Universidad de Córdoba

Escuela Politécnica Superior de Córdoba

Ingeniería Informática

Proyecto de fin de carrera

SimAS: Simulador de Análisis Sintácticos

MANUAL DE CÓDIGO

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Índice general

1. Documentación externa **1**

1.1. Introducción 1

1.2. Recursos 1

1.2.1. Recursos de Hardware 2

1.2.2. Recursos de Software 2

1.3. Entorno de Desarrollo 3

1.3.1. Preparación del entorno de desarrollo y de la Máquina Virtual de Java 3

1.3.2. Compilación de la aplicación 4

1.3.3. Empaquetado de la aplicación 6

1.4. Descripción modular 7

2. Documentacion interna **11**

2.1. Introducción 11

2.2. Paquete SimAS 11

2.2.1. Bienvenida.java 11

2.2.2. SimAS.java 14

2.3. Paquete Centro de ayuda 16

2.3.1. AcercaDe.java 16

2.4. Paquete Editor 20

2.4.1. ColCanLALR.java 20

2.4.2. ColCanLR0.java 24

2.4.3. ColCanLR1.java 30

2.4.4. ConjElementosLALR.java 35

2.4.5. ConjElementosLR0.java 43

2.4.6. ConjElementosLR1.java 48

2.4.7. Editor.java 56

2.4.8. ElementosLALR.java 75

2.4.9. ElementosLR0.java 76

2.4.10. ElementosLR1.java 77

2.4.11. FuncionError.java 78

2.4.12. PanelCreacionGramaticaPaso1.java 79

2.4.13. PanelCreacionGramaticaPaso2.java 85

2.4.14. PanelCreacionGramaticaPaso3.java 91

2.4.15. PanelCreacionGramaticaPaso4.java 97

2.4.16. ParteAccion.java 102

2.4.17. ParteIrA.java 115

2.4.18. TablaLR.java 120

2.4.19. TablaPredictiva.java 121

2.4.20. VentanaCreacionGramatica.java 125

2.4.21. VentanaProducciones.java 128

2.4.22. VentanaResultadosValidacion.java 144

2.4.23. VentanaSimbolosNoTerminales.java 146

2.4.24. VentanaSimbolosTerminales.java 154

2.4.25. Visualizacion.java 172

2.5. Paquete Simulador 178

2.5.1. CadEntrada.java 178

2.5.2. MiRender.java 184

2.5.3. NuevaFuncionError.java 185

2.5.4. NuevaSimulacionAsc.java 193

2.5.5. NuevaSimulacionDesc.java 208

2.5.6. PanelNuevaSimAscPaso1.java 222

2.5.7. PanelNuevaSimAscPaso2.java 226

2.5.8. PanelNuevaSimAscPaso3.java 232

2.5.9. PanelNuevaSimAscPaso4.java 237

2.5.10. PanelNuevaSimAscPaso5.java 243

2.5.11. PanelNuevaSimAscPaso6.java 252

2.5.12. PanelNuevaSimDescPaso1.java 261

2.5.13. PanelNuevaSimDescPaso2.java 272

2.5.14. PanelNuevaSimDescPaso3.java 279

2.5.15. PanelNuevaSimDescPaso4.java 284

2.5.16. PanelNuevaSimDescPaso5.java 292

2.5.17. Simulador.java 301

2.5.18. VentanaSimuladorAsc.java 325

2.5.19. VentanaSimuladorDesc.java 329

2.6. Paquete Gramática 333

2.6.1. Antecedente.java 333

2.6.2. Consecuente.java 334

2.6.3. Gramatica.java 335

2.6.4. NoTerminal.java 367

2.6.5. Produccion.java 368

2.6.6. Simbolo.java 370

2.6.7. Terminal.java 372

Referencias **375**

Índice de figuras

1.1. Añadir las librerías iText 4

1.2. Compilación de SimAS 5

1.3. Ejecución de SimAS 5

1.4. Empaquetado de SimAS 6

Capítulo 1

Documentación externa

1.1. Introducción

Este manual de código corresponde a la aplicación **SimAS**, *Simulador de análisis Sintácticos*. SimAS es una aplicación didáctica y multiplataforma que permite crear y editar gramáticas de contexto libre, con las que se podrá realizar la simulación del análisis sintáctico descendente y del análisis sintáctico ascendente. En este manual se describen los ficheros de código fuente necesarios para la construcción de la aplicación.

En este manual se detallan los recursos de software y hardware necesarios para la implementación del sistema, además se presentan todos los archivos que forman parte de la aplicación, organizados según su funcionalidad y describiendo su contenido.

1.2. Recursos

Para el desarrollo de la aplicación se han utilizado los siguientes recursos:

- Recursos de Hardware.

- Recursos de Software.

1.2.1. Recursos de Hardware

Los recursos hardware se pueden subdividir en dos categorías:

- Recursos de hardware para el desarrollo del proyecto: utilizados en el desarrollo de la aplicación.
    - Ordenador portátil Asus PRO5IJSeries. Intel Core i3-370M, 2,4 GHz. 4 GB de memoria RAM. HDD de 500 GB. Tarjeta gráfica Radeon HD 6370m.
- Recursos hardware para el uso de la aplicación: requisitos mínimos recomendados para el buen funcionamiento de la aplicación.
    - Requisitos mínimos declarados por Sun Microsystems para que la Máquina Virtual de Java pueda funcionar correctamente.

1.2.2. Recursos de Software

- Sistemas operativos:
    - Ubuntu Linux, versión 12.10
    - Microsoft Windows 7
- Este programa está desarrollado en lenguaje **Java** (Java SE (JDK) 7u40).
- Editores: editor de textos Texmaker para Latex.
- Entornos de desarrollo. NetBeans 7.3.1. Se utilizará para la codificación y pruebas de la aplicación.
- Dentro de NetBeans se ha utilizado *Java Swing* para el desarrollo de la interfaz de usuario de SimAS.
- La aplicación SimAS permite la creación de informes de la gramática de contexto libre y de la simulación de ésta. Estos informes se crean mediante la librería *iText* 5.5.0 de Java.
- SimAS también permite guardar y cargar gramáticas en formato *XML*.

1.3. Entorno de Desarrollo

Como se ha comentado anteriormente, el entorno de desarrollo usado es NetBeans IDE 7.3.1. Con esta herramienta se ha desarrollado el código fuente de la aplicación, se han hecho las pruebas, y se ha generado el paquete final ejecutable. Debido a que el lenguaje usado para el desarrollo ha sido Java, esta aplicación tiene la característica de ser multiplataforma y multiarquitectura, es decir, que se puede ejecutar de manera independiente, y sin hacer ninguna modificación, en sistemas con arquitectura distinta y con sistemas operativos diferentes, obteniendo el mismo resultado.

Esto es posible debido a que el intérprete del lenguaje Java, *Java Virtual Machine* (JVM), está instalado en la máquina que se ejecuta; si esto no fuera así, no podría ejecutarse el programa. Así pues, instalando en cada sistema operativo una versión compatible del intérprete, y teniendo en cuenta también la arquitectura del ordenador, se puede ejecutar un mismo programa en cualquier sistema que cuente con este intérprete.

Para llevar a cabo el desarrollo de esta aplicación se han seguido los siguientes pasos:

1. Preparación del entorno de desarrollo y de la Máquina Virtual de Java.

2. Compilación de la aplicación.

3. Empaquetado de la aplicación.

1.3.1. Preparación del entorno de desarrollo y de la Máquina Virtual de Java

Los pasos seguidos para preparar y configurar el entorno de desarrollo y la máquina virtual son los siguientes:

1. Descargar Netbeans con Java SE (actualmente, a la hora de escribir este manual, se encuentra disponible la versión 8.0.2) de la página web [1].

2. Instalar el archivo descargado (nótese que NetBeans es portable y la propia página web detecta el sistema operativo de la máquina, para bajarse un instalador de NetBeans apropiado, para Windows, Linux o Mac).

3. Crear un proyecto en NetBeans y añadir el código fuente de SimAS a la carpeta src.

4. Añadir el archivo .jar de la librería iText (iText-5.5.0.jar) a las referencias del proyecto. Para esto, en la jerarquía de directorios, del proyecto, se hace clic derecho sobre la opción Libraries y después se selecciona la opción Add JAR/Folder para seleccionar la librería a añadir. Se recomienda tener bien localizada esta librería e incluirla en la carpeta de desarrollo del proyecto (para evitar que falle el proyecto si la librería es borrada por error).

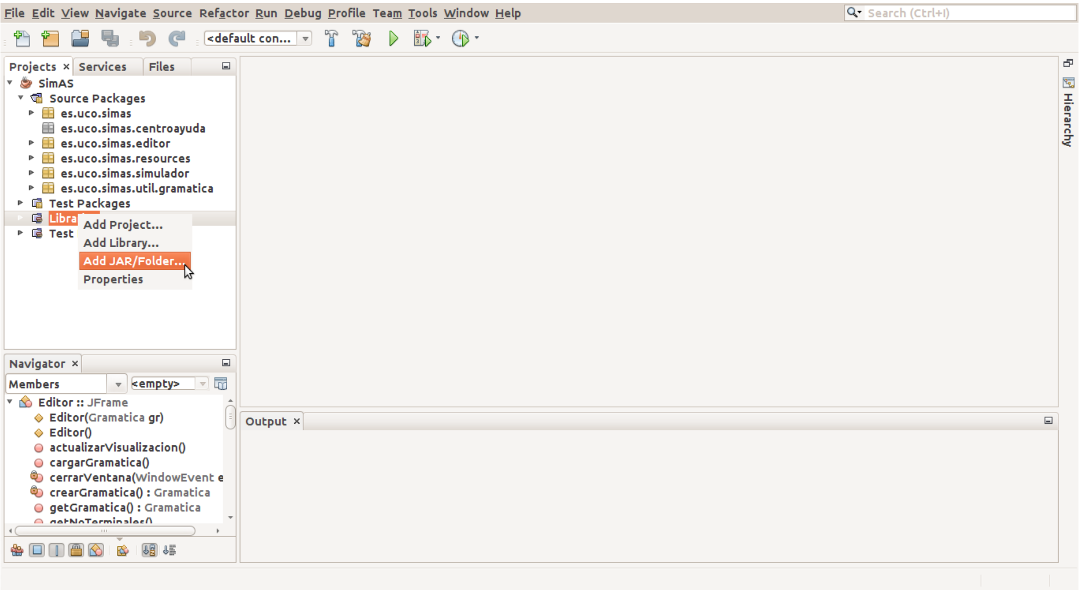


Figura 1.1: Añadir las librerías iText

1.3.2. Compilación de la aplicación

Para compilar el programa y ejectuar la aplicación en NetBeans, sólo hay que pulsar el botón Run tal y como se muestra en la figura 1.2. NetBeans cargará y ejecutará la clase principal de la aplicación directamente (compilándose antes todos los ficheros .java a .class).

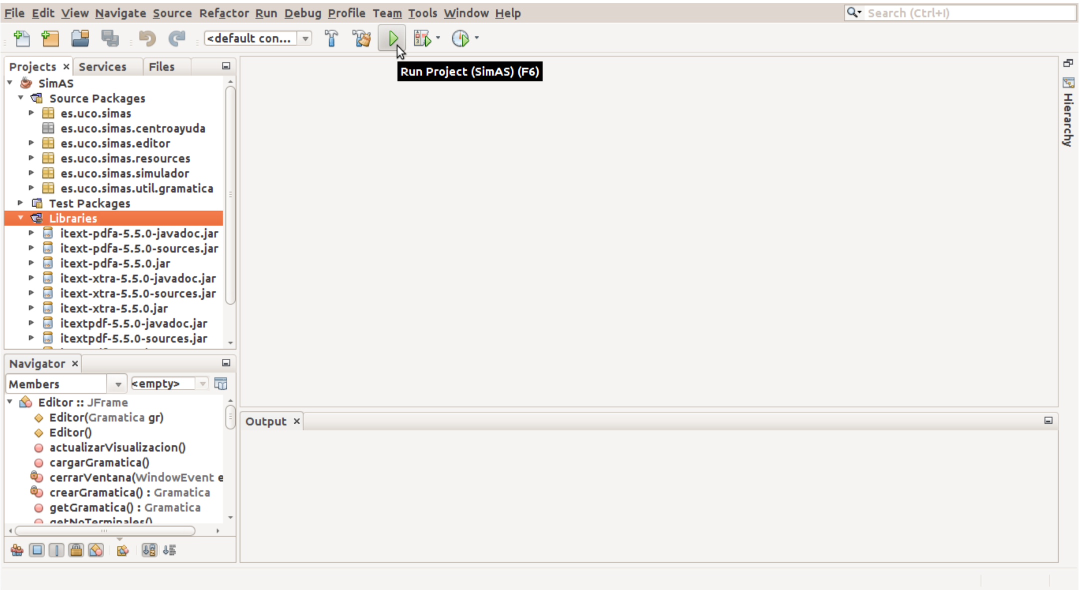
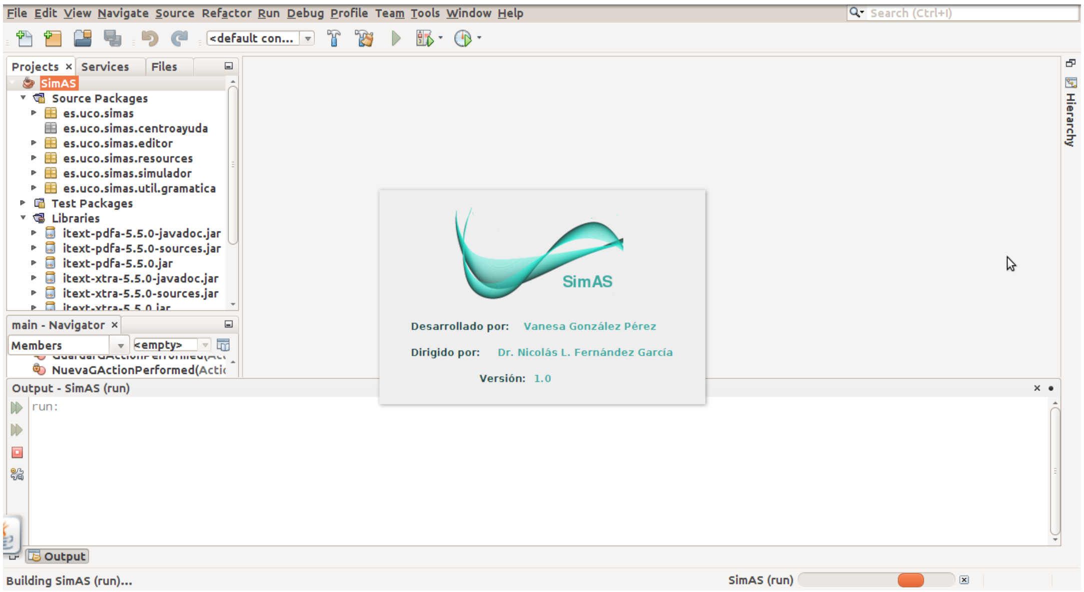

File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help
Search (Ctrl+I)
<default con...
Run Project (SimAS) (F6)
Projects Services Files
SimAS
Source Packages
es.uco.simas
es.uco.simas.centroayuda
es.uco.simas.editor
es.uco.simas.resources
es.uco.simas.simulador
es.uco.simas.util.gramatica
Test Packages
Libraries
itext-pdfa-5.5.0-javadoc.jar
itext-pdfa-5.5.0-sources.jar
itext-pdfa-5.5.0.jar
itext-xtra-5.5.0-javadoc.jar
itext-xtra-5.5.0-sources.jar
itext-xtra-5.5.0.jar
itextpdf-5.5.0-javadoc.jar
itextpdf-5.5.0-sources.jar
Navigator
Members
<empty>
Editor :: JFrame
Editor(Gramatica gr)
Editor()
actualizarVisualizacion()
cargarGramatica()
cerrarVentana(WindowEvent e
crearGramatica() : Gramatica
getGramatica() : Gramatica
Output
Hierarchy

Figura 1.2: Compilación de SimAS



Desarrollado por: Vanesa González Pérez

Dirigido por: Dr. Nicolás L. Fernández García

Versión: 1.0

```
run:
```

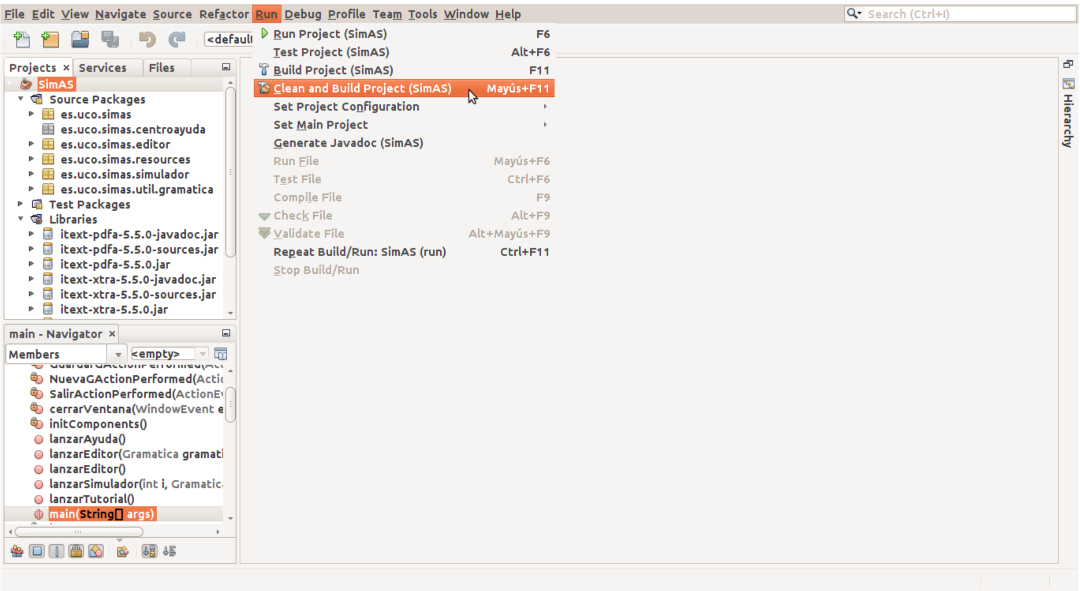
Building SimAS (run)...

SimAS (run)

Figura 1.3: Ejecución de SimAS

1.3.3. Empaquetado de la aplicación

El último paso para obtener la aplicación ejecutable, es empaquetar el código para generar el archivo en formato .jar. Para ello, se ha de usar la opción *Clean and Build Project* del menú Run de Netbeans.


File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help
Run Project (SimAS) F6
Test Project (SimAS) Alt+F6
Build Project (SimAS) F11
Clean and Build Project (SimAS) Mayús+F11
Set Project Configuration
Set Main Project
Generate Javadoc (SimAS)
Run File Mayús+F6
Test File Ctrl+F6
Compile File F9
Check File Alt+F9
Validate File Alt+Mayús+F9
Repeat Build/Run: SimAS (run) Ctrl+F11
Stop Build/Run
Projects Services Files
SimAS
Source Packages
es.uco.simas
es.uco.simas.centroayuda
es.uco.simas.editor
es.uco.simas.resources
es.uco.simas.simulador
es.uco.simas.util.gramatica
Test Packages
Libraries
itext-pdfa-5.5.0-javadoc.jar
itext-pdfa-5.5.0-sources.jar
itext-pdfa-5.5.0.jar
itext-xtra-5.5.0-javadoc.jar
itext-xtra-5.5.0-sources.jar
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main - Navigator
Members
<empty>
NuevaGActionPerformed(Acti
SalirActionPerformed(ActionE
cerrarVentana(WindowEvent e
initComponents()
lanzarAyuda()
lanzarEditor(Gramatica gramati
lanzarEditor()
lanzarSimulador(int i, Gramatic
lanzarTutorial()
main(String[] args)
Hierarchy

Figura 1.4: Empaquetado de SimAS

Una vez hecho esto, en la carpeta del proyecto aparecerá una carpeta denominada *dist*, que contendrá el archivo autoejecutable del proyecto, **SimAS.jar**, así como la carpeta lib, que tendrá las librerías utilizadas por el proyecto:

- **AbsoluteLayout**: utilizada por las interfaces gráficas (la añade NetBeans automáticamente).
- **BeansBinding**: utilizada por NetBeans para la construcción del ejecutable (la añade NetBeans automáticamente).
- **iTextPdf**: librería para la generación de documentos PDF (fue añadida al proyecto tal y como se explicó anteriormente).

Existen dos formas de ejecutar la aplicación fuera de NetBeans:

1. Copiar la carpeta dist y ejecutar SimAS.jar haciendo doble clic con el botón derecho y luego ejecutar la máquina virtual.

2. Abrir un terminal y utilizar la instrucción java -jar SimAS.jar.

Es importante tener en cuenta que la carpeta lib siempre deberá ir junto con el ejecutable de la aplicación, puesto que si se borra, se renombra o se elimina algún componente de la carpeta, la ejecución del programa fallará al no encontrar las librerías necesarias.

1.4. Descripción modular

El proyecto está dividido en paquetes, los cuales contienen los ficheros con el código fuente y los recursos de la aplicación. Los paquetes que componen el programa son:

- **Paquete es.uco.simas**: es el paquete principal de la aplicación, y el que contiene los demás paquetes y la main-class de la aplicación.
  - *SimAS.java*: objeto principal de la aplicación. Es la encargada de lanzar cada uno de los módulos: Editor, Simulador y Ayuda.
  - *Bienvenida.java*: es el panel de bienvenida a la aplicación, donde se muestra el logotipo y la versión de la misma.
- **Paquete es.uco.simas.centroayuda**:
  - Recursos de la ayuda: ficheros en formato .html e imágenes. Es el contenido de la ayuda.
  - AcercaDe.java: información sobre la aplicación.
- **Paquete es.uco.simas.editor**:
  - *ColCanLALR.java*: calcula la colección canónica de elementos LALR.
  - *ColCanLR0.java*: calcula la colección canónica de elementos LR(0).
  - *ColCanLR1.java*: calcula la colección canónica de elementos LR(1).
  - *ConjElementosLALR.java* calcula el conjunto de elementos LALR.
  - *ConjElementosLR0.java* calcula el conjunto de elementos LR(0).
  - *ConjElementosLR1.java* calcula el conjunto de elementos LR(1).
  - *Editor.java*: ventana del editor.
  - *ElementosLALR.java*: calcula los elementos LALR.
  - *ElementosLR0.java*: calcula los elementos LR(0).

  - *ElementosLR1.java*: calcula los elementos LR(1).
  - *FuncionError.java*: crea las funciones de error.
  - *PanelCreacionGramaticaPaso1.java*: paso número uno del asistente de creación de gramáticas.
  - *PanelCreacionGramaticaPaso2.java*: paso número dos del asistente de creación de gramáticas.
  - *PanelCreacionGramaticaPaso3.java*: paso número tres del asistente de creación de gramáticas.
  - *PanelCreacionGramaticaPaso4.java*: paso número cuatro del asistente de creación de gramáticas.
  - *ParteAccion.java*: parte acción de la tabla LR.
  - *ParteIrA.java*: parte ir_a de la tabla LR.
  - *TablaLR.java*: clase que almacena los datos de la tabla LR para el análisis sintáctico ascendente.
  - *TablaPredictiva.java*: clase que almacena los datos de la tabla predictiva para el análisis sintáctico descendente.
  - *VentanaCreacionGramatica.java*: ventana para la creación de la gramática de contexto libre.
  - *VentanaProducciones.java*: ventana para la definición de las producciones de la gramática de contexto libre.
  - *VentanaResultadosValidacion.java*: ventana que muestra los resultados de la validación de la gramática.
  - *VentanaSimbolosNoTerminales.java*: ventana para la definición de los símbolos no terminales de la gramática.
  - *VentanaSimbolosTerminales.java*: ventana para la definición de los símbolos terminales de la gramática.
  - *Visualizacion.java*: ventana para la visualización de la gramática.

- **Paquete es.uco.simas.resources**:

  - Recursos de la interfaz: recursos gráficos de la interfaz (iconos, fuentes de letra, etcétera).

- **Paquete es.uco.simas.simulador**:

  - *CadEntrada.java*: clase que almacena los datos de la cadena de entrada.
  - *MiRender.java*: clase para almacenar el formato para mostrar los datos en las tablas.
  - *NuevaFuncionError.java*: ventana para introducir los datos de una nueva funcion de error.

- *NuevaSimulacionASc.java*: ventana para crear una nueva simulación ascendente.
- *NuevaSimulacionDesc.java*: ventana para crear una nueva sumulación descendente.
- *PanelNuevaSimAscPaso1.java*: paso número uno del asistente de la simulación del método ascendente.
- *PanelNuevaSimAscPaso2.java*: paso número dos del asistente de la simulación del método ascendente.
- *PanelNuevaSimAscPaso3.java*: paso número tres del asistente de la simulación del método ascendente.
- *PanelNuevaSimAscPaso4.java*: paso número cuatro del asistente de la simulación del método ascendente.
- *PanelNuevaSimAscPaso5.java*: paso número cinco del asistente de la simulación del método ascendente.
- *PanelNuevaSimAscPaso6.java*: paso número seis del asistente de la simulación del método ascendente.
- *PanelNuevaSimDescPaso1.java*: paso número uno del asistente de la simulación del método descedente.
- *PanelNuevaSimDescPaso2.java*: paso número dos del asistente de la simulación del método descedente.
- *PanelNuevaSimDescPaso3.java*: paso número tres del asistente de la simulación del método descedente.
- *PanelNuevaSimDescPaso4.java*: paso número cuatro del asistente de la simulación del método descedente.
- *PanelNuevaSimDescPaso5.java*: paso número cinco del asistente de la simulación del método descedente.
- *Simulador.java*: clase que almacena los datos de la simulación.
- *VentanaSimuladorAsc.java*: ventana del simulador ascendente.
- *VentanaSimuladorDesc.java*: ventana del simulador descendente.

- **Paquete es.uco.simas.util.gramatica**:
  - *Antecedente.java*: clase que almacena los datos de los antecedentes de las producciones.
  - *Consecuente.java*: clase que almacena los datos de los consecuentes de las producciones.
  - *Gramatica.java*: clase que almacena los datos de la gramática.
  - *NoTerminal.java*: clase que almacena los datos de los símbolos no terminales de la gramática.

- *Produccion.java*: clase que almacena los datos de las producciones de la gramática.
- *Simbolo.java*: clase que almacena los datos de los símbolos de la gramática.
- *Terminal.java*: clase que almacena los datos de los símbolos terminales de la gramática.

Capítulo 2

Documentacion interna

2.1. Introducción

En este capítulo se mostrará el código fuente de cada uno de los archivos creados para el desarrollo de la aplicación SimAS, dividido en función de los paquetes mostrados en el capítulo anterior.

2.2. Paquete SimAS

2.2.1. Bienvenida.java

```
//SimAS
// Bienvenida

package es.uco.simas;

import java.util.logging.Level;
import java.util.logging.Logger;

/**
 * @author vanesa
 */
public class Bienvenida extends javax.swing.JFrame implements Runnable{

    Thread t;
    public Bienvenida() {

           initComponents();
```

```java

    }

    public void run(){
        try{
            this.setLocationRelativeTo(null);
            this.setVisible(true);
            Thread.sleep(2500);
            this.dispose();

           SimAS simas = new SimAS();
           simas.lanzarEditor();
        }catch(InterruptedException ex){
            Logger.getLogger(Bienvenida.class.getName()).log(Level.SEVERE, null, ex);

        }

    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    private void initComponents() {

        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();
        jLabel6 = new javax.swing.JLabel();
        jLabel7 = new javax.swing.JLabel();

        setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);
        setTitle("Bienvenido a SimAS");
        setFocusTraversalPolicyProvider(true);
        setUndecorated(true);

        jLabel1.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/logo2Antes.png"))); // NOI18N

        jLabel2.setForeground(new java.awt.Color(33, 77, 72));
        jLabel2.setText("Desarrollado por:");

        jLabel3.setForeground(new java.awt.Color(33, 77, 72));
        jLabel3.setText(”Dirigido por: ”);

        jLabel4.setForeground(new java.awt.Color(63, 171, 160));
        jLabel4.setText(”Vanesa Gonzalez Perez”);

        jLabel5.setForeground(new java.awt.Color(63, 171, 160));
        jLabel5.setText(”Dr. Nicolas L. Fernandez Garcia”);

        jLabel6.setForeground(new java.awt.Color(33, 77, 72));
        jLabel6.setText(”Version: ”);

        jLabel7.setForeground(new java.awt.Color(63, 171, 160));
        jLabel7.setText(”1.0”);

        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(40, 40, 40)
                        .addGroup(layout.createParallelGroup(javax.
                            swing.GroupLayout.Alignment.LEADING)
                            .addGroup(layout.createSequentialGroup()
                                .addComponent(jLabel2)
                                .addGap(18, 18, 18)
                                .addComponent(jLabel4))
                            .addGroup(layout.createSequentialGroup()
                                .addComponent(jLabel3)
                                .addGap(18, 18, 18)
                                .addComponent(jLabel5))
                            .addGroup(layout.createSequentialGroup()
                                .addGap(87, 87, 87)
                                .addComponent(jLabel6)
                                .addPreferredGap(javax.swing.
                                    LayoutStyle.ComponentPlacement.
                                    RELATED)
                                .addComponent(jLabel7))))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(95, 95, 95)
                        .addComponent(jLabel1)))
                .addContainerGap(41, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.
                Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(21, 21, 21)
                .addComponent(jLabel1)
                .addGap(27, 27, 27)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jLabel2)
                    .addComponent(jLabel4))
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jLabel3)
                    .addComponent(jLabel5))
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jLabel6)
                    .addComponent(jLabel7))
                .addContainerGap(25, Short.MAX_VALUE))
        );

        pack();
    }// </editor-fold>//GEN-END:initComponents


    // Variables declaration - do not modify//GEN-BEGIN:variables
    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.JLabel jLabel6;
    private javax.swing.JLabel jLabel7;
    // End of variables declaration//GEN-END:variables
}
```

2.2.2. SimAS.java

```
//SimAS

package es.uco.simas;

import es.uco.simas.editor.Editor;
import es.uco.simas.simulador.Simulador;
import es.uco.simas.util.gramatica.Gramatica;

/**
 * @author vanesa
 */
public class SimAS {
    public SimAS(){

    }

    public void lanzarEditor(){ //Lanza el Editor
        Editor editor = new Editor();
        editor.setLocationRelativeTo(null);
        editor.setVisible(true);
    }

    public void lanzarEditor(Gramatica gramatica){  //Editor con una gramatica
        Editor editor = new Editor(gramatica);
        editor.setLocationRelativeTo(null);
        editor.setVisible(true);
    }


    public void lanzarSimulador(int i, Gramatica gramatica, int met){ //Lanza el simulador
        Simulador simulador = new Simulador(i, gramatica, met);
        simulador.setLocationRelativeTo(null);
        simulador.setVisible(true);

    }
    public void lanzarAyuda(){

    }

     public static void main(String args[]) {
        /* Set the Nimbus look and feel */
        //<editor-fold defaultstate="collapsed" desc=" Look and feel setting code (optional) ">
        /* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.
         * For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html
         */

          new Thread(new Bienvenida()).start();


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

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {

                SimAS simas = new SimAS();
            }
        });

    }
}
```

2.3. Paquete Centro de ayuda

2.3.1. AcercaDe.java

```
/*
 * To change this template, choose Tools | Templates
 * and open the template in the editor.
 */
package es.uco.simas.centroayuda;

/**
 *
 * @author vanesa
 */
public class AcercaDe extends javax.swing.JFrame {

    /**
     * Creates new form AcercaDe
     */
    public AcercaDe() {
        initComponents();
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings(”unchecked”)
    // <editor-fold defaultstate=”collapsed” desc=”Generated Code”>//GEN-BEGIN:initComponents
    private void initComponents() {

        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();
        jLabel6 = new javax.swing.JLabel();
        jLabel7 = new javax.swing.JLabel();

        setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

        jLabel1.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/logo2Antes.png”))); // NOI18N

        jLabel2.setFont(new java.awt.Font(”Ubuntu”, 1, 15)); // NOI18N
        jLabel2.setForeground(new java.awt.Color(33, 77, 72));
        jLabel2.setText(”Desarrollado por:”);

        jLabel3.setFont(new java.awt.Font(”Ubuntu”, 1, 15)); // NOI18N
        jLabel3.setForeground(new java.awt.Color(63, 171, 160));
        jLabel3.setText(”Vanesa GonzÃ¡lez PÃ©rez”);

        jLabel4.setFont(new java.awt.Font(”Ubuntu”, 1, 15)); // NOI18N
        jLabel4.setForeground(new java.awt.Color(33, 77, 72));
        jLabel4.setText(”Dirigido por:”);

        jLabel5.setFont(new java.awt.Font(”Ubuntu”, 1, 15)); // NOI18N
        jLabel5.setForeground(new java.awt.Color(63, 171, 160));
        jLabel5.setText(”Dr. NicolÃ¡s L. FernÃ¡ndez GarcÃ a”);

        jLabel6.setFont(new java.awt.Font(”Ubuntu”, 1, 15)); // NOI18N
        jLabel6.setForeground(new java.awt.Color(33, 77, 72));
        jLabel6.setText(”Version: ”);

        jLabel7.setFont(new java.awt.Font(”Ubuntu”, 1, 15)); // NOI18N
        jLabel7.setForeground(new java.awt.Color(63, 171, 160));
        jLabel7.setText(”1.0”);

        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(92, 92, 92)
                        .addComponent(jLabel1))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(37, 37, 37)
                        .addGroup(layout.createParallelGroup(javax.
                            swing.GroupLayout.Alignment.LEADING)
                            .addGroup(layout.createSequentialGroup()
                                .addComponent(jLabel4)
                                .addGap(36, 36, 36)
                                .addComponent(jLabel5))
                            .addGroup(layout.createSequentialGroup()
                                .addComponent(jLabel2)
                                .addGap(29, 29, 29)
                                .addComponent(jLabel3))
                            .addGroup(layout.createSequentialGroup()
                                .addGap(101, 101, 101)
                                .addComponent(jLabel6)
                                .addGap(18, 18, 18)
                                .addComponent(jLabel7)))))
                .addContainerGap(34, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.
                Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(25, 25, 25)
                .addComponent(jLabel1)
                .addGap(36, 36, 36)
                .addGroup(layout.createParallelGroup(javax.swing.
                    GroupLayout.Alignment.BASELINE)
                    .addComponent(jLabel2)
                    .addComponent(jLabel3))
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.
                    GroupLayout.Alignment.BASELINE)
                    .addComponent(jLabel4)
                    .addComponent(jLabel5))
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.
                    GroupLayout.Alignment.BASELINE)
                    .addComponent(jLabel6)
                    .addComponent(jLabel7))
                .addContainerGap(32, Short.MAX_VALUE))
        );

        pack();
    }// </editor-fold>//GEN-END:initComponents

    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        /* Set the Nimbus look and feel */
        //<editor-fold defaultstate=”collapsed” desc=” Look and feel setting code (optional) ”>
        /* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.
         * For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html
         */
        try {
            for (javax.swing.UIManager.LookAndFeelInfo info : javax.swing.UIManager.getInstalledLookAndFeels()) {
                if (”Nimbus”.equals(info.getName())) {
                    javax.swing.UIManager.setLookAndFeel(info.getClassName());
                    break;
                }
            }
        } catch (ClassNotFoundException ex) {
            java.util.logging.Logger.getLogger(AcercaDe.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {
            java.util.logging.Logger.getLogger(AcercaDe.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {
            java.util.logging.Logger.getLogger(AcercaDe.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {
            java.util.logging.Logger.getLogger(AcercaDe.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        }
        //</editor-fold>

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new AcercaDe().setVisible(true);
            }
        });
    }
    // Variables declaration - do not modify//GEN-BEGIN:variables
    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.JLabel jLabel6;
    private javax.swing.JLabel jLabel7;
    // End of variables declaration//GEN-END:variables
```

```
}
```

2.4. Paquete Editor

2.4.1. ColCanLALR.java

```
//SimAS / Editor
// ColCanLALR

package es.uco.simas.editor;

import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.util.gramatica.Simbolo;
import java.util.ArrayList;

/**
 * @author vanesa
 */
public class ColCanLALR {
    Gramatica gramatica;
    ArrayList<ConjElementosLR1> conjElementosLALR = new ArrayList();
    ArrayList<ConjElementosLR1> conj2 = new ArrayList();
    StringBuffer coleccion = new StringBuffer();
    ColCanLR1 colLR1 = new ColCanLR1();
    int i;
    int v;
    public ColCanLALR(){ //Constructor vacio

    }

    public ColCanLALR(Gramatica gramatica, ColCanLR1 col){
        this.gramatica = gramatica;
        this.colLR1 = col;
    }

    public void construir(){ //Construir la coleccion
        ArrayList<ConjElementosLR1> conjLR1 = this.colLR1.getConjElementosLR1();
        unificarConjuntos();

        ArrayList<ConjElementosLR1> c = colLR1.getConj2();
        int w=0;
        while(w < c.size()){
            int z=0;
            while(z < this.conjElementosLALR.size()){
                if(c.get(w).getI() == this.conjElementosLALR.get(z).getI()){
                    c.get(w).setV(this.conjElementosLALR.get(z).getV());
                    conj2.add(c.get(w));
                }
                z++;
            }
            w++;
        }


        int k=0;

        while(k < this.conjElementosLALR.size()){
            this.conjElementosLALR.get(k).setY(k);
            coleccion.append("I").append(this.conjElementosLALR.get(k).getI());
            if(this.conjElementosLALR.get(k).getV() != -1){
                coleccion.append("-").append(this.conjElementosLALR.get(k).getV());
            }
            coleccion.append(" = ");
            imprimirConjunto(k);
            coleccion.append("\n\n");
            k++;
        }
    }

    public String getColeccion(){ //Devuelve la coleccion
        return this.coleccion.toString();
    }

    public void unificarConjuntos(){  //Unifica los conjuntos
        ArrayList<ConjElementosLR1> conjLR1 = this.colLR1.getConjElementosLR1();
        int x=0;
        while(x < conjLR1.size()){
            int prueba = comprobarConjunto(conjLR1.get(x));
            if(prueba == -1){
                this.conjElementosLALR.add(conjLR1.get(x));
            }else{
                anticipacion(prueba, x);
            }
            x++;
        }
    }

    public int comprobarConjunto(ConjElementosLR1 conj){
        int conjunto = -1;
        int i = 1;
        while(i < this.conjElementosLALR.size()){
            int j=0;
            int iguales = 0;
            while(j < conj.getElementosLR1().size()){
                if(elementosIguales(conj.getElementosLR1().get(j), this.conjElementosLALR.get(i).getElementosLR1().get(j))==1){
                    j++;
                    iguales = 1;
                }else{
                    iguales =0;
                    break;
                }
            }
            if(iguales == 1){
                conjunto = i;
                this.conjElementosLALR.get(i).setV(conj.getI());
                ConjElementosLR1 el = conj;
                el.setI(this.conjElementosLALR.get(i).getI());
                el.setV(this.conjElementosLALR.get(i).getV());
                this.conj2.add(el);
                break;
            }else
                i++;
        }
        return conjunto;
    }

    public int elementosIguales(ElementosLR1 el1, ElementosLR1 el2){
        int i=0;
        int iguales =-1;

            if(el1.getPosicion() == el2.getPosicion() && el1.getProduc().getAntec().getSimboloNT().getNombre().equals(el2.getProduc().getAntec().getSimboloNT().getNombre())){
                while(i < el1.getProduc().getConsec().size()){
                    iguales = 0;
                    if(el1.getProduc().getConsec().get(i).getNombre().equals(el2.getProduc().getConsec().get(i).getNombre())){
                        i++;
                    }else{
                        iguales =0;
                        break;
                    }
                    iguales = 1;
                }
            }
        return iguales;
    }

    void anticipacion(int conjunto, int igual){
        ConjElementosLR1 conj = this.conjElementosLALR.get(conjunto);
        ConjElementosLR1 conjIgual = this.colLR1.getConjElementosLR1().get(igual);
        ArrayList<String> anticipacion1 = conj.getElementosLR1().get(0).getAnticipacion();
        ArrayList<String> anticipacion2 = conjIgual.getElementosLR1().get(0).getAnticipacion();
        ArrayList<String> anticipacion = anticipacion1;
        int k=0;

        while(k < anticipacion2.size()){
            int l=0;
            int encontrado = -1;
            while(l < anticipacion.size()){
                if(anticipacion.get(l).equals(anticipacion2.get(k)))
                    encontrado = 1;
                l++;
            }
            if(encontrado == -1){
                anticipacion.add(anticipacion2.get(k));
            }
            k++;
        }
        k=0;
        while(k < this.conjElementosLALR.get(conjunto).getElementosLR1().size()){
            this.conjElementosLALR.get(conjunto).getElementosLR1().get(k).setAnticipacion(anticipacion);
            k++;
        }
    }

    void imprimirConjunto(int conj){
        int j=0;
        ArrayList<ElementosLR1> elementos = this.conjElementosLALR.get(conj).getElementosLR1();
        coleccion.append("{ ");

        while(j < elementos.size()){
            coleccion.append("[");
            ArrayList<Simbolo> consec= elementos.get(j).getProduc().getConsec();
            int posicion = elementos.get(j).getPosicion();
            int k=0;
            coleccion.append(elementos.get(j).getProduc().getAntec().getSimboloNT().getNombre());
            coleccion.append(" \u2192 ");
            if(posicion==0){
                coleccion.append(" \u25CF  ");
            }
            if("\u03B5".equals(consec.get(0).getNombre())){ //Si el consecuente contiene epsilon solo se imprime el punto
                coleccion.append(" \u25CF  ");
            }else{
                while(k < consec.size() ){
                    coleccion.append(consec.get(k).getNombre()).append(" ");
                    k++;
                    if(posicion == k){
                        coleccion.append(" \u25CF  ");
                    }
                }
            }
            int l=0;
                coleccion.append(", ");
                while(l < elementos.get(j).getAnticipacion().size()){
                    coleccion.append(elementos.get(j).getAnticipacion()
                        .get(l));
                    l++;
                    if(l < elementos.get(j).getAnticipacion().size())
                        coleccion.append(", ");
            }
            coleccion.append("]");
            j++;
            if(j == elementos.size()){
                coleccion.append(" }");
            }else
                coleccion.append(", ");
        }
    }

    public ColCanLR1 getColLR1() {
        return colLR1;
    }

    public ArrayList<ConjElementosLR1> getConj2() {
        return conj2;
    }

    public ArrayList<ConjElementosLR1> getConjElementosLALR() {
        return this.conjElementosLALR;
    }
}
```

2.4.2. ColCanLR0.java

```
//SimAS  /  Editor
// ColCanLR0

package es.uco.simas.editor;

import es.uco.simas.util.gramatica.Antecedente;
import es.uco.simas.util.gramatica.Consecuente;
import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.util.gramatica.NoTerminal;
import es.uco.simas.util.gramatica.Produccion;
import es.uco.simas.util.gramatica.Simbolo;
import java.util.ArrayList;
```

```java

/**
 * @author vanesa
 */
public class ColCanLR0 {
    ArrayList<ConjElementosLR0> conjElementosLR0 = new ArrayList();
    ArrayList<ConjElementosLR0> conj2 = new ArrayList();
    Gramatica gramatica;
    int i;
    StringBuffer coleccion = new StringBuffer();

    //\u00b7 punto
    public ColCanLR0(){ //Constructor vacio

    }

    public ColCanLR0(Gramatica gramatica){
        this.gramatica = gramatica;
        ArrayList<Produccion> pr = this.gramatica.getPr();
        if(!pr.get(0).getAntec().getSimboloNT().getNombre().equals(this.gramatica.getSimbInicial()+"'")){
            Antecedente ant = new Antecedente();
            ant.setSimboloNT(new NoTerminal(gramatica.getSimbInicial()+"'",gramatica.getSimbInicial()+"'"));
            Consecuente con = new Consecuente();
            ArrayList<Simbolo> simb = new ArrayList();
            simb.add(new Simbolo(gramatica.getSimbInicial(),gramatica.getSimbInicial()));
            con.setConjSimbolos(simb);
            Produccion produc = new Produccion();
            produc.setConsec(simb);
            produc.setAntec(ant);
            pr.add(0, produc);
            gramatica.setPr(pr);
            this.gramatica = gramatica;
        }
    }

    public void construir(){
        ArrayList<String> simbolos = new ArrayList();
        this.i=0;
        int j=0;

        coleccion.append("I").append(this.i).append(" = ");
        this.conjElementosLR0.add(new ConjElementosLR0(this.gramatica));

        ArrayList<ElementosLR0> elementos = this.conjElementosLR0.get(this.i).getElementosLR0();
        while(j < elementos.size()){
            if(elementos.get(j).getPosicion() < elementos.get(j).getProduc().getConsec().size()){
                if(simbolos.size() ==0)
```

```
                    simbolos.add(elementos.get(j).getPivote());
                else{
                    int k=0;
                    int encontrado = 0;
                    while(k < simbolos.size()){
                        if(simbolos.get(k).equals(elementos.get(j).getPivote()))){
                            encontrado = 1;
                            break;
                        }else
                            k++;
                    }
                    if(encontrado == 0)
                        simbolos.add(elementos.get(j).getPivote());
                }
            }
            j++;
        }

        imprimirConjunto(0);

        j=0;
        while(j < simbolos.size()){
            this.i++;
            this.conjElementosLR0.add(new ConjElementosLR0(i,0,simbolos.get(j), conjElementosLR0.get(0),this.gramatica));
            j++;
            coleccion.append("\n\n");
            coleccion.append("Ir_a (I"+this.conjElementosLR0.get(j).col+", "+this.conjElementosLR0.get(j).simbolo+") = ");
            imprimirConjunto(j);
            coleccion.append(" = I"+ this.conjElementosLR0.get(j).i);
        }

        int tam = this.conjElementosLR0.size();
        int m = 1;
        while(m < this.conjElementosLR0.size()){
            elementos = this.conjElementosLR0.get(m).getElementosLR0();
            simbolos = new ArrayList();
            j=0;
            while(j < elementos.size()){
                if(elementos.get(j).getPivote() != ""){
                    if(simbolos.size() == 0 )
                            simbolos.add(elementos.get(j).getPivote());
                    else{
                        int k=0;
                        int encontrado = 0;
                        while(k < simbolos.size()){
                            if(simbolos.get(k).equals(elementos.get(j).getPivote()))){
                                encontrado = 1;
                                break;
                            }else
```

```
                                k++;
                        }
                        if(encontrado == 0){
                            simbolos.add(elementos.get(j).getPivote());
                        }
                    }
                }
                j++;
            }

            if(simbolos.size()==0){
                coleccion.append("\n\n\u2200 X \u2208 V:     Ir_a (I"+this.conjElementosLR0.get(m).getI()+", X) = \u2205");
            }
            j=0;
            while(j < simbolos.size()){
                this.i++;
                int imprimir=-1;
                ConjElementosLR0 conj = new ConjElementosLR0(i,m,simbolos.get(j), conjElementosLR0.get(m),this.gramatica);

                int prueba = this.comprobarConjunto(conj);
                if(prueba == -1){
                    this.conjElementosLR0.add(conj);
                    imprimir = this.i;
                }else{
                    conj = new ConjElementosLR0(prueba,m,simbolos.get(j));
                    this.conj2.add(conj);
                  // conj = this.conjElementosLR0.get(prueba);
                    conj.setI(this.conjElementosLR0.get(prueba).getI());
                    imprimir = prueba;
                    this.i--;
                }
                j++;
                coleccion.append("\n\n");
                coleccion.append("Ir_a (I"+conj.col+", "+conj.simbolo+") = ");
                imprimirConjunto(imprimir);
                coleccion.append(" = I"+ conj.i);
            }
            m++;
        }
    }

    void imprimirConjunto(int conj){
        int j=0;
        ArrayList<ElementosLR0> elementos = this.conjElementosLR0.get(conj).getElementosLR0();
        coleccion.append("{ ");

        while(j < elementos.size()){
            ArrayList<Simbolo> consec= elementos.get(j).getProduc().
                getConsec();
            int posicion = elementos.get(j).getPosicion();
            int k=0;
            coleccion.append(elementos.get(j).getProduc().getAntec().
                getSimboloNT().getNombre());
            coleccion.append(” \u2192 ”);
            if(posicion==0){
                coleccion.append(” \u25CF ”);//\u25AA ”);
            }
            if(”\u03B5”.equals(consec.get(0).getNombre())){ //Si el
                consecuente contiene epsilon solo se imprime el punto
                coleccion.append(” \u25CF ”);//\u25AA”);
            }else{
                while(k < consec.size() ){
                    coleccion.append(consec.get(k).getNombre()).append(
                        ” ”);
                    k++;
                    if(posicion == k){
                        coleccion.append(” \u25CF ”);//\u25AA ”);//\
                            u25CF ”);//\u00b7 ”);
                    }
                }
            }
            j++;
            if(j == elementos.size())
                coleccion.append(” }”);
            else
                coleccion.append(”, ”);
        }
    }

    public String getColeccion(){
        return this.coleccion.toString();
    }

    public int comprobarConjunto(ConjElementosLR0 conj){
        int conjunto = -1;
        int i = 1;

        while(i < this.conjElementosLR0.size()){
           // System.out.println(this.conjElementosLR0.get(i).
                getElementosLR0().get(0).getProduc().getConsec().get(0).
                getNombre());
            int j=0;
            int iguales = 0;
            if(conj.getElementosLR0().size() == this.conjElementosLR0.
                get(i).getElementosLR0().size()){
                while(j < conj.getElementosLR0().size()){

                    if(elementosIguales(conj.getElementosLR0().get(j), this.conjElementosLR0.get(i).getElementosLR0().get(j))==1){
                        j++;
                        iguales = 1;
                    }else{
                        iguales =0;
                        break;
                    }
                }
            }
            if(iguales == 1){
                conjunto = i;
                break;
            }else
                i++;
        }
        return conjunto;
    }

    public int elementosIguales(ElementosLR0 el1, ElementosLR0 el2){
        int i=0;
        int iguales =-1;

        if(el1.getPosicion() == el2.getPosicion() && el1.getProduc().getAntec().getSimboloNT().getNombre().equals(el2.getProduc().getAntec().getSimboloNT().getNombre())){
            while(i < el1.getProduc().getConsec().size()){
                iguales = 0;
                if(el1.getProduc().getConsec().get(i).getNombre().equals(el2.getProduc().getConsec().get(i).getNombre())){
                    i++;
                }else{
                    iguales =0;
                    break;
                }
                iguales = 1;
            }
        }
        return iguales;
    }

    public ArrayList<ConjElementosLR0> getConjElementosLR0() {
        return conjElementosLR0;
    }

    public ArrayList<ConjElementosLR0> getConj2() {
        return conj2;
    }
}
```

2.4.3. ColCanLR1.java

```java
//SimAS / Editor
// ColCanLR1

package es.uco.simas.editor;

import es.uco.simas.util.gramatica.Antecedente;
import es.uco.simas.util.gramatica.Consecuente;
import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.util.gramatica.NoTerminal;
import es.uco.simas.util.gramatica.Produccion;
import es.uco.simas.util.gramatica.Simbolo;
import java.util.ArrayList;

/**
 * @author vanesa
 */
public class ColCanLR1 {
    Gramatica gramatica;
    ArrayList<ConjElementosLR1> conjElementosLR1 = new ArrayList();
    ArrayList<ConjElementosLR1> conj2 = new ArrayList();
    StringBuffer coleccion = new StringBuffer();
    int i;

    public ColCanLR1(){ //Constructor vacio

    }
    public ColCanLR1(Gramatica gramatica){
        this.gramatica = gramatica;

        ArrayList<Produccion> pr = this.gramatica.getPr();
        if(!pr.get(0).getAntec().getSimboloNT().getNombre().equals(this.gramatica.getSimbInicial()+"'")){
            Antecedente ant = new Antecedente();
            ant.setSimboloNT(new NoTerminal(gramatica.getSimbInicial()+"'",gramatica.getSimbInicial()+"'"));
            Consecuente con = new Consecuente();
            ArrayList<Simbolo> simb = new ArrayList();
            simb.add(new Simbolo(gramatica.getSimbInicial(),gramatica.getSimbInicial()));
            con.setConjSimbolos(simb);
            Produccion produc = new Produccion();
            produc.setConsec(simb);
            produc.setAntec(ant);
            pr.add(0, produc);
            gramatica.setPr(pr);
            this.gramatica = gramatica;
        }
    }

    public void construir(){
        ArrayList<String> simbolos = new ArrayList();
        this.i=0;
        int j=0;

        coleccion.append(”I”).append(this.i).append(” = ”);
        this.conjElementosLR1.add(new ConjElementosLR1(this.gramatica));

        ArrayList<ElementosLR1> elementos = this.conjElementosLR1.get(this.i).getElementosLR1();
        while(j < elementos.size()){
            if(elementos.get(j).getPosicion() < elementos.get(j).getProduc().getConsec().size()){
                if(simbolos.size() ==0)
                    simbolos.add(elementos.get(j).getPivote());
                else{
                    int k=0;
                    int encontrado = 0;
                    while(k < simbolos.size()){
                        if(simbolos.get(k).equals(elementos.get(j).getPivote())){
                            encontrado = 1;
                            break;
                        }else
                            k++;
                    }
                    if(encontrado == 0)
                        simbolos.add(elementos.get(j).getPivote());
                }
            }
            j++;
        }
        imprimirConjunto(0);

        j=0;
        while(j < simbolos.size()){
            this.i++;
            this.conjElementosLR1.add(new ConjElementosLR1(i,0,simbolos.get(j), conjElementosLR1.get(0),this.gramatica));
            j++;
            coleccion.append(”\n\n”);
            coleccion.append(” Ir_a (I”+this.conjElementosLR1.get(j).col+”, ”+this.conjElementosLR1.get(j).simbolo+”) = ”);
            imprimirConjunto(j);
            coleccion.append(” = I”+ this.conjElementosLR1.get(j).i);
        }

        int tam = this.conjElementosLR1.size();

        int m =1;
        while(m < this.conjElementosLR1.size()){
            elementos = this.conjElementosLR1.get(m).getElementosLR1();
            simbolos = new ArrayList();
            j=0;
            while(j < elementos.size()){
                int posicion = elementos.get(j).getPosicion();
                if(elementos.get(j).getPivote() != ””){
                    if(simbolos.size() == 0 )
                            simbolos.add(elementos.get(j).getPivote());
                    else{
                        int k=0;
                        int encontrado = 0;
                        while(k < simbolos.size()){
                            if(simbolos.get(k).equals(elementos.get(j).getPivote())){
                                encontrado = 1;
                                break;
                            }else
                                k++;
                        }
                        if(encontrado ==0)
                            simbolos.add(elementos.get(j).getPivote());
                    }
                }
                j++;
            }

            if(simbolos.size()==0){
                coleccion.append(”\n\n\u2200 X \u2208 V:     Ir_a (I”+this.conjElementosLR1.get(m).getI()+”, X) = \u2205”);
            }
            j=0;
            while(j < simbolos.size()){
                this.i++;
                int imprimir=-1;
                ConjElementosLR1 conj = new ConjElementosLR1(i,m, simbolos.get(j), conjElementosLR1.get(m),this.gramatica);
                int prueba = this.comprobarConjunto(conj);
                if(prueba == -1){
                    this.conjElementosLR1.add(conj);
                    imprimir = this.i;
                }else{
                    conj = new ConjElementosLR1(prueba,m,simbolos.get(j));
                    this.conj2.add(conj);

                    conj.setI(this.conjElementosLR1.get(prueba).getI());
                    imprimir = prueba;
                    this.i--;
                }
                j++;
                coleccion.append(”\n\n”);
                coleccion.append(”Ir_a (I”+conj.col+”, ”+conj.simbolo+”) = ”);
                imprimirConjunto(imprimir);
                coleccion.append(" = I"+ conj.i);
            }
            m++;
        }

    }

    void imprimirConjunto(int conj){
        int j=0;
        ArrayList<ElementosLR1> elementos = this.conjElementosLR1.get(conj).getElementosLR1();
        coleccion.append("{ ");

        while(j < elementos.size()){
            coleccion.append("[");
            ArrayList<Simbolo> consec= elementos.get(j).getProduc().getConsec();
            int posicion = elementos.get(j).getPosicion();
            int k=0;
            coleccion.append(elementos.get(j).getProduc().getAntec().getSimboloNT().getNombre());
            coleccion.append(" \u2192 ");
            if(posicion==0){
                coleccion.append(" \u25CF  ");//\u25AA ");
            }
            if("\u03B5".equals(consec.get(0).getNombre())){ //Si el consecuente contiene epsilon solo se imprime el punto
                coleccion.append(" \u25CF  ");//\u25AA");
            }else{
                while(k < consec.size() ){
                    coleccion.append(consec.get(k).getNombre()).append(" ");
                    k++;
                    if(posicion == k){
                        coleccion.append(" \u25CF  ");//\u25AA ");//\u25CF ");//\u00b7 ");
                    }
                }
            }
            int l=0;
                coleccion.append(", ");
                while(l < elementos.get(j).getAnticipacion().size()){
                    coleccion.append(elementos.get(j).getAnticipacion().get(l));
                    l++;
                    if(l < elementos.get(j).getAnticipacion().size())
                        coleccion.append(", ");

            }
            coleccion.append("]");
            j++;
            if(j == elementos.size()){
                coleccion.append(” }”);
            }else
                coleccion.append(”, ”);
        }
    }

     public String getColeccion(){
        return this.coleccion.toString();
    }

    public ArrayList<ConjElementosLR1> getConjElementosLR1() {
        return conjElementosLR1;
    }

    public ArrayList<ConjElementosLR1> getConj2() {
        return conj2;
    }

     public int comprobarConjunto(ConjElementosLR1 conj){
        int conjunto = −1;
        int i = 1;
        while(i < this.conjElementosLR1.size()){
            int j=0;
            int iguales = 0;
            while(j < conj.getElementosLR1().size()){
                if(elementosIguales(conj.getElementosLR1().get(j), this
                    .conjElementosLR1.get(i).getElementosLR1().get(j))
                    ==1 && this.anticipacionIgual(conj.getElementosLR1
                    ().get(j), this.conjElementosLR1.get(i).
                    getElementosLR1().get(j))==1){
                    j++;
                    iguales = 1;
                }else{
                    iguales =0;
                    break;
                }
            }
            if(iguales == 1){
                conjunto = i;
                break;
            }else
                i++;
        }
        return conjunto;
    }

    public int elementosIguales(ElementosLR1 el1, ElementosLR1 el2){
        int i=0;
        int iguales =−1;

        if(el1.getPosicion() == el2.getPosicion() && el1.getProduc().
            getAntec().getSimboloNT().getNombre().equals(el2.getProduc
            ().getAntec().getSimboloNT().getNombre())){
```

```
            while(i < el1.getProduc().getConsec().size()){
                iguales = 0;
                if(el1.getProduc().getConsec().get(i).getNombre().equals(el2.getProduc().getConsec().get(i).getNombre())){
                    i++;
                }else{
                    iguales =0;
                    break;
                }
                iguales = 1;
            }
        }
        return iguales;
    }

    public int anticipacionIgual(ElementosLR1 el1, ElementosLR1 el2){
        int iguales = -1;
        int j=0;

        if(el1.getAnticipacion().size() == el2.getAnticipacion().size()){
            while(j < el1.getAnticipacion().size()){
                if(el1.getAnticipacion().get(j).equals(el2.getAnticipacion().get(j))){
                    j++;
                }else{
                    iguales = 0;
                    break;
                }
                iguales = 1;
            }
        }else{
            iguales = 0;
        }
        return iguales;
    }
}
```

2.4.4. ConjElementosLALR.java

```
// SimAs / Editor
// ConjElementosLALR

package es.uco.simas.editor;

import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.util.gramatica.NoTerminal;
import es.uco.simas.util.gramatica.Produccion;
import es.uco.simas.util.gramatica.Simbolo;
```

```java
import java.util.ArrayList;

/**
 * @author vanesa
 */
public class ConjElementosLALR {
    ArrayList<ElementosLALR> elementosLALR = new ArrayList();
    Gramatica gramatica;
    int i; // numero de iteracion
    int col; //coleccion con la que se calcula
    String simbolo = "";
    ConjElementosLALR conj;

    public ConjElementosLALR(Gramatica gramatica){
        this.gramatica = gramatica;
        this.primero();
    }

    public ConjElementosLALR(int i, int col, String simbolo,
        ConjElementosLALR conj, Gramatica gr){
        this.i = i;
        this.col = col;
        this.simbolo = simbolo;
        this.conj = conj;
        this.gramatica = gr;
        this.elementosLALR = new ArrayList();
        this.construir();
    }
    public ConjElementosLALR(int i, int col, String simbolo){
        this.i = i;
        this.col = col;
        this.simbolo = simbolo;
    }

    void primero(){
        ArrayList<Produccion> producciones = this.gramatica.getPr();
        ArrayList<String> simb = new ArrayList();
        Produccion prod = producciones.get(0);
        ArrayList<String> ant = new ArrayList();
        ElementosLALR aux = new ElementosLALR();
        ant.add("$");

        //S' -> .S, $
        this.elementosLALR.add(new ElementosLALR(prod,0,prod.getConsec
            ().get(0).getNombre(), ant));
        aux = this.elementosLALR.get(this.elementosLALR.size()-1);

        String simbolo = prod.getConsec().get(0).getNombre();
        int i=1;
        while(i<producciones.size()){
            ant = new ArrayList();
            if(simbolo.equals(producciones.get(i).getAntec().
                getSimboloNT().getNombre())){
```

```
                if(calcularAnt(aux)!=null){
                    ant = calcularAnt(aux);
                }else{
                    ant = aux.getAnticipacion();
                }
                this.elementosLALR.add(new ElementosLALR(producciones.get(i),0, producciones.get(i).getConsec().get(0).getNombre(),ant));
            }
            i++;
        }

        i=1;
        int tam = this.elementosLALR.size();
        while (i < tam){
            if(this.elementosLALR.get(i).getPosicion() != this.elementosLALR.get(i).getProduc().getConsec().size()){
                if(this.gramatica.isNoTerminal(this.elementosLALR.get(i).getProduc().getConsec().get(this.elementosLALR.get(i).getPosicion()).getNombre())){
                    int j=0;
                    simbolo = this.elementosLALR.get(i).getProduc().getConsec().get(this.elementosLALR.get(i).getPosicion()).getNombre();
                    aux = this.elementosLALR.get(i);
                    while(j < producciones.size()){
                        if(simbolo.equals(producciones.get(j).getAntec().getSimboloNT().getNombre())){
                            ant = new ArrayList();
                            if(calcularAnt(aux)!=null){
                                ant = calcularAnt(aux);
                            }else{
                                ant = aux.getAnticipacion();
                            }
                            this.elementosLALR.add(new ElementosLALR(producciones.get(j),0, producciones.get(j).getConsec().get(0).getNombre(), ant));
                        }
                        j++;
                    }
                }
            }
            i++;
        }
        if(tam != this.elementosLALR.size()){
            do{
                i=tam;
                tam = this.elementosLALR.size();
                while (i < tam){
                    if(this.elementosLALR.get(i).getPosicion() != this.elementosLALR.get(i).getProduc().getConsec().size()){
                        if(this.gramatica.isNoTerminal(this.
                            elementosLALR.get(i).getProduc().getConsec
                            ().get(this.elementosLALR.get(i).
                            getPosicion()).getNombre())){
                            int j=0;
                            simbolo = this.elementosLALR.get(i).
                                getProduc().getConsec().get(this.
                                elementosLALR.get(i).getPosicion()).
                                getNombre();
                            aux = this.elementosLALR.get(i);
                            while(j < producciones.size()){
                                if(simbolo.equals(producciones.get(j).
                                    getAntec().getSimboloNT().getNombre
                                    ())){
                                    ant = new ArrayList();
                                    if(calcularAnt(aux)!=null){
                                        ant = calcularAnt(aux);
                                    }else{
                                        ant = aux.getAnticipacion();
                                    }
                                    this.elementosLALR.add(new
                                        ElementosLALR(producciones.get(
                                        j),0, producciones.get(j).
                                        getConsec().get(0).getNombre(),
                                         ant));
                                }
                                j++;
                            }
                        }
                    }
                    i++;
                }
            }while(tam > this.elementosLALR.size());
        }
        this.agrupamos(this.elementosLALR);
    }

    void construir(){
        ArrayList<ElementosLALR> elementos = this.conj.getElementosLALR
            ();
        ArrayList<String> simb = new ArrayList();
        ArrayList<Produccion> producciones = new ArrayList();
        producciones = this.gramatica.getPr();
        String simbolo = new String();
        ArrayList<String> ant = new ArrayList();
        ElementosLALR aux = new ElementosLALR();
        ArrayList<ElementosLALR> elem = new ArrayList();

        int j=0;
        while(j<elementos.size()){
            ElementosLALR el = new ElementosLALR(elementos.get(j).
                getProduc(),elementos.get(j).getPosicion(),elementos.
                get(j).getPivote(), elementos.get(j).getAnticipacion())
                ;
            if(elementos.get(j).getProduc().getConsec().get(0).getNombre().equals("\u03b5")){
                    el.setPosicion(el.getPosicion()+1);
                    el.setPivote("");
            }
            if(el.getPivote().equals(this.simbolo)){

                    el.setPosicion(el.getPosicion()+1);

                String pivote=el.getPivote();
                ArrayList<Simbolo> consec = el.getProduc().getConsec();
                int k=0;
                simb = new ArrayList();

                if(el.posicion < consec.size()){ //Seleccionar pivote
                    if(consec.get(el.posicion -1).getNombre().equals( pivote) ){

                        el.setPivote(consec.get(el.getPosicion()).getNombre());

                        int m =0;
                        if(simb.size()==0){
                            simb.add(el.getPivote());
                        }else{
                            int encontrado = 0;
                            while(m< simb.size()){
                                if(simb.get(m).equals(el.getPivote())){
                                    encontrado = 1;
                                    break;
                                }else
                                    m++;
                            }
                            if(encontrado == 0){
                                simb.add(el.getPivote());
                            }
                        }
                        this.elementosLALR.add(new ElementosLALR(el.getProduc(),el.getPosicion(), el.getPivote(), el.getAnticipacion()));
                        if(simb.size() !=0)
                            elem.add(this.elementosLALR.get(this.elementosLALR.size()-1));
                    }
                }else{
                    el.setPivote("");
                    this.elementosLALR.add(new ElementosLALR(el.getProduc(),el.getPosicion(), el.getPivote(),el.getAnticipacion()));
                }
            }
            j++;
```

```java
        }

        int k =0;
        if(simb.size() != 0){
            while(k < simb.size()){
                simbolo = simb.get(k);
                aux = elem.get(k);
                ant = new ArrayList();
                ant = new ArrayList();
                if(calcularAnt(aux)!=null){
                    ant = calcularAnt(aux);
                }else{
                    ant = aux.getAnticipacion();
                }
                int i=1;
                while(i<producciones.size()){

                    if(simbolo.equals(producciones.get(i).getAntec().getSimboloNT().getNombre())){
                        if(producciones.get(i).getConsec().get(0).getNombre().equals("\u03b5")){
                            this.elementosLALR.add(new ElementosLALR(producciones.get(i),1, "",ant));
                        }else{
                            this.elementosLALR.add(new ElementosLALR(producciones.get(i),0, producciones.get(i).getConsec().get(0).getNombre(),ant));
                        }
                        elem.add(this.elementosLALR.get(this.elementosLALR.size()-1));
                        int l=0;
                        while(l < simb.size()){
                            if(!simb.get(k).equals(producciones.get(i).getConsec().get(0).getNombre())){
                                simb.add(producciones.get(i).getConsec().get(0).getNombre());
                                break;
                            }
                            l++;
                        }
                    }
                    i++;
                }
                k++;
            }
        }
    }

    public ArrayList<String> calcularAnt(ElementosLALR elemento){
        ArrayList<String> ant = new ArrayList();
        ArrayList<Simbolo> consec = elemento.getProduc().getConsec();
        ArrayList<NoTerminal> nterm = this.gramatica.getNoTerm();
        int posicion = elemento.getPosicion();
        if(posicion < consec.size()-1){
            Simbolo simbolo = consec.get(posicion+1);
            if(this.gramatica.isTerminal(simbolo.getNombre())){
                ant.add(simbolo.getNombre());
                return ant;
            }else{
                int j=0;
                while(j < nterm.size()){
                    if(nterm.get(j).getNombre().equals(simbolo.
                       getNombre())){
                        int k=0;
                        while(k < nterm.get(j).getPrimeros().size()){
                            ant.add(nterm.get(j).getPrimeros().get(k).
                                getNombre());
                            k++;
                        }
                        break;
                    }else{
                        j++;
                    }
                }
                return ant;
            }
        }else
            return null;
    }

    public void agrupamos(ArrayList<ElementosLALR> elementos){
        int i=1;
        ArrayList<ElementosLALR> elementosLR = new ArrayList();
        ElementosLALR iguales = new ElementosLALR();
        elementosLR.add(elementos.get(0));
        while(i < elementos.size()){
            ElementosLALR el = elementos.get(i);
            int j=0;
            while(j < elementosLR.size()){
                iguales = null;
                if(elementosLR.get(j).getPosicion() == el.getPosicion()
                    && el.getProduc().getConsec().size() ==
                   elementosLR.get(j).getProduc().getConsec().size()){
                    int x=0;
                    int ig=0;
                    while(x < el.getProduc().getConsec().size()){
                        if(!elementosLR.get(j).getProduc().getConsec().
                           get(x).getNombre().equals(el.getProduc().
                           getConsec().get(x).getNombre())){
                            break;
                        }else{
                            x++;
                            ig=1;
                        }
                    }
                    if(ig==1)
                        iguales = elementosLR.get(j);
                }
                if(iguales == null)
                    j++;
                else
                    break;
            }
            if(iguales == null){
                elementosLR.add(el);
            }else{
                ArrayList<String> ant = new ArrayList();
                int k=0;
                while(k < el.getAnticipacion().size()){
                    ant.add(el.getAnticipacion().get(k));
                    k++;
                }
                int l=0;
                while(l < iguales.getAnticipacion().size()){
                    ant.add(iguales.getAnticipacion().get(l));
                    l++;
                }
                int m=1;
                ArrayList<String> ant2 = new ArrayList();
                ant2.add(ant.get(0));
                while(m < ant.size()){
                    int n=0;
                    int enc = 0;
                    while(n < ant2.size()){
                        if(ant.get(m).equals(ant.get(n))){
                            enc = 1;
                            break;
                        }else
                            n++;
                    }
                    if(enc == 0)
                        ant2.add(ant.get(m));
                    m++;
                }
                elementosLR.set(j, new ElementosLALR(el.getProduc(),el.
                    getPosicion(), el.getPivote(), ant2));
            }
            i++;
        }
        this.setElementosLALR(elementosLR);
    }

    public ArrayList<ElementosLALR> getElementosLALR() {
        return elementosLALR;
    }

    public void setElementosLALR(ArrayList<ElementosLALR> elementosLALR
        ) {
```

```java
        this.elementosLALR = elementosLALR;
    }

    public int getI() {
        return i;
    }

    public void setI(int i) {
        this.i = i;
    }
}
```

2.4.5. ConjElementosLR0.java

```java
// SimAs / Editor
// ConjElementosLR0

package es.uco.simas.editor;

import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.util.gramatica.Produccion;
import es.uco.simas.util.gramatica.Simbolo;
import java.util.ArrayList;

/**
 * @author vanesa
 */
public class ConjElementosLR0 {
    ArrayList<ElementosLR0> elementosLR0 = new ArrayList();
    int i; // numero de iteracion
    int col; //coleccion con la que se calcula
    String simbolo = "";
    Gramatica gramatica;
    ConjElementosLR0 conj;

    public ConjElementosLR0(Gramatica gramatica){
        this.gramatica = gramatica;
        this.primero();
    }

    public ConjElementosLR0(int i, int col, String simbolo,
        ConjElementosLR0 conj, Gramatica gr){
        this.i = i;
        this.col = col;
        this.simbolo = simbolo;
        this.conj = conj;
        this.gramatica = gr;
        this.elementosLR0 = new ArrayList();
        this.construir();
    }

    public ConjElementosLR0(int i, int col, String simbolo){
        this.i = i;
        this.col = col;
        this.simbolo = simbolo;
    }

    void primero(){
        ArrayList<Produccion> producciones = this.gramatica.getPr();
        ArrayList<String> simb = new ArrayList();
        Produccion prod = producciones.get(0);

        this.elementosLR0.add(new ElementosLR0(prod,0,prod.getConsec().
            get(0).getNombre()));

        String simbolo = prod.getConsec().get(0).getNombre();
        int i=1;
        while(i<producciones.size()){
            if(simbolo.equals(producciones.get(i).getAntec().
                getSimboloNT().getNombre())){
                if(producciones.get(i).getConsec().get(0).getNombre().
                    equals(”\u03b5”)){
                    this.elementosLR0.add(new ElementosLR0(producciones
                        .get(i),1, ””));
                }else{
                    this.elementosLR0.add(new ElementosLR0(producciones
                        .get(i),0, producciones.get(i).getConsec().get
                        (0).getNombre()));
                }
            }
            i++;
        }
        i=1;
        while(i<this.elementosLR0.size()){
            if(!this.elementosLR0.get(i).getPivote().equals(simbolo)){
                int k =0;
                if(simb.size()==0){
                    simb.add(this.elementosLR0.get(i).getPivote());
                }else{
                    int encontrado = 0;
                    while(k< simb.size()){
                        if(simb.get(k).equals(this.elementosLR0.get(i).
                            getPivote())){
                            encontrado = 1;
                            break;
                        }else
                            k++;
                    }
                    if(encontrado ==0){
                        simb.add(this.elementosLR0.get(i).getPivote());
                    }
                }
            }
            i++;
        }

        int k =0;
        if(simb.size() != 0){
            while(k < simb.size()){
                simbolo = simb.get(k);
                i=1;
                while(i<producciones.size()){
                    if(simbolo.equals(producciones.get(i).getAntec().
                        getSimboloNT().getNombre())){
                        if(producciones.get(i).getConsec().get(0).
                            getNombre().equals(”\u03b5”)){
                            this.elementosLR0.add(new ElementosLR0(
                                producciones.get(i),1, ””));
                        }else{
                            this.elementosLR0.add(new ElementosLR0(
                                producciones.get(i),0, producciones.get
                                (i).getConsec().get(0).getNombre()));
                        }
                        int l=0;
                        int encontrado =0;
                        while(l < simb.size()){
                            if(simb.get(l).equals(producciones.get(i).
                                getConsec().get(0).getNombre())){
                                encontrado = 1;
                                break;
                            }else{
                                encontrado = 0;
                                l++;
                            }
                        }
                        if(encontrado == 0){
                            simb.add(producciones.get(i).getConsec().
                                get(0).getNombre());
                        }
                    }
                    i++;
                }
                k++;
            }
        }
    }

    void construir(){
        ArrayList<ElementosLR0> elementos = this.conj.getElementosLR0()
            ;
        ArrayList<String> simb = new ArrayList();
        ArrayList<Produccion> producciones = new ArrayList();
        producciones = this.gramatica.getPr();
        String simbolo = new String();
        int j=0;
        while(j<elementos.size()){
            ElementosLR0 el = new ElementosLR0(elementos.get(j).getProduc(),elementos.get(j).getPosicion(),elementos.get(j).getPivote());
             if(elementos.get(j).getProduc().getConsec().get(0).getNombre().equals(”\u03b5”)){
                    el.setPosicion(el.getPosicion()+1);
                    el.setPivote(””);
            }

            if(el.getPivote().equals(this.simbolo)){
                el.setPosicion(el.getPosicion()+1);
                String pivote = el.getPivote();
                ArrayList<Simbolo> consec = el.getProduc().getConsec();
                int k=0;

                if(el.posicion < consec.size()){ //Seleccionar pivote
                    if(consec.get(el.posicion-1).getNombre().equals(pivote)){
                        el.setPivote(consec.get(el.getPosicion()).getNombre());
                        int m =0;
                        if(simb.size()==0){
                            simb.add(el.getPivote());
                        }else{
                            int encontrado = 0;
                            while(m< simb.size()){
                                if(simb.get(m).equals(el.getPivote())){
                                    encontrado = 1;
                                    break;
                                }else
                                    m++;
                            }
                            if(encontrado == 0){
                                simb.add(el.getPivote());
                            }
                        }

                         this.elementosLR0.add(new ElementosLR0(el.getProduc(),el.getPosicion(), el.getPivote()));
                    }
                }else{
                    el.setPivote(””);

                    el.setPivote(””);
                    this.elementosLR0.add(new ElementosLR0(el.getProduc(),el.getPosicion(), el.getPivote()));
                 }
            }
            j++;
        }
        int k =0;
        if(simb.size() != 0){
```

```java
            while(k < simb.size()){
                simbolo = simb.get(k);
                int i=1;
                while(i<producciones.size()){

                    if(simbolo.equals(producciones.get(i).getAntec().getSimboloNT().getNombre())){
                        if(producciones.get(i).getConsec().get(0).getNombre().equals("\u03b5")){
                            this.elementosLR0.add(new ElementosLR0(producciones.get(i),1, ""));
                        }else{
                            this.elementosLR0.add(new ElementosLR0(producciones.get(i),0, producciones.get(i).getConsec().get(0).getNombre()));
                        }

                        int l=0;
                        while(l < simb.size()){
                            if(!simb.get(k).equals(producciones.get(i).getConsec().get(0).getNombre())){
                                simb.add(producciones.get(i).getConsec().get(0).getNombre());
                                break;
                            }
                            l++;
                        }
                    }
                    i++;
                }
                k++;
            }
        }
    }

    public ArrayList<ElementosLR0> getElementosLR0() {
        return elementosLR0;
    }

    public void setElementosLR0(ArrayList<ElementosLR0> elementosLR0) {
        this.elementosLR0 = elementosLR0;
    }

    public int getI() {
        return i;
    }

    public void setI(int i) {
        this.i = i;
    }
}
```

2.4.6. ConjElementosLR1.java

```
// SimAs  / Editor
// ConjElementosLR1

package es.uco.simas.editor;

import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.util.gramatica.NoTerminal;
import es.uco.simas.util.gramatica.Produccion;
import es.uco.simas.util.gramatica.Simbolo;
import java.util.ArrayList;

/**
 * @author vanesa
 */
public class ConjElementosLR1 {
    ArrayList<ElementosLR1> elementosLR1 = new ArrayList();
    Gramatica gramatica;
    int i; // numero de iteracion
    int col; //coleccion con la que se calcula
    String simbolo = "";
    ConjElementosLR1 conj;
    int v=-1;
    int y;

    public ConjElementosLR1(){

    }

    public ConjElementosLR1(Gramatica gramatica){
        this.gramatica = gramatica;
        this.primero();
    }

    public ConjElementosLR1(int i, int col, String simbolo,
       ConjElementosLR1 conj, Gramatica gr){
        this.i = i;
        this.col = col;
        this.simbolo = simbolo;
        this.conj = conj;
        this.gramatica = gr;
        this.elementosLR1 = new ArrayList();
        this.construir();
    }
    public ConjElementosLR1(int i, int col, String simbolo){
        this.i = i;
        this.col = col;
        this.simbolo = simbolo;
    }

    void primero(){
        ArrayList<Produccion> producciones = this.gramatica.getPr();
        ArrayList<String> simb = new ArrayList();
        Produccion prod = producciones.get(0);
        ArrayList<String> ant = new ArrayList();
        ElementosLR1 aux = new ElementosLR1();
        ant.add(”$”);

        //S' -> .S, $
        this.elementosLR1.add(new ElementosLR1(prod,0,prod.getConsec().get(0).getNombre(), ant));
        aux = this.elementosLR1.get(this.elementosLR1.size()-1);

        String simbolo = prod.getConsec().get(0).getNombre();
        int i=1;
        while(i<producciones.size()){
            ant = new ArrayList();
            if(simbolo.equals(producciones.get(i).getAntec().getSimboloNT().getNombre())){
                if(calcularAnt(aux)!=null){
                    ant = calcularAnt(aux);
                }else{
                    ant = aux.getAnticipacion();
                }
                if(producciones.get(i).getConsec().get(0).getNombre().equals(”\u03b5”)){
                    this.elementosLR1.add(new ElementosLR1(producciones.get(i),1, ””,ant));
                }else{
                    this.elementosLR1.add(new ElementosLR1(producciones.get(i),0, producciones.get(i).getConsec().get(0).getNombre(),ant));
                }
            }
            i++;
        }
        i=1;
        int tam = this.elementosLR1.size();
        while (i < tam){
            if(this.elementosLR1.get(i).getPosicion() != this.elementosLR1.get(i).getProduc().getConsec().size()){
                if(this.gramatica.isNoTerminal(this.elementosLR1.get(i).getProduc().getConsec().get(this.elementosLR1.get(i).getPosicion()).getNombre())){
                    int j=0;
                    simbolo = this.elementosLR1.get(i).getProduc().getConsec().get(this.elementosLR1.get(i).getPosicion()).getNombre();
                    aux = this.elementosLR1.get(i);
                    while(j < producciones.size()){
                        if(simbolo.equals(producciones.get(j).getAntec().getSimboloNT().getNombre())){
                            ant = new ArrayList();
                            if(calcularAnt(aux)!=null){
                                ant = calcularAnt(aux);
                            }else{
                                ant = aux.getAnticipacion();
                            }
                            if(producciones.get(j).getConsec().get(0).
                               getNombre().equals(”\u03b5”)){
                                this.elementosLR1.add(new ElementosLR1(
                                   producciones.get(j),1, ””, ant));
                            }else{
                                this.elementosLR1.add(new ElementosLR1(
                                   producciones.get(j),0, producciones
                                   .get(j).getConsec().get(0).
                                   getNombre(), ant));
                            }
                        }
                        j++;
                    }
                }
            }
            i++;
        }
        if(tam != this.elementosLR1.size()){
            do{
                i=tam;
                tam = this.elementosLR1.size();
                while (i < tam){
                    if(this.elementosLR1.get(i).getPosicion() != this.
                       elementosLR1.get(i).getProduc().getConsec().
                       size()){
                        if(this.gramatica.isNoTerminal(this.
                           elementosLR1.get(i).getProduc().getConsec()
                           .get(this.elementosLR1.get(i).getPosicion()
                           ).getNombre())){
                            int j=0;
                            simbolo = this.elementosLR1.get(i).
                               getProduc().getConsec().get(this.
                               elementosLR1.get(i).getPosicion()).
                               getNombre();
                            aux = this.elementosLR1.get(i);
                            while(j < producciones.size()){
                                if(simbolo.equals(producciones.get(j).
                                   getAntec().getSimboloNT().getNombre
                                   ())){
                                    ant = new ArrayList();
                                    if(calcularAnt(aux)!=null){
                                        ant = calcularAnt(aux);
                                    }else{
                                        ant = aux.getAnticipacion();
                                    }
                                    if(producciones.get(j).getConsec().
                                       get(0).getNombre().equals(”\
                                       u03b5”)){
                                        this.elementosLR1.add(new
                                           ElementosLR1(producciones.
                                           get(j),1, "", ant));
                                    }else{
                                        this.elementosLR1.add(new
                                           ElementosLR1(producciones.
                                           get(j),0, producciones.get(
                                           j).getConsec().get(0).
                                           getNombre(), ant));
                                    }
                                }
                                j++;
                            }
                        }
                    }
                    i++;
                }
            }while(tam > this.elementosLR1.size());
        }
        this.agrupamos(this.elementosLR1);
    }

    void construir(){
        ArrayList<ElementosLR1> elementos = this.conj.getElementosLR1()
           ;
        ArrayList<String> simb = new ArrayList();
        ArrayList<Produccion> producciones = new ArrayList();
        producciones = this.gramatica.getPr();
        String simbolo = new String();
        ArrayList<String> ant = new ArrayList();
        ElementosLR1 aux = new ElementosLR1();
        ArrayList<ElementosLR1> elem = new ArrayList();

        int j=0;
        while(j<elementos.size()){
            ElementosLR1 el = new ElementosLR1(elementos.get(j).
               getProduc(),elementos.get(j).getPosicion(),elementos.
               get(j).getPivote(), elementos.get(j).getAnticipacion())
               ;
            if(elementos.get(j).getProduc().getConsec().get(0).
               getNombre().equals("\u03b5")){
                    el.setPosicion(el.getPosicion()+1);
                    el.setPivote("");
            }
            if(el.getPivote().equals(this.simbolo)){

                    el.setPosicion(el.getPosicion()+1);

                String pivote=el.getPivote();
                ArrayList<Simbolo> consec = el.getProduc().getConsec();
                int k=0;
                simb = new ArrayList();

                if(el.posicion < consec.size()){ //Seleccionar pivote
```

```
                    if(consec.get(el.posicion -1).getNombre().equals(pivote) ){

                        el.setPivote(consec.get(el.getPosicion()).getNombre());

                        int m =0;
                        if(simb.size()==0){
                            simb.add(el.getPivote());
                        }else{
                            int encontrado = 0;
                            while(m< simb.size()){
                                if(simb.get(m).equals(el.getPivote())){
                                    encontrado = 1;
                                    break;
                                }else
                                    m++;
                            }
                            if(encontrado == 0){
                                simb.add(el.getPivote());
                            }
                        }
                        this.elementosLR1.add(new ElementosLR1(el.getProduc(),el.getPosicion(), el.getPivote(), el.getAnticipacion()));
                        if(simb.size() !=0)
                            elem.add(this.elementosLR1.get(this.elementosLR1.size()-1));
                    }
                }else{
                    el.setPivote("");
                    this.elementosLR1.add(new ElementosLR1(el.getProduc(),el.getPosicion(), el.getPivote(),el.getAnticipacion()));
                }
            }
            j++;
        }
            int prueba=0;
        int k =0;
        if(simb.size() != 0){
            while(k < simb.size()){
                simbolo = simb.get(k);
                aux = elem.get(k);
                ant = new ArrayList();
                ArrayList<String> ant2 = new ArrayList();

                if(calcularAnt(aux)!=null){
                    ant = calcularAnt(aux);
                }else{
                    ant = aux.getAnticipacion();
                }
                int i=1;
                while(i<producciones.size()){
                    if(simbolo.equals(producciones.get(i).getAntec().getSimboloNT().getNombre())){
                        if(producciones.get(i).getConsec().get(0).getNombre().equals(”\u03b5”)){
                            this.elementosLR1.add(new ElementosLR1(producciones.get(i),1, ””,ant));
                        }else{
                            this.elementosLR1.add(new ElementosLR1(producciones.get(i),0, producciones.get(i).getConsec().get(0).getNombre(),ant));
                        }
                        if(this.gramatica.isNoTerminal(producciones.get(i).getConsec().get(0).getNombre())){
                            if(prueba <1){
                                elem.add(this.elementosLR1.get(this.elementosLR1.size()-1));
                                simb.add(producciones.get(i).getConsec().get(0).getNombre());
                                prueba++;
                            }
                        }
                    }
                    i++;
                }
                k++;
            }
        }
        this.agrupamos(this.elementosLR1);
    }

    public ArrayList<String> calcularAnt(ElementosLR1 elemento){//Produccion produccion, int posicion){
        ArrayList<String> ant = new ArrayList();
        ArrayList<Simbolo> consec = elemento.getProduc().getConsec();
        ArrayList<NoTerminal> nterm = this.gramatica.getNoTerm();
        int posicion = elemento.getPosicion();
        if(posicion < consec.size()-1){
            Simbolo simbolo = consec.get(posicion+1);
            if(this.gramatica.isTerminal(simbolo.getNombre())){
                ant.add(simbolo.getNombre());
                return ant;
            }else{
                int j=0;
                while(j < nterm.size()){
                    if(nterm.get(j).getNombre().equals(simbolo.getNombre())){
                        int k=0;
                        while(k < nterm.get(j).getPrimeros().size()){
                            ant.add(nterm.get(j).getPrimeros().get(k).getNombre());
                            k++;
                        }
                        break;
                    }else{
                        j++;
                    }
                }
                return ant;
            }
        }else
            return null;
    }

    public void agrupamos(ArrayList<ElementosLR1> elementos){
        int i=1;
        ArrayList<ElementosLR1> elementosLR = new ArrayList();
        ElementosLR1 iguales = new ElementosLR1();
        elementosLR.add(elementos.get(0));
        while(i < elementos.size()){
            ElementosLR1 el = elementos.get(i);
            int j=0;
            while(j < elementosLR.size()){
                iguales = null;
                if(elementosLR.get(j).getPosicion() == el.getPosicion()
                    && el.getProduc().getConsec().size() ==
                   elementosLR.get(j).getProduc().getConsec().size()){
                    int x=0;
                    int ig=0;
                    while(x < el.getProduc().getConsec().size()){
                        if(!elementosLR.get(j).getProduc().getConsec().
                           get(x).getNombre().equals(el.getProduc().
                           getConsec().get(x).getNombre())){
                            break;
                        }else{
                            x++;
                            ig=1;
                        }
                    }
                    if(ig==1)
                        iguales = elementosLR.get(j);
                }
                if(iguales == null)
                    j++;
                else
                    break;
            }

            if(iguales == null){
                elementosLR.add(el);
            }else{
                ArrayList<String> ant = new ArrayList();
                int k=0;
                while(k < el.getAnticipacion().size()){
                    ant.add(el.getAnticipacion().get(k));
```

```java
                    k++;
                }
                int l=0;
                while(l < iguales.getAnticipacion().size()){
                    ant.add(iguales.getAnticipacion().get(l));
                    l++;
                }
                int m=1;
                ArrayList<String> ant2 = new ArrayList();
                ant2.add(ant.get(0));
                while(m < ant.size()){
                    int n=0;
                    int enc = 0;
                    while(n < ant2.size()){
                        if(ant.get(m).equals(ant.get(n))){
                            enc = 1;
                            break;
                        }else
                            n++;
                    }
                    if(enc == 0)
                        ant2.add(ant.get(m));
                    m++;
                }
                elementosLR.set(j, new ElementosLR1(el.getProduc(),el.getPosicion(), el.getPivote(), ant2));
            }
            i++;
        }
        this.setElementosLR1(elementosLR);
    }

    public ArrayList<ElementosLR1> getElementosLR1() {
        return elementosLR1;
    }

    public void setElementosLR1(ArrayList<ElementosLR1> elementosLR1) {
        this.elementosLR1 = elementosLR1;
    }

    public int getI() {
        return i;
    }

    public void setI(int i) {
        this.i = i;
    }

    public int getV() {
        return v;
    }

    public void setV(int v) {
        this.v = v;
    }

    public int getY() {
        return y;
    }

    public void setY(int y) {
        this.y = y;
    }
}
```

2.4.7. Editor.java

```
//SimAS / Editor
//Editor

package es.uco.simas.editor;

import javax.swing.JOptionPane;
import es.uco.simas.util.gramatica.*;
import java.util.logging.Level;
import java.util.logging.Logger;
import java.util.ArrayList;
import com.itextpdf.text.DocumentException;
import es.uco.simas.centroayuda.AcercaDe;
import es.uco.simas.simulador.VentanaSimuladorAsc;
import es.uco.simas.simulador.VentanaSimuladorDesc;
import java.io.File;
import javax.swing.DefaultListModel;
import javax.swing.JFileChooser;
import javax.swing.filechooser.FileNameExtensionFilter;

/**
 * @author vanesa
 */
public class Editor extends javax.swing.JFrame {
   Gramatica gramatica = crearGramatica();
   Editor ancestor ;

   public Editor(){
       initComponents();

       this.jMenuItemAsc.setEnabled(false);
       this.jMenuItemDesc.setEnabled(false);
       this.jPanel2.setVisible(false);
       this.jButtonEditar.setEnabled(false);
       this.jButtonEliminar.setEnabled(false);
       this.jButtonGuardar.setEnabled(false);
       this.jButtonSimDesc.setEnabled(false);
```

```
        this.jMenuItemCerrar.setEnabled(false);
        this.jMenuItemEditar.setEnabled(false);
        this.jMenuItemGuardar.setEnabled(false);
        this.jButtonValidar.setEnabled(false);
        this.jMenuItemValidar.setEnabled(false);
        this.jButtonpdf.setEnabled(false);
        this.jLabelEstado.setEnabled(false);
        this.jButton1SimAsc.setEnabled(false);
        this.jButtonSimDesc.setEnabled(false);
        this.jMenuItemAsc.setEnabled(false);
        this.jMenuItemDesc.setEnabled(false);
    }

     public Editor(Gramatica gr) {

         this.gramatica = gr;
         DefaultListModel model = this.gramatica.getProducciones();
         DefaultListModel model2 = new DefaultListModel();
         initComponents();
         DefaultListModel noTerminales = new DefaultListModel();
         ArrayList<NoTerminal> noTerm = this.gramatica.getNoTerm();

        this.jButton1SimAsc.setEnabled(false);
        this.jButtonSimDesc.setEnabled(false);
        this.jMenuItemAsc.setEnabled(false);
        this.jMenuItemDesc.setEnabled(false);
        this.jButtonEditar.setEnabled(true);
        this.jButtonEliminar.setEnabled(true);
        this.jButtonGuardar.setEnabled(true);
        this.jMenuItemCerrar.setEnabled(true);
        this.jMenuItemEditar.setEnabled(true);
        this.jMenuItemGuardar.setEnabled(true);
        this.jButtonValidar.setEnabled(true);
        this.jMenuItemValidar.setEnabled(true);
        if(gr.getEstado()==1){
            this.jLabelEstado.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/aceptar.png”)));
            this.jLabelEstado.setText(”La gramÃ¡tica estÃ¡ validada”);
            this.jButton1SimAsc.setEnabled(true);
            this.jButtonSimDesc.setEnabled(true);
            this.jMenuItemAsc.setEnabled(true);
            this.jMenuItemDesc.setEnabled(true);
        }else {
            this.jLabelEstado.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/cancelar.png”)));
            this.jLabelEstado.setText(”La gramÃ¡tica no estÃ¡ validada”);
            this.jButton1SimAsc.setEnabled(false);
            this.jButtonSimDesc.setEnabled(false);
        }

         this.jTextFieldNombre.setText(this.gramatica.getNombre());
         this.jTextAreaDesc.setText(this.gramatica.getDescripcion());
         this.jTextAreaDesc.setLineWrap(true);
         this.jTextAreaDesc.setWrapStyleWord(true);
         if(this.gramatica.getSimbInicial()!=null)
             this.jTextFieldSI.setText(this.gramatica.getSimbInicial());
         if(this.gramatica.getNoTerminales()!= null){
             int v=0;
             while(v < noTerm.size()){
                 noTerminales.addElement(noTerm.get(v).getNombre());
                 v++;
             }
             this.jListNT.setModel(noTerminales);
         }
         if(this.gramatica.getTerminales() != null)
             this.jListT.setModel(this.gramatica.getTerminales());
         if(this.gramatica.getProducciones() != null){
             int i =0;
             Object obj;
             obj = "P {";
             model2.addElement(obj);
             while (i < model.size()){
                 obj = "    "+(i+1)+")    "+model.getElementAt(i);
                 model2.addElement(obj);
                 i++;
             }
             obj ="}";
             model2.addElement(obj);
             this.jListProd.setModel(model2);
         }
     }

     /**
      * This method is called from within the constructor to initialize the form.
      * WARNING: Do NOT modify this code. The content of this method is always
      * regenerated by the Form Editor.
      */
     @SuppressWarnings("unchecked")
     // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
     private void initComponents() {

         jPanel1 = new javax.swing.JPanel();
         jToolBar1 = new javax.swing.JToolBar();
         jButtonAnadir = new javax.swing.JButton();
         jButtonAbrir = new javax.swing.JButton();
         jButtonGuardar = new javax.swing.JButton();
         jButtonEditar = new javax.swing.JButton();
         jButtonEliminar = new javax.swing.JButton();
         jButtonValidar = new javax.swing.JButton();
         jButtonpdf = new javax.swing.JButton();
         jSeparator1 = new javax.swing.JToolBar.Separator();
         jButtonSimDesc = new javax.swing.JButton();
         jButton1SimAsc = new javax.swing.JButton();
         jSeparator2 = new javax.swing.JToolBar.Separator();
         jButton2 = new javax.swing.JButton();
         jPanel2 = new javax.swing.JPanel();
         jLabelNom = new javax.swing.JLabel();
         jLabelDesc = new javax.swing.JLabel();
         jLabel1 = new javax.swing.JLabel();
         jScrollPane1 = new javax.swing.JScrollPane();
         jListNT = new javax.swing.JList();
         jLabel2 = new javax.swing.JLabel();
         jScrollPane2 = new javax.swing.JScrollPane();
         jListT = new javax.swing.JList();
         jLabel3 = new javax.swing.JLabel();
         jLabel4 = new javax.swing.JLabel();
         jScrollPane3 = new javax.swing.JScrollPane();
         jListProd = new javax.swing.JList();
         jTextFieldNombre = new javax.swing.JTextField();
         jTextFieldSI = new javax.swing.JTextField();
         jScrollPane4 = new javax.swing.JScrollPane();
         jTextAreaDesc = new javax.swing.JTextArea();
         jLabelEstado = new javax.swing.JLabel();
         jMenuBar1 = new javax.swing.JMenuBar();
         jMenuEditor = new javax.swing.JMenu();
         jMenuItemNuevo = new javax.swing.JMenuItem();
         jMenuItemAbrir = new javax.swing.JMenuItem();
         jMenuItemGuardar = new javax.swing.JMenuItem();
         jMenuItemEditar = new javax.swing.JMenuItem();
         jMenuItemCerrar = new javax.swing.JMenuItem();
         jMenuItemValidar = new javax.swing.JMenuItem();
         jMenuItemSalir = new javax.swing.JMenuItem();
         jMenuSimulador = new javax.swing.JMenu();
         jMenuItemDesc = new javax.swing.JMenuItem();
         jMenuItemAsc = new javax.swing.JMenuItem();
         jMenuAyuda = new javax.swing.JMenu();
         jMenuItem1 = new javax.swing.JMenuItem();
         jMenuItem2 = new javax.swing.JMenuItem();

         setDefaultCloseOperation(javax.swing.WindowConstants.
             DISPOSE_ON_CLOSE);
         setTitle(”Editor GramÃ¡tica Contexto Libre”);
         setCursor(new java.awt.Cursor(java.awt.Cursor.DEFAULT_CURSOR));

         jPanel1.setBackground(new java.awt.Color(233, 244, 244));

         jToolBar1.setRollover(true);

         jButtonAnadir.setIcon(new javax.swing.ImageIcon(getClass().
             getResource(”/es/uco/simas/resources/nueva.png”))); //
             NOI18N
         jButtonAnadir.setToolTipText(”Nueva GramÃ¡tica”);
         jButtonAnadir.setFocusable(false);
         jButtonAnadir.setHorizontalTextPosition(javax.swing.SwingConstants.CENTER);
         jButtonAnadir.setVerticalTextPosition(javax.swing.SwingConstants.BOTTOM);
         jButtonAnadir.addActionListener(new java.awt.event.ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt) {
                 jButtonAnadirActionPerformed(evt);
             }
         });
         jToolBar1.add(jButtonAnadir);

         jButtonAbrir.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/abrir.png"))); // NOI18N
         jButtonAbrir.setToolTipText("Abrir GramÃ¡tica");
         jButtonAbrir.setFocusable(false);
         jButtonAbrir.setHorizontalTextPosition(javax.swing.SwingConstants.CENTER);
         jButtonAbrir.setVerticalTextPosition(javax.swing.SwingConstants.BOTTOM);
         jButtonAbrir.addActionListener(new java.awt.event.ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt) {
                 jButtonAbrirActionPerformed(evt);
             }
         });
         jToolBar1.add(jButtonAbrir);

         jButtonGuardar.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/guardar.png"))); // NOI18N
         jButtonGuardar.setToolTipText("Guardar GramÃ¡tica");
         jButtonGuardar.setFocusable(false);
         jButtonGuardar.setHorizontalTextPosition(javax.swing.SwingConstants.CENTER);
         jButtonGuardar.setVerticalTextPosition(javax.swing.SwingConstants.BOTTOM);
         jButtonGuardar.addActionListener(new java.awt.event.ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt) {
                 jButtonGuardarActionPerformed(evt);
             }
         });
         jToolBar1.add(jButtonGuardar);

         jButtonEditar.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/editar.png"))); // NOI18N
         jButtonEditar.setToolTipText("Editar GramÃ¡tica");
         jButtonEditar.setFocusable(false);
         jButtonEditar.setHorizontalTextPosition(javax.swing.
             SwingConstants.CENTER);
         jButtonEditar.setVerticalTextPosition(javax.swing.
             SwingConstants.BOTTOM);
         jButtonEditar.addActionListener(new java.awt.event.
             ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt)
                  {
                 jButtonEditarActionPerformed(evt);
             }
         });
         jToolBar1.add(jButtonEditar);

         jButtonEliminar.setIcon(new javax.swing.ImageIcon(getClass().
             getResource("/es/uco/simas/resources/eliminar.png"))); //
             NOI18N
         jButtonEliminar.setToolTipText("Cerrar GramÃ¡tica");
         jButtonEliminar.setFocusable(false);
         jButtonEliminar.setHorizontalTextPosition(javax.swing.
             SwingConstants.CENTER);
         jButtonEliminar.setVerticalTextPosition(javax.swing.
             SwingConstants.BOTTOM);
         jButtonEliminar.addActionListener(new java.awt.event.
             ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt)
                  {
                 jButtonEliminarActionPerformed(evt);
             }
         });
         jToolBar1.add(jButtonEliminar);

         jButtonValidar.setIcon(new javax.swing.ImageIcon(getClass().
             getResource("/es/uco/simas/resources/validar.png"))); //
             NOI18N
         jButtonValidar.setToolTipText("Validar Gramatica");
         jButtonValidar.setFocusable(false);
         jButtonValidar.setHorizontalTextPosition(javax.swing.
             SwingConstants.CENTER);
         jButtonValidar.setVerticalTextPosition(javax.swing.
             SwingConstants.BOTTOM);
         jButtonValidar.addActionListener(new java.awt.event.
             ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt)
                  {
                 jMenuItemValidarActionPerformed(evt);
             }
         });
         jToolBar1.add(jButtonValidar);

         jButtonpdf.setIcon(new javax.swing.ImageIcon(getClass().
             getResource("/es/uco/simas/resources/informeGr.png"))); //
             NOI18N
         jButtonpdf.setToolTipText("Informe GramÃ¡tica");
         jButtonpdf.setFocusable(false);
         jButtonpdf.setHorizontalTextPosition(javax.swing.SwingConstants.CENTER);
         jButtonpdf.setVerticalTextPosition(javax.swing.SwingConstants.BOTTOM);
         jButtonpdf.addActionListener(new java.awt.event.ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt) {
                 jButtonpdfActionPerformed(evt);
             }
         });
         jToolBar1.add(jButtonpdf);
         jToolBar1.add(jSeparator1);

         jButtonSimDesc.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/simularDesc.png"))); // NOI18N
         jButtonSimDesc.setMnemonic('S');
         jButtonSimDesc.setToolTipText("Simulacion Descendente");
         jButtonSimDesc.setFocusable(false);
         jButtonSimDesc.setHorizontalTextPosition(javax.swing.SwingConstants.CENTER);
         jButtonSimDesc.setVerticalTextPosition(javax.swing.SwingConstants.BOTTOM);
         jButtonSimDesc.addActionListener(new java.awt.event.ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt) {
                 jButtonSimDescActionPerformed(evt);
             }
         });
         jToolBar1.add(jButtonSimDesc);

         jButton1SimAsc.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/simularAsc.png"))); // NOI18N
         jButton1SimAsc.setMnemonic('S');
         jButton1SimAsc.setToolTipText("Simulacion Ascendente");
         jButton1SimAsc.setFocusable(false);
         jButton1SimAsc.setHorizontalTextPosition(javax.swing.SwingConstants.CENTER);
         jButton1SimAsc.setVerticalTextPosition(javax.swing.SwingConstants.BOTTOM);
         jButton1SimAsc.addActionListener(new java.awt.event.ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt) {
                 jButton1SimAscActionPerformed(evt);
             }
         });
         jToolBar1.add(jButton1SimAsc);
         jToolBar1.add(jSeparator2);

         jButton2.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/salir.png"))); // NOI18N
         jButton2.setToolTipText("Salir");
         jButton2.setFocusable(false);
         jButton2.setHorizontalTextPosition(javax.swing.SwingConstants.CENTER);
         jButton2.setVerticalTextPosition(javax.swing.SwingConstants.BOTTOM);
         jButton2.addActionListener(new java.awt.event.ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt) {
                 jButton2ActionPerformed(evt);
             }
         });
         jToolBar1.add(jButton2);

         jPanel2.setBackground(new java.awt.Color(233, 244, 244));
         jPanel2.setOpaque(false);

         jLabelNom.setFont(new java.awt.Font("Ubuntu", 1, 15)); // NOI18N
         jLabelNom.setForeground(new java.awt.Color(33, 77, 72));
         jLabelNom.setText("Nombre: ");

         jLabelDesc.setFont(new java.awt.Font("Ubuntu", 1, 15)); // NOI18N
         jLabelDesc.setForeground(new java.awt.Color(33, 77, 72));
         jLabelDesc.setText("Descripcion: ");

         jLabel1.setFont(new java.awt.Font("Ubuntu", 1, 15)); // NOI18N
         jLabel1.setForeground(new java.awt.Color(33, 77, 72));
         jLabel1.setText("SÃmbolos No Terminales:");

         jScrollPane1.setViewportView(jListNT);

         jLabel2.setFont(new java.awt.Font("Ubuntu", 1, 15)); // NOI18N
         jLabel2.setForeground(new java.awt.Color(33, 77, 72));
         jLabel2.setText("SÃmbolos Terminales:");

         jScrollPane2.setViewportView(jListT);

         jLabel3.setFont(new java.awt.Font("Ubuntu", 1, 15)); // NOI18N
         jLabel3.setForeground(new java.awt.Color(33, 77, 72));
         jLabel3.setText("SÃmbolo inicial: ");

         jLabel4.setFont(new java.awt.Font("Ubuntu", 1, 15)); // NOI18N
         jLabel4.setForeground(new java.awt.Color(33, 77, 72));
         jLabel4.setText("Producciones:");

         jScrollPane3.setViewportView(jListProd);

         jTextFieldNombre.setEditable(false);

         jTextFieldSI.setEditable(false);

         jScrollPane4.setCursor(new java.awt.Cursor(java.awt.Cursor.
             DEFAULT_CURSOR));

         jTextAreaDesc.setEditable(false);
         jTextAreaDesc.setColumns(20);
         jTextAreaDesc.setRows(5);
         jScrollPane4.setViewportView(jTextAreaDesc);

         jLabelEstado.setText(”jLabel5”);

         javax.swing.GroupLayout jPanel2Layout = new javax.swing.
             GroupLayout(jPanel2);
         jPanel2.setLayout(jPanel2Layout);
         jPanel2Layout.setHorizontalGroup(
             jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.
                 Alignment.LEADING)
             .addGroup(jPanel2Layout.createSequentialGroup()
                 .addContainerGap()
                 .addGroup(jPanel2Layout.createParallelGroup(javax.swing
                     .GroupLayout.Alignment.LEADING)
                     .addGroup(jPanel2Layout.createSequentialGroup()
                         .addComponent(jScrollPane4)
                         .addContainerGap())
                     .addGroup(jPanel2Layout.createSequentialGroup()
                         .addGroup(jPanel2Layout.createParallelGroup(
                             javax.swing.GroupLayout.Alignment.LEADING)
                             .addGroup(jPanel2Layout.
                                 createSequentialGroup()
                                 .addComponent(jScrollPane1, javax.swing
                                     .GroupLayout.PREFERRED_SIZE, 319,
                                     javax.swing.GroupLayout.
                                     PREFERRED_SIZE)
                                 .addPreferredGap(javax.swing.
                                     LayoutStyle.ComponentPlacement.
                                     RELATED, javax.swing.GroupLayout.
                                     DEFAULT_SIZE, Short.MAX_VALUE)
                                 .addComponent(jScrollPane2, javax.swing
                                     .GroupLayout.PREFERRED_SIZE, 312,
                                     javax.swing.GroupLayout.
                                     PREFERRED_SIZE))
                             .addGroup(jPanel2Layout.
                                 createSequentialGroup()
                                 .addGroup(jPanel2Layout.
                                     createParallelGroup(javax.swing.
                                     GroupLayout.Alignment.LEADING)
                                     .addGroup(jPanel2Layout.
                                         createSequentialGroup()
                                         .addComponent(jLabelNom)
                                         .addGap(34, 34, 34)
                                         .addComponent(jTextFieldNombre,
                                              javax.swing.GroupLayout.
                                             PREFERRED_SIZE, 258, javax.
                                             swing.GroupLayout.
                                             PREFERRED_SIZE)
                                         .addGap(50, 50, 50)
                                         .addComponent(jLabelEstado))
                                     .addComponent(jLabelDesc)
                                     .addComponent(jLabel4)
                                     .addComponent(jScrollPane3, javax.
                                         swing.GroupLayout.
                                         PREFERRED_SIZE, 670, javax.
                                         swing.GroupLayout.
                                         PREFERRED_SIZE)
                                     .addGroup(jPanel2Layout.
                                         createSequentialGroup()
                                         .addComponent(jLabel3)
                                         .addPreferredGap(javax.swing.
                                             LayoutStyle.
                                             ComponentPlacement.RELATED)
                                         .addComponent(jTextFieldSI,
                                             javax.swing.GroupLayout.
                                             PREFERRED_SIZE, 137, javax.
                                             swing.GroupLayout.
                                             PREFERRED_SIZE)))
                                 .addGap(0, 0, Short.MAX_VALUE)))
                         .addContainerGap(javax.swing.GroupLayout.
                             DEFAULT_SIZE, Short.MAX_VALUE))
                     .addGroup(jPanel2Layout.createSequentialGroup()
                         .addComponent(jLabel1)
                         .addPreferredGap(javax.swing.LayoutStyle.
                             ComponentPlacement.RELATED, javax.swing.
                             GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                         .addComponent(jLabel2)
                         .addGap(0, 0, Short.MAX_VALUE))))
         );
         jPanel2Layout.setVerticalGroup(
             jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.
                 Alignment.LEADING)
             .addGroup(jPanel2Layout.createSequentialGroup()
                 .addContainerGap()
                 .addGroup(jPanel2Layout.createParallelGroup(javax.swing
                     .GroupLayout.Alignment.BASELINE)
                     .addComponent(jLabelNom)
                     .addComponent(jTextFieldNombre, javax.swing.
                         GroupLayout.PREFERRED_SIZE, javax.swing.
                         GroupLayout.DEFAULT_SIZE, javax.swing.
                         GroupLayout.PREFERRED_SIZE)
                     .addComponent(jLabelEstado))
                 .addPreferredGap(javax.swing.LayoutStyle.
                     ComponentPlacement.RELATED)
                 .addComponent(jLabelDesc)
                 .addGap(4, 4, 4)
                 .addComponent(jScrollPane4, javax.swing.GroupLayout.PREFERRED_SIZE, 77, javax.swing.GroupLayout.PREFERRED_SIZE)
                 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                 .addGroup(jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                     .addComponent(jLabel1)
                     .addComponent(jLabel2))
                 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                 .addGroup(jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                     .addGroup(jPanel2Layout.createSequentialGroup()
                         .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 144, javax.swing.GroupLayout.PREFERRED_SIZE)
                         .addGap(0, 0, Short.MAX_VALUE))
                     .addComponent(jScrollPane2))
                 .addGap(12, 12, 12)
                 .addGroup(jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                     .addComponent(jLabel3)
                     .addComponent(jTextFieldSI, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE))
                 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                 .addComponent(jLabel4)
                 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                 .addComponent(jScrollPane3, javax.swing.GroupLayout.PREFERRED_SIZE, 154, javax.swing.GroupLayout.PREFERRED_SIZE)
                 .addContainerGap())
         );

         javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
         jPanel1.setLayout(jPanel1Layout);
         jPanel1Layout.setHorizontalGroup(
             jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
             .addComponent(jToolBar1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
             .addGroup(jPanel1Layout.createSequentialGroup()
                 .addComponent(jPanel2, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                 .addContainerGap())
         );
         jPanel1Layout.setVerticalGroup(
             jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
             .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel1Layout.createSequentialGroup()
                 .addComponent(jToolBar1, javax.swing.GroupLayout.PREFERRED_SIZE, 35, javax.swing.GroupLayout.PREFERRED_SIZE)
                 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                 .addComponent(jPanel2, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)
                 .addContainerGap(184, Short.MAX_VALUE))
         );

         jMenuEditor.setMnemonic(’E’);
         jMenuEditor.setText(”Editor”);

         jMenuItemNuevo.setMnemonic(’N’);
         jMenuItemNuevo.setText(”Nueva GramÃ¡tica”);
         jMenuItemNuevo.addActionListener(new java.awt.event.ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt) {
                 jMenuItemNuevoActionPerformed(evt);
                 jButtonAnadirActionPerformed(evt);
             }
         });
         jMenuEditor.add(jMenuItemNuevo);

         jMenuItemAbrir.setMnemonic(’A’);
         jMenuItemAbrir.setText(”Abrir GramÃ¡tica”);
         jMenuItemAbrir.addActionListener(new java.awt.event.ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt) {
                 jButtonAbrirActionPerformed(evt);
             }
         });
         jMenuEditor.add(jMenuItemAbrir);

         jMenuItemGuardar.setText(”Guardar GramÃ¡tica”);
         jMenuItemGuardar.addActionListener(new java.awt.event.ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt) {
                 jButtonGuardarActionPerformed(evt);
             }
         });
         jMenuEditor.add(jMenuItemGuardar);

         jMenuItemEditar.setMnemonic('D');
         jMenuItemEditar.setText("Editar GramÃ¡tica");
         jMenuItemEditar.addActionListener(new java.awt.event.
             ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt)
                 {
                 jButtonEditarActionPerformed(evt);
             }
         });
         jMenuEditor.add(jMenuItemEditar);

         jMenuItemCerrar.setMnemonic('C');
         jMenuItemCerrar.setText("Cerrar GramÃ¡tica");
         jMenuItemCerrar.addActionListener(new java.awt.event.
             ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt)
                 {
                 jButtonEliminarActionPerformed(evt);
             }
         });
         jMenuEditor.add(jMenuItemCerrar);

         jMenuItemValidar.setMnemonic('V');
         jMenuItemValidar.setText("Validar GramÃ¡tica");
         jMenuItemValidar.addActionListener(new java.awt.event.
             ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt)
                 {
                 jMenuItemValidarActionPerformed(evt);
             }
         });
         jMenuEditor.add(jMenuItemValidar);

         jMenuItemSalir.setText("Salir");
         jMenuItemSalir.addActionListener(new java.awt.event.
             ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt)
                 {
                 jButton2ActionPerformed(evt);
             }
         });
         jMenuEditor.add(jMenuItemSalir);

         jMenuBar1.add(jMenuEditor);

         jMenuSimulador.setMnemonic('S');
         jMenuSimulador.setText("Simulador");

         jMenuItemDesc.setText("Simulacion Descendente");
         jMenuItemDesc.addActionListener(new java.awt.event.
             ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt) {
                 jButtonSimDescActionPerformed(evt);
             }
         });
         jMenuSimulador.add(jMenuItemDesc);

         jMenuItemAsc.setText(”Simulacion Ascendente”);
         jMenuItemAsc.addActionListener(new java.awt.event.ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt) {
                 jButton1SimAscActionPerformed(evt);
             }
         });
         jMenuSimulador.add(jMenuItemAsc);

         jMenuBar1.add(jMenuSimulador);

         jMenuAyuda.setText(”Ayuda”);

         jMenuItem1.setText(”Centro de Ayuda”);
         jMenuItem1.addActionListener(new java.awt.event.ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt) {
                 jMenuItem1ActionPerformed(evt);
             }
         });
         jMenuAyuda.add(jMenuItem1);

         jMenuItem2.setText(”Acerca de...”);
         jMenuItem2.addActionListener(new java.awt.event.ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt) {
                 jMenuItem2ActionPerformed(evt);
             }
         });
         jMenuAyuda.add(jMenuItem2);

         jMenuBar1.add(jMenuAyuda);

         setJMenuBar(jMenuBar1);

         javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());
         getContentPane().setLayout(layout);
         layout.setHorizontalGroup(
             layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
             .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE
                 )
         );
         layout.setVerticalGroup(
             layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
             .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
         );

         pack();
     }// </editor-fold>//GEN-END:initComponents

     private void jMenuItemNuevoActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jMenuItemNuevoActionPerformed
         // TODO add your handling code here:
     }//GEN-LAST:event_jMenuItemNuevoActionPerformed

     private void jButtonAnadirActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonAnadirActionPerformed
         VentanaCreacionGramatica p1 = new VentanaCreacionGramatica(this, null);
         p1.setVisible(true);
         p1.setLocationRelativeTo(null);
     }//GEN-LAST:event_jButtonAnadirActionPerformed

     private void jButtonEditarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonEditarActionPerformed

         VentanaCreacionGramatica p1 = new VentanaCreacionGramatica(this, this.gramatica);
         p1.setVisible(true);
         p1.setLocationRelativeTo(null);
     }//GEN-LAST:event_jButtonEditarActionPerformed

     private void jButtonSimDescActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonSimDescActionPerformed
         Gramatica gr2 = new Gramatica();
         gr2 = this.gramatica;
         VentanaSimuladorDesc simdesc = new VentanaSimuladorDesc(gr2) ;
         simdesc.setVisible(true);
         simdesc.setLocationRelativeTo(null);
     }//GEN-LAST:event_jButtonSimDescActionPerformed

     private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton2ActionPerformed
         int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir de SimAS?", "Salir",JOptionPane.YES_NO_OPTION);

```

```
         if(conf==0)
            System.exit(0);
    }

    private void cerrarVentana(java.awt.event.WindowEvent evt) {
         int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir de SimAS?", "Salir",JOptionPane.YES_NO_OPTION);

        if(conf==0)
            this.dispose();
    }//GEN-LAST:event_jButton2ActionPerformed

    private void jButtonGuardarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonGuardarActionPerformed
        this.grabarGramatica();
    }//GEN-LAST:event_jButtonGuardarActionPerformed

    private void jButtonAbrirActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonAbrirActionPerformed
         this.cargarGramatica();
    }//GEN-LAST:event_jButtonAbrirActionPerformed

    private void jButtonEliminarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonEliminarActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea cerrar la gramÃ¡tica "+this.gramatica.getNombre()+"?", "Cerrar GramÃ¡tica",JOptionPane.YES_NO_OPTION);

        if(conf==0){
            JOptionPane.showConfirmDialog(null,"GramÃ¡tica cerrada", "Cerrar GramÃ¡tica", JOptionPane.DEFAULT_OPTION);
            this.dispose();
            this.gramatica.removeAll();
            Editor editor = new Editor();
            editor.setVisible(true);
            editor.setLocationRelativeTo(null);
        }

    }//GEN-LAST:event_jButtonEliminarActionPerformed

    private void jMenuItemValidarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jMenuItemValidarActionPerformed
         if(this.gramatica != null)
             this.validarGramatica(this.gramatica);
    }//GEN-LAST:event_jMenuItemValidarActionPerformed

    private void jButtonpdfActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonpdfActionPerformed

```

```
        Boolean resultado= null;
        FileNameExtensionFilter filtro= null;
        JFileChooser selector= null;

        JFileChooser chooser = new JFileChooser();
        selector=chooser;
        FileNameExtensionFilter extension = new FileNameExtensionFilter("Informes de gramÃ¡tica (.pdf)",new String[]
            {"pdf"});
        filtro=extension;
        selector.setFileFilter(filtro);
        File fichero = new File("informeGramatica.pdf");
        selector.setSelectedFile(fichero);
        if(selector.showSaveDialog(null)==0) {
            try {
                resultado=this.gramatica.generarInforme(selector.getSelectedFile().toString());
            } catch (DocumentException ex) {
                Logger.getLogger(Editor.class.getName()).log(Level.SEVERE, null, ex);
            }
        }
    }//GEN-LAST:event_jButtonpdfActionPerformed

    private void jButton1SimAscActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton1SimAscActionPerformed
        VentanaSimuladorAsc simasc = new VentanaSimuladorAsc(this.gramatica) ;
        simasc.setVisible(true);
        simasc.setLocationRelativeTo(null);
    }//GEN-LAST:event_jButton1SimAscActionPerformed

    private void jMenuItem1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jMenuItem1ActionPerformed
        // TODO add your handling code here:
    }//GEN-LAST:event_jMenuItem1ActionPerformed

    private void jMenuItem2ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jMenuItem2ActionPerformed
        AcercaDe acerca = new AcercaDe();
        acerca.setVisible(true);
        acerca.setLocationRelativeTo(null);
    }//GEN-LAST:event_jMenuItem2ActionPerformed

    public void cargarGramatica(){
        Gramatica gr = new Gramatica();
        gr = this.gramatica.cargarGramatica();
        if(gr !=null){
            this.gramatica = gr;
            this.dispose();
            Editor edit = new Editor(this.gramatica);
            edit.setVisible(true);
            edit.setLocationRelativeTo(null);
        }
    }

    public void grabarGramatica(){
        int i = this.gramatica.guardarGramatica();
        if (i==1){
           JOptionPane.showConfirmDialog(null,"GramÃ¡tica guardada correctamente", "Guardar GramÃ¡tica",JOptionPane.CLOSED_OPTION);
        }
    }

    private Gramatica crearGramatica(){
         return new Gramatica();
    }

    public Gramatica getGramatica() {
        return this.gramatica;
    }

    public void setGramatica(Gramatica gramatica) {
        this.gramatica = gramatica;
    }

    public void actualizarVisualizacion(){
        this.jListNT.setModel(this.gramatica.getNoTerminales());
        this.jListProd.setModel(this.gramatica.getProducciones());
        this.jListT.setModel(this.gramatica.getTerminales());
    }

    public    void validarGramatica(Gramatica gramatica)  {
        ArrayList<String> mensajesError = new ArrayList();
        Editor panelEditor= null;
        String mensaje= null;
        int estadoValidacion= 0;

         mensajesError = gramatica.validarGramatica();
         estadoValidacion= gramatica.getEstado();

        if(estadoValidacion == 1)     {
            gramatica.setEstado(1);
            JOptionPane.showConfirmDialog(null, "La gramÃ¡tica estÃ¡ validada. ", "GramÃ¡tica Validada",JOptionPane.CLOSED_OPTION);
            this.dispose();
            Editor editor = new Editor(gramatica);
            editor.setVisible(true);
            editor.setLocationRelativeTo(null);
        } else  {
          gramatica.setEstado(-1);
          JOptionPane.showConfirmDialog(null, "<html> <h4>Se han detectado los siguientes errores: </h4><br></br>"+
                mensajesError+"</html>", "Error. GramÃ¡tica No Validada",
                JOptionPane.CLOSED_OPTION);
        }

    }
    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1SimAsc;
    private javax.swing.JButton jButton2;
    private javax.swing.JButton jButtonAbrir;
    private javax.swing.JButton jButtonAnadir;
    private javax.swing.JButton jButtonEditar;
    private javax.swing.JButton jButtonEliminar;
    private javax.swing.JButton jButtonGuardar;
    private javax.swing.JButton jButtonSimDesc;
    private javax.swing.JButton jButtonValidar;
    private javax.swing.JButton jButtonpdf;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JLabel jLabel3;
    private javax.swing.JLabel jLabel4;
    private javax.swing.JLabel jLabelDesc;
    private javax.swing.JLabel jLabelEstado;
    private javax.swing.JLabel jLabelNom;
    private javax.swing.JList jListNT;
    private javax.swing.JList jListProd;
    private javax.swing.JList jListT;
    private javax.swing.JMenu jMenuAyuda;
    private javax.swing.JMenuBar jMenuBar1;
    private javax.swing.JMenu jMenuEditor;
    private javax.swing.JMenuItem jMenuItem1;
    private javax.swing.JMenuItem jMenuItem2;
    private javax.swing.JMenuItem jMenuItemAbrir;
    private javax.swing.JMenuItem jMenuItemAsc;
    private javax.swing.JMenuItem jMenuItemCerrar;
    private javax.swing.JMenuItem jMenuItemDesc;
    private javax.swing.JMenuItem jMenuItemEditar;
    private javax.swing.JMenuItem jMenuItemGuardar;
    private javax.swing.JMenuItem jMenuItemNuevo;
    private javax.swing.JMenuItem jMenuItemSalir;
    private javax.swing.JMenuItem jMenuItemValidar;
    private javax.swing.JMenu jMenuSimulador;
    private javax.swing.JPanel jPanel1;
    private javax.swing.JPanel jPanel2;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JScrollPane jScrollPane2;
    private javax.swing.JScrollPane jScrollPane3;
    private javax.swing.JScrollPane jScrollPane4;
    private javax.swing.JToolBar.Separator jSeparator1;
    private javax.swing.JToolBar.Separator jSeparator2;
    private javax.swing.JTextArea jTextAreaDesc;
    private javax.swing.JTextField jTextFieldNombre;
    private javax.swing.JTextField jTextFieldSI;
    private javax.swing.JToolBar jToolBar1;
    // End of variables declaration//GEN-END:variables
}
```

2.4.8. ElementosLALR.java

```
//SimAS  / editor
// ElementosLALR

package es.uco.simas.editor;

import es.uco.simas.util.gramatica.Produccion;
import java.util.ArrayList;

/**
 * @author vanesa
 */
public class ElementosLALR {

    Produccion produc;
    int posicion;
    ArrayList<String> anticipacion = new ArrayList();
    String pivote;

    public ElementosLALR(Produccion produc, int posicion, String pivote
        , ArrayList<String> anticipacion){
        this.produc = produc;
        this.posicion = posicion;
        this.pivote = pivote;
        this.anticipacion = anticipacion;
    }
    public ElementosLALR(){

    }

    public Produccion getProduc() {
        return produc;
    }

    public void setProduc(Produccion produc) {
        this.produc = produc;
    }

    public int getPosicion() {
        return posicion;
    }

    public void setPosicion(int posicion) {
        this.posicion = posicion;
    }

    public ArrayList<String> getAnticipacion() {
        return anticipacion;
    }

    public void setAnticipacion(ArrayList<String> anticipacion) {
        this.anticipacion = anticipacion;
    }

    public String getPivote() {
        return pivote;
    }

    public void setPivote(String pivote) {
        this.pivote = pivote;
    }
}
```

2.4.9. ElementosLR0.java

```
//SimAS  / editor
// ElementosLR0

package es.uco.simas.editor;

import es.uco.simas.util.gramatica.Produccion;

/**
 * @author vanesa
 */
public class ElementosLR0 {
    public Produccion produc;
    int posicion;
    String pivote;

    public ElementosLR0(Produccion produc, int posicion, String pivote) {
        this.produc = produc;
        this.posicion = posicion;
        this.pivote = pivote;
    }

    public Produccion getProduc() {
        return produc;
    }

    public void setProduc(Produccion produc) {
        this.produc = produc;
    }

    public int getPosicion() {
        return posicion;
    }

    public void setPosicion(int posicion) {
        this.posicion = posicion;
    }

    public String getPivote() {
        return pivote;
    }

    public void setPivote(String pivote) {
        this.pivote = pivote;
    }
}
```

2.4.10. ElementosLR1.java

```
//SimAS / editor
// ElementosLR1

package es.uco.simas.editor;

import es.uco.simas.util.gramatica.Produccion;
import java.util.ArrayList;

/**
 * @author vanesa
 */
public class ElementosLR1 {
    Produccion produc;
    int posicion;
    ArrayList<String> anticipacion = new ArrayList();
    String pivote;

    public ElementosLR1(Produccion produc, int posicion, String pivote,
         ArrayList<String> anticipacion){
        this.produc = produc;
        this.posicion = posicion;
        this.pivote = pivote;
        this.anticipacion = anticipacion;
    }
    public ElementosLR1(){

    }

    public Produccion getProduc() {
        return produc;
    }

    public void setProduc(Produccion produc) {
        this.produc = produc;
    }

    public int getPosicion() {
        return posicion;
    }

    public void setPosicion(int posicion) {
        this.posicion = posicion;
    }

    public ArrayList<String> getAnticipacion() {
        return anticipacion;
    }

    public void setAnticipacion(ArrayList<String> anticipacion) {
        this.anticipacion = anticipacion;
    }

    public String getPivote() {
        return pivote;
    }

    public void setPivote(String pivote) {
        this.pivote = pivote;
    }
}
```

2.4.11. FuncionError.java

```
// SimAS / Editor
//FuncionError

package es.uco.simas.editor;

import es.uco.simas.util.gramatica.Terminal;
/**
 * @author vanesa
 */
public class FuncionError {

    public static final int INSERTAR_ENTRADA =1;
    public static final int BORRAR_ENTRADA =2;
    public static final int MODIFICAR_ENTRADA =3;
    public static final int INSERTAR_PILA =4;
    public static final int BORRAR_PILA =5;
    public static final int MODIFICAR_PILA =6;
    public static final int TERMINAR_ANALISIS =7;
    private int identificador ;
    private int accion ;
    private String mensaje ;
    private Terminal simbolo ;

    public FuncionError(int id, int acc, String mensaje){
        this.identificador = id;
        this.accion = acc;
        this.mensaje = mensaje;
    }
    public FuncionError(){

    }

    public int getIdentificador() {
        return identificador;
    }

    public void setIdentificador(int identificador) {
        this.identificador = identificador;
    }

    public String getMensaje() {
        return mensaje;
    }

    public void setMensaje(String mensaje) {
        this.mensaje = mensaje;
    }

    public int getAccion() {
        return accion;
    }

    public void setAccion(int accion) {
        this.accion = accion;
    }

    public Terminal getSimbolo() {
        return simbolo;
    }

    public void setSimbolo(Terminal simbolo) {
        this.simbolo = simbolo;
    }
}
```

2.4.12. PanelCreacionGramaticaPaso1.java

```
// SimAS / Editor
// Panel Creacion Gramatica Paso 1
```

```java

package es.uco.simas.editor;

import javax.swing.JOptionPane;

/**
 * @author vanesa
 */
public class PanelCreacionGramaticaPaso1 extends javax.swing.JPanel {

    private final VentanaCreacionGramatica ventanaPadre ;

    public PanelCreacionGramaticaPaso1(VentanaCreacionGramatica ventanaPadre) {
        initComponents();
        this.ventanaPadre =ventanaPadre;
        this.jTextNombre.requestFocus();
        this.jTextDescripcion.setLineWrap(true);
    }

    public String getNombreGramatica( )  {
        return this.jTextNombre.getText();
    }
    public void setNombre(String nombre){
        this.jTextNombre.setText(nombre);
    }

    public String getDescripcionGramatica( )  {
        return this.jTextDescripcion.getText();
    }

    public void setDescripcion (String descripcion){
        this.jTextDescripcion.setText(descripcion);
    }
    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */

    // <editor-fold defaultstate=”collapsed” desc=”Generated Code”>//GEN-BEGIN:initComponents
    private void initComponents() {

        jLabel4 = new javax.swing.JLabel();
        jTextNombre = new javax.swing.JTextField();
        jLabel5 = new javax.swing.JLabel();
        jScrollPane2 = new javax.swing.JScrollPane();
        jTextDescripcion = new javax.swing.JTextArea();
        jButtonSiguiente = new javax.swing.JButton();
        jButtonAnterior = new javax.swing.JButton();
        jButtonCancelar = new javax.swing.JButton();
        jLabel1 = new javax.swing.JLabel();
        jButtonUltimo = new javax.swing.JButton();
        jButton1 = new javax.swing.JButton();

        setBackground(new java.awt.Color(233, 244, 244));
        setCursor(new java.awt.Cursor(java.awt.Cursor.DEFAULT_CURSOR));

        jLabel4.setFont(new java.awt.Font(”Ubuntu”, 1, 15)); // NOI18N
        jLabel4.setForeground(new java.awt.Color(33, 77, 72));
        jLabel4.setText(”Nombre de la GramÃ¡tica:”);

        jLabel5.setFont(new java.awt.Font(”Ubuntu”, 1, 15)); // NOI18N
        jLabel5.setForeground(new java.awt.Color(33, 77, 72));
        jLabel5.setText(”Descripcion:”);

        jTextDescripcion.setColumns(20);
        jTextDescripcion.setRows(5);
        jScrollPane2.setViewportView(jTextDescripcion);

        jButtonSiguiente.setForeground(new java.awt.Color(33, 77, 72));
        jButtonSiguiente.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/siguiente.png”))); // NOI18N
        jButtonSiguiente.setToolTipText(”Siguiente”);
        jButtonSiguiente.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonSiguienteActionPerformed(evt);
            }
        });

        jButtonAnterior.setForeground(new java.awt.Color(33, 77, 72));
        jButtonAnterior.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/anterior.png”))); // NOI18N
        jButtonAnterior.setEnabled(false);

        jButtonCancelar.setForeground(new java.awt.Color(33, 77, 72));
        jButtonCancelar.setText(”Cancelar”);
        jButtonCancelar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonCancelarActionPerformed(evt);
            }
        });

        jLabel1.setFont(new java.awt.Font(”Ubuntu”, 1, 18)); // NOI18N
        jLabel1.setForeground(new java.awt.Color(33, 77, 72));
        jLabel1.setText(”Datos de la GramÃ¡tica”);

```

```java
        jButtonUltimo.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/ultimo.png"))); // NOI18N
        jButtonUltimo.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonUltimoActionPerformed(evt);
            }
        });

        jButton1.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/primero.png"))); // NOI18N
        jButton1.setToolTipText("");
        jButton1.setEnabled(false);

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(this);
        this.setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(42, 42, 42)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jButtonCancelar)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addComponent(jButton1)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButtonAnterior)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButtonSiguiente)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButtonUltimo))
                    .addComponent(jScrollPane2, javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(javax.swing.GroupLayout.Alignment.LEADING, layout.createSequentialGroup()
                        .addComponent(jLabel4)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jTextNombre))
                    .addGroup(javax.swing.GroupLayout.Alignment.LEADING, layout.createSequentialGroup()
                        .addComponent(jLabel5)
                        .addGap(0, 0, Short.MAX_VALUE)))
                .addGap(42, 42, 42))
            .addGroup(layout.createSequentialGroup()
                .addGap(218, 218, 218)
                .addComponent(jLabel1)
                .addContainerGap(218, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(10, 10, 10)
                .addComponent(jLabel1)
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jLabel4)
                    .addComponent(jTextNombre, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(25, 25, 25)
                        .addComponent(jLabel5)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jScrollPane2, javax.swing.GroupLayout.PREFERRED_SIZE, 137, javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 58, Short.MAX_VALUE)
                        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                            .addComponent(jButtonAnterior, javax.swing.GroupLayout.Alignment.TRAILING)
                            .addComponent(jButtonSiguiente, javax.swing.GroupLayout.Alignment.TRAILING)
                            .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                                .addComponent(jButtonCancelar)
                                .addComponent(jButton1))))
                    .addGroup(layout.createSequentialGroup()
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addComponent(jButtonUltimo)))
                .addContainerGap())
        );
    }// </editor-fold>//GEN-END:initComponents

    private void jButtonSiguienteActionPerformed(java.awt.event.
        ActionEvent evt) {//GEN-FIRST:
        event_jButtonSiguienteActionPerformed
         if(("".equals(jTextNombre.getText())) || ("".equals(
             jTextDescripcion.getText()))){
             JOptionPane.showConfirmDialog(null, "Los campos Nombre y
                 Descripcion no pueden estar vacÃos.", "Error",
                 JOptionPane.CLOSED_OPTION);
         }else{
             this.ventanaPadre.cambiarPaso(2);
         }
    }//GEN-LAST:event_jButtonSiguienteActionPerformed

    private void jButtonCancelarActionPerformed(java.awt.event.
        ActionEvent evt) {//GEN-FIRST:
        event_jButtonCancelarActionPerformed
         int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir
             de la edicion de la gramÃ¡tica?", "Salir",JOptionPane.
             YES_NO_OPTION);

         if(conf==0)
           this.ventanaPadre.finalizarAsistente();//dispose();
    }//GEN-LAST:event_jButtonCancelarActionPerformed

    private void jButtonUltimoActionPerformed(java.awt.event.
        ActionEvent evt) {//GEN-FIRST:
        event_jButtonUltimoActionPerformed
         if(("".equals(jTextNombre.getText())) || ("".equals(
             jTextDescripcion.getText()))){
             JOptionPane.showConfirmDialog(null, "Los campos Nombre y
                 Descripcion no pueden estar vacÃos.", "Error",
                 JOptionPane.CLOSED_OPTION);
         }else{
             this.ventanaPadre.cambiarPaso(4);
         }
    }//GEN-LAST:event_jButtonUltimoActionPerformed

    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1;
    private javax.swing.JButton jButtonAnterior;
    private javax.swing.JButton jButtonCancelar;
    private javax.swing.JButton jButtonSiguiente;
    private javax.swing.JButton jButtonUltimo;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel4;
    private javax.swing.JLabel jLabel5;
    private javax.swing.JScrollPane jScrollPane2;
    private javax.swing.JTextArea jTextDescripcion;
    private javax.swing.JTextField jTextNombre;
    // End of variables declaration//GEN-END:variables
}
```

2.4.13. PanelCreacionGramaticaPaso2.java

```java
//SimAS / Editor
// Panel Creacion Gramatica Paso 2

package es.uco.simas.editor;

import javax.swing.JOptionPane;
import javax.swing.DefaultListModel;

/**
 * @author vanesa
 */
public class PanelCreacionGramaticaPaso2 extends javax.swing.JPanel {

    private VentanaCreacionGramatica ventanaPadre ;

    public PanelCreacionGramaticaPaso2(VentanaCreacionGramatica ventanaPadre) {
        initComponents();
        this.ventanaPadre =ventanaPadre;
    }
    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */

    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    private void initComponents() {

        jButtonSiguiente = new javax.swing.JButton();
        jButtonAnterior = new javax.swing.JButton();
        jButtonCancelar = new javax.swing.JButton();
        jLabel1 = new javax.swing.JLabel();
        jLabel2 = new javax.swing.JLabel();
        jLabel3 = new javax.swing.JLabel();
        jButtonNoTerminales = new javax.swing.JButton();
        jButtonTerminales = new javax.swing.JButton();
        jScrollPane3 = new javax.swing.JScrollPane();
        jListNoTerminales = new javax.swing.JList();
        jScrollPane4 = new javax.swing.JScrollPane();
        jListTerminales = new javax.swing.JList();
        jButtonUltimo = new javax.swing.JButton();
        jButtonPrimero = new javax.swing.JButton();

        setBackground(new java.awt.Color(233, 244, 244));

        jButtonSiguiente.setForeground(new java.awt.Color(33, 77, 72));
        jButtonSiguiente.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/siguiente.png"))); // NOI18N
        jButtonSiguiente.setToolTipText("Siguiente");
        jButtonSiguiente.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonSiguienteActionPerformed(evt);
            }
        });

        jButtonAnterior.setForeground(new java.awt.Color(33, 77, 72));
        jButtonAnterior.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/anterior.png"))); // NOI18N
        jButtonAnterior.setToolTipText("Anterior");
        jButtonAnterior.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonAnteriorActionPerformed(evt);
            }
        });

        jButtonCancelar.setForeground(new java.awt.Color(33, 77, 72));
        jButtonCancelar.setText("Cancelar");
        jButtonCancelar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonCancelarActionPerformed(evt);
            }
        });

        jLabel1.setFont(new java.awt.Font("Ubuntu", 1, 18)); // NOI18N
        jLabel1.setForeground(new java.awt.Color(33, 77, 72));
        jLabel1.setText("Vocabulario de la gramÃ¡tica");

        jLabel2.setText("Simbolos No Terminales");

        jLabel3.setText("Simbolos Terminales");

        jButtonNoTerminales.setText("Modificar No Terminales");
        jButtonNoTerminales.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonNoTerminalesActionPerformed(evt);
            }
        });

        jButtonTerminales.setText("Modificar Terminales");
        jButtonTerminales.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonTerminalesActionPerformed(evt);
            }
        });

        jScrollPane3.setViewportView(jListNoTerminales);

        jScrollPane4.setViewportView(jListTerminales);

        jButtonUltimo.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/ultimo.png”))); // NOI18N
        jButtonUltimo.setToolTipText(”Ultimo”);
        jButtonUltimo.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonUltimoActionPerformed(evt);
            }
        });

        jButtonPrimero.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/primero.png”))); // NOI18N
        jButtonPrimero.setToolTipText(”Primero”);
        jButtonPrimero.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonPrimeroActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(this);
        this.setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createSequentialGroup()
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                .addComponent(jLabel1)
                .addGap(188, 188, 188))
            .addGroup(layout.createSequentialGroup()
                .addGap(33, 33, 33)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                .addComponent(jButtonCancelar)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED, javax.swing.
                    GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                .addComponent(jButtonPrimero)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED)
                .addComponent(jButtonAnterior)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED)
                .addComponent(jButtonSiguiente)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED)
                .addComponent(jButtonUltimo)
                .addGap(57, 57, 57))
            .addGroup(layout.createSequentialGroup()
                .addGroup(layout.createParallelGroup(javax.
                    swing.GroupLayout.Alignment.LEADING)
                    .addComponent(jLabel2)
                    .addComponent(jScrollPane3, javax.swing.
                        GroupLayout.PREFERRED_SIZE, 222, javax.
                        swing.GroupLayout.PREFERRED_SIZE)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(34, 34, 34)
                        .addComponent(jButtonNoTerminales)))
                .addGroup(layout.createParallelGroup(javax.
                    swing.GroupLayout.Alignment.LEADING)
                    .addGroup(javax.swing.GroupLayout.Alignment
                        .TRAILING, layout.createSequentialGroup
                        ()
                        .addPreferredGap(javax.swing.
                            LayoutStyle.ComponentPlacement.
                            RELATED, javax.swing.GroupLayout.
                            DEFAULT_SIZE, Short.MAX_VALUE)
                        .addComponent(jButtonTerminales)
                        .addGap(79, 79, 79))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(96, 96, 96)
                        .addGroup(layout.createParallelGroup(
                            javax.swing.GroupLayout.Alignment.
                            LEADING)
                            .addComponent(jScrollPane4, javax.
                                swing.GroupLayout.
                                PREFERRED_SIZE, 221, javax.
                                swing.GroupLayout.
                                PREFERRED_SIZE)
                            .addComponent(jLabel3))
                        .addContainerGap(58, Short.MAX_VALUE)))
                            )))
);
layout.setVerticalGroup(
    layout.createParallelGroup(javax.swing.GroupLayout.
        Alignment.LEADING)
```

```
            .addGroup(layout.createSequentialGroup()
                .addContainerGap()
                .addComponent(jLabel1)
                .addGap(15, 15, 15)
                .addGroup(layout.createParallelGroup(javax.swing.
                    GroupLayout.Alignment.BASELINE)
                    .addComponent(jLabel2)
                    .addComponent(jLabel3))
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED)
                .addGroup(layout.createParallelGroup(javax.swing.
                    GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jScrollPane3, javax.swing.
                            GroupLayout.PREFERRED_SIZE, 201, javax.
                            swing.GroupLayout.PREFERRED_SIZE)
                        .addGap(7, 7, 7)
                        .addComponent(jButtonNoTerminales)
                        .addGap(0, 0, Short.MAX_VALUE))
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jScrollPane4, javax.swing.
                            GroupLayout.PREFERRED_SIZE, 201, javax.
                            swing.GroupLayout.PREFERRED_SIZE)
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.RELATED)
                        .addComponent(jButtonTerminales)
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.RELATED, 18, Short.
                            MAX_VALUE)
                        .addGroup(layout.createParallelGroup(javax.
                            swing.GroupLayout.Alignment.LEADING)
                            .addComponent(jButtonAnterior)
                            .addComponent(jButtonSiguiente)
                            .addComponent(jButtonPrimero)
                            .addComponent(jButtonCancelar)
                            .addComponent(jButtonUltimo))
                        .addContainerGap()))))
        );
    }// </editor-fold>//GEN-END:initComponents

    private void jButtonSiguienteActionPerformed(java.awt.event.
        ActionEvent evt) {//GEN-FIRST:
        event_jButtonSiguienteActionPerformed
            this.ventanaPadre.cambiarPaso(3);
    }//GEN-LAST:event_jButtonSiguienteActionPerformed

    private void jButtonCancelarActionPerformed(java.awt.event.
        ActionEvent evt) {//GEN-FIRST:
        event_jButtonCancelarActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir
            de la edicion de la gramÃ¡tica?", "Salir",JOptionPane.
            YES_NO_OPTION);

        if(conf==0){
            this.ventanaPadre.finalizarAsistente();
        }
    }//GEN-LAST:event_jButtonCancelarActionPerformed

    private void jButtonAnteriorActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonAnteriorActionPerformed
        this.ventanaPadre.cambiarPaso(1);
    }//GEN-LAST:event_jButtonAnteriorActionPerformed

    private void jButtonNoTerminalesActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonNoTerminalesActionPerformed
        VentanaSimbolosNoTerminales noTerminal = new VentanaSimbolosNoTerminales(this.jListNoTerminales.getModel(), this.jListNoTerminales.getModel(), this, null);
        noTerminal.setVisible(true);
        noTerminal.setLocationRelativeTo(null);
    }//GEN-LAST:event_jButtonNoTerminalesActionPerformed

    private void jButtonTerminalesActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonTerminalesActionPerformed
        VentanaSimbolosTerminales terminal = new VentanaSimbolosTerminales(this.jListTerminales.getModel(), this.jListTerminales.getModel(),this);
         terminal.setVisible(true);
         terminal.setLocationRelativeTo(null);
    }//GEN-LAST:event_jButtonTerminalesActionPerformed

    private void jButtonUltimoActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonUltimoActionPerformed
        this.ventanaPadre.cambiarPaso(4);
    }//GEN-LAST:event_jButtonUltimoActionPerformed

    private void jButtonPrimeroActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonPrimeroActionPerformed
        this.ventanaPadre.cambiarPaso(1);
    }//GEN-LAST:event_jButtonPrimeroActionPerformed

    public DefaultListModel getSimbolosTerminales( )     {
        if(this.jListTerminales.getModel().getSize()!=0)   {
            return (DefaultListModel)this.jListTerminales.getModel();
        }
        return null;
    }

    public    DefaultListModel getSimbolosNoTerminales( )  {
        if(this.jListNoTerminales.getModel().getSize()!=0) {
            return (DefaultListModel)this.jListNoTerminales.getModel();
        }
        return null;
    }

    public void asignarListaSimbolosTerminales(DefaultListModel modelo) {
        if(modelo !=null)
            this.jListTerminales.setModel(modelo);
        else
            this.jListTerminales = null;
    }

    public void asignarListaSimbolosNoTerminales( DefaultListModel modelo) {
        if(modelo != null)
            this.jListNoTerminales.setModel(modelo);
        else
            this.jListNoTerminales = null;
    }

    public DefaultListModel getProducciones(){
        return this.ventanaPadre.getProducciones();
    }

    public void setProducciones(DefaultListModel pr){
        this.ventanaPadre.setProducciones(pr);
    }

    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButtonAnterior;
    private javax.swing.JButton jButtonCancelar;
    private javax.swing.JButton jButtonNoTerminales;
    private javax.swing.JButton jButtonPrimero;
    private javax.swing.JButton jButtonSiguiente;
    private javax.swing.JButton jButtonTerminales;
    private javax.swing.JButton jButtonUltimo;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JLabel jLabel3;
    private javax.swing.JList jListNoTerminales;
    private javax.swing.JList jListTerminales;
    private javax.swing.JScrollPane jScrollPane3;
    private javax.swing.JScrollPane jScrollPane4;
    // End of variables declaration//GEN-END:variables
}
```

2.4.14. PanelCreacionGramaticaPaso3.java

```
// SimAS / Editor
// Panel Creacion GramÃ¡tica Paso 3
```

```java

package es.uco.simas.editor;

import javax.swing.JOptionPane;
import javax.swing.DefaultListModel;

/**
 * @author vanesa
 */
public class PanelCreacionGramaticaPaso3 extends javax.swing.JPanel {

    private VentanaCreacionGramatica ventanaPadre ;

    public PanelCreacionGramaticaPaso3(VentanaCreacionGramatica ventanaPadre) {
        initComponents();
        this.ventanaPadre = ventanaPadre;
    }
    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */

    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    private void initComponents() {

        jButtonSiguiente = new javax.swing.JButton();
        jButtonAnterior = new javax.swing.JButton();
        jButtonCancelar = new javax.swing.JButton();
        jLabel1 = new javax.swing.JLabel();
        jScrollPane1 = new javax.swing.JScrollPane();
        jListProduccion = new javax.swing.JList();
        jButtonModificar = new javax.swing.JButton();
        jButton1 = new javax.swing.JButton();
        jButton2 = new javax.swing.JButton();

        setBackground(new java.awt.Color(233, 244, 244));

        jButtonSiguiente.setForeground(new java.awt.Color(33, 77, 72));
        jButtonSiguiente.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/siguiente.png"))); // NOI18N
        jButtonSiguiente.setToolTipText("Siguiente");
        jButtonSiguiente.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonSiguienteActionPerformed(evt);
            }
        });

        jButtonAnterior.setForeground(new java.awt.Color(33, 77, 72));
        jButtonAnterior.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/anterior.png”))); // NOI18N
        jButtonAnterior.setToolTipText(”Anterior”);
        jButtonAnterior.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonAnteriorActionPerformed(evt);
            }
        });

        jButtonCancelar.setForeground(new java.awt.Color(33, 77, 72));
        jButtonCancelar.setText(”Cancelar”);
        jButtonCancelar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonCancelarActionPerformed(evt);
            }
        });

        jLabel1.setFont(new java.awt.Font(”Ubuntu”, 1, 18)); // NOI18N
        jLabel1.setForeground(new java.awt.Color(33, 77, 72));
        jLabel1.setText(”Producciones de la gramÃ¡tica”);

        jScrollPane1.setViewportView(jListProduccion);

        jButtonModificar.setText(”Modificar Producciones”);
        jButtonModificar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonModificarActionPerformed(evt);
            }
        });

        jButton1.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/ultimo.png”))); // NOI18N
        jButton1.setToolTipText(”Ultimo”);
        jButton1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton1ActionPerformed(evt);
            }
        });

        jButton2.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/primero.png”))); // NOI18N
        jButton2.setToolTipText(”Primero”);

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(this);
        this.setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(42, 42, 42)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jScrollPane1)
                        .addGap(42, 42, 42))
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jButtonCancelar)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addComponent(jButton2)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButtonAnterior)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButtonSiguiente)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButton1)
                        .addGap(46, 46, 46))))
            .addGroup(layout.createSequentialGroup()
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(209, 209, 209)
                        .addComponent(jButtonModificar))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(183, 183, 183)
                        .addComponent(jLabel1)))
                .addContainerGap(186, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addContainerGap()
                .addComponent(jLabel1)
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 19, Short.MAX_VALUE)
                .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 188, javax.swing.GroupLayout.PREFERRED_SIZE)
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                .addComponent(jButtonModificar)
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                        .addComponent(jButtonSiguiente, javax.swing.GroupLayout.Alignment.TRAILING)
                        .addComponent(jButtonAnterior, javax.swing.GroupLayout.Alignment.TRAILING)
                        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                            .addComponent(jButtonCancelar)
                            .addComponent(jButton2)))
                    .addComponent(jButton1, javax.swing.GroupLayout.Alignment.TRAILING))
                .addGap(40, 40, 40))
        );
    }// </editor-fold>//GEN-END:initComponents

    private void jButtonSiguienteActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonSiguienteActionPerformed
            this.ventanaPadre.cambiarPaso(4);
    }//GEN-LAST:event_jButtonSiguienteActionPerformed

    private void jButtonCancelarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonCancelarActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir de la edicion de la gramÃ¡tica?", "Salir",JOptionPane.YES_NO_OPTION);

        if(conf==0)
          this.ventanaPadre.finalizarAsistente();
    }//GEN-LAST:event_jButtonCancelarActionPerformed

    private void jButtonAnteriorActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonAnteriorActionPerformed
        this.ventanaPadre.cambiarPaso(2);
    }//GEN-LAST:event_jButtonAnteriorActionPerformed

    private void jButtonModificarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonModificarActionPerformed
```

```
        VentanaProducciones producciones = new VentanaProducciones(this, this.jListProduccion.getModel());
        producciones.setVisible(true);
        producciones.setLocationRelativeTo(null);
    }//GEN-LAST:event_jButtonModificarActionPerformed

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton1ActionPerformed
        this.ventanaPadre.cambiarPaso(4);
    }//GEN-LAST:event_jButton1ActionPerformed

    public  DefaultListModel getSimbolosTerminales( ) {
        return this.ventanaPadre.getSimbolosTerminales();
    }

    public  DefaultListModel getSimbolosNoTerminales( ) {
        return this.ventanaPadre.getSimbolosNoTerminales();
    }

    public  void asignarProducciones( DefaultListModel producciones) {
        if(producciones != null){
            this.jListProduccion.setModel(producciones);
        }else
            this.jListProduccion = null;
    }

    public  DefaultListModel getProducciones( ) {
        DefaultListModel producciones= new DefaultListModel();
        if(this.jListProduccion.getModel().getSize()!=0) {
            producciones=(DefaultListModel)this.jListProduccion.getModel();
            return producciones;
        }
        return null;
    }

    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1;
    private javax.swing.JButton jButton2;
    private javax.swing.JButton jButtonAnterior;
    private javax.swing.JButton jButtonCancelar;
    private javax.swing.JButton jButtonModificar;
    private javax.swing.JButton jButtonSiguiente;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JList jListProduccion;
    private javax.swing.JScrollPane jScrollPane1;
    // End of variables declaration//GEN-END:variables
}
```

2.4.15. PanelCreacionGramaticaPaso4.java

```
// SimAS / Editor
// Panel Creacion GramÃ¡tica Paso 4

package es.uco.simas.editor;

import javax.swing.JOptionPane;
import javax.swing.DefaultComboBoxModel;
import javax.swing.DefaultListModel;

/**
 * @author vanesa
 */
public class PanelCreacionGramaticaPaso4 extends javax.swing.JPanel {

    private VentanaCreacionGramatica ventanaPadre ;
    DefaultListModel noTerminales = new DefaultListModel();
    String simboloInicial = null;

    public PanelCreacionGramaticaPaso4(VentanaCreacionGramatica ventanaPadre) {
        super();
        initComponents();
        this.ventanaPadre =ventanaPadre;
    }

    public     String getSimboloInicial( ) {
        if(this.jComboBox1.getModel().getSize()==0)    {
          return null;

        }
        if(this.jComboBox1.getSelectedIndex() == -1 && this.jComboBox1.getModel().getSize()!=0)   {
            return this.jComboBox1.getModel().getElementAt(0).toString();

        }
        if(this.jComboBox1.getSelectedIndex() != -1 && this.jComboBox1.getModel().getSize()!=0) {
            return this.jComboBox1.getSelectedItem().toString();
        }
        return null;
    }

    public void setSimboloInicial(String inicial){
        this.simboloInicial= inicial;
    }

    public      void setSimbolosNoTerminales(   DefaultListModel simbolosNoTerminales)   {
        this.noTerminales = simbolosNoTerminales;
        String[] combo = new String[simbolosNoTerminales.getSize()];
        int i= 0;
        int inicial=-1;

         while(true) {
            if(i >= simbolosNoTerminales.getSize())     {
              break;
            }
            if(i < simbolosNoTerminales.getSize())    {
                combo[i] = simbolosNoTerminales.getElementAt(i).toString();
                if(combo[i].equals(this.simboloInicial))
                    inicial=i;
             }
              i = i+1;
         }
         DefaultComboBoxModel nt = new DefaultComboBoxModel(combo);
         this.jComboBox1.setModel(nt);
         if(inicial != -1)
            this.jComboBox1.setSelectedIndex(inicial);
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */

    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    private void initComponents() {

        buttonGroup1 = new javax.swing.ButtonGroup();
        jButtonFin = new javax.swing.JButton();
        jButtonAnterior = new javax.swing.JButton();
        jButtonCancelar = new javax.swing.JButton();
        jLabel2 = new javax.swing.JLabel();
        jComboBox1 = new javax.swing.JComboBox();
        jButtonPrimero = new javax.swing.JButton();

        setBackground(new java.awt.Color(233, 244, 244));
        setToolTipText("Seleccion SÃmbolo Inicial");

        jButtonFin.setFont(new java.awt.Font("Ubuntu", 1, 15)); // NOI18N
        jButtonFin.setForeground(new java.awt.Color(33, 77, 72));
        jButtonFin.setText("Finalizar");
        jButtonFin.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonFinActionPerformed(evt);
            }
        });

        jButtonAnterior.setForeground(new java.awt.Color(33, 77, 72));
        jButtonAnterior.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/anterior.png”))); // NOI18N
        jButtonAnterior.setToolTipText(”Anterior”);
        jButtonAnterior.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonAnteriorActionPerformed(evt);
            }
        });

        jButtonCancelar.setForeground(new java.awt.Color(33, 77, 72));
        jButtonCancelar.setText(”Cancelar”);
        jButtonCancelar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonCancelarActionPerformed(evt);
            }
        });

        jLabel2.setFont(new java.awt.Font(”Ubuntu”, 1, 18)); // NOI18N
        jLabel2.setForeground(new java.awt.Color(33, 77, 72));
        jLabel2.setText(”Seleccione el sÃmbolo Inicial de la GramÃ¡tica:”);

        jComboBox1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jComboBox1ActionPerformed(evt);
            }
        });

        jButtonPrimero.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/primero.png”))); // NOI18N
        jButtonPrimero.setToolTipText(”Primero”);
        jButtonPrimero.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonPrimeroActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(this);
        this.setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.
                Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(40, 40, 40)
                .addComponent(jButtonCancelar)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED, javax.swing.GroupLayout
                    .DEFAULT_SIZE, Short.MAX_VALUE)
                .addComponent(jButtonPrimero)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED)
                .addComponent(jButtonAnterior)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED)
                .addComponent(jButtonFin)
                .addGap(42, 42, 42))
            .addGroup(layout.createSequentialGroup()
                .addGroup(layout.createParallelGroup(javax.swing.
                    GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(61, 61, 61)
                        .addComponent(jLabel2))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(139, 139, 139)
                        .addComponent(jComboBox1, javax.swing.
                            GroupLayout.PREFERRED_SIZE, 196, javax.
                            swing.GroupLayout.PREFERRED_SIZE)))
                .addContainerGap(67, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.
                Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(41, 41, 41)
                .addComponent(jLabel2)
                .addGap(55, 55, 55)
                .addComponent(jComboBox1, javax.swing.GroupLayout.
                    PREFERRED_SIZE, javax.swing.GroupLayout.
                    DEFAULT_SIZE, javax.swing.GroupLayout.
                    PREFERRED_SIZE)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED, 105, Short.MAX_VALUE)
                .addGroup(layout.createParallelGroup(javax.swing.
                    GroupLayout.Alignment.LEADING)
                    .addGroup(javax.swing.GroupLayout.Alignment.
                        TRAILING, layout.createSequentialGroup()
                        .addGroup(layout.createParallelGroup(javax.
                            swing.GroupLayout.Alignment.LEADING, false)
                            .addComponent(jButtonAnterior, javax.swing.
                                GroupLayout.Alignment.TRAILING)
                            .addComponent(jButtonPrimero, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                            .addComponent(jButtonFin, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
                        .addGap(40, 40, 40))
                    .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createSequentialGroup()
                        .addComponent(jButtonCancelar)
                        .addGap(37, 37, 37))))
        );
    }// </editor-fold>//GEN-END:initComponents

    private void jButtonFinActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonFinActionPerformed
        this.ventanaPadre.finalizarAsistente();
    }//GEN-LAST:event_jButtonFinActionPerformed

    private void jButtonCancelarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonCancelarActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir de la edicion de la gramÃ¡tica?", "Salir",JOptionPane.YES_NO_OPTION);

        if(conf==0)
          this.ventanaPadre.finalizarAsistente();//dispose();
    }//GEN-LAST:event_jButtonCancelarActionPerformed

    private void jButtonAnteriorActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonAnteriorActionPerformed

        this.ventanaPadre.cambiarPaso(3);
    }//GEN-LAST:event_jButtonAnteriorActionPerformed

    private void jComboBox1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jComboBox1ActionPerformed
        // TODO add your handling code here:
    }//GEN-LAST:event_jComboBox1ActionPerformed

    private void jButtonPrimeroActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonPrimeroActionPerformed
        this.ventanaPadre.cambiarPaso(1);
    }//GEN-LAST:event_jButtonPrimeroActionPerformed

    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.ButtonGroup buttonGroup1;
    private javax.swing.JButton jButtonAnterior;
    private javax.swing.JButton jButtonCancelar;
    private javax.swing.JButton jButtonFin;
    private javax.swing.JButton jButtonPrimero;
    private javax.swing.JComboBox jComboBox1;
    private javax.swing.JLabel jLabel2;
    // End of variables declaration//GEN-END:variables
}
```

2.4.16. ParteAccion.java

```
//SimAS / Editor
// PateAccion

package es.uco.simas.editor;

import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.util.gramatica.Produccion;
import es.uco.simas.util.gramatica.Terminal;
import java.util.ArrayList;
import javax.swing.table.DefaultTableModel;

/**
 * @author vanesa
 */
public class ParteAccion {
    ArrayList<FuncionError> funError = new ArrayList();
    private  DefaultTableModel matrizAccion ;
    Gramatica gramatica;

    public ParteAccion(Gramatica gramatica){
        this.gramatica = gramatica;
    }

    void construir(int met){
        int i =0;
        ColCanLR0 coleccion = new ColCanLR0();
        ColCanLR1 col1 = new ColCanLR1();
        ColCanLALR col2 = new ColCanLALR();
        if(met == 1)
            coleccion = this.gramatica.getColeccionLR0();
        if(met == 2)
            col1 = this.gramatica.getColeccionLR1();
        if(met == 3)
            col2 = this.gramatica.getColeccionLALR();

        this.matrizAccion =new DefaultTableModel();
        if(met == 3){
            this.matrizAccion.addColumn(”Estados Antiguos”);
            this.matrizAccion.addColumn(”Estados Nuevos”);
        }else{
            this.matrizAccion.addColumn(”Estados”);
        }
        //Se anaden los simbolos terminales en las columnas
        while(i < this.gramatica.getTerm().size()){
            this.matrizAccion.addColumn(this.gramatica.getTerm().get(i).getNombre());
            i++;
        }
        this.matrizAccion.addColumn(”$”);

        if(met == 1){   //SLR
            //Se anaden los estados en las filas
            i=0;
            while(i < this.gramatica.getColeccionLR0().getConjElementosLR0().size()){
                Object []   linea = new Object[]   {
                      i
                     };
                    this.matrizAccion.addRow(linea);
                i++;
            }

            //Los anaden los desplazamientos
            i=0;
            while(i < coleccion.getConjElementosLR0().size()){
                int fila = coleccion.getConjElementosLR0().get(i).col;
                int columna = 0;
                int j=0;
                int encontrado =0;
                while(j < this.matrizAccion.getColumnCount()){
                    if(coleccion.getConjElementosLR0().get(i).simbolo.equals(this.matrizAccion.getColumnName(j))){
                        columna = j;
                        encontrado = 1;
                        break;
                    }else
                        j++;
                }
                if(encontrado == 1){
                    if(this.matrizAccion.getValueAt(fila, columna)==null){
                        this.matrizAccion.setValueAt(”d”+coleccion.getConjElementosLR0().get(i).getI(), fila, columna);
                    }else{
                        String valor = this.matrizAccion.getValueAt(fila, columna)+”, d”+coleccion.getConjElementosLR0().get(i).getI();
                        this.matrizAccion.setValueAt(”conf. ”+valor, fila, columna);
                    }
                }
                i++;
            }
            i=0;
            while(i < coleccion.getConj2().size()){
                int fila = coleccion.getConj2().get(i).col;
                int columna = 0;
                int j=0;
                int encontrado =0;
                while(j < this.matrizAccion.getColumnCount()){
                    if(coleccion.getConj2().get(i).simbolo.equals(this.matrizAccion.getColumnName(j))){
                        columna = j;
                        encontrado = 1;
                        break;
                    }else
                        j++;
                }
                if(encontrado == 1){
                    if(this.matrizAccion.getValueAt(fila, columna) == null){
                        this.matrizAccion.setValueAt(”d”+coleccion.getConj2().get(i).getI(), fila, columna);
                    }else{
                        String valor = this.matrizAccion.getValueAt(fila, columna)+”, d”+coleccion.getConj2().get(i).getI();
                        this.matrizAccion.setValueAt(”conf. ”+valor, fila, columna);
                    }
                }

                i++;
            }
            this.reducciones(met);
        }

        if(met == 2){     //LR-canonico
            //Se anaden los estados en las filas
            i=0;
            while(i < this.gramatica.getColeccionLR1().getConjElementosLR1().size()){
                Object []   linea = new Object[]   {
                      i
                     };
                    this.matrizAccion.addRow(linea);
                i++;
            }

            //Los anaden los desplazamientos
            i=0;
            while(i < col1.getConjElementosLR1().size()){
                int fila = col1.getConjElementosLR1().get(i).col;
                int columna = 0;
                int j=0;
                int encontrado =0;
                while(j < this.matrizAccion.getColumnCount()){
                    if(col1.getConjElementosLR1().get(i).simbolo.equals(this.matrizAccion.getColumnName(j))){
                        columna = j;
                        encontrado = 1;
                        break;
                    }else
                        j++;
                }
                if(encontrado == 1){
                    if(this.matrizAccion.getValueAt(fila, columna)==null){
                        this.matrizAccion.setValueAt(”d”+col1.getConjElementosLR1().get(i).getI(), fila, columna);
                    }else{
                        String valor = this.matrizAccion.getValueAt(fila, columna)+”, d”+col1.getConjElementosLR1().get(i).getI();
                        this.matrizAccion.setValueAt(”conf. ”+valor, fila, columna);
                    }
                }
                i++;
            }
            i=0;
            while(i < col1.getConj2().size()){
                int fila = col1.getConj2().get(i).col;
                int columna = 0;
                int j=0;
                int encontrado =0;
                while(j < this.matrizAccion.getColumnCount()){
                    if(col1.getConj2().get(i).simbolo.equals(this.matrizAccion.getColumnName(j))){
                        columna = j;
                        encontrado = 1;
                        break;
                    }else
                        j++;
                }
                if(encontrado == 1){
                    if(this.matrizAccion.getValueAt(fila, columna) == null)
                        this.matrizAccion.setValueAt(”d”+col1.getConj2().get(i).getI(), fila, columna);
                    else{
                        String valor = this.matrizAccion.getValueAt(fila, columna)+”, d”+col1.getConj2().get(i).getI();
                        this.matrizAccion.setValueAt(”conf. ”+valor, fila, columna);
                    }
                }
                i++;
            }
            this.reducciones(met);
        }
        if(met == 3){      //LALR
            //Se anaden los estados en las filas
            i=0;
            while(i < this.gramatica.getColeccionLALR().
                getConjElementosLALR().size()){
                if(this.gramatica.getColeccionLALR().
                    getConjElementosLALR().get(i).getV()!=-1){
                    Object [] linea = new Object[] {
                           this.gramatica.getColeccionLALR().
                               getConjElementosLALR().get(i).getI()+"-"+
                               this.gramatica.getColeccionLALR().
                               getConjElementosLALR().get(i).getV(),
                           i
                          };
                    this.matrizAccion.addRow(linea);
                }else{
                    Object [] linea2 = new Object[] {
                          this.gramatica.getColeccionLALR().
                              getConjElementosLALR().get(i).getI(),
                          i
                         };
                    this.matrizAccion.addRow(linea2);
                }
                i++;
            }

            //Se anaden los desplazamientos
            i=0;
            while(i < col2.getConjElementosLALR().size()){
                int fila = col2.getConjElementosLALR().get(i).col;
                int columna = 0;
                int j=0;
                int encontrado =0;
                while(j < this.matrizAccion.getColumnCount()){
                    if(col2.getConjElementosLALR().get(i).simbolo.
                        equals(this.matrizAccion.getColumnName(j))){
                        columna = j;
                        encontrado = 1;
                        break;
                    }else
                        j++;
                }
                if(encontrado == 1){
                    if(this.matrizAccion.getValueAt(fila, columna)==
                        null){
                        if(col2.getConjElementosLALR().get(i).getV() !=
                            -1){
```

```
                this.matrizAccion.setValueAt(”d”+col2.getConjElementosLALR().get(i).getI()+”−”+col2.getConjElementosLALR().get(i).getV(), fila, columna);
            }else{
                this.matrizAccion.setValueAt(”d”+col2.getConjElementosLALR().get(i).getI(), fila, columna);
            }
        }else{
            String valor= ””;
            if(col2.getConjElementosLALR().get(i).getV() != −1){
                valor = this.matrizAccion.getValueAt(fila, columna)+”, d”+col2.getConjElementosLALR().get(i).getI()+”−”+col2.getConjElementosLALR().get(i).getV();
            }else{
                valor = this.matrizAccion.getValueAt(fila, columna)+”, d”+col2.getConjElementosLALR().get(i).getI();
            }
            this.matrizAccion.setValueAt(”conf. ”+valor, fila, columna);
        }
    }
    i++;
}
i=0;
while(i < col2.getConj2().size()){
    int w=0;
    int fila = −1;
    while(w < col2.getConjElementosLALR().size()){
        if(col2.getConjElementosLALR().get(w).getI() == col2.getConj2().get(i).col){
            fila = w;
            break;
        }
        w++;
    }
    if(fila == −1){
        w=0;
        while(w < col2.getConjElementosLALR().size()){
        if(col2.getConjElementosLALR().get(w).getV() == col2.getConj2().get(i).col){
            fila = w;
            break;
        }
        w++;
        }
    }
    //int fila = col2.getConj2().get(i).col;
```

```java
                int columna = 0;
                int j=0;
                int encontrado =0;
                while(j < this.matrizAccion.getColumnCount()){
                    if(col2.getConj2().get(i).simbolo.equals(this.matrizAccion.getColumnName(j)))){
                        columna = j;
                        encontrado = 1;
                        break;
                    }else
                        j++;
                }
                if(encontrado == 1){
                    System.out.println(fila +"    "+ columna);
                    if(this.matrizAccion.getValueAt(fila, columna) == null){
                        if(col2.getConj2().get(i).getV() != -1){
                            this.matrizAccion.setValueAt("d"+col2.getConj2().get(i).getI()+"-"+col2.getConj2().get(i).getV(), fila, columna);
                        }else{
                            this.matrizAccion.setValueAt("d"+col2.getConj2().get(i).getI(), fila, columna);
                        }
                    }else{
                        String valor= "";
                        if(col2.getConj2().get(i).getV() != -1){
                            valor = this.matrizAccion.getValueAt(fila, columna)+", d"+col2.getConj2().get(i).getI()+"-"+col2.getConj2().get(i).getV();
                        }else{
                            valor = this.matrizAccion.getValueAt(fila, columna)+", d"+col2.getConj2().get(i).getI();
                        }
                        this.matrizAccion.setValueAt("conf. "+valor, fila, columna);
                    }
                }

                i++;
            }
            this.reducciones(met);
        }
    }

    public void reducciones(int met){
        ArrayList<ConjElementosLR0> coleccion = new ArrayList();
        ArrayList<ConjElementosLR1> col1 = new ArrayList();
        ArrayList<ConjElementosLR1> col2 = new ArrayList();
        if(met == 1)
            coleccion = this.gramatica.getColeccionLR0().getConjElementosLR0();
        if(met == 2)
            col1 = this.gramatica.getColeccionLR1().getConjElementosLR1();
        if(met == 3)
            col2 = this.gramatica.getColeccionLALR().getConjElementosLALR();

        ArrayList<Produccion> produc = new ArrayList();
        ArrayList<Integer> estado = new ArrayList();
        ArrayList<Terminal> siguientes = new ArrayList<>();
        int i=0;
        int v=0;
        if(met == 1){
            while(i < coleccion.size()){
                int j=0;
                while(j < coleccion.get(i).getElementosLR0().size()){
                    if(coleccion.get(i).getElementosLR0().get(j).getPosicion() == coleccion.get(i).getElementosLR0().get(j).getProduc().getConsec().size()){
                     estado.add(coleccion.get(i).getI());
                     produc.add(coleccion.get(i).getElementosLR0().get(j).getProduc());
                     v++;
                    }
                    j++;
                }
                i++;
            }

            i=0;
            while(i < estado.size()){
                if(estado.get(i) == 1 && produc.get(i).getAntec().getSimboloNT().getNombre().equals(this.gramatica.getSimbInicial()+"'")){
                 this.matrizAccion.setValueAt("Aceptar", 1, this.matrizAccion.getColumnCount()-1);
                }else{
                    int m=0;
                    //Conjunto siguiente del antecedente
                    while(m < this.gramatica.getNoTerm().size()){
                        siguientes = new ArrayList();
                        if (this.gramatica.getNoTerm().get(m).getNombre().equals(produc.get(i).getAntec().getSimboloNT().getNombre())){
                         siguientes = this.gramatica.getNoTerm().get(m).getSiguientes();
                         break;
                        }else
                            m++;
                        }
                        int j=1;
                        while(j < this.matrizAccion.getColumnCount()){
                            int k=0;
                            while(k < siguientes.size()){
                                if(this.matrizAccion.getColumnName(j).equals(siguientes.get(k).getNombre())){
                                    int n=1;
                                    int pr =0;
                                    //buscar el numero de la produccion
                                    while(n < this.gramatica.getPr().size()){
                                        pr=0;
                                        int iguales =1;
                                        if(this.gramatica.getPr().get(n).getAntec().getSimboloNT().getNombre().equals(produc.get(i).getAntec().getSimboloNT().getNombre())){
                                            int p=0;
                                            if(this.gramatica.getPr().get(n).getConsec().size() != produc.get(i).getConsec().size()){
                                                iguales =0;
                                            }else{
                                                while(p < this.gramatica.getPr().get(n).getConsec().size()){
                                                    if(!this.gramatica.getPr().get(n).getConsec().get(p).getNombre().equals(produc.get(i).getConsec().get(p).getNombre())){
                                                        iguales =0;
                                                        break;
                                                    }else
                                                        p++;
                                                }
                                            }
                                            if(iguales == 1){
                                                pr = n;
                                                break;
                                            }
                                        }
                                        n++;
                                    }
                                    if(pr !=0){
                                        if(this.matrizAccion.getValueAt(estado.get(i), j) == null)
                                            this.matrizAccion.setValueAt("r"+pr, estado.get(i), j);
                                        else {
                                            String valor = this.matrizAccion.getValueAt(estado.get(i),j)+", r"+pr;
                                            this.matrizAccion.setValueAt("conf. "+valor, estado.get(i), j);
                                        }
                                        break;
                                    }
                                }
                                k++;
                            }
                            j++;
                        }
                    }
                    i++;
                }
            }

            if(met == 2){
                ArrayList<String> anticipacion = new ArrayList();
                while(i < col1.size()){
                    int j=0;
                    while(j < col1.get(i).getElementosLR1().size()){
                        //Elementos con el punto al final
                        if(col1.get(i).getElementosLR1().get(j).getPosicion() == col1.get(i).getElementosLR1().get(j).getProduc().getConsec().size()){
                            int est = col1.get(i).getI();
                            Produccion prod = col1.get(i).getElementosLR1().get(j).getProduc();
                            anticipacion = col1.get(i).getElementosLR1().get(j).getAnticipacion();
                            int n=1;
                            int pr =0;
                            //buscar el numero de la produccion
                            while(n < this.gramatica.getPr().size()){
                                pr=0;
                                int iguales =1;
                                if(this.gramatica.getPr().get(n).getAntec().getSimboloNT().getNombre().equals(prod.getAntec().getSimboloNT().getNombre())){
                                    int p=0;
                                    while(p < this.gramatica.getPr().get(n).getConsec().size()){
                                        if(!this.gramatica.getPr().get(n).getConsec().get(p).getNombre().equals(prod.getConsec().get(p).getNombre())){
```

```
                    iguales =0;
                    break;
                }else
                    p++;
            }
            if(iguales == 1){
                pr = n;
                break;
            }
        }
        n++;
    }
    if(est == 1 && prod.getAntec().getSimboloNT().getNombre().equals(this.gramatica.getSimbInicial()+"'")){
        this.matrizAccion.setValueAt("Aceptar", i, this.matrizAccion.getColumnCount()-1);
    }else{

        v=1;

        while(v < this.matrizAccion.getColumnCount()){
            int w = 0;
            while(w < anticipacion.size()){
                if(anticipacion.get(w).equals(this.matrizAccion.getColumnName(v))){

                    if(pr !=0){
                        if(this.matrizAccion.getValueAt(est, v) == null)
                            this.matrizAccion.setValueAt("r"+pr, est, v);
                        else{
                            String valor = this.matrizAccion.getValueAt(est,v)+", r"+pr;
                            this.matrizAccion.setValueAt("conf. "+valor, est, v);
                        }
                    }
                }
                w++;
            }
            v++;
        }
    }
}
```

```
                    j++;
                }
                i++;
            }
        }

        if(met == 3){
            ArrayList<String> anticipacion = new ArrayList();
            while(i < col2.size()){
                int j=0;
                while(j < col2.get(i).getElementosLR1().size()){
                    //Elementos con el punto al final
                    if(col2.get(i).getElementosLR1().get(j).getPosicion
                       () == col2.get(i).getElementosLR1().get(j).
                       getProduc().getConsec().size()){
                        int est = col2.get(i).getY();
                        Produccion prod = col2.get(i).getElementosLR1()
                            .get(j).getProduc();
                        anticipacion = col2.get(i).getElementosLR1().
                            get(j).getAnticipacion();
                        int n=1;
                        int pr =0;
                        //buscar el numero de la produccion
                        while(n < this.gramatica.getPr().size()){
                            pr=0;
                            int iguales =1;
                            if(this.gramatica.getPr().get(n).getAntec()
                                .getSimboloNT().getNombre().equals(prod
                                .getAntec().getSimboloNT().getNombre())
                                ){
                                int p=0;
                                while(p < this.gramatica.getPr().get(n)
                                    .getConsec().size()){
                                    if(!this.gramatica.getPr().get(n).
                                        getConsec().get(p).getNombre().
                                        equals(prod.getConsec().get(p).
                                        getNombre())){
                                        iguales =0;
                                        break;
                                    }else
                                        p++;
                                }

                                if(iguales == 1){
                                    pr = n;
                                    break;
                                }
                            }
                            n++;
                        }
                        if(est == 1 && prod.getAntec().getSimboloNT().
                            getNombre().equals(this.gramatica.
                            getSimbInicial()+"'")){
```

```
                            this.matrizAccion.setValueAt(”Aceptar”, i, this.matrizAccion.getColumnCount()-1);
                        }else{

                            v=1;
                            while(v < this.matrizAccion.getColumnCount()){
                                int w = 0;
                                while(w < anticipacion.size()){
                                    if(anticipacion.get(w).equals(this.matrizAccion.getColumnName(v))){

                                        if(pr !=0){
                                            if(this.matrizAccion.getValueAt(est, v) == null)
                                                this.matrizAccion.setValueAt(”r”+pr, est, v);
                                            else{
                                                String valor = this.matrizAccion.getValueAt(est,v)+”, r”+pr;
                                                this.matrizAccion.setValueAt(”conf. ”+valor, est, v);
                                            }
                                        }
                                    }
                                    w++;
                                }
                                v++;
                            }
                        }
                    }
                    j++;
                }
                i++;
            }
        }

    }

    public DefaultTableModel getMatrizAccion() {
        return matrizAccion;
    }

    public void crearFunError(FuncionError fun){
        this.funError.add(fun);
    }

    public ArrayList<FuncionError> getFunError() {
        return funError;
    }

    public void setFunError(ArrayList<FuncionError> funcion){
        this.funError = funcion;
    }
}
```

2.4.17. ParteIrA.java

```
//SimAS / Editor
// Parte ir_a

package es.uco.simas.editor;

import es.uco.simas.util.gramatica.Gramatica;
import javax.swing.table.DefaultTableModel;

/**
 * @author vanesa
 */
public class ParteIrA {
    private  DefaultTableModel matrizIrA ;
    Gramatica gramatica;

    public ParteIrA(Gramatica gramatica){
        this.gramatica = gramatica;
    }

    void construir(int met){
        ColCanLR0 coleccion = new ColCanLR0();
        ColCanLR1 col1 = new ColCanLR1();
        ColCanLALR col2 = new ColCanLALR();
        if(met == 1){
            coleccion = this.gramatica.getColeccionLR0();
        }
        if(met == 2){
            col1 = this.gramatica.getColeccionLR1();
        }
        if(met == 3){
            col2 = this.gramatica.getColeccionLALR();
        }

        int i =0;
        this.matrizIrA =new DefaultTableModel();
        //Se anaden los simbolos no terminales en las columnas
        while(i < this.gramatica.getNoTerm().size()){
            this.matrizIrA.addColumn(this.gramatica.getNoTerm().get(i).
                getNombre());
            i++;
        }
        if(met == 1){
            //Se anaden los estados en las filas
            i=0;
            while(i < this.gramatica.getColeccionLR0().getConjElementosLR0().size()){
                Object [] linea = new Object[] {

                     };
                    this.matrizIrA.addRow(linea);
                i++;
            }

            i=0;
            while(i < coleccion.getConjElementosLR0().size()){
                int fila = coleccion.getConjElementosLR0().get(i).col;
                int columna = 0;
                int j=0;
                int encontrado =0;
                while(j < this.matrizIrA.getColumnCount()){
                    if(coleccion.getConjElementosLR0().get(i).simbolo.equals(this.matrizIrA.getColumnName(j))){
                        columna = j;
                        encontrado = 1;
                        break;
                    }else
                        j++;
                }
                if(encontrado == 1)
                    this.matrizIrA.setValueAt(coleccion.getConjElementosLR0().get(i).getI(), fila, columna);

                i++;
            }
            i=0;
            while(i < coleccion.getConj2().size()){
                int fila = coleccion.getConj2().get(i).col;
                int columna = 0;
                int j=0;
                int encontrado =0;
                while(j < this.matrizIrA.getColumnCount()){
                    if(coleccion.getConj2().get(i).simbolo.equals(this.matrizIrA.getColumnName(j))){
                        columna = j;
                        encontrado = 1;
                        break;
                    }else
                        j++;
                }
                if(encontrado == 1){
                    this.matrizIrA.setValueAt(coleccion.getConj2().get(
                       i).getI(), fila, columna);
                }
                i++;
            }
        }
        if(met == 2){
            //Se anaden los estados en las filas
            i=0;
            while(i < this.gramatica.getColeccionLR1().
               getConjElementosLR1().size()){
                Object [] linea = new Object[] {

                     };
                    this.matrizIrA.addRow(linea);
                i++;
            }
            i=0;
            while(i < col1.getConjElementosLR1().size()){
                int fila = col1.getConjElementosLR1().get(i).col;
                int columna = 0;
                int j=0;
                int encontrado =0;
                while(j < this.matrizIrA.getColumnCount()){
                    if(col1.getConjElementosLR1().get(i).simbolo.equals
                       (this.matrizIrA.getColumnName(j))){
                        columna = j;
                        encontrado = 1;
                        break;
                    }else
                        j++;
                }
                if(encontrado == 1)
                    this.matrizIrA.setValueAt(col1.getConjElementosLR1
                       ().get(i).getI(), fila, columna);

                i++;
            }
            i=0;
            while(i < col1.getConj2().size()){
                int fila = col1.getConj2().get(i).col;
                int columna = 0;
                int j=0;
                int encontrado =0;
                while(j < this.matrizIrA.getColumnCount()){
                    if(col1.getConj2().get(i).simbolo.equals(this.
                       matrizIrA.getColumnName(j))){
                        columna = j;
                        encontrado = 1;
                        break;
                    }else
                        j++;
                }
```

```java
                if(encontrado == 1){
                    this.matrizIrA.setValueAt(col1.getConj2().get(i).getI(), fila, columna);
                }
                i++;
            }
        }

        if(met == 3){
            //Se anaden los estados en las filas
            i=0;
            while(i < this.gramatica.getColeccionLALR().getConjElementosLALR().size()){
                Object [] linea = new Object[] {
                      };
                    this.matrizIrA.addRow(linea);
                i++;
            }
            i=0;
            while(i < col2.getConjElementosLALR().size()){
                int fila = col2.getConjElementosLALR().get(i).col;
                int columna = 0;
                int j=0;
                int encontrado =0;
                while(j < this.matrizIrA.getColumnCount()){
                    if(col2.getConjElementosLALR().get(i).simbolo.equals(this.matrizIrA.getColumnName(j))){
                        columna = j;
                        encontrado = 1;
                        break;
                    }else
                        j++;
                }
                if(encontrado == 1)
                    if(col2.getConjElementosLALR().get(i).getV() != -1) {
                        this.matrizIrA.setValueAt(col2.getConjElementosLALR().get(i).getI()+”−”+col2.getConjElementosLALR().get(i).getV(), fila, columna);
                    }else{
                        this.matrizIrA.setValueAt(col2.getConjElementosLALR().get(i).getI(), fila, columna);
                    }
                i++;
            }
            i=0;
            while(i < col2.getConj2().size()){
                int w=0;
                int fila = -1;
                while(w < col2.getConjElementosLALR().size()){
                    if(col2.getConjElementosLALR().get(w).getI() == col2.getConj2().get(i).col){
                        fila = w;
                        break;
                    }
                    w++;
                }
                if(fila == -1){
                    w=0;
                    while(w < col2.getConjElementosLALR().size()){
                    if(col2.getConjElementosLALR().get(w).getV() == col2.getConj2().get(i).col){
                        fila = w;
                        break;
                    }
                    w++;
                    }
                }

                int columna = 0;
                int j=0;
                int encontrado =0;
                while(j < this.matrizIrA.getColumnCount()){
                    if(col2.getConj2().get(i).simbolo.equals(this.matrizIrA.getColumnName(j))){
                        columna = j;
                        encontrado = 1;
                        break;
                    }else
                        j++;
                }
                if(encontrado == 1){
                    if(col2.getConj2().get(i).getV() != -1){
                        this.matrizIrA.setValueAt(col2.getConj2().get(i).getI()+"-"+col2.getConj2().get(i).getV(), fila, columna);
                    }else{
                        this.matrizIrA.setValueAt(col2.getConj2().get(i).getI(), fila, columna);
                    }
                }
                i++;
            }
        }
    }

    public DefaultTableModel getMatrizIrA() {
        return matrizIrA;
    }
}
```

2.4.18. TablaLR.java

```
// SimAS  /  Editor
// Tabla LR

package es.uco.simas.editor;

import es.uco.simas.util.gramatica.Gramatica;
import javax.swing.table.DefaultTableModel;

/**
 * @author vanesa
 */
public class TablaLR {
    int metodoAscendente;
    ParteAccion TAccion;
    ParteIrA TIrA;
    DefaultTableModel matrizLR ;
    DefaultTableModel matrizAccion;
    DefaultTableModel matrizIra;
    Gramatica gramatica;

    public TablaLR(Gramatica gramatica){
        this.gramatica = gramatica;
    }

    public void construir(int i){
        this.TAccion = new ParteAccion(this.gramatica);
        this.TAccion.construir(i);
        this.TIrA = new ParteIrA(this.gramatica);
        this.TIrA.construir(i);
        this.matrizAccion = this.TAccion.getMatrizAccion();
        this.matrizIra = this.TIrA.getMatrizIrA();

        this.gramatica.setTlr(this);
    }

    public int getMetodoAscendente() {
        return metodoAscendente;
    }

    public void setMetodoAscendente(int metodoAscendente) {
        this.metodoAscendente = metodoAscendente;
    }

    public ParteAccion getTAccion() {
        return TAccion;
    }

    public void setTAccion(ParteAccion TAccion) {
        this.TAccion = TAccion;
    }

```

```java
    public ParteIrA getTIrA() {
        return TIrA;
    }

    public void setTIrA(ParteIrA TIrA) {
        this.TIrA = TIrA;
    }

    public DefaultTableModel getMatrizLR() {
        return matrizLR;
    }
}
```

2.4.19. TablaPredictiva.java

```java
//SimAS / Editor
//Tabla Predictiva

package es.uco.simas.editor;

import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.util.gramatica.Terminal;
import java.util.ArrayList;
import javax.swing.DefaultListModel;
import javax.swing.table.DefaultTableModel;

/**
 * @author vanesa
 */
public class TablaPredictiva {

    ArrayList<FuncionError> funError = new ArrayList();
    private DefaultTableModel matrizPred ;
    Gramatica gramatica;

    public TablaPredictiva(){
        DefaultTableModel tabla = new DefaultTableModel();
        this.matrizPred = tabla;
    }

    public void construir(Gramatica gramatica){
        int i = 0;
        int j = 0;
        int fila = 0;
        int columna = 0;
        this.gramatica = gramatica;
        DefaultListModel produc = gramatica.getProducciones();
        ArrayList<Terminal> primeros = null;
        ArrayList<Terminal> siguientes = null;

        this.matrizPred = new DefaultTableModel();
        this.matrizPred.addColumn("");
        //Se anaden los simbolos terminales en las columnas
        while(i < this.gramatica.getTerm().size()){
            this.matrizPred.addColumn(this.gramatica.getTerm().get(i).getNombre());
            i++;
        }
        this.matrizPred.addColumn("$");

        //Se anaden los simbolos no terminales en las filas
        i=0;
        while(i < this.gramatica.getNoTerm().size()){
            Object [] linea = new Object[] {
                  this.gramatica.getNoTerm().get(i).getNombre()
                 };
                this.matrizPred.addRow(linea);

            i++;
        }

        i=0;
        while(i < produc.size()){
            String valor = produc.getElementAt(i).toString();
            String [] separado = valor.split(" ");
            String antec = separado[0];

            int k=0;
            while(k < this.gramatica.getNoTerm().size()){
                if(this.gramatica.getNoTerm().get(k).getNombre().equals(separado[0])){
                    fila = k;
                    break;
                }
                k++;
            }

            if(this.gramatica.isNoTerminal(separado[2])){
                j=0;
                while(j < this.gramatica.getNoTerm().size()){
                    if(this.gramatica.getNoTerm().get(j).getNombre().equals(separado[2])){
                        primeros = this.gramatica.getNoTerm().get(j).getPrimeros();
                        break;
                    }else
                        j++;
                }
                if(primeros != null){
                    j=0;
                    while(j < primeros.size()){
                        String nombre = ""+(i+1);
                        Object objeto = nombre;

                        k=0;
                        while(k < this.gramatica.getTerm().size()){
                            if(this.gramatica.getTerm().get(k).
                               getNombre().equals(primeros.get(j).
                               getNombre())){
                                columna = k+1;
                                break;
                            }
                            k++;
                        }
                        if(columna!=0)
                            setCeldaPredictiva(objeto, fila, columna);

                        j++;
                    }
                }
            }else{
                if(this.gramatica.isTerminal(separado[2])){
                    String nombre = ""+(i+1);
                    Object objeto = nombre;
                    k=0;
                    while(k < this.gramatica.getTerm().size()){
                        if(this.gramatica.getTerm().get(k).getNombre().
                           equals(separado[2])){
                            columna = k+1;
                            break;
                        }
                        k++;
                    }
                    setCeldaPredictiva(objeto, fila, columna);

                }else{ // Si contiene epsilon se utiliza el conj.
                   siguiente
                    if(separado[2].equals("\u03b5")){
                        j=0;
                        while(j < this.gramatica.getNoTerm().size()){
                            if(this.gramatica.getNoTerm().get(j).
                               getNombre().equals(antec)){
                                siguientes = this.gramatica.getNoTerm()
                                    .get(j).getSiguientes();
                                break;
                            }else
                                j++;
                        }
                        if(siguientes != null){
                            j=0;
                            while(j < siguientes.size()){
                                String nombre = ""+(i+1);
                                Object objeto = nombre;

                                k=0;
                                while(k < this.gramatica.getTerm().size()){
                                    if(siguientes.get(j).getNombre().equals("$")){
                                        columna = this.matrizPred.getColumnCount()-1;
                                        break;
                                    }else{

                                        if(this.gramatica.getTerm().get(k).getNombre().equals(siguientes.get(j).getNombre())){
                                            columna = k+1;
                                            break;
                                        }
                                    }
                                        k++;
                                }
                                setCeldaPredictiva(objeto, fila, columna);
                                j++;
                            }
                        }
                    }
                }
            }
            i++;
        }

    }

    public DefaultTableModel getTabla(){
        return this.matrizPred;
    }

    public void setTabla(DefaultTableModel tabla){
        this.matrizPred = tabla;
    }

    public Object getCeldaPredictiva(int i, int j){
        return this.matrizPred.getValueAt(i, j);
    }

    public void setCeldaPredictiva(Object objeto, int i, int j){
        this.matrizPred.setValueAt(objeto, i, j);
    }

    public void crearFunError(FuncionError fun){
        this.funError.add(fun);
    }

    public ArrayList<FuncionError> getFunError() {
        return funError;
    }

    public void setFunError(ArrayList<FuncionError> funcion){
        this.funError = funcion;
    }
}
```

2.4.20. VentanaCreacionGramatica.java

```
// SimAS / Editor
// Ventana Creacion Gramatica

package es.uco.simas.editor;

import es.uco.simas.util.gramatica.Gramatica;
import javax.swing.DefaultListModel;

/**
 * @author vanesa
 */
public class VentanaCreacionGramatica extends javax.swing.JFrame {

    private  PanelCreacionGramaticaPaso1 paso1 ;
    private  PanelCreacionGramaticaPaso2 paso2 ;
    private  PanelCreacionGramaticaPaso3 paso3 ;
    private  PanelCreacionGramaticaPaso4 paso4 ;
    private  Editor ventanaPadre ;

    public VentanaCreacionGramatica(Editor ventanaPadre, Gramatica gr){

        initComponents();
        this.setResizable(false);
        this.ventanaPadre =ventanaPadre;
        PanelCreacionGramaticaPaso1 paso1 = new PanelCreacionGramaticaPaso1(this);
        this.paso1 =paso1;
        PanelCreacionGramaticaPaso2 paso2 = new PanelCreacionGramaticaPaso2(this);
        this.paso2 =paso2;
        PanelCreacionGramaticaPaso3 paso3 = new PanelCreacionGramaticaPaso3(this);
        this.paso3 =paso3;
        PanelCreacionGramaticaPaso4 paso4 = new PanelCreacionGramaticaPaso4(this);
        this.paso4 =paso4;
        this.getContentPane().removeAll();
        this.setContentPane(this.paso1);
        this.pack();
        this.validate();
        this.setTitle("Asistente de creacion de gramÃ¡ticas. Paso 1 de 4");
        this.setVisible(true);

        if(gr!=null){
            this.paso1.setNombre(gr.getNombre());
            this.paso1.setDescripcion(gr.getDescripcion());
            this.paso2.asignarListaSimbolosTerminales(gr.getTerminales());
            this.paso2.asignarListaSimbolosNoTerminales(gr.getNoTerminales());
            this.paso3.asignarProducciones(gr.getProducciones());
            this.paso4.setSimboloInicial(gr.getSimbInicial());
        }
    }

    public   void cambiarPaso( int paso)  {
        switch(paso){
          case 1: {
            this.setContentPane(this.paso1);
            this.pack();
            this.setVisible(true);
            this.validate();
            this.setTitle("Asistente de creacion de gramÃ¡ticas. Paso 1 de 4");
            break;
          }
          case 2: {
            this.setContentPane(this.paso2);
            this.pack();
            this.setVisible(true);
            this.validate();
            this.setTitle("Asistente de creacion de gramÃ¡ticas. Paso 2 de 4");
            break;
          }
          case 3: {
            this.setContentPane(this.paso3);
            this.pack();
            this.setVisible(true);
            this.validate();
            this.setTitle("Asistente de creacion de gramÃ¡ticas. Paso 3 de 4");
            break;
          }
          case 4:  {
            this.setContentPane(this.paso4);
            this.pack();
            if(this.paso2.getSimbolosNoTerminales()!=  null) {
              this.paso4.setSimbolosNoTerminales(this.paso2.getSimbolosNoTerminales());
            }
```

```
                this.setVisible(true);
                this.validate();
                this.setTitle(”Asistente de creacion de gramÃ¡ticas. Paso 4 de 4”);
            }
        }
    }

     public    DefaultListModel getSimbolosTerminales( )      {
       return this.paso2.getSimbolosTerminales();
    }

    public    DefaultListModel getSimbolosNoTerminales( )      {
       return this.paso2.getSimbolosNoTerminales();
    }

    public DefaultListModel getProducciones(){
        return this.paso3.getProducciones();
    }

    public void setProducciones(DefaultListModel pr){
        this.paso3.asignarProducciones(pr);
    }

    public    void finalizarAsistente( ) {
        Gramatica gramatica= new Gramatica(this.paso1.getNombreGramatica(), this.paso1.getDescripcionGramatica());
        gramatica.setVocabulario(this.paso2.getSimbolosNoTerminales(), this.paso2.getSimbolosTerminales());
        gramatica.setNoTerminales(this.paso2.getSimbolosNoTerminales());
        gramatica.setTerminales(this.paso2.getSimbolosTerminales());
        gramatica.setProducciones(this.paso3.getProducciones());
        gramatica.setSimbInicial(this.paso4.getSimboloInicial());

        Editor p1 = new Editor(gramatica);
        this.ventanaPadre.dispose();
        p1.setVisible(true);
        p1.setLocationRelativeTo(null);
        this.dispose();
}

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    //@SuppressWarnings(”unchecked”)
    // <editor-fold defaultstate=”collapsed” desc=”Generated Code”>//GEN-BEGIN:initComponents
    private void initComponents() {

        jLabel1 = new javax.swing.JLabel();

        setDefaultCloseOperation(javax.swing.WindowConstants.
            DISPOSE_ON_CLOSE);

        jLabel1.setText("Ventana");

        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(185, 185, 185)
                .addComponent(jLabel1)
                .addContainerGap(370, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.
                Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(39, 39, 39)
                .addComponent(jLabel1)
                .addContainerGap(358, Short.MAX_VALUE))
        );

        pack();
    }// </editor-fold>//GEN-END:initComponents
/**/
    /**
     * @param args the command line arguments
     */

    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JLabel jLabel1;
    // End of variables declaration//GEN-END:variables

}
```

2.4.21. VentanaProducciones.java

```
// SimAS / Editor
// Ventana Producciones

package es.uco.simas.editor;

import java.util.ArrayList;
```

```java
import javax.swing.DefaultComboBoxModel;
import javax.swing.DefaultListModel;
import javax.swing.JOptionPane;
import javax.swing.*;

/**
 * @author vanesa
 */
public class VentanaProducciones extends javax.swing.JFrame {

    private DefaultListModel modeloProducciones ;
    private  PanelCreacionGramaticaPaso3 panelPadre ;
    private  int idxProduccionSeleccionada ;

    public VentanaProducciones(PanelCreacionGramaticaPaso3 ventanaPadre ,  ListModel producciones) {

        this.idxProduccionSeleccionada =-1;
        DefaultListModel list = new DefaultListModel();
        this.modeloProducciones = list;
        int i=0;
        while(true)  {
            if(i >= producciones.getSize()) {
                break;
            }
            if(i < producciones.getSize()) {
                this.modeloProducciones.add(i,producciones.getElementAt(i));
                i = i+1;
            }
        }

        initComponents();
        this.jList1.setModel(producciones);
        this.panelPadre = ventanaPadre;
        inicializarCombos();
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings(”unchecked”)
    // <editor-fold defaultstate=”collapsed” desc=”Generated Code”>//GEN-BEGIN:initComponents
    private void initComponents() {

        jPanel1 = new javax.swing.JPanel();
        jScrollPane1 = new javax.swing.JScrollPane();
        jList1 = new javax.swing.JList();
        jLabel1 = new javax.swing.JLabel();
        jLabel2 = new javax.swing.JLabel();
        jComboBoxAntecedente = new javax.swing.JComboBox();
        jTextFieldConsecuente = new javax.swing.JTextField();
        jLabel4 = new javax.swing.JLabel();
        jLabel5 = new javax.swing.JLabel();
        jButtonInsertar = new javax.swing.JButton();
        jButtonEliminar = new javax.swing.JButton();
        jButtonAceptar = new javax.swing.JButton();
        jButtonCancelar = new javax.swing.JButton();
        jButtonBorrar = new javax.swing.JButton();
        jLabel6 = new javax.swing.JLabel();
        jButtonModificar = new javax.swing.JButton();
        jLabel3 = new javax.swing.JLabel();
        jLabel7 = new javax.swing.JLabel();
        jScrollPane2 = new javax.swing.JScrollPane();
        jListTerm = new javax.swing.JList();
        jScrollPane3 = new javax.swing.JScrollPane();
        jListNTerm = new javax.swing.JList();
        jButton1 = new javax.swing.JButton();

        setDefaultCloseOperation(javax.swing.WindowConstants.DISPOSE_ON_CLOSE);
        setTitle("Producciones de la GramÃ¡tica");

        jPanel1.setBackground(new java.awt.Color(233, 244, 244));

        jScrollPane1.setViewportView(jList1);

        jLabel1.setFont(new java.awt.Font("Ubuntu", 1, 18)); // NOI18N
        jLabel1.setText("Nueva Produccion:");

        jLabel2.setText("Antecedente");

        jLabel4.setText("Consecuente");

        jLabel5.setText("Anadir sÃmbolo al consecuente:");

        jButtonInsertar.setText("Insertar Produccion");
        jButtonInsertar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonInsertarActionPerformed(evt);
            }
        });

        jButtonEliminar.setText("Eliminar Produccion");
        jButtonEliminar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonEliminarActionPerformed(evt);
            }
        });

        jButtonAceptar.setText("Aceptar");
        jButtonAceptar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonAceptarActionPerformed(evt);
            }
        });

        jButtonCancelar.setText("Cancelar");
        jButtonCancelar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonCancelarActionPerformed(evt);
            }
        });

        jButtonBorrar.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/flechaI.png"))); // NOI18N
        jButtonBorrar.setToolTipText("Borrar");
        jButtonBorrar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonBorrarActionPerformed(evt);
            }
        });

        jLabel6.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/flechaD.png"))); // NOI18N

        jButtonModificar.setText("Modificar Produccion");
        jButtonModificar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonModificarActionPerformed(evt);
            }
        });

        jLabel3.setText("No Terminales");

        jLabel7.setText("Terminales");

        jListTerm.addMouseListener(new java.awt.event.MouseAdapter() {
            public void mousePressed(java.awt.event.MouseEvent evt) {
                addNTerminales(evt);
```

```java
            }
        });
        jScrollPane2.setViewportView(jListTerm);

        jListNTerm.addMouseListener(new java.awt.event.MouseAdapter() {
            public void mousePressed(java.awt.event.MouseEvent evt) {
                addTerminales(evt);
            }
        });
        jScrollPane3.setViewportView(jListNTerm);

        jButton1.setText(”\u03b5”);
        jButton1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton1ActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
        jPanel1.setLayout(jPanel1Layout);
        jPanel1Layout.setHorizontalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addGap(45, 45, 45)
                        .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                            .addGroup(jPanel1Layout.createSequentialGroup()
                                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                                    .addComponent(jScrollPane2, javax.swing.GroupLayout.PREFERRED_SIZE, 200, javax.swing.GroupLayout.PREFERRED_SIZE)
                                    .addComponent(jButtonInsertar))
                                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                                    .addGroup(jPanel1Layout.createSequentialGroup()
                                        .addGap(82, 82, 82)
                                        .addComponent(jScrollPane3, javax.swing.GroupLayout.PREFERRED_SIZE, 228, javax.
                                            swing.GroupLayout.
                                            PREFERRED_SIZE))
                                    .addGroup(jPanel1Layout.
                                        createSequentialGroup()
                                        .addPreferredGap(javax.swing.
                                            LayoutStyle.
                                            ComponentPlacement.RELATED)
                                        .addComponent(jButtonModificar)
                                            )))
                            .addGroup(jPanel1Layout.createParallelGroup
                                (javax.swing.GroupLayout.Alignment.
                                TRAILING)
                                .addComponent(jButtonEliminar)
                                .addComponent(jScrollPane1, javax.swing
                                    .GroupLayout.PREFERRED_SIZE, 508,
                                    javax.swing.GroupLayout.
                                    PREFERRED_SIZE))))
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addGap(89, 89, 89)
                        .addComponent(jLabel3)
                        .addGap(233, 233, 233)
                        .addComponent(jLabel7)))
                .addGap(0, 0, Short.MAX_VALUE))
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
                jPanel1Layout.createSequentialGroup()
                .addGap(28, 28, 28)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing
                    .GroupLayout.Alignment.LEADING)
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addComponent(jLabel5)
                        .addGap(40, 40, 40)
                        .addComponent(jButton1, javax.swing.GroupLayout
                            .PREFERRED_SIZE, 89, javax.swing.
                            GroupLayout.PREFERRED_SIZE))
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addGroup(jPanel1Layout.createParallelGroup(
                            javax.swing.GroupLayout.Alignment.LEADING)
                            .addGroup(jPanel1Layout.
                                createSequentialGroup()
                                .addComponent(jLabel2)
                                .addGap(55, 55, 55))
                            .addComponent(jComboBoxAntecedente, javax.
                                swing.GroupLayout.Alignment.TRAILING,
                                javax.swing.GroupLayout.PREFERRED_SIZE,
                                 151, javax.swing.GroupLayout.
                                PREFERRED_SIZE))
                        .addGroup(jPanel1Layout.createParallelGroup(
                            javax.swing.GroupLayout.Alignment.LEADING)
                            .addGroup(jPanel1Layout.
                                createSequentialGroup()
                                .addGap(93, 93, 93)
                                .addComponent(jLabel4))
                            .addGroup(jPanel1Layout.
                                createSequentialGroup()
                                .addGap(18, 18, 18)
                                .addComponent(jLabel6)
                                .addPreferredGap(javax.swing.
                                   LayoutStyle.ComponentPlacement.
                                   RELATED)
                                .addComponent(jTextFieldConsecuente,
                                   javax.swing.GroupLayout.
                                   PREFERRED_SIZE, 274, javax.swing.
                                   GroupLayout.PREFERRED_SIZE)
                                .addPreferredGap(javax.swing.
                                   LayoutStyle.ComponentPlacement.
                                   RELATED)
                                .addComponent(jButtonBorrar, javax.
                                   swing.GroupLayout.PREFERRED_SIZE,
                                   37, javax.swing.GroupLayout.
                                   PREFERRED_SIZE))))
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addGap(191, 191, 191)
                        .addComponent(jLabel1)))
                .addGap(169, 169, 169))
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
                jPanel1Layout.createSequentialGroup()
                .addGap(64, 64, 64)
                .addComponent(jButtonCancelar)
                .addGap(248, 248, 248)
                .addComponent(jButtonAceptar)
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
                    Short.MAX_VALUE))
        );
        jPanel1Layout.setVerticalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.
                Alignment.LEADING)
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
                jPanel1Layout.createSequentialGroup()
                .addContainerGap()
                .addComponent(jLabel1)
                .addGap(14, 14, 14)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing
                    .GroupLayout.Alignment.BASELINE)
                    .addComponent(jLabel2)
                    .addComponent(jLabel4))
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.UNRELATED)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing
                    .GroupLayout.Alignment.LEADING)
                    .addComponent(jLabel6, javax.swing.GroupLayout.
                        Alignment.TRAILING, javax.swing.GroupLayout.
                        PREFERRED_SIZE, 27, javax.swing.GroupLayout.
                        PREFERRED_SIZE)
                    .addGroup(jPanel1Layout.createParallelGroup(javax.
                        swing.GroupLayout.Alignment.BASELINE)
                        .addComponent(jComboBoxAntecedente, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addComponent(jTextFieldConsecuente, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE))
                    .addComponent(jButtonBorrar))
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addComponent(jLabel5)
                    .addComponent(jButton1))
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jLabel3)
                    .addComponent(jLabel7))
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)
                    .addComponent(jScrollPane3)
                    .addComponent(jScrollPane2))
                .addGap(27, 27, 27)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jButtonInsertar)
                    .addComponent(jButtonModificar)
                    .addComponent(jButtonEliminar))
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 148, javax.swing.GroupLayout.PREFERRED_SIZE)
                .addGap(23, 23, 23)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jButtonCancelar)
                    .addComponent(jButtonAceptar))
                .addGap(77, 77, 77))
        );

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.PREFERRED_SIZE, 584, javax.swing.GroupLayout.PREFERRED_SIZE)
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.PREFERRED_SIZE, 584, javax.swing.GroupLayout.PREFERRED_SIZE)
        );

        pack();
    }// </editor-fold>//GEN-END:initComponents

    private void jButtonBorrarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonBorrarActionPerformed
        Boolean espacioEncontrado= null;
        String cadenaConsecuente= null;
        String espacioBlanco= null;
        int indice= 0;
        cadenaConsecuente=this.jTextFieldConsecuente.getText();
        indice=0;
        espacioEncontrado=Boolean.valueOf(false);
        espacioBlanco="";

        if(cadenaConsecuente.length()!= 0){
            if(cadenaConsecuente.charAt((cadenaConsecuente.length()- 1)) == 32) {
                cadenaConsecuente =cadenaConsecuente.substring(0,(cadenaConsecuente.length()- 2));

            }
            if(cadenaConsecuente.length() > 0) {
                indice=(cadenaConsecuente.length()- 1);
                while(true) {
                    if(indice<=0) {
                        break;
                    }
                    if(indice > 0) {
                        if(String.valueOf(cadenaConsecuente.charAt(indice)).equals(" ")!=false) {
                            espacioEncontrado =Boolean.valueOf(true);
                            break ;

                        }
                        indice = indice+(-1);
                    }
                }
            }
            if(espacioEncontrado.booleanValue())   {
                this.jTextFieldConsecuente.setText(cadenaConsecuente.substring(0,indice));

            } else    {
                this.jTextFieldConsecuente.setText("");
            }
        }
    }//GEN-LAST:event_jButtonBorrarActionPerformed

    private void jButtonCancelarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonCancelarActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir de la edicion de las producciones?", "Salir",JOptionPane.YES_NO_OPTION);

        if(conf==0)
        this.dispose();
    }//GEN-LAST:event_jButtonCancelarActionPerformed

    private void jButtonAceptarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonAceptarActionPerformed
        if(this.panelPadre!=  null) {
            if(this.jList1.getModel().getSize() > 0) {
                this.panelPadre.asignarProducciones((DefaultListModel)this.jList1.getModel());
            }
        }
        this.dispose();
    }//GEN-LAST:event_jButtonAceptarActionPerformed

    private void jButtonEliminarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonEliminarActionPerformed
        DefaultListModel modelo= null;
        int seleccion= 0;
        seleccion=this.jList1.getSelectedIndex();
        if(seleccion != -1) {
            modelo=(DefaultListModel)this.jList1.getModel();
            modelo.remove(seleccion);
        }
    }//GEN-LAST:event_jButtonEliminarActionPerformed

    private void jButtonInsertarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonInsertarActionPerformed
        String produccion= null;
        int encontrado= 0;
        int i= 0;

        if(this.jButtonInsertar.getText().equals("Insertar Produccion")){
            if(this.jTextFieldConsecuente.getText().length() > 0) {
                encontrado=0;
                i=0;
                while(true)  {
                    if(i >= this.modeloProducciones.getSize()){
                        break;
                    }
                    if(i < this.modeloProducciones.getSize())  {
                        produccion=this.modeloProducciones.getElementAt(i).toString();
                        StringBuilder aux = new StringBuilder();
                        if(produccion.equals(aux.append(this.jComboBoxAntecedente.getSelectedItem().toString()).append(" ").append("\u2192").append(" ").append(this.jTextFieldConsecuente.getText()).append(" ").toString())!=false) {
                         encontrado=1;
                        }
                    i = i+1;
                    }
                }
                if(encontrado==0) {
                    StringBuilder prod = new StringBuilder();
                    this.modeloProducciones.add(this.modeloProducciones.getSize(),prod.append(this.jComboBoxAntecedente.getSelectedItem()).append(" ").append("\u2192").append(" ").append(this.jTextFieldConsecuente.getText()).append(" ").toString());
                    this.jList1.setModel(this.modeloProducciones);
                    this.jTextFieldConsecuente.requestFocus();
                    this.jTextFieldConsecuente.setText("");
                }
            }
        }else{
            StringBuilder prod = new StringBuilder();
            this.modeloProducciones.setElementAt(prod.append(this.jComboBoxAntecedente.getSelectedItem()).append(" ").append("\u2192").append(" ").append(this.jTextFieldConsecuente.getText()).append(" ").toString(), this.jList1.getSelectedIndex());//add(this.modeloProducciones.getSize(),prod.append(this.jComboBoxAntecedente.getSelectedItem()).append(" ").append("\u2192").append(" ").append(this.jTextFieldConsecuente.getText()).append(" ").toString());
            this.jList1.setModel(this.modeloProducciones);
            this.jTextFieldConsecuente.requestFocus();
            this.jTextFieldConsecuente.setText("");
            this.jButtonInsertar.setText("Insertar Produccion");
        }
    }//GEN-LAST:event_jButtonInsertarActionPerformed
```

```java

    private void jButtonModificarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonModificarActionPerformed
        String produccion= null;
        int i= 0;

        if(this.jList1.getSelectedIndex()>=0) {
            produccion=this.jList1.getSelectedValue().toString();
            this.idxProduccionSeleccionada = this.jList1.getSelectedIndex();

            i=0;
            while(true)    {
                if(i >= this.jComboBoxAntecedente.getItemCount()) {
                    break;
                }
                if(i < this.jComboBoxAntecedente.getItemCount())     {
                    if(this.jComboBoxAntecedente.getItemAt(i).toString().equals(produccion.substring(0,1))!=false){
                        this.jComboBoxAntecedente.setSelectedIndex(i);
                    }
                i = i+1;
                }
            }
            this.jTextFieldConsecuente.setText(produccion.substring(4));
            this.jButtonInsertar.setText("Guardar cambios");
        }
    }//GEN-LAST:event_jButtonModificarActionPerformed

    private void addTerminales(java.awt.event.MouseEvent evt) {//GEN-FIRST:event_addTerminales
        if(this.jTextFieldConsecuente.getText().length()==0) {
            StringBuilder string = new StringBuilder();
            this.jTextFieldConsecuente.setText(string.append(this.jTextFieldConsecuente.getText()).append(this.jListNTerm.getSelectedValue()).toString());
        } else {
            //Si se ha insertado epsilon en el consecuente no se puede insertar ningun simbolo
            int i=0;
            int j=0;
            String [] aux = this.jTextFieldConsecuente.getText().split(" ");

            while(i < aux.length){
                if("\u03b5".equals(aux[i])){
                    JOptionPane.showConfirmDialog(null, "El sÃmbolo \u03b5 debe aparecer solo en el consecuente de una produccion.", "Error",JOptionPane.CLOSED_OPTION);
                    j=1;
                    break;
                }
                i++;
            }
            //Si el consecuente no tiene epsilon se inserta el simbolo seleccionado
            if(j==0){
                if(this.jTextFieldConsecuente.getText().charAt((this.jTextFieldConsecuente.getText().length()- 1)) != 32){
                    StringBuilder string2 = new StringBuilder();
                    this.jTextFieldConsecuente.setText(string2.append(this.jTextFieldConsecuente.getText()).append(" ").append(this.jListNTerm.getSelectedValue()).toString());
                } else {
                    StringBuilder string3 = new StringBuilder();
                    this.jTextFieldConsecuente.setText(string3.append(this.jTextFieldConsecuente.getText()).append(this.jListNTerm.getSelectedValue()).toString());
                }
            }
        }
    }//GEN-LAST:event_addTerminales

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton1ActionPerformed
        if(this.jTextFieldConsecuente.getText().length() == 0) {
            StringBuilder string = new StringBuilder();
            this.jTextFieldConsecuente.setText(string.append(this.jTextFieldConsecuente.getText()).append("\u03b5").toString());
        } else {
            JOptionPane.showConfirmDialog(null, "El sÃmbolo \u03b5 debe aparecer solo en el consecuente de una produccion.", "Error",JOptionPane.CLOSED_OPTION);
        }
    }//GEN-LAST:event_jButton1ActionPerformed

    private void addNTerminales(java.awt.event.MouseEvent evt) {//GEN-FIRST:event_addNTerminales
        if(this.jTextFieldConsecuente.getText().length()==0) {
            StringBuilder string = new StringBuilder();
            this.jTextFieldConsecuente.setText(string.append(this.jTextFieldConsecuente.getText()).append(this.jListTerm.getSelectedValue()).toString());
        } else {
            //Si se ha insertado epsilon en el consecuente no se puede insertar ningun simbolo
            int i=0;
            int j=0;
            String [] aux = this.jTextFieldConsecuente.getText().split(" ");

            while(i < aux.length){

                if("\u03b5".equals(aux[i])){
                    JOptionPane.showConfirmDialog(null, "El sÃmbolo \u03b5 debe aparecer solo en el consecuente de una produccion.", "Error",JOptionPane.CLOSED_OPTION);
                    j=1;
                    break;
                }
                i++;
             }
            //Si el consecuente no tiene epsilon se inserta el simbolo seleccionado
            if(j==0){
                if(this.jTextFieldConsecuente.getText().charAt((this.jTextFieldConsecuente.getText().length()- 1)) != 32){
                    StringBuilder string2 = new StringBuilder();
                    this.jTextFieldConsecuente.setText(string2.append(this.jTextFieldConsecuente.getText()).append(" ").append(this.jListTerm.getSelectedValue()).toString());

                } else {
                    StringBuilder string3 = new StringBuilder();
                    this.jTextFieldConsecuente.setText(string3.append(this.jTextFieldConsecuente.getText()).append(this.jListTerm.getSelectedValue()).toString());
                }
            }
        }
    }//GEN-LAST:event_addNTerminales

    private    void inicializarCombos( )  {
        ArrayList<String> listaAntecedente= null;
        ArrayList<String> listaConsecuente= null;
        DefaultComboBoxModel modeloAntecedente= null;
        DefaultComboBoxModel modeloConsecuente= null;
        DefaultListModel noTerminales= null;
        DefaultListModel terminales= null;
        int i= 0;
        terminales=this.panelPadre.getSimbolosTerminales();
        noTerminales=this.panelPadre.getSimbolosNoTerminales();
        ArrayList antecedente = new ArrayList();
        listaAntecedente=antecedente;
        ArrayList consecuente = new ArrayList();
        listaConsecuente=consecuente;

        while(true)  {
            if(i >= noTerminales.size())  {
                break;
            }
            if(i < noTerminales.size())  {
                listaAntecedente.add((String)noTerminales.get(i));
                i = i+1;
            }
        }
        i=0;
        while(true) {
            if(i >= noTerminales.size())   {
                break;
            }
            if(i < noTerminales.size())  {
                listaConsecuente.add((String)noTerminales.get(i));
                i = i+1;
            }
        }
        i=0;
        while(true) {
            if(i >= terminales.size())  {
                break;
            }
            if(i < terminales.size()) {
                listaConsecuente.add((String)terminales.get(i));
                i = i+1;
            }
        }
        DefaultComboBoxModel comboAntecedente = new DefaultComboBoxModel(listaAntecedente.toArray());
        modeloAntecedente=comboAntecedente;
        DefaultComboBoxModel comboConsecuente = new DefaultComboBoxModel(listaConsecuente.toArray());
        modeloConsecuente=comboConsecuente;
        this.jComboBoxAntecedente.setModel(modeloAntecedente);
        this.jListNTerm.setModel(terminales);
        this.jListTerm.setModel(noTerminales);
}

    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        /* Set the Nimbus look and feel */
        //<editor-fold defaultstate=”collapsed” desc=” Look and feel setting code (optional) ”>
        /* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.
         * For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html
         */
        try {
```

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

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                // new VentanaProducciones().setVisible(true);
            }
        });
    }
    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1;
    private javax.swing.JButton jButtonAceptar;
    private javax.swing.JButton jButtonBorrar;
    private javax.swing.JButton jButtonCancelar;
    private javax.swing.JButton jButtonEliminar;
    private javax.swing.JButton jButtonInsertar;
    private javax.swing.JButton jButtonModificar;
    private javax.swing.JComboBox jComboBoxAntecedente;
    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.JLabel jLabel6;
    private javax.swing.JLabel jLabel7;
    private javax.swing.JList jList1;
    private javax.swing.JList jListNTerm;
    private javax.swing.JList jListTerm;
    private javax.swing.JPanel jPanel1;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JScrollPane jScrollPane2;
    private javax.swing.JScrollPane jScrollPane3;
    private javax.swing.JTextField jTextFieldConsecuente;
    // End of variables declaration//GEN-END:variables
}
```

2.4.22. VentanaResultadosValidacion.java

```
//SimAS / Editor
//Ventana Resultados Validacion

package es.uco.simas.editor;

import java.util.ArrayList;

/**
 * @author vanesa
 */
public class VentanaResultadosValidacion extends javax.swing.JFrame {

     private  int estadoValidacion ;
     private  ArrayList<String> mensajesError ;

    public VentanaResultadosValidacion(int estadoValidacion,  ArrayList<String> mensajesError){
        this.estadoValidacion =estadoValidacion;
        this.mensajesError =mensajesError;
        initComponents();
    }

    public VentanaResultadosValidacion() {
        initComponents();
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    private void initComponents() {

        jPanel1 = new javax.swing.JPanel();

        setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);
        setBackground(new java.awt.Color(233, 244, 244));

        jPanel1.setBackground(new java.awt.Color(233, 244, 244));
        jPanel1.setToolTipText(”Validacion”);

        javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
        jPanel1.setLayout(jPanel1Layout);
        jPanel1Layout.setHorizontalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGap(0, 437, Short.MAX_VALUE)
        );
        jPanel1Layout.setVerticalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGap(0, 323, Short.MAX_VALUE)
        );

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        );

        pack();
    }// </editor-fold>//GEN-END:initComponents

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

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new VentanaResultadosValidacion().setVisible(true);
            }
        });
    }
    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JPanel jPanel1;
    // End of variables declaration//GEN-END:variables
}
```

2.4.23. VentanaSimbolosNoTerminales.java

```
// SimAS / Editor
// Ventana Simbolos No Terminales

package es.uco.simas.editor;

import es.uco.simas.util.gramatica.Gramatica;
import java.util.ArrayList;
import javax.swing.JOptionPane;
import javax.swing.DefaultListModel;
import javax.swing.ListModel;

/**
 * @author vanesa
 */
public class VentanaSimbolosNoTerminales extends javax.swing.JFrame {

    private  DefaultListModel modeloListaTerminales ;
    private  DefaultListModel modeloListaNoTerminales ;
    private  PanelCreacionGramaticaPaso2 panelPadre ;
    private  Gramatica gramatica;

    public VentanaSimbolosNoTerminales(ListModel simbolosNoTerminales, ListModel simbolosTerminales,  PanelCreacionGramaticaPaso2 ventanaPadre, Gramatica gr) {

        int i=0;
        DefaultListModel NoTerminales = new DefaultListModel();
        this.modeloListaNoTerminales =NoTerminales;

        while(true)  {
            if(i >= simbolosNoTerminales.getSize())  {
                break;
            }
            if(i < simbolosNoTerminales.getSize()) {
                this.modeloListaNoTerminales.add(i,simbolosNoTerminales.getElementAt(i));
                i = i+1;
            }
        }

        initComponents();
        this.jList1.setModel(simbolosNoTerminales);
        this.setResizable(false);
        this.panelPadre =ventanaPadre;
        this.gramatica = gr;
        this.jTextField1.setText(””);
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings(”unchecked”)
    // <editor-fold defaultstate=”collapsed” desc=”Generated Code”>//GEN-BEGIN:initComponents
    private void initComponents() {

        jPanel1 = new javax.swing.JPanel();
        jButtonAceptar = new javax.swing.JButton();
        jButtonCancelar = new javax.swing.JButton();
        jTextField1 = new javax.swing.JTextField();
        jButtonInsertar = new javax.swing.JButton();
        jScrollPane2 = new javax.swing.JScrollPane();
        jList1 = new javax.swing.JList();
        jButtonEliminar = new javax.swing.JButton();

        setDefaultCloseOperation(javax.swing.WindowConstants.DISPOSE_ON_CLOSE);
        setTitle(”SÃmbolos No Terminales”);

        jPanel1.setBackground(new java.awt.Color(233, 244, 244));

        jButtonAceptar.setText(”Aceptar”);
        jButtonAceptar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonAceptarActionPerformed(evt);
            }
        });

        jButtonCancelar.setText(”Cancelar”);
        jButtonCancelar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonCancelarActionPerformed(evt);
            }
        });

        jButtonInsertar.setText(”Insertar”);
        jButtonInsertar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonInsertarActionPerformed(evt);
            }
        });

        jList1.setSelectionMode(javax.swing.ListSelectionModel.SINGLE_SELECTION);
        jScrollPane2.setViewportView(jList1);

        jButtonEliminar.setText(”Eliminar”);
        jButtonEliminar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonEliminarActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
        jPanel1.setLayout(jPanel1Layout);
        jPanel1Layout.setHorizontalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel1Layout.createSequentialGroup()
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                .addComponent(jButtonCancelar)
                .addGap(18, 18, 18)
                .addComponent(jButtonAceptar)
                .addContainerGap())
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGap(34, 34, 34)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)
                    .addComponent(jScrollPane2)
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addComponent(jTextField1, javax.swing.GroupLayout.PREFERRED_SIZE, 287, javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addGap(26, 26, 26)
                        .addComponent(jButtonInsertar)))
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                .addComponent(jButtonEliminar)
                .addContainerGap(142, Short.MAX_VALUE))
        );
        jPanel1Layout.setVerticalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGap(40, 40, 40)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jTextField1, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addComponent(jButtonInsertar)
                    .addComponent(jButtonEliminar))
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                .addComponent(jScrollPane2, javax.swing.GroupLayout.DEFAULT_SIZE, 251, Short.MAX_VALUE)
                .addGap(18, 18, 18)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jButtonAceptar)
                    .addComponent(jButtonCancelar))
                .addContainerGap())
        );

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        );

        pack();
    }// </editor-fold>//GEN-END:initComponents

    private void jButtonCancelarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonCancelarActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir de la edicion de la gramÃ¡tica?", "Salir",JOptionPane.YES_NO_OPTION);

        if(conf==0){
            this.dispose();
        }
    }//GEN-LAST:event_jButtonCancelarActionPerformed

    private void jButtonInsertarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonInsertarActionPerformed
        String elemento = jTextField1.getText();
        int encontrado= 0;
        int i= 0;

        if(elemento.equals("")){
            encontrado =1;
        }else{
            while(true){
                if(i >= this.modeloListaNoTerminales.getSize()) {
                    break;
                }
                if(i < this.modeloListaNoTerminales.getSize())  {
                    if(this.modeloListaNoTerminales.getElementAt(i).
                        equals(elemento)) {
                         encontrado=1;
                    }
                i = i+1;
                }
            }
        }
        if(encontrado==0)  {
            this.modeloListaNoTerminales.add(this.
                modeloListaNoTerminales.getSize(),elemento);
            this.jList1.setModel(this.modeloListaNoTerminales);
        }
        this.jTextField1.requestFocus();
        this.jTextField1.setText("");
    }//GEN-LAST:event_jButtonInsertarActionPerformed

    private void jButtonEliminarActionPerformed(java.awt.event.
        ActionEvent evt) {//GEN-FIRST:
        event_jButtonEliminarActionPerformed
        DefaultListModel modelo= null;
        DefaultListModel producciones = this.panelPadre.getProducciones
            ();
        String[] pr;
        ArrayList<String> prod = new ArrayList();
        String nt;
        int seleccion= 0;
        nt = this.jList1.getSelectedValue().toString();


        seleccion=this.jList1.getSelectedIndex();
        if(seleccion != -1) {
            if(producciones != null){
                int i=0;
                while(i< producciones.size()){
                    int j=0;
                    pr = (producciones.getElementAt(i).toString()).
                        split(" ");
                    while(j < pr.length){
                        if(pr[j].equals(this.jList1.getSelectedValue())
                            ){
                            prod.add(producciones.getElementAt(i).
                                toString());
                        }
                        j++;
                    }
                    i++;
                }
            }
            if(prod.size()>0){
                int conf = JOptionPane.showConfirmDialog(null, "El
                    sÃmbolo "+nt+" ha sido usado, si lo elimina
                    tambiÃ©n se eliminarÃ¡n las producciones en las que
```

```
                         aparezca, Â¿desea eliminarlo?", "SÃmbolo usado",
                        JOptionPane.YES_NO_OPTION);
                if(conf==0){
                    int k=0;
                    while(k < prod.size()){
                        int l=0;
                        while(l < producciones.size()){
                            if(prod.get(k).equals(producciones.get(l).
                                toString())){
                                producciones.remove(l);
                                break;
                            }else
                                l++;
                        }
                        k++;
                    }

                    this.panelPadre.setProducciones(producciones);
                    modelo=(DefaultListModel)this.jList1.getModel();
                    modelo.remove(seleccion);
                }

            }else{
                modelo=(DefaultListModel)this.jList1.getModel();
                modelo.remove(seleccion);
            }
        }
    }//GEN-LAST:event_jButtonEliminarActionPerformed

    private void jButtonAceptarActionPerformed(java.awt.event.
        ActionEvent evt) {//GEN-FIRST:
        event_jButtonAceptarActionPerformed
        if(this.panelPadre!= null) {
            if(this.jList1.getModel().getSize() > 0) {
                this.panelPadre.asignarListaSimbolosNoTerminales((
                    DefaultListModel)this.jList1.getModel());
            }
        }else{
            this.gramatica.setNoTerminales(modeloListaNoTerminales);
        }
        this.dispose();
    }//GEN-LAST:event_jButtonAceptarActionPerformed

    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        /* Set the Nimbus look and feel */
        //<editor-fold defaultstate="collapsed" desc=" Look and feel
            setting code (optional) ">
        /* If Nimbus (introduced in Java SE 6) is not available, stay
            with the default look and feel.
```

```
         * For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html
         */
        try {
            for (javax.swing.UIManager.LookAndFeelInfo info : javax.swing.UIManager.getInstalledLookAndFeels()) {
                if ("Nimbus".equals(info.getName())) {
                    javax.swing.UIManager.setLookAndFeel(info.getClassName());
                    break;
                }
            }
        } catch (ClassNotFoundException ex) {
            java.util.logging.Logger.getLogger(VentanaSimbolosNoTerminales.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {
            java.util.logging.Logger.getLogger(VentanaSimbolosNoTerminales.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {
            java.util.logging.Logger.getLogger(VentanaSimbolosNoTerminales.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {
            java.util.logging.Logger.getLogger(VentanaSimbolosNoTerminales.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        }
        //</editor-fold>

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
              //  new VentanaSimbolosNoTerminales().setVisible(true);
            }
        });
    }
    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButtonAceptar;
    private javax.swing.JButton jButtonCancelar;
    private javax.swing.JButton jButtonEliminar;
    private javax.swing.JButton jButtonInsertar;
    private javax.swing.JList jList1;
    private javax.swing.JPanel jPanel1;
    private javax.swing.JScrollPane jScrollPane2;
    private javax.swing.JTextField jTextField1;
    // End of variables declaration//GEN-END:variables
}
```

2.4.24. VentanaSimbolosTerminales.java

```
// SimAS / Editor
// Ventana Simbolos Terminales

package es.uco.simas.editor;

import java.util.ArrayList;
import javax.swing.JOptionPane;
import javax.swing.DefaultListModel;
import javax.swing.ListModel;

/**
 * @author vanesa
 */
public class VentanaSimbolosTerminales extends javax.swing.JFrame {

  private  DefaultListModel modeloListaTerminales  ;
  private  DefaultListModel modeloListaNoTerminales  ;
  private  PanelCreacionGramaticaPaso2 panelPadre  ;


  public VentanaSimbolosTerminales(ListModel simbolosTerminales,
      ListModel simbolosNoTerminales,  PanelCreacionGramaticaPaso2
      ventanaPadre) {

      int  i= 0;

      DefaultListModel  list  = new DefaultListModel();
      this.modeloListaTerminales =list;
      i=0;
      while(true){
          if(i >= simbolosTerminales.getSize()) {
               break;
          }
          if(i < simbolosTerminales.getSize())  {
               this.modeloListaTerminales.add(i,simbolosTerminales.
                   getElementAt(i));
               i = i+1;
          }
     }
     DefaultListModel  lista  = new DefaultListModel();
     this.modeloListaNoTerminales =lista;
     i=0;
     while(true) {
        if(i >= simbolosNoTerminales.getSize()) {
          break;
        }
        if(i < simbolosNoTerminales.getSize())  {
          this.modeloListaNoTerminales.add(i,simbolosNoTerminales.
              getElementAt(i));
          i = i+1;
        }
```

```
    }

    initComponents();
    this.jList1.setModel(simbolosTerminales);

    this.setResizable(false);
    this.panelPadre =ventanaPadre;
    this.jTextField1.setText("");
   // this.btnTerminal13.setText("\u03b5");
 //  this.btnTerminal13.setToolTipText("<html>Inserta el s\u00edmbolo <b>\u03b5</b>.</html>");
   // this.txtSimboloTerminal.requestFocus();
 //  this.estaVentana =this;
   /* VentanaSimbolosTerminales prueba = new VentanaSimbolosTerminales(this, null, null);
    this.jTextField1.addKeyListener(prueba);
    VentanaGestionarSimbolosTerminales$4 JdecGenerated190 = new VentanaGestionarSimbolosTerminales$4(this);
    this.txtSimboloTerminal.addActionListener(JdecGenerated190);
    return;*/
}
    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
 //  @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    private void initComponents() {

        jPanel1 = new javax.swing.JPanel();
        jButtonAceptar = new javax.swing.JButton();
        jButtonCancelar = new javax.swing.JButton();
        jLabel1 = new javax.swing.JLabel();
        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();
        jTextField1 = new javax.swing.JTextField();
        jButtonInsertar = new javax.swing.JButton();
        jScrollPane2 = new javax.swing.JScrollPane();
        jList1 = new javax.swing.JList();
        jButtonEliminar = new javax.swing.JButton();

        setDefaultCloseOperation(javax.swing.WindowConstants.
            DISPOSE_ON_CLOSE);
        setTitle(”SÃmbolos Terminales”);

        jPanel1.setBackground(new java.awt.Color(233, 244, 244));

        jButtonAceptar.setText(”Aceptar”);
        jButtonAceptar.addActionListener(new java.awt.event.
            ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt)
                {
                jButtonAceptarActionPerformed(evt);
            }
        });

        jButtonCancelar.setText(”Cancelar”);
        jButtonCancelar.addActionListener(new java.awt.event.
            ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt)
                {
                jButtonCancelarActionPerformed(evt);
            }
        });

        jLabel1.setText(”SÃmbolos Terminales Predefinidos”);

        jButton1.setText(” + ”);
        jButton1.addActionListener(new java.awt.event.ActionListener()
            {
            public void actionPerformed(java.awt.event.ActionEvent evt)
                {
                jButton1ActionPerformed(evt);
            }
        });

        jButton2.setText(” − ”);
        jButton2.addActionListener(new java.awt.event.ActionListener()
            {
            public void actionPerformed(java.awt.event.ActionEvent evt)
                {
                jButton2ActionPerformed(evt);
            }
        });

        jButton3.setText(” ∗ ”);
        jButton3.addActionListener(new java.awt.event.ActionListener()
            {
            public void actionPerformed(java.awt.event.ActionEvent evt)
                {
                jButton3ActionPerformed(evt);
            }
        });

        jButton4.setText(” / ”);
        jButton4.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton4ActionPerformed(evt);
            }
        });

        jButton5.setText(” ( ”);
        jButton5.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton5ActionPerformed(evt);
            }
        });

        jButton6.setText(” ) ”);
        jButton6.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton6ActionPerformed(evt);
            }
        });

        jButton7.setText(” { ”);
        jButton7.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton7ActionPerformed(evt);
            }
        });

        jButton8.setText(” } ”);
        jButton8.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton8ActionPerformed(evt);
            }
        });

        jButton9.setText(” = ”);
        jButton9.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton9ActionPerformed(evt);
            }
        });

        jButton10.setText(".");
        jButton10.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton10ActionPerformed(evt);
            }
        });

        jButton11.setText(",");
        jButton11.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton11ActionPerformed(evt);
            }
        });

        jButton12.setText(";");
        jButton12.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton12ActionPerformed(evt);
            }
        });

        jButton13.setText(":");
        jButton13.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton13ActionPerformed(evt);
            }
        });

        jButtonInsertar.setText("Insertar");
        jButtonInsertar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonInsertarActionPerformed(evt);
            }
        });

        jList1.setSelectionMode(javax.swing.ListSelectionModel.SINGLE_SELECTION);
        jList1.setDropMode(javax.swing.DropMode.INSERT);
        jScrollPane2.setViewportView(jList1);

        jButtonEliminar.setText("Eliminar");
        jButtonEliminar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonEliminarActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
        jPanel1.setLayout(jPanel1Layout);
        jPanel1Layout.setHorizontalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel1Layout.createSequentialGroup()
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                .addComponent(jButtonCancelar)
                .addGap(18, 18, 18)
                .addComponent(jButtonAceptar)
                .addGap(20, 20, 20))
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGap(29, 29, 29)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)
                    .addComponent(jLabel1)
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING, false)
                            .addComponent(jTextField1, javax.swing.GroupLayout.Alignment.LEADING)
                            .addGroup(jPanel1Layout.createSequentialGroup()
                                .addComponent(jButton1)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton2)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton3)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton4)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton5)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton6)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton7)))
                        .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                            .addGroup(jPanel1Layout.createSequentialGroup()
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton8)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton9)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton10)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton11)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton12)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton13))
                            .addGroup(jPanel1Layout.createSequentialGroup()
                                .addGap(23, 23, 23)
                                .addComponent(jButtonInsertar)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButtonEliminar))))
                    .addComponent(jScrollPane2))
                .addContainerGap(41, Short.MAX_VALUE))
        );
        jPanel1Layout.setVerticalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addContainerGap()
```

```
                    .addComponent(jLabel1)
                    .addPreferredGap(javax.swing.LayoutStyle.
                       ComponentPlacement.UNRELATED)
                    .addGroup(jPanel1Layout.createParallelGroup(javax.swing
                       .GroupLayout.Alignment.BASELINE)
                        .addComponent(jButton1)
                        .addComponent(jButton2)
                        .addComponent(jButton3)
                        .addComponent(jButton4)
                        .addComponent(jButton5)
                        .addComponent(jButton6)
                        .addComponent(jButton7)
                        .addComponent(jButton8)
                        .addComponent(jButton9)
                        .addComponent(jButton10)
                        .addComponent(jButton11)
                        .addComponent(jButton12)
                        .addComponent(jButton13))
                    .addGap(36, 36, 36)
                    .addGroup(jPanel1Layout.createParallelGroup(javax.swing
                       .GroupLayout.Alignment.BASELINE)
                        .addComponent(jTextField1, javax.swing.GroupLayout.
                           PREFERRED_SIZE, javax.swing.GroupLayout.
                           DEFAULT_SIZE, javax.swing.GroupLayout.
                           PREFERRED_SIZE)
                        .addComponent(jButtonInsertar)
                        .addComponent(jButtonEliminar))
                    .addPreferredGap(javax.swing.LayoutStyle.
                       ComponentPlacement.RELATED)
                    .addComponent(jScrollPane2, javax.swing.GroupLayout.
                       PREFERRED_SIZE, 216, javax.swing.GroupLayout.
                       PREFERRED_SIZE)
                    .addPreferredGap(javax.swing.LayoutStyle.
                       ComponentPlacement.RELATED, 22, Short.MAX_VALUE)
                    .addGroup(jPanel1Layout.createParallelGroup(javax.swing
                       .GroupLayout.Alignment.BASELINE)
                        .addComponent(jButtonAceptar)
                        .addComponent(jButtonCancelar))
                    .addGap(21, 21, 21))
            );

            javax.swing.GroupLayout layout = new javax.swing.GroupLayout(
                getContentPane());
            getContentPane().setLayout(layout);
            layout.setHorizontalGroup(
                layout.createParallelGroup(javax.swing.GroupLayout.
                    Alignment.LEADING)
                .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE
                    , javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE
                    )
            );
            layout.setVerticalGroup(
                layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
            );

            pack();
    }// </editor-fold>//GEN-END:initComponents

    private void jButtonCancelarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonCancelarActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir de la edicion de la gramÃ¡tica?", "Salir",JOptionPane.YES_NO_OPTION);

        if(conf==0)
            this.dispose();
    }//GEN-LAST:event_jButtonCancelarActionPerformed

    private void jButtonInsertarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonInsertarActionPerformed
     /*    DefaultListModel listModel = new DefaultListModel();
        String elemento = jTextField1.getText();
        listModel.addElement(elemento);*/
        String elemento = jTextField1.getText();
        int encontrado= 0;
        int i= 0;

        if(elemento.equals("")){
            encontrado =1;
        }else{
        while(true)     {
            if(i >= this.modeloListaTerminales.getSize())   {
                break;
            }
            if(i < this.modeloListaTerminales.getSize()) {
                if(this.modeloListaTerminales.getElementAt(i).equals(elemento)) {
                    encontrado=1;
                }

            i = i+1;
        //continue  ;
            }
      }

    }
    if(encontrado==0)
    {
      this.modeloListaTerminales.add(this.modeloListaTerminales.getSize(),elemento);
      this.jList1.setModel(this.modeloListaTerminales);

    }
    this.jTextField1.requestFocus();
    this.jTextField1.setText(””);
    }//GEN-LAST:event_jButtonInsertarActionPerformed

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton1ActionPerformed
        int encontrado= 0;
        int i= 0;
        encontrado=0;
        i=0;
        while(true)  {
            if(i >= this.modeloListaTerminales.getSize()) {
                break;
            }
            if(i < this.modeloListaTerminales.getSize()) {
                if(this.modeloListaTerminales.getElementAt(i).equals(”+”)) {
                    encontrado=1;
                }
            i = i+1;
            }
        }
        if(encontrado==0) {
            this.modeloListaTerminales.add(this.modeloListaTerminales.getSize(),”+”);
            this.jList1.setModel(this.modeloListaTerminales);
        }
        this.jTextField1.requestFocus();
    }//GEN-LAST:event_jButton1ActionPerformed

    private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton2ActionPerformed
        int encontrado= 0;
        int i= 0;
        while(true)  {
            if(i >= this.modeloListaTerminales.getSize())  {
                break;
            }
            if(i < this.modeloListaTerminales.getSize()) {
                if(this.modeloListaTerminales.getElementAt(i).equals(”-”)) {
                    encontrado=1;
                }
            i = i+1;
            }
        }
        if(encontrado==0) {
            this.modeloListaTerminales.add(this.modeloListaTerminales.getSize(),”−”);
            this.jList1.setModel(this.modeloListaTerminales);
        }
        this.jTextField1.requestFocus();
    }//GEN-LAST:event_jButton2ActionPerformed

    private void jButtonAceptarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonAceptarActionPerformed
        if(this.panelPadre!=  null)  {
            if(this.jList1.getModel().getSize() > 0)  {
                this.panelPadre.asignarListaSimbolosTerminales((DefaultListModel)this.jList1.getModel());
             }
       }
        this.dispose();
    }//GEN-LAST:event_jButtonAceptarActionPerformed

    private void jButtonEliminarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonEliminarActionPerformed
        DefaultListModel modelo= null;
        DefaultListModel producciones = this.panelPadre.getProducciones();
        String[] pr;
        ArrayList<String> prod = new ArrayList();
        String nt;
        int seleccion= 0;
        nt = this.jList1.getSelectedValue().toString();


        seleccion=this.jList1.getSelectedIndex();
        if(seleccion != -1) {
            if(producciones != null){
                int i=0;
                while(i< producciones.size()){
                    int j=0;
                    pr = (producciones.getElementAt(i).toString()).split(” ”);
                    while(j < pr.length){
                        if(pr[j].equals(this.jList1.getSelectedValue())){
                            prod.add(producciones.getElementAt(i).toString());
                        }
                        j++;
                    }
                    i++;
                }
            }
            if(prod.size()>0){
                int conf = JOptionPane.showConfirmDialog(null, "El sÃmbolo "+nt+" ha sido usado, si lo elimina tambiÃ©n se eliminarÃ¡n las producciones en las que aparezca, Â¿desea eliminarlo?", "SÃmbolo usado", JOptionPane.YES_NO_OPTION);
                if(conf==0){
                    int k=0;
                    while(k < prod.size()){
                        int l=0;
                        while(l < producciones.size()){
                            if(prod.get(k).equals(producciones.get(l).toString())){
                                producciones.remove(l);
                                break;
                            }else
                                l++;
                        }
                        k++;
                    }

                    this.panelPadre.setProducciones(producciones);
                    modelo=(DefaultListModel)this.jList1.getModel();
                    modelo.remove(seleccion);
                }

            }else{
                modelo=(DefaultListModel)this.jList1.getModel();
                modelo.remove(seleccion);
            }
        }



        /*DefaultListModel modelo= null;
        int seleccion= 0;
        seleccion=this.jList1.getSelectedIndex();

        if(seleccion != -1) {
            modelo=(DefaultListModel)this.jList1.getModel();
            modelo.remove(seleccion);
        }*/
    }//GEN-LAST:event_jButtonEliminarActionPerformed

    private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton3ActionPerformed
        int encontrado= 0;
        int i= 0;

        while(true) {
            if(i >= this.modeloListaTerminales.getSize()) {
                break;
            }
            if(i < this.modeloListaTerminales.getSize()) {
                if(this.modeloListaTerminales.getElementAt(i).equals("*")) {
                    encontrado=1;
                }
            i = i+1;
            }
        }
        if(encontrado==0){
            this.modeloListaTerminales.add(this.modeloListaTerminales.getSize(),"*");
            this.jList1.setModel(this.modeloListaTerminales);
        }
        this.jTextField1.requestFocus();
    }//GEN-LAST:event_jButton3ActionPerformed

    private void jButton4ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton4ActionPerformed
        int encontrado= 0;
        int i= 0;

        while(true) {
            if(i >= this.modeloListaTerminales.getSize()){
                break;
            }
            if(i < this.modeloListaTerminales.getSize()) {
                if(this.modeloListaTerminales.getElementAt(i).equals("/")) {
                    encontrado=1;
                }
            i = i+1;
            }
        }
        if(encontrado==0) {
            this.modeloListaTerminales.add(this.modeloListaTerminales.getSize(),"/");
            this.jList1.setModel(this.modeloListaTerminales);
        }
        this.jTextField1.requestFocus();
    }//GEN-LAST:event_jButton4ActionPerformed

    private void jButton5ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton5ActionPerformed
        int encontrado= 0;
        int i= 0;

        while(true) {
            if(i >= this.modeloListaTerminales.getSize()){
                break;
            }
            if(i < this.modeloListaTerminales.getSize()) {
                if(this.modeloListaTerminales.getElementAt(i).equals("(")) {
                    encontrado=1;
```

```java
                }
            i = i+1;
            }
        }
        if(encontrado==0) {
            this.modeloListaTerminales.add(this.modeloListaTerminales.getSize(),"(");
            this.jList1.setModel(this.modeloListaTerminales);
        }
        this.jTextField1.requestFocus();
    }//GEN-LAST:event_jButton5ActionPerformed

    private void jButton6ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton6ActionPerformed
        int encontrado= 0;
        int i= 0;

        while(true) {
            if(i >= this.modeloListaTerminales.getSize()) {
                break;
            }
            if(i < this.modeloListaTerminales.getSize()) {
                if(this.modeloListaTerminales.getElementAt(i).equals(")")) {
                    encontrado=1;
                }
            i = i+1;
            }
        }
        if(encontrado==0) {
            this.modeloListaTerminales.add(this.modeloListaTerminales.getSize(),")");
            this.jList1.setModel(this.modeloListaTerminales);
        }
        this.jTextField1.requestFocus();
    }//GEN-LAST:event_jButton6ActionPerformed

    private void jButton7ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton7ActionPerformed
        int encontrado= 0;
        int i= 0;

        while(true)  {
            if(i >= this.modeloListaTerminales.getSize()) {
                break;
            }
            if(i < this.modeloListaTerminales.getSize()) {
                if(this.modeloListaTerminales.getElementAt(i).equals("{")) {
                    encontrado=1;
                }
            i = i+1;
            }
        }
        if(encontrado==0){
            this.modeloListaTerminales.add(this.modeloListaTerminales.getSize(),"{");
            this.jList1.setModel(this.modeloListaTerminales);
        }
        this.jTextField1.requestFocus();
    }//GEN-LAST:event_jButton7ActionPerformed

    private void jButton8ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton8ActionPerformed
        int encontrado= 0;
        int i= 0;

        while(true) {
            if(i >= this.modeloListaTerminales.getSize()) {
                break;
            }
            if(i < this.modeloListaTerminales.getSize()) {
                if(this.modeloListaTerminales.getElementAt(i).equals("}")) {
                    encontrado=1;
                }
            i = i+1;
            }
        }
        if(encontrado==0)  {
            this.modeloListaTerminales.add(this.modeloListaTerminales.getSize(),"}");
            this.jList1.setModel(this.modeloListaTerminales);
        }
        this.jTextField1.requestFocus();
    }//GEN-LAST:event_jButton8ActionPerformed

    private void jButton9ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton9ActionPerformed
        int encontrado= 0;
        int i= 0;

        while(true) {
            if(i >= this.modeloListaTerminales.getSize()) {
                break;
            }
            if(i < this.modeloListaTerminales.getSize())  {
                if(this.modeloListaTerminales.getElementAt(i).equals("=")) {
                    encontrado=1;
                }
            i = i+1;
            }
        }
        if(encontrado==0) {
            this.modeloListaTerminales.add(this.modeloListaTerminales.getSize(),"=");
            this.jList1.setModel(this.modeloListaTerminales);
        }
        this.jTextField1.requestFocus();
    }//GEN-LAST:event_jButton9ActionPerformed

    private void jButton10ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton10ActionPerformed
        int encontrado= 0;
        int i= 0;

        while(true) {
            if(i >= this.modeloListaTerminales.getSize()) {
                break;
            }
            if(i < this.modeloListaTerminales.getSize())  {
                if(this.modeloListaTerminales.getElementAt(i).equals(".")) {
                    encontrado=1;
                }
            i = i+1;
            }
        }
        if(encontrado==0) {
            this.modeloListaTerminales.add(this.modeloListaTerminales.getSize(),".");
            this.jList1.setModel(this.modeloListaTerminales);
        }
        this.jTextField1.requestFocus();
    }//GEN-LAST:event_jButton10ActionPerformed

    private void jButton11ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton11ActionPerformed
        int encontrado= 0;
        int i= 0;

        while(true)  {
            if(i >= this.modeloListaTerminales.getSize())  {
                break;
            }
            if(i < this.modeloListaTerminales.getSize()) {
                if(this.modeloListaTerminales.getElementAt(i).equals(",")) {
                    encontrado=1;
                }
            i = i+1;
            }
        }
        if(encontrado==0)  {
            this.modeloListaTerminales.add(this.modeloListaTerminales.getSize(),",");
            this.jList1.setModel(this.modeloListaTerminales);
        }
        this.jTextField1.requestFocus();
    }//GEN-LAST:event_jButton11ActionPerformed

    private void jButton12ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton12ActionPerformed
        int encontrado= 0;
        int i= 0;

        while(true) {
            if(i >= this.modeloListaTerminales.getSize()) {
                break;
            }
            if(i < this.modeloListaTerminales.getSize()) {
                if(this.modeloListaTerminales.getElementAt(i).equals(";")) {
                    encontrado=1;
                }
            i = i+1;
            }
        }
        if(encontrado==0)  {
            this.modeloListaTerminales.add(this.modeloListaTerminales.getSize(),";");
            this.jList1.setModel(this.modeloListaTerminales);
        }
        this.jTextField1.requestFocus();
    }//GEN-LAST:event_jButton12ActionPerformed

    private void jButton13ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton13ActionPerformed
        int encontrado= 0;
        int i= 0;

        while(true) {
            if(i >= this.modeloListaTerminales.getSize()) {
                break;
            }
            if(i < this.modeloListaTerminales.getSize()) {
                if(this.modeloListaTerminales.getElementAt(i).equals(":")) {
                    encontrado=1;
                }
            i = i+1;
            }
        }
        if(encontrado==0) {
            this.modeloListaTerminales.add(this.modeloListaTerminales.getSize(),":");
            this.jList1.setModel(this.modeloListaTerminales);
        }
        this.jTextField1.requestFocus();
    }//GEN-LAST:event_jButton13ActionPerformed

    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        /* Set the Nimbus look and feel */
        //<editor-fold defaultstate=”collapsed” desc=” Look and feel setting code (optional) ”>
        /* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.
         * For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html
         */
        try {
            for (javax.swing.UIManager.LookAndFeelInfo info : javax.swing.UIManager.getInstalledLookAndFeels()) {
                if (”Nimbus”.equals(info.getName())) {
                    javax.swing.UIManager.setLookAndFeel(info.getClassName());
                    break;
                }
            }
        } catch (ClassNotFoundException ex) {
            java.util.logging.Logger.getLogger(VentanaSimbolosTerminales.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {
            java.util.logging.Logger.getLogger(VentanaSimbolosTerminales.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {
            java.util.logging.Logger.getLogger(VentanaSimbolosTerminales.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {
            java.util.logging.Logger.getLogger(VentanaSimbolosTerminales.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        }
        //</editor-fold>

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
//                new VentanaSimbolosTerminales().setVisible(true);
            }
        });
    }
    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1;
    private javax.swing.JButton jButton10;
    private javax.swing.JButton jButton11;
    private javax.swing.JButton jButton12;
    private javax.swing.JButton jButton13;
    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.JButton jButtonAceptar;
    private javax.swing.JButton jButtonCancelar;
    private javax.swing.JButton jButtonEliminar;
    private javax.swing.JButton jButtonInsertar;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JList jList1;
    private javax.swing.JPanel jPanel1;
    private javax.swing.JScrollPane jScrollPane2;
    private javax.swing.JTextField jTextField1;
    // End of variables declaration//GEN-END:variables
}
```

2.4.25. Visualizacion.java

```
//SimAS  / Editor
// Visualizacion

package es.uco.simas.editor;
import es.uco.simas.util.gramatica.*;
import javax.swing.*;

/**
 * @author vanesa
 */
public class Visualizacion extends javax.swing.JFrame {
    Gramatica gramatica = new Gramatica();
    DefaultListModel noTerminales = new DefaultListModel();
    DefaultListModel terminales = new DefaultListModel();

    public Visualizacion(Gramatica gr) {

         initComponents();
        this.gramatica = gr;

        this.jListNT.setModel(this.gramatica.getNoTerminales());
        this.jListT.setModel(this.gramatica.getTerminales());
        this.jListProd.setModel(this.gramatica.getProducciones());
        this.nombre.setText(this.gramatica.getNombre());
        this.descripcion.setText(this.gramatica.getDescripcion());
        this.inicial.setText(this.gramatica.getSimbInicial());
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    private void initComponents() {

        jPanel1 = new javax.swing.JPanel();
        jLabel1 = new javax.swing.JLabel();
        jLabel3 = new javax.swing.JLabel();
        jScrollPane1 = new javax.swing.JScrollPane();
        jListNT = new javax.swing.JList();
        jLabel5 = new javax.swing.JLabel();
        jScrollPane2 = new javax.swing.JScrollPane();
        jListT = new javax.swing.JList();
        jLabel6 = new javax.swing.JLabel();
        jLabel8 = new javax.swing.JLabel();
        jScrollPane3 = new javax.swing.JScrollPane();
        jListProd = new javax.swing.JList();
        jLabel9 = new javax.swing.JLabel();
        nombre = new javax.swing.JLabel();
        descripcion = new javax.swing.JLabel();
        jButtonNT = new javax.swing.JButton();
        inicial = new javax.swing.JLabel();

        setDefaultCloseOperation(javax.swing.WindowConstants.DISPOSE_ON_CLOSE);

        jPanel1.setBackground(new java.awt.Color(233, 244, 244));

        jLabel1.setText("Nombre gramÃ¡tica: ");

        jLabel3.setText("Descripcion: ");

        jScrollPane1.setViewportView(jListNT);

        jLabel5.setText("SÃmbolos No Terminales:");

        jScrollPane2.setViewportView(jListT);

        jLabel6.setText("SÃmbolos Terminales:");

        jLabel8.setText("Producciones:");

        jScrollPane3.setViewportView(jListProd);

        jLabel9.setText("SÃmbolo Inicial de la gramÃ¡tica:");

        jButtonNT.setText("Editar");
        jButtonNT.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonNTActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
        jPanel1.setLayout(jPanel1Layout);
        jPanel1Layout.setHorizontalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGap(31, 31, 31)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)
                            .addComponent(jLabel8)
                            .addGroup(jPanel1Layout.createSequentialGroup()
                                .addComponent(jLabel1)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(nombre))
                            .addGroup(jPanel1Layout.createSequentialGroup()
                                .addComponent(jLabel3)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(descripcion))
                            .addComponent(jScrollPane1, javax.swing.GroupLayout.DEFAULT_SIZE, 551, Short.MAX_VALUE)
                            .addComponent(jLabel5)
                            .addComponent(jLabel6)
                            .addComponent(jScrollPane2)
                            .addComponent(jScrollPane3))
                        .addGap(18, 18, 18)
                        .addComponent(jButtonNT))
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addComponent(jLabel9)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                        .addComponent(inicial)))
                .addContainerGap(107, Short.MAX_VALUE))
        );
        jPanel1Layout.setVerticalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.
                Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGap(22, 22, 22)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing
                    .GroupLayout.Alignment.BASELINE)
                    .addComponent(jLabel1)
                    .addComponent(nombre))
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing
                    .GroupLayout.Alignment.BASELINE)
                    .addComponent(jLabel3)
                    .addComponent(descripcion))
                .addGap(9, 9, 9)
                .addComponent(jLabel5, javax.swing.GroupLayout.
                    PREFERRED_SIZE, 17, javax.swing.GroupLayout.
                    PREFERRED_SIZE)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing
                    .GroupLayout.Alignment.LEADING)
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.RELATED)
                        .addComponent(jScrollPane1, javax.swing.
                            GroupLayout.PREFERRED_SIZE, 113, javax.
                            swing.GroupLayout.PREFERRED_SIZE))
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addGap(46, 46, 46)
                        .addComponent(jButtonNT)))
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED)
                .addComponent(jLabel6)
                .addGap(9, 9, 9)
                .addComponent(jScrollPane2, javax.swing.GroupLayout.
                    PREFERRED_SIZE, 106, javax.swing.GroupLayout.
                    PREFERRED_SIZE)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing
                    .GroupLayout.Alignment.LEADING)
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.UNRELATED)
                        .addComponent(jLabel8)
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.RELATED)
                        .addComponent(jScrollPane3, javax.swing.
                            GroupLayout.PREFERRED_SIZE, javax.swing.
                            GroupLayout.DEFAULT_SIZE, javax.swing.
                            GroupLayout.PREFERRED_SIZE)
                        .addGap(24, 24, 24)
                        .addComponent(jLabel9)
                        .addContainerGap(18, Short.MAX_VALUE))
                    .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel1Layout.createSequentialGroup()
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addComponent(inicial)
                        .addContainerGap())))
        );

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        );

        pack();
    }// </editor-fold>//GEN-END:initComponents

    private void jButtonNTActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonNTActionPerformed
        VentanaSimbolosNoTerminales noTerminal = new VentanaSimbolosNoTerminales(gramatica.getNoTerminales(), gramatica.getTerminales(), null, gramatica);
         noTerminal.setVisible(true);
         noTerminal.setLocationRelativeTo(null);

    }//GEN-LAST:event_jButtonNTActionPerformed

    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        /* Set the Nimbus look and feel */
        //<editor-fold defaultstate="collapsed" desc=" Look and feel setting code (optional) ">
        /* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.
         * For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html
         */
```

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

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
            //     new Visualizacion().setVisible(true);
            }
        });
    }
    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JLabel descripcion;
    private javax.swing.JLabel inicial;
    private javax.swing.JButton jButtonNT;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel3;
    private javax.swing.JLabel jLabel5;
    private javax.swing.JLabel jLabel6;
    private javax.swing.JLabel jLabel8;
    private javax.swing.JLabel jLabel9;
    private javax.swing.JList jListNT;
    private javax.swing.JList jListProd;
    private javax.swing.JList jListT;
    private javax.swing.JPanel jPanel1;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JScrollPane jScrollPane2;
    private javax.swing.JScrollPane jScrollPane3;
    private javax.swing.JLabel nombre;
    // End of variables declaration//GEN-END:variables
}
```

2.5. Paquete Simulador

2.5.1. CadEntrada.java

```
//SimAS / Simulador
// Cadena de entrada

package es.uco.simas.simulador;

import javax.swing.DefaultListModel;
import javax.swing.JOptionPane;
import java.util.ArrayList;
import es.uco.simas.util.gramatica.*;

/**
 * @author Vanesa
 */
public class CadEntrada extends javax.swing.JFrame {

    NuevaSimulacionDesc nuevo;
    NuevaSimulacionAsc nuevoAsc;

    public CadEntrada(NuevaSimulacionDesc nuevo) {
        initComponents();
        this.nuevo = nuevo;
        this.jTextField1.setText("");
        ArrayList<Terminal> cadenaEntrada = this.nuevo.ventanaPadre.
            getCadenaEntrada();
        String aux = "";
        int i=0;
        DefaultListModel terminales = new DefaultListModel();
        terminales = this.nuevo.gramatica.getTerminales();
        this.jList1.setModel(terminales);

        if(cadenaEntrada != null){
            while (i < cadenaEntrada.size()){
                aux = aux+cadenaEntrada.get(i).getNombre()+" ";
                i++;
            }
        }
        this.jTextField1.setText(aux);
    }

    public CadEntrada(NuevaSimulacionAsc nuevo) {
        initComponents();
        this.nuevoAsc = nuevo;
        this.jTextField1.setText("");
        ArrayList<Terminal> cadenaEntrada = this.nuevoAsc.ventanaPadre.getCadenaEntrada();
        String aux = "";
        int i=0;
        DefaultListModel terminales = new DefaultListModel();
        terminales = this.nuevoAsc.gramatica.getTerminales();
        this.jList1.setModel(terminales);

        if(cadenaEntrada != null){
            while (i < cadenaEntrada.size()){
                aux = aux+cadenaEntrada.get(i).getNombre()+" ";
                i++;
            }
        }
        this.jTextField1.setText(aux);
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    private void initComponents() {

        jPanel1 = new javax.swing.JPanel();
        jLabel1 = new javax.swing.JLabel();
        jTextField1 = new javax.swing.JTextField();
        jButton1 = new javax.swing.JButton();
        jScrollPane1 = new javax.swing.JScrollPane();
        jList1 = new javax.swing.JList();
        jLabel2 = new javax.swing.JLabel();
        jButton2 = new javax.swing.JButton();
        jButton3 = new javax.swing.JButton();

        setDefaultCloseOperation(javax.swing.WindowConstants.DISPOSE_ON_CLOSE);
        setTitle("Cadena de Entrada");
        setBackground(new java.awt.Color(233, 244, 244));

        jPanel1.setBackground(new java.awt.Color(233, 244, 244));

        jLabel1.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
        jLabel1.setText("Cadena de Entrada");

        jButton1.setText("Borrar");
        jButton1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton1ActionPerformed(evt);
            }
        });

        jList1.addMouseListener(new java.awt.event.MouseAdapter() {
            public void mousePressed(java.awt.event.MouseEvent evt) {
                addTerminal(evt);
            }
        });
        jScrollPane1.setViewportView(jList1);

        jLabel2.setText("SÃmbolos Terminales");

        jButton2.setText("Cancelar");
        jButton2.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton2ActionPerformed(evt);
            }
        });

        jButton3.setText("Aceptar");
        jButton3.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton3ActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
        jPanel1.setLayout(jPanel1Layout);
        jPanel1Layout.setHorizontalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)
                    .addGroup(javax.swing.GroupLayout.Alignment.LEADING, jPanel1Layout.createSequentialGroup()
                        .addGap(53, 53, 53)
                        .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 202, javax.swing.GroupLayout.PREFERRED_SIZE))
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addGap(44, 44, 44)
```

```
                            .addGroup(jPanel1Layout.createParallelGroup(
                               javax.swing.GroupLayout.Alignment.TRAILING)
                                .addComponent(jLabel2)
                                .addComponent(jTextField1, javax.swing.
                                   GroupLayout.PREFERRED_SIZE, 160, javax.
                                   swing.GroupLayout.PREFERRED_SIZE))
                            .addPreferredGap(javax.swing.LayoutStyle.
                               ComponentPlacement.RELATED)
                            .addComponent(jButton1)
                            .addGap(34, 34, 34)))
                    .addContainerGap(34, Short.MAX_VALUE))
                .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
                   jPanel1Layout.createSequentialGroup()
                    .addGap(0, 0, Short.MAX_VALUE)
                    .addComponent(jLabel1)
                    .addGap(105, 105, 105))
                .addGroup(jPanel1Layout.createSequentialGroup()
                    .addGap(21, 21, 21)
                    .addComponent(jButton2)
                    .addPreferredGap(javax.swing.LayoutStyle.
                       ComponentPlacement.RELATED, javax.swing.GroupLayout
                       .DEFAULT_SIZE, Short.MAX_VALUE)
                    .addComponent(jButton3)
                    .addGap(57, 57, 57))
            );
            jPanel1Layout.setVerticalGroup(
                jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.
                   Alignment.LEADING)
                .addGroup(jPanel1Layout.createSequentialGroup()
                    .addGap(19, 19, 19)
                    .addComponent(jLabel1)
                    .addGap(27, 27, 27)
                    .addGroup(jPanel1Layout.createParallelGroup(javax.swing
                       .GroupLayout.Alignment.BASELINE)
                        .addComponent(jTextField1, javax.swing.GroupLayout.
                           PREFERRED_SIZE, javax.swing.GroupLayout.
                           DEFAULT_SIZE, javax.swing.GroupLayout.
                           PREFERRED_SIZE)
                        .addComponent(jButton1))
                    .addGap(26, 26, 26)
                    .addComponent(jLabel2)
                    .addPreferredGap(javax.swing.LayoutStyle.
                       ComponentPlacement.UNRELATED)
                    .addComponent(jScrollPane1, javax.swing.GroupLayout.
                       PREFERRED_SIZE, javax.swing.GroupLayout.
                       DEFAULT_SIZE, javax.swing.GroupLayout.
                       PREFERRED_SIZE)
                    .addGap(18, 18, 18)
                    .addGroup(jPanel1Layout.createParallelGroup(javax.swing
                       .GroupLayout.Alignment.BASELINE)
                        .addComponent(jButton3)
                        .addComponent(jButton2))
                    .addContainerGap(36, Short.MAX_VALUE))
```

```
        );

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        );

        pack();
    }// </editor-fold>//GEN-END:initComponents

    private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton2ActionPerformed
         int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir?", "Salir",JOptionPane.YES_NO_OPTION);

        if(conf==0)
            this.dispose();
    }//GEN-LAST:event_jButton2ActionPerformed

    private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton3ActionPerformed
        String cadena = this.jTextField1.getText();
        String [] separado = cadena.split(" ");
        ArrayList<Terminal> cadenaEntrada = new ArrayList<>();
        int i = 0;
        while(i < separado.length){
            cadenaEntrada.add(new Terminal(separado[i],separado[i]));
            i++;
        }
        if(this.nuevo != null){
            this.nuevo.ventanaPadre.setCadenaEntrada(cadenaEntrada);
            this.nuevo.actualizarVisualizacion();
        }
        if(this.nuevoAsc != null){
            this.nuevoAsc.ventanaPadre.setCadenaEntrada(cadenaEntrada);
            this.nuevoAsc.actualizarVisualizacion();
        }

        this.dispose();
    }//GEN-LAST:event_jButton3ActionPerformed

    private void addTerminal(java.awt.event.MouseEvent evt) {//GEN-FIRST:event_addTerminal

        StringBuilder string = new StringBuilder();
        this.jTextField1.setText(string.append(this.jTextField1.getText()).append(this.jList1.getSelectedValue()).append(" ").toString());
    }//GEN-LAST:event_addTerminal

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton1ActionPerformed
        String cadena = this.jTextField1.getText();
        String [] separado = cadena.split(" ");
        String aux = "";
        int i = 0;
        while(i < (separado.length -1)){
            aux = aux + separado[i]+" ";
            i++;
        }
        this.jTextField1.setText(aux);

    }//GEN-LAST:event_jButton1ActionPerformed

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

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

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
             //    new CadEntrada().setVisible(true);
            }
        });
    }

    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1;
    private javax.swing.JButton jButton2;
    private javax.swing.JButton jButton3;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JList jList1;
    private javax.swing.JPanel jPanel1;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JTextField jTextField1;
    // End of variables declaration//GEN-END:variables
}
```

2.5.2. MiRender.java

```java
//SimAS  / Simulador
//Mi Render

package es.uco.simas.simulador;

import java.awt.Color;
import java.awt.Component;
import javax.swing.JTable;
import javax.swing.table.DefaultTableCellRenderer;

/**
 * @author Vanesa
 */
public class MiRender extends DefaultTableCellRenderer{

    public Component getTableCellRendererComponent(JTable table,
        Object value,
        boolean isSelected,
        boolean hasFocus,
        int row,
        int column
        )
    {
        Component cell = super.getTableCellRendererComponent (table,
            value, isSelected, hasFocus, row, column);
        if (value != null && column != 0 && value.toString().startsWith(
            "E") && !value.toString().startsWith("Emp")) {
            cell.setForeground(Color.RED);
        } else {
            cell.setForeground(Color.BLACK);
        }
        if(value != null){
            if(value == "Error" || value.toString().contains("conf"))
                cell.setForeground(Color.RED);
        }
            if(value == "Emparejar")
                cell.setForeground(Color.BLUE);
            if(value == "Aceptar")
                cell.setForeground(Color.GREEN);
            if(value != null && column != 0 && value.toString().startsWith
                ("d"))
                cell.setForeground(Color.BLUE);
            if(value != null && column != 0 && value.toString().startsWith
                ("r"))
                cell.setForeground(Color.MAGENTA);
            if(value != null && column != 0 && value.toString().contains("
                *"))
                cell.setForeground(Color.GRAY);

        return cell;
    }
}
```

2.5.3. NuevaFuncionError.java

```
//SimAS / Simulador
// Nueva Funcion error

package es.uco.simas.simulador;

import es.uco.simas.editor.FuncionError;
import es.uco.simas.editor.ParteAccion;
import es.uco.simas.editor.TablaLR;
import es.uco.simas.editor.TablaPredictiva;
import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.util.gramatica.Terminal;
import java.util.ArrayList;
import javax.swing.DefaultComboBoxModel;
import javax.swing.DefaultListModel;
```

```java
import javax.swing.JOptionPane;

/**
 * @author vanesa
 */
public class NuevaFuncionError extends javax.swing.JFrame {

    Gramatica gramatica;
    TablaPredictiva tPredictiva;
    TablaLR tlr;
    PanelNuevaSimDescPaso4 paso4;
    PanelNuevaSimAscPaso5 paso5;
    int sim =0;

    public NuevaFuncionError(Gramatica gramatica, PanelNuevaSimDescPaso4 paso4) {
        this.gramatica = gramatica;
        initComponents();
        inicializarCombos();
        this.tPredictiva = this.gramatica.getTPredictiva();
        this.paso4 = paso4;
        this.sim = 1;
    }

     public NuevaFuncionError(Gramatica gramatica, PanelNuevaSimAscPaso5 paso5, int i) {
        this.gramatica = gramatica;
        initComponents();
        inicializarCombos();
        this.tlr = this.gramatica.getTlr();
        this.paso5 = paso5;
        this.sim = 2;
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    private void initComponents() {

        jPanel1 = new javax.swing.JPanel();
        jLabel1 = new javax.swing.JLabel();
        jLabel2 = new javax.swing.JLabel();
        jLabel3 = new javax.swing.JLabel();
        jTextField1 = new javax.swing.JTextField();
        jLabel4 = new javax.swing.JLabel();
        jComboBox1 = new javax.swing.JComboBox();
        jLabel5 = new javax.swing.JLabel();
        jComboBox2 = new javax.swing.JComboBox();
        jLabel6 = new javax.swing.JLabel();
        jTextField2 = new javax.swing.JTextField();
        jButton1 = new javax.swing.JButton();
        jButton2 = new javax.swing.JButton();

        setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);
        setTitle(”Nueva Funcion de error”);

        jPanel1.setBackground(new java.awt.Color(233, 244, 244));

        jLabel1.setFont(new java.awt.Font(”Ubuntu”, 0, 18)); // NOI18N
        jLabel1.setText(”Nueva Funcion Error”);

        jLabel2.setText(”Identificador”);

        jLabel3.setText(”E”);

        jLabel4.setText(”Accion”);

        jComboBox1.setFont(new java.awt.Font(”Ubuntu”, 0, 14)); // NOI18N
        jComboBox1.setModel(new javax.swing.DefaultComboBoxModel(new String[] { ”1. Insertar un SÃmbolo en la Entrada”, ”2. Borrar un SÃmbolo de la Entrada”, ”3. Modificar un SÃmbolo de la Entrada”, ”4. Insertar un SÃmbolo de la Pila”, ”5. Borrar un SÃmbolo de la Pila”, ”6. Modificar un SÃmbolo de la Pila”, ”7. Terminar el anÃ¡lisis” }));
        jComboBox1.addItemListener(new java.awt.event.ItemListener() {
            public void itemStateChanged(java.awt.event.ItemEvent evt) {
                combo(evt);
            }
        });

        jLabel5.setText(”SÃmbolo”);

        jLabel6.setText(”Mensaje”);

        jButton1.setText(”Cancelar”);
        jButton1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton1ActionPerformed(evt);
            }
        });

        jButton2.setText(”Aceptar”);
        jButton2.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton2ActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
        jPanel1.setLayout(jPanel1Layout);
        jPanel1Layout.setHorizontalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGap(23, 23, 23)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)
                            .addGroup(jPanel1Layout.createSequentialGroup()
                                .addComponent(jLabel2)
                                .addGap(43, 43, 43)
                                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                                    .addComponent(jLabel1)
                                    .addGroup(jPanel1Layout.createSequentialGroup()
                                        .addComponent(jLabel3)
                                        .addGap(4, 4, 4)
                                        .addComponent(jTextField1, javax.swing.GroupLayout.PREFERRED_SIZE, 24, javax.swing.GroupLayout.PREFERRED_SIZE)
                                        .addGap(77, 77, 77)
                                        .addComponent(jLabel6))))
                            .addComponent(jButton1, javax.swing.GroupLayout.Alignment.LEADING))
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addComponent(jButton2))
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel1Layout.createSequentialGroup()
                                .addGap(0, 0, Short.MAX_VALUE)
                                .addComponent(jLabel4)
                                .addGap(209, 209, 209))
                    .addGroup(jPanel1Layout.
                        createSequentialGroup()
                        .addGroup(jPanel1Layout.
                            createParallelGroup(javax.swing.
                            GroupLayout.Alignment.LEADING)
                            .addComponent(jComboBox2, javax.
                                swing.GroupLayout.
                                PREFERRED_SIZE, 215, javax.
                                swing.GroupLayout.
                                PREFERRED_SIZE)
                            .addComponent(jComboBox1, javax.
                                swing.GroupLayout.
                                PREFERRED_SIZE, 246, javax.
                                swing.GroupLayout.
                                PREFERRED_SIZE)
                            .addComponent(jLabel5))
                        .addPreferredGap(javax.swing.
                            LayoutStyle.ComponentPlacement.
                            RELATED, javax.swing.GroupLayout.
                            DEFAULT_SIZE, Short.MAX_VALUE)))
                .addComponent(jTextField2, javax.swing.
                    GroupLayout.PREFERRED_SIZE, 221, javax.
                    swing.GroupLayout.PREFERRED_SIZE)))
        .addGap(30, 30, 30))
);
jPanel1Layout.setVerticalGroup(
    jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.
        Alignment.LEADING)
    .addGroup(jPanel1Layout.createSequentialGroup()
        .addGap(20, 20, 20)
        .addComponent(jLabel1)
        .addGap(23, 23, 23)
        .addGroup(jPanel1Layout.createParallelGroup(javax.swing
            .GroupLayout.Alignment.BASELINE)
            .addComponent(jLabel2)
            .addComponent(jLabel3)
            .addComponent(jTextField1, javax.swing.GroupLayout.
                PREFERRED_SIZE, javax.swing.GroupLayout.
                DEFAULT_SIZE, javax.swing.GroupLayout.
                PREFERRED_SIZE)
            .addComponent(jLabel6))
        .addGap(18, 18, 18)
        .addGroup(jPanel1Layout.createParallelGroup(javax.swing
            .GroupLayout.Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addComponent(jLabel4)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.UNRELATED)
                .addComponent(jComboBox1, javax.swing.
                    GroupLayout.PREFERRED_SIZE, javax.swing.
                    GroupLayout.DEFAULT_SIZE, javax.swing.
                    GroupLayout.PREFERRED_SIZE)
                .addGap(62, 62, 62)
```

```
                        .addComponent(jLabel5)
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.RELATED)
                        .addComponent(jComboBox2, javax.swing.
                            GroupLayout.PREFERRED_SIZE, javax.swing.
                            GroupLayout.DEFAULT_SIZE, javax.swing.
                            GroupLayout.PREFERRED_SIZE))
                    .addComponent(jTextField2, javax.swing.GroupLayout.
                        PREFERRED_SIZE, 180, javax.swing.GroupLayout.
                        PREFERRED_SIZE))
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED, 45, Short.MAX_VALUE)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing
                    .GroupLayout.Alignment.BASELINE)
                    .addComponent(jButton1)
                    .addComponent(jButton2))
                .addGap(24, 24, 24))
        );

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(
            getContentPane());
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.
                Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE
                , javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE
                )
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.
                Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE
                , javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE
                )
        );

        pack();
    }// </editor-fold>//GEN-END:initComponents


    private void inicializarCombos() {
        ArrayList<String> listaCombo = new ArrayList();
        DefaultListModel terminales= new DefaultListModel();
        int i= 0;
        terminales = this.gramatica.getTerminales();

        while(true) {
            if(i >= terminales.size())  {
                break;
            }
            if(i < terminales.size()) {
                listaCombo.add((String)terminales.get(i));
                i++;
            }
        }
        DefaultComboBoxModel combo = new DefaultComboBoxModel(
            listaCombo.toArray());
        this.jComboBox2.setModel(combo);

    }

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt
        ) {//GEN-FIRST:event_jButton1ActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿ Desea salir
            ?", "Salir",JOptionPane.YES_NO_OPTION);

        if(conf==0)
          this.dispose();
    }//GEN-LAST:event_jButton1ActionPerformed

    private void jButton2ActionPerformed(java.awt.event.ActionEvent evt
        ) {//GEN-FIRST:event_jButton2ActionPerformed
        ArrayList<FuncionError> funciones = new ArrayList();
        if(this.sim ==1)
            funciones = this.gramatica.getTPredictiva().getFunError();
        if(this.sim ==2)
            funciones = this.gramatica.getTlr().getTAccion().
                getFunError();

        int i=0;
        if("".equals(this.jTextField1.getText().toString())){
            JOptionPane.showConfirmDialog(null, "El identificador no
                puede estar vacÃo.", "Salir",JOptionPane.CLOSED_OPTION
                );
        }else{
            int j=0;
            while(i < funciones.size()){
                if(funciones.get(i).getIdentificador()==Integer.
                    parseInt(this.jTextField1.getText())){
                    JOptionPane.showConfirmDialog(null, "El
                        identificador estÃ¡ repetido.", "Salir",
                        JOptionPane.CLOSED_OPTION);
                    j=1;
                    break;
                }else
                    i++;
            }

            if(j==0) {
                int id = Integer.parseInt(this.jTextField1.getText().
                    toString());
                int accion = this.jComboBox1.getSelectedIndex()+1;
                String mensaje = this.jTextField2.toString();
                Terminal term = new Terminal(this.jComboBox2.
                    getSelectedItem().toString(),this.jComboBox2.
```

```
                        getSelectedItem().toString());
                FuncionError funError = new FuncionError(id,accion, mensaje );
                funError.setSimbolo(term);
                if(sim==1){
                    this.tPredictiva.crearFunError(funError);
                    this.gramatica.setTPredictiva(tPredictiva);
                    if(this.paso4 != null)
                        this.paso4.funcionError();
                }
                if(sim==2){
                    ParteAccion ac = this.tlr.getTAccion();
                    ac.crearFunError(funError);
                    this.tlr.setTAccion(ac);
                    this.gramatica.setTlr(this.tlr);
                    if(this.paso5 != null)
                        this.paso5.funcionError();
                }
                this.dispose();
            }
        }

    }//GEN-LAST:event_jButton2ActionPerformed

    private void combo(java.awt.event.ItemEvent evt) {//GEN-FIRST:event_combo
        if(this.jComboBox1.getSelectedIndex() ==1 || this.jComboBox1.getSelectedIndex() ==4 || this.jComboBox1.getSelectedIndex()==6){
            this.jLabel5.setVisible(false);
            this.jComboBox2.setVisible(false);
        }else{
            this.jLabel5.setVisible(true);
            this.jComboBox2.setVisible(true);
        }
    }//GEN-LAST:event_combo

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

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                //new NuevaFuncionError().setVisible(true);
            }
        });
    }
    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1;
    private javax.swing.JButton jButton2;
    private javax.swing.JComboBox jComboBox1;
    private javax.swing.JComboBox jComboBox2;
    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.JLabel jLabel6;
    private javax.swing.JPanel jPanel1;
    private javax.swing.JTextField jTextField1;
    private javax.swing.JTextField jTextField2;
    // End of variables declaration//GEN-END:variables
}
```

2.5.4. NuevaSimulacionAsc.java

```java
//SimAS / Simulador
//Nueva Simulacion Ascendente

package es.uco.simas.simulador;

import com.itextpdf.text.DocumentException;
import es.uco.simas.editor.Editor;
import es.uco.simas.editor.FuncionError;
import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.util.gramatica.Produccion;
import es.uco.simas.util.gramatica.Terminal;
import java.io.File;
import java.util.ArrayList;
import java.util.Stack;
import java.util.logging.Level;
import java.util.logging.Logger;
import javax.swing.JFileChooser;
import javax.swing.JOptionPane;
import javax.swing.filechooser.FileNameExtensionFilter;
import javax.swing.table.DefaultTableModel;

/**
 * @author vanesa
 */
public class NuevaSimulacionAsc extends javax.swing.JFrame {

    public Gramatica gramatica;
    public Simulador ventanaPadre;
    private DefaultTableModel tabla = new DefaultTableModel();
    Stack<String> pila = new Stack<String>();
    Stack<String> entrada = new Stack<String>();
    private String accion = ””;

    public NuevaSimulacionAsc(Gramatica gramatica, Simulador ventanaPadre) {
        initComponents();

        this.gramatica = gramatica;
        this.ventanaPadre = ventanaPadre;
        if(this.ventanaPadre.getMetodoAscendente()==0){
            this.jLabel1.setText(”Simulacion Ascendente SLR”);
        }
        if(this.ventanaPadre.getMetodoAscendente()==1){
            this.jLabel1.setText(”Simulacion Ascendente LR–canonico”);
        }
        if(this.ventanaPadre.getMetodoAscendente()==3){
            this.jLabel2.setText(”Simulacion Ascendente LALR”);
        }

        if(this.ventanaPadre.getCadenaEntrada() != null){
            iniciarSimulacion();
        }
        this.jTableSim.setModel(this.tabla);
        this.jTableSim.setDefaultRenderer (Object.class, new MiRender()
            );
    }

    public void actualizarVisualizacion(){
        String cadena =””;
        this.pila.removeAllElements();
        this.entrada.removeAllElements();
        this.tabla = new DefaultTableModel();
        this.jTableSim.setModel(this.tabla);

        ArrayList<Terminal> cadenaEntrada = this.ventanaPadre.
            getCadenaEntrada();
        int i = 0;
        while (i < cadenaEntrada.size()){
            cadena = cadena+cadenaEntrada.get(i).getNombre()+” ”;
            i++;
        }
        this.jTextField1.setText(cadena);
        if(!cadena.equals(””)){
            this.iniciarSimulacion();
        }
    }

    private void iniciarSimulacion(){
        this.tabla.addColumn(”Pila”);
        this.tabla.addColumn(”Entrada”);
        this.tabla.addColumn(”Accion”);

        ArrayList<Terminal> cadEntrada = this.ventanaPadre.
            getCadenaEntrada();
        int i=0;
        this.entrada.push(”$”);
        i = cadEntrada.size()-1;
        while(i >= 0){
            this.entrada.push(cadEntrada.get(i).getNombre());
            i--;
        }
        this.pila.push(”0”);

        this.accion = this.buscarTablaAccion(0, this.entrada.peek());

        Object [] linea = new Object[] {
            mostrarPila(this.pila),
            mostrarEntrada(this.entrada),
            accion,
            };

        this.tabla.addRow(linea);
    }

    private String mostrarPila(Stack pila){
        int i = 0;
        String str = "";
        while(i < pila.size()){
            str = str + " "+pila.get(i);
            i++;
        }
        return str;
    }

    private String mostrarEntrada(Stack pila){
        int i = pila.size()-1;
        String str = "";
        while(i >= 0){
            str = str + " "+pila.get(i);
            i--;
        }
        return str;
    }

    private String buscarTablaAccion(int fila, String columna){
        DefaultTableModel tablaAccion = this.gramatica.getTlr().getTAccion().getMatrizAccion();
        int i=0;
        int fil = -1;
        int col = -1;
        Object celda = "";

        while(i < tablaAccion.getRowCount()){
            if(tablaAccion.getValueAt(i, 0).toString().contains("-")){
                int a =tablaAccion.getValueAt(i, 0).toString().indexOf("-");
                int numero = Integer.parseInt(tablaAccion.getValueAt(i, 0).toString().substring(0, a));
                if(fila == numero){
                    fil = i;
                    break;
                }else{
                    i++;
                }
            }else{
                if(fila == Integer.parseInt(tablaAccion.getValueAt(i, 0).toString())){
                    fil = i;
                    break;
                }else{
                    i++;
                }
            }
        }
        i = 1;
        while(i < tablaAccion.getColumnCount()){
            if(columna.equals(tablaAccion.getColumnName(i))){
                col = i;
                break;
            }else{
                i++;
            }
        }
        if(fil != -1 && col != -1){
            celda = tablaAccion.getValueAt(fil, col);
        }
        if(celda == null){
            return "Error";
        }else{
            return celda.toString();
        }
    }

     private String buscarTablaIra(int fila, String columna){
        DefaultTableModel tablaIra = this.gramatica.getTlr().getTIrA().getMatrizIrA();
        DefaultTableModel tablaAccion = this.gramatica.getTlr().getTAccion().getMatrizAccion();
        int i=0;
        int fil = -1;
        int col = -1;
        Object celda = "";

        while(i < tablaIra.getRowCount()){
            if(tablaAccion.getValueAt(i, 0).toString().contains("-")){
                int a = tablaAccion.getValueAt(i, 0).toString().indexOf("-");
                int numero = Integer.parseInt(tablaAccion.getValueAt(i, 0).toString().substring(0, a));
                if(fila == numero){
                    fil = i;
                    break;
                }else{
                    i++;
                }
            }else{
                if(fila == Integer.parseInt(tablaAccion.getValueAt(i, 0).toString())){
                    fil = i;
                    break;
                }else{
                    i++;
                }
            }
        }
        i = 0;
        while(i < tablaIra.getColumnCount()){
            if(columna.equals(tablaIra.getColumnName(i))){
                col = i;
                break;
            }else{
                i++;
            }
        }
        if(fil != -1 && col != -1){
            celda = tablaIra.getValueAt(fil, col);
        }
        if(celda == null){
            return ”Error”;
        }else{
            return celda.toString();
        }
    }

    private void siguientePaso(){
        int desp = -1;
        int red = -1;
        int i=0;
        ArrayList<Produccion> prod = this.gramatica.getPr();
        if(this.accion.equals(”Aceptar”) || this.accion.equals(”Error”)
             || this.accion.contains(”conf”)){
            this.jButton4.setEnabled(false);
        }else{
            if(this.accion.startsWith(”d”)){
                this.pila.push(this.entrada.peek());
                this.entrada.pop();
                this.pila.push(this.accion.substring(1, this.accion.
                    length()));
            }
            if(this.accion.startsWith(”r”)){
                int aux;

                if(this.accion.substring(2, 2)==” ”){
                    aux=1;
                }else{
                    aux=2;
                }

                red= Integer.parseInt(this.accion.substring(1, aux));
                Produccion pr = prod.get(red);

                if(pr.getConsec().get(0).getNombre().equals(”\u03b5”)){
                    this.pila.push(pr.getAntec().getSimboloNT().
                        getNombre());
                    String num =(this.buscarTablaIra(Integer.parseInt(
                        this.pila.get(this.pila.size()-2)), this.pila.
                        get(this.pila.size()-1)));
                    this.pila.push(num);
                }else{
                    this.pila.pop();
                    i=pr.getConsec().size()-1;
                    while(i >= 0){
                        if(pr.getConsec().get(i).getNombre().equals(
                            this.pila.peek())){
                            this.pila.pop();
                            if(i > 0)
                                this.pila.pop();
                        }
                        i--;
                    }
                    this.pila.push(pr.getAntec().getSimboloNT().
                        getNombre());

                    String num= "";
                    if(this.pila.get(this.pila.size()-2).contains("-"))
                        {
                        int a =this.pila.get(this.pila.size()-2).
                            indexOf("-");
                        int numero = Integer.parseInt(this.pila.get(
                            this.pila.size()-2).substring(0, a));
                        num =(this.buscarTablaIra(numero, this.pila.get
                            (this.pila.size()-1)));
                    }else{
                        num =(this.buscarTablaIra(Integer.parseInt(this
                            .pila.get(this.pila.size()-2)), this.pila.
                            get(this.pila.size()-1)));
                    }
                    this.pila.push(num);
                }
            }

            if(this.pila.peek().contains("-")){
                int a =this.pila.peek().indexOf("-");
                int numero = Integer.parseInt(this.pila.peek().
                    substring(0, a));
                this.accion = this.buscarTablaAccion(numero, this.
                    entrada.peek());
            }else{
                this.accion = this.buscarTablaAccion(Integer.parseInt(
                    this.pila.peek()), this.entrada.peek());
            }

            if(this.accion.startsWith("r")){
                Produccion pr = prod.get(Integer.parseInt(this.accion.
                    substring(1, this.accion.length())));
                this.accion = this.accion + "    " + pr.getAntec().
                    getSimboloNT().getNombre();
                this.accion = this.accion + " \u2192 ";
                i=0;
                while(i < pr.getConsec().size()){
                    this.accion = this.accion +" "+pr.getConsec().get(i
                        ).getNombre();
                    i++;
                }
            }

            if(this.accion.startsWith("E") && !this.accion.equals("
                Error")){
```

```
                funError();
            }

            Object [] linea = new Object[] {
                mostrarPila(this.pila),
                mostrarEntrada(this.entrada),
                this.accion,
                };
            this.tabla.addRow(linea);
        }
    }

    public DefaultTableModel getTabla(){
        this.jButton5ActionPerformed(null);
        return this.tabla;
    }

    private void funError(){
        ArrayList<FuncionError> funError = this.gramatica.getTlr().getTAccion().getFunError();
        FuncionError fun = new FuncionError();
        int i = 0;
        int num = Integer.parseInt(this.accion.substring(1));

        while(i < funError.size()){
            if(funError.get(i).getIdentificador() == num){
                fun = funError.get(i);
                break;
            }else
                i++;
        }

        if(fun.getAccion()==1){
            this.entrada.push(fun.getSimbolo().getNombre());
        }
        if(fun.getAccion()==2){
            this.entrada.pop();
        }
        if(fun.getAccion()==3){
            this.entrada.pop();
            this.entrada.push(fun.getSimbolo().getNombre());
        }
        if(fun.getAccion()==4){
            this.pila.push(fun.getSimbolo().getNombre());
        }
        if(fun.getAccion()==5){
            this.pila.pop();
        }
        if(fun.getAccion()==6){
            this.pila.pop();
            this.pila.push(fun.getSimbolo().getNombre());
        }
        if(fun.getAccion()==7){
            this.accion = "Fin";
        }
    }

    /**
     * This method is called from within the constructor to initialize
         the form.
     * WARNING: Do NOT modify this code. The content of this method is
         always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//
        GEN-BEGIN:initComponents
    private void initComponents() {

        jPanel1 = new javax.swing.JPanel();
        jLabel1 = new javax.swing.JLabel();
        jLabel2 = new javax.swing.JLabel();
        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();
        jScrollPane1 = new javax.swing.JScrollPane();
        jTableSim = new javax.swing.JTable();
        jButton6 = new javax.swing.JButton();
        jButton7 = new javax.swing.JButton();

        setDefaultCloseOperation(javax.swing.WindowConstants.
            DISPOSE_ON_CLOSE);
        setTitle("Simulacion Ascendente");
        setBackground(new java.awt.Color(233, 242, 242));

        jPanel1.setBackground(new java.awt.Color(233, 242, 242));

        jLabel1.setFont(new java.awt.Font("Tahoma", 1, 18)); // NOI18N
        jLabel1.setText("Simulacion Ascendente");

        jLabel2.setFont(new java.awt.Font("Tahoma", 1, 12)); // NOI18N
        jLabel2.setText("Cadena de Entrada: ");

        jButton1.setText("Editar");
        jButton1.addActionListener(new java.awt.event.ActionListener()
            {
            public void actionPerformed(java.awt.event.ActionEvent evt)
                {
                jButton1ActionPerformed(evt);
            }
        });

        jButton2.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/primero.png”))); // NOI18N
        jButton2.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton2ActionPerformed(evt);
            }
        });

        jButton3.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/anterior.png”))); // NOI18N
        jButton3.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton3ActionPerformed(evt);
            }
        });

        jButton4.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/siguiente.png”))); // NOI18N
        jButton4.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton4ActionPerformed(evt);
            }
        });

        jButton5.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/ultimo.png”))); // NOI18N
        jButton5.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton5ActionPerformed(evt);
            }
        });

        jTableSim.setModel(new javax.swing.table.DefaultTableModel(
            new Object [][] {
                {null, null, null, null},
                {null, null, null, null},
                {null, null, null, null},
                {null, null, null, null}
            },
            new String [] {
                ”Title 1”, ”Title 2”, ”Title 3”, ”Title 4”
            }
        ));
        jScrollPane1.setViewportView(jTableSim);

        jButton6.setText(”Cancelar”);
        jButton6.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton6ActionPerformed(evt);
            }
        });

        jButton7.setText(”Informe de la Simulacion”);
        jButton7.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton7ActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
        jPanel1.setLayout(jPanel1Layout);
        jPanel1Layout.setHorizontalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addGap(48, 48, 48)
                        .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)
                            .addGroup(jPanel1Layout.createSequentialGroup()
                                .addComponent(jLabel2)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                                    .addGroup(jPanel1Layout.createSequentialGroup()
                                        .addGap(32, 32, 32)
                                        .addComponent(jButton2)
                                        .addGap(18, 18, 18)
                                        .addComponent(jButton3)
                                        .addGap(18, 18, 18)
                                        .addComponent(jButton4)
                                        .addGap(18, 18, 18)
                                        .addComponent(jButton5)
                                        .addGap(0, 0, Short.MAX_VALUE))
                                    .addGroup(jPanel1Layout.
                                        createSequentialGroup()
                                        .addComponent(jTextField1,
                                            javax.swing.GroupLayout.
                                            PREFERRED_SIZE, 300, javax.
                                            swing.GroupLayout.
                                            PREFERRED_SIZE)
                                        .addPreferredGap(javax.swing.
                                            LayoutStyle.
                                            ComponentPlacement.RELATED,
                                             javax.swing.GroupLayout.
                                            DEFAULT_SIZE, Short.
                                            MAX_VALUE)
                                        .addComponent(jButton1)
                                        .addGap(19, 19, 19))))
                            .addGroup(javax.swing.GroupLayout.Alignment
                                .TRAILING, jPanel1Layout.
                                createSequentialGroup()
                                .addComponent(jButton6)
                                .addPreferredGap(javax.swing.
                                    LayoutStyle.ComponentPlacement.
                                    RELATED, javax.swing.GroupLayout.
                                    DEFAULT_SIZE, Short.MAX_VALUE)
                                .addComponent(jButton7))
                            .addComponent(jScrollPane1, javax.swing.
                                GroupLayout.Alignment.TRAILING, javax.
                                swing.GroupLayout.PREFERRED_SIZE, 567,
                                javax.swing.GroupLayout.PREFERRED_SIZE)
                                ))
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addGap(110, 110, 110)
                        .addComponent(jLabel1)))
                .addContainerGap(46, Short.MAX_VALUE))
        );
        jPanel1Layout.setVerticalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.
                Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGap(23, 23, 23)
                .addComponent(jLabel1)
                .addGap(35, 35, 35)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing
                    .GroupLayout.Alignment.BASELINE)
                    .addComponent(jLabel2)
                    .addComponent(jTextField1, javax.swing.GroupLayout.
                        PREFERRED_SIZE, javax.swing.GroupLayout.
                        DEFAULT_SIZE, javax.swing.GroupLayout.
                        PREFERRED_SIZE)
                    .addComponent(jButton1))
                .addGap(30, 30, 30)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addComponent(jButton2)
                    .addComponent(jButton3)
                    .addComponent(jButton4)
                    .addComponent(jButton5))
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 410, javax.swing.GroupLayout.PREFERRED_SIZE)
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 32, Short.MAX_VALUE)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jButton6)
                    .addComponent(jButton7))
                .addGap(20, 20, 20))
        );

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        );

        pack();
    }// </editor-fold>//GEN-END:initComponents

    private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton2ActionPerformed
        DefaultTableModel tabla2 = new DefaultTableModel();
        this.tabla = tabla2;
        this.jTableSim.setModel(this.tabla);
        this.pila.removeAllElements();
        this.entrada.removeAllElements();
        this.accion = "";
        this.iniciarSimulacion();
    }//GEN-LAST:event_jButton2ActionPerformed

```

```java
    private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton3ActionPerformed
        ArrayList<Produccion> prod = this.gramatica.getPr();
        if(this.jTableSim.getRowCount()<2){
            this.jButton3.setEnabled(false);
        }else{
            this.jButton5.setEnabled(true);
            this.jButton3.setEnabled(true);
            this.jButton2.setEnabled(true);
            this.jButton4.setEnabled(true);
            String pila = this.tabla.getValueAt(this.jTableSim.getRowCount()-2, 0).toString();
            String entrada = this.tabla.getValueAt(this.jTableSim.getRowCount()-2, 1).toString();
            this.tabla.removeRow(this.jTableSim.getRowCount()-1);

            String[] p = pila.split(" ");
            String[] e = entrada.split(" ");
            int i = 1;
            this.pila.removeAllElements();
            while(i < p.length ){
                this.pila.push(p[i]);
                i++;
            }
            i=e.length-1;
            this.entrada.removeAllElements();
            while(i > 0 ){
                this.entrada.push(e[i]);
                i--;
            }

            this.accion = this.buscarTablaAccion(Integer.parseInt(this.pila.peek()), this.entrada.peek());

            if(this.accion.startsWith("r")){
                Produccion pr = prod.get(Integer.parseInt(this.accion.substring(1, this.accion.length())));
                this.accion = this.accion + "    " + pr.getAntec().getSimboloNT().getNombre();
                this.accion = this.accion + " \u2192 ";
                i=0;
                while(i < pr.getConsec().size()){
                    this.accion = this.accion +" "+pr.getConsec().get(i).getNombre();
                    i++;
                }
            }
        }
    }//GEN-LAST:event_jButton3ActionPerformed

    private void jButton4ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton4ActionPerformed
        this.siguientePaso();
    }//GEN-LAST:event_jButton4ActionPerformed

    private void jButton6ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton6ActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿ Desea salir?", "Salir",JOptionPane.YES_NO_OPTION);

        if(conf==0)
          this.dispose();
    }//GEN-LAST:event_jButton6ActionPerformed

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton1ActionPerformed
        CadEntrada ent = new CadEntrada(this);
        ent.setVisible(true);
        ent.setLocationRelativeTo(null);
    }//GEN-LAST:event_jButton1ActionPerformed

    private void jButton5ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton5ActionPerformed
        int i=0;
        while(i < 500){
            if(!this.accion.equals("Aceptar") || !this.accion.equals("Error") || !this.accion.contains("conf")){
                this.siguientePaso();
                i++;
            }else
                break;
        }
    }//GEN-LAST:event_jButton5ActionPerformed

    private void jButton7ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton7ActionPerformed
        Boolean resultado= null;
        FileNameExtensionFilter filtro= null;
        JFileChooser selector= null;

        if(this.jTextField1.getText().isEmpty()){
            JOptionPane.showConfirmDialog(null, "La cadena de entrada no puede estar vacÃ a", "Error",JOptionPane.CLOSED_OPTION);
        }else{
            JFileChooser chooser = new JFileChooser();
            selector=chooser;
            FileNameExtensionFilter extension = new FileNameExtensionFilter("Informes de simulacion Ascendente (.pdf)",new String[]
                {"pdf"});
            filtro=extension;
            selector.setFileFilter(filtro);
            File fichero = new File("informeSimulacionAsc.pdf");
            selector.setSelectedFile(fichero);
            if(selector.showSaveDialog(null)==0) {
                try {
                    resultado = this.ventanaPadre.generarInforme(selector.getSelectedFile().toString());
                } catch (DocumentException ex) {
                    Logger.getLogger(Editor.class.getName()).log(Level.SEVERE, null, ex);
                }

                if(resultado.booleanValue())  {
                    StringBuilder JdecGenerated80 = new StringBuilder();
                }  else  {
                    JOptionPane.showConfirmDialog(null,"El informe de la gramÃ¡tica no se puede generar hasta que la gramÃ¡tica estÃ© validada.", "Informe de la gramÃ¡tica", JOptionPane.DEFAULT_OPTION);
                }
            }
        }

    }//GEN-LAST:event_jButton7ActionPerformed

    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1;
    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.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JPanel jPanel1;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JTable jTableSim;
    private javax.swing.JTextField jTextField1;
    // End of variables declaration//GEN-END:variables
}
```

2.5.5. NuevaSimulacionDesc.java

```
//SimAS / Simulador
//Nueva Simulacion Descendente

package es.uco.simas.simulador;

import com.itextpdf.text.DocumentException;
import es.uco.simas.editor.Editor;
import es.uco.simas.editor.FuncionError;
import es.uco.simas.editor.TablaPredictiva;
import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.util.gramatica.Simbolo;
import es.uco.simas.util.gramatica.Terminal;
import java.io.File;
import java.util.ArrayList;
import java.util.Stack;
import java.util.logging.Level;
import java.util.logging.Logger;
import javax.swing.DefaultListModel;
import javax.swing.JFileChooser;
import javax.swing.JOptionPane;
import javax.swing.filechooser.FileNameExtensionFilter;
import javax.swing.table.DefaultTableModel;

/**
 * @author Vanesa
 */
public class NuevaSimulacionDesc extends javax.swing.JFrame {

    public Gramatica gramatica;
    public Simulador ventanaPadre;
    private DefaultTableModel tabla = new DefaultTableModel();
    Stack<String> pila = new Stack<String>();
    Stack<String> entrada = new Stack<String>();
    private String accion = "";
    private ArrayList<Simbolo> consec;

    public NuevaSimulacionDesc(Gramatica gramatica, Simulador ventanaPadre) {
        initComponents();

        this.gramatica = gramatica;
        this.ventanaPadre = ventanaPadre;
        this.jButton6.setEnabled(false);
        if(this.ventanaPadre.getCadenaEntrada() != null){
            iniciarSimulacion();
        }
        this.jTableSim.setDefaultRenderer (Object.class, new MiRender());
        this.jTableSim.setModel(this.tabla);

        this.jButton2.setEnabled(false);
        this.jButton4.setEnabled(false);
        this.jButton5.setEnabled(false);
        this.jButton3.setEnabled(false);
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    private void initComponents() {

        jPanel1 = new javax.swing.JPanel();
        jButton1 = new javax.swing.JButton();
        jLabel1 = new javax.swing.JLabel();
        jScrollPane1 = new javax.swing.JScrollPane();
        jTableSim = new javax.swing.JTable();
        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();
        jLabel2 = new javax.swing.JLabel();
        jTextField1 = new javax.swing.JTextField();
        jButton7 = new javax.swing.JButton();

        setDefaultCloseOperation(javax.swing.WindowConstants.DISPOSE_ON_CLOSE);
        setTitle("Simulacion Descendente");

        jPanel1.setBackground(new java.awt.Color(233, 242, 242));

        jButton1.setText("Cancelar");
        jButton1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton1ActionPerformed(evt);
            }
        });

        jLabel1.setFont(new java.awt.Font("Tahoma", 1, 15)); // NOI18N
        jLabel1.setText("Simulacion Descendente");

        jTableSim.setModel(new javax.swing.table.DefaultTableModel(
            new Object [][] {
                {null, null, null},
                {null, null, null},
                {null, null, null},
                {null, null, null}
            },
            new String [] {
                "", "", ""
            }
        ) {
            boolean[] canEdit = new boolean [] {
                false, false, false
            };

            public boolean isCellEditable(int rowIndex, int columnIndex) {
                return canEdit [columnIndex];
            }
        });
        jScrollPane1.setViewportView(jTableSim);

        jButton2.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/siguiente.png”))); // NOI18N
        jButton2.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton2ActionPerformed(evt);
            }
        });

        jButton3.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/anterior.png”))); // NOI18N
        jButton3.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton3ActionPerformed(evt);
            }
        });

        jButton4.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/ultimo.png”))); // NOI18N
        jButton4.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton4ActionPerformed(evt);
            }
        });

        jButton5.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/primero.png”))); // NOI18N
        jButton5.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton5ActionPerformed(evt);
            }
        });

        jButton6.setText(”Informe de la Simulacion”);
        jButton6.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton6ActionPerformed(evt);
            }
        });

        jLabel2.setFont(new java.awt.Font(”Tahoma”, 1, 12)); // NOI18N
        jLabel2.setText(”Cadena de Entrada:”);

        jTextField1.setEditable(false);

        jButton7.setText(”Editar”);
        jButton7.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton7ActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
        jPanel1.setLayout(jPanel1Layout);
        jPanel1Layout.setHorizontalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGap(24, 24, 24)
                .addComponent(jButton1)
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                .addComponent(jButton6)
                .addGap(41, 41, 41))
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGap(54, 54, 54)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)
                            .addGroup(jPanel1Layout.createSequentialGroup()
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                                .addComponent(jButton5)
                                .addGap(18, 18, 18)
                                .addComponent(jButton3)
                                .addGap(18, 18, 18)
                                .addComponent(jButton2)
                                .addGap(18, 18, 18)
                                .addComponent(jButton4))
                            .addGroup(jPanel1Layout.
                               createSequentialGroup()
                                .addComponent(jLabel2)
                                .addPreferredGap(javax.swing.
                                   LayoutStyle.ComponentPlacement.
                                   UNRELATED)
                                .addComponent(jTextField1)))
                        .addGap(18, 18, 18)
                        .addComponent(jButton7))
                    .addComponent(jScrollPane1, javax.swing.GroupLayout
                       .PREFERRED_SIZE, 484, javax.swing.GroupLayout.
                       PREFERRED_SIZE))
                .addContainerGap(37, Short.MAX_VALUE))
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
               jPanel1Layout.createSequentialGroup()
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
                   Short.MAX_VALUE)
                .addComponent(jLabel1)
                .addGap(165, 165, 165))
        );
        jPanel1Layout.setVerticalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.
               Alignment.LEADING)
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
               jPanel1Layout.createSequentialGroup()
                .addContainerGap()
                .addComponent(jLabel1)
                .addGap(29, 29, 29)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing
                   .GroupLayout.Alignment.BASELINE)
                    .addComponent(jLabel2)
                    .addComponent(jTextField1, javax.swing.GroupLayout.
                       PREFERRED_SIZE, javax.swing.GroupLayout.
                       DEFAULT_SIZE, javax.swing.GroupLayout.
                       PREFERRED_SIZE)
                    .addComponent(jButton7))
                .addPreferredGap(javax.swing.LayoutStyle.
                   ComponentPlacement.RELATED, 44, Short.MAX_VALUE)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing
                   .GroupLayout.Alignment.LEADING)
                    .addComponent(jButton5, javax.swing.GroupLayout.
                       Alignment.TRAILING)
                    .addComponent(jButton3, javax.swing.GroupLayout.
                       Alignment.TRAILING)
                    .addComponent(jButton2, javax.swing.GroupLayout.
                       Alignment.TRAILING)
                    .addComponent(jButton4, javax.swing.GroupLayout.
                       Alignment.TRAILING))
                .addGap(31, 31, 31)
```

```
                    .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 319, javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                    .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                        .addComponent(jButton1)
                        .addComponent(jButton6))
                    .addGap(19, 19, 19))
        );

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        );

        pack();
    }// </editor-fold>//GEN-END:initComponents

    public void actualizarVisualizacion(){
        String cadena ="";
        this.pila.removeAllElements();
        this.entrada.removeAllElements();
        this.tabla = new DefaultTableModel();
        this.jTableSim.setModel(this.tabla);

        ArrayList<Terminal> cadenaEntrada = this.ventanaPadre.getCadenaEntrada();
        int i = 0;
        while (i < cadenaEntrada.size()){
            cadena = cadena+cadenaEntrada.get(i).getNombre()+" ";
            i++;
        }
        this.jTextField1.setText(cadena);
        if(!cadena.equals("")){
            this.iniciarSimulacion();
        }
        this.jButton2.setEnabled(true);
        this.jButton4.setEnabled(true);
        this.jButton5.setEnabled(false);
        this.jButton3.setEnabled(false);
    }

    private void iniciarSimulacion(){            //Con piLA
        this.tabla.addColumn("Pila");
        this.tabla.addColumn("Entrada");
        this.tabla.addColumn("Accion");

        ArrayList<Terminal> cadEntrada = this.ventanaPadre.
            getCadenaEntrada();
        this.pila.push("$");
        this.pila.push(this.gramatica.getSimbInicial());

        int i=0;

        this.entrada.push("$");
        i = cadEntrada.size()-1;
        while(i >= 0){
            this.entrada.push(cadEntrada.get(i).getNombre());
            i--;
        }

        String accion = buscarTabla(this.pila.peek().toString(),this.
            entrada.peek().toString());
        if(accion.equals("Error")){
            this.jButton2.setEnabled(false);
            this.jButton4.setEnabled(false);
            this.jButton5.setEnabled(true);
            this.jButton3.setEnabled(true);
        }

        Object [] linea = new Object[] {
            mostrarPila(this.pila),
            mostrarEntrada(this.entrada),
            accion,
            };

        this.tabla.addRow(linea);
        this.accion = accion;
        this.jButton5.setEnabled(false);
        this.jButton3.setEnabled(false);
        this.jButton2.setEnabled(true);
        this.jButton5.setEnabled(true);
        this.jButton6.setEnabled(true);

    }

    private String buscarTabla(String fila, String columna){
        DefaultTableModel tabla = this.gramatica.getTPredictiva().
            getTabla();
        TablaPredictiva tpredictiva = this.gramatica.getTPredictiva();
        int i=0;
        int fil = -1;
        int col = -1;
        Object celda = ””;

        while(i < tabla.getRowCount()){
            if(fila.equals(tpredictiva.getCeldaPredictiva(i, 0))){
                fil = i;
                break;
            }else{
                i++;
            }
        }
        i = 1;
        while(i < tabla.getColumnCount()){
            if(columna.equals(tabla.getColumnName(i))){
                col = i;
                break;
            }else{
                i++;
            }
        }
        if(fil != -1 && col != -1){
            celda = tpredictiva.getCeldaPredictiva(fil, col);
        }
        if(celda == null){
            return ”Error”;
        }else{
            if(celda.toString().startsWith(”E”) && !celda.toString().
                equals(”Emparejar”) ){
                return celda.toString();
            }else{
                String prod = buscarProduccion(Integer.parseInt(celda.
                    toString()));
                return (celda+”) ”+prod);
            }
        }
    }

    private String mostrarPila(Stack pila){
        int i = 0;
        String str = ””;
        while(i < pila.size()){
            str = str + ” ”+pila.get(i);
            i++;
        }
        return str;
    }

    private String mostrarEntrada(Stack pila){
        int i = pila.size()-1;
        String str = ””;
        while(i >= 0){
            str = str + ” ”+pila.get(i);
            i--;
        }
        return str;
    }

    private String buscarProduccion(int numero){
        DefaultListModel prod = this.gramatica.getProducciones();
        this.consec = this.gramatica.getPr().get(numero-1).getConsec();

        return prod.getElementAt(numero-1).toString();
    }

    private void siguientePaso(){
        if(this.accion.equals("Aceptar") || this.accion.equals("Error") || this.accion.equals("Fin")){
            this.jButton2.setEnabled(false);
            this.jButton4.setEnabled(false);
            this.jButton3.setEnabled(true);
            this.jButton5.setEnabled(true);
        }else{
            if(this.accion.equals("Emparejar")){
                    this.pila.pop();
                    this.entrada.pop();
            }else{
                if(this.accion.startsWith("E")){
                        funError();

                }else{
                    if(this.consec.get(0).getNombre().equals("\u03b5")){
                        this.pila.pop();
                    }else{
                        int i=this.consec.size()-1;
                        this.pila.pop();
                        while(i >= 0){
                            this.pila.push(consec.get(i).getNombre());
                            i--;
                        }
                    }
                }
            }
            if(this.pila.peek().equals("$") && this.entrada.peek().equals("$")){
                this.accion = "Aceptar";
            }else{
                if(this.pila.peek().equals(this.entrada.peek())){
                    this.accion = "Emparejar";
                }else{
                    this.accion = buscarTabla(this.pila.peek().toString(),this.entrada.peek().toString());
                }
            }

            Object [] linea = new Object[] {
                mostrarPila(this.pila),
                mostrarEntrada(this.entrada),
                this.accion,
                };

            this.tabla.addRow(linea);
        }
    }

    private void funError(){
        ArrayList<FuncionError> funError = this.gramatica.
            getTPredictiva().getFunError();
        FuncionError fun = new FuncionError();
        int i = 0;
        int num = Integer.parseInt(this.accion.substring(1));

        while(i < funError.size()){
            if(funError.get(i).getIdentificador() == num){
                fun = funError.get(i);
                break;
            }else
                i++;
        }

        if(fun.getAccion()==1){
            this.entrada.push(fun.getSimbolo().getNombre());
        }
        if(fun.getAccion()==2){
            this.entrada.pop();
        }
        if(fun.getAccion()==3){
            this.entrada.pop();
            this.entrada.push(fun.getSimbolo().getNombre());
        }
        if(fun.getAccion()==4){
            this.pila.push(fun.getSimbolo().getNombre());
        }
        if(fun.getAccion()==5){
            this.pila.pop();
        }
        if(fun.getAccion()==6){
            this.pila.pop();
            this.pila.push(fun.getSimbolo().getNombre());
        }
        if(fun.getAccion()==7){
            this.accion = ”Fin”;
        }
    }

    public DefaultTableModel getTabla(){
        this.jButton4ActionPerformed(null);
        return this.tabla;
```

```java
    }

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton1ActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿ Desea salir?", "Salir",JOptionPane.YES_NO_OPTION);

        if(conf==0)
          this.dispose();
    }//GEN-LAST:event_jButton1ActionPerformed

    private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton2ActionPerformed
        siguientePaso();
        this.jButton5.setEnabled(true);
        this.jButton3.setEnabled(true);
        this.jButton2.setEnabled(true);
        this.jButton4.setEnabled(true);
    }//GEN-LAST:event_jButton2ActionPerformed

    private void jButton5ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton5ActionPerformed
        DefaultTableModel tabla2 = new DefaultTableModel();
        this.tabla = tabla2;
        this.jTableSim.setModel(this.tabla);
        this.pila.removeAllElements();
        this.entrada.removeAllElements();
        this.accion = "";
        this.iniciarSimulacion();
        this.jButton5.setEnabled(false);
        this.jButton3.setEnabled(false);
        this.jButton2.setEnabled(true);
        this.jButton4.setEnabled(true);
    }//GEN-LAST:event_jButton5ActionPerformed

    private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton3ActionPerformed
        if(this.jTableSim.getRowCount()<2){
            this.jButton3.setEnabled(false);
        }else{
            this.jButton5.setEnabled(true);
            this.jButton3.setEnabled(true);
            this.jButton2.setEnabled(true);
            this.jButton4.setEnabled(true);
            String pila = this.tabla.getValueAt(this.jTableSim.getRowCount()-2, 0).toString();
            String entrada = this.tabla.getValueAt(this.jTableSim.getRowCount()-2, 1).toString();
            this.tabla.removeRow(this.jTableSim.getRowCount()-1);

            String[] p = pila.split(" ");
            String[] e = entrada.split(" ");
            int i = 1;
            this.pila.removeAllElements();
            while(i < p.length ){
                this.pila.push(p[i]);
                i++;
            }
            i=e.length-1;
            this.entrada.removeAllElements();
            while(i > 0 ){
                this.entrada.push(e[i]);
                i--;
            }

            if(this.pila.peek().equals("$") && this.entrada.peek().equals("$")){
                this.accion = "Aceptar";
            }else{
                if(this.pila.peek().equals(this.entrada.peek())){
                    this.accion = "Emparejar";
                }else{
                    this.accion = buscarTabla(this.pila.peek().toString(),this.entrada.peek().toString());
                }
            }
        }
    }//GEN-LAST:event_jButton3ActionPerformed

    private void jButton4ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton4ActionPerformed
        int i=0;
        while(i < 500){
            if(!this.accion.equals("Aceptar") || !this.accion.equals("Error") || !this.accion.equals("Fin")){
                this.siguientePaso();
                i++;
            }else
                break;
        }
        this.jButton3.setEnabled(true);
        this.jButton5.setEnabled(true);
        this.jButton2.setEnabled(false);
        this.jButton4.setEnabled(false);
    }//GEN-LAST:event_jButton4ActionPerformed

    private void jButton6ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton6ActionPerformed

        Boolean resultado= null;
        FileNameExtensionFilter filtro= null;
        JFileChooser selector= null;

        JFileChooser chooser = new JFileChooser();
        selector=chooser;
```

```java
        FileNameExtensionFilter extension = new FileNameExtensionFilter("Informe de simulacion Descendente (.pdf)",new String[]
            {"pdf"});
        filtro=extension;
        selector.setFileFilter(filtro);
        File fichero = new File("informeSimulacionDesc.pdf");
        selector.setSelectedFile(fichero);
        if(selector.showSaveDialog(null)==0)  {
            try {
                resultado = this.ventanaPadre.generarInforme(selector.getSelectedFile().toString());
            } catch (DocumentException ex) {
                Logger.getLogger(Editor.class.getName()).log(Level.SEVERE, null, ex);
            }

            if(resultado.booleanValue())  {
                StringBuilder JdecGenerated80 = new StringBuilder();
            }  else  {
                JOptionPane.showConfirmDialog(null,"El informe de la gramÃ¡tica no se puede generar hasta que la gramÃ¡tica estÃ© validada.", "Informe de la gramÃ¡tica", JOptionPane.DEFAULT_OPTION);

            }
        }
    }//GEN-LAST:event_jButton6ActionPerformed

    private void jButton7ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton7ActionPerformed
        CadEntrada ent = new CadEntrada(this);
        ent.setVisible(true);
        ent.setLocationRelativeTo(null);
    }//GEN-LAST:event_jButton7ActionPerformed

    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1;
    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.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JPanel jPanel1;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JTable jTableSim;
    private javax.swing.JTextField jTextField1;
    // End of variables declaration//GEN-END:variables
}
```

2.5.6. PanelNuevaSimAscPaso1.java

```
//SimAS / Simulador
//Panel Nueva Simulacion Ascendente paso 1

package es.uco.simas.simulador;

import javax.swing.JOptionPane;

/**
 * @author vanesa
 */
public class PanelNuevaSimAscPaso1 extends javax.swing.JPanel {

    private VentanaSimuladorAsc ventanaPadre;
    int metodo = −1;

    public PanelNuevaSimAscPaso1(VentanaSimuladorAsc ventanaPadre) {
        initComponents();
        this.ventanaPadre = ventanaPadre;

    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings(”unchecked”)
    // <editor−fold defaultstate=”collapsed” desc=”Generated Code”>//GEN−BEGIN:initComponents
    private void initComponents() {

        jLabel1 = new javax.swing.JLabel();
        jButtonCancelar = new javax.swing.JButton();
        jButton2 = new javax.swing.JButton();
        jButton3 = new javax.swing.JButton();
        jButton4 = new javax.swing.JButton();
        jButton5 = new javax.swing.JButton();
        jComboBox1 = new javax.swing.JComboBox();

        setBackground(new java.awt.Color(233, 244, 244));
        setToolTipText(”Simulacion Ascendente. Paso 1.”);

        jLabel1.setFont(new java.awt.Font(”Tahoma”, 1, 18)); // NOI18N
        jLabel1.setText(”Elige el MÃ©todo de simulacion Ascendente:”);

        jButtonCancelar.setText(”Cancelar”);
        jButtonCancelar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonCancelarActionPerformed(evt);
            }
        });

        jButton2.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/ultimo.png"))); // NOI18N
        jButton2.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton2ActionPerformed(evt);
            }
        });

        jButton3.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/siguiente.png"))); // NOI18N
        jButton3.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton3ActionPerformed(evt);
            }
        });

        jButton4.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/anterior.png"))); // NOI18N
        jButton4.setEnabled(false);

        jButton5.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/primero.png"))); // NOI18N
        jButton5.setEnabled(false);

        jComboBox1.setModel(new javax.swing.DefaultComboBoxModel(new String[] { "MÃ©todo SLR", "MÃ©todo LR-Canonico", "MÃ©todo LALR" }));

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(this);
        this.setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(152, 152, 152)
                .addComponent(jComboBox1, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.
                   PREFERRED_SIZE)
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
                   Short.MAX_VALUE))
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
               layout.createSequentialGroup()
                .addGroup(layout.createParallelGroup(javax.swing.
                   GroupLayout.Alignment.TRAILING)
                    .addGroup(layout.createSequentialGroup()
                        .addContainerGap(29, Short.MAX_VALUE)
                        .addComponent(jLabel1))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(41, 41, 41)
                        .addComponent(jButtonCancelar)
                        .addPreferredGap(javax.swing.LayoutStyle.
                           ComponentPlacement.RELATED, javax.swing.
                           GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addComponent(jButton5)
                        .addPreferredGap(javax.swing.LayoutStyle.
                           ComponentPlacement.RELATED)
                        .addComponent(jButton4)
                        .addPreferredGap(javax.swing.LayoutStyle.
                           ComponentPlacement.RELATED)
                        .addComponent(jButton3)))
                .addPreferredGap(javax.swing.LayoutStyle.
                   ComponentPlacement.RELATED)
                .addComponent(jButton2)
                .addGap(18, 18, 18))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.
               Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(67, 67, 67)
                .addComponent(jLabel1)
                .addGap(53, 53, 53)
                .addComponent(jComboBox1, javax.swing.GroupLayout.
                   PREFERRED_SIZE, javax.swing.GroupLayout.
                   DEFAULT_SIZE, javax.swing.GroupLayout.
                   PREFERRED_SIZE)
                .addPreferredGap(javax.swing.LayoutStyle.
                   ComponentPlacement.RELATED, 117, Short.MAX_VALUE)
                .addGroup(layout.createParallelGroup(javax.swing.
                   GroupLayout.Alignment.LEADING)
                    .addComponent(jButton2)
                    .addGroup(layout.createParallelGroup(javax.swing.
                       GroupLayout.Alignment.BASELINE)
                        .addComponent(jButtonCancelar)
                        .addComponent(jButton3)
                        .addComponent(jButton4)
                        .addComponent(jButton5)))
                .addGap(24, 24, 24))
        );

```

```java
        getAccessibleContext().setAccessibleParent(jButtonCancelar);
    }// </editor-fold>//GEN-END:initComponents

    private void jButtonCancelarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonCancelarActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir del asistente de la simulacion de la gramÃ¡tica?", "Salir", JOptionPane.YES_NO_OPTION);

        if(conf==0)
          this.ventanaPadre.dispose();
    }//GEN-LAST:event_jButtonCancelarActionPerformed

    private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton3ActionPerformed
        this.metodo = this.jComboBox1.getSelectedIndex();
        this.ventanaPadre.setMetodo(this.metodo);
        this.ventanaPadre.cambiarPaso(2);
    }//GEN-LAST:event_jButton3ActionPerformed

    private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton2ActionPerformed

        this.metodo = this.jComboBox1.getSelectedIndex();
        this.ventanaPadre.setMetodo(this.metodo);

        this.ventanaPadre.gramatica.generarConjPrim();
        this.ventanaPadre.gramatica.generarConjSig();
        this.ventanaPadre.paso2.construirConjuntos(this.ventanaPadre.gramatica);

        PanelNuevaSimAscPaso3 paso3 = new PanelNuevaSimAscPaso3(this.ventanaPadre);

        PanelNuevaSimAscPaso4 paso4 = new PanelNuevaSimAscPaso4(this.ventanaPadre);

        this.ventanaPadre.cambiarPaso(5);

    }//GEN-LAST:event_jButton2ActionPerformed

    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton2;
    private javax.swing.JButton jButton3;
    private javax.swing.JButton jButton4;
    private javax.swing.JButton jButton5;
    private javax.swing.JButton jButtonCancelar;
    private javax.swing.JComboBox jComboBox1;
    private javax.swing.JLabel jLabel1;
    // End of variables declaration//GEN-END:variables
}
```

2.5.7. PanelNuevaSimAscPaso2.java

```
//SimAS / Simulador
//Panel Nueva Simulacion Ascendente paso 2

package es.uco.simas.simulador;

import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.util.gramatica.NoTerminal;
import es.uco.simas.util.gramatica.Terminal;
import java.util.ArrayList;
import java.util.Iterator;
import javax.swing.JOptionPane;
import javax.swing.JTable;
import javax.swing.table.DefaultTableModel;

/**
 * @author vanesa
 */
public class PanelNuevaSimAscPaso2 extends javax.swing.JPanel {

    private VentanaSimuladorAsc ventanaPadre;
    private  DefaultTableModel modeloConjuntos ;
    private  JTable tblConjuntos ;

    public PanelNuevaSimAscPaso2(VentanaSimuladorAsc ventanaPadre) {
        DefaultTableModel tabla = new DefaultTableModel();
        this.modeloConjuntos =tabla;
        initComponents();

        this.ventanaPadre =ventanaPadre;

        this.jTable1.getColumnModel().getColumn(0).setPreferredWidth(90);
        this.jTable1.getColumnModel().getColumn(1).setPreferredWidth(250);
        this.jTable1.getColumnModel().getColumn(2).setPreferredWidth(290);
        this.jTable1.setEnabled(false);
        Gramatica gr = this.ventanaPadre.gramatica;

    }

    public void construirConjuntos(Gramatica gramatica)  {
        ArrayList<com.itextpdf.text.Paragraph> construccionConjuntoPrimero= new ArrayList();
        ArrayList<com.itextpdf.text.Paragraph> construccionConjuntoSiguiente= new ArrayList();
        ArrayList<NoTerminal> noTerminales= null;
        ArrayList<Terminal> conjuntoPrimero= null;
        ArrayList<Terminal> conjuntoSiguiente= null;
        ArrayList<Terminal> conjuntoPrimeroSimbolo= null;
        ArrayList<Terminal> conjuntoSiguienteSimbolo= null;
        Iterator i$= null;
        NoTerminal noTerminal= null;
        String strConjuntoPrimero= null;
        String strConjuntoSiguiente= null;

        int i= 0;
        int j=0;

        this.modeloConjuntos =new DefaultTableModel();
        this.modeloConjuntos.addColumn(”Simbolo”);
        this.modeloConjuntos.addColumn(”Conjunto primero”);
        this.modeloConjuntos.addColumn(”Conjunto siguiente”);
        this.jTable1.setModel(this.modeloConjuntos);
        this.jTable1.getColumnModel().getColumn(0).setPreferredWidth
           (95);
        this.jTable1.getColumnModel().getColumn(1).setPreferredWidth
           (250);
        this.jTable1.getColumnModel().getColumn(2).setPreferredWidth
           (290);
        this.jTable1.setEnabled(false);

        noTerminales = gramatica.getNoTerm();

        i=0;
        while(i < noTerminales.size()){
            strConjuntoPrimero = ””;
            strConjuntoSiguiente = ””;
            noTerminal = noTerminales.get(i);
            conjuntoPrimero = noTerminal.getPrimeros();
            conjuntoSiguiente = noTerminal.getSiguientes();

            j=0;
            while(j < conjuntoPrimero.size()){
                StringBuilder cadena = new StringBuilder();
                strConjuntoPrimero = cadena.append(strConjuntoPrimero).
                   append(” ”).append(conjuntoPrimero.get(j).getNombre
                   ()).toString();

                j++;
            }

            j=0;
            while(j < conjuntoSiguiente.size()){
                StringBuilder cadena = new StringBuilder();
                strConjuntoSiguiente = cadena.append(
                   strConjuntoSiguiente).append(” ”).append(
                   conjuntoSiguiente.get(j).getNombre()).toString();

                j++;
            }

            Object [] linea = new Object[]
            {
              noTerminal.getValor(),            strConjuntoPrimero, strConjuntoSiguiente
             };
            this.modeloConjuntos.addRow(linea);
            i++;
        }
        this.ventanaPadre.gramatica = gramatica;
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings(”unchecked”)
    // <editor-fold defaultstate=”collapsed” desc=”Generated Code”>//GEN-BEGIN:initComponents
    private void initComponents() {

        jScrollPane1 = new javax.swing.JScrollPane();
        jTable1 = new javax.swing.JTable();
        jLabel1 = new javax.swing.JLabel();
        jButtonCancelar = new javax.swing.JButton();
        jButtonPrimero = new javax.swing.JButton();
        jButtonAnterior = new javax.swing.JButton();
        jButtonSiguiente = new javax.swing.JButton();
        jButtonUltimo = new javax.swing.JButton();

        setBackground(new java.awt.Color(233, 244, 244));

        jTable1.setFont(new java.awt.Font(”Tahoma”, 0, 12)); // NOI18N
        jTable1.setModel(new javax.swing.table.DefaultTableModel(
            new Object [][] {
                {null, null, null},
                {null, null, null},
                {null, null, null},
                {null, null, null},
                {null, null, null}
            },
            new String [] {
                ”SÃmbolo”, ”Conjunto Primero”, ”Conjunto Siguiente”
            }
        ) {
            boolean[] canEdit = new boolean [] {
                false, false, false
            };

            public boolean isCellEditable(int rowIndex, int columnIndex) {
                return canEdit [columnIndex];
            }
        });
        jScrollPane1.setViewportView(jTable1);

        jLabel1.setFont(new java.awt.Font(”Tahoma”, 1, 18)); // NOI18N
        jLabel1.setText(”Conjunto Primero y Siguiente”);

        jButtonCancelar.setText(”Cancelar”);
        jButtonCancelar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonCancelarActionPerformed(evt);
            }
        });

        jButtonPrimero.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/primero.png”))); // NOI18N
        jButtonPrimero.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonPrimeroActionPerformed(evt);
            }
        });

        jButtonAnterior.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/anterior.png”))); // NOI18N
        jButtonAnterior.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonAnteriorActionPerformed(evt);
            }
        });

        jButtonSiguiente.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/siguiente.png”))); // NOI18N
        jButtonSiguiente.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonSiguienteActionPerformed(evt);
            }
        });

        jButtonUltimo.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/ultimo.png”))); // NOI18N
        jButtonUltimo.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonUltimoActionPerformed(evt);
            }
        });

        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.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(126, 126, 126)
                        .addComponent(jLabel1))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(21, 21, 21)
                        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)
                            .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 575, javax.swing.GroupLayout.PREFERRED_SIZE)
                            .addGroup(layout.createSequentialGroup()
                                .addComponent(jButtonCancelar)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                                .addComponent(jButtonPrimero)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButtonAnterior)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButtonSiguiente)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButtonUltimo)))))
                .addContainerGap(36, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(42, 42, 42)
                .addComponent(jLabel1)
                .addGap(36, 36, 36)
                .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 274, javax.swing.GroupLayout.PREFERRED_SIZE)
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 26, Short.MAX_VALUE)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)
                        .addComponent(jButtonAnterior)
                        .addComponent(jButtonSiguiente)
                        .addComponent(jButtonUltimo))
                    .addComponent(jButtonCancelar)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(2, 2, 2)
                        .addComponent(jButtonPrimero)))
                .addGap(18, 18, 18))
        );
    }// </editor-fold>//GEN-END:initComponents

    private void jButtonCancelarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonCancelarActionPerformed
     int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir del asistente de la simulacion de la gramÃ¡tica?", "Salir", JOptionPane.YES_NO_OPTION);
     if(conf==0)
       this.ventanaPadre.dispose();
    }//GEN-LAST:event_jButtonCancelarActionPerformed

    private void jButtonPrimeroActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonPrimeroActionPerformed
        this.ventanaPadre.cambiarPaso(1);
    }//GEN-LAST:event_jButtonPrimeroActionPerformed

    private void jButtonAnteriorActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonAnteriorActionPerformed
        this.ventanaPadre.cambiarPaso(1);
    }//GEN-LAST:event_jButtonAnteriorActionPerformed

    private void jButtonSiguienteActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonSiguienteActionPerformed
        this.ventanaPadre.cambiarPaso(3);
    }//GEN-LAST:event_jButtonSiguienteActionPerformed

    private void jButtonUltimoActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonUltimoActionPerformed

```

```java
        PanelNuevaSimAscPaso3 paso3 = new PanelNuevaSimAscPaso3(this.ventanaPadre);

        PanelNuevaSimAscPaso4 paso4 = new PanelNuevaSimAscPaso4(this.ventanaPadre);

        this.ventanaPadre.cambiarPaso(5);
    }//GEN-LAST:event_jButtonUltimoActionPerformed

    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButtonAnterior;
    private javax.swing.JButton jButtonCancelar;
    private javax.swing.JButton jButtonPrimero;
    private javax.swing.JButton jButtonSiguiente;
    private javax.swing.JButton jButtonUltimo;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JTable jTable1;
    // End of variables declaration//GEN-END:variables
}
```

2.5.8. PanelNuevaSimAscPaso3.java

```java
//SimAS / Simulador
//Panel Nueva Simulacion Ascendente paso 3

package es.uco.simas.simulador;

import es.uco.simas.editor.ColCanLALR;
import es.uco.simas.editor.ColCanLR0;
import es.uco.simas.editor.ColCanLR1;
import javax.swing.JOptionPane;

/**
 * @author vanesa
 */
public class PanelNuevaSimAscPaso3 extends javax.swing.JPanel {

    private VentanaSimuladorAsc ventanaPadre;

    public PanelNuevaSimAscPaso3(VentanaSimuladorAsc ventanaPadre) {
        initComponents();
        this.ventanaPadre =ventanaPadre;
        if(this.ventanaPadre.getMetodo() == 0){
            this.jLabel1.setText("Coleccion Canonica Elementos LR(0)");
            if(this.ventanaPadre.getGramatica().getColeccionLR0()==null){
                ColCanLR0 col = new ColCanLR0(this.ventanaPadre.getGramatica());
                col.construir();
                this.ventanaPadre.getGramatica().setColeccionLR0(col);
                this.ventanaPadre.setColeccion(col);
            }
                this.jTextArea1.setText(this.ventanaPadre.getGramatica().getColeccionLR0().getColeccion());
        }
        if(this.ventanaPadre.getMetodo() == 1){
            this.jLabel1.setText("Coleccion Canonica LR(1)-elementos");
            if(this.ventanaPadre.getGramatica().getColeccionLR1()==null){
                ColCanLR1 col = new ColCanLR1(this.ventanaPadre.getGramatica());
                col.construir();
                this.ventanaPadre.getGramatica().setColeccionLR1(col);
                this.ventanaPadre.setColeccion(col);
            }
                this.jTextArea1.setText(this.ventanaPadre.getGramatica().getColeccionLR1().getColeccion());

        }
        if(this.ventanaPadre.getMetodo() == 2){
            this.jLabel1.setText("Coleccion Canonica Elementos LALR(1)");
            ColCanLR1 col = new ColCanLR1();
            if(this.ventanaPadre.getGramatica().getColeccionLALR()==null){
                if(this.ventanaPadre.getGramatica().getColeccionLR1() == null){
                    col = new ColCanLR1(this.ventanaPadre.getGramatica());
                    col.construir();
                }else{
                    col = this.ventanaPadre.getGramatica().getColeccionLR1();
                }

                ColCanLALR colLALR = new ColCanLALR(this.ventanaPadre.getGramatica(), col);
                colLALR.construir();

                this.ventanaPadre.getGramatica().setColeccionLALR(colLALR);
                this.ventanaPadre.setColeccion(colLALR);
            }
                this.jTextArea1.setText(this.ventanaPadre.getGramatica().getColeccionLALR().getColeccion());
        }
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings(”unchecked”)
    // <editor-fold defaultstate=”collapsed” desc=”Generated Code”>//GEN-BEGIN:initComponents
    private void initComponents() {

        jLabel1 = new javax.swing.JLabel();
        jScrollPane1 = new javax.swing.JScrollPane();
        jTextArea1 = new javax.swing.JTextArea();
        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();

        setBackground(new java.awt.Color(233, 244, 244));
        setCursor(new java.awt.Cursor(java.awt.Cursor.DEFAULT_CURSOR));

        jLabel1.setFont(new java.awt.Font(”Tahoma”, 1, 18)); // NOI18N
        jLabel1.setText(”Coleccion Canonica Elementos LR(0)”);

        jTextArea1.setColumns(20);
        jTextArea1.setRows(5);
        jScrollPane1.setViewportView(jTextArea1);

        jButton1.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/ultimo.png”))); // NOI18N
        jButton1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton1ActionPerformed(evt);
            }
        });

        jButton2.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/siguiente.png”))); // NOI18N
        jButton2.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton2ActionPerformed(evt);
            }
        });

        jButton3.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/anterior.png”))); // NOI18N
```

```java
        jButton3.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton3ActionPerformed(evt);
            }
        });

        jButton4.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/primero.png"))); // NOI18N
        jButton4.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton4ActionPerformed(evt);
            }
        });

        jButton5.setText("Cancelar");
        jButton5.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton5ActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(this);
        this.setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createSequentialGroup()
                .addGap(46, 46, 46)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)
                    .addComponent(jScrollPane1)
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jButton5)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addComponent(jButton4)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButton3)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButton2)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButton1)))
                .addGap(30, 30, 30))
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createSequentialGroup()
                .addContainerGap(201, Short.MAX_VALUE)
                .addComponent(jLabel1)
                .addGap(177, 177, 177))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(22, 22, 22)
                .addComponent(jLabel1)
                .addGap(35, 35, 35)
                .addComponent(jScrollPane1, javax.swing.GroupLayout.DEFAULT_SIZE, 502, Short.MAX_VALUE)
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)
                    .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                        .addComponent(jButton5)
                        .addComponent(jButton4)
                        .addComponent(jButton3)
                        .addComponent(jButton2))
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jButton1)
                        .addGap(2, 2, 2)))
                .addGap(19, 19, 19))
        );
    }// </editor-fold>//GEN-END:initComponents

    private void jButton5ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton5ActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir del asistente de la simulacion de la gramÃ¡tica?", "Salir", JOptionPane.YES_NO_OPTION);

        if(conf==0)
          this.ventanaPadre.dispose();
    }//GEN-LAST:event_jButton5ActionPerformed

    private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton3ActionPerformed
        this.ventanaPadre.cambiarPaso(2);
    }//GEN-LAST:event_jButton3ActionPerformed

    private void jButton4ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton4ActionPerformed
        this.ventanaPadre.cambiarPaso(1);
    }//GEN-LAST:event_jButton4ActionPerformed

    private void jButton2ActionPerformed(java.awt.event.ActionEvent evt
        ) {//GEN-FIRST:event_jButton2ActionPerformed
        this.ventanaPadre.cambiarPaso(4);
    }//GEN-LAST:event_jButton2ActionPerformed

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt
        ) {//GEN-FIRST:event_jButton1ActionPerformed

        PanelNuevaSimAscPaso4 paso4 = new PanelNuevaSimAscPaso4(this.
            ventanaPadre);

        this.ventanaPadre.cambiarPaso(5);
    }//GEN-LAST:event_jButton1ActionPerformed

    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1;
    private javax.swing.JButton jButton2;
    private javax.swing.JButton jButton3;
    private javax.swing.JButton jButton4;
    private javax.swing.JButton jButton5;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JTextArea jTextArea1;
    // End of variables declaration//GEN-END:variables
}
```

2.5.9. PanelNuevaSimAscPaso4.java

```
//SimAS / Simulador
//Panel Nueva Simulacion Ascendente paso 4

package es.uco.simas.simulador;

import es.uco.simas.editor.TablaLR;
import es.uco.simas.util.gramatica.Gramatica;
import javax.swing.JOptionPane;

/**
 * @author vanesa
 */
public class PanelNuevaSimAscPaso4 extends javax.swing.JPanel {
    private Gramatica gramatica;
    private VentanaSimuladorAsc ventanaPadre;

    public PanelNuevaSimAscPaso4(VentanaSimuladorAsc ventanaPadre) {
        initComponents();
        this.ventanaPadre = ventanaPadre;
        this.gramatica = ventanaPadre.getGramatica();
        this.jTable1.setDefaultRenderer (Object.class, new MiRender());
        this.jTable2.setDefaultRenderer (Object.class, new MiRender());
        if(this.ventanaPadre.getMetodo() == 0){
            this.construirTablaSLR();
        }
        if(this.ventanaPadre.getMetodo() == 1){
            this.construirTablaLR();
        }
        if(this.ventanaPadre.getMetodo() == 2){
            this.construirTablaLALR();
        }
    }

    public void construirTablaSLR(){
        this.gramatica.generarTLR(1);
        TablaLR tabla = this.gramatica.getTlr();

        this.jTable1.setModel(tabla.getTAccion().getMatrizAccion());
        this.jTable2.setModel(tabla.getTIrA().getMatrizIrA());

        this.ventanaPadre.setGramatica(gramatica);
    }

    public void construirTablaLR(){
        this.gramatica.generarTLR(2);
        TablaLR tabla = this.gramatica.getTlr();

        this.jTable1.setModel(tabla.getTAccion().getMatrizAccion());
        this.jTable2.setModel(tabla.getTIrA().getMatrizIrA());

        this.ventanaPadre.setGramatica(gramatica);
    }

    public void construirTablaLALR(){
        this.gramatica.generarTLR(3);
        TablaLR tabla = this.gramatica.getTlr();

        this.jTable1.setModel(tabla.getTAccion().getMatrizAccion());
        this.jTable2.setModel(tabla.getTIrA().getMatrizIrA());

        this.ventanaPadre.setGramatica(gramatica);
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings(”unchecked”)
    // <editor-fold defaultstate=”collapsed” desc=”Generated Code”>//GEN-BEGIN:initComponents
    private void initComponents() {

        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();
        jLabel1 = new javax.swing.JLabel();
        jScrollPane1 = new javax.swing.JScrollPane();
        jTable1 = new javax.swing.JTable();
        jScrollPane2 = new javax.swing.JScrollPane();
        jTable2 = new javax.swing.JTable();
        jLabel2 = new javax.swing.JLabel();
        jLabel3 = new javax.swing.JLabel();

        setBackground(new java.awt.Color(233, 244, 244));

        jButton1.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/ultimo.png”))); // NOI18N
        jButton1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton1ActionPerformed(evt);
            }
        });

        jButton2.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/siguiente.png”))); // NOI18N
        jButton2.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton2ActionPerformed(evt);
            }
        });

        jButton3.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/anterior.png”))); // NOI18N
        jButton3.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton3ActionPerformed(evt);
            }
        });

        jButton4.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/primero.png”))); // NOI18N
        jButton4.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton4ActionPerformed(evt);
            }
        });

        jButton5.setText(”Cancelar”);
        jButton5.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton5ActionPerformed(evt);
            }
        });

        jLabel1.setFont(new java.awt.Font(”Tahoma”, 1, 36)); // NOI18N
        jLabel1.setText(”Tabla LR”);

        jTable1.setModel(new javax.swing.table.DefaultTableModel(
            new Object [][] {
                {null, null},
                {null, null}
            },
            new String [] {
                ””, ””
            }
        ) {
            boolean[] canEdit = new boolean [] {
                false, false
            };

            public boolean isCellEditable(int rowIndex, int columnIndex) {
                return canEdit [columnIndex];
            }
        });
        jScrollPane1.setViewportView(jTable1);

        jTable2.setModel(new javax.swing.table.DefaultTableModel(
            new Object [][] {
                {null, null, null, null},
                {null, null, null, null},
                {null, null, null, null},
                {null, null, null, null}
            },
            new String [] {
                ””, ””, ””, ””
            }
        ) {
            boolean[] canEdit = new boolean [] {
                false, false, false, false
            };

            public boolean isCellEditable(int rowIndex, int columnIndex) {
                return canEdit [columnIndex];
            }
        });
        jScrollPane2.setViewportView(jTable2);

        jLabel2.setFont(new java.awt.Font(”Tahoma”, 1, 18)); // NOI18N
        jLabel2.setText(”Parte Accion”);

        jLabel3.setFont(new java.awt.Font(”Tahoma”, 1, 18)); // NOI18N
        jLabel3.setText(”Parte Ir_a”);

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(this);
        this.setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addContainerGap()
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jButton5, javax.swing.GroupLayout.PREFERRED_SIZE, 92, javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addComponent(jButton4)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                        .addComponent(jButton3)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                        .addComponent(jButton2)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButton1)
                        .addGap(20, 20, 20))
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jScrollPane1)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jScrollPane2, javax.swing.GroupLayout.PREFERRED_SIZE, 323, javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addGap(32, 32, 32))))
            .addGroup(layout.createSequentialGroup()
                .addGap(307, 307, 307)
                .addComponent(jLabel1)
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
            .addGroup(layout.createSequentialGroup()
                .addGap(94, 94, 94)
                .addComponent(jLabel2)
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 415, Short.MAX_VALUE)
                .addComponent(jLabel3)
                .addGap(176, 176, 176))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createSequentialGroup()
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(73, 73, 73)
                        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                            .addComponent(jLabel2)
                            .addComponent(jLabel3)))
                    .addGroup(layout.createSequentialGroup()
                        .addContainerGap()
                        .addComponent(jLabel1)))
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addComponent(jScrollPane2, javax.swing.GroupLayout.DEFAULT_SIZE, 408, Short.MAX_VALUE)
                    .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 0, Short.MAX_VALUE))
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(18, 18, 18)
                        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                            .addComponent(jButton1)
                            .addComponent(jButton2)
                            .addComponent(jButton3)
                            .addComponent(jButton4))
                        .addGap(31, 31, 31))
                    .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createSequentialGroup()
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButton5)
                        .addGap(28, 28, 28))))
        );
    }// </editor-fold>//GEN-END:initComponents

    private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton3ActionPerformed
        this.ventanaPadre.cambiarPaso(3);
    }//GEN-LAST:event_jButton3ActionPerformed

    private void jButton4ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton4ActionPerformed
        this.ventanaPadre.cambiarPaso(1);
    }//GEN-LAST:event_jButton4ActionPerformed

    private void jButton5ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton5ActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir del asistente de la simulacion de la gramÃ¡tica?", "Salir", JOptionPane.YES_NO_OPTION);

        if(conf==0)
          this.ventanaPadre.dispose();
    }//GEN-LAST:event_jButton5ActionPerformed

    private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton2ActionPerformed
        this.ventanaPadre.cambiarPaso(5);
    }//GEN-LAST:event_jButton2ActionPerformed

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton1ActionPerformed

        this.ventanaPadre.cambiarPaso(5);
    }//GEN-LAST:event_jButton1ActionPerformed

    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1;
    private javax.swing.JButton jButton2;
    private javax.swing.JButton jButton3;
    private javax.swing.JButton jButton4;
    private javax.swing.JButton jButton5;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JLabel jLabel3;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JScrollPane jScrollPane2;
    private javax.swing.JTable jTable1;
    private javax.swing.JTable jTable2;
    // End of variables declaration//GEN-END:variables
}
```

2.5.10. PanelNuevaSimAscPaso5.java

```java
//SimAS / Simulador
//Panel Nueva Simulacion Ascendente paso 5

package es.uco.simas.simulador;

import es.uco.simas.editor.FuncionError;
import es.uco.simas.util.gramatica.Gramatica;
import java.util.ArrayList;
import javax.swing.DefaultListModel;
import javax.swing.JOptionPane;

/**
 * @author Vanesa
 */
public class PanelNuevaSimAscPaso5 extends javax.swing.JPanel {

    private VentanaSimuladorAsc ventanaPadre;
    private Gramatica gramatica;
    private int funError=0;

    public PanelNuevaSimAscPaso5(VentanaSimuladorAsc ventanaPadre) {
        initComponents();
        this.ventanaPadre = ventanaPadre;
        this.gramatica = ventanaPadre.getGramatica();

        if(this.gramatica.getTlr().getTAccion().getFunError().size() != 0){
            this.funcionError();
            this.funError = 1;
        }
        if(funError ==0){
            this.jButtonFinalizar.setVisible(true);
            this.jButtonUltimo.setVisible(false);
            this.jButtonSiguiente.setEnabled(false);
            this.jButtonEliminar.setEnabled(false);
        }
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    private void initComponents() {

        jLabel1 = new javax.swing.JLabel();
        jButtonCancelar = new javax.swing.JButton();
        jButtonUltimo = new javax.swing.JButton();
        jButtonSiguiente = new javax.swing.JButton();
        jButton3 = new javax.swing.JButton();
        jButton4 = new javax.swing.JButton();
        jScrollPane1 = new javax.swing.JScrollPane();
        jList1 = new javax.swing.JList();
        jCheckBox1 = new javax.swing.JCheckBox();
        jButtonNueva = new javax.swing.JButton();
        jButtonEliminar = new javax.swing.JButton();
        jButtonFinalizar = new javax.swing.JButton();

        setBackground(new java.awt.Color(233, 244, 244));

        jLabel1.setFont(new java.awt.Font("Tahoma", 1, 18)); // NOI18N
        jLabel1.setText("Funciones de Error");

        jButtonCancelar.setText("Cancelar");
        jButtonCancelar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonCancelarActionPerformed(evt);
            }
        });

        jButtonUltimo.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/ultimo.png"))); // NOI18N
        jButtonUltimo.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonUltimoActionPerformed(evt);
            }
        });

        jButtonSiguiente.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/siguiente.png"))); // NOI18N
        jButtonSiguiente.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonSiguienteActionPerformed(evt);
            }
        });

        jButton3.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/anterior.png"))); // NOI18N
        jButton3.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton3ActionPerformed(evt);
            }
        });

        jButton4.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/primero.png"))); // NOI18N
        jButton4.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton4ActionPerformed(evt);
            }
        });

        jScrollPane1.setViewportView(jList1);

        jCheckBox1.setText("No utilizar Funciones de error");
        jCheckBox1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jCheckBox1ActionPerformed1(evt);
            }
        });

        jButtonNueva.setText("Nueva Funcion Error  ");
        jButtonNueva.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonNuevaActionPerformed(evt);
            }
        });

        jButtonEliminar.setText("Eliminar Funcion Error");
        jButtonEliminar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonEliminarActionPerformed(evt);
            }
        });

        jButtonFinalizar.setFont(new java.awt.Font("Ubuntu", 1, 15)); // NOI18N
        jButtonFinalizar.setText("Finalizar");
        jButtonFinalizar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonFinalizarActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(
            this);
        this.setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.
                Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(21, 21, 21)
                .addGroup(layout.createParallelGroup(javax.swing.
                    GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jButtonCancelar)
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.RELATED, javax.swing.
                            GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addComponent(jButton4)
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.UNRELATED)
                        .addComponent(jButton3)
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.RELATED)
                        .addComponent(jButtonSiguiente)
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.RELATED)
                        .addComponent(jButtonUltimo)
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.RELATED)
                        .addComponent(jButtonFinalizar))
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jScrollPane1, javax.swing.
                            GroupLayout.DEFAULT_SIZE, 472, Short.
                            MAX_VALUE)
                        .addGap(18, 18, 18)
                        .addGroup(layout.createParallelGroup(javax.
                            swing.GroupLayout.Alignment.LEADING)
                             .addComponent(jButtonNueva, javax.swing.
                                GroupLayout.Alignment.TRAILING)
                             .addComponent(jButtonEliminar, javax.swing.
                                GroupLayout.Alignment.TRAILING))))
                .addGap(24, 24, 24))
            .addGroup(layout.createSequentialGroup()
                .addGroup(layout.createParallelGroup(javax.swing.
                    GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(48, 48, 48)
                        .addComponent(jCheckBox1))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(205, 205, 205)
                        .addComponent(jLabel1)))
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(102, 102, 102)
                        .addComponent(jButtonNueva)
                        .addGap(41, 41, 41)
                        .addComponent(jButtonEliminar)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 183, Short.MAX_VALUE))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(22, 22, 22)
                        .addComponent(jLabel1)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jScrollPane1)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)))
                .addComponent(jCheckBox1)
                .addGap(35, 35, 35)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addComponent(jButtonFinalizar)
                    .addComponent(jButtonUltimo)
                    .addComponent(jButton3)
                    .addComponent(jButtonCancelar)
                    .addComponent(jButton4)
                    .addComponent(jButtonSiguiente))
                .addGap(19, 19, 19))
        );
    }// </editor-fold>//GEN-END:initComponents

    public void funcionError(){
        DefaultListModel lista = new DefaultListModel();
        ArrayList<FuncionError> funError = this.gramatica.getTlr().getTAccion().getFunError();
        StringBuilder string = new StringBuilder();
        int i=0;

        while(i < funError.size()){
            string = new StringBuilder();
            int accion;
            string = string.append(funError.get(i).getIdentificador());
            string = string.append(” - ”);
            accion = funError.get(i).getAccion();
            if(accion == 1)
```

```
                string.append("Insertar un SÃmbolo en la Entrada: ");
            if(accion == 2)
                string.append("Borrar un SÃmbolo de la Entrada");
            if(accion == 3)
                string.append("Modificar un SÃmbolo de la Entrada: ");
            if(accion == 4)
                string.append("Insertar un SÃmbolo de la Pila: ");
            if(accion == 5)
                string.append("Borrar un SÃmbolo de la Pila");
            if(accion == 6)
                string.append("Modificar un SÃmbolo de la Pila: ");
            if(accion == 7)
                string.append("Terminar el anÃ¡lisis");
            if(accion == 1 || accion ==3 || accion ==4 || accion ==6)
                string.append(funError.get(i).getSimbolo().getNombre())
                    ;

            lista.add(i, string);
            i++;

        }
        this.jList1.setModel(lista);

        if(this.jList1.getModel().getSize()!=0){
            this.jButtonFinalizar.setVisible(false);
            this.jButtonUltimo.setVisible(true);
            this.jButtonSiguiente.setEnabled(true);
            this.jButtonNueva.setEnabled(true);
            this.jButtonEliminar.setEnabled(true);
        }else{
            this.jButtonNueva.setEnabled(true);
            this.jButtonEliminar.setEnabled(false);
            this.jButtonFinalizar.setVisible(true);
            this.jButtonUltimo.setVisible(false);
            this.jButtonSiguiente.setEnabled(false);
        }

    }
    void setGramatica(Gramatica gr){
        this.ventanaPadre.setGramatica(gr);
        this.gramatica = gr;
    }
    private void jButtonCancelarActionPerformed(java.awt.event.
        ActionEvent evt) {//GEN-FIRST:
        event_jButtonCancelarActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir
            del asistente de la simulacion de la gramÃ¡tica?", "Salir",
            JOptionPane.YES_NO_OPTION);

        if(conf==0)
          this.ventanaPadre.dispose();
    }//GEN-LAST:event_jButtonCancelarActionPerformed
```

```java

    private void jButton4ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton4ActionPerformed
        this.ventanaPadre.cambiarPaso(1);
    }//GEN-LAST:event_jButton4ActionPerformed

    private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton3ActionPerformed
        this.ventanaPadre.cambiarPaso(3);
    }//GEN-LAST:event_jButton3ActionPerformed

    private void jButtonSiguienteActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonSiguienteActionPerformed
        this.ventanaPadre.cambiarPaso(6);
    }//GEN-LAST:event_jButtonSiguienteActionPerformed

    private void jButtonNuevaActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonNuevaActionPerformed
        NuevaFuncionError error = new NuevaFuncionError(this.gramatica, this, 1);
        error.setLocationRelativeTo(null);
        error.setVisible(true);
    }//GEN-LAST:event_jButtonNuevaActionPerformed

    private void jCheckBox1ActionPerformed1(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jCheckBox1ActionPerformed1
        if(this.jCheckBox1.isSelected()){
            this.jButtonNueva.setEnabled(false);
            this.jButtonEliminar.setEnabled(false);
            this.jButtonFinalizar.setVisible(true);
            this.jButtonUltimo.setVisible(false);
            this.jButtonSiguiente.setEnabled(false);
        }else{
            if(this.jList1.getModel().getSize()!=0){
                this.jButtonFinalizar.setVisible(false);
                this.jButtonUltimo.setVisible(true);
                this.jButtonSiguiente.setEnabled(true);
                this.jButtonNueva.setEnabled(true);
                this.jButtonEliminar.setEnabled(true);
            }else{
                this.jButtonNueva.setEnabled(true);
                this.jButtonEliminar.setEnabled(false);
                this.jButtonFinalizar.setVisible(true);
                this.jButtonUltimo.setVisible(false);
                this.jButtonSiguiente.setEnabled(false);
            }
        }
    }//GEN-LAST:event_jCheckBox1ActionPerformed1

    private void jButtonFinalizarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonFinalizarActionPerformed
```

```java
        /*Simulador sim = new Simulador(2, this.gramatica);
        sim.setVisible(true);
        sim.setLocationRelativeTo(null);*/
        this.ventanaPadre.finalizarAsistente();
        this.ventanaPadre.dispose();
    }//GEN-LAST:event_jButtonFinalizarActionPerformed

    private void jButtonEliminarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonEliminarActionPerformed
        DefaultListModel modelo= null;
        int seleccion= this.jList1.getSelectedIndex();
        String funcion = this.jList1.getModel().getElementAt(seleccion).toString();
        ArrayList<FuncionError> funError = this.gramatica.getTlr().getTAccion().getFunError();
        String id = funcion.substring(0, 1);
        int num = Integer.parseInt(id);
        int i=0;

        if(seleccion != -1) {
            modelo=(DefaultListModel)this.jList1.getModel();
            modelo.remove(seleccion);

            while(i < funError.size()){
                if(funError.get(i).getIdentificador() == num){
                    funError.remove(i);
                }else
                    i++;
            }
            this.gramatica.getTlr().getTAccion().setFunError(funError);
        }

        if(this.jList1.getModel().getSize()!=0){
                this.jButtonFinalizar.setVisible(false);
                this.jButtonUltimo.setVisible(true);
                this.jButtonSiguiente.setEnabled(true);
                this.jButtonNueva.setEnabled(true);
                this.jButtonEliminar.setEnabled(true);
            }else{
                this.jButtonNueva.setEnabled(true);
                this.jButtonEliminar.setEnabled(false);
                this.jButtonFinalizar.setVisible(true);
                this.jButtonUltimo.setVisible(false);
                this.jButtonSiguiente.setEnabled(false);
            }
    }//GEN-LAST:event_jButtonEliminarActionPerformed

    private void jButtonUltimoActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonUltimoActionPerformed
        this.ventanaPadre.cambiarPaso(6);
    }//GEN-LAST:event_jButtonUltimoActionPerformed

    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton3;
    private javax.swing.JButton jButton4;
    private javax.swing.JButton jButtonCancelar;
    private javax.swing.JButton jButtonEliminar;
    private javax.swing.JButton jButtonFinalizar;
    private javax.swing.JButton jButtonNueva;
    private javax.swing.JButton jButtonSiguiente;
    private javax.swing.JButton jButtonUltimo;
    private javax.swing.JCheckBox jCheckBox1;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JList jList1;
    private javax.swing.JScrollPane jScrollPane1;
    // End of variables declaration//GEN-END:variables
}
```

2.5.11. PanelNuevaSimAscPaso6.java

```
//SimAS / Simulador
//Panel Nueva Simulacion Ascendente paso 6

package es.uco.simas.simulador;

import es.uco.simas.editor.FuncionError;
import es.uco.simas.editor.ParteAccion;
import es.uco.simas.editor.TablaLR;
import es.uco.simas.util.gramatica.Gramatica;
import java.util.ArrayList;
import javax.swing.DefaultComboBoxModel;
import javax.swing.JOptionPane;
import javax.swing.table.DefaultTableModel;

/**
 * @author Vanesa
 */
public class PanelNuevaSimAscPaso6 extends javax.swing.JPanel {

    private VentanaSimuladorAsc ventanaPadre;
    private Gramatica gramatica;
    private DefaultTableModel modeloConjuntos ;
    private TablaLR tlr;
    int red = 0;

    public PanelNuevaSimAscPaso6(VentanaSimuladorAsc ventanaPadre) {
        DefaultTableModel tabla = new DefaultTableModel();
        this.modeloConjuntos = tabla;
        initComponents();
        this.ventanaPadre = ventanaPadre;
        this.gramatica = ventanaPadre.getGramatica();
        this.jButton6.setEnabled(false);
        this.tlr = this.gramatica.getTlr();
        this.jTable1.setDefaultRenderer (Object.class, new MiRender());
        this.jTable1.setModel(this.tlr.getTAccion().getMatrizAccion());
        this.inicializarCombos(this.tlr);
        this.jButton7.setText(”Completar con Reducciones”);
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
   // @SuppressWarnings(”unchecked”)
    // <editor-fold defaultstate=”collapsed” desc=”Generated Code”>//GEN-BEGIN:initComponents
    private void initComponents() {

        jLabel1 = new javax.swing.JLabel();
        jButton1 = new javax.swing.JButton();
        jButton2 = new javax.swing.JButton();
        jButton3 = new javax.swing.JButton();
        jButton4 = new javax.swing.JButton();
        jScrollPane1 = new javax.swing.JScrollPane();
        jTable1 = new javax.swing.JTable();
        jButton5 = new javax.swing.JButton();
        jComboBox1 = new javax.swing.JComboBox();
        jLabel2 = new javax.swing.JLabel();
        jButton6 = new javax.swing.JButton();
        jButton7 = new javax.swing.JButton();

        setBackground(new java.awt.Color(233, 244, 244));

        jLabel1.setFont(new java.awt.Font(”Tahoma”, 1, 18)); // NOI18N
        jLabel1.setText(”Incluir Funciones de Error”);

        jButton1.setFont(new java.awt.Font(”Tahoma”, 1, 15)); // NOI18N
        jButton1.setText(”Finalizar”);
        jButton1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton1ActionPerformed(evt);
            }
        });

        jButton2.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/siguiente.png”))); // NOI18N
        jButton2.setEnabled(false);

        jButton3.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/anterior.png”))); // NOI18N
        jButton3.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton3ActionPerformed(evt);
            }
        });

        jButton4.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/primero.png”))); // NOI18N
        jButton4.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton4ActionPerformed(evt);
            }
        });

        jTable1.setModel(new javax.swing.table.DefaultTableModel(
            new Object [][] {
                {null, null, null, null},
                {null, null, null, null},
                {null, null, null, null},
                {null, null, null, null}
            },
            new String [] {
                ””, ””, ””, ””
            }
        ) {
            boolean[] canEdit = new boolean [] {
                false, false, false, false
            };

            public boolean isCellEditable(int rowIndex, int columnIndex) {
                return canEdit [columnIndex];
            }
        });
        jTable1.addMouseListener(new java.awt.event.MouseAdapter() {
            public void mouseClicked(java.awt.event.MouseEvent evt) {
                jTable1MouseClicked(evt);
            }
        });
        jScrollPane1.setViewportView(jTable1);

        jButton5.setFont(new java.awt.Font(”Tahoma”, 1, 15)); // NOI18N
        jButton5.setText(”Cancelar”);
        jButton5.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt)
                {
                jButton5ActionPerformed(evt);
            }
        });

        jLabel2.setText(”Pulse en la tabla para insertar la funcion de
            error:”);

        jButton6.setText(”Eliminar Funcion de Error”);
        jButton6.addActionListener(new java.awt.event.ActionListener()
            {
            public void actionPerformed(java.awt.event.ActionEvent evt)
                {
                jButton6ActionPerformed(evt);
            }
        });

        jButton7.addActionListener(new java.awt.event.ActionListener()
            {
            public void actionPerformed(java.awt.event.ActionEvent evt)
                {
                jButton7ActionPerformed(evt);
            }
        });

        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.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(26, 26, 26)
                        .addComponent(jButton5)
                        .addGap(255, 255, 255)
                        .addComponent(jButton4)
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.RELATED)
                        .addComponent(jButton3)
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.RELATED)
                        .addComponent(jButton2)
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.RELATED)
                        .addComponent(jButton1))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(70, 70, 70)
                        .addComponent(jButton6)
                        .addGap(61, 61, 61)
                        .addComponent(jButton7))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(164, 164, 164)
                        .addComponent(jLabel1))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(121, 121, 121)
                        .addComponent(jLabel2))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(191, 191, 191)
                        .addComponent(jComboBox1, javax.swing.
                            GroupLayout.PREFERRED_SIZE, javax.swing.
                            GroupLayout.DEFAULT_SIZE, javax.swing.
                            GroupLayout.PREFERRED_SIZE))
                    .addGroup(layout.createSequentialGroup()
                        .addContainerGap()
                        .addComponent(jScrollPane1, javax.swing.
                            GroupLayout.PREFERRED_SIZE, 570, javax.
                            swing.GroupLayout.PREFERRED_SIZE)))
                .addContainerGap(28, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.
               Alignment.LEADING)
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
               layout.createSequentialGroup()
                .addGap(15, 15, 15)
                .addComponent(jLabel1)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED)
                .addComponent(jLabel2)
                .addGap(18, 18, 18)
                .addComponent(jComboBox1, javax.swing.GroupLayout.
                    PREFERRED_SIZE, javax.swing.GroupLayout.
                    DEFAULT_SIZE, javax.swing.GroupLayout.
                    PREFERRED_SIZE)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.UNRELATED)
                .addComponent(jScrollPane1, javax.swing.GroupLayout.
                    DEFAULT_SIZE, 398, Short.MAX_VALUE)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.UNRELATED)
                .addGroup(layout.createParallelGroup(javax.swing.
                    GroupLayout.Alignment.LEADING)
                    .addComponent(jButton6)
                    .addComponent(jButton7))
                .addGap(26, 26, 26)
                .addGroup(layout.createParallelGroup(javax.swing.
                    GroupLayout.Alignment.LEADING)
                    .addComponent(jButton5)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(2, 2, 2)
                        .addGroup(layout.createParallelGroup(javax.
                            swing.GroupLayout.Alignment.TRAILING)
                            .addComponent(jButton3)
                            .addComponent(jButton4)
                            .addComponent(jButton2)
                            .addComponent(jButton1))))
                .addGap(23, 23, 23))
        );
    }// </editor-fold>//GEN-END:initComponents

     private void inicializarCombos(TablaLR tlr) {
        ArrayList<String> listaCombo = new ArrayList();
        ArrayList<FuncionError> funError = tlr.getTAccion().getFunError();
        StringBuilder string = new StringBuilder();
        int i= 0;

        while(i < funError.size()) {
            string = new StringBuilder();
            int accion;
            string = string.append(funError.get(i).getIdentificador());
            string = string.append(” - ”);
            accion = funError.get(i).getAccion();
            if(accion == 1)
                string.append(”Insertar un SÃmbolo en la Entrada: ”);
            if(accion == 2)
                string.append(”Borrar un SÃmbolo de la Entrada”);
            if(accion == 3)
                string.append(”Modificar un SÃmbolo de la Entrada: ”);
            if(accion == 4)
                string.append(”Insertar un SÃmbolo de la Pila: ”);
            if(accion == 5)
                string.append(”Borrar un SÃmbolo de la Pila”);
            if(accion == 6)
                string.append(”Modificar un SÃmbolo de la Pila: ”);
            if(accion == 7)
                string.append(”Terminar el anÃ¡lisis”);
            if(accion == 1 || accion ==3 || accion ==4 || accion ==6)
                string.append(funError.get(i).getSimbolo().getNombre());

            listaCombo.add(string.toString());
            i++;
        }
        DefaultComboBoxModel combo = new DefaultComboBoxModel(listaCombo.toArray());
        this.jComboBox1.setModel(combo);
    }

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton1ActionPerformed
        this.gramatica.setTlr(this.tlr);
        this.ventanaPadre.finalizarAsistente();
        this.ventanaPadre.dispose();
    }//GEN-LAST:event_jButton1ActionPerformed

    private void jButton5ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton5ActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir del asistente de la simulacion de la gramÃ¡tica?", "Salir", JOptionPane.YES_NO_OPTION);

        if(conf==0)
          this.ventanaPadre.dispose();
    }//GEN-LAST:event_jButton5ActionPerformed

    private void jTable1MouseClicked(java.awt.event.MouseEvent evt) {//GEN-FIRST:event_jTable1MouseClicked
        int columna = this.jTable1.getSelectedColumn();
        int fila = this.jTable1.getSelectedRow();
        this.jButton6.setEnabled(false);
        ArrayList<String> term = new ArrayList<>();
        term = buscarTerm();
        int i=0;
        int x=0;
        while(i<term.size()){
            if(this.tlr.getTAccion().getMatrizAccion().getValueAt(fila, 0).toString().equals(term.get(i))){
                JOptionPane.showConfirmDialog(null, "Esta fila no se puede rellenar, debido a que el sÃmbolo "+term.get(i)+" aparece el primero en una de las producciones.", "Salir",JOptionPane.CLOSED_OPTION);
                x=-1;
                break;
            }else
                i++;
        }
        if(x==0){
            if(this.tlr.getTAccion().getMatrizAccion().getValueAt(fila, columna) == null){
                String str = "E"+this.jComboBox1.getSelectedItem().toString().substring(0, 1);
                this.tlr.getTAccion().getMatrizAccion().setValueAt(str, fila, columna);
                this.jTable1.setDefaultRenderer (Object.class, new MiRender());
            }
            if(this.tlr.getTAccion().getMatrizAccion().getValueAt(fila, columna).toString().startsWith("E")){
                this.jButton6.setEnabled(true);
            }
            this.gramatica.setTlr(this.tlr);
        }
    }//GEN-LAST:event_jTable1MouseClicked

    private ArrayList<String> buscarTerm(){
        ArrayList<String> term = new ArrayList<>();
        int i=0;
        while(i< this.gramatica.getPr().size()){
            if(this.gramatica.isTerminal(this.gramatica.getPr().get(i).getConsec().get(0).getNombre()))
                term.add(this.gramatica.getPr().get(i).getConsec().get(0).getNombre());
            i++;
        }
        return term;
    }

    private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton3ActionPerformed
        this.ventanaPadre.cambiarPaso(5);
    }//GEN-LAST:event_jButton3ActionPerformed

    private void jButton4ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton4ActionPerformed
        this.ventanaPadre.cambiarPaso(1);
    }//GEN-LAST:event_jButton4ActionPerformed

    private void jButton6ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton6ActionPerformed
        int columna = this.jTable1.getSelectedColumn();
        int fila = this.jTable1.getSelectedRow();
        this.tlr.getTAccion().getMatrizAccion().setValueAt(null, fila, columna);
        this.jButton6.setEnabled(false);
    }//GEN-LAST:event_jButton6ActionPerformed

    private void jButton7ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton7ActionPerformed
       this.red ++;
       ParteAccion tabla = this.tlr.getTAccion();

       if(red %2 != 0 ){ //red es impar: completar con reducciones

            int i=0;
            int j=1;

            while(i < tabla.getMatrizAccion().getRowCount()){
                String reduccion="";
                j=1;
                while(j < tabla.getMatrizAccion().getColumnCount()){
                    if(tabla.getMatrizAccion().getValueAt(i, j) == null){
                        j++;
                    }else{
                        if(tabla.getMatrizAccion().getValueAt(i, j).toString().startsWith("r")){
                            reduccion = tabla.getMatrizAccion().getValueAt(i, j).toString()+"*";
                            completarTabla(i, reduccion);
                            break;
                        }else{
                            j++;
                        }
                    }
                }
                i++;
            }
            this.jButton7.setText("Eliminar Reducciones");
        }else{ //red par: Eliminar reducciones

            int i=0;
            int j=1;

            while(i < tabla.getMatrizAccion().getRowCount()){
                j=1;
                while(j < tabla.getMatrizAccion().getColumnCount()){
                    if(tabla.getMatrizAccion().getValueAt(i, j)!=null){
                        if(tabla.getMatrizAccion().getValueAt(i, j).
                            toString().contains("*")){
                            tabla.getMatrizAccion().setValueAt(null, i,
                                j);
                        }
                    }
                    j++;
                }
                i++;
            }
            this.jButton7.setText("Completar con Reducciones");
        }
        this.tlr.setTAccion(tabla);
        this.ventanaPadre.gramatica.setTlr(this.tlr);
    }//GEN-LAST:event_jButton7ActionPerformed

    void completarTabla(int fila, String reduccion){
        int i=0;

        while(i < this.tlr.getTAccion().getMatrizAccion().
            getColumnCount()){
            if(this.tlr.getTAccion().getMatrizAccion().getValueAt(fila,
                i) == null){
                this.tlr.getTAccion().getMatrizAccion().setValueAt(
                    reduccion, fila, i);
            }
            i++;
        }
    }

    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1;
    private javax.swing.JButton jButton2;
    private javax.swing.JButton jButton3;
    private javax.swing.JButton jButton4;
```

```java
    private javax.swing.JButton jButton5;
    private javax.swing.JButton jButton6;
    private javax.swing.JButton jButton7;
    private javax.swing.JComboBox jComboBox1;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JTable jTable1;
    // End of variables declaration//GEN-END:variables
}
```

2.5.12. PanelNuevaSimDescPaso1.java

```java
//SimAS / Simulador
//Panel nueva simulacion descendente paso 1

package es.uco.simas.simulador;

import javax.swing.JOptionPane;
import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.util.gramatica.Produccion;
import java.util.ArrayList;
import javax.swing.DefaultListModel;

/**
 * @author Vanesa
 */
public class PanelNuevaSimDescPaso1 extends javax.swing.JPanel {

    private VentanaSimuladorDesc ventanaPadre;
    private Gramatica gramatica;

    public PanelNuevaSimDescPaso1(VentanaSimuladorDesc ventanaPadre) {
        initComponents();
        this.ventanaPadre = ventanaPadre;
        this.gramatica = this.ventanaPadre.getGramatica();

        int recursiva = this.recursividad(this.gramatica);
        int factorizar = this.factorizar(this.gramatica);
        if(recursiva == 1){
            this.jLabel2.setText("La gramÃ¡tica original era recursiva por la izquierda.");
            this.jLabel2.setForeground(new java.awt.Color(162, 7, 7));
        }
        if(factorizar == 1){
            this.jLabel3.setText("La gramÃ¡tica original no estaba factorizada.");
            this.jLabel3.setForeground(new java.awt.Color(162, 7, 7));
        }
        if(factorizar == 0 && recursiva == 0){
            this.jLabel2.setText("La gramÃ¡tica original es correcta.");
            this.jLabel2.setForeground(new java.awt.Color(33, 77, 72));
        }
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    private void initComponents() {

        jLabel1 = new javax.swing.JLabel();
        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();
        jScrollPane1 = new javax.swing.JScrollPane();
        jList1 = new javax.swing.JList();
        jLabel2 = new javax.swing.JLabel();
        jLabel3 = new javax.swing.JLabel();

        setBackground(new java.awt.Color(233, 244, 244));

        jLabel1.setFont(new java.awt.Font("Tahoma", 1, 14)); // NOI18N
        jLabel1.setText("Producciones para la simulacion Descendente:");

        jButton1.setText("Cancelar");
        jButton1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton1ActionPerformed(evt);
            }
        });

        jButton2.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/ultimo.png"))); // NOI18N
        jButton2.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton2ActionPerformed(evt);
            }
        });

        jButton3.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/siguiente.png”))); // NOI18N
        jButton3.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton3ActionPerformed(evt);
            }
        });

        jButton4.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/anterior.png”))); // NOI18N
        jButton4.setEnabled(false);

        jButton5.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/primero.png”))); // NOI18N
        jButton5.setEnabled(false);

        jScrollPane1.setViewportView(jList1);

        jLabel2.setForeground(new java.awt.Color(44, 103, 71));

        jLabel3.setForeground(new java.awt.Color(162, 7, 7));

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(this);
        this.setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(62, 62, 62)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                            .addGroup(layout.createSequentialGroup()
                                .addGap(26, 26, 26)
                                .addComponent(jButton1)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                                .addComponent(jButton5)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton4)
                                .addPreferredGap(javax.swing.
                                    LayoutStyle.ComponentPlacement.
                                    RELATED)
                                .addComponent(jButton3)
                                .addPreferredGap(javax.swing.
                                    LayoutStyle.ComponentPlacement.
                                    RELATED))
                            .addGroup(layout.createSequentialGroup()
                                .addComponent(jScrollPane1, javax.swing
                                    .GroupLayout.PREFERRED_SIZE, 400,
                                    javax.swing.GroupLayout.
                                    PREFERRED_SIZE)
                                .addPreferredGap(javax.swing.
                                    LayoutStyle.ComponentPlacement.
                                    RELATED, 23, Short.MAX_VALUE)))
                        .addComponent(jButton2))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(10, 10, 10)
                        .addGroup(layout.createParallelGroup(javax.
                            swing.GroupLayout.Alignment.LEADING)
                            .addComponent(jLabel1)
                            .addComponent(jLabel2))
                        .addGap(0, 0, Short.MAX_VALUE)))
                .addContainerGap())
            .addGroup(layout.createSequentialGroup()
                .addGap(82, 82, 82)
                .addComponent(jLabel3)
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
                    Short.MAX_VALUE))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.
                Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(20, 20, 20)
                .addComponent(jLabel1)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED)
                .addComponent(jLabel2)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED, 60, Short.MAX_VALUE)
                .addComponent(jLabel3)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED)
                .addComponent(jScrollPane1, javax.swing.GroupLayout.
                    PREFERRED_SIZE, 290, javax.swing.GroupLayout.
                    PREFERRED_SIZE)
                .addGap(26, 26, 26)
                .addGroup(layout.createParallelGroup(javax.swing.
                    GroupLayout.Alignment.BASELINE)
                    .addComponent(jButton1)
                    .addComponent(jButton2)
                    .addComponent(jButton3)
                    .addComponent(jButton4)
                    .addComponent(jButton5))
                .addGap(20, 20, 20))
        );
    }// </editor-fold>//GEN-END:initComponents

    public int recursividad(Gramatica gramatica){
        int recursiva = 0;
        DefaultListModel noTerminales = gramatica.getNoTerminales();
        DefaultListModel produc = gramatica.getProducciones();
        DefaultListModel produc2 = new DefaultListModel();
        StringBuilder nombre = new StringBuilder();
        StringBuilder prod = new StringBuilder();
        DefaultListModel eliminar = new DefaultListModel();
        ArrayList<Produccion> pr = new ArrayList();
        int i=0;
        int l=0;
        int elim = -1;

        while(i < produc.size()){
            String valor = produc.getElementAt(i).toString();
            String antec = "";
            String [] separado;
            separado = valor.split(" ");
            antec = separado[0];

            produc2.addElement(produc.getElementAt(i));

            if(antec.equals(separado[2])){
                recursiva = 1;
                produc2.removeElement(produc.getElementAt(i));
                //Se crea el sÃmbolo no terminal "Nombre'"
                nombre.delete(0,nombre.length());
                nombre = nombre.append(antec);
                nombre = nombre.append("'");
                int k=0;
                int iguales = 0;
                while(k < noTerminales.size()){
                    if(noTerminales.getElementAt(k).toString().equals(
                       nombre.toString())){
                        iguales = 1;
                        break;
                    }else
                        k++;
                }
                if(iguales == 0){
                    noTerminales.addElement(nombre.toString());
                    this.gramatica.setNoTerminales(noTerminales);
                }

                prod.delete(0,prod.length());
                k=0;
                while(k < produc.size()){
                    String [] aux=produc.getElementAt(k).toString().split(” ”);

                    if(aux[0].equals(antec) && !aux[0].toString().equals(aux[2].toString()) && produc.getElementAt(k) != produc.getElementAt(i) && i != k){
                        eliminar.addElement(produc.getElementAt(k));

                        String valor2 = produc.getElementAt(k).toString();
                        String [] separado2 = valor2.split(” ”);
                        prod.delete(0,prod.length());
                        prod = prod.append(antec).append(” \u2192”);

                        l=2;
                        while(l<separado2.length){
                            if(!separado2[2].toString().equals(”\u03b5”))
                                prod = prod.append(” ”).append(separado2[l]);
                            l++;
                        }
                        prod = prod.append(” ”).append(nombre.toString());

                        l=0;
                        iguales = 0;
                        while(l < produc2.size()){
                            if(produc2.getElementAt(l).toString().equals(prod.toString())){
                                iguales = 1;
                                break;
                            }else
                                l++;
                        }
                        if(iguales == 0)
                            produc2.addElement(prod.toString());

                    }
                        k++;
                }

                k=0;
                while(k < produc2.size()){
                    String [] aux=produc2.getElementAt(k).toString().split(” ”);
                    if(!aux[0].toString().equals(nombre) && !separado[3].toString().equals(aux[2].toString()) ){
                        prod.delete(0,prod.length());
                        prod = prod.append(nombre.toString());
                        prod = prod.append(” \u2192”);
                        int j=3;
                        while(j<separado.length){
                            prod = prod.append(” ”);
                            prod = prod.append(separado[j]);
                            j++;
                        }
                        prod = prod.append(” ”).append(nombre.toString
                            ());
                        l=0;
                        iguales = 0;
                        while(l < produc2.size()){
                            if(produc2.getElementAt(l).toString().
                                equals(prod.toString())){
                                iguales = 1;
                                break;
                            }else
                                l++;
                        }
                        if(iguales == 0)
                            produc2.addElement(prod.toString());

                        break;
                    }else
                        k++;
                }
                        prod.delete(0,prod.length());
                        prod = prod.append(nombre.toString()).append(”
                            \u2192 ”).append(”\u03b5”);

                        l=0;
                        iguales = 0;
                        while(l < produc2.size()){
                            if(produc2.getElementAt(l).toString().
                                equals(prod.toString())){
                                iguales = 1;
                                break;
                            }else
                                l++;
                        }
                        if(iguales == 0)
                            produc2.addElement(prod.toString());

            }else
                elim = -1;
            i++;
        }

        l=0;

        while(l < eliminar.size()){
            int j=0;
            while(j < produc2.size()){
                if(produc2.getElementAt(j).toString().equals(eliminar.getElementAt(l).toString())){
                    produc2.remove(j);
                }
                j++;
            }
            l++;
        }

        this.gramatica.setProducciones(new DefaultListModel());
        this.gramatica.setProducciones(produc2);
        this.jList1.setModel(produc2);
        this.gramatica = gramatica;
        this.ventanaPadre.setGramatica(gramatica);
        return recursiva;
    }

    public int factorizar(Gramatica gramatica){
        int factorizar = 0;
        ArrayList<Integer> comprobado = new ArrayList<>();
        DefaultListModel noTerminales = gramatica.getNoTerminales();
        DefaultListModel produc = gramatica.getProducciones();
        DefaultListModel produc2 = new DefaultListModel();
        DefaultListModel aux;
        StringBuilder nombre = new StringBuilder();
        StringBuilder prod = new StringBuilder();
        int i=0;
        int j=0;
        int k=0;
        int iguales=0;

        this.ventanaPadre.setPr(this.gramatica.getPr());
        this.ventanaPadre.setNoTerminales(this.gramatica.getNoTerm());

        while(i < produc.size()){
            String valor = produc.getElementAt(i).toString();
            String[] separado = valor.split(” ”);
            String antec = separado[0];
            aux = new DefaultListModel();
            k=0;

            if(!comprobado.isEmpty()){
                j=0;
                while(j < comprobado.size()){
                    if(comprobado.get(j) == i){
                        i++;
                        if(i<produc.size()){
                            valor = produc.getElementAt(i).toString();
                            separado = valor.split(” ”);
                            antec = separado[0];
                        }
                        break;
                    }else
                        j++;
                }
            }

            j=0;
            while(j < produc.size()){
                String valor2 = produc.getElementAt(j).toString();
                String [] separado2 = valor2.split(" ");
                String antec2 = separado2[0];

                if(antec.equals(antec2) && separado[2].toString().
                   equals(separado2[2].toString()) && i != j ){
                    comprobado.add(j);
                    factorizar = 1;
                    aux.addElement(produc.getElementAt(j));
                }
                j++;
            }

            if(!aux.isEmpty()){
                j=0;
                while(j<aux.size()){
                    String valor2 = aux.getElementAt(j).toString();
                    String antec2 = "";
                    String [] separado2 = valor2.split(" ");
                    antec2 = separado2[0];
                    nombre.delete(0,nombre.length());
                    nombre = nombre.append(antec);
                    nombre = nombre.append("'");
                    k=0;
                    iguales = 0;
                    while(k < noTerminales.size()){
                        if(noTerminales.getElementAt(k).toString().
                           equals(nombre.toString())){
                            iguales = 1;
                            break;
                        }else
                            k++;
                    }
                    if(iguales == 0){
                        noTerminales.addElement(nombre.toString());
                    }else{

                        k=0;
                        while(k < produc2.size()){
                            String valor3 = produc2.getElementAt(k).
                               toString();
                            String [] separado3 = valor3.split(" ");
                            if(antec.equals(separado3[0]) && !separado
                               [2].equals(separado3[2])){
                                nombre = nombre.append("'");
                                int m=0;
                                iguales = 0;
```

```
                                while(m < noTerminales.size()){
                                    if(noTerminales.getElementAt(m).toString().equals(nombre.toString())){
                                        iguales = 1;
                                        break;
                                    }else
                                        m++;
                                }
                                if(iguales == 0){
                                    noTerminales.addElement(nombre.toString());
                                }
                                break;
                            }else
                                k++;
                        }

                    }

                    prod.delete(0,prod.length());
                    prod = prod.append(antec).append(” \u2192 ”).append(separado[2]).append(” ”).append(nombre);
                    k=0;
                    iguales=0;
                    while(k < produc2.size()){
                        if(produc2.getElementAt(k).toString().equals(prod.toString())){
                            iguales = 1;
                            break;
                        }else
                            k++;
                    }
                    if(iguales == 0){
                        produc2.addElement(prod.toString());
                    }

                    prod.delete(0,prod.length());
                    prod = prod.append(nombre).append(” \u2192”);

                    if(separado.length > 3 ){
                        k=3;
                        while(k < separado.length){
                            prod = prod.append(” ”).append(separado[k]);
                            k++;
                        }
                    }else{
                        prod = prod.append(” \u03b5”);
                    }
                    k=0;
                    iguales=0;
                    while(k < produc2.size()){
                        if(produc2.getElementAt(k).toString().equals(prod.toString())){
                            iguales = 1;
                            break;
                        }else
                            k++;
                    }
                    if(iguales == 0){
                        produc2.addElement(prod.toString());
                    }

                    prod.delete(0,prod.length());
                    prod = prod.append(nombre).append(" \u2192");

                    if(separado2.length > 3){
                        k=3;
                        while(k < separado2.length){
                            prod = prod.append(" ").append(separado2[k]);
                            k++;
                        }
                    }else{
                         prod = prod.append(" \u03b5");
                    }
                    k=0;
                    iguales=0;
                    while(k < produc2.size()){
                        if(produc2.getElementAt(k).toString().equals(prod.toString())){
                            iguales = 1;
                            break;
                        }else
                            k++;
                    }
                    if(iguales == 0){
                        produc2.addElement(prod.toString());
                    }
                    j++;
                }
            }else
                produc2.addElement(produc.get(i));

            i++;
        }

        if(produc2.size()!=0){
            this.gramatica.setProducciones(produc2);
            this.gramatica.setNoTerminales(noTerminales);
            this.ventanaPadre.setGramatica(gramatica);
            this.jList1.setModel(produc2);
            this.gramatica = gramatica;
        }

        return factorizar;
    }

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton1ActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir del asistente de la simulacion de la gramÃ¡tica?", "Salir", JOptionPane.YES_NO_OPTION);

        if(conf==0)
          this.ventanaPadre.dispose();
    }//GEN-LAST:event_jButton1ActionPerformed

    private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton2ActionPerformed
        PanelNuevaSimDescPaso2 paso2 = new PanelNuevaSimDescPaso2(this.ventanaPadre);
        this.gramatica.generarConjPrim();
        this.gramatica.generarConjSig();
        paso2.construirConjuntos(this.gramatica);

        PanelNuevaSimDescPaso3 paso3 = new PanelNuevaSimDescPaso3(this.ventanaPadre);
        paso3.ConstruirTPredictiva(this.gramatica);

        this.ventanaPadre.cambiarPaso(4);
    }//GEN-LAST:event_jButton2ActionPerformed

    private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton3ActionPerformed
        this.ventanaPadre.cambiarPaso(2);
    }//GEN-LAST:event_jButton3ActionPerformed


    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1;
    private javax.swing.JButton jButton2;
    private javax.swing.JButton jButton3;
    private javax.swing.JButton jButton4;
    private javax.swing.JButton jButton5;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JLabel jLabel3;
    private javax.swing.JList jList1;
    private javax.swing.JScrollPane jScrollPane1;
    // End of variables declaration//GEN-END:variables
}
```

2.5.13. PanelNuevaSimDescPaso2.java

```
//SimAS / Simulador
//Panel nueva simulacion descendente paso 2

package es.uco.simas.simulador;

import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.util.gramatica.NoTerminal;
import es.uco.simas.util.gramatica.Terminal;
import java.util.ArrayList;
import javax.swing.JOptionPane;
import javax.swing.JTable;
import javax.swing.table.DefaultTableModel;

/**
 * @author Vanesa
 */
public class PanelNuevaSimDescPaso2 extends javax.swing.JPanel {

    private VentanaSimuladorDesc ventanaPadre;
    private  DefaultTableModel modeloConjuntos ;
    private  JTable tblConjuntos ;

    public PanelNuevaSimDescPaso2(VentanaSimuladorDesc ventanaPadre) {
        DefaultTableModel tabla = new DefaultTableModel();
        this.modeloConjuntos =tabla;
        initComponents();

        this.ventanaPadre =ventanaPadre;

        this.jTable1.getColumnModel().getColumn(0).setPreferredWidth(90);
        this.jTable1.getColumnModel().getColumn(1).setPreferredWidth(250);
        this.jTable1.getColumnModel().getColumn(2).setPreferredWidth(290);
        this.jTable1.setEnabled(false);
    }

    public void construirConjuntos(Gramatica gramatica)  {

        ArrayList<NoTerminal> noTerminales= null;
        ArrayList<Terminal> conjuntoPrimero= null;
        ArrayList<Terminal> conjuntoSiguiente= null;

        NoTerminal noTerminal= null;
        String strConjuntoPrimero= null;
        String strConjuntoSiguiente= null;

        int i= 0;
        int j=0;

        this.modeloConjuntos =new DefaultTableModel();
```

```java
        this.modeloConjuntos.addColumn(”Simbolo”);
        this.modeloConjuntos.addColumn(”Conjunto primero”);
        this.modeloConjuntos.addColumn(”Conjunto siguiente”);
        this.jTable1.setModel(this.modeloConjuntos);
        this.jTable1.getColumnModel().getColumn(0).setPreferredWidth(95);
        this.jTable1.getColumnModel().getColumn(1).setPreferredWidth(250);
        this.jTable1.getColumnModel().getColumn(2).setPreferredWidth(290);
        this.jTable1.setEnabled(false);

        noTerminales = gramatica.getNoTerm();

        i=0;
        while(i < noTerminales.size()){
            strConjuntoPrimero = ””;
            strConjuntoSiguiente = ””;
            noTerminal = noTerminales.get(i);
            conjuntoPrimero = noTerminal.getPrimeros();
            conjuntoSiguiente = noTerminal.getSiguientes();

            j=0;
            while(j < conjuntoPrimero.size()){
                StringBuilder cadena = new StringBuilder();
                strConjuntoPrimero = cadena.append(strConjuntoPrimero).append(” ”).append(conjuntoPrimero.get(j).getNombre()).toString();

                j++;
            }

            j=0;
            while(j < conjuntoSiguiente.size()){
                StringBuilder cadena = new StringBuilder();
                strConjuntoSiguiente = cadena.append(strConjuntoSiguiente).append(” ”).append(conjuntoSiguiente.get(j).getNombre()).toString();

                j++;
            }

            Object [] linea = new Object[] {
              noTerminal.getValor(),        strConjuntoPrimero, strConjuntoSiguiente
             };
            this.modeloConjuntos.addRow(linea);

            i++;
        }
    }

    /**
```

```
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    private void initComponents() {

        jScrollPane1 = new javax.swing.JScrollPane();
        jTable1 = new javax.swing.JTable();
        jLabel1 = new javax.swing.JLabel();
        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();

        setBackground(new java.awt.Color(233, 244, 244));
        setMinimumSize(new java.awt.Dimension(45, 80));

        jTable1.setModel(new javax.swing.table.DefaultTableModel(
            new Object [][] {
                {null, null, null},
                {null, null, null},
                {null, null, null},
                {null, null, null}
            },
            new String [] {
                "SÃmbolo", "Conjunto Primero", "Conjunto Siguiente"
            }
        ) {
            boolean[] canEdit = new boolean [] {
                false, false, false
            };

            public boolean isCellEditable(int rowIndex, int columnIndex) {
                return canEdit [columnIndex];
            }
        });
        jScrollPane1.setViewportView(jTable1);

        jLabel1.setFont(new java.awt.Font("Tahoma", 1, 18)); // NOI18N
        jLabel1.setText("Conjunto Primero y Siguiente");

        jButton1.setText("Cancelar");
        jButton1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton1ActionPerformed(evt);
            }
        });

        jButton2.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/ultimo.png”))); // NOI18N
        jButton2.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton2ActionPerformed(evt);
            }
        });

        jButton3.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/siguiente.png”))); // NOI18N
        jButton3.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton3ActionPerformed(evt);
            }
        });

        jButton4.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/anterior.png”))); // NOI18N
        jButton4.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton4ActionPerformed(evt);
            }
        });

        jButton5.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/primero.png”))); // NOI18N
        jButton5.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton5ActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(this);
        this.setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.
                Alignment.LEADING)
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
                layout.createSequentialGroup()
                .addGap(24, 24, 24)
                .addGroup(layout.createParallelGroup(javax.swing.
                    GroupLayout.Alignment.TRAILING)
                    .addComponent(jScrollPane1, javax.swing.GroupLayout
                        .DEFAULT_SIZE, 556, Short.MAX_VALUE)
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jButton1)
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.RELATED, javax.swing.
                            GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addComponent(jButton5)
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.UNRELATED)
                        .addComponent(jButton4)
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.RELATED)
                        .addComponent(jButton3)
                        .addPreferredGap(javax.swing.LayoutStyle.
                            ComponentPlacement.RELATED)
                        .addComponent(jButton2)))
                .addGap(33, 33, 33))
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
                layout.createSequentialGroup()
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
                    Short.MAX_VALUE)
                .addComponent(jLabel1)
                .addGap(156, 156, 156))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.
                Alignment.LEADING)
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
                layout.createSequentialGroup()
                .addContainerGap()
                .addComponent(jLabel1)
                .addGap(43, 43, 43)
                .addComponent(jScrollPane1, javax.swing.GroupLayout.
                    PREFERRED_SIZE, 313, javax.swing.GroupLayout.
                    PREFERRED_SIZE)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED, 40, Short.MAX_VALUE)
                .addGroup(layout.createParallelGroup(javax.swing.
                    GroupLayout.Alignment.LEADING)
                    .addGroup(javax.swing.GroupLayout.Alignment.
                        TRAILING, layout.createParallelGroup(javax.
                        swing.GroupLayout.Alignment.LEADING)
                        .addComponent(jButton2, javax.swing.GroupLayout
                            .Alignment.TRAILING)
                        .addComponent(jButton1))
                        .addComponent(jButton3, javax.swing.GroupLayout.Alignment.TRAILING)
                        .addComponent(jButton4, javax.swing.GroupLayout.Alignment.TRAILING)
                        .addComponent(jButton5, javax.swing.GroupLayout.Alignment.TRAILING))
                    .addContainerGap())
        );
    }// </editor-fold>//GEN-END:initComponents

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton1ActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir del asistente de la simulacion de la gramÃ¡tica?", "Salir", JOptionPane.YES_NO_OPTION);

        if(conf==0)
          this.ventanaPadre.dispose();
    }//GEN-LAST:event_jButton1ActionPerformed

    private void jButton5ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton5ActionPerformed
        this.ventanaPadre.cambiarPaso(1);
    }//GEN-LAST:event_jButton5ActionPerformed

    private void jButton4ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton4ActionPerformed
        this.ventanaPadre.cambiarPaso(1);
    }//GEN-LAST:event_jButton4ActionPerformed

    private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton3ActionPerformed
        this.ventanaPadre.cambiarPaso(3);
    }//GEN-LAST:event_jButton3ActionPerformed

    private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton2ActionPerformed
        PanelNuevaSimDescPaso3 paso3 = new PanelNuevaSimDescPaso3(this.ventanaPadre);
        paso3.ConstruirTPredictiva(this.ventanaPadre.gramatica);

        this.ventanaPadre.cambiarPaso(4);
    }//GEN-LAST:event_jButton2ActionPerformed


    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1;
    private javax.swing.JButton jButton2;
    private javax.swing.JButton jButton3;
    private javax.swing.JButton jButton4;
    private javax.swing.JButton jButton5;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JScrollPane jScrollPane1;
```

```java
    private javax.swing.JTable jTable1;
    // End of variables declaration//GEN-END:variables
}
```

2.5.14. PanelNuevaSimDescPaso3.java

```java
//SimAS / Simulador
//Panel nueva simulacion descendente paso 3

package es.uco.simas.simulador;

import es.uco.simas.editor.TablaPredictiva;
import es.uco.simas.util.gramatica.*;
import javax.swing.JOptionPane;
import javax.swing.table.DefaultTableModel;

/**
 * @author Vanesa
 */
public class PanelNuevaSimDescPaso3 extends javax.swing.JPanel {

    private VentanaSimuladorDesc ventanaPadre;
    private Gramatica gramatica;
    private DefaultTableModel modeloConjuntos ;

    public PanelNuevaSimDescPaso3(VentanaSimuladorDesc ventanaPadre) {
        DefaultTableModel tabla = new DefaultTableModel();
        this.modeloConjuntos = tabla;
        initComponents();
        this.ventanaPadre = ventanaPadre;
        this.gramatica = ventanaPadre.getGramatica();
    }

    public void ConstruirTPredictiva(Gramatica gramatica){

        this.gramatica.generarTPredictiva();
        TablaPredictiva tpredictiva = this.gramatica.getTPredictiva();

        this.jTable1.setModel(tpredictiva.getTabla());
    }

    /**
     * This method is called from within the constructor to initialize
         the form.
     * WARNING: Do NOT modify this code. The content of this method is
         always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate=”collapsed” desc=”Generated Code”>//GEN-BEGIN:initComponents
    private void initComponents() {

        jLabel1 = new javax.swing.JLabel();
        jButton1 = new javax.swing.JButton();
        jButton2 = new javax.swing.JButton();
        jButton4 = new javax.swing.JButton();
        jButton5 = new javax.swing.JButton();
        jScrollPane1 = new javax.swing.JScrollPane();
        jTable1 = new javax.swing.JTable();
        jButton6 = new javax.swing.JButton();

        setBackground(new java.awt.Color(233, 244, 244));

        jLabel1.setFont(new java.awt.Font(”Tahoma”, 1, 18)); // NOI18N
        jLabel1.setText(”Tabla Predictiva”);

        jButton1.setText(”Cancelar”);
        jButton1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton1ActionPerformed(evt);
            }
        });

        jButton2.setFont(new java.awt.Font(”Tahoma”, 1, 12)); // NOI18N
        jButton2.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/ultimo.png”))); // NOI18N
        jButton2.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton2ActionPerformed(evt);
            }
        });

        jButton4.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/anterior.png”))); // NOI18N
        jButton4.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton4ActionPerformed(evt);
            }
        });

        jButton5.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/primero.png”))); // NOI18N
        jButton5.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton5ActionPerformed(evt);
            }
        });

        jTable1.setModel(new javax.swing.table.DefaultTableModel(
            new Object [][] {
                {null, null, null, null},
                {null, null, null, null},
                {null, null, null, null},
                {null, null, null, null}
            },
            new String [] {
                "", "", "", ""
            }
        ) {
            boolean[] canEdit = new boolean [] {
                false, false, false, false
            };

            public boolean isCellEditable(int rowIndex, int columnIndex) {
                return canEdit [columnIndex];
            }
        });
        jScrollPane1.setViewportView(jTable1);

        jButton6.setIcon(new javax.swing.ImageIcon(getClass().getResource("/es/uco/simas/resources/siguiente.png"))); // NOI18N
        jButton6.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton6ActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(this);
        this.setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(23, 23, 23)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 652, javax.swing.GroupLayout.PREFERRED_SIZE)
                        .addContainerGap(39, Short.MAX_VALUE))
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jButton1)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addComponent(jButton5)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButton4)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButton6)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButton2)
                        .addGap(36, 36, 36))))
            .addGroup(layout.createSequentialGroup()
                .addGap(262, 262, 262)
                .addComponent(jLabel1)
                .addGap(0, 0, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createSequentialGroup()
                .addContainerGap()
                .addComponent(jLabel1)
                .addGap(28, 28, 28)
                .addComponent(jScrollPane1, javax.swing.GroupLayout.DEFAULT_SIZE, 400, Short.MAX_VALUE)
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createSequentialGroup()
                            .addComponent(jButton1)
                            .addGap(5, 5, 5))
                        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                            .addComponent(jButton2, javax.swing.GroupLayout.PREFERRED_SIZE, 31, javax.swing.GroupLayout.PREFERRED_SIZE)
                            .addComponent(jButton6)
                            .addComponent(jButton4)))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(2, 2, 2)
                        .addComponent(jButton5)))
                .addContainerGap())
        );
    }// </editor-fold>//GEN-END:initComponents

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt
        ) {//GEN-FIRST:event_jButton1ActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir
            del asistente de la simulacion de la gramÃ¡tica?", "Salir",
            JOptionPane.YES_NO_OPTION);

        if(conf==0)
          this.ventanaPadre.dispose();
    }//GEN-LAST:event_jButton1ActionPerformed

    private void jButton5ActionPerformed(java.awt.event.ActionEvent evt
        ) {//GEN-FIRST:event_jButton5ActionPerformed
        this.ventanaPadre.cambiarPaso(1);
    }//GEN-LAST:event_jButton5ActionPerformed

    private void jButton4ActionPerformed(java.awt.event.ActionEvent evt
        ) {//GEN-FIRST:event_jButton4ActionPerformed
        this.ventanaPadre.cambiarPaso(3);
    }//GEN-LAST:event_jButton4ActionPerformed

    private void jButton2ActionPerformed(java.awt.event.ActionEvent evt
        ) {//GEN-FIRST:event_jButton2ActionPerformed
        this.ventanaPadre.cambiarPaso(4);
    }//GEN-LAST:event_jButton2ActionPerformed

    private void jButton6ActionPerformed(java.awt.event.ActionEvent evt
        ) {//GEN-FIRST:event_jButton6ActionPerformed
        this.ventanaPadre.cambiarPaso(4);
    }//GEN-LAST:event_jButton6ActionPerformed


    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1;
    private javax.swing.JButton jButton2;
    private javax.swing.JButton jButton4;
    private javax.swing.JButton jButton5;
    private javax.swing.JButton jButton6;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JTable jTable1;
    // End of variables declaration//GEN-END:variables
}
```

2.5.15. PanelNuevaSimDescPaso4.java

```
//SimAS / Simulador
//Panel nueva simulacion descendente paso 4

package es.uco.simas.simulador;

import es.uco.simas.editor.FuncionError;
import es.uco.simas.util.gramatica.Gramatica;
import java.util.ArrayList;
import javax.swing.DefaultListModel;
import javax.swing.JOptionPane;

/**
 * @author vanesa
 */
public class PanelNuevaSimDescPaso4 extends javax.swing.JPanel {

    Gramatica gramatica;
    VentanaSimuladorDesc ventanaPadre;
    private int funError=0;

    public PanelNuevaSimDescPaso4(VentanaSimuladorDesc ventanaPadre) {
        initComponents();
        this.ventanaPadre = ventanaPadre;
        this.gramatica = ventanaPadre.getGramatica();

        if(this.gramatica.getTPredictiva().getFunError().size() != 0){
            funcionError();
            this.funError = 1;
        }
        if(funError ==0){
            this.jButtonFinalizar.setVisible(true);
            this.jButtonUltimo.setVisible(false);
            this.jButtonSiguiente.setEnabled(false);
            this.jButtonEliminar.setEnabled(false);
        }
    }

    public void funcionError(){
        DefaultListModel lista = new DefaultListModel();
        ArrayList<FuncionError> funError = this.gramatica.
            getTPredictiva().getFunError();
        StringBuilder string = new StringBuilder();
        int i=0;

        while(i < funError.size()){
            string = new StringBuilder();
            int accion;
            string = string.append(funError.get(i).getIdentificador());
            string = string.append(" - ");
            accion = funError.get(i).getAccion();
            if(accion == 1)
```

```
                string.append(”Insertar un SÃmbolo en la Entrada: ”);
            if(accion == 2)
                string.append(”Borrar un SÃmbolo de la Entrada”);
            if(accion == 3)
                string.append(”Modificar un SÃmbolo de la Entrada: ”);
            if(accion == 4)
                string.append(”Insertar un SÃmbolo de la Pila: ”);
            if(accion == 5)
                string.append(”Borrar un SÃmbolo de la Pila”);
            if(accion == 6)
                string.append(”Modificar un SÃmbolo de la Pila: ”);
            if(accion == 7)
                string.append(”Terminar el anÃ¡lisis”);
            if(accion == 1 || accion ==3 || accion ==4 || accion ==6)
                string.append(funError.get(i).getSimbolo().getNombre());

            lista.add(i, string);
            i++;

        }
        this.jList1.setModel(lista);

        if(this.jList1.getModel().getSize()!=0){
            this.jButtonFinalizar.setVisible(false);

            this.jButtonSiguiente.setEnabled(true);
            this.jButtonNueva.setEnabled(true);
            this.jButtonEliminar.setEnabled(true);
        }else{
            this.jButtonNueva.setEnabled(true);
            this.jButtonEliminar.setEnabled(false);
            this.jButtonFinalizar.setVisible(true);

            this.jButtonSiguiente.setEnabled(false);
        }

    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings(”unchecked”)
    // <editor-fold defaultstate=”collapsed” desc=”Generated Code”>//GEN-BEGIN:initComponents
    private void initComponents() {

        jLabel1 = new javax.swing.JLabel();
        jButtonCancelar = new javax.swing.JButton();
        jButtonUltimo = new javax.swing.JButton();
        jButtonSiguiente = new javax.swing.JButton();
        jButton3 = new javax.swing.JButton();
        jButton4 = new javax.swing.JButton();
        jScrollPane1 = new javax.swing.JScrollPane();
        jList1 = new javax.swing.JList();
        jCheckBox1 = new javax.swing.JCheckBox();
        jButtonNueva = new javax.swing.JButton();
        jButtonEliminar = new javax.swing.JButton();
        jButtonFinalizar = new javax.swing.JButton();

        setBackground(new java.awt.Color(233, 244, 244));

        jLabel1.setFont(new java.awt.Font(”Tahoma”, 1, 18)); // NOI18N
        jLabel1.setText(”Funciones de Error”);

        jButtonCancelar.setText(”Cancelar”);
        jButtonCancelar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonCancelarActionPerformed(evt);
            }
        });

        jButtonUltimo.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/ultimo.png”))); // NOI18N
        jButtonUltimo.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonUltimoActionPerformed(evt);
            }
        });

        jButtonSiguiente.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/siguiente.png”))); // NOI18N
        jButtonSiguiente.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonSiguienteActionPerformed(evt);
            }
        });

        jButton3.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/anterior.png”))); // NOI18N
        jButton3.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton3ActionPerformed(evt);
            }
        });

        jButton4.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/primero.png”))); // NOI18N
        jButton4.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton4ActionPerformed(evt);
            }
        });

        jScrollPane1.setViewportView(jList1);

        jCheckBox1.setText(”No utilizar Funciones de error”);
        jCheckBox1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jCheckBox1ActionPerformed(evt);
            }
        });

        jButtonNueva.setText(”Nueva Funcion Error  ”);
        jButtonNueva.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonNuevaActionPerformed(evt);
            }
        });

        jButtonEliminar.setText(”Eliminar Funcion Error”);
        jButtonEliminar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonEliminarActionPerformed(evt);
            }
        });

        jButtonFinalizar.setFont(new java.awt.Font(”Ubuntu”, 1, 15)); // NOI18N
        jButtonFinalizar.setText(”Finalizar”);
        jButtonFinalizar.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButtonFinalizarActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout layout = new javax.swing.GroupLayout(this);
        this.setLayout(layout);
        layout.setHorizontalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(183, 183, 183)
                .addComponent(jLabel1)
                .addContainerGap(303, Short.MAX_VALUE))
            .addGroup(layout.createSequentialGroup()
                .addGap(21, 21, 21)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jCheckBox1)
                        .addGap(0, 0, Short.MAX_VALUE))
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jButtonCancelar)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                        .addComponent(jButton4)
                        .addGap(18, 18, 18)
                        .addComponent(jButton3)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButtonSiguiente)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButtonUltimo)
                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                        .addComponent(jButtonFinalizar)
                        .addGap(24, 24, 24))
                    .addGroup(layout.createSequentialGroup()
                        .addComponent(jScrollPane1)
                        .addGap(18, 18, 18)
                        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                            .addComponent(jButtonEliminar)
                            .addComponent(jButtonNueva))
                        .addGap(52, 52, 52))))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addGap(22, 22, 22)
                .addComponent(jLabel1)
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(45, 45, 45)
                        .addComponent(jButtonNueva)
                        .addGap(58, 58, 58)
                        .addComponent(jButtonEliminar)
                        .addGap(0, 146, Short.MAX_VALUE))
                    .addComponent(jScrollPane1))
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                .addComponent(jCheckBox1)
                .addGap(48, 48, 48)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addComponent(jButtonFinalizar)
                    .addComponent(jButtonUltimo)
                    .addComponent(jButton3)
                    .addComponent(jButtonCancelar)
                    .addComponent(jButton4)
                    .addComponent(jButtonSiguiente))
                .addGap(19, 19, 19))
        );
    }// </editor-fold>//GEN-END:initComponents

    private void jButtonNuevaActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonNuevaActionPerformed
        NuevaFuncionError error = new NuevaFuncionError(this.gramatica, this);
        error.setLocationRelativeTo(null);
        error.setVisible(true);
    }//GEN-LAST:event_jButtonNuevaActionPerformed

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton1ActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir del asistente de la simulacion de la gramÃ¡tica?", "Salir", JOptionPane.YES_NO_OPTION);

        if(conf==0)
          this.ventanaPadre.dispose();
    }//GEN-LAST:event_jButton1ActionPerformed

    private void jCheckBox1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jCheckBox1ActionPerformed
        if(this.jCheckBox1.isSelected()){
            this.jButtonNueva.setEnabled(false);
            this.jButtonEliminar.setEnabled(false);
            this.jButtonFinalizar.setVisible(true);
            this.jButtonUltimo.setVisible(false);
```

```
                this.jButtonSiguiente.setEnabled(false);
        }else{
            if(this.jList1.getModel().getSize()!=0){
                this.jButtonFinalizar.setVisible(false);
                this.jButtonUltimo.setVisible(true);
                this.jButtonSiguiente.setEnabled(true);
                this.jButtonNueva.setEnabled(true);
                this.jButtonEliminar.setEnabled(true);
            }else{
                this.jButtonNueva.setEnabled(true);
                this.jButtonEliminar.setEnabled(false);
                this.jButtonFinalizar.setVisible(true);
                this.jButtonUltimo.setVisible(false);
                this.jButtonSiguiente.setEnabled(false);
            }

        }
    }//GEN-LAST:event_jCheckBox1ActionPerformed

    private void jButtonEliminarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonEliminarActionPerformed
        DefaultListModel modelo= null;
        int seleccion= this.jList1.getSelectedIndex();
        String funcion = this.jList1.getModel().getElementAt(seleccion).toString();
        ArrayList<FuncionError> funError = this.gramatica.getTPredictiva().getFunError();
        String id = funcion.substring(0, 1);
        int num = Integer.parseInt(id);
        int i=0;

        if(seleccion != -1) {
            modelo=(DefaultListModel)this.jList1.getModel();
            modelo.remove(seleccion);

            while(i < funError.size()){
                if(funError.get(i).getIdentificador() == num){
                    funError.remove(i);
                }else
                    i++;
            }
            this.gramatica.getTPredictiva().setFunError(funError);
            this.ventanaPadre.setGramatica(this.gramatica);
        }

        if(this.jList1.getModel().getSize()!=0){
                this.jButtonFinalizar.setVisible(false);
                this.jButtonUltimo.setVisible(true);
                this.jButtonSiguiente.setEnabled(true);
                this.jButtonNueva.setEnabled(true);
                this.jButtonEliminar.setEnabled(true);
            }else{
                this.jButtonNueva.setEnabled(true);
                this.jButtonEliminar.setEnabled(false);
                this.jButtonFinalizar.setVisible(true);
                this.jButtonUltimo.setVisible(false);
                this.jButtonSiguiente.setEnabled(false);
            }
    }//GEN-LAST:event_jButtonEliminarActionPerformed

    private void jButtonSiguienteActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonSiguienteActionPerformed
        this.ventanaPadre.cambiarPaso(5);
    }//GEN-LAST:event_jButtonSiguienteActionPerformed

    private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton2ActionPerformed
        this.ventanaPadre.cambiarPaso(3);
    }//GEN-LAST:event_jButton2ActionPerformed

    private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton3ActionPerformed
        this.ventanaPadre.cambiarPaso(1);
    }//GEN-LAST:event_jButton3ActionPerformed

    private void jButtonFinalizarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonFinalizarActionPerformed
        this.ventanaPadre.finalizarAsistente();
    }//GEN-LAST:event_jButtonFinalizarActionPerformed

    private void jButtonUltimoActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonUltimoActionPerformed
        this.ventanaPadre.cambiarPaso(5);
    }//GEN-LAST:event_jButtonUltimoActionPerformed

    private void jButtonCancelarActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButtonCancelarActionPerformed
          int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir del asistente de la simulacion de la gramÃ¡tica?", "Salir",JOptionPane.YES_NO_OPTION);

        if(conf==0)
          this.ventanaPadre.dispose();
    }//GEN-LAST:event_jButtonCancelarActionPerformed

    private void jButton4ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton4ActionPerformed
        this.ventanaPadre.cambiarPaso(1);
    }//GEN-LAST:event_jButton4ActionPerformed


    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton3;
    private javax.swing.JButton jButton4;
    private javax.swing.JButton jButtonCancelar;
    private javax.swing.JButton jButtonEliminar;
    private javax.swing.JButton jButtonFinalizar;
    private javax.swing.JButton jButtonNueva;
    private javax.swing.JButton jButtonSiguiente;
    private javax.swing.JButton jButtonUltimo;
    private javax.swing.JCheckBox jCheckBox1;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JList jList1;
    private javax.swing.JScrollPane jScrollPane1;
    // End of variables declaration//GEN-END:variables
}
```

2.5.16. PanelNuevaSimDescPaso5.java

```
//SimAS / Simulador
//Panel nueva simulacion descendente paso 5

package es.uco.simas.simulador;

import es.uco.simas.editor.FuncionError;
import es.uco.simas.editor.TablaPredictiva;
import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.util.gramatica.Produccion;
import es.uco.simas.util.gramatica.Terminal;
import java.util.ArrayList;
import javax.swing.DefaultComboBoxModel;
import javax.swing.JOptionPane;
import javax.swing.table.DefaultTableModel;

/**
 * @author Vanesa
 */
public class PanelNuevaSimDescPaso5 extends javax.swing.JPanel {

    private VentanaSimuladorDesc ventanaPadre;
    private Gramatica gramatica;
    private DefaultTableModel modeloConjuntos ;
    private TablaPredictiva tpredictiva;
    int red = 0;

    public PanelNuevaSimDescPaso5(VentanaSimuladorDesc ventanaPadre) {
        DefaultTableModel tabla = new DefaultTableModel();
        this.modeloConjuntos = tabla;
        initComponents();
        this.ventanaPadre = ventanaPadre;
        this.gramatica = ventanaPadre.getGramatica();
        this.jButton6.setEnabled(false);
        this.tpredictiva = this.gramatica.getTPredictiva();
        this.jTable1.setModel(this.tpredictiva.getTabla());
        this.inicializarCombos(this.tpredictiva);
        this.anadirTerminales();
        this.jTable1.setDefaultRenderer (Object.class, new MiRender());
    }

    private void anadirTerminales(){
        ArrayList<Terminal> term = this.ventanaPadre.getGramatica().getTerm();
        DefaultTableModel tabla = this.tpredictiva.getTabla();
        int fila = this.tpredictiva.getTabla().getRowCount();
        int columna = 1;
        int i=0;

        while(i < term.size()){
            Object [] linea = new Object[] {
                    term.get(i).getNombre()
                   };
            tabla.addRow(linea);

            i++;
        }
        Object [] linea = new Object[] {
                    "$"
                   };
            tabla.addRow(linea);

        this.tpredictiva.setTabla(tabla);
        i = fila;
        while(i < tabla.getRowCount()-1){
            this.tpredictiva.setCeldaPredictiva("<HTML> <FONT COLOR=\"blue\">Emparejar</FONT></HTML>", i, columna);
            i++;
            columna++;
        }
        this.tpredictiva.setCeldaPredictiva("<HTML> <FONT COLOR=\"blue\">Aceptar</FONT></HTML>", i, columna);
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
   // @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    private void initComponents() {

        jLabel1 = new javax.swing.JLabel();
        jButton1 = new javax.swing.JButton();
        jButton2 = new javax.swing.JButton();
        jButton3 = new javax.swing.JButton();
        jButton4 = new javax.swing.JButton();
        jScrollPane1 = new javax.swing.JScrollPane();
        jTable1 = new javax.swing.JTable();
        jButton5 = new javax.swing.JButton();
        jComboBox1 = new javax.swing.JComboBox();
        jLabel2 = new javax.swing.JLabel();
        jButton6 = new javax.swing.JButton();
        jButton7 = new javax.swing.JButton();

        setBackground(new java.awt.Color(233, 244, 244));

        jLabel1.setFont(new java.awt.Font(”Tahoma”, 1, 18)); // NOI18N
        jLabel1.setText(”Incluir Funciones de Error”);

        jButton1.setFont(new java.awt.Font(”Tahoma”, 1, 15)); // NOI18N
        jButton1.setText(”Finalizar”);
        jButton1.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton1ActionPerformed(evt);
            }
        });

        jButton2.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/siguiente.png”))); // NOI18N
        jButton2.setEnabled(false);

        jButton3.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/anterior.png”))); // NOI18N
        jButton3.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton3ActionPerformed(evt);
            }
        });

        jButton4.setIcon(new javax.swing.ImageIcon(getClass().getResource(”/es/uco/simas/resources/primero.png”))); // NOI18N
        jButton4.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton4ActionPerformed(evt);
            }
        });

        jTable1.setModel(new javax.swing.table.DefaultTableModel(
            new Object [][] {
                {null, null, null, null},
                {null, null, null, null},
                {null, null, null, null},
                {null, null, null, null}
            },
            new String [] {
                ””, ””, ””, ””
            }
        ) {
            boolean[] canEdit = new boolean [] {
                false, false, false, false
            };

            public boolean isCellEditable(int rowIndex, int columnIndex) {
                return canEdit [columnIndex];
            }
        });
        jTable1.addMouseListener(new java.awt.event.MouseAdapter() {
            public void mouseClicked(java.awt.event.MouseEvent evt) {
                jTable1MouseClicked(evt);
            }
        });
        jScrollPane1.setViewportView(jTable1);

        jButton5.setFont(new java.awt.Font(”Tahoma”, 1, 15)); // NOI18N
        jButton5.setText(”Cancelar”);
        jButton5.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton5ActionPerformed(evt);
            }
        });

        jLabel2.setText(”Pulse en la tabla para insertar la funcion de error:”);

        jButton6.setText(”Eliminar Funcion de Error”);
        jButton6.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton6ActionPerformed(evt);
            }
        });

        jButton7.setText(”Rellenar con producciones Ã©psilon”);
        jButton7.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton7ActionPerformed(evt);
            }
        });

        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.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(26, 26, 26)
                        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                            .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 582, javax.swing.GroupLayout.PREFERRED_SIZE)
                            .addGroup(layout.createSequentialGroup()
                                .addComponent(jButton5)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 309, Short.MAX_VALUE)
                                .addComponent(jButton4)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton3)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton2)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jButton1))))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(172, 172, 172)
                        .addComponent(jLabel1))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(121, 121, 121)
                        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                            .addComponent(jLabel2)
                            .addGroup(layout.createSequentialGroup()
                                .addGap(118, 118, 118)
                                .addComponent(jComboBox1, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)))))
                .addContainerGap())
            .addGroup(layout.createSequentialGroup()
                .addGap(102, 102, 102)
                .addComponent(jButton6)
                .addGap(31, 31, 31)
                .addComponent(jButton7)
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createSequentialGroup()
                .addGap(15, 15, 15)
                .addComponent(jLabel1)
                .addGap(12, 12, 12)
                .addComponent(jLabel2)
                .addGap(18, 18, 18)
                .addComponent(jComboBox1, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)
                .addGap(18, 18, 18)
                .addComponent(jScrollPane1, javax.swing.GroupLayout.DEFAULT_SIZE, 351, Short.MAX_VALUE)
                .addGap(32, 32, 32)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jButton6)
                    .addComponent(jButton7))
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)
                        .addComponent(jButton2)
                        .addComponent(jButton1)
                        .addComponent(jButton3)
                        .addComponent(jButton4))
                    .addComponent(jButton5))
                .addGap(25, 25, 25))
        );
    }// </editor-fold>//GEN-END:initComponents

     private void inicializarCombos(TablaPredictiva tpredictiva) {
        ArrayList<String> listaCombo = new ArrayList();
        ArrayList<FuncionError> funError = tpredictiva.getFunError();
        StringBuilder string = new StringBuilder();
        int i= 0;

        while(i < funError.size()) {
            string = new StringBuilder();
            int accion;
            string = string.append(funError.get(i).getIdentificador());
            string = string.append(" - ");
            accion = funError.get(i).getAccion();
            if(accion == 1)
                string.append("Insertar un SÃmbolo en la Entrada: ");
            if(accion == 2)
                string.append("Borrar un SÃmbolo de la Entrada");
            if(accion == 3)
                string.append("Modificar un SÃmbolo de la Entrada: ");
            if(accion == 4)
                string.append("Insertar un SÃmbolo de la Pila: ");
            if(accion == 5)
                string.append("Borrar un SÃmbolo de la Pila");
            if(accion == 6)
                string.append("Modificar un SÃmbolo de la Pila: ");
            if(accion == 7)
                string.append("Terminar el anÃ¡lisis");
            if(accion == 1 || accion ==3 || accion ==4 || accion ==6)
                string.append(funError.get(i).getSimbolo().getNombre());

            listaCombo.add(string.toString());
            i++;
        }
        DefaultComboBoxModel combo = new DefaultComboBoxModel(listaCombo.toArray());
        this.jComboBox1.setModel(combo);
    }

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton1ActionPerformed
        this.gramatica.setTPredictiva(this.tpredictiva);
        this.ventanaPadre.finalizarAsistente();
        this.ventanaPadre.dispose();
    }//GEN-LAST:event_jButton1ActionPerformed

    private void jButton5ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton5ActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir del asistente de la simulacion de la gramÃ¡tica?", "Salir", JOptionPane.YES_NO_OPTION);

        if(conf==0)
          this.ventanaPadre.dispose();
    }//GEN-LAST:event_jButton5ActionPerformed

```

```java
    private void jTable1MouseClicked(java.awt.event.MouseEvent evt) {//GEN-FIRST:event_jTable1MouseClicked
        int columna = this.jTable1.getSelectedColumn();
        int fila = this.jTable1.getSelectedRow();
        this.jButton6.setEnabled(false);
        ArrayList<String> term = new ArrayList<>();
        term = buscarTerm();
        int i=0;
        int x=0;
        while(i<term.size()){
            if(this.tpredictiva.getCeldaPredictiva(fila, 0).toString().equals(term.get(i))){
                JOptionPane.showConfirmDialog(null, "Esta fila no se puede rellenar, debido a que el sÃmbolo \""+term.get(i)+"\" no aparece en la parte derecha de una produccion en un lugar que no sea el primero.", "Salir",JOptionPane.CLOSED_OPTION);
                //Esta fila no se puede rellenar, debido a que el sÃmbolo "+term.get(i)+" aparece el primero en una de las producciones.", "Salir",JOptionPane.CLOSED_OPTION);
                x=-1;
                break;
            }else
                i++;
        }
        if(x==0){
            if(this.tpredictiva.getCeldaPredictiva(fila, columna) == null){
                String str = "E"+this.jComboBox1.getSelectedItem().toString().substring(0, 1);
                this.tpredictiva.setCeldaPredictiva(str, fila, columna);
           //    this.jTable1.setDefaultRenderer(Object.class, new MiRender());
            }
            if(this.tpredictiva.getCeldaPredictiva(fila, columna).toString().startsWith("E")){
                this.jButton6.setEnabled(true);
            }
            this.gramatica.setTPredictiva(this.tpredictiva);
        }
    }//GEN-LAST:event_jTable1MouseClicked

    private ArrayList<String> buscarTerm(){
        ArrayList<String> term = new ArrayList<>();
        int i=0;
        while(i< this.gramatica.getPr().size()){
            if(this.gramatica.isTerminal(this.gramatica.getPr().get(i).getConsec().get(0).getNombre()))
                term.add(this.gramatica.getPr().get(i).getConsec().get(0).getNombre());
            i++;
        }
        return term;
    }

    private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton3ActionPerformed
        this.ventanaPadre.cambiarPaso(4);
    }//GEN-LAST:event_jButton3ActionPerformed

    private void jButton4ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton4ActionPerformed
        this.ventanaPadre.cambiarPaso(1);
    }//GEN-LAST:event_jButton4ActionPerformed

    private void jButton6ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton6ActionPerformed
        int columna = this.jTable1.getSelectedColumn();
        int fila = this.jTable1.getSelectedRow();
        this.tpredictiva.setCeldaPredictiva(null, fila, columna);
        this.jButton6.setEnabled(false);
    }//GEN-LAST:event_jButton6ActionPerformed

    private void jButton7ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton7ActionPerformed
        ArrayList<Produccion> prod = this.gramatica.getPr();
        int i=0;
        red++;

        if(red %2 != 0 ){ //red es impar: completar con reducciones
            while(i < prod.size()){
                if(prod.get(i).getConsec().get(0).getNombre().equals(”\u03b5”)){
                    String ant = prod.get(i).getAntec().getSimboloNT().getNombre();
                    int j=0;
                    while(j < this.jTable1.getRowCount()){
                        if(this.jTable1.getValueAt(j, 0).toString().equals(ant)){
                            int k=1;
                            while(k < this.jTable1.getColumnCount()){
                                if(this.jTable1.getValueAt(j, k)==null){
                                    this.jTable1.setValueAt(i+1+”*”, j, k);
                                }
                                k++;
                            }

                        }
                        j++;
                    }
                }
                i++;
            }
            this.jButton7.setText("Eliminar producciones Ã©psilon");
        }else{ //red par: Eliminar reducciones

            i=0;
            int j=1;

            while(i < this.jTable1.getRowCount()){
                j=1;
                while(j < this.jTable1.getColumnCount()){
                    if(this.jTable1.getValueAt(i, j)!=null){
                        if(this.jTable1.getValueAt(i, j).toString().contains("*")){
                            this.jTable1.setValueAt(null, i, j);
                        }
                    }
                    j++;
                }
                i++;
            }
            this.jButton7.setText("Rellenar con producciones Ã©psilon");
        }
        this.gramatica.setTPredictiva(this.tpredictiva);

    }//GEN-LAST:event_jButton7ActionPerformed

    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1;
    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.JComboBox jComboBox1;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JTable jTable1;
    // End of variables declaration//GEN-END:variables
}
```

2.5.17. Simulador.java

```
//SimAS / Simulador
//Simulador

package es.uco.simas.simulador;

```

```
import com.itextpdf.text.BadElementException;
import com.itextpdf.text.BaseColor;
import com.itextpdf.text.Chunk;
import com.itextpdf.text.DocumentException;
import com.itextpdf.text.Font;
import com.itextpdf.text.Image;
import com.itextpdf.text.PageSize;
import com.itextpdf.text.Paragraph;
import com.itextpdf.text.pdf.BaseFont;
import com.itextpdf.text.pdf.PdfPCell;
import com.itextpdf.text.pdf.PdfPTable;
import com.itextpdf.text.pdf.PdfWriter;
import com.itextpdf.text.pdf.draw.LineSeparator;
import es.uco.simas.centroayuda.AcercaDe;
import es.uco.simas.editor.Editor;
import es.uco.simas.editor.FuncionError;
import es.uco.simas.editor.TablaLR;
import es.uco.simas.editor.TablaPredictiva;
import es.uco.simas.util.gramatica.*;
import java.io.File;
import java.io.FileNotFoundException;
import java.io.FileOutputStream;
import java.io.IOException;
import java.net.MalformedURLException;
import java.util.ArrayList;
import java.util.logging.Level;
import java.util.logging.Logger;
import javax.swing.DefaultListModel;
import javax.swing.JFileChooser;
import javax.swing.JOptionPane;
import javax.swing.filechooser.FileNameExtensionFilter;
import javax.swing.table.DefaultTableModel;

/**
 * @author vanesa
 */
public class Simulador extends javax.swing.JFrame {

    ArrayList<Terminal> cadenaEntrada = new ArrayList<>();
    int metodoSimulacion;
    int modoFuncionamiento;
    int metodoAscendente = -1;
    Gramatica gramatica;

    public Simulador(int i, Gramatica gramatica, int met) {

        this.setCadenaEntrada(null);
        this.metodoSimulacion = i;
        this.gramatica = gramatica;
        this.metodoAscendente = met;

        DefaultListModel model = this.gramatica.getProducciones();
        DefaultListModel model2 = new DefaultListModel();
        initComponents();
        this.jTable3.setVisible(false);
        this.jTable2.removeAll();
        this.jTable3.removeAll();
        this.jTable2.setDefaultRenderer (Object.class, new MiRender());
        this.jTable3.setDefaultRenderer (Object.class, new MiRender());

        if(this.metodoSimulacion == 2){
            if(this.metodoAscendente == 0){
                this.jLabelSimulador.setText("Simulacion Ascendente SLR");
            }
            if(this.metodoAscendente == 1){
                this.jLabelSimulador.setText("Simulacion Ascendente LR-Canonico");
            }
            if(this.metodoAscendente == 2){
                this.jLabelSimulador.setText("Simulacion Ascendente LALR");
            }

            this.jTable3.setVisible(true);
            this.jLabelTabla.setText("Tabla LR");
            this.jLabelAccion.setVisible(true);
            this.jLabelIra.setVisible(true);
            TablaLR tlr = this.gramatica.getTlr();
            this.jTable2.setModel(tlr.getTAccion().getMatrizAccion());
            this.jTable3.setModel(tlr.getTIrA().getMatrizIrA());
            this.funError(tlr.getTAccion().getFunError());
        }
        if(this.metodoSimulacion == 1){
            this.jTable3.setVisible(false);
            this.jLabelSimulador.setText("Simulacion Descendente");
            this.jLabelTabla.setText("Tabla Predictiva");
            this.jLabelAccion.setVisible(false);
            this.jLabelIra.setVisible(false);
            TablaPredictiva tpred = this.gramatica.getTPredictiva();
            this.jTable2.setModel(tpred.getTabla());
            this.funError(tpred.getFunError());
        }

        if(this.gramatica.getProducciones() != null){
            int j =0;
            Object obj;
            obj = "P {";
            model2.addElement(obj);
            while (j < model.size()){
                obj = "    "+(j+1)+")    "+model.getElementAt(j);
                model2.addElement(obj);
                j++;
            }
            obj ="}";
            model2.addElement(obj);
            this.jList1.setModel(model2);
        }
    }

    void funError(ArrayList<FuncionError> funError){
        StringBuilder string = new StringBuilder();
        DefaultListModel lista = new DefaultListModel();
            int j= 0;

            while(j < funError.size()) {
                string = new StringBuilder();
                int accion;

                string = string.append(funError.get(j).getIdentificador
                    ()));
                string = string.append(” - ”);
                accion = funError.get(j).getAccion();
                if(accion == 1)
                    string.append(”Insertar un SÃmbolo en la Entrada:
                        ”);
                if(accion == 2)
                    string.append(”Borrar un SÃmbolo de la Entrada”);
                if(accion == 3)
                    string.append(”Modificar un SÃmbolo de la Entrada:
                        ”);
                if(accion == 4)
                    string.append(”Insertar un SÃmbolo de la Pila: ”);
                if(accion == 5)
                    string.append(”Borrar un SÃmbolo de la Pila”);
                if(accion == 6)
                    string.append(”Modificar un SÃmbolo de la Pila: ”)
                        ;
                if(accion == 7)
                    string.append(”Terminar el anÃ¡lisis”);
                if(accion == 1 || accion ==3 || accion ==4 || accion
                    ==6)
                    string.append(funError.get(j).getSimbolo().
                        getNombre());

                lista.addElement(string);
                j++;
            }
            this.jList2.setModel(lista);
    }

    public Boolean generarInforme(String fichero) throws
        DocumentException{
        try {
            String font = ”fonts/arialuni.ttf”;
            com.itextpdf.text.Document document = new com.itextpdf.text
                .Document(PageSize.LETTER , 45, 45, 54, 45);
            Image imagen = Image.getInstance("./src/es/uco/simas/resources/logo2Antes.png");
            imagen.setAlignment(com.itextpdf.text.Element.ALIGN_CENTER);
            imagen.scalePercent(40);

            LineSeparator ls = new LineSeparator();
             BaseFont bf;
             bf = BaseFont.createFont(font, BaseFont.IDENTITY_H, BaseFont.EMBEDDED);

             Font titulo = new Font(bf, 21, Font.BOLD);
             Font font2 = new Font(bf, 15, Font.BOLD);
             Font font3 = new Font(bf, 12);
             Font font4 = new Font(bf, 12);
             Font font5 = new Font(bf, 13, Font.BOLD);
             BaseColor claro = new BaseColor(63,171,160);
             Font tabla1 = new Font(bf, 12, Font.BOLD);
             Font azul = new Font(bf, 12);
             Font rojo = new Font(bf, 12);
             Font verde = new Font(bf, 12);
             Font magenta = new Font(bf, 12);

             rojo.setColor(BaseColor.RED);
             azul.setColor(BaseColor.BLUE);
             verde.setColor(BaseColor.GREEN);
             magenta.setColor(BaseColor.MAGENTA);
             titulo.setColor(33, 77, 72);
             font2.setColor(BaseColor.BLACK);
             font3.setColor(43,102,95);
             ls.setLineWidth(1);
             ls.setLineColor(claro);

             Paragraph parrafo = new Paragraph();
             Paragraph met = new Paragraph();

            if(this.metodoSimulacion == 1)
                parrafo = new Paragraph("         INFORME DE LA SIMULACION DESCENDENTE", titulo);
            if(this.metodoSimulacion == 2){
                parrafo = new Paragraph("          INFORME DE LA SIMULACION ASCENDENTE", titulo);
                if(this.metodoAscendente == 0)
                    met = new Paragraph("                                          METODO SLR           ", titulo);
                if(this.metodoAscendente == 1)
                    met = new Paragraph("                                         METODO LR-CANONICO          ", titulo);
                if(this.metodoAscendente == 2)
                    met = new Paragraph("                                          METODO LALR           ", titulo);
            }

```

```
        int i =0;
        int j =0;
        Paragraph parrafo1 = new Paragraph("\n Producciones de la gramÃ¡tica: ", font2);

        DefaultListModel produc = this.gramatica.getProducciones();
        DefaultListModel produc2 = new DefaultListModel();
        i =0;
        Object obj;
        obj = "P {";
        produc2.addElement(obj);
        while (i < produc.size()){
            obj = "    "+(i+1)+")    "+produc.getElementAt(i);
            produc2.addElement(obj);
            i++;
        }
        obj ="}";
        produc2.addElement(obj);

        i=0;
        while(i<produc2.getSize()){

            parrafo1.add(new Paragraph("     "+produc2.getElementAt(i).toString(), font4));
            i++;
        }
        Paragraph parrafo2 = new Paragraph("\n Conjunto Primero y Siguiente: \n\n", font2);
        PdfPTable table = new PdfPTable(3);

        PdfPCell celda =new PdfPCell (new Paragraph("SÃmbolos", tabla1));
        table.addCell(celda);
        celda =new PdfPCell (new Paragraph("Conjunto Primero", tabla1));
        table.addCell(celda);
        celda =new PdfPCell (new Paragraph("Conjunto Siguiente", tabla1));
        table.addCell(celda);

        i=0;
        while(i < this.gramatica.getNoTerm().size()){
            String primeros = "";
            String siguientes = "";
            celda =new PdfPCell (new Paragraph(this.gramatica.getNoTerm().get(i).getNombre(), font4));
            table.addCell(celda);
            j=0;
            while(j < this.gramatica.getNoTerm().get(i).getPrimeros().size()){
                primeros = primeros +" "+ this.gramatica.getNoTerm().get(i).getPrimeros().get(j).getNombre();
                j++;
            }
            celda =new PdfPCell (new Paragraph(primeros, font4));
            table.addCell(celda);
            j=0;
            while(j < this.gramatica.getNoTerm().get(i).getSiguientes().size()){
                siguientes = siguientes +” ”+ this.gramatica.getNoTerm().get(i).getSiguientes().get(j).getNombre();
                j++;
            }
            celda =new PdfPCell (new Paragraph(siguientes, font4));
            table.addCell(celda);
            i++;
        }

        Paragraph parrafo3 = new Paragraph(”\n Funciones de Error: ”, font2);
        if(this.gramatica.getTPredictiva().getFunError().size() == 0)
            parrafo3.add(new Paragraph(”No se han declarado Funciones de Error.”, font4));
        else{
            ArrayList<FuncionError> funError = this.gramatica.getTPredictiva().getFunError();
            StringBuilder string = new StringBuilder();
            j= 0;

            while(j < funError.size()) {
                string = new StringBuilder();
                int accion;

                string = string.append(funError.get(j).getIdentificador());
                string = string.append(” − ”);
                accion = funError.get(j).getAccion();
                if(accion == 1)
                    string.append(”Insertar un SÃmbolo en la Entrada: ”);
                if(accion == 2)
                    string.append(”Borrar un SÃmbolo de la Entrada”);
                if(accion == 3)
                    string.append(”Modificar un SÃmbolo de la Entrada: ”);
                if(accion == 4)
                    string.append(”Insertar un SÃmbolo de la Pila: ”);
                if(accion == 5)
                    string.append(”Borrar un SÃmbolo de la Pila”);
                if(accion == 6)
                    string.append(”Modificar un SÃmbolo de la Pila: ”);
                if(accion == 7)
                    string.append("Terminar el anÃ¡lisis");
                if(accion == 1 || accion ==3 || accion ==4 || accion ==6)
                    string.append(funError.get(j).getSimbolo().getNombre());

                parrafo3.add(new Paragraph("\n    "+string, font4));
                j++;
            }
        }
        Paragraph parrafo4 = new Paragraph();
        if(this.cadenaEntrada != null){
            parrafo4 = new Paragraph("\n Cadena de Entrada: ", font2);
            i = 0;
            String str ="  ";
            while(i < this.cadenaEntrada.size()){
                str = str +" "+this.cadenaEntrada.get(i).getNombre();
                i++;
            }
            parrafo4.add(new Paragraph("  "+str, font4));
        }
        Paragraph parrafo5 = new Paragraph();
        PdfPTable table2 = new PdfPTable(1);
        Paragraph parrafo6 = new Paragraph();
        PdfPTable table3 = new PdfPTable(1);
        PdfPTable table4 = new PdfPTable(1);
        Paragraph col1 = new Paragraph("\n Coleccion Canonica Elementos LR(0) \n\n", font2);
        PdfPTable col2 = new PdfPTable(1);
        Paragraph accion = new Paragraph("    PARTE ACCION \n\n", font5);
        Paragraph ira = new Paragraph("      PARTE IR_A \n\n", font5);

        if(this.metodoSimulacion == 1){   // Metodo Descendente
            parrafo5 = new Paragraph("\n Tabla Predictiva: \n\n", font2);
            DefaultTableModel tpredictiva = this.gramatica.getTPredictiva().getTabla();
            table2 = new PdfPTable(tpredictiva.getColumnCount());
            i=0;
            while(i < tpredictiva.getColumnCount()){
                celda =new PdfPCell (new Paragraph(tpredictiva.getColumnName(i), tabla1));
                table2.addCell(celda);
                i++;
            }
            i =0;
            j =0;
```

```
while(i < tpredictiva.getRowCount()){
    j=0;
    while(j < tpredictiva.getColumnCount()){
        if(tpredictiva.getValueAt(i, j) == null){
            table2.addCell(””);
        }else{
            if(tpredictiva.getValueAt(i, j).toString().startsWith(”<”)){
                celda =new PdfPCell (new Paragraph(”Emparejar”, azul));
                table2.addCell(celda);
            }else{
                if(j==0)
                    celda =new PdfPCell (new Paragraph(tpredictiva.getValueAt(i, j).toString(), tabla1));
                else{
                    if(tpredictiva.getValueAt(i, j).toString().startsWith(”E”))
                        celda =new PdfPCell (new Paragraph(tpredictiva.getValueAt(i, j).toString(), rojo));
                    else
                        celda =new PdfPCell (new Paragraph(tpredictiva.getValueAt(i, j).toString(), font4));
                }
                table2.addCell(celda);
            }
        }
        j++;
    }
    i++;
}
if(this.cadenaEntrada != null){
    parrafo6 = new Paragraph(”\n Simulacion Descendente : \n\n”, font2);
    DefaultTableModel sim = this.gramatica.getTPredictiva().getTabla();
    NuevaSimulacionDesc nuevo = new NuevaSimulacionDesc(this.gramatica, this);
    sim = nuevo.getTabla();
    table3 = new PdfPTable(sim.getColumnCount());
    i=0;
    while(i < sim.getColumnCount()){
        celda =new PdfPCell (new Paragraph(sim.getColumnName(i), tabla1));
        table3.addCell(celda);
        i++;
    }

```

```
                i =0;
                j =0;
                while(i < sim.getRowCount()){
                    j=0;
                    while(j < sim.getColumnCount()){
                        celda =new PdfPCell (new Paragraph(sim.getValueAt(i, j).toString(), font4));
                        table3.addCell(celda);
                        j++;
                    }
                    i++;
                }
            }
        }
        if(this.metodoSimulacion == 2){ //Metodo ascendente
            parrafo5 = new Paragraph("\n Tabla LR: \n\n", font2);
            DefaultTableModel taccion = this.gramatica.getTlr().getTAccion().getMatrizAccion();
            DefaultTableModel tira = this.gramatica.getTlr().getTIrA().getMatrizIrA();
            table2 = new PdfPTable(taccion.getColumnCount());
            table4 = new PdfPTable(tira.getColumnCount()+1);
            if(this.metodoAscendente ==0)
                celda =new PdfPCell (new Paragraph(this.gramatica.getColeccionLR0().getColeccion(), font4));
            if(this.metodoAscendente ==1)
                celda =new PdfPCell (new Paragraph(this.gramatica.getColeccionLR1().getColeccion(), font4));
            col2.addCell(celda);
            i=0;
            while(i < taccion.getColumnCount()){ //parte accion
                celda = new PdfPCell (new Paragraph(taccion.getColumnName(i), tabla1));
                table2.addCell(celda);
                i++;
            }
            i=0;
            celda = new PdfPCell (new Paragraph(taccion.getColumnName(i), tabla1));
            table4.addCell(celda);
            i=0;
            while(i < tira.getColumnCount()){ // parte ir_a
                celda =new PdfPCell (new Paragraph(tira.getColumnName(i), tabla1));
                table4.addCell(celda);
                i++;
            }
            i =0;
            j =0;
            while(i < taccion.getRowCount()){ //parte accion
                j=0;
                while(j < taccion.getColumnCount()){
                    if(taccion.getValueAt(i, j) == null){
                            table2.addCell("");
                        }else{
                            if(taccion.getValueAt(i, j).toString().equals("Aceptar")){
                                celda =new PdfPCell (new Paragraph("Aceptar", verde));
                                table2.addCell(celda);
                            }else{
                                if(taccion.getValueAt(i, j).toString().startsWith("<")){
                                    celda =new PdfPCell (new Paragraph("Emparejar", azul));
                                    table2.addCell(celda);
                                }else{
                                    if(j==0)
                                        celda =new PdfPCell (new Paragraph(taccion.getValueAt(i, j).toString(), tabla1));
                                    else{
                                        if(taccion.getValueAt(i, j).toString().startsWith("E")){
                                            celda =new PdfPCell (new Paragraph(taccion.getValueAt(i, j).toString(), rojo));
                                        }else{
                                            if(taccion.getValueAt(i, j).toString().startsWith("d")){
                                                celda =new PdfPCell (new Paragraph(taccion.getValueAt(i, j).toString(), azul));
                                            }else{
                                                if(taccion.getValueAt(i, j).toString().startsWith("r")){
                                                    celda =new PdfPCell (new Paragraph(taccion.getValueAt(i, j).toString(), magenta));
                                                }else{
                                                    if(taccion.getValueAt(i, j).toString().startsWith("conf")){
                                                        celda =new PdfPCell (new Paragraph(taccion.getValueAt(i, j).toString(), rojo));
                                                    }else{
                                                        celda =new PdfPCell (new Paragraph(taccion.getValueAt(i, j).toString(), font4));
                                                    }
                                                }
                                            }
                                        }
                                    }
                                    table2.addCell(celda);
                                }
                            }
                        }
                        j++;
                    }
                    i++;
                }
                i =0;
                j =0;
                while(i < tira.getRowCount()){ // parte ir_a
                    j=0;
                    while(j < tira.getColumnCount()){
                        if(j == 0){
                            if(taccion.getValueAt(i,j) != null){
                                celda =new PdfPCell (new Paragraph(taccion.getValueAt(i, j).toString(), font4));
                                table4.addCell(celda);
                            }
                        }
                        if(tira.getValueAt(i, j) == null){
                            table4.addCell("");
                        }else{
                            if(j==0)
                                celda =new PdfPCell (new Paragraph(tira.getValueAt(i, j).toString(), tabla1));
                            else
                                celda =new PdfPCell (new Paragraph(tira
                                   .getValueAt(i, j).toString(), font4
                                   ));

                            table4.addCell(celda);

                        }
                        j++;
                    }
                    i++;
                }

                if(this.cadenaEntrada != null){
                    parrafo6 = new Paragraph("\n Simulacion Ascendente:
                        \n\n", font2);
                    DefaultTableModel sim = this.gramatica.
                       getTPredictiva().getTabla();
                    NuevaSimulacionAsc nuevo = new NuevaSimulacionAsc(
                       this.gramatica, this);
                    sim = nuevo.getTabla();
                    table3 = new PdfPTable(sim.getColumnCount());
                    i=0;
                    while(i < sim.getColumnCount()){
                        celda =new PdfPCell (new Paragraph(sim.
                           getColumnName(i), tabla1));
                        table3.addCell(celda);
                        i++;
                    }

                    i =0;
                    j =0;
                    while(i < sim.getRowCount()){
                        j=0;
                        while(j < sim.getColumnCount()){
                            celda =new PdfPCell (new Paragraph(sim.
                               getValueAt(i, j).toString(), font4));
                            table3.addCell(celda);
                            j++;
                        }
                        i++;
                    }
                }
             }
            try {

                PdfWriter.getInstance(document, new FileOutputStream(
                   fichero));
            } catch (DocumentException | FileNotFoundException ex) {
                Logger.getLogger(Editor.class.getName()).log(Level.
                   SEVERE, null, ex);
            }

             document.open();
```

```
            try {

             document.add(imagen);
             document.add(parrafo);
             if(this.metodoSimulacion == 2)
                 document.add(met);

             document.add(new Chunk(ls));
             document.add(parrafo1);
             document.add(parrafo2);
             document.add(table);
             document.add(parrafo3);
             document.add(parrafo4);
             if(this.metodoSimulacion == 2){
                 document.add(col1);
                 document.add(col2);
             }
             document.add(parrafo5);
             if(this.metodoSimulacion == 2)
                 document.add(accion);
             document.add(table2);
             if(this.metodoSimulacion == 2){
                 document.add(ira);
                 document.add(table4);
             }
             document.add(parrafo6);
             document.add(table3);

            } catch (DocumentException ex) {
                Logger.getLogger(Editor.class.getName()).log(Level.SEVERE, null, ex);
            }

             document.close();
         } catch (BadElementException ex) {
             Logger.getLogger(Editor.class.getName()).log(Level.SEVERE, null, ex);
         } catch (MalformedURLException ex) {
             Logger.getLogger(Editor.class.getName()).log(Level.SEVERE, null, ex);
         } catch (IOException ex) {
             Logger.getLogger(Editor.class.getName()).log(Level.SEVERE, null, ex);
         }

     return true;
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    private void initComponents() {

         jScrollPane3 = new javax.swing.JScrollPane();
         jTable1 = new javax.swing.JTable();
         jPanel1 = new javax.swing.JPanel();
         jLabelSimulador = new javax.swing.JLabel();
         jScrollPane1 = new javax.swing.JScrollPane();
         jList1 = new javax.swing.JList();
         jLabel2 = new javax.swing.JLabel();
         jScrollPane2 = new javax.swing.JScrollPane();
         jList2 = new javax.swing.JList();
         jLabel3 = new javax.swing.JLabel();
         jScrollPane4 = new javax.swing.JScrollPane();
         jTable2 = new javax.swing.JTable();
         jButton1 = new javax.swing.JButton();
         jScrollPane5 = new javax.swing.JScrollPane();
         jTable3 = new javax.swing.JTable();
         jButton4 = new javax.swing.JButton();
         jToolBar1 = new javax.swing.JToolBar();
         jButton3 = new javax.swing.JButton();
         jSeparator1 = new javax.swing.JToolBar.Separator();
         jButton2 = new javax.swing.JButton();
         jLabelTabla = new javax.swing.JLabel();
         jLabelAccion = new javax.swing.JLabel();
         jLabelIra = new javax.swing.JLabel();
         jMenuBar1 = new javax.swing.JMenuBar();
         jMenu1 = new javax.swing.JMenu();
         jMenuItem1 = new javax.swing.JMenuItem();
         jMenuItem2 = new javax.swing.JMenuItem();
         jMenu2 = new javax.swing.JMenu();
         jMenuItem3 = new javax.swing.JMenuItem();
         jMenuItem4 = new javax.swing.JMenuItem();

         jTable1.setModel(new javax.swing.table.DefaultTableModel(
             new Object [][] {
                 {null, null, null, null},
                 {null, null, null, null},
                 {null, null, null, null},
                 {null, null, null, null}
             },
             new String [] {
                 "Title 1", "Title 2", "Title 3", "Title 4"
             }
         ));
         jScrollPane3.setViewportView(jTable1);

         setDefaultCloseOperation(javax.swing.WindowConstants.DISPOSE_ON_CLOSE);
         setTitle("Simulador");

         jPanel1.setBackground(new java.awt.Color(233, 244, 244));
         jPanel1.setToolTipText("");
         jPanel1.setCursor(new java.awt.Cursor(java.awt.Cursor.DEFAULT_CURSOR));
         jPanel1.setFocusable(false);

         jLabelSimulador.setFont(new java.awt.Font("Tahoma", 1, 18)); // NOI18N
         jLabelSimulador.setText("jLabel1");

         jList1.setPreferredSize(new java.awt.Dimension(706, 770));
         jScrollPane1.setViewportView(jList1);

         jLabel2.setFont(new java.awt.Font("Ubuntu", 1, 15)); // NOI18N
         jLabel2.setText("GramÃ¡tica");

         jScrollPane2.setViewportView(jList2);

         jLabel3.setFont(new java.awt.Font("Ubuntu", 1, 15)); // NOI18N
         jLabel3.setText("Funciones de Error");

         jTable2.setModel(new javax.swing.table.DefaultTableModel(
             new Object [][] {
                 {null, null, null, null},
                 {null, null, null, null},
                 {null, null, null, null},
                 {null, null, null, null}
             },
             new String [] {
                 "", "", "", ""
             }
         ) {
             boolean[] canEdit = new boolean [] {
                 false, false, false, false
             };

             public boolean isCellEditable(int rowIndex, int columnIndex) {
                 return canEdit [columnIndex];
             }
         });
         jScrollPane4.setViewportView(jTable2);

         jButton1.setText("Modificar Funciones de Error");
         jButton1.addActionListener(new java.awt.event.ActionListener() {
             public void actionPerformed(java.awt.event.ActionEvent evt) {
                 jButton1ActionPerformed(evt);
             }
         });

         jTable3.setModel(new javax.swing.table.DefaultTableModel(
             new Object [][] {
                 {},
                 {},
                 {},
                 {}
             },
             new String [] {

             }
         ));
         jScrollPane5.setViewportView(jTable3);

         jButton4.setText("Generar Informe");
         jButton4.addActionListener(new java.awt.event.ActionListener()
             {
             public void actionPerformed(java.awt.event.ActionEvent evt)
                 {
                 jButton4ActionPerformed(evt);
             }
         });

         jToolBar1.setRollover(true);

         jButton3.setFont(new java.awt.Font("Ubuntu", 1, 15)); // NOI18N
         jButton3.setText("Simular");
         jButton3.setFocusable(false);
         jButton3.setHorizontalTextPosition(javax.swing.SwingConstants.
             CENTER);
         jButton3.setVerticalTextPosition(javax.swing.SwingConstants.
             BOTTOM);
         jButton3.addActionListener(new java.awt.event.ActionListener()
             {
             public void actionPerformed(java.awt.event.ActionEvent evt)
                 {
                 jButton3ActionPerformed(evt);
             }
         });
         jToolBar1.add(jButton3);
         jToolBar1.add(jSeparator1);

         jButton2.setIcon(new javax.swing.ImageIcon(getClass().
             getResource("/es/uco/simas/resources/salir.png"))); //
             NOI18N
         jButton2.setToolTipText("Salir");
         jButton2.setFocusable(false);
         jButton2.setHorizontalTextPosition(javax.swing.SwingConstants.
             CENTER);
         jButton2.setVerticalTextPosition(javax.swing.SwingConstants.
             BOTTOM);
         jButton2.addActionListener(new java.awt.event.ActionListener()
             {
```

```java
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton2ActionPerformed(evt);
            }
        });
        jToolBar1.add(jButton2);

        jLabelTabla.setFont(new java.awt.Font("Ubuntu", 1, 15)); // NOI18N
        jLabelTabla.setText("jLabel1");

        jLabelAccion.setFont(new java.awt.Font("Ubuntu", 1, 15)); // NOI18N
        jLabelAccion.setText("Parte Accion");

        jLabelIra.setFont(new java.awt.Font("Ubuntu", 1, 15)); // NOI18N
        jLabelIra.setText("Parte Ir_a");

        javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
        jPanel1.setLayout(jPanel1Layout);
        jPanel1Layout.setHorizontalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addGap(20, 20, 20)
                        .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                            .addGroup(jPanel1Layout.createSequentialGroup()
                                .addComponent(jScrollPane4, javax.swing.GroupLayout.PREFERRED_SIZE, 465, javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(jScrollPane5, javax.swing.GroupLayout.PREFERRED_SIZE, 325, javax.swing.GroupLayout.PREFERRED_SIZE))
                            .addGroup(jPanel1Layout.createSequentialGroup()
                                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                                    .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 346, javax.
                                        swing.GroupLayout.
                                        PREFERRED_SIZE)
                                    .addGroup(jPanel1Layout.
                                        createSequentialGroup()
                                        .addGap(48, 48, 48)
                                        .addComponent(jLabelTabla)
                                        .addGap(109, 109, 109)
                                        .addComponent(jLabelAccion)))
                                .addGap(18, 18, 18)
                                .addGroup(jPanel1Layout.
                                    createParallelGroup(javax.swing.
                                    GroupLayout.Alignment.LEADING)
                                    .addComponent(jScrollPane2, javax.
                                        swing.GroupLayout.
                                        PREFERRED_SIZE, 282, javax.
                                        swing.GroupLayout.
                                        PREFERRED_SIZE)
                                    .addGroup(javax.swing.GroupLayout.
                                        Alignment.TRAILING,
                                        jPanel1Layout.
                                        createSequentialGroup()
                                        .addComponent(jLabelIra)
                                        .addGap(38, 38, 38))))
                            .addGroup(jPanel1Layout.
                                createSequentialGroup()
                                .addGap(3, 3, 3)
                                .addComponent(jLabel2)
                                .addGap(301, 301, 301)
                                .addComponent(jLabel3))))
                    .addGroup(jPanel1Layout.createSequentialGroup()
                        .addGap(174, 174, 174)
                        .addComponent(jButton1)))
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
                    Short.MAX_VALUE))
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addGap(283, 283, 283)
                .addComponent(jLabelSimulador)
                .addPreferredGap(javax.swing.LayoutStyle.
                    ComponentPlacement.RELATED, javax.swing.GroupLayout
                    .DEFAULT_SIZE, Short.MAX_VALUE)
                .addComponent(jButton4)
                .addGap(113, 113, 113))
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addComponent(jToolBar1, javax.swing.GroupLayout.
                    DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
                     Short.MAX_VALUE)
                .addContainerGap())
        );
        jPanel1Layout.setVerticalGroup(
            jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.
                Alignment.LEADING)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addComponent(jToolBar1, javax.swing.GroupLayout.PREFERRED_SIZE, 34, javax.swing.GroupLayout.PREFERRED_SIZE)
                .addGap(18, 18, 18)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jLabelSimulador)
                    .addComponent(jButton4))
                .addGap(26, 26, 26)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jLabel2)
                    .addComponent(jLabel3))
                .addGap(18, 18, 18)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addComponent(jScrollPane2, javax.swing.GroupLayout.PREFERRED_SIZE, 219, javax.swing.GroupLayout.PREFERRED_SIZE)
                            .addGroup(jPanel1Layout.createSequentialGroup()
                                .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 209, javax.swing.GroupLayout.PREFERRED_SIZE)
                                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                                    .addGroup(jPanel1Layout.createSequentialGroup()
                                        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                        .addComponent(jLabelTabla))
                                    .addGroup(jPanel1Layout.createSequentialGroup()
                                .addGap(20, 20, 20)
                                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                                    .addComponent(jLabelAccion)
                                    .addComponent(jLabelIra))))))
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)
                            .addComponent(jScrollPane5, javax.swing.GroupLayout.DEFAULT_SIZE, 254, Short.MAX_VALUE)
                            .addComponent(jScrollPane4, javax.swing.GroupLayout.PREFERRED_SIZE, 0, Short.MAX_VALUE))
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                .addComponent(jButton1)
                .addContainerGap(136, Short.MAX_VALUE))
        );

```

```
        jMenu1.setText(”Simulador”);

        jMenuItem1.setText(”Nueva Simulacion”);
        jMenu1.add(jMenuItem1);

        jMenuItem2.setText(”Salir”);
        jMenuItem2.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jButton2ActionPerformed(evt);
            }
        });
        jMenu1.add(jMenuItem2);

        jMenuBar1.add(jMenu1);

        jMenu2.setText(”Ayuda”);

        jMenuItem3.setText(”Centro de Ayuda”);
        jMenuItem3.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jMenuItem3ActionPerformed(evt);
            }
        });
        jMenu2.add(jMenuItem3);

        jMenuItem4.setText(”Acerca de ...”);
        jMenuItem4.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                jMenuItem4ActionPerformed(evt);
            }
        });
        jMenu2.add(jMenuItem4);

        jMenuBar1.add(jMenu2);

        setJMenuBar(jMenuBar1);

        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()
                .addComponent(jPanel1, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.
                        DEFAULT_SIZE, javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addGap(0, 0, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addContainerGap()
                .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                .addContainerGap())
        );

        pack();
    }// </editor-fold>//GEN-END:initComponents

    private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton2ActionPerformed
        int conf = JOptionPane.showConfirmDialog(null, "Â¿Desea salir del simulador?", "Salir",JOptionPane.YES_NO_OPTION);

        if(conf==0) {
            this.dispose();
        }
    }//GEN-LAST:event_jButton2ActionPerformed

    private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton3ActionPerformed

        if(this.metodoSimulacion == 1){
            NuevaSimulacionDesc simDesc = new NuevaSimulacionDesc(this.gramatica, this);
            simDesc.setVisible(true);
            simDesc.setLocationRelativeTo(null);
        }
        if(this.metodoSimulacion == 2){
            NuevaSimulacionAsc simAsc = new NuevaSimulacionAsc(this.gramatica, this);
            simAsc.setVisible(true);
            simAsc.setLocationRelativeTo(null);
        }

    }//GEN-LAST:event_jButton3ActionPerformed

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton1ActionPerformed
        if(this.metodoSimulacion == 1){
            new VentanaSimuladorDesc(this.gramatica).cambiarPaso(4);
            this.dispose();
        }
        if(this.metodoSimulacion == 2){
            new VentanaSimuladorAsc(this.gramatica).cambiarPaso(5);
            this.dispose();
        }
    }//GEN-LAST:event_jButton1ActionPerformed

    private void jButton4ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jButton4ActionPerformed

        Boolean resultado= null;
        FileNameExtensionFilter filtro= null;
        JFileChooser selector= null;

        JFileChooser chooser = new JFileChooser();
        selector=chooser;
        FileNameExtensionFilter extension = new FileNameExtensionFilter(”Informes de simulacion Ascendente (.pdf)”,new String[]
            {”pdf”});
        filtro=extension;
        selector.setFileFilter(filtro);
        File fichero= new File(””);
        if(this.metodoSimulacion==1)
            fichero = new File(”informeSimulacionDesc.pdf”);
        if(this.metodoSimulacion==2)
            fichero = new File(”informeSimulacionAsc.pdf”);
        selector.setSelectedFile(fichero);
        if(selector.showSaveDialog(null)==0) {
            try {
                resultado = this.generarInforme(selector.getSelectedFile().toString());
            } catch (DocumentException ex) {
                Logger.getLogger(Editor.class.getName()).log(Level.SEVERE, null, ex);
            }

          if(resultado.booleanValue())  {
            StringBuilder JdecGenerated80 = new StringBuilder();

          }  else  {
              JOptionPane.showConfirmDialog(null,”El informe de la gramÃ¡tica no se puede generar hasta que la gramÃ¡tica estÃ© validada.”, ”Informe de la gramÃ¡tica”, JOptionPane.DEFAULT_OPTION);
          }
        }

    }//GEN-LAST:event_jButton4ActionPerformed

    private void jMenuItem3ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jMenuItem3ActionPerformed
        // TODO add your handling code here:
    }//GEN-LAST:event_jMenuItem3ActionPerformed

    private void jMenuItem4ActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_jMenuItem4ActionPerformed
        AcercaDe acerca = new AcercaDe();
        acerca.setVisible(true);
        acerca.setLocationRelativeTo(null);
    }//GEN-LAST:event_jMenuItem4ActionPerformed

    public Gramatica getGramatica(){
        return this.gramatica;
    }

    public ArrayList<Terminal> getCadenaEntrada() {
        return cadenaEntrada;
    }

    public void setCadenaEntrada(ArrayList<Terminal> cadenaEntrada) {
        this.cadenaEntrada = cadenaEntrada;
    }

    public int getMetodoSimulacion() {
        return this.metodoSimulacion;
    }

    public void setMetodoSimulacion(int metodoSimulacion) {
        this.metodoSimulacion = metodoSimulacion;
    }

    public int getModoFuncionamiento() {
        return modoFuncionamiento;
    }

    public void setModoFuncionamiento(int modoFuncionamiento) {
        this.modoFuncionamiento = modoFuncionamiento;
    }

    public int getMetodoAscendente() {
        return this.metodoAscendente;
    }

    public void setMetodoAscendente(int metodoAscendente) {
        this.metodoAscendente = metodoAscendente;
    }

    public String actualizarVisualizacion(){
        String cadena ="";
        ArrayList<Terminal> cadenaEntrada = this.getCadenaEntrada();
        int i = 0;
        while (i < cadenaEntrada.size()){
            cadena = cadena+cadenaEntrada.get(i).getNombre()+" ";
            i++;
        }
        return cadena;
    }

    // Variables declaration - do not modify//GEN-BEGIN:variables
    private javax.swing.JButton jButton1;
    private javax.swing.JButton jButton2;
    private javax.swing.JButton jButton3;
    private javax.swing.JButton jButton4;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JLabel jLabel3;
    private javax.swing.JLabel jLabelAccion;
    private javax.swing.JLabel jLabelIra;
    private javax.swing.JLabel jLabelSimulador;
    private javax.swing.JLabel jLabelTabla;
    private javax.swing.JList jList1;
    private javax.swing.JList jList2;
    private javax.swing.JMenu jMenu1;
    private javax.swing.JMenu jMenu2;
    private javax.swing.JMenuBar jMenuBar1;
    private javax.swing.JMenuItem jMenuItem1;
    private javax.swing.JMenuItem jMenuItem2;
    private javax.swing.JMenuItem jMenuItem3;
    private javax.swing.JMenuItem jMenuItem4;
    private javax.swing.JPanel jPanel1;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JScrollPane jScrollPane2;
    private javax.swing.JScrollPane jScrollPane3;
    private javax.swing.JScrollPane jScrollPane4;
    private javax.swing.JScrollPane jScrollPane5;
    private javax.swing.JToolBar.Separator jSeparator1;
    private javax.swing.JTable jTable1;
    private javax.swing.JTable jTable2;
    private javax.swing.JTable jTable3;
    private javax.swing.JToolBar jToolBar1;
    // End of variables declaration//GEN-END:variables
}
```

2.5.18. VentanaSimuladorAsc.java

```
//SimAS / Simulador
//Ventana simulador Ascendente

package es.uco.simas.simulador;

import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.SimAS;
import es.uco.simas.editor.ColCanLR0;
import es.uco.simas.editor.ColCanLR1;
import es.uco.simas.editor.ColCanLALR;

/**
 * @author vanesa
 */
public class VentanaSimuladorAsc extends javax.swing.JFrame {

   private PanelNuevaSimAscPaso1 paso1;
   PanelNuevaSimAscPaso2 paso2;
   private PanelNuevaSimAscPaso3 paso3;
   private PanelNuevaSimAscPaso4 paso4;
   private PanelNuevaSimAscPaso5 paso5;
   private PanelNuevaSimAscPaso6 paso6;

   public  Simulador simulacion  ;
   public Gramatica gramatica;
   public int metodo = -1;

    public VentanaSimuladorAsc(Gramatica gramatica) {
        initComponents();
        this.gramatica = gramatica;
        this.setResizable(false);
        PanelNuevaSimAscPaso1 paso1 = new PanelNuevaSimAscPaso1(this);
        this.paso1 = paso1;

        PanelNuevaSimAscPaso2 paso2 = new PanelNuevaSimAscPaso2(this);
        this.paso2 = paso2;

        this.getContentPane().removeAll();
        this.setContentPane(this.paso1);
        this.pack();
        this.validate();
        this.setTitle(”Simulador Ascendente. Paso 1 de 5”);
        this.setVisible(true);
        this.setLocationRelativeTo(null);

    }

    public Simulador getSimulador(){
        return this.simulacion;
    }
    public void setSimulador(Simulador sim){
        this.simulacion = sim;
    }
    public void setMetodo(int m){
        this.metodo = m;
    }
    public int getMetodo(){
        return this.metodo;
    }

    public void cambiarPaso( int paso) {
    switch(paso){
      case 1:{
        this.setContentPane(this.paso1);
        this.pack();
        this.setVisible(true);
```

```
          this.validate();
          this.setTitle(”Simulador Ascendente. Paso 1 de 5”);
          break;
        }
       case 2: {
          this.setContentPane(this.paso2);
          this.pack();
          this.setVisible(true);
          this.validate();
          this.gramatica.generarConjPrim();
          this.gramatica.generarConjSig();
          this.paso2.construirConjuntos(this.gramatica);
          this.setTitle(”Simulador Ascendente. Paso 2 de 5”);
          this.setLocationRelativeTo(null);
          break;
        }
        case 3:
        {
          PanelNuevaSimAscPaso3 paso3 = new PanelNuevaSimAscPaso3(this);
          this.paso3 = paso3;
          this.setContentPane(this.paso3);
          this.pack();
          this.setVisible(true);
          this.validate();
          this.setTitle(”Simulador Ascendente. Paso 3 de 5”);
          break;
        }
        case 4:
        {
          PanelNuevaSimAscPaso4 paso4 = new PanelNuevaSimAscPaso4(this);
          this.paso4 = paso4;
          this.setContentPane(this.paso4);
          this.pack();
          this.setVisible(true);
          this.validate();
          this.setTitle(”Simulador Ascendente. Paso 4 de 5”);
          break;
        }
        case 5:
        {
          PanelNuevaSimAscPaso5 paso5 = new PanelNuevaSimAscPaso5(this);
          this.paso5 = paso5;
          this.setContentPane(this.paso5);
          this.pack();
          this.setVisible(true);
          this.validate();
          this.setTitle(”Simulador Ascendente. Paso 5 de 5”);
          this.setLocationRelativeTo(null);
          break;
        }
        case 6:
        {
          PanelNuevaSimAscPaso6 paso6 = new PanelNuevaSimAscPaso6(this);
```

```java
        this.paso6 = paso6;
        this.setContentPane(this.paso6);
        this.pack();
        this.setVisible(true);
        this.validate();
        this.setTitle("Simulador Ascendente. Paso 6 de 6");
        this.setLocationRelativeTo(null);
        break;
      }
    }
}
    public Gramatica getGramatica(){
        return this.gramatica;
    }

    void setGramatica(Gramatica gr){
        this.gramatica = gr;
    }

    public void finalizarAsistente(){
        this.dispose();
        SimAS simas = new SimAS();
        simas.lanzarSimulador(2, this.gramatica, this.getMetodo());
    }

    public void setColeccion(ColCanLR0 col){
        this.gramatica.setColeccionLR0(col);
    }

    public void setColeccion(ColCanLR1 col){
       this.gramatica.setColeccionLR1(col);
    }

    public void setColeccion(ColCanLALR col){
       this.gramatica.setColeccionLALR(col);
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    private void initComponents() {

        setDefaultCloseOperation(javax.swing.WindowConstants.DISPOSE_ON_CLOSE);
        setBounds(new java.awt.Rectangle(0, 0, 0, 0));
        setCursor(new java.awt.Cursor(java.awt.Cursor.DEFAULT_CURSOR));

        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();
    }// </editor-fold>//GEN-END:initComponents

    // Variables declaration - do not modify//GEN-BEGIN:variables
    // End of variables declaration//GEN-END:variables
}
```

2.5.19. VentanaSimuladorDesc.java

```
//SimAS / Simulador
//Ventana simulador Descendente

package es.uco.simas.simulador;

import es.uco.simas.util.gramatica.Gramatica;
import es.uco.simas.SimAS;
import es.uco.simas.util.gramatica.NoTerminal;
import es.uco.simas.util.gramatica.Produccion;
import java.util.ArrayList;

/**
 * @author Vanesa
 */
public class VentanaSimuladorDesc extends javax.swing.JFrame {

    private PanelNuevaSimDescPaso1 paso1;
    private PanelNuevaSimDescPaso2 paso2;
    private PanelNuevaSimDescPaso3 paso3;
    private PanelNuevaSimDescPaso4 paso4;
    private PanelNuevaSimDescPaso5 paso5;

    Gramatica gramatica;
    ArrayList<NoTerminal> noTerminales = new ArrayList<>();
    ArrayList<Produccion> pr = new ArrayList<>();

    public VentanaSimuladorDesc(Gramatica gramatica) {
        initComponents();
        this.gramatica = gramatica;

        this.setResizable(false);

        PanelNuevaSimDescPaso1 paso1 = new PanelNuevaSimDescPaso1(this);
        this.paso1 = paso1;

        PanelNuevaSimDescPaso3 paso3 = new PanelNuevaSimDescPaso3(this);
        this.paso3 = paso3;

        PanelNuevaSimDescPaso4 paso4 = new PanelNuevaSimDescPaso4(this);
        this.paso4 = paso4;

        this.getContentPane().removeAll();
        this.setContentPane(this.paso1);
        this.pack();
        this.validate();
        this.setTitle(”Simulador Descendente. Paso 1 de 5”);
        this.setVisible(true);
        this.setLocationRelativeTo(null);
    }

    public Gramatica getGramatica(){
        return this.gramatica;
    }

    public void setGramatica(Gramatica gramatica){
        this.gramatica = gramatica;
    }

    public ArrayList<NoTerminal> getNoTerminales() {
        return noTerminales;
    }

    public void setNoTerminales(ArrayList<NoTerminal> noTerminales) {
        this.noTerminales = noTerminales;
    }

    public ArrayList<Produccion> getPr() {
        return pr;
    }

    public void setPr(ArrayList<Produccion> pr) {
        this.pr = pr;
    }

    public void cambiarPaso(int paso) {
        switch(paso){

            case 1:{

                this.setContentPane(this.paso1);
                this.pack();
                this.setVisible(true);
                this.validate();
                this.setTitle(”Simulador Descendente. Paso 1 de 5”);
                break;

            }
            case 2: {
                this.setTitle(”Simulador Descendente. Paso 2 de 5”);
                PanelNuevaSimDescPaso2 paso2 = new
                    PanelNuevaSimDescPaso2(this);
                this.paso2 = paso2;
                this.setContentPane(this.paso2);
                this.pack();
                this.setVisible(true);
                this.validate();
                this.gramatica.generarConjPrim();
                this.gramatica.generarConjSig();
                this.paso2.construirConjuntos(this.gramatica);
                this.setTitle(”Simulador Descendente. Paso 2 de 5”);
                break;

            }
            case 3:{
                this.setContentPane(this.paso3);
                this.pack();
                this.setVisible(true);
                this.validate();
                this.paso3.ConstruirTPredictiva(this.gramatica);
                this.setTitle(”Simulador Descendente. Paso 3 de 5”);
                break;

            }
            case 4:{
                this.setContentPane(this.paso4);
                this.pack();
                this.setVisible(true);
                this.validate();
                this.setTitle(”Simulador Descendente. Paso 4 de 5”);
                break;

            }
            case 5:{
                PanelNuevaSimDescPaso5 paso5 = new
                    PanelNuevaSimDescPaso5((VentanaSimuladorDesc)this);
                this.paso5 = paso5;
                this.setContentPane(this.paso5);
                this.pack();
                this.setVisible(true);
                this.validate();
                this.setTitle(”Simulador Descendente. Paso 5 de 5”);
                break;

            }
        }
    }

    public void finalizarAsistente(){
        this.dispose();
        SimAS simas = new SimAS();
        simas.lanzarSimulador(1, this.gramatica, -1);
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings(”unchecked”)
    // <editor-fold defaultstate=”collapsed” desc=”Generated Code”>//GEN-BEGIN:initComponents
    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();
    }// </editor-fold>//GEN-END:initComponents

    // Variables declaration - do not modify//GEN-BEGIN:variables
    // End of variables declaration//GEN-END:variables
}
```

2.6. Paquete Gramática

2.6.1. Antecedente.java

```
//SimAS / Gramatica
//Antecedente

package es.uco.simas.util.gramatica;

/**
 * @author vanesa
 */
public class Antecedente extends javax.swing.JFrame {

    NoTerminal simboloNT = new NoTerminal(null,null);

    public Antecedente() {
        initComponents();
    }

    public NoTerminal getSimboloNT() {
        return simboloNT;
    }

    public void setSimboloNT(NoTerminal simboloNT) {
       this.simboloNT = simboloNT;
    }


    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings(”unchecked”)
    // <editor-fold defaultstate=”collapsed” desc=”Generated Code”>//GEN-BEGIN:initComponents
    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)
```

```java
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGap(0, 300, Short.MAX_VALUE)
        );

        pack();
    }// </editor-fold>//GEN-END:initComponents

    // Variables declaration - do not modify//GEN-BEGIN:variables
    // End of variables declaration//GEN-END:variables
}
```

2.6.2. Consecuente.java

```java
//SimAS / Gramatica
//Consecuente

package es.uco.simas.util.gramatica;

import java.util.ArrayList;

/**
 * @author vanesa
 */
public class Consecuente extends javax.swing.JFrame {

    ArrayList<Simbolo> conjSimbolos = new ArrayList<>();

    public Consecuente() {
        initComponents();
    }

    public ArrayList<Simbolo> getConjSimbolos() {
        return conjSimbolos;
    }

    public void setConjSimbolos(ArrayList<Simbolo> conjSimbolos) {
        this.conjSimbolos = conjSimbolos;
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    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();
    }// </editor-fold>//GEN-END:initComponents

    // Variables declaration - do not modify//GEN-BEGIN:variables
    // End of variables declaration//GEN-END:variables
}
```

2.6.3. Gramatica.java

```
//SimAS / Gramatica
//Gramatica

package es.uco.simas.util.gramatica;

import com.itextpdf.text.BadElementException;
import com.itextpdf.text.BaseColor;
import com.itextpdf.text.Chunk;
import com.itextpdf.text.DocumentException;
import com.itextpdf.text.Font;
import com.itextpdf.text.Image;
import com.itextpdf.text.PageSize;
import com.itextpdf.text.Paragraph;
import com.itextpdf.text.pdf.BaseFont;
import com.itextpdf.text.pdf.draw.LineSeparator;
import com.itextpdf.text.pdf.PdfWriter;
import es.uco.simas.editor.ColCanLR0;
import es.uco.simas.editor.ColCanLR1;
import es.uco.simas.editor.ColCanLALR;
import es.uco.simas.editor.Editor;
import es.uco.simas.editor.TablaLR;
import es.uco.simas.editor.TablaPredictiva;
import java.util.*;
import java.io.File;
import javax.swing.JFileChooser;
import javax.swing.filechooser.FileNameExtensionFilter;
import javax.swing.DefaultListModel;
import java.io.*;
import java.net.MalformedURLException;
import java.util.logging.Level;
import java.util.logging.Logger;
import javax.xml.parsers.DocumentBuilder;
import javax.xml.parsers.DocumentBuilderFactory;
import javax.xml.parsers.ParserConfigurationException;
import org.w3c.dom.Document;
import org.w3c.dom.Element;
import org.w3c.dom.Node;
import org.w3c.dom.NodeList;
import org.xml.sax.SAXException;

/**
 * @author vanesa
 */
public class Gramatica extends javax.swing.JFrame {

    public String nombre;
    public String descripcion;
    public String simbInicial;
    public int estado;
    ArrayList<Terminal> terminales = new ArrayList<>();
    ArrayList<NoTerminal> noTerminales = new ArrayList<>();
    ArrayList<Produccion> pr = new ArrayList<>();
    DefaultListModel noTerm = new DefaultListModel();
    DefaultListModel term = new DefaultListModel();
    DefaultListModel producciones = new DefaultListModel();
    TablaPredictiva tpredictiva = new TablaPredictiva();
    TablaLR tlr;
    ColCanLR0 coleccionLR0;
    ColCanLR1 coleccionLR1;
    ColCanLALR coleccionLALR;


    public Gramatica (String nombre, String descripcion){
        this.nombre = nombre;
        this.descripcion = descripcion;
    }

    public Gramatica() {
        initComponents();
    }

    /**
```

```
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    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();
    }// </editor-fold>//GEN-END:initComponents

    public String getNombre() {
        return nombre;
    }

    public void setNombre(String nombre) {
        this.nombre = nombre;
    }

    public String getDescripcion() {
        return descripcion;
    }

    public void setDescripcion(String descripcion) {
        this.descripcion = descripcion;
    }

    public int getEstado() {
        return estado;
    }

    public void setEstado(int estado) {
        this.estado = estado;
    }

    public    void setVocabulario(  DefaultListModel noTerm,
       DefaultListModel term) {
      this.noTerm.clear();
      this.noTerminales.clear();
      this.term.clear();
      this.terminales.clear();
      int  i= 0;
      if(noTerm!=  null) {
            i=0;
            while(true) {
                if(i >= noTerm.size())  {
                    break;
                }
                if(i <noTerm.size())   {
                    NoTerminal noterminal = new NoTerminal((String)
                       noTerm.get(i),(String)noTerm.get(i));
                    this.noTerminales.add(noterminal);
                    i = i+1;
                }
            }
        }
        if(term !=  null) {
            i=0;
            while(true)  {
                if(i >= term.size())   {
                    break;
                }
                if(i <term.size())  {
                    Terminal terminal = new Terminal((String)term.get(i
                       ), (String)term.get(i));
                    this.terminales.add(terminal);
                    i = i+1;
                }
            }
        }
    }
    public DefaultListModel getNoTerminales(){
        return this.noTerm;
    }

    public ArrayList<Terminal> getTerm() {
        return terminales;
    }

    public ArrayList<NoTerminal> getNoTerm() {
        return noTerminales;
    }

    public void setNoTerminales(DefaultListModel noTerminales){
        this.noTerminales.clear();
        this.noTerm = noTerminales;
```

```

         int i=0;
         if(noTerminales !=null){
            while(i < this.noTerm.size()){
                NoTerminal nt = new NoTerminal(this.noTerm.getElementAt(i).toString(),this.noTerm.getElementAt(i).toString());
                this.noTerminales.add(nt);
                i++;
            }
        }
    }

    public DefaultListModel getTerminales(){
        return term;
    }

     public void setTerminales(DefaultListModel te){
         this.terminales.clear();
         this.term.clear();
         int i=0;

         if(te != null){
            this.term = te;
             if(terminales !=null){
               while(i < this.term.size()){
                   Terminal t = new Terminal(this.term.getElementAt(i).toString(),this.term.getElementAt(i).toString());
                   this.terminales.add(t);
                   i++;
               }
             }
         }
     }

    public void setTerminales(ArrayList<Terminal> terminales) {
        this.terminales = terminales;
    }

    public DefaultListModel getProducciones() {
        return producciones;
    }

    public ArrayList<Produccion> getPr() {
        return pr;
    }

    public void setPr(ArrayList<Produccion> pr) {
        this.pr = pr;
    }

    public void setProducciones(DefaultListModel produc){

        this.producciones = produc;
        this.pr = new ArrayList();

        int i,j= 0;
        if(produc!=  null)  {
          i=0;

            while(i < produc.size()){

                String valor = produc.getElementAt(i).toString();
                String antec = ””;
                String [] separado;
                separado = valor.split(” ”);

                Antecedente antecedente = new Antecedente();
                ArrayList<Simbolo> consecuente = new ArrayList<>();
                antec = separado[0];


                j=2;
                while(j < separado.length){

                    Simbolo simb = new Simbolo(separado[j],separado[j])
                        ;

                     consecuente.add(simb);
                    j++;
                }
                NoTerminal nt = new NoTerminal(null,null);
                nt.setValor(antec);
                nt.setNombre(antec);
                antecedente.setSimboloNT(nt);
                Produccion produccion = new Produccion();
                produccion.setAntec(antecedente);
                produccion.setConsec(consecuente);
                this.pr.add(produccion);

              i ++;
            }
        }
    }

    public void setSimbInicial(String simInicial){
        this.simbInicial = simInicial;
    }

    public String getSimbInicial(){
        return this.simbInicial;
    }

    public void selecSimboloInicial(String simInicial){

        int i= 0;
        if(this.noTerminales!=  null) {
            i=0;
            while(true)   {
                if(i >= this.noTerminales.size()) {
                break;
                }
                if(i <this.noTerminales.size())  {
                    if(noTerminales.get(i).toString().equals(simInicial)){

                        this.noTerminales.get(i).setSimboloInicial(true);
                        break;
                    }else{
                    i = i+1;
                    }
                }
            }
        }
     }

    public int guardarGramatica( )  {
        FileNameExtensionFilter filtro = new FileNameExtensionFilter("Archivos de XML", "xml");
        JFileChooser fileChooserGuardar = new JFileChooser();
        fileChooserGuardar.setFileFilter(filtro);
        fileChooserGuardar.setDialogTitle("Guardar");
        String documentoXml= "";
        FileWriter fstream= null;
        BufferedWriter out= null;
        String nombreFichero= null;
        String causasError= null;
        String codigoError= null;
        JFileChooser selector= null;
        String mensajeError= null;

        int seleccion = fileChooserGuardar.showSaveDialog(null);

        if (seleccion == JFileChooser.APPROVE_OPTION) {
            File file = fileChooserGuardar.getSelectedFile();
            StringBuilder doc = new StringBuilder();
            documentoXml =doc.append(documentoXml).append("<?xml version=\"1.0\" encoding=\"UTF-8\"?>\n").toString();
            StringBuilder doc2 = new StringBuilder();
            documentoXml =doc2.append(documentoXml).append("<?xml-stylesheet type=\"text/xsl\" href=\"gramatica.xsl\"?>\n").toString();
            StringBuilder doc3 = new StringBuilder();
            documentoXml =doc3.append(documentoXml).append("<grammar>\n").toString();
            StringBuilder nombre = new StringBuilder();
```

```
documentoXml =nombre.append(documentoXml).append(”\t<name>”
    ).append(this.getNombre()).append(”</name>\n”).toString
    ();
StringBuilder desc = new StringBuilder();
documentoXml =desc.append(documentoXml).append(”\t<
    description>”).append(this.getDescripcion()).append(”</
    description>\n”).toString();
StringBuilder nTerm = new StringBuilder();
documentoXml =nTerm.append(documentoXml).append(”\t<non−
    terminal−symbols>\n”).toString();
int i=0;
while(true)    {
    if(i >= this.noTerminales.size())   {
        break;
    }
    if(i < this.noTerminales.size())    {
        StringBuilder JdecGenerated162 = new StringBuilder
            ();
        documentoXml =JdecGenerated162.append(documentoXml)
            .append(”\t\t<non−terminal>\n\t\t\t<value>”).
            append(this.getNoTerminales().get(i)).append(”
            </value>\n\t\t</non−terminal>\n”).toString();
        i = i+1;
        continue   ;
    }

}
StringBuilder JdecGenerated210 = new StringBuilder();
documentoXml =JdecGenerated210.append(documentoXml).append(
    ”\t</non−terminal−symbols>\n”).toString();
StringBuilder JdecGenerated230 = new StringBuilder();
documentoXml =JdecGenerated230.append(documentoXml).append(
    ”\t<terminal−symbols>\n”).toString();
i=0;
while(true) {
    if(i >= this.terminales.size()) {
         break;
    }
    if(i < this.terminales.size())  {
      StringBuilder JdecGenerated263 = new StringBuilder();
      documentoXml =JdecGenerated263.append(documentoXml).
          append(”\t\t<terminal>\n\t\t\t<value>”).append(
          this.getTerminales().get(i)).append(”</value>\n\t
          \t</terminal>\n”).toString();
      i = i+1;
      continue   ;
    }

}
StringBuilder JdecGenerated311 = new StringBuilder();
documentoXml =JdecGenerated311.append(documentoXml).append(
    ”\t</terminal−symbols>\n”).toString();
StringBuilder JdecGenerated331 = new StringBuilder();
```

```
        documentoXml =JdecGenerated331.append(documentoXml).append("\t<init-symbol>").append(this.getSimbInicial()).append("</init-symbol>\n").toString();
        StringBuilder JdecGenerated366 = new StringBuilder();
        documentoXml =JdecGenerated366.append(documentoXml).append("\t<rule-set>\n").toString();
        i=0;
        if(this.producciones != null){
            while(true)    {
                if(i >= this.producciones.size()){
                    break;
                }
                if(i < this.producciones.size()) {
                    StringBuilder JdecGenerated399 = new StringBuilder();
                    documentoXml =JdecGenerated399.append(documentoXml).append("\t\t<rule>\n\t\t\t<value>").append(this.getProducciones().get(i)).append("</value>\n\t\t</rule>\n").toString();
                    i = i+1;
                }
            }
        }
        StringBuilder JdecGenerated859 = new StringBuilder();
        documentoXml =JdecGenerated859.append(documentoXml).append("\t</rule-set>\n").toString();
        StringBuilder JdecGenerated879 = new StringBuilder();
        documentoXml =JdecGenerated879.append(documentoXml).append("</grammar>\n").toString();

        try   {
            nombreFichero=fileChooserGuardar.getSelectedFile().toString();
            if(!nombreFichero.contains(".xml"))    {
                StringBuilder JdecGenerated998 = new StringBuilder();
                nombreFichero =JdecGenerated998.append(nombreFichero).append(".xml").toString();
            }

            FileWriter JdecGenerated1020 = new FileWriter(nombreFichero);
            fstream=JdecGenerated1020;
            BufferedWriter JdecGenerated1031 = new BufferedWriter(fstream);
            out=JdecGenerated1031;
            out.write(documentoXml);
            out.close();
            return 1;

        }  catch(IOException  e)  {
            codigoError="E-8";
```

```
                mensajeError=”Error de entrada−salida al guardar el
                    fichero de gram\u00e1tica.”;
                StringBuilder JdecGenerated1065 = new StringBuilder();
                causasError=JdecGenerated1065.append(”<br/>&nbsp;&nbsp
                    ;&nbsp;&nbsp;<b>Causas del error</b><br/><
                    blockquote><ul><li>No hay espacio de disco <b>
                    suficiente</b>.<br><br/></li><li>No tienes <b>
                    permisos de escritura</b> en el directorio.<br><br
                    /></li><li>El sistema de archivos est\u00e1 <b>
                    fallando</b></li></ul></blockquote>&nbsp;&nbsp;&
                    nbsp;&nbsp;<b>Soluciones</b><blockquote><ul><li>
                    Revisa que hay <b>espacio libre</b> en el disco<br
                    ><br/></li><li>Revisa que tienes <b>permisos de
                    escritura</b> en el directorio de guardado.<br><br
                    /></li><li>Revisa que el sistema de archivos no est
                    \u00e9 fallando y comprueba la <b>excepci\u00f3n
                    java</b> para m\u00e1s informaci\u00f3n.</li></ul
                    ></blockquote>&nbsp;&nbsp;&nbsp;&nbsp;<b>Excepci\
                    u00f3n JAVA</b><blockquote><b>IOException</b>: ”).
                    append(e.getLocalizedMessage().toString()).append(”
                    <br/></blockquote>”).toString();
            }
          return −1;
        }
        return −2;
     }

    public   Gramatica cargarGramatica( )  {
        FileNameExtensionFilter filtro= null;
        Gramatica gramatica= null;
        JFileChooser selector= null;

        JFileChooser JdecGenerated23 = new JFileChooser();
        selector=JdecGenerated23;
        FileNameExtensionFilter JdecGenerated10 = new
           FileNameExtensionFilter(”Gramaticas de SimAS (.xml)”,new
           String[]{”xml”});
        filtro=JdecGenerated10;
        selector.setFileFilter(filtro);

        if(selector.showOpenDialog(null)==0) {
            Gramatica gram = new Gramatica();
            gramatica=gram;
            if(gramatica!=  null) {
                StringBuilder JdecGenerated72 = new StringBuilder();
            }
        }

        String nombreFichero = null;
        if(selector.getSelectedFile() != null)
            nombreFichero=selector.getSelectedFile().toString();

        Document doc= null;
```

```java
        DocumentBuilder db= null;
        DocumentBuilderFactory dbf= null;
        Element elemento= null;
        Element elementoAntecedente= null;
        Element elementoConsecuente= null;
        Element elementoTipo= null;
        Element elementoValor= null;
        File file= null;
        NoTerminal noTerminal= null;
        Node nodo= null;
        Node nodoAntecedente= null;
        Node nodoConsecuente= null;
        Node nodoTipo= null;
        Node nodoValor= null;
        NodeList description= null;
        NodeList initSymbol= null;
        NodeList name= null;
        NodeList nodeNonTerminalSymbols= null;
        NodeList nodeRules= null;
        NodeList nodeTerminalSymbols= null;
        NodeList valueNode= null;
        NodeList valueNodeAntecedente= null;
        NodeList valueNodeConsecuente= null;
        NodeList valueNodoTipo= null;
        NodeList valueNodoValor= null;
        Produccion produccion= null;
        String causasError= null;
        String codigoError= null;
        String descripcion= null;
        String mensajeError= null;
        String nombre= null;
        String simboloInicial= null;
        Terminal terminal= null;
        DefaultListModel NT = new DefaultListModel();
        DefaultListModel term = new DefaultListModel();
        DefaultListModel prod = new DefaultListModel();

        int i= 0;
        int j= 0;
        try    {
            if(nombreFichero != null)    {
                File JdecGenerated2 = new File(nombreFichero);
                file=JdecGenerated2;
                dbf=DocumentBuilderFactory.newInstance();
                db=dbf.newDocumentBuilder();
                doc=db.parse(file);
                doc.getDocumentElement().normalize();
                name=doc.getDocumentElement().getElementsByTagName(”name”);
                nombre=name.item(0).getChildNodes().item(0).getNodeValue().toString();
                description=doc.getDocumentElement().getElementsByTagName(”description”);
                descripcion=description.item(0).getChildNodes().item(0)
                    .getNodeValue().toString();
                Gramatica JdecGenerated129 = new Gramatica(nombre,
                    descripcion);
                gramatica=JdecGenerated129;
                nodeNonTerminalSymbols=doc.getElementsByTagName(”non−
                    terminal”);
                i=0;
                while(true) {
                    if(i >= nodeNonTerminalSymbols.getLength())  {
                        gramatica.setNoTerminales(NT);
                        break;
                    }
                    if(i < nodeNonTerminalSymbols.getLength()) {
                        nodo=nodeNonTerminalSymbols.item(i);
                        elemento=(Element)nodo;
                        valueNode=elemento.getElementsByTagName(”value”
                            );
                        NT.addElement(valueNode.item(0).getChildNodes()
                            .item(0).getNodeValue());
                        i = i+1;
                        continue  ;
                    }

                }
                nodeTerminalSymbols=doc.getElementsByTagName(”terminal”
                    );
                i=0;
                while(true) {
                    if(i >= nodeTerminalSymbols.getLength()) {
                        gramatica.setTerminales(term);
                        break;
                    }
                    if(i < nodeTerminalSymbols.getLength()){
                        nodo=nodeTerminalSymbols.item(i);
                        elemento=(Element)nodo;
                        valueNode=elemento.getElementsByTagName(”value”
                            );
                        term.addElement(valueNode.item(0).getChildNodes
                            ().item(0).getNodeValue());
                        i = i+1;
                        continue  ;
                    }

                }
                this.setVocabulario(NT, term);
                initSymbol=doc.getDocumentElement().
                    getElementsByTagName(”init−symbol”);
                simboloInicial=initSymbol.item(0).getChildNodes().item
                    (0).getNodeValue().toString();
                gramatica.setSimbInicial(simboloInicial);

                nodeRules=doc.getElementsByTagName(”rule”);
                i=0;
                while(true) {
                  if(i >= nodeRules.getLength()) {
                    break;
                  }
                  if(i < nodeRules.getLength()) {
                    nodo=nodeRules.item(i);
                    elemento=(Element)nodo;
                    valueNode=elemento.getElementsByTagName("value");
                    prod.addElement(valueNode.item(0).getChildNodes().item(0).getNodeValue());

                    i = i+1;
                  }
                }
                gramatica.setProducciones(prod);

                return gramatica;
            }

        } catch(IOException  e)   {
          codigoError="E-6";
          mensajeError="Error de formato al cargar el fichero de gram\u00e1tica.";
          StringBuilder JdecGenerated713 = new StringBuilder();
          causasError=JdecGenerated713.append("<br/>&nbsp;&nbsp;&nbsp;&nbsp;<b>Causas del error</b><br/><blockquote><ul><li>El formato de la gram\u00e1tica no es correcto. \u00bfHas modificado el fichero manualmente?.<br><br/></li><li>Es posible que el fichero est\u00e9 corrupto, debido a un fallo del S.O. o del sistema de archivos.</li></ul></blockquote>&nbsp;&nbsp;&nbsp;&nbsp;<b>Soluciones</b><blockquote><ul><li>Crea la gram\u00e1tica de nuevo a partir de un informe de gram\u00e1tica o intenta recuperarla de otro fichero. Este error es cr\u00edtico y no se puede <b>recuperar</b> la gram\u00e1tica del fichero da\u00f1ado.<br><br/></li><li>Podr\u00edas intentar seguir la <b>excepci\u00f3n de java</b> e intentar <b>reconstruir</b> el fichero (no es recomendable)</li></ul></blockquote>&nbsp;&nbsp;&nbsp;&nbsp;<b>Excepci\u00f3n JAVA</b><blockquote><b>SAXParseException</b>: ").append(e.getLocalizedMessage().toString().replaceAll("/","\u2215").replaceAll("<","").replaceAll(">","")).append("<br/></blockquote>").toString();

        }   catch (ParserConfigurationException ex) {
            Logger.getLogger(Gramatica.class.getName()).log(Level.SEVERE, null, ex);
        } catch (SAXException ex) {
            Logger.getLogger(Gramatica.class.getName()).log(Level.SEVERE, null, ex);
        }

        return null;
    }

    public   ArrayList<String> validarGramatica(  )  {

        ArrayList<String> mensajesError = new ArrayList();
        ArrayList<Simbolo> conjSimbolos= new ArrayList();
        Antecedente antec = new Antecedente();

        Iterator i= null;
        Antecedente antecedente= null;
        Produccion produccion= new Produccion();
        Simbolo simbolo= null;
        NoTerminal nt = null;
        Terminal t = null;
        int encontrado= 0;
        int errorIndex= 0;
        int simbolosNoTerminalesEncontrados= 0;
        int simbolosTerminalesEncontrados= 0;
        errorIndex=1;
        this.setEstado(1);

        if(this.producciones==null) {
            this.setEstado(-1);
            StringBuilder mensaje = new StringBuilder();
            mensajesError.add(mensaje.append("<b>").append(errorIndex++).append("</b>").append(". <font color=\"red\"><i>No existen producciones</i>.</font><br> La gramÃ¡tica no contiene ninguna <b>produccion</b>. DeberÃa contener al menos una para poder ser vÃ¡lida.<br></br>").toString());
        }
        if(this.terminales.isEmpty() == true) {
            this.setEstado(-1);
            StringBuilder mensaje = new StringBuilder();
            mensajesError.add(mensaje.append("<b>").append(errorIndex++).append("</b>").append(". <font color=\"red\"><i>No existen sÃmbolos terminales</i></font>.<br> La gramÃ¡tica no contiene ningÃºn <b>sÃmbolo terminal</b>. DeberÃa contener al menos uno para poder ser vÃ¡lida.<br></br>").toString());
        }
        if(this.noTerminales.isEmpty() == true){
            this.setEstado(-1);
            StringBuilder mensaje = new StringBuilder();
            mensajesError.add(mensaje.append("<b>").append(errorIndex++).append("</b>").append(". <font color=\"red\"><i>No existen sÃmbolos no terminales</i></font>.<br> La gramÃ¡tica no contiene ningÃºn sÃmbolo <b>no terminal</b>. DeberÃa contener al menos uno para poder ser
               vÃ¡lida.<br></br>").toString());

        }
        if(this.simbInicial == null) {
            this.setEstado(-1);
            StringBuilder mensaje = new StringBuilder();
            mensajesError.add(mensaje.append("<b>").append(errorIndex
               ++).append("</b>").append(". <font color=\"red\"><i>
               SÃmbolo inicial no asignado</i></font>.<br> La
               gramÃ¡tica no tiene asignado el sÃmbolo <b>inicial</b
               >.<br></br>").toString());
        }

        //Simbolo terminal no aparece en el consecuente de ninguna
           produccion
        int j=0;
        int k=0;
        int l=0;

        while(j< this.terminales.size()){
            t = this.terminales.get(j);
            encontrado = 0;
            k=0;
            while(k < this.pr.size()){

                conjSimbolos = pr.get(k).getConsec();
                l=0;
                while(l< conjSimbolos.size()){
                    if(conjSimbolos.get(l).getValor().equals(t.getValor
                       ())){
                        encontrado = 1;
                    }
                       l++;
                }
                  k++;
            }
            if(encontrado == 0){
                this.setEstado(-1);
                StringBuilder str = new StringBuilder();
                mensajesError.add(str.append("<b>").append(errorIndex
                   ++).append("</b>").append(". <font color=\"red\"><i
                   >Simbolo terminal no usado</i></font>.<br> El
                   sÃmbolo terminal <b>").append(t.getNombre()).
                   append("</b> no aparece en ningÃºn <b>consecuente</
                   b> de ninguna produccion.<br></br>").toString());
            }
            j++;

        }

        //Simbolo no terminal no aparece en el consecuente de ninguna
           produccion
        j=0;
```

```java

        while(j< this.noTerminales.size()){
            nt = this.noTerminales.get(j);
            encontrado = 0;
            k=0;
            while(k < this.pr.size()){

                conjSimbolos = pr.get(k).getConsec();
                l=0;
                while(l< conjSimbolos.size()){
                    if(nt.getValor().equals(this.getSimbInicial())){
                        encontrado = 1;
                        l++;
                    }else{
                      if(conjSimbolos.get(l).getValor().equals(nt.getValor())){
                        encontrado = 1;
                        l=conjSimbolos.size();
                      } else
                            l++;
                    }
                }
                    k++;

            }
            if(encontrado == 0){
                this.setEstado(-1);
                StringBuilder str = new StringBuilder();
                mensajesError.add(str.append("<b>").append(errorIndex++).append("</b>").append(". <font color=\"red\"><i>Simbolo no terminal no usado</i></font>.<br> El sÃ mbolo no terminal <b>").append(nt.getNombre()).append("</b> no aparece en ningÃºn <b>consecuente</b> de ninguna produccion.<br></br>").toString());
            }
            j++;
        }

        //Simbolo no terminal no aparece en el antecedente de ninguna produccion
         j=0;

        while(j< this.noTerminales.size()){
            nt = this.noTerminales.get(j);
            encontrado = 0;
            k=0;
            while(k < this.pr.size()){
                produccion = this.pr.get(k);
                antec = pr.get(k).getAntec();

                if(nt.getValor().equals(antec.getSimboloNT().getValor())){
                    encontrado = 1;
                }
                    k++;
            }
            if(encontrado==0) {
                this.setEstado(-1);
                StringBuilder str = new StringBuilder();
                mensajesError.add(str.append("<b>").append(errorIndex++).append("</b>").append(". <font color=\"red\"><i>Simbolo no terminal no usado</i></font>.<br> El sÃmbolo no terminal <b>").append(nt.getNombre()).append("</b> no aparece en el <b>antecedente</b> de ninguna produccion.<br></br>").toString());
            }
         j++;
        }

        //Simbolo no terminal del antecedente no esta en el conjunto de simbolos no terminales de la gramatica
        j=0;
        while(j < this.pr.size()){

            nt = new NoTerminal(this.pr.get(j).getAntec().getSimboloNT().getValor(), this.pr.get(j).getAntec().getSimboloNT().getValor());

            encontrado = 0;
            k=0;
            while(k< this.noTerminales.size()){

                if(nt.getValor().equals(this.noTerminales.get(k).getValor())){
                    encontrado = 1;
                }
                    k++;
            }
            if(encontrado == 0){
                this.setEstado(-1);
                StringBuilder str = new StringBuilder();
                mensajesError.add(str.append("<b>").append(errorIndex++).append("</b>").append(". <font color=\"red\"><i>Simbolo no terminal inexistente</i></font><br>. El sÃmbolo no terminal <b>").append(this.pr.get(j).getAntec().getSimboloNT().getNombre()).append("</b>, que es el antecedente de la produccion <b>").append("</b>, no estÃ¡ contenido en el conjunto de sÃmbolos <b>no terminales</b> de la gramÃ¡tica.<br></br>").toString());
            }
            j++;
        }

        //Simbolo no terminal del consecuente no estÃ¡ en el conjunto de Simbolos no terminales
        j=0;

        while(j < this.pr.size()){
            conjSimbolos = pr.get(j).getConsec();

            encontrado = 0;
            k=0;

            while(k< conjSimbolos.size()){
                encontrado = 0;
                simbolo = conjSimbolos.get(k);

                if(simbolo.getValor().equals("\u03b5")){
                    encontrado = 1;
               }else{
                    l=0;
                    while(l < this.noTerminales.size()){
                        nt = this.noTerminales.get(l);

                        if(nt.getValor().equals(simbolo.getValor())){
                            encontrado = 1;
                        }
                          l++;
                    }
                    int m=0;
                    if(encontrado ==0){
                        while(m < this.terminales.size()){
                            t = this.terminales.get(m);

                            if(t.getValor().equals(simbolo.getValor())){
                                encontrado = 1;
                            }
                         m++;

                        }
                    }

                }
                k++;

                if(encontrado == 0){
                    this.setEstado(-1);
                    StringBuilder str = new StringBuilder();
                    mensajesError.add(str.append("<b>").append(errorIndex++).append("</b>").append(". <font color=\"red\"><i>Consecuente erroneo</i></font>.<br> El sÃmbolo <b>").append(simbolo.getNombre()).append("</b> del <b>consecuente</b> de la produccion, no pertenece al conjunto de sÃmbolos declarado.<br></br>").toString());
                }
            }
```

```
             j++;
        }

        return mensajesError;
    }

    public Boolean generarInforme(String fichero) throws DocumentException{

         if(this.estado==1){
             try {
                   String font = "fonts/arial.ttf";
                   com.itextpdf.text.Document document = new com.itextpdf.text.Document(PageSize.LETTER , 45, 45, 54, 45);
                    Image imagen = Image.getInstance("./src/es/uco/simas/resources/logo2Antes.png");
                    imagen.setAlignment(com.itextpdf.text.Element.ALIGN_CENTER);
                    imagen.scalePercent(40);

                    LineSeparator ls = new LineSeparator();
                     BaseFont bf;
                     bf = BaseFont.createFont(font, BaseFont.IDENTITY_H, BaseFont.EMBEDDED);

                     Font titulo = new Font(bf, 21, Font.BOLD);
                     Font font2 = new Font(bf, 15, Font.BOLD);
                     Font font3 = new Font(bf, 12);
                     BaseColor claro = new BaseColor(63,171,160);

                     titulo.setColor(33, 77, 72);
                     font2.setColor(BaseColor.BLACK);

                     ls.setLineWidth(1);
                     ls.setLineColor(claro);

                    Paragraph parrafo = new Paragraph(" INFORME DE LA GRAMATICA ", titulo);
                    parrafo.setAlignment(com.itextpdf.text.Element.ALIGN_CENTER);
                    Paragraph parrafo1 = new Paragraph("\n Nombre de la gramÃ¡tica: ", font2);
                        parrafo1.add(new Paragraph("     "+this.nombre+"\n", font3));
                    Paragraph parrafo2 = new Paragraph("\n Descripcion de la gramÃ¡tica: ", font2);
                        parrafo2.add(new Paragraph("     "+this.descripcion+"\n", font3));
                    Paragraph parrafo3 = new Paragraph("\n SÃmbolos terminales: ", font2);
                        DefaultListModel term = this.term;
                        int i=0;
                        while(i<term.getSize()){
```

```

                parrafo3.add(new Paragraph("     "+term.
                    getElementAt(i).toString(), font3));
                i++;
            }
        Paragraph parrafo4 = new Paragraph("\n SÃmbolos no
            terminales: ", font2);
            DefaultListModel nterm = this.noTerm;
            i=0;
            while(i<nterm.getSize()){

                parrafo4.add(new Paragraph("     "+nterm.
                    getElementAt(i).toString(), font3));
                i++;
            }
        Paragraph parrafo5 = new Paragraph("\n SÃmbolo
            inicial de la gramÃ¡tica: ", font2);
            parrafo5.add(new Paragraph("     "+this.simbInicial,
                font3));
        Paragraph parrafo6 = new Paragraph("\n Producciones de
              la gramÃ¡tica: ", font2);

            DefaultListModel produc = this.producciones;
            DefaultListModel produc2 = new DefaultListModel();
            i =0;
            Object obj;
            obj = "P {";
            produc2.addElement(obj);
            while (i < produc.size()){
                obj = "    "+(i+1)+")    "+produc.getElementAt(i)
                    ;
                produc2.addElement(obj);
                i++;
            }
            obj ="}";
            produc2.addElement(obj);

            i=0;
            while(i<produc2.getSize()){

                parrafo6.add(new Paragraph("     "+produc2.
                    getElementAt(i).toString(), font3));
                i++;
            }

      try {

            PdfWriter.getInstance(document, new
                FileOutputStream(fichero));
      } catch (DocumentException | FileNotFoundException ex) {
          Logger.getLogger(Editor.class.getName()).log(Level.
              SEVERE, null, ex);
      }
```

```java

                document.open();
               try {

                   document.add(imagen);
                   document.add(parrafo);
                   document.add(new Chunk(ls));
                   document.add(parrafo1);
                   document.add(parrafo2);
                   document.add(parrafo3);
                   document.add(parrafo4);
                   document.add(parrafo5);
                   document.add(parrafo6);

               } catch (DocumentException ex) {
                   Logger.getLogger(Editor.class.getName()).log(Level.SEVERE, null, ex);
               }

                document.close();
            } catch (BadElementException ex) {
                Logger.getLogger(Editor.class.getName()).log(Level.SEVERE, null, ex);
            } catch (MalformedURLException ex) {
                Logger.getLogger(Editor.class.getName()).log(Level.SEVERE, null, ex);
            } catch (IOException ex) {
                Logger.getLogger(Editor.class.getName()).log(Level.SEVERE, null, ex);
            }
        }else{
            return false;

        }

     return true;
    }

    public boolean isNoTerminal (String nombre){
        int i=0;
        int encontrado = 0;
        ArrayList<NoTerminal> noTerminales = this.getNoTerm();

        while(i < noTerminales.size()){
            if(noTerminales.get(i).getNombre().equals(nombre)){
                encontrado = 1;
                break;
            }else{
                i++;
            }
        }
        if(encontrado == 1)
            return true;
        else
            return false;
    }

     public boolean isTerminal (String nombre){
        int i=0;
        int encontrado = 0;
        ArrayList<Terminal> terminales = this.getTerm();

        while(i < terminales.size()){
            if(terminales.get(i).getNombre().equals(nombre)){
                encontrado = 1;
                break;
            }else{
                i++;
            }
        }
        if(encontrado == 1)
            return true;
        else
            return false;
    }

    public void generarConjPrim(){
        int i=0;
        int j=0;
        int k=0;
        int encontrado=0;
        Iterator it;
        ArrayList<Terminal> terminales = new ArrayList();
        ArrayList<Produccion> producciones = new ArrayList();
        ArrayList<Terminal> conjPrim = new ArrayList();
        Map<String, String> despues = new HashMap<String, String>();
        Terminal term;
        NoTerminal nterm;
        Produccion pr;
        Simbolo primero;
        terminales = this.getTerm();
        producciones = this.getPr();

        while(i < producciones.size()){
            pr = producciones.get(i);
            nterm = pr.getAntec().getSimboloNT();  //Antecedente
            j=0;
            while(j < this.noTerminales.size()){
                if(this.noTerminales.get(j).getNombre().equals(nterm.getNombre())){
                    primero = pr.getConsec().get(0); //Primer simbolo del consecuente
                    conjPrim = this.noTerminales.get(j).getPrimeros();

                    if(primero.getNombre().equals("\u03b5")){ // El primer simbolo del consecuente es epsilon
```

```
                        k=0;
                        encontrado=0;
                        while(k < conjPrim.size()){
                            if(conjPrim.get(k).getNombre().equals("\
                                u03b5")){
                                encontrado = 1;
                            }
                            k++;
                        }
                        if(encontrado == 0)
                            conjPrim.add(new Terminal("\u03b5","\u03b5"
                                ));
                    }else {
                        if(isTerminal(primero.getNombre())){// El
                            primer simbolo del consecuente es Terminal
                            k=0;
                            encontrado=0;
                            while(k < conjPrim.size()){
                                if(primero.getNombre().equals(conjPrim.
                                    get(k).getNombre())){
                                    encontrado = 1;
                                }
                                k++;
                            }
                            if(encontrado == 0){
                                conjPrim.add(new Terminal (primero.
                                    getNombre(), primero.getNombre()));
                            }
                        }else{ // El primer simbolo del consecuente es
                            no Terminal
                            if(!this.noTerminales.get(j).getNombre().
                                equals(primero.getNombre()) ){
                                despues.put(this.noTerminales.get(j).
                                    getNombre(), primero.getNombre());
                            }
                        }
                    }

                    this.noTerminales.get(j).setPrimeros(conjPrim);
                    break;
                }else
                    j++;
            }
            i++;
        }
        // Si el primer simbolo del consecuente es un terminal se
            resuelve
        int x=0;
        while(x < 2){
            it = despues.keySet().iterator();
            while(it.hasNext()){
                String nterminal = (String) it.next();
                String prim = despues.get(nterminal);
                j=0;
                while(j < this.noTerminales.size()){
                    if(this.noTerminales.get(j).getNombre().equals(prim)){
                            terminales = this.noTerminales.get(j).getPrimeros();
                            break;
                    }else
                        j++;
                }
                j=0;
                int indice = -1;
                while(j < this.noTerminales.size()){
                    if(this.noTerminales.get(j).getNombre().equals(nterminal)){
                        conjPrim = this.noTerminales.get(j).getPrimeros();
                        indice = j;
                        break;
                    }else
                        j++;
                }
                j=0;
                while(j < terminales.size()){
                    encontrado = 0;
                    k=0;
                    while(k < conjPrim.size()){
                        if(conjPrim.get(k).getNombre().equals(terminales.get(j).getNombre())){
                            encontrado = 1;
                            break;
                        }else
                            k++;
                    }
                    if(encontrado == 0){
                        conjPrim.add(new Terminal(terminales.get(j).getNombre(), terminales.get(j).getNombre()));
                    }
                    j++;
                }
                this.noTerminales.get(indice).setPrimeros(conjPrim);
            }
            x++;
        }
    }

    public void generarConjSig(){
        int i=0;
        int j=0;
        int k=0;
        int l=0;
        int m=0;
        int n=0;
        int o=0;
        int encontrado = 0;
        ArrayList<Terminal> conjSig = new ArrayList();
        ArrayList<Terminal> conjSig2 = new ArrayList();
        ArrayList<Terminal> conjPrim = new ArrayList();
        ArrayList<Produccion> producciones = this.getPr();
        ArrayList<Simbolo> consecuente = new ArrayList();
        Terminal terminal;
        NoTerminal antecedente;

        while(i < this.noTerminales.size()){ // $ al simbolo inicial
            if(this.noTerminales.get(i).getNombre().equals(this.
                simbInicial)){
                conjSig.add(new Terminal("$", "$"));
                this.noTerminales.get(i).setSiguientes(conjSig);
                break;
            }else
                i++;
        }
        i=0;
        while(i < producciones.size()){
            consecuente = producciones.get(i).getConsec();
            j=1;
            while(j < consecuente.size()){
                //Si el simbolo posterior a un No terminal es un
                    terminal forma parte del conjunto siguiente
                if(isNoTerminal(consecuente.get(j-1).getNombre()) &&
                    isTerminal(consecuente.get(j).getNombre())){
                    k=0;
                    while(k < this.noTerminales.size()){
                        if(this.noTerminales.get(k).getNombre().equals(
                            consecuente.get(j-1).getNombre())){
                            conjSig = this.noTerminales.get(k).
                                getSiguientes();

                            l=0;
                            encontrado = 0;
                            while(l < conjSig.size()){
                                if(conjSig.get(l).getNombre().equals(
                                    consecuente.get(j).getNombre())){
                                    encontrado = 1;
                                    break;
                                }else
                                    l++;
                            }
                            if(encontrado == 0){
                                conjSig.add(new Terminal (consecuente.
                                    get(j).getNombre(),consecuente.get(
                                    j).getNombre()));
                            }
                            this.noTerminales.get(k).setSiguientes(
                                conjSig);
                        }
                        k++;
                    }
                }
                j++;
            }
            i++;
        }

        i=0;
        while(i < producciones.size()){
            consecuente = producciones.get(i).getConsec();
            antecedente = producciones.get(i).getAntec().getSimboloNT();
            j=1;
            while(j < consecuente.size()){
                 //Si hay dos No terminales seguidos el primero del
                    ultimo forma parte del conjunto siguiente del
                    primero
                 if(isNoTerminal(consecuente.get(j-1).getNombre()) &&
                    isNoTerminal(consecuente.get(j).getNombre())){
                      k=0;
                      while(k < this.noTerminales.size()){
                          if(this.noTerminales.get(k).getNombre().equals
                             (consecuente.get(j).getNombre())){
                              conjPrim = this.noTerminales.get(k).
                                 getPrimeros();
                              break;
                          }else
                              k++;
                      }
                      k=0;
                      while(k < this.noTerminales.size()){
                          if(this.noTerminales.get(k).getNombre().equals
                             (consecuente.get(j-1).getNombre())){
                              conjSig = this.noTerminales.get(k).
                                 getSiguientes();
                              l=0;
                              encontrado = 0;
                              while(l < conjPrim.size()){
                                 m=0;
                                 encontrado =0;
                                 while(m < conjSig.size()){

                                      if(conjSig.get(m).getNombre().
                                         equals(conjPrim.get(l).
                                         getNombre())){
                                          encontrado = 1;
                                          break;
                                      }else
                                         m++;
                                  }
                                  if(encontrado == 0 && !conjPrim.get(l)
                                     .getNombre().equals("\u03b5")){
```

```
                conjSig.add(new Terminal (conjPrim
                    .get(l).getNombre(),conjPrim.
                    get(l).getNombre()));

            }
            //Si el conjunto primero contiene la
                palabra vacia:
            if(conjPrim.get(l).getNombre().equals(
                "\u03b5")){

                m=0;
                encontrado = 0;
                n=0;
                while(n < this.noTerminales.size()
                    ){
                    if(this.noTerminales.get(n).
                        getNombre().equals(
                        antecedente.getNombre())){
                        conjSig2 = this.
                            noTerminales.get(n).
                            getSiguientes();
                        break;
                    }else
                        n++;
                }

                while(m < conjSig2.size()){
                    n=0;
                    encontrado =0;
                    while(n < conjSig.size()){
                        if(conjSig2.get(m).
                            getNombre().equals(
                            conjSig.get(n).
                            getNombre())){
                            encontrado = 1;
                            break;
                        }else
                            n++;
                    }
                    if(encontrado ==0){
                        conjSig.add(new Terminal(
                            conjSig2.get(m).
                            getNombre(), conjSig2.
                            get(m).getNombre()));

                    }
                    m++;
                }

                m=0;
                encontrado = 0;
                n=0;
```

```
while(n < this.noTerminales.size()){
    if(this.noTerminales.get(n).getNombre().equals(consecuente.get(j).getNombre())){

        conjSig = this.noTerminales.get(n).getSiguientes();
        break;
    }else
        n++;
}

while(m < conjSig2.size()){
    encontrado=0;
    n=0;
    while(n < conjSig.size()){
        if(conjSig2.get(m).getNombre().equals(conjSig.get(n).getNombre())){
            encontrado = 1;
            break;
        }else
            n++;
    }
    if(encontrado ==0){
        conjSig.add(new Terminal(conjSig2.get(m).getNombre(), conjSig2.get(m).getNombre()));
    }
    m++;

}
m=0;
encontrado = 0;
n=0;
while(n < this.noTerminales.size()){
    if(this.noTerminales.get(n).getNombre().equals(antecedente.getNombre())){

        conjSig2 = this.noTerminales.get(n).getSiguientes();
        break;
    }else
        n++;
}
```

```java

                    n=0;
                    while(n < this.noTerminales.size()){
                        if(this.noTerminales.get(n).getNombre().equals(consecuente.get(j-1).getNombre())){

                            conjSig = this.noTerminales.get(n).getSiguientes();
                            break;
                        }else
                            n++;
                    }

                    while(m < conjSig2.size()){
                        encontrado=0;
                        n=0;
                        while(n < conjSig.size()){
                            if(conjSig2.get(m).getNombre().equals(conjSig.get(n).getNombre())){
                                encontrado = 1;
                                break;
                            }else
                                n++;
                        }
                        if(encontrado ==0){
                            conjSig.add(new Terminal(conjSig2.get(m).getNombre(), conjSig2.get(m).getNombre()));
                        }
                        m++;
                    }
                }
                l++;
            }

        }
        k++;
    }
}

if(isNoTerminal(consecuente.get(consecuente.size()-1).getNombre())){
    m=0;
    encontrado = 0;
    n=0;
    while(n < this.noTerminales.size()){
```

```
                        if(this.noTerminales.get(n).getNombre().equals(antecedente.getNombre())){
                            conjSig2 = this.noTerminales.get(n).getSiguientes();
                            break;
                        }else
                            n++;
                    }
                    n=0;
                    while(n < this.noTerminales.size()){
                        if(this.noTerminales.get(n).getNombre().equals(consecuente.get(consecuente.size()-1).getNombre())){

                            conjSig = this.noTerminales.get(n).getSiguientes();
                            break;
                        }else
                            n++;
                    }

                    while(m < conjSig2.size()){

                        n=0;
                        encontrado =0;
                        while(n < conjSig.size()){
                            if(conjSig2.get(m).getNombre().equals(conjSig.get(n).getNombre())){
                                encontrado = 1;
                                break;
                            }else
                                n++;
                        }
                        if(encontrado ==0){
                            conjSig.add(new Terminal(conjSig2.get(m).getNombre(), conjSig2.get(m).getNombre()));

                        }
                        m++;
                    }
                }
                j++;
            }
            i++;
        }
        i=0;
        while(i < producciones.size()){
            consecuente = producciones.get(i).getConsec();
            antecedente = producciones.get(i).getAntec().getSimboloNT();
            j=0;
            while(j < consecuente.size()){
            if(isNoTerminal(consecuente.get(consecuente.size()−1).getNombre())){
                    m=0;
                    encontrado = 0;
                    n=0;
                    while(n < this.noTerminales.size()){
                        if(this.noTerminales.get(n).getNombre().equals(antecedente.getNombre())){
                            conjSig2 = this.noTerminales.get(n).getSiguientes();
                            break;
                        }else
                            n++;
                    }
                    n=0;
                    while(n < this.noTerminales.size()){
                        if(this.noTerminales.get(n).getNombre().equals(consecuente.get(consecuente.size()−1).getNombre())){

                            conjSig = this.noTerminales.get(n).getSiguientes();
                            break;
                        }else
                            n++;
                    }

                    while(m < conjSig2.size()){

                        n=0;
                        encontrado =0;
                        while(n < conjSig.size()){
                            if(conjSig2.get(m).getNombre().equals(conjSig.get(n).getNombre())){
                                encontrado = 1;
                                break;
                            }else
                                n++;
                        }
                        if(encontrado ==0){
                            conjSig.add(new Terminal(conjSig2.get(m).getNombre(), conjSig2.get(m).getNombre()));

                        }
                        m++;
                    }
                }
                j++;
            }
            i++;
        }
    }

    public void generarTPredictiva(){
        this.tpredictiva.construir(this);
    }

    public TablaPredictiva getTPredictiva(){

        return this.tpredictiva;
    }

    public void setTPredictiva(TablaPredictiva tabla){
        this.tpredictiva = tabla;
    }

    public void generarTLR(int i){
        this.tlr = new TablaLR(this);
        this.tlr.construir(i);
    }

      public TablaLR getTlr() {
          return tlr;
      }

      public void setTlr(TablaLR tlr) {
          this.tlr = tlr;
      }

      public ColCanLR0 getColeccionLR0() {
          return this.coleccionLR0;
      }

      public void setColeccionLR0(ColCanLR0 coleccionLR0) {
          this.coleccionLR0 = coleccionLR0;
      }

      public ColCanLR1 getColeccionLR1() {
          return coleccionLR1;
      }

      public void setColeccionLR1(ColCanLR1 coleccionLR1) {
          this.coleccionLR1 = coleccionLR1;
      }

      public ColCanLALR getColeccionLALR() {
          return coleccionLALR;
      }

      public void setColeccionLALR(ColCanLALR coleccionLALR) {
          this.coleccionLALR = coleccionLALR;
      }

    // Variables declaration - do not modify//GEN-BEGIN:variables
    // End of variables declaration//GEN-END:variables
```

```
}
```

2.6.4. NoTerminal.java

```
//SimAS / Gramatica
//No Terminal

package es.uco.simas.util.gramatica;
import java.util.*;

/**
 * @author vanesa
 */
public class NoTerminal extends Simbolo {

    boolean simboloInicial;
    ArrayList<Terminal> primeros = new ArrayList<>();
    ArrayList<Terminal> siguientes = new ArrayList<>();

    public NoTerminal(String nombre, String valor) {
        super(nombre, valor);
        initComponents();
    }

    public boolean getSimboloInicial() {
        return simboloInicial;
    }

    public void setSimboloInicial(boolean simboloInicial) {
        this.simboloInicial = simboloInicial;
    }

    public ArrayList<Terminal> getPrimeros() {
        return primeros;
    }

    public void setPrimeros(ArrayList<Terminal> primeros) {
        this.primeros = primeros;
    }

    public ArrayList<Terminal> getSiguientes() {
        return siguientes;
    }

    public void setSiguientes(ArrayList<Terminal> siguientes) {
        this.siguientes = siguientes;
    }

    /**
```

```
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    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();
    }// </editor-fold>//GEN-END:initComponents

    // Variables declaration - do not modify//GEN-BEGIN:variables
    // End of variables declaration//GEN-END:variables
}
```

2.6.5. Produccion.java

```
//SimAS / Gramatica
//Produccion

package es.uco.simas.util.gramatica;

import java.util.ArrayList;

/**
 * @author vanesa
 */
public class Produccion extends javax.swing.JFrame {

    Antecedente antec = new Antecedente();
    ArrayList<Simbolo> consec = null;

    public Produccion() {
        initComponents();
    }

    public Antecedente getAntec() {
        return antec;
    }

    public void setAntec(Antecedente antec) {
        this.antec = antec;
    }

    public ArrayList<Simbolo> getConsec() {
        return consec;
    }

    public void setConsec(ArrayList<Simbolo> consec) {
        this.consec = consec;
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings(”unchecked”)
    // <editor-fold defaultstate=”collapsed” desc=”Generated Code”>//GEN-BEGIN:initComponents
    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();
    }// </editor-fold>//GEN-END:initComponents

    // Variables declaration - do not modify//GEN-BEGIN:variables
    // End of variables declaration//GEN-END:variables
}
```

2.6.6. Simbolo.java

```
//SimAS  /  Gramatica
// Simbolo

package es.uco.simas.util.gramatica;

/**
 * @author vanesa
 */
public class Simbolo extends javax.swing.JFrame {

    String nombre =null;
    String valor=null;

    public Simbolo(String nombre, String valor) {
        this.nombre = nombre;
        this.valor = valor;
    }

    public String getNombre() {
        return nombre;
    }

    public void setNombre(String nombre) {
        this.nombre = nombre;
    }

    public String getValor() {
        return valor;
    }

    public void setValor(String valor) {
        this.valor = valor;
    }



    /**
     * This method is called from within the constructor to initialize
        the form.
     * WARNING: Do NOT modify this code. The content of this method is
        always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings(”unchecked”)
    // <editor-fold defaultstate=”collapsed” desc=”Generated Code”>//GEN-BEGIN:initComponents
    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();
    }// </editor-fold>//GEN-END:initComponents

    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        /* Set the Nimbus look and feel */
        //<editor-fold defaultstate=”collapsed” desc=” Look and feel setting code (optional) ”>
        /* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.
         * For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html
         */
        try {
            for (javax.swing.UIManager.LookAndFeelInfo info : javax.swing.UIManager.getInstalledLookAndFeels()) {
                if (”Nimbus”.equals(info.getName())) {
                    javax.swing.UIManager.setLookAndFeel(info.getClassName());
                    break;
                }
            }
        } catch (ClassNotFoundException ex) {
            java.util.logging.Logger.getLogger(Simbolo.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {
            java.util.logging.Logger.getLogger(Simbolo.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {
            java.util.logging.Logger.getLogger(Simbolo.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {
            java.util.logging.Logger.getLogger(Simbolo.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        }
        //</editor-fold>

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
              //  new Simbolo().setVisible(true);
            }
        });
    }
    // Variables declaration - do not modify//GEN-BEGIN:variables
    // End of variables declaration//GEN-END:variables
}
```

2.6.7. Terminal.java

```
//SimAS  /  Gramatica
//Terminal

package es.uco.simas.util.gramatica;

/**
 * @author vanesa
 */
public class Terminal extends Simbolo{

    public Terminal(String nombre, String valor) {
        super(nombre, valor);
        initComponents();
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents
    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();
    }// </editor-fold>//GEN-END:initComponents

    // Variables declaration - do not modify//GEN-BEGIN:variables
    // End of variables declaration//GEN-END:variables
}
```

Referencias

1. Descarga de **Netbeans**:
   Último acceso: junio de 2015.
   URL: http://netbeans.org/downloads

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   Último acceso: junio de 2015.
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