private javax.swing.JLabel jLabel1;

    private javax.swing.JLabel jLabel2;

    private javax.swing.JLayeredPane jLayeredPane1;

    private javax.swing.JRadioButton jRadioButton1;

    private javax.swing.JRadioButton jRadioButton2;

    private javax.swing.JTextField jTextField1;

}
```

(15)

Frame

```java
package com.mycompany.jq15;


public class JQ15 {


    public static void main(String[] args)
    {
        cal c = new cal();
        c.show();
    }
}
```

call.java

```java
package com.mycompany.jq15;

public class call extends javax.swing.JFrame {

    public call() {

        initComponents();

    }

    @SuppressWarnings("unchecked")


    private void initComponents() {


        setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);


        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());

        getContentPane().setLayout(layout);

        layout.setHorizontalGroup(

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

            .addGap(0, 400, Short.MAX_VALUE)

        );

        layout.setVerticalGroup(

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

            .addGap(0, 300, Short.MAX_VALUE)

        );


        pack();

    }
```

```java
    public static void main(String args[]) {

        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(call.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {
            java.util.logging.Logger.getLogger(call.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {
            java.util.logging.Logger.getLogger(call.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {
            java.util.logging.Logger.getLogger(call.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        }

        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new call().setVisible(true);
            }
        });
    }
}
```

call.form

```xml
<?xml version="1.0" encoding="UTF-8" ?>

<Form version="1.3" maxVersion="1.9" type="org.netbeans.modules.form.forminfo.JFrameFormInfo">
 <Properties>
  <Property name="defaultCloseOperation" type="int" value="3"/>
 </Properties>
 <SyntheticProperties>
  <SyntheticProperty name="formSizePolicy" type="int" value="1"/>
  <SyntheticProperty name="generateCenter" type="boolean" value="false"/>
 </SyntheticProperties>
 <AuxValues>
  <AuxValue name="FormSettings_autoResourcing" type="java.lang.Integer" value="0"/>
  <AuxValue name="FormSettings_autoSetComponentName" type="java.lang.Boolean" value="false"/>
  <AuxValue name="FormSettings_generateFQN" type="java.lang.Boolean" value="true"/>
  <AuxValue name="FormSettings_generateMnemonicsCode" type="java.lang.Boolean" value="false"/>
  <AuxValue name="FormSettings_i18nAutoMode" type="java.lang.Boolean" value="false"/>
  <AuxValue name="FormSettings_layoutCodeTarget" type="java.lang.Integer" value="1"/>
  <AuxValue name="FormSettings_listenerGenerationStyle" type="java.lang.Integer" value="0"/>
  <AuxValue name="FormSettings_variablesLocal" type="java.lang.Boolean" value="false"/>
  <AuxValue name="FormSettings_variablesModifier" type="java.lang.Integer" value="2"/>
 </AuxValues>
```

```xml
  <Layout>

    <DimensionLayout dim="0">

     <Group type="103" groupAlignment="0" attributes="0">

       <EmptySpace min="0" pref="400" max="32767" attributes="0"/>

     </Group>

    </DimensionLayout>

    <DimensionLayout dim="1">

     <Group type="103" groupAlignment="0" attributes="0">

       <EmptySpace min="0" pref="300" max="32767" attributes="0"/>

     </Group>

    </DimensionLayout>

   </Layout>

  </Form>
```

cal.java

```java
package com.mycompany.jq15;

public class cal extends javax.swing.JPanel {

    public cal() {

        initComponents();

    }


    @SuppressWarnings("unchecked")

    private void initComponents() {


        jTextField1 = new javax.swing.JTextField();

        jButton1 = new javax.swing.JButton();

        jButton2 = new javax.swing.JButton();

        jButton3 = new javax.swing.JButton();

        jButton4 = new javax.swing.JButton();

        jButton5 = new javax.swing.JButton();

        jButton6 = new javax.swing.JButton();

        jButton7 = new javax.swing.JButton();

        jButton8 = new javax.swing.JButton();

        jButton9 = new javax.swing.JButton();

        jButton10 = new javax.swing.JButton();

        jButton11 = new javax.swing.JButton();

        jButton12 = new javax.swing.JButton();

        jButton13 = new javax.swing.JButton();

        jButton14 = new javax.swing.JButton();

        jButton15 = new javax.swing.JButton();

        jButton16 = new javax.swing.JButton();
```

```
jButton1.setText("8");

jButton2.setText("3");

jButton3.setText("7");

jButton4.setText("9");

jButton5.setText("6");

jButton6.setText("4");

jButton7.setText("5");

jButton8.setText("2");

jButton9.setText("0");

jButton10.setText("1");

jButton11.setText("-");

jButton12.setText("+");

jButton13.setText("*");

jButton14.setText("/");

jButton15.setText("=");
```

```java
    jButton16.setText("Clear");


    javax.swing.GroupLayout layout = new javax.swing.GroupLayout(this);

    this.setLayout(layout);

    layout.setHorizontalGroup(

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

      .addGroup(layout.createSequentialGroup()

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

          .addComponent(jTextField1, javax.swing.GroupLayout.PREFERRED_SIZE, 307,
javax.swing.GroupLayout.PREFERRED_SIZE)

          .addGroup(layout.createSequentialGroup()

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

              .addGroup(layout.createSequentialGroup()

                .addGap(62, 62, 62)

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

                  .addComponent(jButton6, javax.swing.GroupLayout.PREFERRED_SIZE, 47,
javax.swing.GroupLayout.PREFERRED_SIZE)

                  .addGroup(layout.createSequentialGroup()

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

                    .addComponent(jButton7, javax.swing.GroupLayout.PREFERRED_SIZE, 47,
javax.swing.GroupLayout.PREFERRED_SIZE)

                    .addComponent(jButton1, javax.swing.GroupLayout.PREFERRED_SIZE, 47,
javax.swing.GroupLayout.PREFERRED_SIZE)

                      .addGroup(layout.createSequentialGroup()

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

                            .addComponent(jButton5, javax.swing.GroupLayout.PREFERRED_SIZE, 47,
javax.swing.GroupLayout.PREFERRED_SIZE)

                            .addComponent(jButton2, javax.swing.GroupLayout.PREFERRED_SIZE, 47,
javax.swing.GroupLayout.PREFERRED_SIZE))

                        .addGap(24, 24, 24)
```

```
                        .addComponent(jButton8, javax.swing.GroupLayout.PREFERRED_SIZE, 47,
javax.swing.GroupLayout.PREFERRED_SIZE))

                        .addComponent(jButton9, javax.swing.GroupLayout.PREFERRED_SIZE, 47,
javax.swing.GroupLayout.PREFERRED_SIZE))

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

                        .addGroup(layout.createSequentialGroup()

                            .addGap(28, 28, 28)

                            .addComponent(jButton10, javax.swing.GroupLayout.PREFERRED_SIZE, 47,
javax.swing.GroupLayout.PREFERRED_SIZE))

                        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
layout.createSequentialGroup()

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

                            .addComponent(jButton4, javax.swing.GroupLayout.PREFERRED_SIZE, 47,
javax.swing.GroupLayout.PREFERRED_SIZE))))))

                .addGroup(layout.createSequentialGroup()

                    .addGap(109, 109, 109)

                    .addComponent(jButton16, javax.swing.GroupLayout.PREFERRED_SIZE, 92,
javax.swing.GroupLayout.PREFERRED_SIZE)))

                .addGap(55, 55, 55)

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

                    .addComponent(jButton11, javax.swing.GroupLayout.PREFERRED_SIZE, 57,
javax.swing.GroupLayout.PREFERRED_SIZE)

                    .addComponent(jButton12, javax.swing.GroupLayout.PREFERRED_SIZE, 57,
javax.swing.GroupLayout.PREFERRED_SIZE)

                    .addComponent(jButton13, javax.swing.GroupLayout.PREFERRED_SIZE, 57,
javax.swing.GroupLayout.PREFERRED_SIZE)

                    .addComponent(jButton14, javax.swing.GroupLayout.PREFERRED_SIZE, 57,
javax.swing.GroupLayout.PREFERRED_SIZE)

                    .addComponent(jButton15, javax.swing.GroupLayout.PREFERRED_SIZE, 57,
javax.swing.GroupLayout.PREFERRED_SIZE))))

            .addContainerGap(61, Short.MAX_VALUE))

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

            .addGroup(layout.createSequentialGroup()
```

```
            .addGap(63, 63, 63)

            .addComponent(jButton3, javax.swing.GroupLayout.PREFERRED_SIZE, 47,
javax.swing.GroupLayout.PREFERRED_SIZE)

            .addContainerGap(318, Short.MAX_VALUE)))
    );

    layout.setVerticalGroup(

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

        .addGroup(layout.createSequentialGroup()

            .addGap(40, 40, 40)

            .addComponent(jTextField1, javax.swing.GroupLayout.PREFERRED_SIZE, 39,
javax.swing.GroupLayout.PREFERRED_SIZE)

            .addGap(48, 48, 48)

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

                .addComponent(jButton1, javax.swing.GroupLayout.PREFERRED_SIZE, 37,
javax.swing.GroupLayout.PREFERRED_SIZE)

                .addComponent(jButton4, javax.swing.GroupLayout.PREFERRED_SIZE, 37,
javax.swing.GroupLayout.PREFERRED_SIZE)

                .addComponent(jButton12, javax.swing.GroupLayout.PREFERRED_SIZE, 39,
javax.swing.GroupLayout.PREFERRED_SIZE))

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

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

                .addGroup(layout.createSequentialGroup()

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

                        .addComponent(jButton7, javax.swing.GroupLayout.PREFERRED_SIZE, 37,
javax.swing.GroupLayout.PREFERRED_SIZE)

                        .addComponent(jButton6, javax.swing.GroupLayout.PREFERRED_SIZE, 37,
javax.swing.GroupLayout.PREFERRED_SIZE)

                        .addComponent(jButton11, javax.swing.GroupLayout.PREFERRED_SIZE, 39,
javax.swing.GroupLayout.PREFERRED_SIZE))

                    .addGap(18, 18, 18)

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

                        .addComponent(jButton8, javax.swing.GroupLayout.PREFERRED_SIZE, 37,
javax.swing.GroupLayout.PREFERRED_SIZE)
```

```java
                .addComponent(jButton2, javax.swing.GroupLayout.PREFERRED_SIZE, 37,
javax.swing.GroupLayout.PREFERRED_SIZE)

                .addComponent(jButton10, javax.swing.GroupLayout.PREFERRED_SIZE, 37,
javax.swing.GroupLayout.PREFERRED_SIZE)

                .addComponent(jButton13, javax.swing.GroupLayout.PREFERRED_SIZE, 39,
javax.swing.GroupLayout.PREFERRED_SIZE))

            .addGap(18, 18, 18)

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

                .addComponent(jButton9, javax.swing.GroupLayout.PREFERRED_SIZE, 37,
javax.swing.GroupLayout.PREFERRED_SIZE)

                .addComponent(jButton14, javax.swing.GroupLayout.PREFERRED_SIZE, 39,
javax.swing.GroupLayout.PREFERRED_SIZE)))

        .addComponent(jButton5, javax.swing.GroupLayout.PREFERRED_SIZE, 37,
javax.swing.GroupLayout.PREFERRED_SIZE))

        .addGap(18, 18, 18)

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

            .addComponent(jButton15, javax.swing.GroupLayout.PREFERRED_SIZE, 39,
javax.swing.GroupLayout.PREFERRED_SIZE)

            .addComponent(jButton16, javax.swing.GroupLayout.PREFERRED_SIZE, 39,
javax.swing.GroupLayout.PREFERRED_SIZE))

        .addContainerGap(75, Short.MAX_VALUE))

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

        .addGroup(layout.createSequentialGroup()

          .addGap(124, 124, 124)

          .addComponent(jButton3, javax.swing.GroupLayout.PREFERRED_SIZE, 37,
javax.swing.GroupLayout.PREFERRED_SIZE)

          .addContainerGap(302, Short.MAX_VALUE)))
  );
}


private javax.swing.JButton jButton1;

private javax.swing.JButton jButton10;

private javax.swing.JButton jButton11;
```

```java
    private javax.swing.JButton jButton12;

    private javax.swing.JButton jButton13;

    private javax.swing.JButton jButton14;

    private javax.swing.JButton jButton15;

    private javax.swing.JButton jButton16;

    private javax.swing.JButton jButton2;

    private javax.swing.JButton jButton3;

    private javax.swing.JButton jButton4;

    private javax.swing.JButton jButton5;

    private javax.swing.JButton jButton6;

    private javax.swing.JButton jButton7;

    private javax.swing.JButton jButton8;

    private javax.swing.JButton jButton9;

    private javax.swing.JTextField jTextField1;

    // End of variables declaration//GEN-END:variables

}
```

Cal.form

```xml
<?xml version="1.0" encoding="UTF-8" ?>

<Form version="1.3" maxVersion="1.9" type="org.netbeans.modules.form.forminfo.JPanelFormInfo">
  <AuxValues>
    <AuxValue name="FormSettings_autoResourcing" type="java.lang.Integer" value="0"/>
    <AuxValue name="FormSettings_autoSetComponentName" type="java.lang.Boolean" value="false"/>
    <AuxValue name="FormSettings_generateFQN" type="java.lang.Boolean" value="true"/>
    <AuxValue name="FormSettings_generateMnemonicsCode" type="java.lang.Boolean" value="false"/>
    <AuxValue name="FormSettings_i18nAutoMode" type="java.lang.Boolean" value="false"/>
    <AuxValue name="FormSettings_layoutCodeTarget" type="java.lang.Integer" value="1"/>
    <AuxValue name="FormSettings_listenerGenerationStyle" type="java.lang.Integer" value="0"/>
    <AuxValue name="FormSettings_variablesLocal" type="java.lang.Boolean" value="false"/>
    <AuxValue name="FormSettings_variablesModifier" type="java.lang.Integer" value="2"/>
  </AuxValues>

  <Layout>
    <DimensionLayout dim="0">
      <Group type="103" groupAlignment="0" attributes="0">
        <Group type="102" alignment="0" attributes="0">
          <Group type="103" groupAlignment="1" attributes="0">
            <Component id="jTextField1" min="-2" pref="307" max="-2" attributes="0"/>
            <Group type="102" attributes="0">
              <Group type="103" groupAlignment="0" attributes="0">
                <Group type="102" attributes="0">
                  <EmptySpace min="-2" pref="62" max="-2" attributes="0"/>
                  <Group type="103" groupAlignment="1" attributes="0">
                    <Component id="jButton6" min="-2" pref="47" max="-2" attributes="0"/>
                    <Group type="102" attributes="0">
                      <Group type="103" groupAlignment="1" attributes="0">
                        <Component id="jButton7" min="-2" pref="47" max="-2" attributes="0"/>
```

```
                            <Component id="jButton1" min="-2" pref="47" max="-2" attributes="0"/>

                            <Group type="102" attributes="0">

                              <Group type="103" groupAlignment="0" attributes="0">

                                <Component id="jButton5" min="-2" pref="47" max="-2" attributes="0"/>

                                <Component id="jButton2" min="-2" pref="47" max="-2" attributes="0"/>

                              </Group>

                              <EmptySpace min="-2" pref="24" max="-2" attributes="0"/>

                              <Component id="jButton8" min="-2" pref="47" max="-2" attributes="0"/>

                            </Group>

                            <Component id="jButton9" alignment="1" min="-2" pref="47" max="-2" attributes="0"/>

                          </Group>

                          <Group type="103" groupAlignment="0" attributes="0">

                            <Group type="102" attributes="0">

                              <EmptySpace min="-2" pref="28" max="-2" attributes="0"/>

                              <Component id="jButton10" min="-2" pref="47" max="-2" attributes="0"/>

                            </Group>

                            <Group type="102" alignment="1" attributes="0">

                              <EmptySpace max="-2" attributes="0"/>

                              <Component id="jButton4" min="-2" pref="47" max="-2" attributes="0"/>

                            </Group>

                          </Group>

                        </Group>

                      </Group>

                    </Group>

                  <Group type="102" alignment="0" attributes="0">

                    <EmptySpace min="-2" pref="109" max="-2" attributes="0"/>

                    <Component id="jButton16" min="-2" pref="92" max="-2" attributes="0"/>

                  </Group>

                </Group>

              <EmptySpace min="-2" pref="55" max="-2" attributes="0"/>
```

```xml
                <Group type="103" groupAlignment="0" attributes="0">
                    <Component id="jButton11" min="-2" pref="57" max="-2" attributes="0"/>
                    <Component id="jButton12" min="-2" pref="57" max="-2" attributes="0"/>
                    <Component id="jButton13" alignment="0" min="-2" pref="57" max="-2" attributes="0"/>
                    <Component id="jButton14" min="-2" pref="57" max="-2" attributes="0"/>
                    <Component id="jButton15" alignment="0" min="-2" pref="57" max="-2" attributes="0"/>
                </Group>
            </Group>
        </Group>
        <EmptySpace pref="61" max="32767" attributes="0"/>
    </Group>
    <Group type="103" rootIndex="1" groupAlignment="0" attributes="0">
        <Group type="102" alignment="0" attributes="0">
            <EmptySpace min="-2" pref="63" max="-2" attributes="0"/>
            <Component id="jButton3" min="-2" pref="47" max="-2" attributes="0"/>
            <EmptySpace pref="318" max="32767" attributes="0"/>
        </Group>
    </Group>
 </Group>
</DimensionLayout>
<DimensionLayout dim="1">
 <Group type="103" groupAlignment="0" attributes="0">
    <Group type="102" alignment="0" attributes="0">
        <EmptySpace min="-2" pref="40" max="-2" attributes="0"/>
        <Component id="jTextField1" min="-2" pref="39" max="-2" attributes="0"/>
        <EmptySpace min="-2" pref="48" max="-2" attributes="0"/>
        <Group type="103" groupAlignment="3" attributes="0">
            <Component id="jButton1" alignment="3" min="-2" pref="37" max="-2" attributes="0"/>
            <Component id="jButton4" alignment="3" min="-2" pref="37" max="-2" attributes="0"/>
            <Component id="jButton12" alignment="3" min="-2" pref="39" max="-2" attributes="0"/>
```

```xml
            </Group>
            <EmptySpace type="unrelated" max="-2" attributes="0"/>
            <Group type="103" groupAlignment="0" attributes="0">
              <Group type="102" attributes="0">
                <Group type="103" groupAlignment="3" attributes="0">
                  <Component id="jButton7" alignment="3" min="-2" pref="37" max="-2" attributes="0"/>
                  <Component id="jButton6" alignment="3" min="-2" pref="37" max="-2" attributes="0"/>
                  <Component id="jButton11" alignment="3" min="-2" pref="39" max="-2" attributes="0"/>
                </Group>
                <EmptySpace type="separate" max="-2" attributes="0"/>
                <Group type="103" groupAlignment="3" attributes="0">
                  <Component id="jButton8" alignment="3" min="-2" pref="37" max="-2" attributes="0"/>
                  <Component id="jButton2" alignment="3" min="-2" pref="37" max="-2" attributes="0"/>
                  <Component id="jButton10" alignment="3" min="-2" pref="37" max="-2" attributes="0"/>
                  <Component id="jButton13" alignment="3" min="-2" pref="39" max="-2" attributes="0"/>
                </Group>
                <EmptySpace type="separate" max="-2" attributes="0"/>
                <Group type="103" groupAlignment="3" attributes="0">
                  <Component id="jButton9" alignment="3" min="-2" pref="37" max="-2" attributes="0"/>
                  <Component id="jButton14" alignment="3" min="-2" pref="39" max="-2" attributes="0"/>
                </Group>
              </Group>
              <Component id="jButton5" min="-2" pref="37" max="-2" attributes="0"/>
            </Group>
            <EmptySpace type="separate" max="-2" attributes="0"/>
            <Group type="103" groupAlignment="3" attributes="0">
              <Component id="jButton15" alignment="3" min="-2" pref="39" max="-2" attributes="0"/>
              <Component id="jButton16" alignment="0" min="-2" pref="39" max="-2" attributes="0"/>
            </Group>
            <EmptySpace pref="75" max="32767" attributes="0"/>
```

```xml
        </Group>

        <Group type="103" rootIndex="1" groupAlignment="0" attributes="0">

          <Group type="102" alignment="0" attributes="0">

            <EmptySpace min="-2" pref="124" max="-2" attributes="0"/>

            <Component id="jButton3" min="-2" pref="37" max="-2" attributes="0"/>

            <EmptySpace pref="302" max="32767" attributes="0"/>

          </Group>

        </Group>

      </Group>

    </DimensionLayout>

  </Layout>

  <SubComponents>

    <Component class="javax.swing.JTextField" name="jTextField1">

    </Component>

    <Component class="javax.swing.JButton" name="jButton1">

      <Properties>

        <Property name="text" type="java.lang.String" value="8"/>

      </Properties>

    </Component>

    <Component class="javax.swing.JButton" name="jButton2">

      <Properties>

        <Property name="text" type="java.lang.String" value="3"/>

      </Properties>

    </Component>

    <Component class="javax.swing.JButton" name="jButton3">

      <Properties>

        <Property name="text" type="java.lang.String" value="7"/>

      </Properties>

    </Component>

    <Component class="javax.swing.JButton" name="jButton4">
```

```xml
  <Properties>
    <Property name="text" type="java.lang.String" value="9"/>
  </Properties>
</Component>
<Component class="javax.swing.JButton" name="jButton5">
  <Properties>
    <Property name="text" type="java.lang.String" value="6"/>
  </Properties>
</Component>
<Component class="javax.swing.JButton" name="jButton6">
  <Properties>
    <Property name="text" type="java.lang.String" value="4"/>
  </Properties>
</Component>
<Component class="javax.swing.JButton" name="jButton7">
  <Properties>
    <Property name="text" type="java.lang.String" value="5"/>
  </Properties>
</Component>
<Component class="javax.swing.JButton" name="jButton8">
  <Properties>
    <Property name="text" type="java.lang.String" value="2"/>
  </Properties>
</Component>
<Component class="javax.swing.JButton" name="jButton9">
  <Properties>
    <Property name="text" type="java.lang.String" value="0"/>
  </Properties>
</Component>
<Component class="javax.swing.JButton" name="jButton10">
```

```xml
  <Properties>

    <Property name="text" type="java.lang.String" value="1"/>

  </Properties>

</Component>

<Component class="javax.swing.JButton" name="jButton11">

  <Properties>

    <Property name="text" type="java.lang.String" value="-"/>

  </Properties>

</Component>

<Component class="javax.swing.JButton" name="jButton12">

  <Properties>

    <Property name="text" type="java.lang.String" value="+"/>

  </Properties>

</Component>

<Component class="javax.swing.JButton" name="jButton13">

  <Properties>

    <Property name="text" type="java.lang.String" value="*"/>

  </Properties>

</Component>

<Component class="javax.swing.JButton" name="jButton14">

  <Properties>

    <Property name="text" type="java.lang.String" value="/"/>

  </Properties>

</Component>

<Component class="javax.swing.JButton" name="jButton15">

  <Properties>

    <Property name="text" type="java.lang.String" value="="/>

  </Properties>

</Component>

<Component class="javax.swing.JButton" name="jButton16">
```

```
    <Properties>

      <Property name="text" type="java.lang.String" value="Clear"/>

    </Properties>

   </Component>

  </SubComponents>

</Form>
```

(16)

```java
import javax.swing.*;

import java.awt.*;

import java.awt.event.ActionEvent;

import java.awt.event.ActionListener;

import java.sql.*;


public class StudentManagementSystem {

    private static final String DB_URL = "jdbc:mysql:

    private static final String DB_USER = "your_db_username";

    private static final String DB_PASSWORD = "your_db_password";


    private Connection connection;

    private Statement statement;

    private ResultSet resultSet;


    private JFrame loginFrame;

    private JFrame studentManagementFrame;


    private JTextField usernameField;

    private JPasswordField passwordField;

    private JButton loginButton;


    private JTextField employeeIdField;

    private JTextField firstNameField;

    private JTextField lastNameField;

    private JTextField batchIdField;

    private JButton insertButton;

    private JButton updateButton;

    private JButton deleteButton;

    private JButton loadAllButton;
```

```java
public static void main(String[] args) {

    SwingUtilities.invokeLater(() -> new StudentManagementSystem().createAndShowGUI());

}


public void createAndShowGUI() {


    initializeDatabase();


    createLoginForm();


    createStudentManagementForm();

}


private void initializeDatabase() {
    try {
        Class.forName("com.mysql.cj.jdbc.Driver");
        connection = DriverManager.getConnection(DB_URL, DB_USER, DB_PASSWORD);
        statement = connection.createStatement();
    } catch (ClassNotFoundException | SQLException e) {
        e.printStackTrace();

    }
}


private void createLoginForm() {

}


private void createStudentManagementForm() {

}
```

```java
    private void insertRecord() {

    }


    private void updateRecord() {

    }


    private void deleteRecord() {

    }


    private void loadAllRecords() {

    }


    private void closeConnection() {
        try {
            if (resultSet != null)
                resultSet.close();
            if (statement != null)
                statement.close();
            if (connection != null)
                connection.close();
        } catch (SQLException e) {
            e.printStackTrace();
        }
    }
}
```