National Textile University, Faisalabad

Department of Computer Science

Name:	Minahil Fatima
Class:	BSCS-5B
Registration No:	23-NTU-CS-1051
Lab Report:	Week 6 Home task
Course Name:	Embedded IoT Systems
Submitted To:	Sir Nasir Mahmood
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Week 6 Home Task

Task: Display of temperature, humidity, and LDR readings on OLED

Circuit pin map:

Device name	Pin name	Pin number
OLED	VCC	3.3 V
OLED	GND	GND
OLED	SCL	GPIO22
OLED	SDA	GPIO21
DHT	GND	GND
DHT	DATA	GPIO14
DHT	VCC	5.5 V
LDR	First side	GND
LDR	Second side	3.3 V
10K Resistor	First side	GND
10K Resistor	Second side	GPIO36

Code screenshots:

src > main.cpp > ...

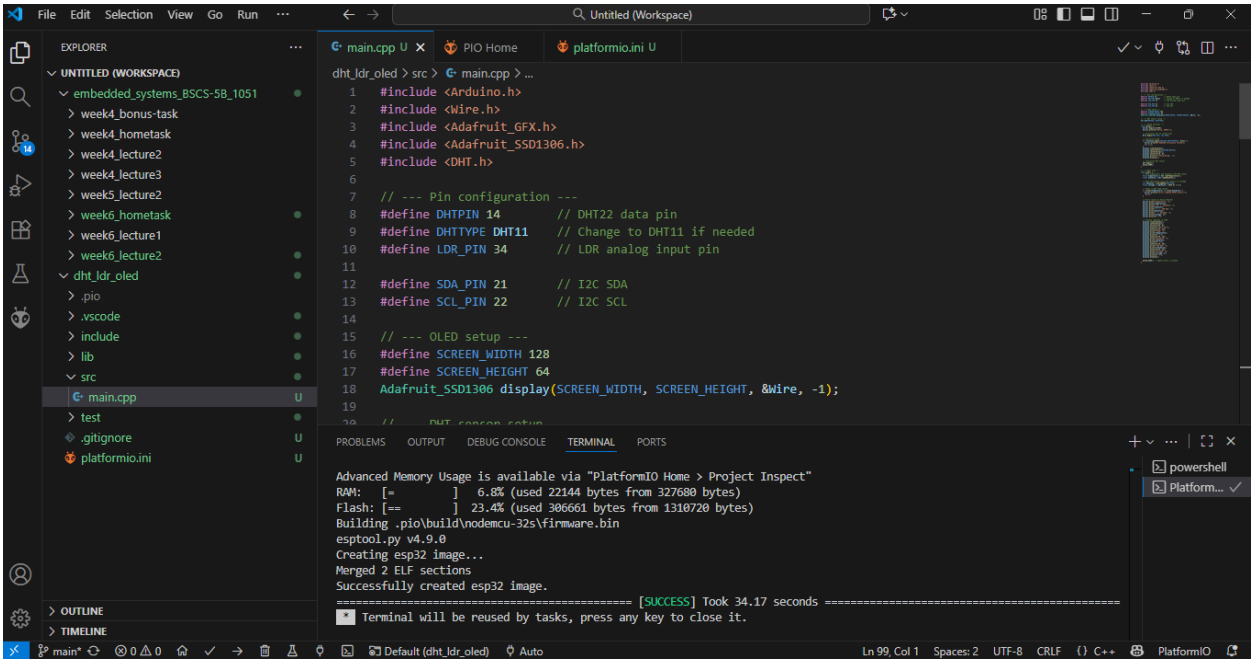
```cpp
#include <Arduino.h>
#include <Wire.h>
#include <Adafruit_GFX.h>
#include <Adafruit_SSD1306.h>
#include <DHT.h>

// --- Pin configuration ---
#define DHTPIN 14         // DHT22 data pin
#define DHTTYPE DHT11     // Change to DHT11 if needed
#define LDR_PIN 34        // LDR analog input pin

#define SDA_PIN 21        // I2C SDA
#define SCL_PIN 22        // I2C SCL

// --- OLED setup ---
#define SCREEN_WIDTH 128
#define SCREEN_HEIGHT 64
Adafruit_SSD1306 display(SCREEN_WIDTH, SCREEN_HEIGHT, &Wire, -1);

// --- DHT sensor setup ---
DHT dht(DHTPIN, DHTTYPE);

// --- Setup function ---
void setup() {
  Serial.begin(115200);
  Serial.println("Hello, ESP32!");

  // Initialize I2C on custom pins
  Wire.begin(SDA_PIN, SCL_PIN);

```

```
  // Initialize OLED
  if (!display.begin(SSD1306_SWITCHCAPVCC, 0x3C)) {
    Serial.println("SSD1306 allocation failed");
    for (;;);
  }
  display.clearDisplay();
  display.setTextColor(SSD1306_WHITE);
  display.setTextSize(1);
  display.setCursor(0, 0);
  display.println("Initializing...");
  display.display();

  // Initialize DHT sensor
  dht.begin();
  delay(1000);
}

// --- Main loop ---
void loop() {
  // Read temperature and humidity from DHT sensor
  float temperature = dht.readTemperature();
  float humidity = dht.readHumidity();

  // Read LDR analog value and convert to voltage
  int adcValue = analogRead(LDR_PIN);
  float voltage = (adcValue / 4095.0) * 3.3;

  // Check if DHT read failed
  if (isnan(temperature) || isnan(humidity)) {
    Serial.println("Error reading DHT22 sensor!");
```

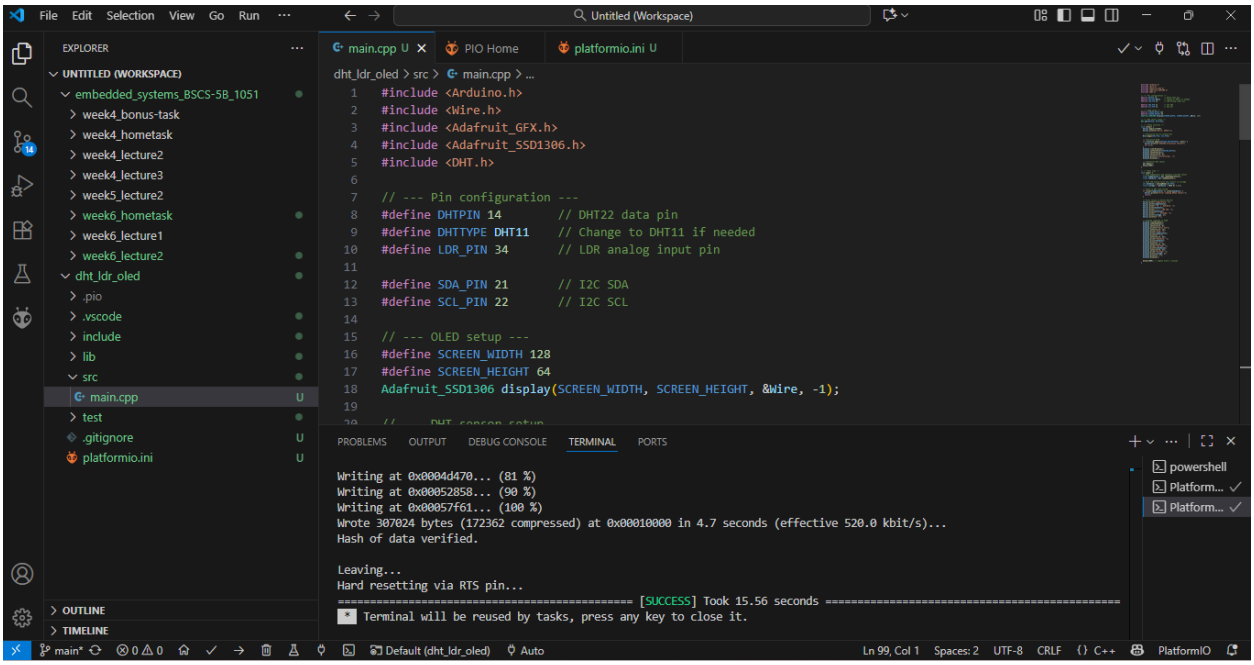
```
    return;
  }

  // Print values on Serial Monitor
  Serial.print("Temperature: ");
  Serial.print(temperature);
  Serial.print(" °C  |  Humidity: ");
  Serial.print(humidity);
  Serial.print(" %  |  LDR ADC: ");
  Serial.print(adcValue);
  Serial.print("  |  Voltage: ");
  Serial.print(voltage, 2);
  Serial.println(" V");

  // Display readings on OLED
  display.clearDisplay();
  display.setTextSize(1);
  display.setCursor(0, 0);
  display.println("Hello IoT");
  display.setCursor(0, 16);
  display.print("Temp: ");
  display.print(temperature);
  display.println(" C");
  display.setCursor(0, 28);
  display.print("Humidity: ");
  display.print(humidity);
  display.println(" %");
  display.setCursor(0, 40);
```

```
    display.print("LDR ADC: ");
    display.println(adcValue);
    display.setCursor(0, 52);
    display.print("Voltage: ");
    display.print(voltage, 2);
    display.println(" V");
    display.display();

    delay(2000); // update every 2 seconds
  }
```

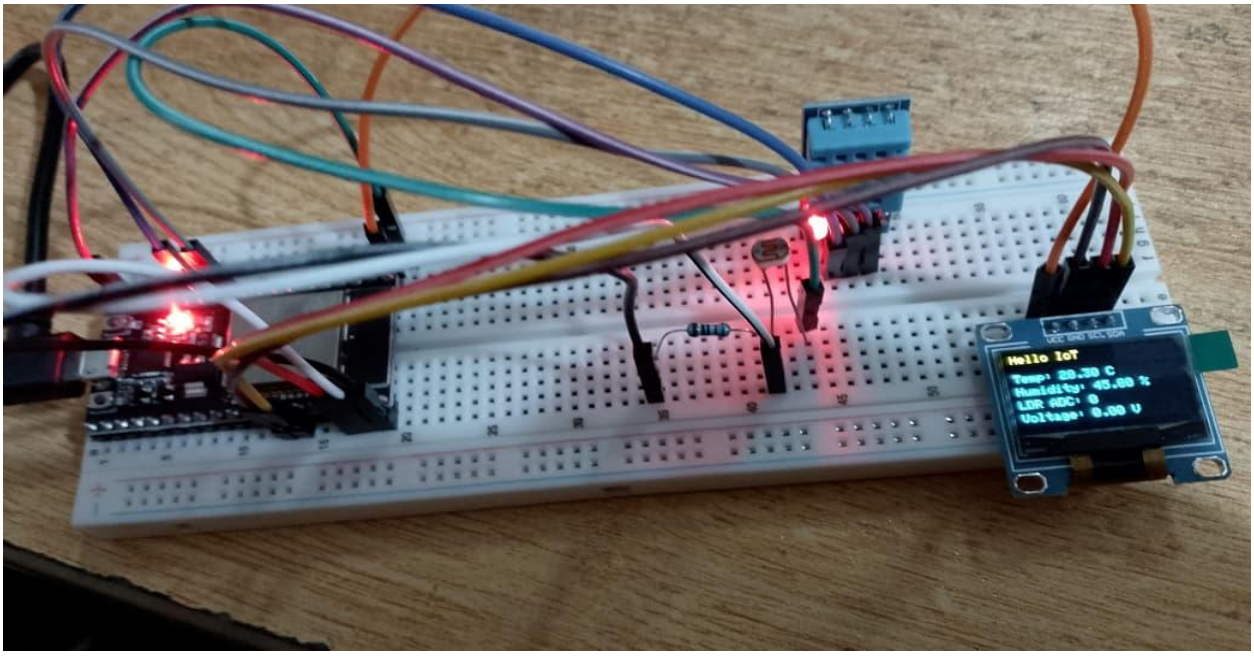
Code build success:

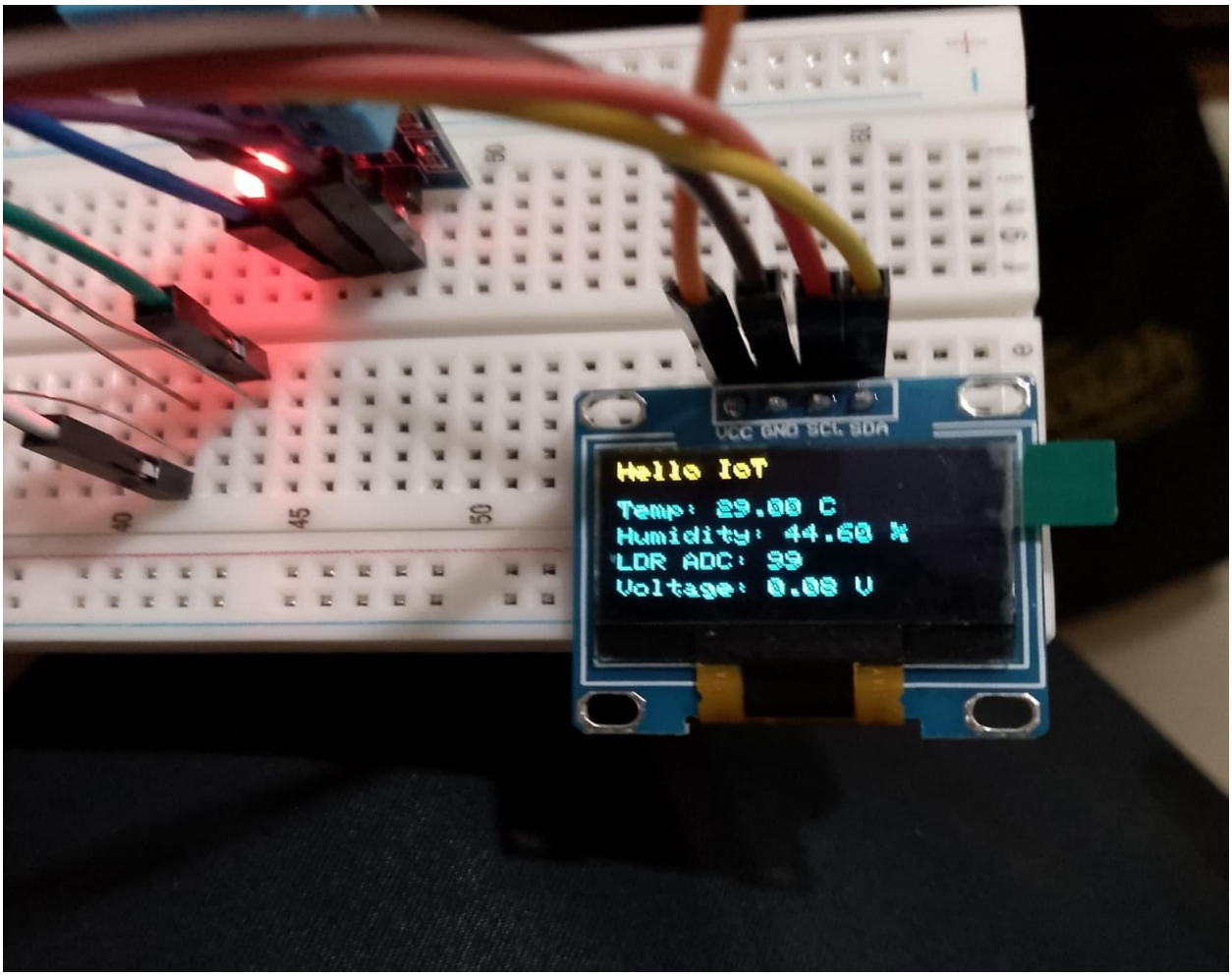


Code upload success:



Output:


Hello IoT
Temp: 28.30 C
Humidity: 45.00 %
LDR ADC: 0
Voltage: 0.00 V


VCC GND SCL SDA
Hello IoT
Temp: 29.00 C
Humidity: 44.60 %
LDR ADC: 39
Voltage: 0.03 V