```
#include <FastLED.h>
#include "DHT.h"


#define LED_PIN     5
#define NUM_LEDS    18

#define DHTPIN 7    // what pin we're connected to
#define DHTTYPE DHT11   // DHT 11

CRGB leds[NUM_LEDS];

const int WR_LED_PIN = 2;
const int WG_LED_PIN = 3;
const int WB_LED_PIN = 4;

const int TR_LED_PIN = 6;
const int TG_LED_PIN = 8;
const int TB_LED_PIN = 9;

const int SR_LED_PIN = 10;
const int SG_LED_PIN = 11;
const int SB_LED_PIN = 12;

int sun = A3;

int sensorPin = A0;
float sensorValue = 0;
int day = 0;
float sun_lev_light;
float sun_level;
float sun_per;
int sun_numb;

int sun_readings[24]; // array to store the sunlight readings
int interval = 3600000;
int index = 0;

float moist_level;
float temp_level;
float temp_sum;
float overall_level;
```

```
DHT dht(DHTPIN, DHTTYPE);

void setup() {
 pinMode(WR_LED_PIN, OUTPUT);
 pinMode(WG_LED_PIN, OUTPUT);
 pinMode(WB_LED_PIN, OUTPUT);

 pinMode(TR_LED_PIN, OUTPUT);
 pinMode(TG_LED_PIN, OUTPUT);
 pinMode(TB_LED_PIN, OUTPUT);

 pinMode(SR_LED_PIN, OUTPUT);
 pinMode(SG_LED_PIN, OUTPUT);
 pinMode(SB_LED_PIN, OUTPUT);

 pinMode(sensorPin, INPUT);
 pinMode(sun, INPUT);
  FastLED.addLeds<WS2812, LED_PIN, GRB>(leds, NUM_LEDS);

 Serial.begin(9600);
 dht.begin();
}

void loop() {

 delay(2000);

 ////////sunlight
 unsigned long currentMil = millis();

 sun_level = analogRead(sun);
 sun_per = map(sun_level, 0, 1023, 0, 100);


 if(day == 0){

   if(sun_per >= 8 && sun_per <= 20){ // sun_per >= 8 && sun_per <= 20
     sun_lev_light = 5;
     analogWrite(SR_LED_PIN, 0);
     analogWrite(SG_LED_PIN, 255);
     analogWrite(SB_LED_PIN, 0);
```

```
  }
  if((sun_per < 8 && sun_per >= 6)|| (sun_per > 20 && sun_per <= 30)){ // 8-6 | 20-30
    sun_lev_light = 4;
  }
  if((sun_per < 6 && sun_per >= 4)|| (sun_per > 30 && sun_per <= 40)){ //6-4 |30-40
    sun_lev_light = 3;
  }
  if((sun_per < 4 && sun_per >= 3)|| (sun_per > 40 && sun_per <= 50)){ //4-3 |40-50
    sun_lev_light = 2;
  }
  if((sun_per < 3)|| (sun_per > 50)){ //3 |50
    sun_lev_light = 1;
  }
  if(sun_per < 8 && sun_lev_light < 5){ //low blue 8
    analogWrite(SR_LED_PIN, 0);
    analogWrite(SG_LED_PIN, 0);
    analogWrite(SB_LED_PIN, 255);
  }
  if(sun_per > 20 && sun_lev_light < 5){//high red 20
    analogWrite(SR_LED_PIN, 255);
    analogWrite(SG_LED_PIN, 0);
    analogWrite(SB_LED_PIN, 0);
  }
 }


if(currentMil % interval == 0){ //one hour has passed
  sun_level = analogRead(sun);
  sun_per = map(sun_level, 0, 1023, 0, 100);
  sun_readings[index] = sun_per;

  if(sun_per >= 8 && sun_per <= 20){
    sun_numb++;
  }
  index++;
}
if(index == 24){ // resetting day

  if(sun_numb >=4 && sun_numb <= 7){
    sun_lev_light = 5;
   analogWrite(SR_LED_PIN, 0);
   analogWrite(SG_LED_PIN, 255);
```

```
    analogWrite(SB_LED_PIN, 0);

   }
   if((sun_numb < 4 && sun_numb >= 3)|| (sun_numb > 7 && sun_numb <= 8)){
     sun_lev_light = 4;
   }
   if((sun_numb < 3 && sun_numb >= 2)|| (sun_numb > 8 && sun_numb <= 9)){
     sun_lev_light = 3;
   }
   if((sun_numb < 2 && sun_numb >= 1)|| (sun_numb > 9 && sun_numb <= 10)){
     sun_lev_light = 2;
   }
   if((sun_numb < 1)|| (sun_numb > 11)){
     sun_lev_light = 1;
   }

if(sun_numb < 4){ //low blue
      analogWrite(SR_LED_PIN, 0);
      analogWrite(SG_LED_PIN, 0);
      analogWrite(SB_LED_PIN, 255);
    }
    if(sun_numb > 7){//high red
      analogWrite(SR_LED_PIN, 255);
      analogWrite(SG_LED_PIN, 0);
      analogWrite(SB_LED_PIN, 0);
    }



   day = 1;
   index = 0;
 }
  Serial.print("Light LEVEL: ");
 Serial.print(sun_lev_light);
 Serial.print(" | Light Sensor Value: ");
 Serial.print(sun_per);
 Serial.println("%");

 ////////// soil moisture
 sensorValue = analogRead(sensorPin);
 float moist;
 moist = (sensorValue/1023)*100;
```

```
if(moist >= 50 && moist <=69){
  moist_level = 5;
  analogWrite(WR_LED_PIN, 0);
  analogWrite(WG_LED_PIN, 255);
  analogWrite(WB_LED_PIN, 0);
}
if((moist >= 37 && moist <= 49)|| (moist > 69 && moist <= 75)){
  moist_level = 4;
}
if((moist >= 24 && moist <= 36)|| (moist >=76 && moist <= 81)){
  moist_level = 3;
}
if((moist >= 11 && moist <=23)|| (moist >=82 && moist <= 89)){
  moist_level = 2;
}
if(moist<=10 || moist >=90){
  moist_level = 1;
}
if(moist <= 49){ //low blue
  analogWrite(WR_LED_PIN, 0);
  analogWrite(WG_LED_PIN, 0);
  analogWrite(WB_LED_PIN, 255);
}
if(moist > 69){ //high red
  analogWrite(WR_LED_PIN, 255);
  analogWrite(WG_LED_PIN, 0);
  analogWrite(WB_LED_PIN, 0);
}


Serial.print("Soil Moisture LEVEL: ");
Serial.print(moist_level);
Serial.print(" | Moist Percent LEVEL: ");
Serial.print(moist);
Serial.print(" | Moisture Sensor Value: ");
Serial.println(sensorValue);

////////////// temp and humid
float h = dht.readHumidity(true);
float f = dht.readTemperature(true);
if (isnan(h) || isnan(f)) {
```

```
  Serial.println("Failed to read from DHT sensor!");
  return;
}
 if(f >= 65 && f <=90){
  temp_level = 5;
  analogWrite(TR_LED_PIN, 0);
  analogWrite(TG_LED_PIN, 255);
  analogWrite(TB_LED_PIN, 0);
}
if((f >= 49 && f <=64)|| (f >=91 && f <= 95)){
  temp_level = 4;
}
if((f >= 33 && f <=48)|| (f >=96 && f <= 105)){
  temp_level = 3;
}
if((f >= 17 && f <=32)|| (f >=106 && f <= 116)){
  temp_level = 2;
}
if(f<=16 || f >=117){
  temp_level = 1;
}

if(f <= 64){
  analogWrite(TR_LED_PIN, 0);
  analogWrite(TG_LED_PIN, 0);
  analogWrite(TB_LED_PIN, 255);
}
if(f >= 91){
  analogWrite(TR_LED_PIN, 255);
  analogWrite(TG_LED_PIN, 0);
  analogWrite(TB_LED_PIN, 0);
}


Serial.print("Temperature LEVEL: ");
Serial.print(temp_level);
Serial.print(" | Temp Sensor Value: ");
Serial.println(f);
////////////////////// equations for average

overall_level = (temp_level + moist_level + sun_lev_light)/3;
```

```
Serial.print("OVERALL LEVEL: ");
Serial.println(overall_level);

Serial.println("////////////////////////////////////////////");
 ////////////overall level color

if(overall_level >= 5){ // purple

  for(int i = 0; i < NUM_LEDS; i++) {
    leds[i] = CRGB(75, 0, 130); // set all LEDs to white
  }
  FastLED.show(); // display all LEDs
  delay(500);



}
if(overall_level < 5 && overall_level >= 4){ //blue

  for(int i = 0; i < NUM_LEDS; i++) {
    leds[i] = CRGB(0, 0, 255); // set all LEDs to white
  }
  FastLED.show(); // display all LEDs
  delay(500);



}
if(overall_level < 4 && overall_level >= 3){ //yeloow

  for(int i = 0; i < NUM_LEDS; i++) {
    leds[i] = CRGB(255, 110, 0); // set all LEDs to white
  }
  FastLED.show(); // display all LEDs
  delay(500);

}
if(overall_level < 3 && overall_level >= 2){// orange

  for(int i = 0; i < NUM_LEDS; i++) {
    leds[i] = CRGB(255, 50, 0); // set all LEDs to white (255,140,0)
  }
  FastLED.show(); // display all LEDs
```

```
    delay(500);

  }
  if(overall_level < 2){ // red

     for(int i = 0; i < NUM_LEDS; i++) {
      leds[i] = CRGB(255, 0, 0);
    }
    FastLED.show(); // display all LEDs
    delay(500);

  }

}
```