EXPERIMENT NO.– 10

Problem Statement:

Write an Arduino program that:

- Reads temperature data from a temperature sensor (e.g., LM35 or DHT11).

- Sends the temperature values to the Serial Monitor (or computer).

Components Required:

- Arduino Board (UNO, Mega, etc.)

- Temperature Sensor (LM35 or DHT11)

- Breadboard

- Jumper Wires

- Arduino IDE

Circuit Connections:

☐ LM35 Temperature Sensor Pinout

- VCC → 5V

- GND → GND

- Output → Analog Pin A0

☐ DHT11 Temperature Sensor Pinout

- VCC → 5V

- GND → GND

- Data Pin → Digital Pin 2

- Use a 10kΩ pull-up resistor between the VCC and Data Pin for stability.

Arduino Code (for LM35 Sensor):

```
#define TEMP_PIN A0

void setup() {
  Serial.begin(9600);
  Serial.println("Reading Temperature Sensor...");
}

void loop() {
  int rawValue = analogRead(TEMP_PIN);
  float voltage = rawValue * (5.0 / 1023.0);
  float temperature = voltage * 100.0;

  Serial.print("Temperature: ");
  Serial.print(temperature);
  Serial.println(" °C");

  delay(1000);
}
```

Arduino Code (for DHT11 Sensor):

```
#include <DHT.h>

#define DHTPIN 2
#define DHTTYPE DHT11

DHT dht(DHTPIN, DHTTYPE);

void setup() {
  Serial.begin(9600);
  dht.begin();
  Serial.println("Reading Temperature and Humidity...");
}

void loop() {
  float temperature = dht.readTemperature();
  float humidity = dht.readHumidity();

  if (isnan(temperature) || isnan(humidity)) {
    Serial.println("Failed to read from DHT11 sensor!");
    return;
  }

  Serial.print("Temperature: ");
  Serial.print(temperature);
  Serial.println(" °C");

  Serial.print("Humidity: ");
  Serial.print(humidity);
  Serial.println(" %");

  delay(2000);
}
```

Output:

For LM35:

1. The program reads the temperature from the LM35 sensor every second.
2. The Serial Monitor displays the temperature in the following format:
3. Temperature: 25.3 °C
4. Temperature: 26.1 °C
5. Temperature: 24.8 °C

For DHT11:

6. The program reads the temperature and humidity from the DHT11 sensor every 2 seconds.
7. The Serial Monitor displays the values in the following format:
8. Temperature: 27.5 °C
9. Humidity: 55.2 %

Output:

1. When you turn the potentiometers, the color of the RGB LED changes based on the combined Red, Green, and Blue intensity values.
2. The Serial Monitor displays the current RGB values in the format:
- Red: 120
- Green: 200
- Blue: 45
3. The LED color dynamically changes as you adjust the potentiometers, creating a range of color combinations.