Programación Orientada a Objetos

Actividad 4 grupal

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04/06/2025

Repositorio: https://github.com/el-sebitas/POO_actividad_4

1. Ejercicio 8.2 página 483

Enlace a GitHub: https://github.com/el-sebitas/POO_actividad_4/tree/master/src/Ejercicio_8_2

```
package Ejercicio_8_2;

import java.util.ArrayList;
import java.util.Collections;

public class Notas {
    private ArrayList<Double> notas = new ArrayList<>();

    public void ingresarNota(double nota) {
        notas.add(nota);
    }

    public double promedio() {
        double total = 0;
        for (double nota: notas) {
            total += nota;
        }
        return total / notas.size();
    }

    public double mayorNota() {
        ArrayList<Double> notas = this.notas;
        Collections.sort(notas);
        return notas.get(notas.size() - 1);
    }

    public double menorNota() {
        ArrayList<Double> notas = this.notas;
        Collections.sort(notas);
        return notas.get(0);
    }

    public double desviacion() {
        double prom = promedio();
        double suma = 0;

        for (double nota: notas) {
            suma = Math.pow(nota - prom, 2);
        }
        return Math.sqrt(suma);
    }
}
```

```
package Ejercicio_8_2;

public class Ventana extends javax.swing.JFrame {
   public Ventana() {
      initComponents();
   }

   @SuppressWarnings("unchecked")
   private void initComponents() {

      nota1 = new javax.swing.JFormattedTextField();
      nota2 = new javax.swing.JFormattedTextField();
      nota3 = new javax.swing.JFormattedTextField();
      nota4 = new javax.swing.JFormattedTextField();
      nota5 = new javax.swing.JFormattedTextField();
      btnCalcular = new javax.swing.JButton();
      btnLimpiar = new javax.swing.JButton();
      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();
      campPromedio = new javax.swing.JLabel();
      campDesviacion = new javax.swing.JLabel();
      campMayor = new javax.swing.JLabel();
      campMenor = new javax.swing.JLabel();


setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);
      setTitle("Ejercicio_8_2.Notas");

      btnCalcular.setText("Calcular");
      btnCalcular.addMouseListener(new java.awt.event.MouseAdapter() {
         public void mouseClicked(java.awt.event.MouseEvent evt) {
            btnCalcularMouseClicked(evt);
         }
      });

      btnLimpiar.setText("Limpiar");
      btnLimpiar.addMouseListener(new java.awt.event.MouseAdapter() {
         public void mouseClicked(java.awt.event.MouseEvent evt) {
            btnLimpiarMouseClicked(evt);
         }
      });

      jLabel1.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
      jLabel1.setText("Nota 1:");

      jLabel2.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
      jLabel2.setText("Nota 3:");
```

```
        jLabel3.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
        jLabel3.setText("Nota 2:");

        jLabel4.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
        jLabel4.setText("Nota 4:");

        jLabel5.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
        jLabel5.setText("Nota 5:");

        campPromedio.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
        campPromedio.setText("Promedio:");

        campDesviacion.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
        campDesviacion.setText("Desviación estandar:");

        campMayor.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
        campMayor.setText("Mayor valor:");

        campMenor.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
        campMenor.setText("Menor valor:");

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

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
layout.createSequentialGroup()
                            .addGap(30, 30, 30)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAI
LING)
                                    .addGroup(layout.createSequentialGroup()
                                            .addComponent(btnCalcular,
javax.swing.GroupLayout.PREFERRED_SIZE, 100,
javax.swing.GroupLayout.PREFERRED_SIZE)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 37,
Short.MAX_VALUE)
                                            .addComponent(btnLimpiar,
javax.swing.GroupLayout.PREFERRED_SIZE, 100,
javax.swing.GroupLayout.PREFERRED_SIZE))
                                    .addGroup(layout.createSequentialGroup()

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEA
DING)
                                                    .addComponent(jLabel2,
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.Alignment.TRAILING,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                                        .addComponent(jLabel3,
javax.swing.GroupLayout.Alignment.TRAILING,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                                        .addComponent(jLabel1,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
                                    .addGap(27, 27, 27)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEA
DING)
                                        .addComponent(nota5,
javax.swing.GroupLayout.PREFERRED_SIZE, 126,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                        .addComponent(nota4,
javax.swing.GroupLayout.PREFERRED_SIZE, 126,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                        .addComponent(nota3,
javax.swing.GroupLayout.PREFERRED_SIZE, 126,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                        .addComponent(nota2,
javax.swing.GroupLayout.PREFERRED_SIZE, 126,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                        .addComponent(nota1,
javax.swing.GroupLayout.PREFERRED_SIZE, 126,
javax.swing.GroupLayout.PREFERRED_SIZE)))
                                .addComponent(campPromedio,
javax.swing.GroupLayout.Alignment.LEADING,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                                .addComponent(campDesviacion,
javax.swing.GroupLayout.Alignment.LEADING,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                                .addComponent(campMayor,
javax.swing.GroupLayout.Alignment.LEADING,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                                .addComponent(campMenor,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
                            .addGap(33, 33, 33))
        );
        layout.setVerticalGroup(
```

```
layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                .addGroup(layout.createSequentialGroup()
                    .addGap(37, 37, 37)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BAS
ELINE)
                        .addComponent(nota1,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addComponent(jLabel1))
                    .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BAS
ELINE)
                        .addComponent(nota2,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addComponent(jLabel3))
                    .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BAS
ELINE)
                        .addComponent(nota3,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addComponent(jLabel2))
                    .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BAS
ELINE)
                        .addComponent(nota4,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addComponent(jLabel4))
                    .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BAS
ELINE)
                        .addComponent(nota5,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addComponent(jLabel5))
                    .addGap(43, 43, 43)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BAS
ELINE)
```

```
                        .addComponent(btnCalcular)
                        .addComponent(btnLimpiar))
                    .addGap(28, 28, 28)
                    .addComponent(campPromedio)
                    .addGap(18, 18, 18)
                    .addComponent(campDesviacion)
                    .addGap(18, 18, 18)
                    .addComponent(campMayor)
                    .addGap(18, 18, 18)
                    .addComponent(campMenor)
                    .addContainerGap(38, Short.MAX_VALUE))
        );

        pack();
    }

    private void btnCalcularMouseClicked(java.awt.event.MouseEvent evt) {
        Notas notas = new Notas();

        notas.ingresarNota(Double.valueOf(nota1.getText()));
        notas.ingresarNota(Double.valueOf(nota2.getText()));
        notas.ingresarNota(Double.valueOf(nota3.getText()));
        notas.ingresarNota(Double.valueOf(nota4.getText()));
        notas.ingresarNota(Double.valueOf(nota5.getText()));


        campPromedio.setText("Promedio: " + notas.promedio());
        campDesviacion.setText("Desviación estandar: " + notas.desviacion());
        campMayor.setText("Mayor valor: " + notas.mayorNota());
        campMenor.setText("Menor valor: " + notas.menorNota());
    }

    private void btnLimpiarMouseClicked(java.awt.event.MouseEvent evt) {
        nota1.setText("");
        nota2.setText("");
        nota3.setText("");
        nota4.setText("");
        nota5.setText("");

        campPromedio.setText("Promedio: ");
        campDesviacion.setText("Desviación estandar: ");
        campMayor.setText("Mayor valor: ");
        campMenor.setText("Menor valor: ");
    }

    // Variables declaration
    private javax.swing.JButton btnCalcular;
    private javax.swing.JButton btnLimpiar;
    private javax.swing.JLabel campDesviacion;
    private javax.swing.JLabel campMayor;
    private javax.swing.JLabel campMenor;
```

```
    private javax.swing.JLabel campPromedio;
    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.JFormattedTextField nota1;
    private javax.swing.JFormattedTextField nota2;
    private javax.swing.JFormattedTextField nota3;
    private javax.swing.JFormattedTextField nota4;
    private javax.swing.JFormattedTextField nota5;
    // End of variables declaration
}
```

```
package Ejercicio_8_2;

public class Main {
    public static void main(String[] args) {
        Ventana ventana = new Ventana();
        ventana.setVisible(true);
    }
}
```

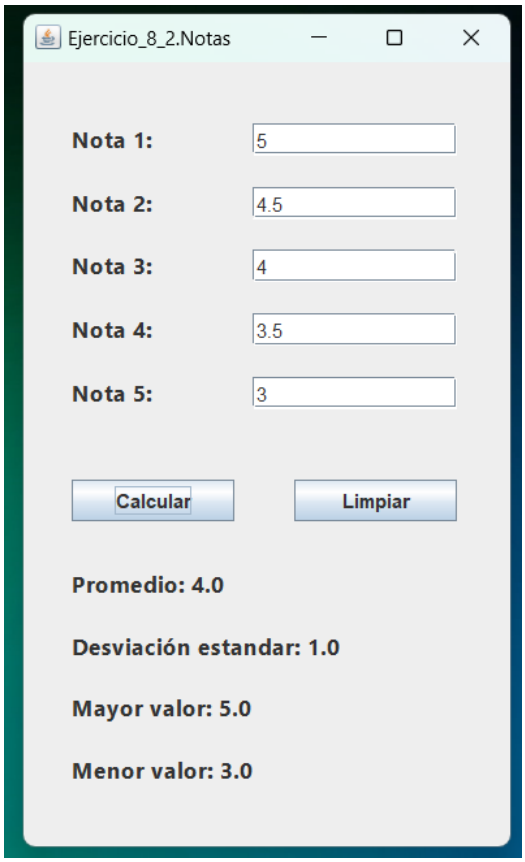
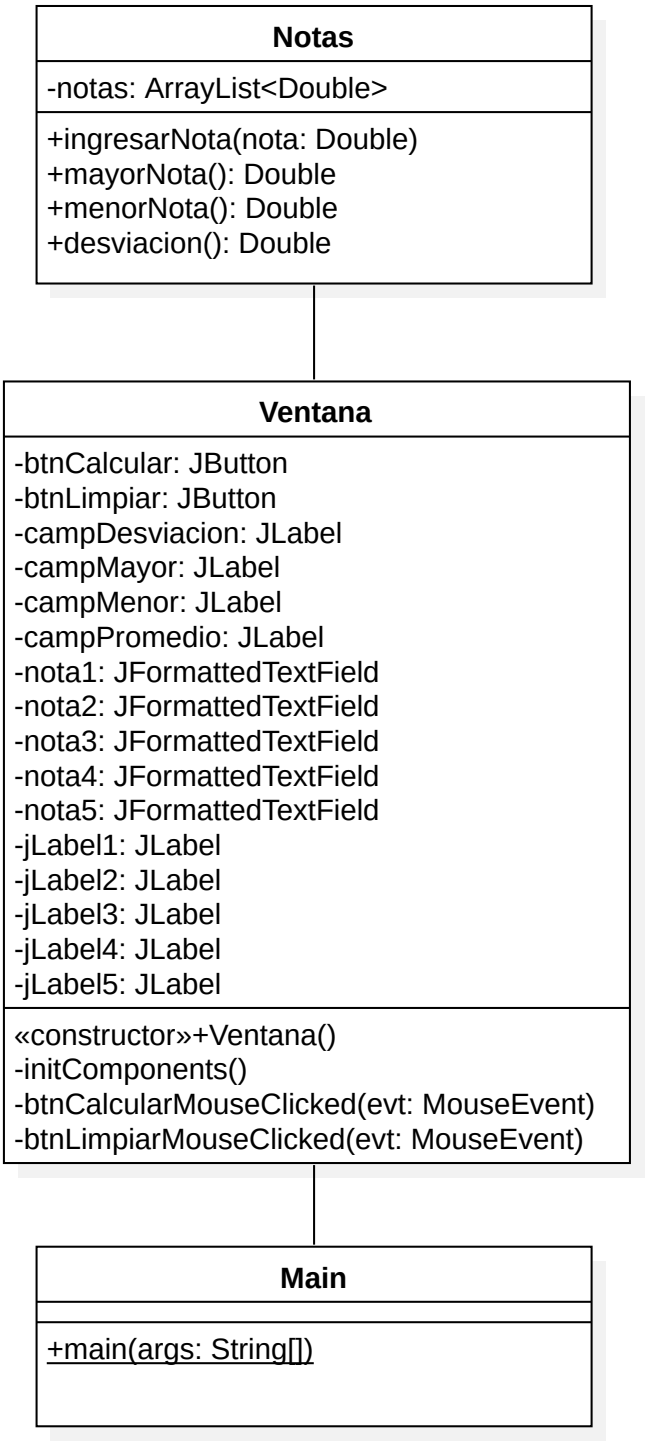
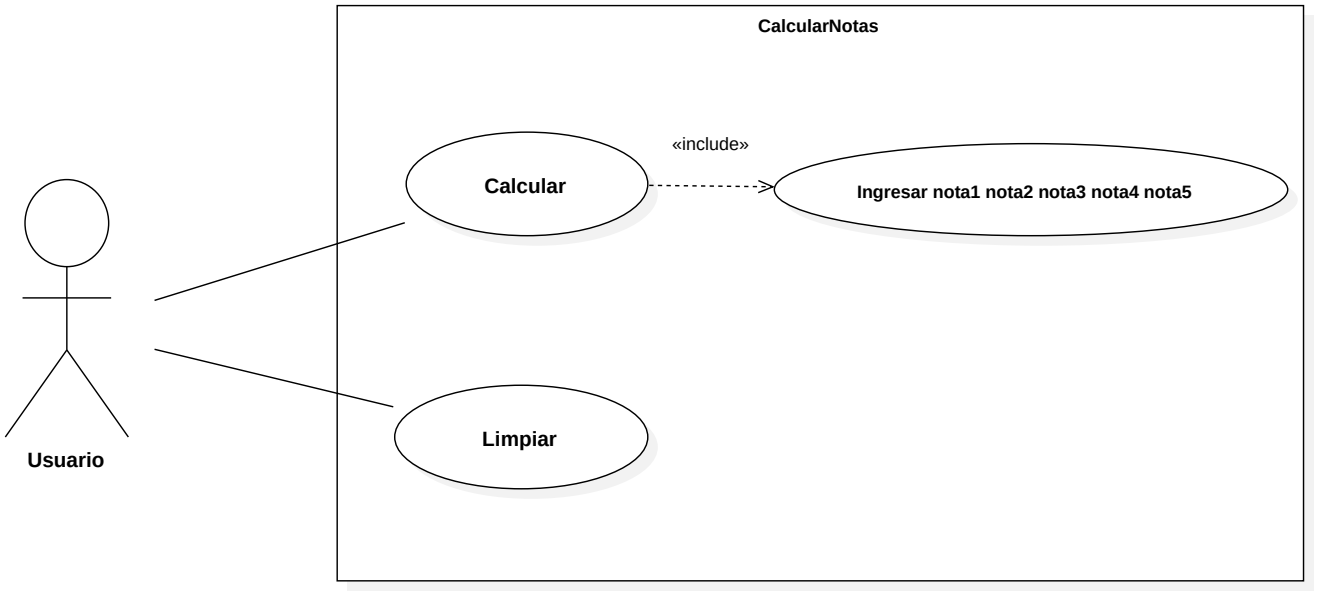


Diagrama de clases



Casos de uso


CalcularNotas
Calcular
«include»
Ingresar nota1 nota2 nota3 nota4 nota5
Limpiar
Usuario

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Enlace a GitHub: https://github.com/el-sebitas/POO_actividad_4/tree/master/src/Ejercicio_8_3

```
package Ejercicio_8_3.Figuras;

public class Figuras {
    private double volumen;
    private double superficie;

    public double getSuperficie() {
        return superficie;
    }

    public void setSuperficie(double superficie) {
        this.superficie = superficie;
    }

    public double getVolumen() {
        return volumen;
    }

    public void setVolumen(double volumen) {
        this.volumen = volumen;
    }
}
```

```
package Ejercicio_8_3.Figuras;

public class Cilindro extends Figuras {
    private double radio;
    private double altura;

    public Cilindro(double altura, double radio) {
        this.altura = altura;
        this.radio = radio;
        setSuperficie(calcularSuperficie());
        setVolumen(calcularVolumen());
    }

    public double calcularVolumen() {
        return Math.PI * Math.pow(radio, 2) * altura;
    }

    public double calcularSuperficie() {
        return 2 * Math.PI * Math.pow(radio, 2) + 2 * Math.PI * radio * altura;
    }
}
```

```
package Ejercicio_8_3.Figuras;

public class Esfera extends Figuras {
   private double radio;

   public Esfera(double radio) {
      this.radio = radio;
      setSuperficie(calcularSuperficie());
      setVolumen(calcularVolumen());
   }

   public double calcularVolumen() {
      return ((double) 4 /3) * Math.PI * Math.pow(radio, 3);
   }

   public double calcularSuperficie() {
      return 4 * Math.PI * Math.pow(radio, 2);
   }
}
```

```
package Ejercicio_8_3.Figuras;

public class Piramide extends Figuras {
   private double base;
   private double altura;
   private double apotema;

   public Piramide(double altura, double apotema, double base) {
      this.altura = altura;
      this.apotema = apotema;
      this.base = base;
      setSuperficie(calcularSuperficie());
      setVolumen(calcularVolumen());
   }

   public double calcularSuperficie() {
      return Math.pow(base, 2) + 2 * base * apotema;
   }

   public double calcularVolumen() {
      return (Math.pow(base, 2) * altura) / 3;
   }
}
```

```
package Ejercicio_8_3.UI;

import Ejercicio_8_3.Figuras.Cilindro;

public class VentanaCilindro extends javax.swing.JFrame {
    public VentanaCilindro() {
        initComponents();
    }

    @SuppressWarnings("unchecked")
    private void initComponents() {

        jLabel1 = new javax.swing.JLabel();
        jLabel2 = new javax.swing.JLabel();
        radioField = new javax.swing.JTextField();
        alturaField = new javax.swing.JTextField();
        btnCalcular = new javax.swing.JButton();
        volumenField = new javax.swing.JLabel();
        superficieField = new javax.swing.JLabel();


setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);
        setTitle("Cilindro");

        jLabel1.setFont(new java.awt.Font("Segoe UI", 1, 14));
        jLabel1.setText(" Altura (cms)");

        jLabel2.setFont(new java.awt.Font("Segoe UI", 1, 14));
        jLabel2.setText(" Radio (cms)");

        btnCalcular.setFont(new java.awt.Font("Segoe UI", 1, 14));
        btnCalcular.setText("Calcular");
        btnCalcular.addMouseListener(new java.awt.event.MouseAdapter() {
            public void mouseClicked(java.awt.event.MouseEvent evt) {
                btnCalcularMouseClicked(evt);
            }
        });

        volumenField.setFont(new java.awt.Font("Segoe UI", 1, 14));
        volumenField.setText("Volumen (cm3): ");

        superficieField.setFont(new java.awt.Font("Segoe UI", 1, 14));
        superficieField.setText("Superficie (cm3): ");

        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(38, 38, 38)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)
                        .addComponent(volumenField, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addGroup(layout.createSequentialGroup()

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)
                                .addComponent(jLabel1, javax.swing.GroupLayout.DEFAULT_SIZE, 119, Short.MAX_VALUE)
                                .addComponent(jLabel2, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
                            .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)
                                .addComponent(btnCalcular, javax.swing.GroupLayout.DEFAULT_SIZE, 136, Short.MAX_VALUE)
                                .addComponent(radioField)
                                .addComponent(alturaField)))
                        .addComponent(superficieField, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
                    .addContainerGap(37, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                .addGroup(layout.createSequentialGroup()
                    .addGap(29, 29, 29)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                        .addComponent(radioField, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addComponent(jLabel2))
                    .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                        .addComponent(jLabel1)
                        .addComponent(alturaField, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE))
```

```
                        .addGap(18, 18, 18)
                        .addComponent(btnCalcular)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 31,
Short.MAX_VALUE)
                        .addComponent(volumenField)
                        .addGap(18, 18, 18)
                        .addComponent(superficieField)
                        .addGap(38, 38, 38))
        );

        pack();
    }

    private void btnCalcularMouseClicked(java.awt.event.MouseEvent evt) {
        double altura = Double.valueOf(alturaField.getText());
        double radio = Double.valueOf(radioField.getText());
        Cilindro cilindro = new Cilindro(altura, radio);

        volumenField.setText("Volumen (cm3): " + String.format("%.2f",
cilindro.getVolumen()));
        superficieField.setText("Superficie (cm3): " + String.format("%.2f",
cilindro.getSuperficie()));
    }

    // Variables declaration - do not modify
    private javax.swing.JTextField alturaField;
    private javax.swing.JButton btnCalcular;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JTextField radioField;
    private javax.swing.JLabel superficieField;
    private javax.swing.JLabel volumenField;
    // End of variables declaration
}


package Ejercicio_8_3.UI;

import Ejercicio_8_3.Figuras.Esfera;

public class VentanaEsfera extends javax.swing.JFrame {
    public VentanaEsfera() {
        initComponents();
    }

    @SuppressWarnings("unchecked")
    private void initComponents() {

        jLabel2 = new javax.swing.JLabel();
        radioField = new javax.swing.JTextField();
```

```
        btnCalcular = new javax.swing.JButton();
        volumenField = new javax.swing.JLabel();
        superficieField = new javax.swing.JLabel();


setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);
        setTitle("Esfera");

        jLabel2.setFont(new java.awt.Font("Segoe UI", 1, 14));
        jLabel2.setText(" Radio (cms)");

        btnCalcular.setFont(new java.awt.Font("Segoe UI", 1, 14));
        btnCalcular.setText("Calcular");
        btnCalcular.addMouseListener(new java.awt.event.MouseAdapter() {
            public void mouseClicked(java.awt.event.MouseEvent evt) {
                btnCalcularMouseClicked(evt);
            }
        });

        volumenField.setFont(new java.awt.Font("Segoe UI", 1, 14));
        volumenField.setText("Volumen (cm3): ");

        superficieField.setFont(new java.awt.Font("Segoe UI", 1, 14));
        superficieField.setText("Superficie (cm3): ");

        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(38, 38, 38)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEA
DING, false)
                                    .addComponent(volumenField,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                                    .addGroup(layout.createSequentialGroup()
                                            .addComponent(jLabel2,
javax.swing.GroupLayout.PREFERRED_SIZE, 119,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                            .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEA
DING, false)
                                                    .addComponent(btnCalcular,
javax.swing.GroupLayout.DEFAULT_SIZE, 136, Short.MAX_VALUE)
                                                    .addComponent(radioField)))
                                    .addComponent(superficieField,
```

```
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
                        .addContainerGap(52, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(29, 29, 29)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BAS
ELINE)
                                .addComponent(radioField,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jLabel2))
                        .addGap(18, 18, 18)
                        .addComponent(btnCalcular)
                        .addGap(18, 18, 18)
                        .addComponent(volumenField)
                        .addGap(18, 18, 18)
                        .addComponent(superficieField)
                        .addContainerGap(36, Short.MAX_VALUE))
        );

        pack();
    }

    private void btnCalcularMouseClicked(java.awt.event.MouseEvent evt) {
        double radio = Double.valueOf(radioField.getText());
        Esfera esfera = new Esfera(radio);
        volumenField.setText("Volumen (cm3): " + String.format("%.2f",
esfera.getVolumen()));
        superficieField.setText("Superficie (cm3): " + String.format("%.2f",
esfera.getSuperficie()));
    }

    // Variables declaration - do not modify
    private javax.swing.JButton btnCalcular;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JTextField radioField;
    private javax.swing.JLabel superficieField;
    private javax.swing.JLabel volumenField;
    // End of variables declaration
}
```

```
package Ejercicio_8_3.UI;

import Ejercicio_8_3.Figuras.Piramide;

public class VentanaPiramide extends javax.swing.JFrame {
    public VentanaPiramide() {
        initComponents();
    }

    @SuppressWarnings("unchecked")
    private void initComponents() {

        jLabel1 = new javax.swing.JLabel();
        jLabel2 = new javax.swing.JLabel();
        baseField = new javax.swing.JTextField();
        alturaField = new javax.swing.JTextField();
        btnCalcular = new javax.swing.JButton();
        volumenField = new javax.swing.JLabel();
        superficieField = new javax.swing.JLabel();
        jLabel3 = new javax.swing.JLabel();
        apotemaField1 = new javax.swing.JTextField();


setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);
        setTitle("Pirámide");

        jLabel1.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
        jLabel1.setText(" Altura (cms)");

        jLabel2.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
        jLabel2.setText(" Base (cms)");

        btnCalcular.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
        btnCalcular.setText("Calcular");
        btnCalcular.addMouseListener(new java.awt.event.MouseAdapter() {
            public void mouseClicked(java.awt.event.MouseEvent evt) {
                btnCalcularMouseClicked(evt);
            }
        });

        volumenField.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
        volumenField.setText("Volumen (cm3): ");

        superficieField.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
        superficieField.setText("Superficie (cm3): ");

        jLabel3.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
        jLabel3.setText(" Apotema (cms)");

        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(38, 38, 38)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEA
DING, false)
                        .addComponent(volumenField,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addGroup(layout.createSequentialGroup()

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEA
DING, false)
                            .addComponent(jLabel1,
javax.swing.GroupLayout.DEFAULT_SIZE, 119, Short.MAX_VALUE)
                            .addComponent(jLabel2,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
                        .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEA
DING, false)
                            .addComponent(baseField,
javax.swing.GroupLayout.DEFAULT_SIZE, 136, Short.MAX_VALUE)
                            .addComponent(alturaField)))
                        .addComponent(superficieField,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addGroup(layout.createSequentialGroup()
                            .addComponent(jLabel3,
javax.swing.GroupLayout.PREFERRED_SIZE, 131,
javax.swing.GroupLayout.PREFERRED_SIZE)

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

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEA
DING)
                            .addComponent(btnCalcular,
javax.swing.GroupLayout.Alignment.TRAILING,
javax.swing.GroupLayout.DEFAULT_SIZE, 136, Short.MAX_VALUE)
                            .addComponent(apotemaField1))))
                    .addContainerGap(56, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                .addGroup(layout.createSequentialGroup()
                    .addGap(29, 29, 29)
```

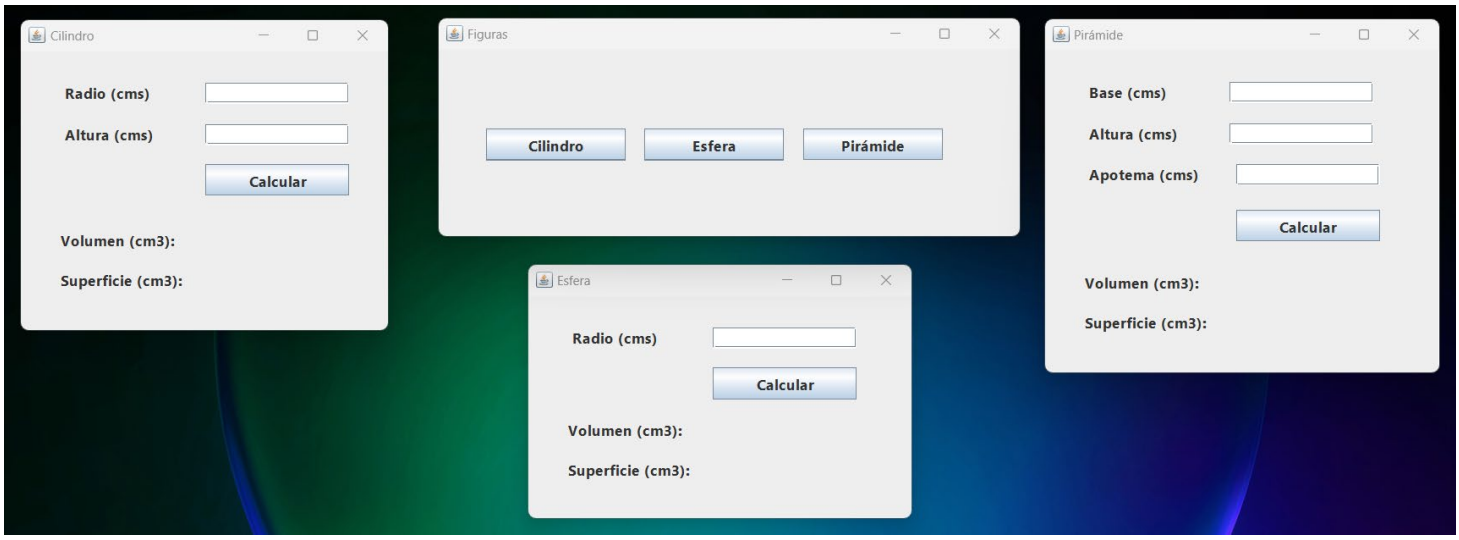
```
.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BAS
ELINE)
                                .addComponent(baseField,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addComponent(jLabel2))
                            .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BAS
ELINE)
                                .addComponent(jLabel1)
                                .addComponent(alturaField,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
                            .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BAS
ELINE)
                                .addComponent(jLabel3)
                                .addComponent(apotemaField1,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 23,
Short.MAX_VALUE)
                            .addComponent(btnCalcular)
                            .addGap(28, 28, 28)
                            .addComponent(volumenField)
                            .addGap(18, 18, 18)
                            .addComponent(superficieField)
                            .addGap(38, 38, 38))
        );

        pack();
    }

    private void btnCalcularMouseClicked(java.awt.event.MouseEvent evt) {
        double altura = Double.valueOf(alturaField.getText());
        double apotema = Double.valueOf(apotemaField1.getText());
        double base = Double.valueOf(baseField.getText());
        Piramide piramide = new Piramide(altura, apotema, base);


        volumenField.setText("Volumen (cm3): " + String.format("%.2f",
piramide.getVolumen()));
        superficieField.setText("Superficie (cm3): " + String.format("%.2f",
piramide.getSuperficie()));
```

```
    }

    // Variables declaration - do not modify
    private javax.swing.JTextField alturaField;
    private javax.swing.JTextField apotemaField1;
    private javax.swing.JTextField baseField;
    private javax.swing.JButton btnCalcular;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JLabel jLabel3;
    private javax.swing.JLabel superficieField;
    private javax.swing.JLabel volumenField;
    // End of variables declaration
}


package Ejercicio_8_3.UI;

public class VentanaPrincipal extends javax.swing.JFrame {
    public VentanaPrincipal() {
        initComponents();
    }

    @SuppressWarnings("unchecked")
    private void initComponents() {

        btnCilindro = new javax.swing.JButton();
        btnEsfera = new javax.swing.JButton();
        btnPiramide = new javax.swing.JButton();


setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);
        setTitle("Figuras");

        btnCilindro.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
        btnCilindro.setText("Cilindro");
        btnCilindro.addMouseListener(new java.awt.event.MouseAdapter() {
            public void mouseClicked(java.awt.event.MouseEvent evt) {
                btnCilindroMouseClicked(evt);
            }
        });

        btnEsfera.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
        btnEsfera.setText("Esfera");
        btnEsfera.addMouseListener(new java.awt.event.MouseAdapter() {
            public void mouseClicked(java.awt.event.MouseEvent evt) {
                btnEsferaMouseClicked(evt);
            }
        });

        btnPiramide.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
```

```
        btnPiramide.setText("Pirámide");
        btnPiramide.addMouseListener(new java.awt.event.MouseAdapter() {
            public void mouseClicked(java.awt.event.MouseEvent evt) {
                btnPiramideMouseClicked(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(45, 45, 45)
                            .addComponent(btnCilindro,
javax.swing.GroupLayout.PREFERRED_SIZE, 132,
javax.swing.GroupLayout.PREFERRED_SIZE)
                            .addGap(18, 18, 18)
                            .addComponent(btnEsfera,
javax.swing.GroupLayout.PREFERRED_SIZE, 132,
javax.swing.GroupLayout.PREFERRED_SIZE)
                            .addGap(18, 18, 18)
                            .addComponent(btnPiramide,
javax.swing.GroupLayout.PREFERRED_SIZE, 132,
javax.swing.GroupLayout.PREFERRED_SIZE)
                            .addContainerGap(73, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                            .addGap(75, 75, 75)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BAS
ELINE)
                                    .addComponent(btnCilindro)
                                    .addComponent(btnEsfera)
                                    .addComponent(btnPiramide))
                            .addContainerGap(72, Short.MAX_VALUE))
        );

        pack();
    }

    private void btnCilindroMouseClicked(java.awt.event.MouseEvent evt) {
        VentanaCilindro ventanaCilindro = new VentanaCilindro();
        ventanaCilindro.setVisible(true);
    }

    private void btnEsferaMouseClicked(java.awt.event.MouseEvent evt) {
```

```
        VentanaEsfera ventanaEsfera = new VentanaEsfera();
        ventanaEsfera.setVisible(true);
    }

    private void btnPiramideMouseClicked(java.awt.event.MouseEvent evt) {
        VentanaPiramide ventanaPiramide = new VentanaPiramide();
        ventanaPiramide.setVisible(true);
    }

    // Variables declaration - do not modify
    private javax.swing.JButton btnCilindro;
    private javax.swing.JButton btnEsfera;
    private javax.swing.JButton btnPiramide;
    // End of variables declaration
}
```

```
package Ejercicio_8_3;

import Ejercicio_8_3.UI.VentanaPrincipal;

public class Main {
    public static void main(String[] args) {
        VentanaPrincipal ventana = new VentanaPrincipal();
        ventana.setVisible(true);
    }
}
```


Cilindro
Radio (cms)
Altura (cms)
Calcular
Volumen (cm3):
Superficie (cm3):
Figuras
Cilindro
Esfera
Pirámide
Esfera
Radio (cms)
Calcular
Volumen (cm3):
Superficie (cm3):
Pirámide
Base (cms)
Altura (cms)
Apotema (cms)
Calcular
Volumen (cm3):
Superficie (cm3):

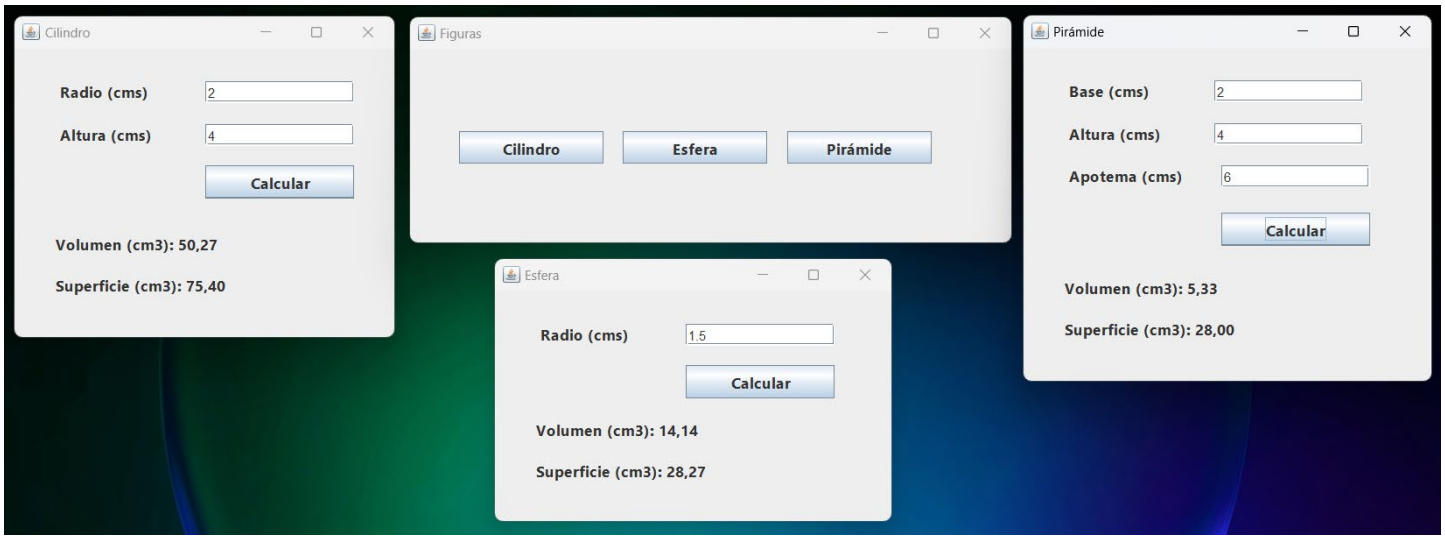
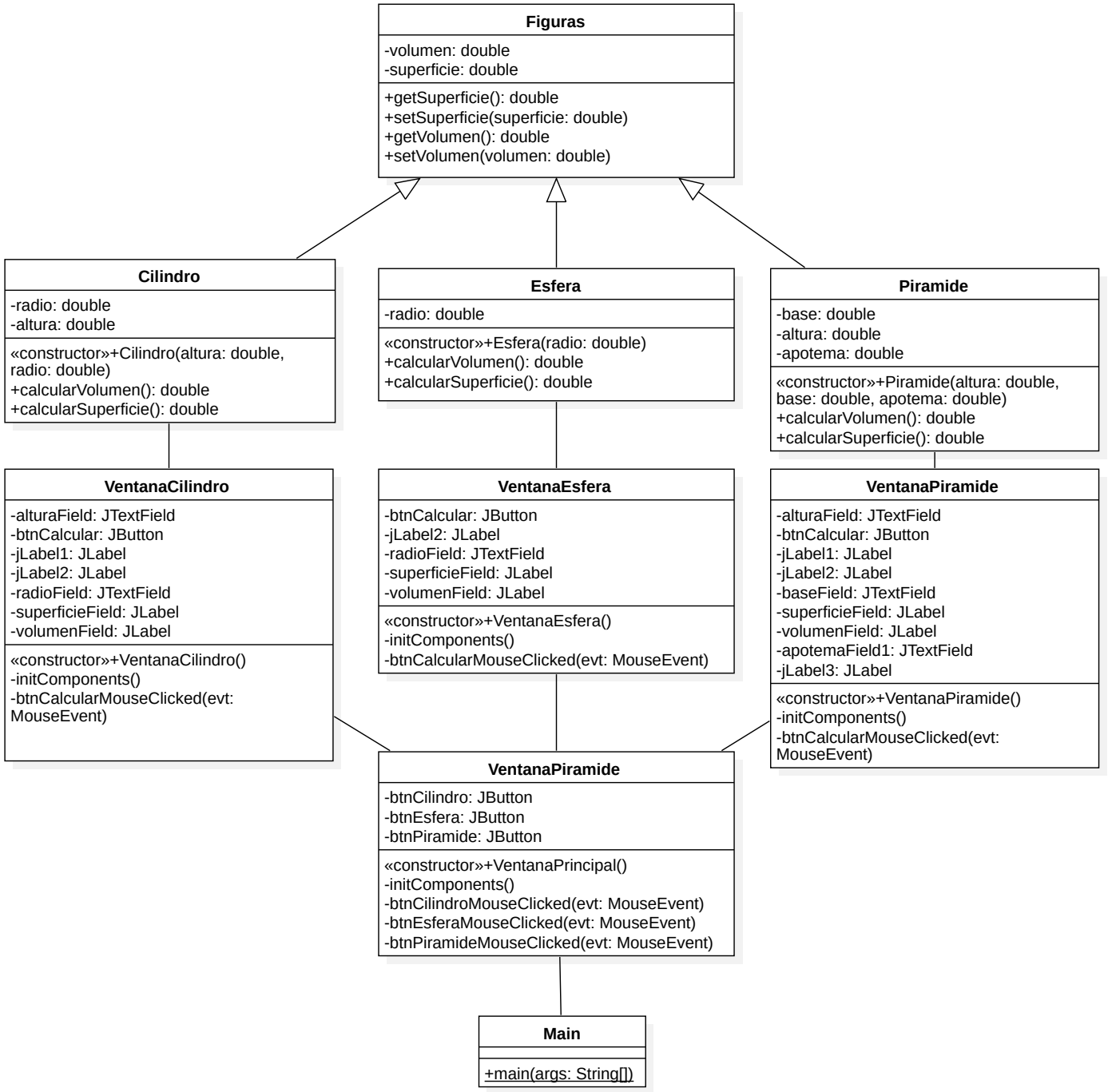
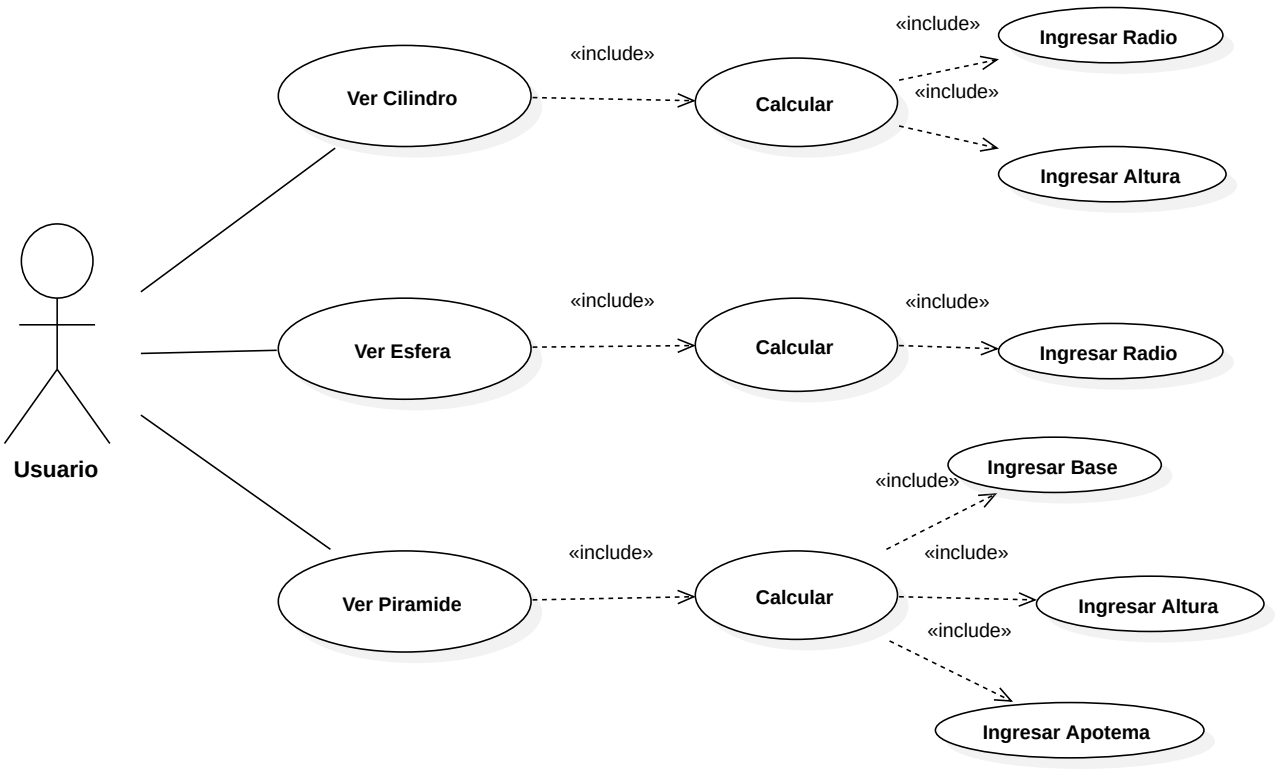

Cilindro
Radio (cms) 2
Altura (cms) 4
Calcular
Volumen (cm3): 50,27
Superficie (cm3): 75,40
Figuras
Cilindro
Esfera
Pirámide
Esfera
Radio (cms) 1.5
Calcular
Volumen (cm3): 14,14
Superficie (cm3): 28,27
Pirámide
Base (cms) 2
Altura (cms) 4
Apotema (cms) 6
Calcular
Volumen (cm3): 5,33
Superficie (cm3): 28,00

Diagrama de clases



Casos de uso


Usuario
Ver Cilindro
Ver Esfera
Ver Piramide
Calcular
Calcular
Calcular
«include»
«include»
«include»
«include»
«include»
«include»
«include»
«include»
Ingresar Radio
Ingresar Altura
Ingresar Radio
Ingresar Base
Ingresar Altura
Ingresar Apotema