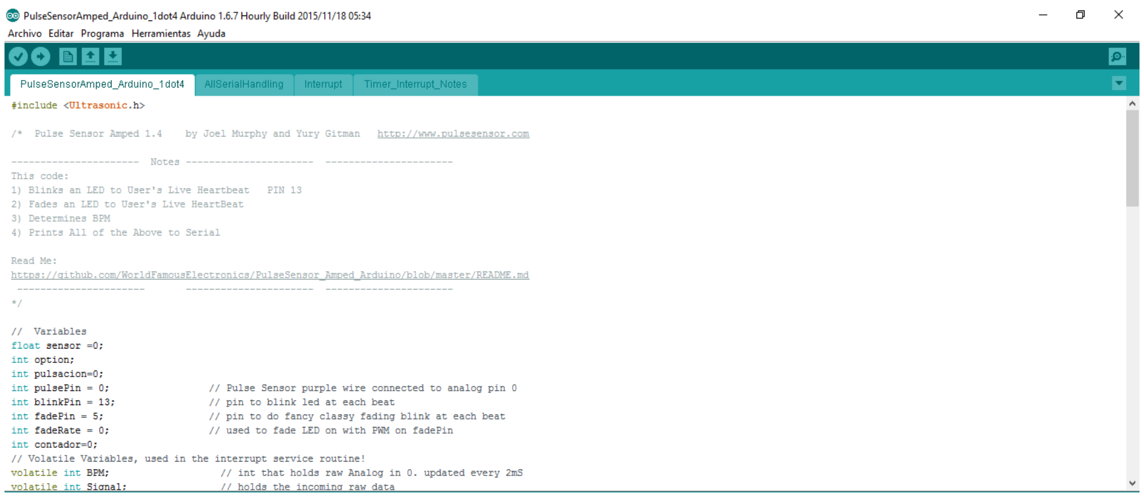
Codigo

```
#include <Ultrasonic.h>


/*  Pulse Sensor Amped 1.4    by Joel Murphy and Yury Gitman   http://www.pulsesensor.com


----------------------  Notes ----------------------  ----------------------

This code:

1) Blinks an LED to User's Live Heartbeat   PIN 13

2) Fades an LED to User's Live HeartBeat

3) Determines BPM

4) Prints All of the Above to Serial


Read Me:

https://github.com/WorldFamousElectronics/PulseSensor_Amped_Arduino/blob/master/README.md

 ----------------------      ----------------------  ----------------------

*/


//  Variables

float sensor =0;

int option;

int pulsacion=0;

int pulsePin = 0;                // Pulse Sensor purple wire connected to analog pin 0

int blinkPin = 13;               // pin to blink led at each beat

int fadePin = 5;                 // pin to do fancy classy fading blink at each beat

int fadeRate = 0;                // used to fade LED on with PWM on fadePin

int contador=0;

// Volatile Variables, used in the interrupt service routine!

volatile int BPM;                   // int that holds raw Analog in 0. updated every 2mS

volatile int Signal;                // holds the incoming raw data

volatile int IBI = 600;             // int that holds the time interval between beats! Must be seeded!
volatile boolean Pulse = false;     // "True" when User's live heartbeat is detected. "False" when
not a "live beat".

volatile boolean QS = false;        // becomes true when Arduoino finds a beat.


// Regards Serial OutPut  -- Set This Up to your needs

static boolean serialVisual = true;   // Set to 'false' by Default.  Re-set to 'true' to see Arduino
Serial Monitor ASCII Visual Pulse


Ultrasonic ultrasonic(6,7,23200);// (Trig PIN,Echo PIN, TIMEOUT)


//TIMEOUT = (CENTIMETROS)*(58)



void setup(){

  pinMode(blinkPin,OUTPUT);         // pin that will blink to your heartbeat!

  pinMode(fadePin,OUTPUT);          // pin that will fade to your heartbeat!

  //Serial.begin(115200);             // we agree to talk fast!

  Serial.begin(9600);             // we agree to talk fast!

  interruptSetup();                 // sets up to read Pulse Sensor signal every 2mS

   // IF YOU ARE POWERING The Pulse Sensor AT VOLTAGE LESS THAN THE BOARD VOLTAGE,

   // UN-COMMENT THE NEXT LINE AND APPLY THAT VOLTAGE TO THE A-REF PIN

//   analogReference(EXTERNAL);

}



//  Where the Magic Happens

void loop()

{


    serialOutput() ;


  if (QS == true)
```

```
 {    // A Heartbeat Was Found
                 // BPM and IBI have been Determined
                 // Quantified Self "QS" true when arduino finds a heartbeat
     fadeRate = 255;        // Makes the LED Fade Effect Happen
                        // Set 'fadeRate' Variable to 255 to fade LED with pulse
     serialOutputWhenBeatHappens();   // A Beat Happened, Output that to serial.
     QS = false;                   // reset the Quantified Self flag for next time
 }

 ledFadeToBeat();                   // Makes the LED Fade Effect Happen
 delay(20);                        //  take a break
}






void ledFadeToBeat()
{

   fadeRate -= 15;                       //  set LED fade value
   fadeRate = constrain(fadeRate,0,255);   //  keep LED fade value from going into negative
numbers!
   analogWrite(fadePin,fadeRate);         //  fade LED



   if ((BPM>90)&(BPM<150))
   {
      pulsacion=BPM;
   }
   if (Serial.available()>0)
```

```
  {
    option=Serial.read();
  }
   if(option=='1')
  {
    sensor =(analogRead(A1)*48875)/100000;
     Serial.println(pulsacion);
     Serial.println(ultrasonic.Ranging(CM)); // CM or INC
     Serial.println(sensor);
     option=0;
  }
}
```


PulseSensorAmped_Arduino_1dot4 Arduino 1.6.7 Hourly Build 2015/11/18 05:34
Archivo Editar Programa Herramientas Ayuda
PulseSensorAmped_Arduino_1dot4
AllSerialHandling
Interrupt
Timer_Interrupt_Notes

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volatile int BPM;                   // int that holds raw Analog in 0. updated every 2mS
volatile int Signal;                // holds the incoming raw data
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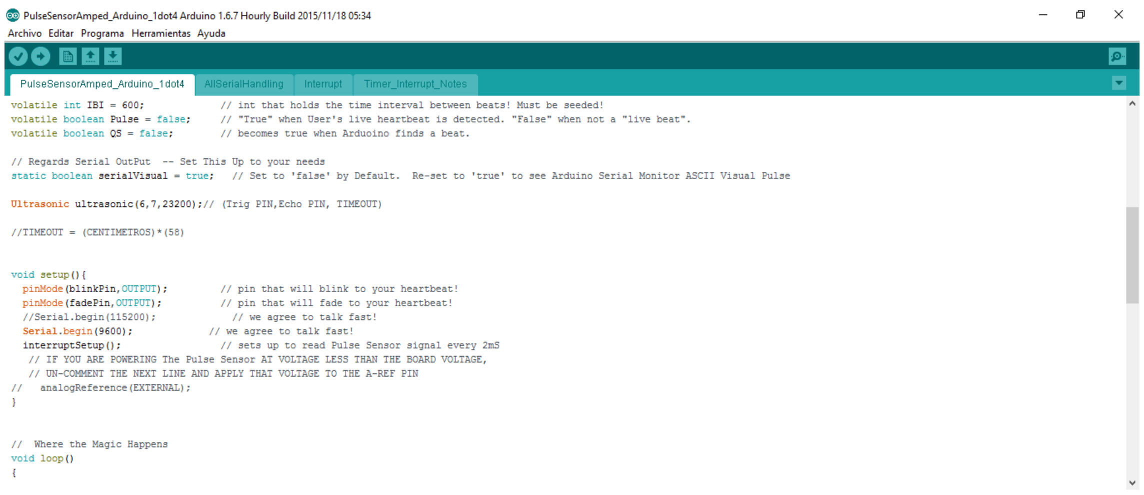
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```
volatile int IBI = 600;             // int that holds the time interval between beats! Must be seeded!
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// Regards Serial OutPut  -- Set This Up to your needs
static boolean serialVisual = true;   // Set to 'false' by Default.  Re-set to 'true' to see Arduino Serial Monitor ASCII Visual Pulse

Ultrasonic ultrasonic(6,7,23200);// (Trig PIN,Echo PIN, TIMEOUT)

//TIMEOUT = (CENTIMETROS)*(58)


void setup(){
  pinMode(blinkPin,OUTPUT);         // pin that will blink to your heartbeat!
  pinMode(fadePin,OUTPUT);          // pin that will fade to your heartbeat!
  //Serial.begin(115200);             // we agree to talk fast!
  Serial.begin(9600);             // we agree to talk fast!
  interruptSetup();                 // sets up to read Pulse Sensor signal every 2mS
   // IF YOU ARE POWERING The Pulse Sensor AT VOLTAGE LESS THAN THE BOARD VOLTAGE,
   // UN-COMMENT THE NEXT LINE AND APPLY THAT VOLTAGE TO THE A-REF PIN
//   analogReference(EXTERNAL);
}


//  Where the Magic Happens
void loop()
{
```

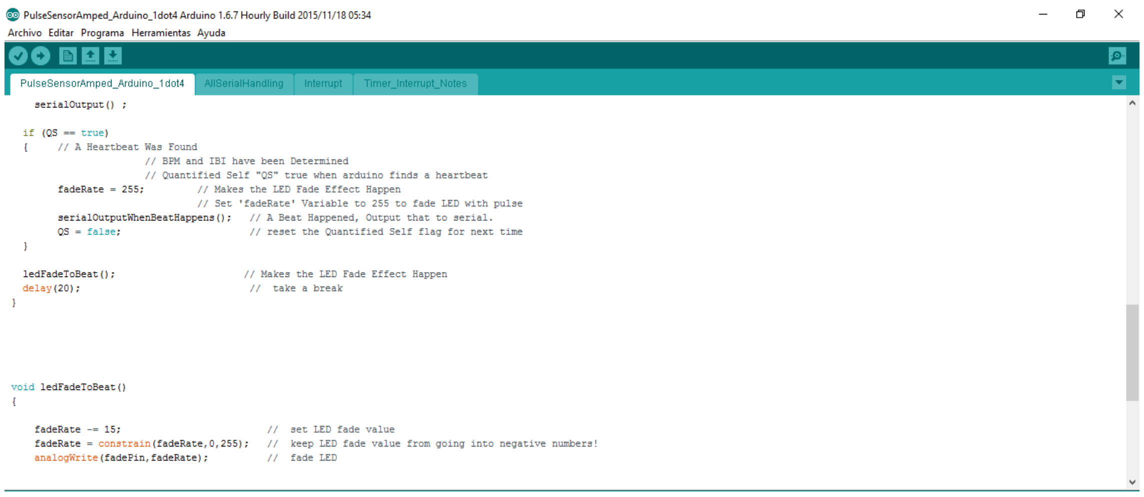
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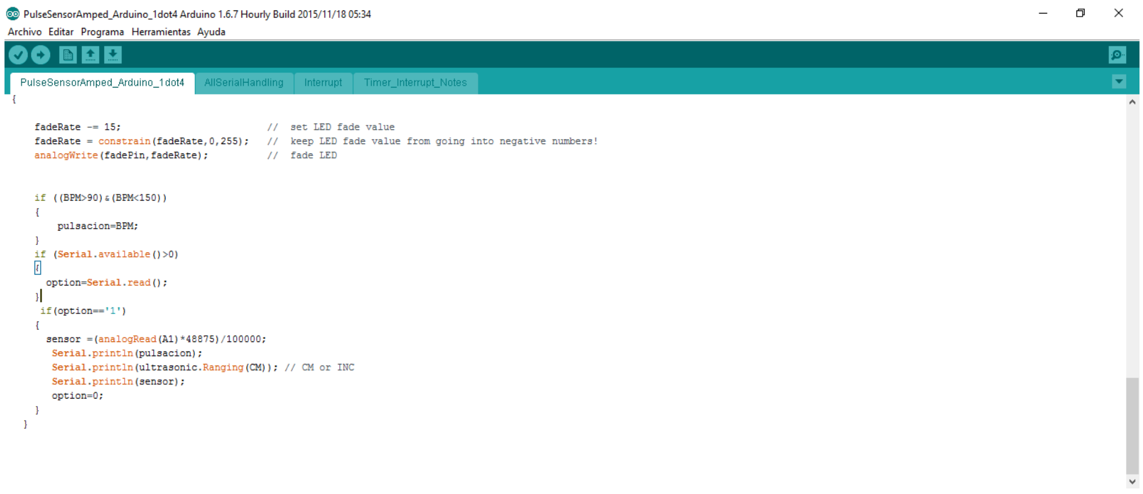
```
    serialOutput() ;

  if (QS == true)
  {     // A Heartbeat Was Found
                     // BPM and IBI have been Determined
                     // Quantified Self "QS" true when arduino finds a heartbeat
        fadeRate = 255;         // Makes the LED Fade Effect Happen
                                // Set 'fadeRate' Variable to 255 to fade LED with pulse
        serialOutputWhenBeatHappens();   // A Beat Happened, Output that to serial.
        QS = false;                      // reset the Quantified Self flag for next time
  }

  ledFadeToBeat();                      // Makes the LED Fade Effect Happen
  delay(20);                             //  take a break
}




void ledFadeToBeat()
{

    fadeRate -= 15;                         //  set LED fade value
    fadeRate = constrain(fadeRate,0,255);   //  keep LED fade value from going into negative numbers!
    analogWrite(fadePin,fadeRate);          //  fade LED
```



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Archivo Editar Programa Herramientas Ayuda
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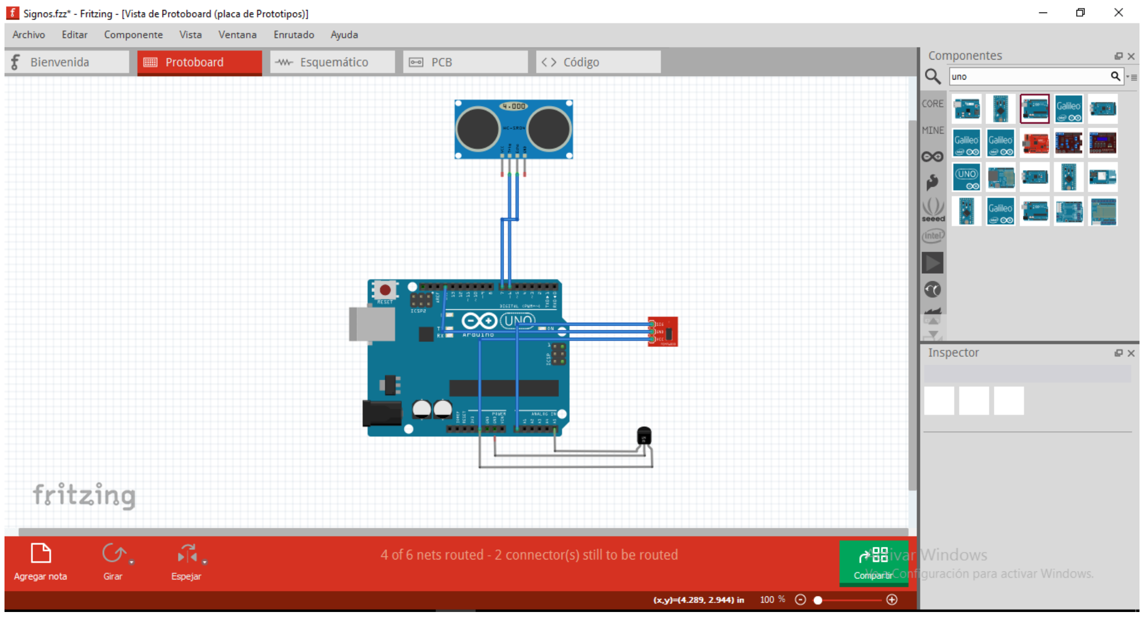
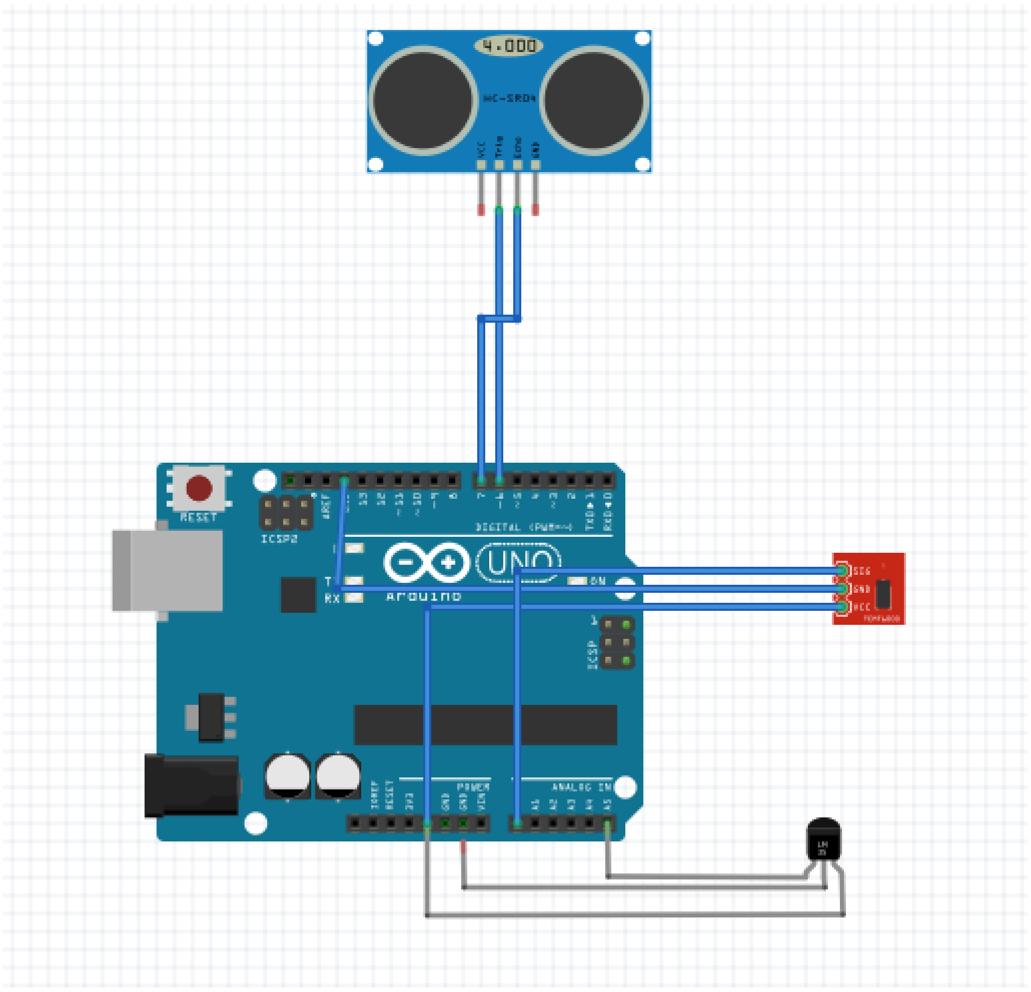
```
{

    fadeRate -= 15;                         //  set LED fade value
    fadeRate = constrain(fadeRate,0,255);   //  keep LED fade value from going into negative numbers!
    analogWrite(fadePin,fadeRate);          //  fade LED


    if ((BPM>90)&(BPM<150))
    {
        pulsacion=BPM;
    }
    if (Serial.available()>0)
    {
      option=Serial.read();
    }
     if(option=='1')
    {
      sensor =(analogRead(A1)*48875)/100000;
       Serial.println(pulsacion);
       Serial.println(ultrasonic.Ranging(CM)); // CM or INC
       Serial.println(sensor);
       option=0;
    }
  }
```



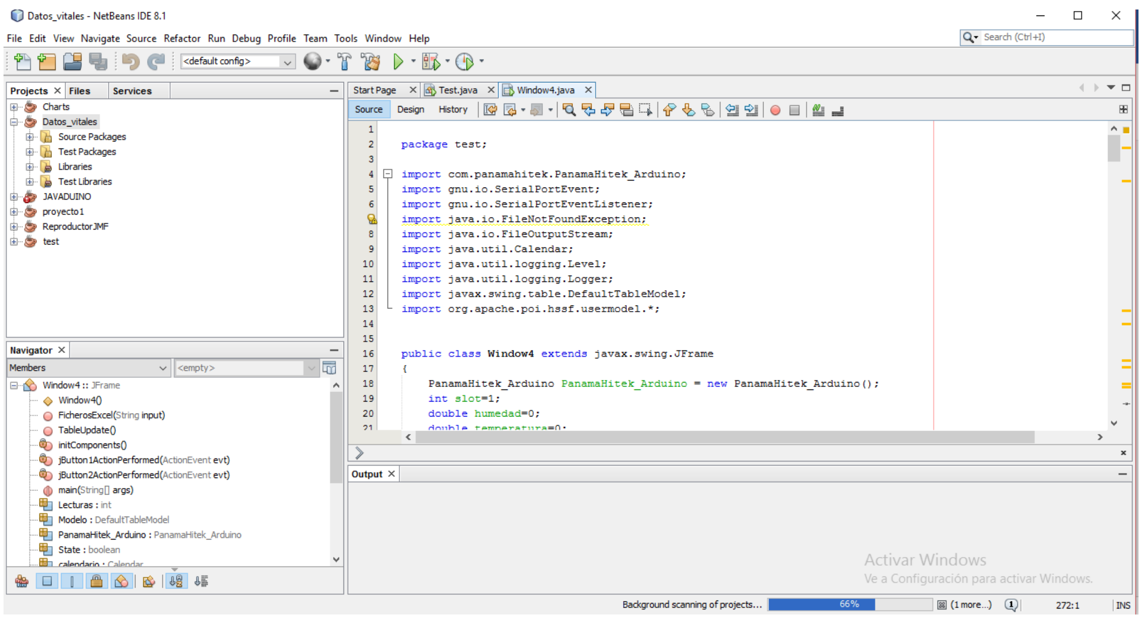
Signos.fzz* - Fritzing - [Vista de Protoboard (placa de Prototipos)]

4 of 6 nets routed - 2 connector(s) still to be routed

(x,y)=(4.289, 2.944) in 100 %



Diseño software Java Netbeans



```java

package test;

import com.panamahitek.PanamaHitek_Arduino;
import gnu.io.SerialPortEvent;
import gnu.io.SerialPortEventListener;
import java.io.FileNotFoundException;
import java.io.FileOutputStream;
import java.util.Calendar;
import java.util.logging.Level;
import java.util.logging.Logger;
import javax.swing.table.DefaultTableModel;
import org.apache.poi.hssf.usermodel.*;


public class Window4 extends javax.swing.JFrame
{
    PanamaHitek_Arduino PanamaHitek_Arduino = new PanamaHitek_Arduino();
    int slot=1;
    double humedad=0;
    double temperatura=0;
```

Codigo

```
package test;


import com.panamahitek.PanamaHitek_Arduino;
import gnu.io.SerialPortEvent;
import gnu.io.SerialPortEventListener;
import java.io.FileNotFoundException;
import java.io.FileOutputStream;
import java.util.Calendar;
import java.util.logging.Level;
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import javax.swing.table.DefaultTableModel;
import org.apache.poi.hssf.usermodel.*;



public class Window4 extends javax.swing.JFrame
{
  PanamaHitek_Arduino PanamaHitek_Arduino = new PanamaHitek_Arduino();
  int slot=1;
  double humedad=0;
  double temperatura=0;
  double temperatura2=0;//john
  int Lecturas =0;

  Calendar calendario;
  SerialPortEventListener evento = new SerialPortEventListener() {
    @Override
    public void serialEvent(SerialPortEvent spe)
    {
      if (PanamaHitek_Arduino.MessageAvailable())
```

```
 {



   //System.out.println(PanamaHitek_Arduino.printMessage());
   if (slot==1)
   {
     if(Lecturas>1)
     {
       TableUpdate();
     }
     slot=2;
     Lecturas++;
     humedad = Double.parseDouble(PanamaHitek_Arduino.printMessage());
   }
   else if (slot==2)
   {
     slot=3;
     Lecturas++;
     temperatura = Double.parseDouble(PanamaHitek_Arduino.printMessage());
   }
   //john
   else if (slot==3)
   {
     slot=1;
     Lecturas++;
     temperatura2 = Double.parseDouble(PanamaHitek_Arduino.printMessage());
   }



 }
}
```

```
};

DefaultTableModel Modelo;
boolean State=false;
public void TableUpdate()
{
  String Output="";
  int hora = calendario.get(Calendar.HOUR_OF_DAY);
  int minuto = calendario.get(Calendar.MINUTE);
  int segundo = calendario.get(Calendar.SECOND);
  if (hora<10)
    Output= "0"+hora+":"+minuto+":"+segundo;
  else if(minuto<10)
    Output= hora+":"+"0"+minuto+":"+segundo;
  else if(segundo<10)
    Output= hora+":"+minuto+":"+"0"+segundo;
  else
    Output= hora+":"+minuto+":"+segundo;
  calendario = Calendar.getInstance();

  //System.out.println("Temperatura: "+temperatura+" Humedad: "+humedad);
  //Modelo.addRow(new Object[]{""+Output,humedad,temperatura});
  Modelo.addRow(new Object[]{humedad,temperatura,temperatura2});
}

public Window4()
{
  this.calendario = Calendar.getInstance();
  initComponents();
  Modelo = (DefaultTableModel) jTable1.getModel();
  try
```

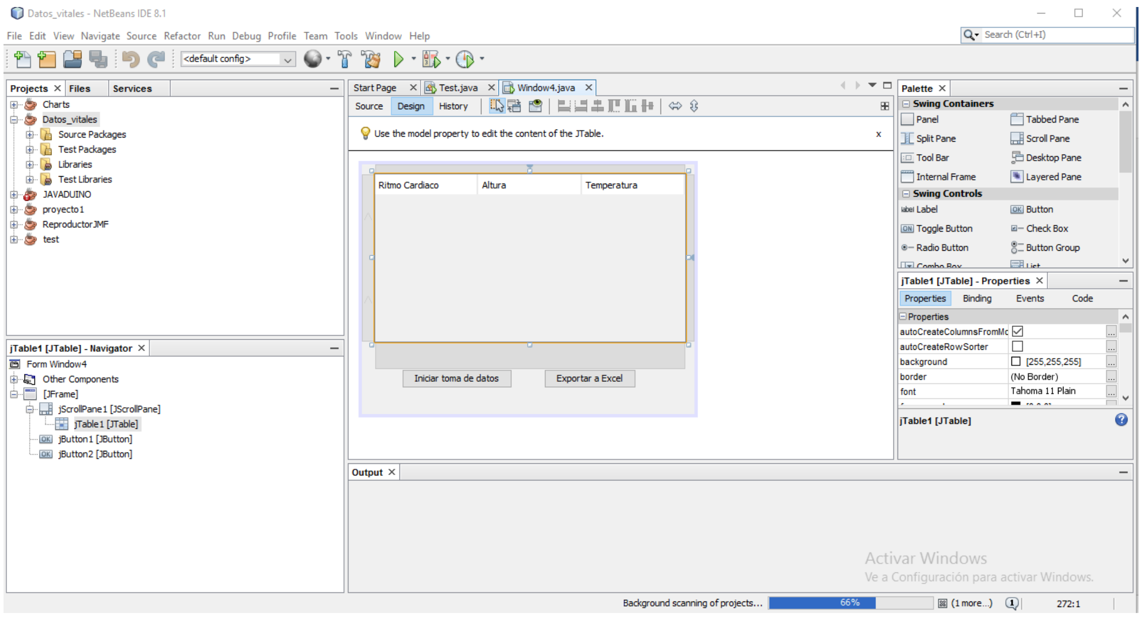
```
    {
        PanamaHitek_Arduino.ArduinoRXTX("COM9", 2000, 9600, evento);
    } catch (Exception ex)
    {
        Logger.getLogger(Window4.class.getName()).log(Level.SEVERE, null, ex);
    }

}

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

    jScrollPane1 = new javax.swing.JScrollPane();
    jTable1 = new javax.swing.JTable();
    jButton1 = new javax.swing.JButton();
    jButton2 = new javax.swing.JButton();

    setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

    jTable1.setModel(new javax.swing.table.DefaultTableModel(
        new Object [][] {

        },
        new String [] {
            "Ritmo Cardiaco", "Altura", "Temperatura"
        }
    ));
    jScrollPane1.setViewportView(jTable1);

    jButton1.setText("Iniciar toma de datos");
```

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

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

        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()
                .addContainerGap(15, Short.MAX_VALUE)
                .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 375,
javax.swing.GroupLayout.PREFERRED_SIZE)
                .addContainerGap())
            .addGroup(layout.createSequentialGroup()
                .addGap(48, 48, 48)
                .addComponent(jButton1)
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                .addComponent(jButton2)
                .addGap(70, 70, 70))
        );
        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(layout.createSequentialGroup()
                .addContainerGap()
                .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 203,
javax.swing.GroupLayout.PREFERRED_SIZE)
                .addGap(32, 32, 32)
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
                    .addComponent(jButton1)
                    .addComponent(jButton2))
                .addContainerGap(31, Short.MAX_VALUE))
        );

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

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {

        if (State==true)
        {
            jButton1.setText("Iniciar toma de datos");
            State=false;
            try {
            //Modelo.addRow(new Object[]{"1","2","3"});
            PanamaHitek_Arduino.sendData("1");
            } catch (Exception ex) {
                Logger.getLogger(Window4.class.getName()).log(Level.SEVERE, null, ex);
            }
        }
        else
        {
            State =true;
            //jButton1.setText("Parar toma de datos");
            try {
            //Modelo.addRow(new Object[]{"1","2","3"});
            PanamaHitek_Arduino.sendData("1");
            } catch (Exception ex) {
                Logger.getLogger(Window4.class.getName()).log(Level.SEVERE, null, ex);
            }
        }

    }

    private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {
        //Modelo.removeRow(0);
        javax.swing.JFileChooser Ventana = new javax.swing.JFileChooser();
        String ruta = "";
        try {
            if (Ventana.showSaveDialog(null)== Ventana.APPROVE_OPTION)
            {
                ruta = Ventana.getSelectedFile().getAbsolutePath()+".xls";
                FicherosExcel(ruta);
            }

        } catch (Exception ex)
        {
            ex.printStackTrace();
        }
    }

    public void FicherosExcel(String input){
        HSSFWorkbook libro = new HSSFWorkbook();
        HSSFSheet hoja  = libro.createSheet();
```

```
HSSFRow fila = hoja.createRow(0);
HSSFCell celda = fila.createCell(0);
celda.setCellValue("Datos obtenidos: Paciente");

fila= hoja.createRow(1);
celda = fila.createCell(0);
celda.setCellValue("Ritmo Cardiaco");
celda = fila.createCell(1);
celda.setCellValue("Altura");
celda = fila.createCell(2);
celda.setCellValue("Temperatura");

for(int i=0; i <= Modelo.getRowCount()-1;i++ ){
   fila = hoja.createRow(i+2);
   for(int j=0;j<=2;j++){
      celda = fila.createCell(j);
      celda.setCellValue(jTable1.getValueAt(i,j).toString());

   }

}
 try {
    FileOutputStream Fichero = new FileOutputStream(input);
    libro.write(Fichero);
    Fichero.close();
 } catch (Exception e)
 {
    e.printStackTrace();
 }
```

```
  }






  public static void main(String args[]) {


      java.awt.EventQueue.invokeLater(new Runnable()
      {
          public void run()
          {
              new Window4().setVisible(true);
          }
      });
  }

  // Variables declaration - do not modify
  private javax.swing.JButton jButton1;
  private javax.swing.JButton jButton2;
  private javax.swing.JScrollPane jScrollPane1;
  private javax.swing.JTable jTable1;
  // End of variables declaration
}
```

Interfaz



Use the model property to edit the content of the JTable.

Properties	
autoCreateColumnsFromMc	✓
autoCreateRowSorter	☐
background	[255,255,255]
border	(No Border)
font	Tahoma 11 Plain