#include <Wire.h>

#include <LiquidCrystal\_I2C.h>

#include <Adafruit\_NeoPixel.h>

#include "DHT.h"

// Definitions

#define DHTPIN 4

#define DHTTYPE DHT11

#define MQ135PIN 34

#define LEDPIN 15

#define NUMPIXELS 60

#define I2C\_ADDR 0x27

LiquidCrystal\_I2C lcd(I2C\_ADDR, 16, 2);

DHT dht(DHTPIN, DHTTYPE);

Adafruit\_NeoPixel pixels(NUMPIXELS, LEDPIN, NEO\_GRB + NEO\_KHZ800);

void setup() {

Serial.begin(115200);

dht.begin();

pixels.begin();

lcd.init();

lcd.backlight();

}

void loop() {

float temp = dht.readTemperature();

float hum = dht.readHumidity();

int airQuality = analogRead(MQ135PIN);

if (!isnan(temp) && !isnan(hum)) {

// 1. First Output: AQI + Temp + Hum + RGB Color

String airStatus;

int r = 0, g = 0, b = 0;

if (airQuality < 2000) {

airStatus = "Good";

r = 0; g = 255; b = 0; // Green

} else if (airQuality < 3000) {

airStatus = "Moderate";

r = 255; g = 255; b = 0; // Yellow

} else {

airStatus = "Poor";

r = 255; g = 0; b = 0; // Red

}

setColor(r, g, b);

scrollText("Temp: " + String(temp, 1) + "C | Hum: " + String(hum, 0) + "% | AQ: " + String(airQuality) + " " + airStatus, r, g, b);

delay(3000);

// 2. Second Output: Environment Feasibility

String feelStatus;

int r2 = 0, g2 = 0, b2 = 0;

if (temp >= 20 && temp <= 30 && hum >= 30 && hum <= 60 && airQuality < 2000) {

feelStatus = "Feels Pleasant";

r2 = 135; g2 = 206; b2 = 235; // Sky Blue

} else {

feelStatus = "Feels Suffocated";

r2 = 255; g2 = 0; b2 = 255; // Purple

}

setColor(r2, g2, b2);

scrollText(feelStatus, r2, g2, b2);

} else {

lcd.clear();

lcd.setCursor(0, 0);

lcd.print("DHT11 Error");

setColor(255, 0, 0); // Red for error

}

delay(3000);

}

void setColor(uint8\_t r, uint8\_t g, uint8\_t b) {

for (int i = 0; i < NUMPIXELS; i++) {

pixels.setPixelColor(i, pixels.Color(r, g, b));

}

pixels.show();

}

void scrollText(String text, uint8\_t r, uint8\_t g, uint8\_t b) {

for (int i = 0; i < text.length() - 15; i++) {

lcd.clear();

lcd.setCursor(0, 0);

lcd.print(text.substring(i, i + 16));

setColor(r, g, b); // Reapply color while scrolling

delay(300);

}

}