**Source code:**

#include <DHT.h>

#include <Wire.h>

#include <LiquidCrystal\_I2C.h>

//const char\* WIFI\_SSID = "NoInternet";

//const char\* WIFI\_PASSWORD = "NoNetwork546";

#define DHTPIN 2            // Digital pin connected to the DHT22 sensor

#define DHTTYPE DHT22      // DHT22 sensor type

#define LDR\_PIN A0          // Analog pin connected to the LDR sensor

#define SOIL\_MOISTURE\_PIN A1// Analog pin connected to the soil moisture sensor

#define coolingSwitch 11       // Digital pin connected to the relay controlling the fan

#define LightingSwitch 9       // Digital pin connected to the relay controlling the lighting system

#define wateringSwitch 7       // Digital pin connected to the relay controlling the watering system

#define LCD\_ADDRESS 0x27    // I2C address of the LCD

#define LCD\_COLUMNS 20      // Number of columns of the LCD

#define LCD\_ROWS 4          // Number of rows of the LCD

DHT dht(DHTPIN, DHTTYPE);   // Initialize the DHT22 sensor

LiquidCrystal\_I2C lcd(LCD\_ADDRESS, LCD\_COLUMNS, LCD\_ROWS); // Initialize the LCD

int chk;

float hum;  //Stores humidity value

float temp; //Stores temperature value

const float GAMMA = 0.7;

const float RL10 = 50;

//const int WIFI\_CONNECT\_TIMEOUT = 10000; // Timeout for WiFi connection in milliseconds

// WiFi credentials

//const char\* WIFI\_SSID = "NoInternet";

//const char\* WIFI\_PASSWORD = "NoNetwork546";

// ThinkSpeak channel information

//const char\* THINKSPEAK\_API\_KEY = "Z8Q8Y4BPAA5VEJRM";

//const char\* THINKSPEAK\_CHANNEL\_ID = "2273478";

// Thresholds for the different parameters

//const int TEMPERATURE\_MIN = 22;

const int TEMPERATURE\_MAX = 24;

const int LDR\_THRESHOLD = 500;

const int SOIL\_MOISTURE\_THRESHOLD = 500;

void setup() {

  // Initialize serial communication

**Serial**.begin(9600);

  dht.begin();

  // Initialize the LCD

  lcd.init();

  lcd.backlight();

  // Initialize the relays

  pinMode(coolingSwitch, OUTPUT);

  pinMode(LightingSwitch, OUTPUT);

  pinMode (wateringSwitch, OUTPUT);

  lcd.print("Welcome");

  delay(1000);

  lcd.clear();

  // Connect to WiFi

  //WiFi.begin(WIFI\_SSID, WIFI\_PASSWORD);

  //Serial.print("Connecting to WiFi");

  // unsigned long wifi\_connect\_start\_time = millis();

  //while (WiFi.status() != WL\_CONNECTED && millis() - wifi\_connect\_start\_time < WIFI\_CONNECT\_TIMEOUT) {

  //  delay(500);

  //  Serial.print(".");

  //}

  //Serial.println();

  //if (WiFi.status() == WL\_CONNECTED) {

  // lcd.println("WiFi connected");

  //} else {

  // lcd.println("WiFi connection failed");

  // }

}

void loop() {

  // Read temperature

  float temperature = dht.readTemperature();

  hum = dht.readHumidity();

  lcd.clear();

  //delay(100);

  lcd.print("TEMP = ");

  lcd.print(temperature);

  lcd.print("\*C");

  hum = dht.readHumidity();

  lcd.setCursor(0, 1);

  lcd.print("HUMIDITY = ");

  lcd.print(hum);

  lcd.print("%");

  // Read sunlight

  //int ldr\_value = analogRead(LDR\_PIN);

  //bool is\_dark = ldr\_value < LDR\_THRESHOLD;

  int analogValue = analogRead(A0);

  float voltage = analogValue / 1024. \* 5;

  float resistance = 2000 \* voltage / (1 - voltage / 5);

  float lux = pow(RL10 \* 1e3 \* pow(10, GAMMA) / resistance, (1 / GAMMA));

  lcd.setCursor(0, 2);

  lcd.print("LIGHT= ");

  lcd.print(lux);

  lcd.print(" LUX");

  // Read soil moisture

  int soil\_moisture = analogRead(SOIL\_MOISTURE\_PIN);

  //bool is\_dry = soil\_moisture < SOIL\_MOISTURE\_THRESHOLD;

  lcd.setCursor(0, 3);

  lcd.print("SOIL MOISTURE = ");

  lcd.print(soil\_moisture);

  lcd.print("%");

  delay(1000);

  // Control temperature

  if (temperature > TEMPERATURE\_MAX)

  {

    digitalWrite(coolingSwitch, HIGH);  // Fan on

    lcd.clear();

    lcd.print("Temp =");

    lcd.print(temperature);

    lcd.print("\*C");

    lcd.print(" FAN ON");

    //delay (1000);

  }

  else if (temperature < TEMPERATURE\_MAX)

  {

    digitalWrite(coolingSwitch, LOW);  // Fan Off

    lcd.clear();

    lcd.print("TEMP=");

    lcd.print(temperature);

    lcd.print("\*C");

    lcd.print(" FAN OFF");

    //delay(1000);

  }

  //Control lighting

  if (lux < 1000)

  {

    digitalWrite(LightingSwitch, HIGH);

    lcd.setCursor(0, 1);

    lcd.print("LIGHT=");

    lcd.print(lux);

    lcd.print("LIGHT ON");

    //delay(1000);

  }

  else if (lux > 1000)

  {

    digitalWrite(LightingSwitch, LOW);

    lcd.setCursor(0, 1);

    lcd.print("LIGHT=");

    lcd.print(lux);

    lcd.print("LIGHTOF");

    //delay(1000);

  }

  //Control irrigation

  if (soil\_moisture < 500)

  {

    digitalWrite(wateringSwitch, HIGH);

    lcd.setCursor(0, 2);

    lcd.print("Soil=");

    lcd.print(soil\_moisture);

    lcd.print("%");

    lcd.print(" Watering");

    delay(1000);

  }

  else if (soil\_moisture > 500)

  {

    digitalWrite(wateringSwitch, LOW);

    lcd.setCursor(0, 2);

    lcd.print("SOIL=");

    lcd.print(soil\_moisture);

    lcd.print("%");

    lcd.print(" NotWaterin");

    delay(1000);

  }

  delay (500);

}

**Output screenshot:**

