ANNEXES

SISTEMA DOMÒTIC PER A CASA 100% SOSTENIBLE

Autor: David Burrieza Montserrat

Director: Victor Barcons Xixons

Data: 26 de Maig de 2021

Localitat: Manresa

INDEX

PROGRAMA IL·LUMINACIÓ

```
#define BROKER_IP "192.168.1.161"

#define DEV_NAME "mqttdevice2"

#define MQTT_USER "mqtt_user1"

#define MQTT_PW "mqtt_password"

const char ssid[] = "Iguana.cat-97DD60";

const char pass[] = "263ec09a2c";

#include <MQTT.h>

#ifdef ARDUINO_SAMD_MKRWIFI1010

#include <WiFiNINA.h>

//#elif ARDUINO_SAMD_MKR1000

//#include <WiFi101.h>

//#elif ESP8266

//#include <ESP8266WiFi.h>

//#else

//#error unknown board

#endif

int comp=0;

WiFiClient net;

MQTTClient client;

void connect() {

 Serial.print("checking wifi...");

 while (WiFi.status() != WL_CONNECTED) {

 Serial.print(".");

 delay(1000);

 }

 Serial.print("\nconnecting...");

 while (!client.connect(DEV_NAME, MQTT_USER, MQTT_PW))

{

 Serial.print(".");
```

```
delay(1000);

}

Serial.println("\nconnected!");

client.subscribe("/house/out"); client.subscribe("/house/in");

client.subscribe("/house/AutoLlums");

}
void messageReceived(String &topic, String &payload) {

Serial.println("incoming: " + topic + " - " +

payload);

if (topic == "/house/in"){

comp=0;

while(comp=1){

if ((payload == "ences")){

digitalWrite(8, HIGH);

digitalWrite(9, HIGH);

digitalWrite(10, HIGH);}

else if ((payload == "apagat")){

digitalWrite(8, LOW);

digitalWrite(9, LOW);

digitalWrite(10, LOW);

}loop();}

}

if ((topic == "/house/out") or (topic ==

"/house/AutoLlums")){

comp=1;

while (comp=1){

if (digitalRead(2) == 1){

digitalWrite(8,HIGH);

digitalWrite(10,HIGH);

digitalWrite(9,HIGH);

}
```

```
if (digitalRead(2) ==0){

digitalWrite(8,LOW);

digitalWrite(10,LOW); digitalWrite(9,LOW);

}loop();}}}

void setup() {

 Serial.begin(115200);

 WiFi.begin(ssid, pass);

 pinMode(8,OUTPUT);

 pinMode(9,OUTPUT);

 pinMode(10,OUTPUT);

 client.begin(BROKER_IP, 1883, net);

 client.onMessage(messageReceived);

 connect();

}

void loop() {

 client.loop();
```

PROGRAMA PERSIANES

```
int IN1 = 12;

int IN2 = 13;

int IN3 = 6;

int IN4 = 7;

int IN5 = 8;

int IN6 = 9;

int IN7 = 10;

int IN8 = 11;

int IN9 = 1;

int IN10 = 3;

int compt2=0;

int compt3=0;

int compt4=0;

#define ON 0

#define OFF 1

#define BROKER_IP "192.168.1.161"

#define DEV_NAME "mqttdevice"

#define MQTT_USER "mqtt_user"

#define MQTT_PW "mqtt_password"

const char ssid[] = "Iguana.cat-97DD60";

const char pass[] = "263ec09a2c";

#include <MQTT.h>

#ifdef ARDUINO_SAMD_MKRWIFI1010

#include <WiFiNINA.h>

//#elif ARDUINO_SAMD_MKR1000

//#include <WiFi101.h>

//#elif ESP8266

//#include <ESP8266WiFi.h>

//#else
```

```
//#error unknown board

#endif

int comp=0;

WiFiClient net;MQTTClient client;

void connect() {

 Serial.print("checking wifi...");

 while (WiFi.status() != WL_CONNECTED) {

 Serial.print(".");

 delay(1000);

 }

 Serial.print("\nconnecting...");

 while (!client.connect(DEV_NAME, MQTT_USER, MQTT_PW))

{

 Serial.print(".");

 delay(1000);

 }

 Serial.println("\nconnected!");

 client.subscribe("/house/hab");

 client.subscribe("/house/out");

 client.subscribe("/house/AutoPersianas");

}

void messageReceived(String &topic, String &payload) {

 Serial.println("incoming: " + topic + " - " +

payload);

 if (topic == "/house/hab"){

 comp=0;

 while(comp=1){

 if (compt3==1){

 relay_SetStatus(OFF, OFF);

 relay_SetStatus2(OFF, OFF);

 relay_SetStatus3(OFF, OFF);
```

```
relay_SetStatus4(OFF, OFF);

relay_SetStatus5(OFF, OFF);

compt3=0;

nosurt();  }

if ((payload == "open1")){

relay_SetStatus(ON, OFF);}

else if ((payload == "closed1")){

relay_SetStatus(OFF, ON);}

else if ((payload == "open")){

relay_SetStatus2(ON, OFF);}

else if ((payload == "closed")){

relay_SetStatus2(OFF, ON);}

else if ((payload == "open2")){

relay_SetStatus3(ON, OFF);}

else if ((payload == "closed2")){

relay_SetStatus3(OFF, ON);}

else if ((payload == "open3")){

relay_SetStatus4(ON, OFF);}

else if ((payload == "closed3")){

relay_SetStatus4(OFF, ON);}

else if ((payload == "open4")){

relay_SetStatus5(ON, OFF);}

else if ((payload == "closed4")){

relay_SetStatus5(OFF, ON);

}loop();}}

if ((topic == "/house/out") or (topic ==

"/house/AutoPersianas")){

comp=1;

while (comp=1){

if ((digitalRead(2) == 1) and (compt2==0)){

compt2=1;
```

```
relay_SetStatus(ON, OFF);

relay_SetStatus2(ON, OFF);

relay_SetStatus3(ON, OFF);

relay_SetStatus4(ON, OFF); relay_SetStatus5(ON, OFF);

if (digitalRead(0)==HIGH){

relay_SetStatus(OFF, OFF);

relay_SetStatus2(OFF, OFF);

relay_SetStatus3(OFF, OFF);

relay_SetStatus4(OFF, OFF);

relay_SetStatus5(OFF, OFF);

}

}

if ((digitalRead(2) == 0) and (compt2==1)){

compt2=0;

relay_SetStatus(OFF, ON);

relay_SetStatus2(OFF, ON);

relay_SetStatus3(OFF, ON);

relay_SetStatus4(OFF, ON);

relay_SetStatus5(OFF, ON);

if (digitalRead(0)==HIGH){

relay_SetStatus(OFF, OFF);

relay_SetStatus2(OFF, OFF);

relay_SetStatus3(OFF, OFF);

relay_SetStatus4(OFF, OFF);

relay_SetStatus5(OFF, OFF);

}

}

loop();

}}}

void setup()

{
```

```
Serial.begin(115200); WiFi.begin(ssid, pass);

client.begin(BROKER_IP, 1883, net);

client.onMessage(messageReceived);

connect();

relay_init();//initialize the relay

}

void loop() {

client.loop();

if (digitalRead(0)==HIGH){

compt3=1;

relay_SetStatus(OFF, OFF);

relay_SetStatus2(OFF, OFF);

relay_SetStatus3(OFF, OFF);

relay_SetStatus4(OFF, OFF);

relay_SetStatus5(OFF, OFF);

}

}

void relay_init(void)//initialize the relay

{

//set all the relays OUTPUT

pinMode(IN1, OUTPUT);

pinMode(IN2, OUTPUT);

pinMode(IN3, OUTPUT);

pinMode(IN4, OUTPUT);

pinMode(IN5, OUTPUT);

pinMode(IN6, OUTPUT);

pinMode(IN7, OUTPUT);

pinMode(IN8, OUTPUT);

pinMode(IN9, OUTPUT);

pinMode(IN10, OUTPUT);

relay_SetStatus(OFF, OFF);  relay_SetStatus2(OFF, OFF);
```

```
relay_SetStatus3(OFF, OFF);

relay_SetStatus4(OFF, OFF);

relay_SetStatus5(OFF, OFF);

}

void relay_SetStatus( unsigned char status_1,

unsigned char status_2)

{

 digitalWrite(IN1, status_1);

 digitalWrite(IN2, status_2);

}

void relay_SetStatus2( unsigned char status_1,

unsigned char status_2)

{

 digitalWrite(IN3, status_1);

 digitalWrite(IN4, status_2);

}

void relay_SetStatus3( unsigned char status_1,

unsigned char status_2)

{

 digitalWrite(IN5, status_1);

 digitalWrite(IN6, status_2);

}

void relay_SetStatus4( unsigned char status_1,

unsigned char status_2)

{

 digitalWrite(IN7, status_1);

 digitalWrite(IN8, status_2);

}void relay_SetStatus5( unsigned char status_1,

unsigned char status_2)

{

 digitalWrite(IN9, status_1);
```

```
  digitalWrite(IN10, status_2);
}
void nosurt (){
 relay_SetStatus(OFF, OFF);
 relay_SetStatus2(OFF, OFF);
 relay_SetStatus3(OFF, OFF);
 relay_SetStatus4(OFF, OFF);
 relay_SetStatus5(OFF, OFF);
 if (compt4==0) {
loop();
 }
 nosurt();
}
```

PROGRAMA ALARMA

```
#define BROKER_IP "192.168.1.161"

#define DEV_NAME "mqttdevice1"

#define MQTT_USER "mqtt_user1"

#define MQTT_PW "mqtt_password"

const char ssid[] = "Iguana.cat-97DD60";

const char pass[] = "263ec09a2c";

#include <MQTT.h>

#ifdef ARDUINO_SAMD_MKRWIFI1010

#include <WiFiNINA.h>

//#elif ARDUINO_SAMD_MKR1000

//#include <WiFi101.h>

//#elif ESP8266

//#include <ESP8266WiFi.h>

//#else

//#error unknown board

#endif

#include <Keypad.h>

#include <Password.h>

int buzzer = 19 ;

//INICIEM PANTALLA

#include <Wire.h> // Library for I2C communication

#include <LiquidCrystal_I2C.h> // Library for LCD

LiquidCrystal_I2C lcd = LiquidCrystal_I2C(0x27, 16,

2); // Change to (0x27,20,4) for 20x4 LCD.

//INICIEM TECLAT

const byte ROWS = 4;

const byte COLS = 4;

char keys[ROWS][COLS] = {

{'1','2','3','A'},
```

```
{'4','5','6','B'},

{'7','8','9','C'},

{'*','0','#','D'}

};byte rowPins[ROWS] = {2, 3, 4, 5};

byte colPins[COLS] = {6, 7, 8, 9};

Keypad keypad = Keypad( makeKeymap(keys), rowPins,

colPins, ROWS, COLS );

//INICIEM PINS

int D0 = 0;

int D7 = 10;

Password password = Password( "1234" ); //Definim la

contrasenya

14etorn14nt EchoPin = 20;

14etorn14nt TriggerPin = 21;

int cm;

int comp=0;

WiFiClient net;

MQTTClient client;

void connect() {

 Serial.print("checking wifi...");

 while (WiFi.status() != WL_CONNECTED) {

 Serial.print(".");

 delay(1000);

 }

 Serial.print("\nconnecting...");

 while (!client.connect(DEV_NAME, MQTT_USER, MQTT_PW))

 {

 Serial.print(".");

 delay(1000);

 }

 Serial.println("\nconnected!");
```

```
client.subscribe("/house/out");
}
void messageReceived(String &15etor, String &payload) {
 Serial.println("incoming: " + 15etor + " – " +
payload); if (15etor == "/house/out"){
 comp=1;
 loop();
 }}
void setup() {
 lcd.init();
 lcd.backlight();
 Serial.begin(115200);
 pinMode (buzzer, OUTPUT) ;// Initialization of the
output pin.
 PinMode(TriggerPin, OUTPUT);
 pinMode(EchoPin, INPUT);
 keypad.addEventListener(keypadEvent);
 pinMode(D7, OUTPUT);
 pinMode(D0, INPUT);
 pinMode(0,OUTPUT);
 WiFi.begin(ssid, pass);
 client.begin(BROKER_IP, 1883, net);
 client.onMessage(messageReceived);
 connect();
 }
void loop() {
Serial.println("2222");
client.loop();
cm = ping(TriggerPin, EchoPin);
if (digitalRead(1) == HIGH){
 comp=1;
```

```
}
if (comp==1){ lcd.clear();

lcd.setCursor(0,0);

lcd.print("ALARMA ON IN:");

lcd.setCursor(0,1);

lcd.print("5 SEC");

delay(1000);

lcd.clear();

lcd.setCursor(0,0);

lcd.print("ALARMA ON IN:");

lcd.setCursor(0,1);

lcd.print("4 SEC");

delay(1000);

lcd.clear();

lcd.setCursor(0,0);

lcd.print("ALARMA ON IN:");

lcd.setCursor(0,1);

lcd.print("3 SEC");

delay(1000);

lcd.clear();

lcd.setCursor(0,0);

lcd.print("ALARMA ON IN:");

lcd.setCursor(0,1);

lcd.print("2 SEC");

delay(1000);

lcd.clear();

lcd.setCursor(0,0);

lcd.print("ALARMA ON IN:");

lcd.setCursor(0,1);

lcd.print("1 SEC");

delay(1000);
```

```
  TEMP();
}if (comp==0){
// Serial.println("COMP0")
client.loop();
 lcd.clear();
 lcd.print("ALARMA OFF");
 digitalWrite(0,LOW);
 lcd.setCursor(0,1);
 delay(100);
 loop();
}}
int ping(int TriggerPin, int EchoPin) {
 long duration, distanceCm;
 digitalWrite(TriggerPin, LOW);
 delayMicroseconds(4);
 digitalWrite(TriggerPin, HIGH);
 delayMicroseconds(10);
 digitalWrite(TriggerPin, LOW);
 duration = pulseIn(EchoPin, HIGH);
 distanceCm = duration * 10 / 292/ 2;
 17etorn distanceCm;
}
void ALARMA(){
 digitalWrite (buzzer, HIGH) ;
 delay (1) ;
 digitalWrite (buzzer, LOW) ;
 delay (1) ;
 lcd.setCursor(0,0);
 lcd.print("PASSWORD:"); lcd.setCursor(0,1);
 digitalWrite(0,HIGH);
 SORTIRALARMA();
```

```
}
void SORTIRALARMA(){
// Serial.print("sa");
 digitalWrite (buzzer, HIGH) ;
 delay (1) ;
 digitalWrite (buzzer, LOW) ;
 delay (1) ;
 char key = keypad.getKey();
 Serial.println(key);
 Serial.println(cm);
 if (key != NO_KEY and key != '*' and key != '#'){
 lcd.print(key);}
 SORTIRALARMA();
}
void TEMP(){
 lcd.clear();
 lcd.setCursor(0,0);
 lcd.print("ALARMA ON");
 Serial.print("TEMP");
 cm = ping(TriggerPin, EchoPin);
 if (cm < 70){
 lcd.clear();
 ALARMA();
 }else{
 digitalWrite(0,LOW);
 lcd.clear();
 lcd.setCursor(0,0); lcd.print("ALARMA ON");
 delay(1000);
 TEMP();
}}
void keypadEvent(KeypadEvent Key){
```

```
switch (keypad.getState()){

case PRESSED:

switch (Key){

case '*':

lcd.clear();

checkPassword();

break;

case '#':

lcd.clear();

password.reset();

lcd.begin(16, 2);

lcd.print("PASSWORD");

lcd.setCursor(0,1);

break;

default: password.append(Key);

}

}

}

void checkPassword(){

if (password.evaluate()){

lcd.print("CORRECTE");

delay(1500);

password.reset();

lcd.clear();

comp=0;

loop();

} else{

lcd.print("INCORRECTE");

delay(1500);

password.reset();

lcd.clear();
```

```
 lcd.begin(16, 2);

 lcd.print("PASSWORD ");

 lcd.setCursor(0,1);

 ALARMA();

}

}
```

PROGRAMA CÀRREGUES CONTROLADES I NO CONTROLADES

```
#include "EmonLib.h" // 28, 178, 223

#include <Wire.h> // Library for I2C communication

#include <LiquidCrystal_I2C.h> // Library for LCD

LiquidCrystal_I2C lcd = LiquidCrystal_I2C(0x27, 16,

2); // Change to (0x27,20,4) for 20x4 LCD.

#define VOLT A1

int V;

float voltajeRed = 230.0;

EnergyMonitor energyMonitor;

void setup(){

 Serial.begin(9600);

 pinMode(5, OUTPUT);

 pinMode(6, OUTPUT);

 pinMode(7, OUTPUT);

 pinMode(8, OUTPUT);

 lcd.init();

 lcd.backlight();

 energyMonitor.current(A0, 2.6);

}

void loop(){

 double Irms = energyMonitor.calcIrms(1484);

 double potencia = Irms * voltajeRed;

 Serial.print("Potència: ");

 Serial.println(potencia);

 V=analogRead(VOLT);

// volts= (temp1/511.5)*5;

 delay(10);

// Serial.println(V);

 lcd.setCursor(0,0);
```

```
lcd.print("PRODUCCIO SOLAR");

lcd.setCursor(0,1);

lcd.print((V*0.3)/1023);

lcd.print(" W"); Serial.print("Generat: ");

Serial.println((V*0.3)/1023);

delay(2000);

if (V<100) {

digitalWrite(8, LOW);

digitalWrite(5, LOW);

digitalWrite(6, LOW);

digitalWrite(7, LOW);

}

if ((V>100)and(V<200)) {

digitalWrite(8, LOW);

digitalWrite(5, HIGH);

digitalWrite(6, LOW);

digitalWrite(7, LOW);}

if ((V>200) and (V<400)){

digitalWrite(8, HIGH);

digitalWrite(5, HIGH);

digitalWrite(6, LOW);

digitalWrite(7, LOW); }

if ((V>200) and (V<400)and (potencia>100)){

digitalWrite(8, LOW);

digitalWrite(5, HIGH);

digitalWrite(6, LOW);

digitalWrite(7, LOW); }

if ((V>400) and (V<700)){

digitalWrite(8, HIGH);

digitalWrite(5, HIGH); digitalWrite(6, LOW);

digitalWrite(7, HIGH);}
```

```
if ((V>400) and (V<700)and (potencia>150)){

digitalWrite(8, HIGH);

digitalWrite(5, HIGH);

digitalWrite(6, LOW);

digitalWrite(7, LOW);}

if ((V>400) and (V<700)and (potencia>200)){

digitalWrite(8, LOW);

digitalWrite(5, HIGH);

digitalWrite(6, LOW);

digitalWrite(7, LOW);}

if ((V>700)){

digitalWrite(8, HIGH);

digitalWrite(5, HIGH);

digitalWrite(6, HIGH);

digitalWrite(7, HIGH);

}

if ((V>700)and (potencia>100)){

digitalWrite(8, HIGH);

digitalWrite(5, HIGH);

digitalWrite(6, LOW);

digitalWrite(7, HIGH);

}

if ((V>700)and (potencia>200)){

digitalWrite(8, HIGH);

digitalWrite(5, HIGH); digitalWrite(6, LOW);

digitalWrite(7, LOW);

}

}
```