FINAL PROJECT
PROYECTO FINAL

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Project summary
This project will be based on solving a somewhat daily problem in the lives of people that usually occurs in homes and we believe that this problem happens throughout Mexico Since in different states of the Mexican Republic it usually happens that we are not aware of the control and security of our homes since we cannot stay in it all the time, so we thought and decided to offer users the power to have some electrical appliances in an automated way with a security system based on card identification with the possibility of to grow and generate new things.

I. PROJECT INTRODUCTION

This project was created through a very common problem, we decided to offer a solution to the little security and little control that we have in some homes.
Our project aims to offer users control over some electrical appliances in their homes, a security for the user which is the control of the main door, with which the user can have surveillance and verification to open and close the door.

Theoretical framework
• Arduino uno
• Java
• One connection per port will be used on an Arduino
• Not used lm35
• LCD screen not used
• We will use 1 LEDs (yellow) to present the temperature level in a more graphic and visual way of the moment the fan will turn on.

PROBLEMATIC:

Our own safety and that of our family is very important today, offering a safe home for our loved ones is a priority. And it is necessary to find any method to be able to have everything under control and operating in a safe way since, for us, the home is our refuge center and where we belong.
Every day there is much more insecurity and accidents in our own homes.
In life you have to adapt to all kinds of change, that is why we developed this project in order to offer greater comfort and safety to our daily lives and our main objective is to provide a creative solution to those who face people in their daily lives, give greater ease and comfort to users, from our cell phones or computers we can have better control of our own homes.
So, we developed our idea to turn our home into a smart home which is operated by a computer that allows us to control the on and off of our fan, allows us to know the temperature that there is in our house and it allows us to have greater control and security when opening and closing our front door.

II. DEVELOPING

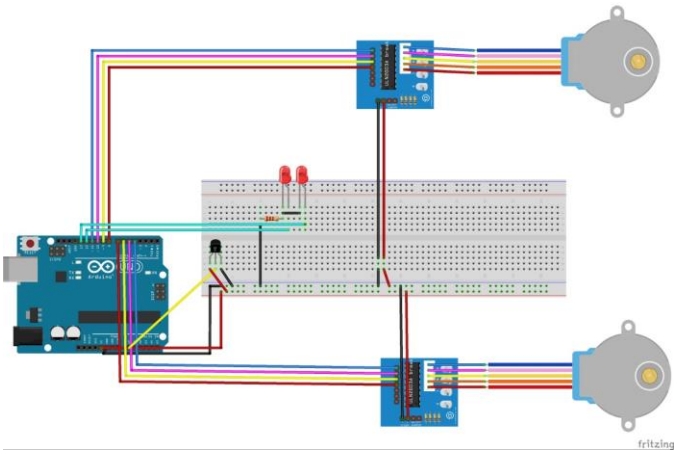
A. Model development

For our project, we decided to make our model of a house and in this way make our own smart home to scale with different functionalities and decorations.

We started by making a small prototype of a house, to make it a smart home, capable of performing some tasks using a computer.

Electrical diagram of connections used to develop our project:

Here is shown the connection diagram that we are using for the elaboration of our project.



Java code commented on lines of code.

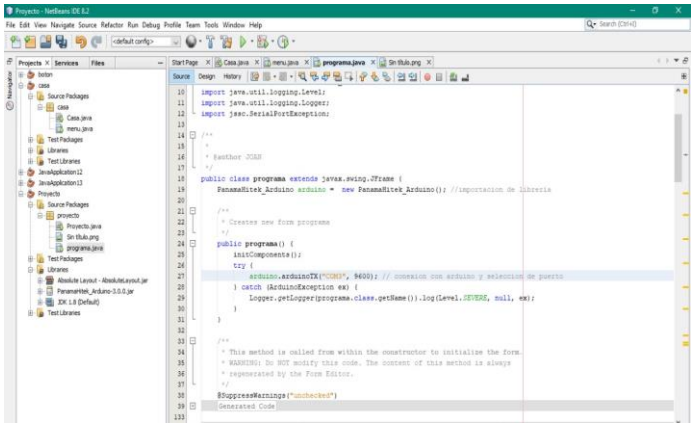
/*

```
 * To change this license header, choose License Headers in
Project Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package proyecto;

import com.panamahitek.ArduinoException;
import com.panamahitek.PanamaHitek_Arduino;
import java.util.logging.Level;
import java.util.logging.Logger;
import jssc.SerialPortException;

/**
 *
 * @author JOAN
 */
public class programa extends javax.swing.JFrame {
    PanamaHitek_Arduino arduino =  new
PanamaHitek_Arduino();

    /**
     * Creates new form programa
     */
    public programa() {
        initComponents();
        try {
            arduino.arduinoTX("COM3", 9600);
        } catch (ArduinoException ex) {

Logger.getLogger(programa.class.getName()).log(Level.SEV
ERE, 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() {

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

setDefaultCloseOperation(javax.swing.WindowConstants.EXI
T_ON_CLOSE);
        getContentPane().setLayout(new
org.netbeans.lib.awtextra.AbsoluteLayout());

        jButton1.setText("ON");
        jButton1.addActionListener(new
java.awt.event.ActionListener() {
            public void
actionPerformed(java.awt.event.ActionEvent evt) {
                jButton1ActionPerformed(evt);
            }
        });
        getContentPane().add(jButton1, new
org.netbeans.lib.awtextra.AbsoluteConstraints(20, 90, -1, -1));

        jButton2.setText("OFF");
        jButton2.addActionListener(new
java.awt.event.ActionListener() {
            public void
actionPerformed(java.awt.event.ActionEvent evt) {
                jButton2ActionPerformed(evt);
            }
        });
        getContentPane().add(jButton2, new
org.netbeans.lib.awtextra.AbsoluteConstraints(120, 90, -1, -
1));

        jButton3.setText("OPEN");
        jButton3.addActionListener(new
java.awt.event.ActionListener() {
            public void
actionPerformed(java.awt.event.ActionEvent evt) {
                jButton3ActionPerformed(evt);
            }
        });
        getContentPane().add(jButton3, new
org.netbeans.lib.awtextra.AbsoluteConstraints(220, 90, -1, -
1));

        jButton4.setText("CLOSE");
        jButton4.addActionListener(new
java.awt.event.ActionListener() {
            public void
actionPerformed(java.awt.event.ActionEvent evt) {
                jButton4ActionPerformed(evt);
            }
        });
        getContentPane().add(jButton4, new
org.netbeans.lib.awtextra.AbsoluteConstraints(300, 90, -1, -
1));

        jButton5.setText("ON");
        jButton5.addActionListener(new
java.awt.event.ActionListener() {
            public void
actionPerformed(java.awt.event.ActionEvent evt) {
                jButton5ActionPerformed(evt);
```

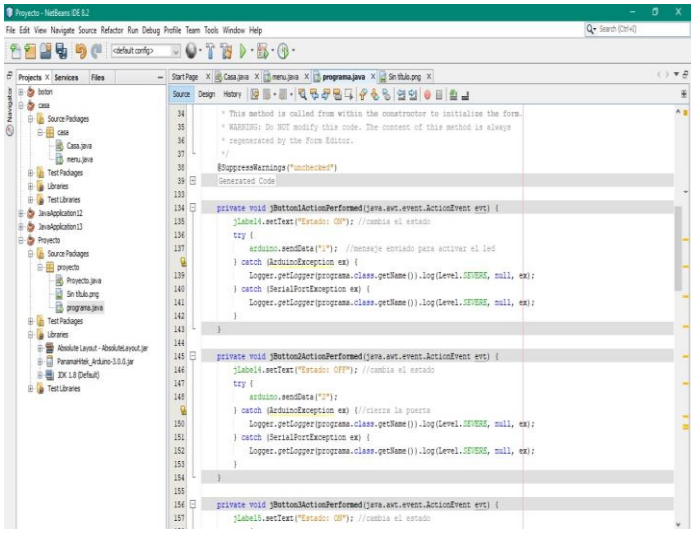
```
        }
    });
    getContentPane().add(jButton5, new
org.netbeans.lib.awtextra.AbsoluteConstraints(430, 90, -1, -
1));

    jButton6.setText("OFF");
    jButton6.addActionListener(new
java.awt.event.ActionListener() {
        public void
actionPerformed(java.awt.event.ActionEvent evt) {
            jButton6ActionPerformed(evt);
        }
    });
    getContentPane().add(jButton6, new
org.netbeans.lib.awtextra.AbsoluteConstraints(550, 90, -1, -
1));

    jLabel1.setText("   LED");

jLabel1.setBorder(javax.swing.BorderFactory.createBevelBor
der(javax.swing.border.BevelBorder.RAISED));
    getContentPane().add(jLabel1, new
org.netbeans.lib.awtextra.AbsoluteConstraints(80, 30, 40, -1));

    jLabel2.setText("  DOOR");

jLabel2.setBorder(javax.swing.BorderFactory.createBevelBor
der(javax.swing.border.BevelBorder.RAISED));
    getContentPane().add(jLabel2, new
org.netbeans.lib.awtextra.AbsoluteConstraints(270, 30, 50,
20));

    jLabel3.setText("     VENTILATION");

jLabel3.setBorder(javax.swing.BorderFactory.createBevelBor
der(javax.swing.border.BevelBorder.RAISED));
    getContentPane().add(jLabel3, new
org.netbeans.lib.awtextra.AbsoluteConstraints(470, 30, 110,
20));

    jLabel4.setText("Estado: ");
    getContentPane().add(jLabel4, new
org.netbeans.lib.awtextra.AbsoluteConstraints(80, 60, -1, -1));

    jLabel5.setText("Estado:");
    getContentPane().add(jLabel5, new
org.netbeans.lib.awtextra.AbsoluteConstraints(280, 60, -1, -
1));

    jLabel7.setText("Estado:");
    getContentPane().add(jLabel7, new
org.netbeans.lib.awtextra.AbsoluteConstraints(490, 60, -1, -
1));

    jLabel6.setIcon(new
javax.swing.ImageIcon(getClass().getResource("/proyecto/Sin
título.png"))); // NOI18N
    getContentPane().add(jLabel6, new
org.netbeans.lib.awtextra.AbsoluteConstraints(0, 0, -1, -1));

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

  private void
jButton1ActionPerformed(java.awt.event.ActionEvent evt)
{//GEN-FIRST:event_jButton1ActionPerformed
    jLabel4.setText("Estado: ON"); //cambia el estado
    try {
      arduino.sendData("1");  //mensaje enviado para activar
el led
    } catch (ArduinoException ex) {

Logger.getLogger(programa.class.getName()).log(Level.SEV
ERE, null, ex);
    } catch (SerialPortException ex) {

Logger.getLogger(programa.class.getName()).log(Level.SEV
ERE, null, ex);
    }
  }//GEN-LAST:event_jButton1ActionPerformed

  private void
jButton2ActionPerformed(java.awt.event.ActionEvent evt)
{//GEN-FIRST:event_jButton2ActionPerformed
    jLabel4.setText("Estado: OFF"); //cambia el estado
    try {
      arduino.sendData("2");
    } catch (ArduinoException ex) {//cierra la puerta

Logger.getLogger(programa.class.getName()).log(Level.SEV
ERE, null, ex);
    } catch (SerialPortException ex) {

Logger.getLogger(programa.class.getName()).log(Level.SEV
ERE, null, ex);
    }
  }//GEN-LAST:event_jButton2ActionPerformed

  private void
jButton3ActionPerformed(java.awt.event.ActionEvent evt)
{//GEN-FIRST:event_jButton3ActionPerformed
    jLabel5.setText("Estado: ON");  //cambia el estado
    try {
      arduino.sendData("3"); //mensaje enviado para activar
la puerta
    } catch (ArduinoException ex) {

Logger.getLogger(programa.class.getName()).log(Level.SEV
ERE, null, ex);
    } catch (SerialPortException ex) {

Logger.getLogger(programa.class.getName()).log(Level.SEV
ERE, null, ex);
    }
  }//GEN-LAST:event_jButton3ActionPerformed

  private void
jButton4ActionPerformed(java.awt.event.ActionEvent evt)
{//GEN-FIRST:event_jButton4ActionPerformed
```

```
        jLabel5.setText("Estado: OFF"); //cambia el estado
        try {
            arduino.sendData("4"); //desactiva la puerta
        } catch (ArduinoException ex) {

Logger.getLogger(programa.class.getName()).log(Level.SEV
ERE, null, ex);
        } catch (SerialPortException ex) {

Logger.getLogger(programa.class.getName()).log(Level.SEV
ERE, null, ex);
        }
    }//GEN-LAST:event_jButton4ActionPerformed

    private void
jButton5ActionPerformed(java.awt.event.ActionEvent evt)
{//GEN-FIRST:event_jButton5ActionPerformed
        jLabel7.setText("Estado: ON"); //cambia el estado
        try {
            arduino.sendData("5"); //mensaje enviado para activar
la ventilacion
        } catch (ArduinoException ex) {

Logger.getLogger(programa.class.getName()).log(Level.SEV
ERE, null, ex);
        } catch (SerialPortException ex) {

Logger.getLogger(programa.class.getName()).log(Level.SEV
ERE, null, ex);
        }
    }//GEN-LAST:event_jButton5ActionPerformed

    private void
jButton6ActionPerformed(java.awt.event.ActionEvent evt)
{//GEN-FIRST:event_jButton6ActionPerformed
        jLabel7.setText("Estado: OFF"); //cambia el estado
        try {
            arduino.sendData("6");
        } catch (ArduinoException ex) { //desactiva la
ventilacion

Logger.getLogger(programa.class.getName()).log(Level.SEV
ERE, null, ex);
        } catch (SerialPortException ex) {

Logger.getLogger(programa.class.getName()).log(Level.SEV
ERE, null, ex);
        }
    }//GEN-LAST:event_jButton6ActionPerformed

    /**
     * @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/lookandfee
l/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(programa.class.getName()
).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {

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

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

java.util.logging.Logger.getLogger(programa.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 programa().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.JButton jButton4;
    private javax.swing.JButton jButton5;
    private javax.swing.JButton jButton6;
    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
}
```

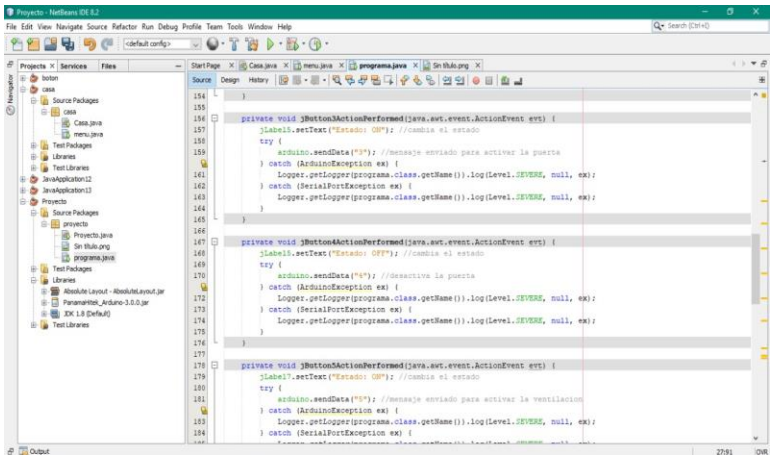
Here I attach screenshots of the JAVA code commented on lines.



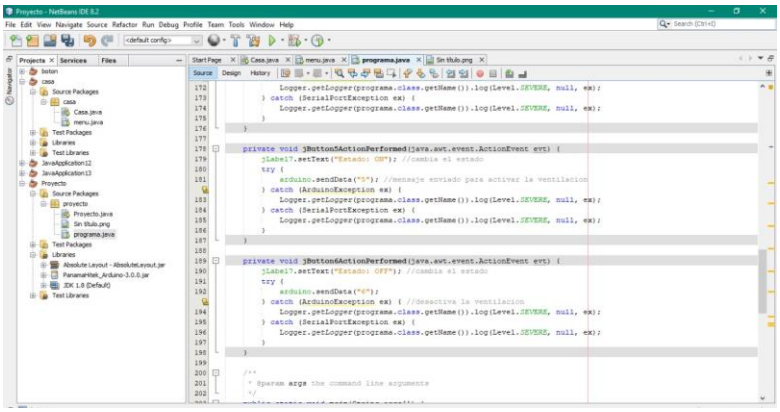
In this part of the code are the two buttons that turn on the light



This part of the code shows the other two buttons that open and close the door

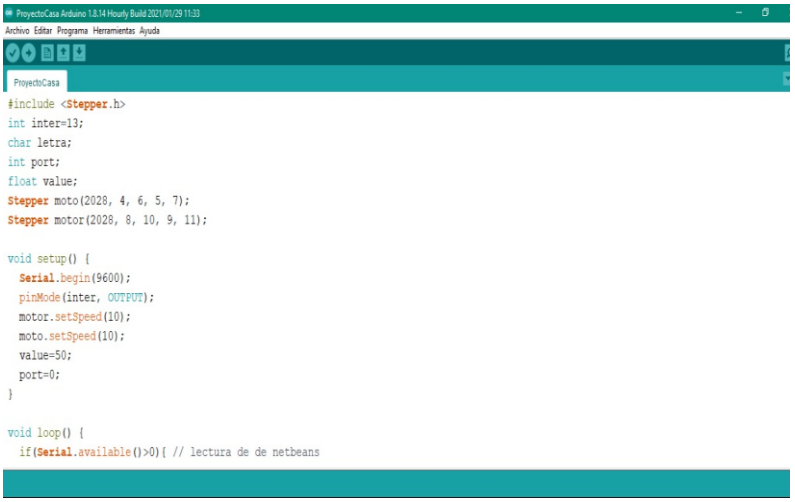


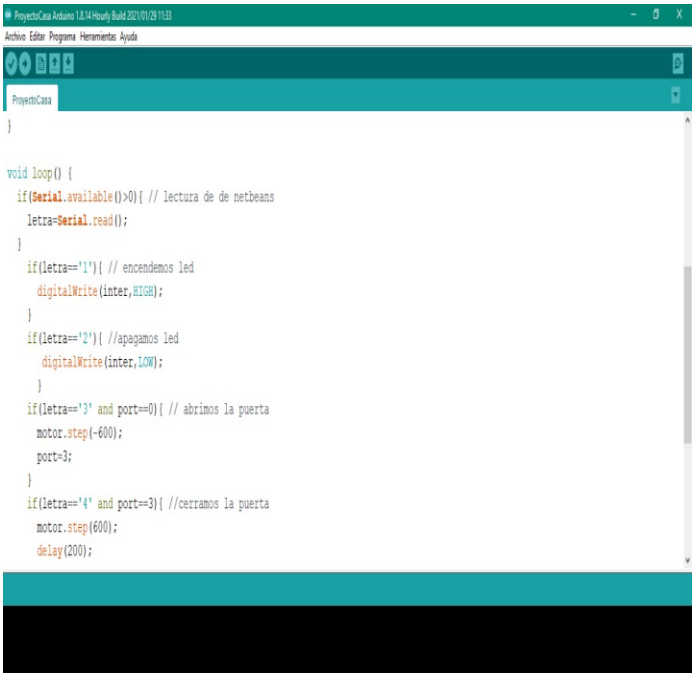
This part of the code shows how these two turn the fan on and off

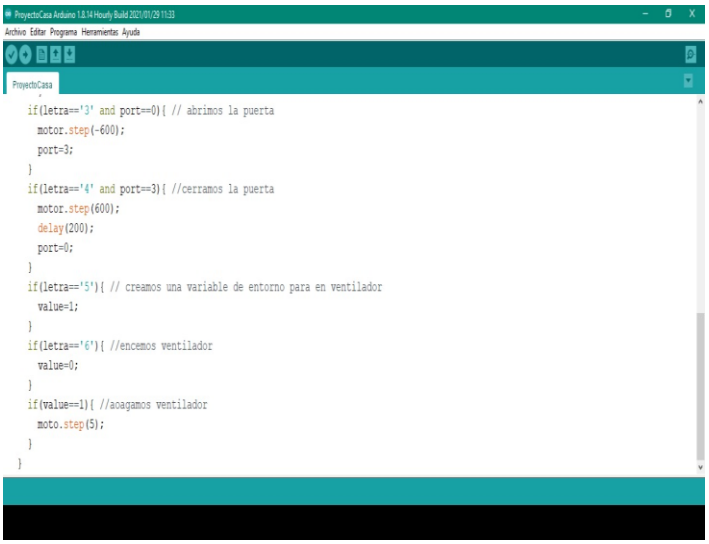


Arduino code commented on lines of code.

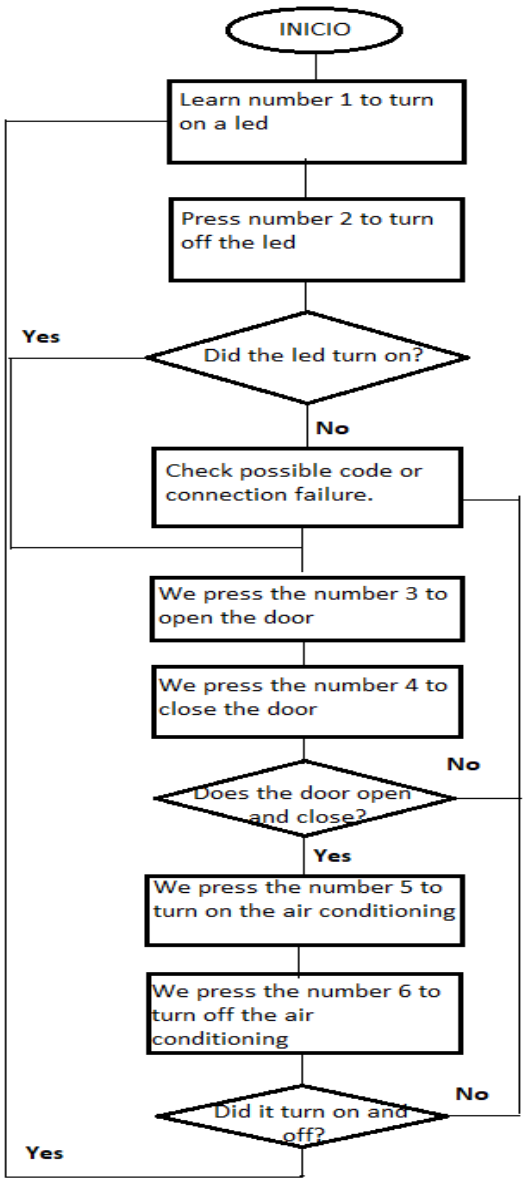
```
#include <Stepper.h>
int inter=13;
char letra;
int port;
float value;
Stepper moto(2028, 4, 6, 5, 7);
Stepper motor(2028, 8, 10, 9, 11);

void setup() {
  Serial.begin(9600);
  pinMode(inter, OUTPUT);
  motor.setSpeed(10);
  moto.setSpeed(10);
  value=50;
  port=0;
}

void loop() {
  if(Serial.available()>0){ // lectura de de netbeans
    letra=Serial.read();
  }
    if(letra=='1'){ // encendemos led
      digitalWrite(inter,HIGH);
    }
    if(letra=='2'){ //apagamos led
       digitalWrite(inter,LOW);
      }
    if(letra=='3' and port==0){ // abrimos la puerta
      motor.step(-600);
      port=3;
    }
    if(letra=='4' and port==3){ //cerramos la puerta
      motor.step(600);
      delay(200);
      port=0;
    }
    if(letra=='5'){ // creamos una variable de entorno para en
ventilador
      value=1;
    }
    if(letra=='6'){ //encemos ventilador
      value=0;
    }
    if(value==1){ //aoagamos ventilador
      moto.step(5);
    }
  }
```





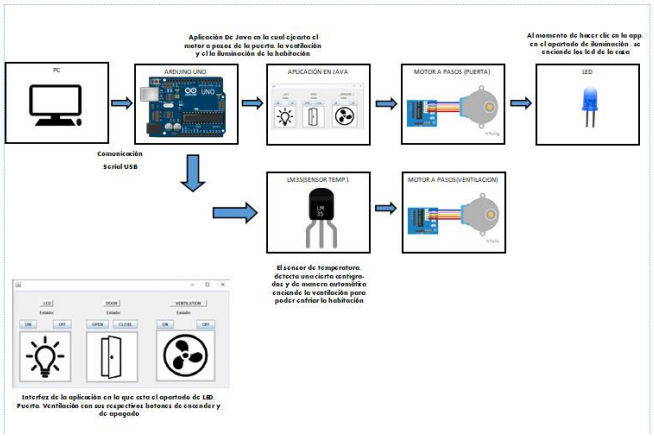


Flowchart



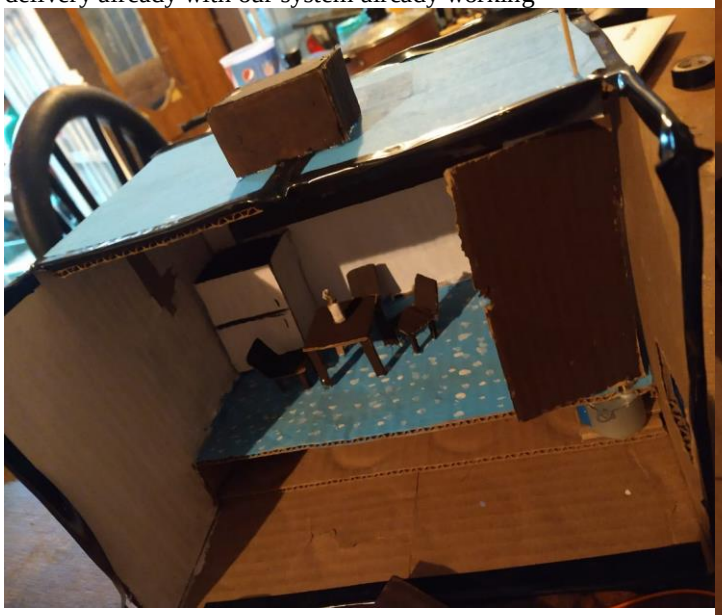
Blocks diagram

Here is the block diagram that we were using or making for the elaboration of the project

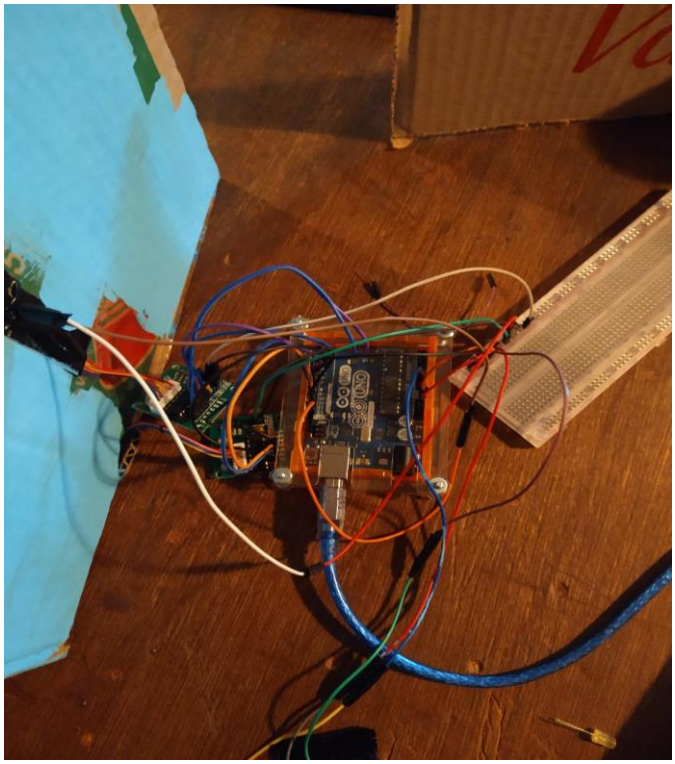


Images of the elaboration of the commented project

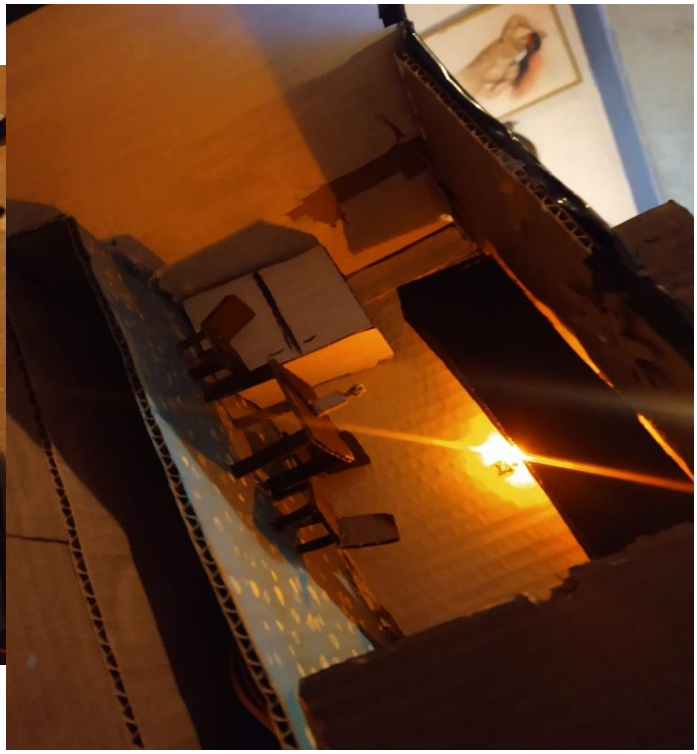
In this image we can see the model of our project as the last delivery already with our system already working



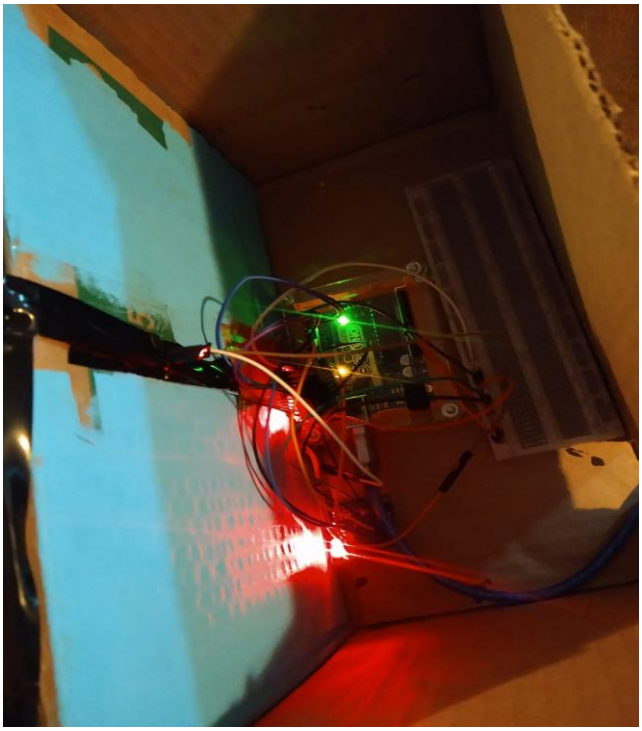
In this image we can see the connection of our arudiono to the model about to be saved to deliver



In this image you can see the led that we use already working in our final model



In this image you can see When we have already prepared the project and the model we are seeing how to hide the cables and trying not to leave anything loose



B. Conclusions and contributions

Karla Moriana - Personally, I really liked our idea and proposal, since I consider it necessary to have greater control of our homes, greater security and comfort.
Our upgraded app will be for android or you can increase your rank.

Joan Emmanuel - Our proposal is good since, we offer users the most important thing that is control and security to facilitate daily tasks that they exercise daily, I still feel that we can improve our application, since we still have many more functions to incorporate and to get better.

Oscar Renato - I really liked working on this project since it was very good to try to implement a solution to a problem that we always handle, so doing this project left me many lessons and I learned things that I did not know, I feel good with the final result and I believe that this work can reach much more since it can be made to grow too much since at the moment of life, everything is worked with technology and we can get to implement it in all the electronic devices of our home

Ricardo Montoya - In conclusion, it is normal to start creating smart homes, for security reasons and for times of pandemic it is something that should get used to starting to take the concept, apart from helping us to understand how it would be and work and begin to familiarize yourself with them, it is something that is not very well implemented not because people do not want to or because they do not know how they work, but because of their costs, something expensive and very high prices to what a common house