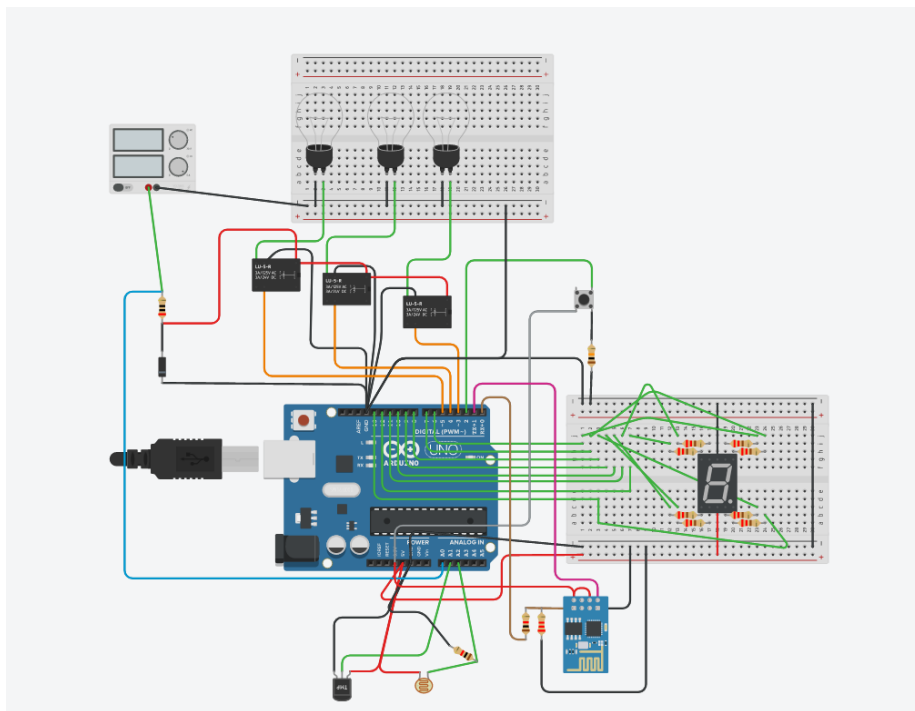


Course Project

Oskari Läntinen

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Task 1



[link to Tinkercad setup HERE](#)

```
#include <SoftwareSerial.h>
#define DEBUG true
SoftwareSerial esp8266(0,1);

const int buttonPin = 2;
```

```

const int lamp1Pin = 3;
const int lamp2Pin = 4;
const int lamp3Pin = 5;
const int conPin = A0;

int buttonCounter = 0;
int buttonState = LOW;
int prevButtonState = LOW;

int lampsOn = 0; // Counter for how many lamps are on

// temp/light calibration
int minT = 0;
int maxT = 1;
int minL = 0;
int maxL = 1;
int cT = 0; // current temp
int cL = 0; // current rh

void setup()
{
    esp8266.begin(115200);
    sendData("AT+RST\r\n",2000,DEBUG); // reset module
    sendData("AT+CWMODE=1\r\n",1000,DEBUG); // configure as Wireless Station mode
    sendData("AT+CWLAP=\"Simulator_Wifi\", \" \"\r\n", 6000,DEBUG); //Login to wifi
    sendData("AT+CIFSR\r\n",2000,DEBUG); // get ip address
    sendData("AT+CIPMUX=1\r\n",1000,DEBUG); // configure for multiple connections
    sendData("AT+CIPSERVER=1,80\r\n",1000,DEBUG); // turn on server on port 80

    pinMode(lamp1Pin , OUTPUT);
    pinMode(lamp2Pin , OUTPUT);
    pinMode(lamp3Pin , OUTPUT);
    pinMode(buttonPin , INPUT);

    // seven segment display pins
    pinMode(6, OUTPUT); //TOP
    pinMode(7, OUTPUT); //TOP RIGHT
    pinMode(8, OUTPUT); //BOTTOM RIGHT
    pinMode(9, OUTPUT); //BOTTOM
    pinMode(10, OUTPUT); //BOTTOM LEFT
    pinMode(11, OUTPUT); //TOP LEFT
    pinMode(12, OUTPUT); //MIDDLE
    pinMode(13, OUTPUT); //DP

    pinMode(conPin , INPUT);

```

```

pinMode(A1, INPUT);
pinMode(A2, INPUT);

Serial.begin(9600);
Serial.println("Device started. Beginning calibration.");

//checks the used current with 1,2 or 3 lamps
digitalWrite(lamp1Pin, HIGH);
delay(200);
int oneLamp = analogRead(conPin);
Serial.println(oneLamp);

digitalWrite(lamp2Pin, HIGH);
delay(200);
int twoLamp = analogRead(conPin);
Serial.println(twoLamp);

digitalWrite(lamp3Pin, HIGH);
delay(200);
int threeLamp = analogRead(conPin);
Serial.println(threeLamp);

Serial.println("Beginning temperature and humidity calibration.");

// read and set min and max values (set to 10000ms)
while(millis() < 0) {
    cT = analogRead(A1);
    cL = analogRead(A2);
    if(cT < minT){minT = cT;}
    if(cT > maxT){maxT = cT;}
    delay(200);
    if(cL < minL){minL = cL;}
    if(cL > maxL){maxL = cL;}
    delay(200);
}
Serial.println("Calibration done!");
}

void loop(){
    String url = "https://console.firebase.google.com/project/iot-home-monitoring-
    // google firebase stuff here

```

```

tempAndLightLoop();
delay(200);
lampLoop();
}

// Sends commands to ESP8266
void sendData(String command, const int timeout, boolean debug)
{
    esp8266.print(command); // send the read character to the esp8266
    long int time = millis();

    while( (time+timeout) > millis())
    {
        while(esp8266.available())
        {
            // The esp has data so display its output to the serial window
            Serial.write(esp8266.read());
        }
    }
}

void tempAndLightLoop(){
    // Reads the current temperature and light level, maps
    // them to range of 0-1023 and prints them out to serial
    int temp = analogRead(A1);
    int light = analogRead(A2);
    temp = map(temp,minT,maxT,0,1023);
    light = map(light,minL,maxL,0,1023);
    Serial.println("Temp_is_");
    Serial.println(temp);
    Serial.println("Light_level_is_");
    Serial.println(light);
}

void digits(int a) // converts "int a" to data for the 7 segment
{
    // Set all to LOW to show nothing
    digitalWrite(6, LOW);
    digitalWrite(7, LOW);
    digitalWrite(8, LOW);
    digitalWrite(9, LOW);
    digitalWrite(10, LOW);
    digitalWrite(11, LOW);
    digitalWrite(12, LOW);
    digitalWrite(13, LOW);
}

```

```

// "0"
if(a == 0){
    digitalWrite(6, HIGH);
    digitalWrite(7, HIGH);
    digitalWrite(8, HIGH);
    digitalWrite(9, HIGH);
    digitalWrite(10, HIGH);
    digitalWrite(11, HIGH);
}

// "1"
if(a == 1){
    digitalWrite(7, HIGH);
    digitalWrite(8, HIGH);
}

// "2"
if(a == 2){
    digitalWrite(6, HIGH);
    digitalWrite(7, HIGH);
    digitalWrite(9, HIGH);
    digitalWrite(10, HIGH);
    digitalWrite(12, HIGH);
}

// "3"
if(a == 3){
    digitalWrite(6, HIGH);
    digitalWrite(7, HIGH);
    digitalWrite(8, HIGH);
    digitalWrite(9, HIGH);
    digitalWrite(12, HIGH);
}
}

void lampLoop(){

    // Never got the button and counter working for some reason
    buttonState = digitalRead(buttonPin);
    Serial.println(buttonState);
    delay(500);
    Serial.println("x");

    delay(200);
    if (buttonState != prevButtonState) {

```

```

// if the state has changed, increment the counter
if (buttonState >= 1) {
    // if the current state is HIGH then the button went from off to on:
    buttonCounter++;
    Serial.println("on");
    Serial.print("number_of_button_pushes: ");
    Serial.println(buttonCounter);
} else {
    // if the current state is LOW then the button went from on to off:
    Serial.println("off");
}

    delay(50);
}
delay(200);
prevButtonState = buttonState;

for(int x = 0; x<4; x++){
    lampsOn = x;
    digits(lampsOn);
    delay(1000);
}

if (buttonCounter == 3) {
    digitalWrite(lamp3Pin, HIGH);
    buttonCounter = 0;
    lampsOn = 3;
}
else if (buttonCounter == 2) {
    digitalWrite(lamp2Pin, HIGH);
    lampsOn = 2;
}
else if (buttonCounter == 1 ) {
    digitalWrite(lamp1Pin, HIGH);
    lampsOn = 1;
}
else{
    digitalWrite(lamp1Pin, LOW);
    digitalWrite(lamp2Pin, LOW);
    digitalWrite(lamp3Pin, LOW);
    lampsOn = 0;
}
}

```
