**Assignment 3: Develop a Smart Home Automation project using ESP32.**

**The tasks involved in completing this project are:**

**1)Get the Temperature, Humidity from the DHT11 sensor**

**2)Get the light intensity from LDR**

**3)Display the light intensity, Temperature, Humidity values on the OLED display.**

**4) Control the lights based on Light intensity ( Control led's as an indication of light)**

**5)Control the fans based on the temperature and humidity parameters ( Control led's as an indication of fan)**

**Code:**

#include "DHT.h"

#define DHTPIN 4 // Digital pin connected to the DHT sensor

#define DHTTYPE DHT11

#include <Wire.h>

#include <Adafruit\_GFX.h>

#include <Adafruit\_SSD1306.h>

#define SCREEN\_WIDTH 128 // OLED display width, in pixels

#define SCREEN\_HEIGHT 64 // OLED display height, in pixels

// Declaration for an SSD1306 display connected to I2C (SDA, SCL pins)

Adafruit\_SSD1306 display(SCREEN\_WIDTH, SCREEN\_HEIGHT, &Wire, -1);

DHT dht(DHTPIN, DHTTYPE);

void setup() {

//Serial.begin(9600);

Serial.println(F("DHTxx test!"));

Serial.begin(115200);

pinMode(2,OUTPUT);

pinMode(1,OUTPUT);

delay(2000);

Serial.println("oled test");

if(!display.begin(SSD1306\_SWITCHCAPVCC, 0x3C)) {

Serial.println("SSD1306 allocation failed");

for(;;);

}

dht.begin();

}

void loop() {

// Wait a few seconds between measurements.

delay(2000);

// Reading temperature or humidity takes about 250 milliseconds!

// Sensor readings may also be up to 2 seconds 'old' (its a very slow sensor)

float h = dht.readHumidity();

// Read temperature as Celsius (the default)

float t = dht.readTemperature();

// Read temperature as Fahrenheit (isFahrenheit = true)

float f = dht.readTemperature(true);

// Check if any reads failed and exit early (to try again).

if (isnan(h) || isnan(t) || isnan(f)) {

Serial.println(F("Failed to read from DHT sensor!"));

return;

}

// Compute heat index in Fahrenheit (the default)

float hif = dht.computeHeatIndex(f, h);

// Compute heat index in Celsius (isFahreheit = false)

float hic = dht.computeHeatIndex(t, h, false);

int a=analogRead(15);

Serial.print("the ldr value is ");

Serial.println(a);

delay(2000);

Serial.print("Humidity in F: ");

Serial.println(h);

Serial.print(F("Temperature in °C: "));

Serial.println(t);

Serial.print("Temperature in F: ");

Serial.println(f);

Serial.print("Heat index in °C: ");

Serial.println(hic);

Serial.print("Heat index in F: ");

Serial.println(hif);

if (t>32 and h>52){

Serial.print("LED is on");

digitalWrite(2,HIGH);

delay(1000);

}

else {

digitalWrite(2,LOW);

Serial.print("LED is off");

delay(1000);

}

if (a<3000){

Serial.print("Switch on the light");

digitalWrite(1,HIGH);

delay(1000);

}

else {

digitalWrite(2,LOW);

Serial.print("Switch off the light");

delay(1000);

}

display.clearDisplay();

display.setTextSize(1);

display.setTextColor(WHITE);

display.setCursor(0, 10);

// Display static text

display.print("LIght Intensity: ");

display.println(a);

display.print("Temperature in °C: ");

display.println(t);

display.print("Humidity: ");

display.println(h);

display.display();

}

**Circuit**

A picture containing computer, indoor, computer, floor

Description automatically generated