3(B)

```
#include "DHT.h"
#define DHTPIN 19        // Digital pin connected to the DHT sensor
#define DHTTYPE DHT11    // DHT 11
#include <LiquidCrystal_I2C.h>
DHT dht(DHTPIN, DHTTYPE);
LiquidCrystal_I2C lcd(0x3f, 16, 2);

void setup() {
  lcd.init();
  lcd.backlight();
  Serial.begin(9600);
  Serial.println(F("DHTxx test!"));
  dht.begin();
}

void loop() {
  // Wait a few seconds between measurements.
  delay(2000);

  float humidity = dht.readHumidity();
  float temperature = dht.readTemperature();  // Temperature in Celsius
  float f = dht.readTemperature(true);       // Temperature in Fahrenheit

  // Check if any reads failed and exit early (to try again).
  if (isnan(humidity) || isnan(temperature) || isnan(f)) {
    Serial.println(F("Failed to read from DHT sensor!"));
    return;
  }

  Serial.print(F("Humidity: "));
  Serial.print(humidity);
  Serial.print(F("% Temperature: "));
  Serial.print(temperature);
  Serial.println(F("°C "));

  lcd.setCursor(0, 0);
  lcd.print("Temp");
  lcd.setCursor(5, 0);
  lcd.print((char)223);  // Degree symbol
  lcd.setCursor(6, 0);
  lcd.print("C");
  lcd.setCursor(9, 0);
  lcd.print("Humi %");
```

```
  lcd.setCursor(0, 1);
  lcd.print(temperature);  // Display temperature in Celsius
  lcd.setCursor(9, 1);
  lcd.print(humidity);     // Display humidity
}
```

3(A)

```
#define Relay 19
#define LIGHT_SENSOR_PIN 34 // ESP32 pin GPIO34 (ADC0)

#include <LiquidCrystal_I2C.h>
LiquidCrystal_I2C lcd(0x27, 16, 2);

void setup() {
  // Initialize LCD
  lcd.init();
  lcd.backlight();

  // Start serial communication
  Serial.begin(9600);

  // Set Relay pin as output
  pinMode(Relay, OUTPUT);
}

void loop() {
  // Read the input on analog pin (value between 0 and 4095)
  int analogValue = analogRead(LIGHT_SENSOR_PIN);

  // Output the raw analog value to serial monitor
  Serial.print("Analog Value = ");
  Serial.println(analogValue);

  // Display the analog value on LCD
  lcd.setCursor(0, 0);
  lcd.print("Light Intensity");
  lcd.setCursor(0, 1);
  lcd.print(analogValue);

  // Control the relay based on the light intensity
  if (analogValue < 500) {  // Threshold for turning the relay ON
    Serial.println("Relay ON");
    digitalWrite(Relay, LOW);  // Active LOW, turn relay ON
```

```
  } else {
    Serial.println("Relay OFF");
    digitalWrite(Relay, HIGH); // Turn relay OFF
  }

  // Delay for a second
  delay(1000);
}
```