Smart Home Project

Made by :

Abdelrahman Mohamed Samir

Amira Elsayed Ahmed

Esraa abd_elHady

Sara Hegazy

Ali Mohamed

Ahmed Salah

Project OverView:

This Project is a smart home project that the home controlled by an android app throw serial Communication throw Bluetooth

Project Component:

Bluetooth Module HC_05

Pic 16f877a

Red led x6

Green led x2

Yellow led

Push Button x2

Resistors 10,000 x2

Oscillator 8Mhz

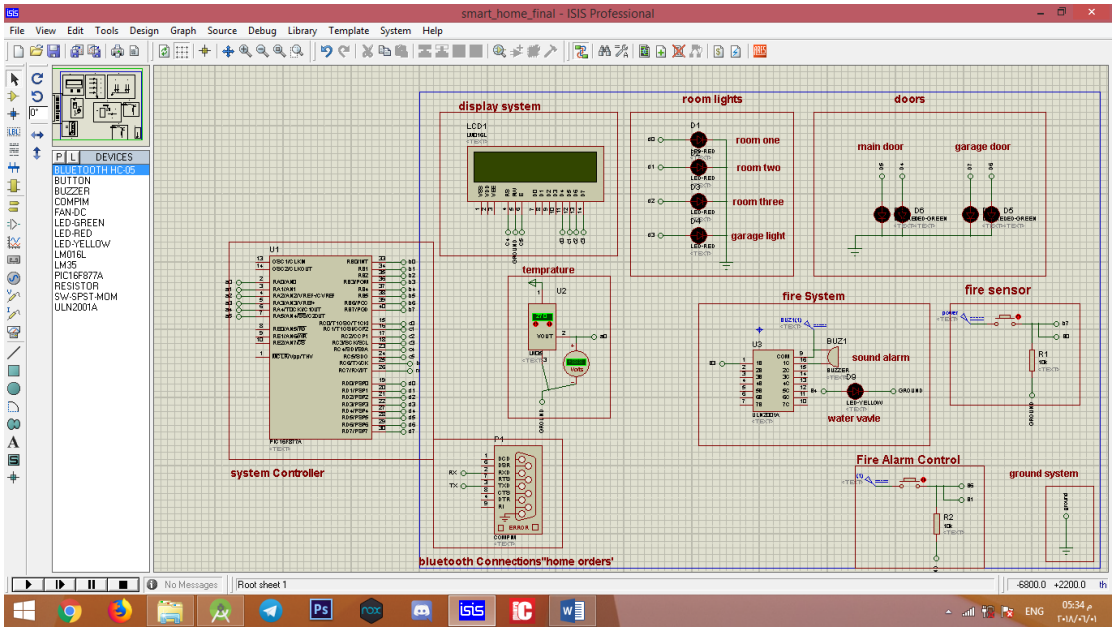
LCD 16X2

BUZZER 9V

Uln2001a "transistor Array"

Regulator 5v

Project schematic



MicroC Code Explanation

In the code we using Uart Serial Communication to communicate with the Bluetooth module which connected to mobile app

And the fire alarm System built with interrupt

Note: you should watch "Project Video Intro" first

The code:

```
char deto;
int statue=0;
int alert_state=0;
 //Lcd pinout settings
sbit LCD_RS at RC4_bit;
sbit LCD_EN at RC5_bit;
sbit LCD_D7 at RC3_bit;
sbit LCD_D6 at RC2_bit;
```

```
sbit LCD_D5 at RC1_bit;
sbit LCD_D4 at RC0_bit;

 //Pin direction
sbit LCD_RS_Direction at TRISC4_bit;
sbit LCD_EN_Direction at TRISC5_bit;
sbit LCD_D7_Direction at TRISC3_bit;
sbit LCD_D6_Direction at TRISC2_bit;
sbit LCD_D5_Direction at TRISC1_bit;
sbit LCD_D4_Direction at TRISC0_bit;


          void INTERRUPT()
         {
           if(INTCON.RBIF==1)
{


           INTCON.B0=0;
           }

              if(statue==0)
               {
       if(portb.b0==1)
       {
Delay_ms(20);
```

```
        if(portb.b0==1)
{
          portb.b3=1;
          portb.b4=1;
          alert_state=1;
        }} else
        {


}
  if(portb.b1==1)
        {
Delay_ms(20);

  if(portb.b1==1)
        {
        if(alert_state==1)
{
         portb.b3=0;
          portb.b4=0;
          alert_state=0;
        }
else if (alert_state==0}
        {
        portb.b3=1;
          portb.b4=1;
          alert_state=1;
```

```
        }


}}
else
        {
}
        statue=1;
                        }
else
                        {
                        statue=0;
}
```

```
                                }
```

```
void main} ()
//Initialize hardware UART1 and establish communication at 9600 bps

          UART1_Init(9600);
          lcd_Init();
                  option_reg=0b10000000;
                   INTCON=0b10001000;
```

```
TRISB=0b11000011;
  portb.b1=0;
  portb.b2=0;

              portb=0x00;
              TRISD=0;
              portd=0x00;
              portd.b4=0;
              portd.b5=1;
              portd.b6=0;
              portd.b7=1;

              Lcd_Cmd(_LCD_CURSOR_OFF);
               while(1)
            {

             if (UART1_Data_Ready() == 1)
  {

               lcd_out(1,1,"good");
                deto = UART1_Read();
                if(deto =='1')
               {
                  if(portd.b0==0)
    {          portd.b0=1;
```

```
                Lcd_Cmd(_LCD_CLEAR);
                 lcd_out(1,1,"good");
                lcd_out(2,1,"room 1 on");
}
                else
    {          Lcd_Cmd(_LCD_CLEAR);
                portd.b0=0;
                lcd_out(1,1,"good");
                lcd_out(2,1,"room 1 off");
}


              }     else if(deto == '2('
              {
              if(portd.b1==0)
 {            portd.b1=1;
                Lcd_Cmd(_LCD_CLEAR);
                 lcd_out(1,1,"good");
                lcd_out(2,1,"room 2 on"){;
                else
   {            Lcd_Cmd(_LCD_CLEAR;(
                portd.b1=0;
                lcd_out(1,1,"good");
                lcd_out(2,1,"room 2 off");
}
```

```
                }       else if(deto == '3')
                {
                if(portd.b2==0)
               {          portd.b2=1;
                  Lcd_Cmd(_LCD_CLEAR);
                   lcd_out(1,1,"good");
                  lcd_out(2,1,"room 3 on");
}
                  else
               {        Lcd_Cmd(_LCD_CLEAR);
                  portd.b2=0;
                  lcd_out(1,1,"good");
                  lcd_out(2,1,"room 3 off");
}

                }       else if(deto == '4('
                {
                if(portd.b3==0)
                  {        portd.b3=1;
                  Lcd_Cmd(_LCD_CLEAR);
                   lcd_out(1,1,"good");
                  lcd_out(2,1,"room 4 on");
}
                  else
                  {           Lcd_Cmd(_LCD_CLEAR;(
                  portd.b3=0;
```

```
                lcd_out(1,1,"good");
                lcd_out(2,1,"room 4 off");
}

              }  else if(deto == '6')
              {
                if(portd.b6==0)
            {       portd.b6=1;
                 portd.b7=0;
                Lcd_Cmd(_LCD_CLEAR);
                lcd_out(1,1,"garage Opened"){;
                else
               {    Lcd_Cmd(_LCD_CLEAR);
                portd.b6=0;
                 portd.b7=1;
                lcd_out(1,1,"garage Closed");
}

              }       else if(deto == '5')
              {
                if(portd.b4==0)
               {            portd.b4=1;
                 portd.b5=0;
                Lcd_Cmd(_LCD_CLEAR);
                 lcd_out(1,1,"good");
                lcd_out(2,1,"mainDoor Opened"); }
```

```
                    else
                   {     Lcd_Cmd(_LCD_CLEAR);
                    portd.b4=0;
                     portd.b5=1;
                    lcd_out(1,1,"good");
                    lcd_out(2,1,"mainDoor Closed");
}

                  }       else if (deto=='7')
                 {
                   portd=0x00;
                   portb.b3=0;
                   portb.b4=0;
                    portd.b5=1;
                    portd.b7=1;
                    portd.b3=0;
                    portd.b4=0;
                    Lcd_Cmd(_LCD_CLEAR);

                    lcd_out(2,1,"System restarted");
 }
               }    else if (UART1_Data_Ready() == 0(
            {
   }
         }
}
```

Android code : for button functions

Android code explanation :

When someone click on the button it send a specific String after converting it to bytes

"String consists of one character"

Code:

```
package net.abdelrahman.www.bluetoothtocar;

import android.annotation.SuppressLint;
import android.bluetooth.BluetoothAdapter;
import android.bluetooth.BluetoothDevice;
import android.bluetooth.BluetoothSocket;
import android.content.Intent;
import android.os.Bundle;
import android.support.v7.app.AppCompatActivity;
import android.view.MotionEvent;
import android.view.View;
import android.widget.Button;
import android.widget.Switch;
import android.widget.Toast;

import java.io.IOException;
import java.io.OutputStream;
import java.util.Set;
import java.util.UUID;

public class MainActivity extends AppCompatActivity {
    private final String DEVICE_ADDRESS = "C0:F8:DA:E8:8C:49"; //MAC Address of Bluetooth Module
    private final UUID PORT_UUID = UUID.fromString("00001101-0000-1000-8000-00805f9b34fb");

    private BluetoothDevice device;
    private BluetoothSocket socket;
    private OutputStream outputStream;
    private Switch
SwitchMainDoor,SwitchGarageDoor,SwitchRoomOne,SwitchRoomTwo,SwitchRoomThree,SwitchGarageLight;
    private Button bluetooth_connect_btn,reset_button;
    String command; //string variable that will store value to be transmitted to the bluetooth
module
    char com;
    @SuppressLint("ClickableViewAccessibility")
    @Override
    protected void onCreate(Bundle savedInstanceState) { // this method called after the app run
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        SwitchRoomOne    = (Switch) findViewById(R.id.switch_room_one);//finding the spacific button
in the layout
        SwitchRoomTwo    = (Switch) findViewById(R.id.switch_room_two);
        SwitchRoomThree  = (Switch) findViewById(R.id.switch_room_three);
        SwitchGarageLight   = (Switch) findViewById(R.id.switch_Garage_light);
        SwitchMainDoor   = (Switch) findViewById(R.id.switch_main_door);
        SwitchGarageDoor = (Switch) findViewById(R.id.switch_garage_door);
        bluetooth_connect_btn = (Button) findViewById(R.id.bluetooth_connect_btn);
        reset_button = (Button) findViewById(R.id.reset_button);


        SwitchRoomOne.setOnClickListener(new View.OnClickListener() {
```

```
            @Override
            public void onClick(View view) {
                command = "1";
                try
                {
                    outputStream.write(command.getBytes()); //transmits the value of command to the
bluetooth module
                }
                catch (IOException e)
                {
                    e.printStackTrace();
                }
            }
        });
        SwitchRoomTwo.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                command = "2";
                try
                {
                    outputStream.write(command.getBytes()); //transmits the value of command to the
bluetooth module
                }
                catch (IOException e)
                {
                    e.printStackTrace();
                }
            }
        });
        SwitchRoomThree.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                command = "3";
                try
                {
                    outputStream.write(command.getBytes()); //transmits the value of command to the
bluetooth module
                }
                catch (IOException e)
                {
                    e.printStackTrace();
                }
            }
        });
        SwitchGarageLight.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                command = "4";
                try
                {
                    outputStream.write(command.getBytes()); //transmits the value of command to the
bluetooth module
                }
                catch (IOException e)
                {
                    e.printStackTrace();
                }
            }
        });

        SwitchMainDoor.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                command = "5";
                try
                {
                    outputStream.write(command.getBytes()); //transmits the value of command to the
bluetooth module
```

```
                }
                catch (IOException e)
                {
                    e.printStackTrace();
                }
            }
        });

        SwitchGarageDoor.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                command = "6";
                try
                {
                    outputStream.write(command.getBytes()); //transmits the value of command to the
bluetooth module
                }
                catch (IOException e)
                {
                    e.printStackTrace();
                }
            }
        });
    //to restart the hole System
        reset_button.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                command = "7";
                try
                {
                    outputStream.write(command.getBytes()); //transmits the value of command to the
bluetooth module
                }
                catch (IOException e)
                {
                    e.printStackTrace();
                }
            }
        });

        //Button that connects the device to the bluetooth module when pressed
        bluetooth_connect_btn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {


                if(BTinit())
                {
                    BTconnect();
                }

            }
        });


    }

    //Initializes bluetooth module
    public boolean BTinit()
    {
        boolean found = false;

        BluetoothAdapter bluetoothAdapter = BluetoothAdapter.getDefaultAdapter();

        if(bluetoothAdapter == null) //Checks if the device supports bluetooth
        {
            Toast.makeText(getApplicationContext(), "Device doesn't support bluetooth",
Toast.LENGTH_SHORT).show();
```

```
        }

        if(!bluetoothAdapter.isEnabled()) //Checks if bluetooth is enabled. If not, the program will
ask permission from the user to enable it
        {
            Intent enableAdapter = new Intent(BluetoothAdapter.ACTION_REQUEST_ENABLE);
            startActivityForResult(enableAdapter,0);

            try
            {
                Thread.sleep(1000);
            }
            catch(InterruptedException e)
            {
                e.printStackTrace();
            }
        }

        Set<BluetoothDevice> bondedDevices = bluetoothAdapter.getBondedDevices();

        if(bondedDevices.isEmpty()) //Checks for paired bluetooth devices
        {
            Toast.makeText(getApplicationContext(), "Please pair the device first",
Toast.LENGTH_SHORT).show();
        }
        else
        {
            for(BluetoothDevice iterator : bondedDevices)
            {
                if(iterator.getAddress().equals(DEVICE_ADDRESS))
                {
                    device = iterator;
                    found = true;
                    break;
                }
            }
        }

        return found;
    }

    public boolean BTconnect()
    {
        boolean connected = true;

        try
        {
            socket = device.createRfcommSocketToServiceRecord(PORT_UUID); //Creates a socket to
handle the outgoing connection
            socket.connect();

            Toast.makeText(getApplicationContext(),
                    "Connection to bluetooth device successful", Toast.LENGTH_LONG).show();
        }
        catch(IOException e)
        {
            e.printStackTrace();
            connected = false;
        }

        if(connected)
        {
            try
            {
                outputStream = socket.getOutputStream(); //gets the output stream of the socket
            }
            catch(IOException e)
            {
```

```
                e.printStackTrace();
            }
        }

        return connected;
    }

    @Override
    protected void onStart()
    {
        super.onStart();
    }

}
```