University of Information Technology and Sciences (UITS)

Department Of CSE

Assignment

Course Title: Internet of Things Lab

Course Code: CSE 402

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Topic: Interfacing DHT11 Temperature and Humidity Sensor with Arduino

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1. Objectives

- To interface a temperature sensor with Arduino to measure temperature, humidity and use potentiometer to control or simulate a temperature threshold for specific actions.
- To process and visualize sensor data using the Arduino IDE Serial Monitor.
- To demonstrate the working principles of temperature and humidity sensors.

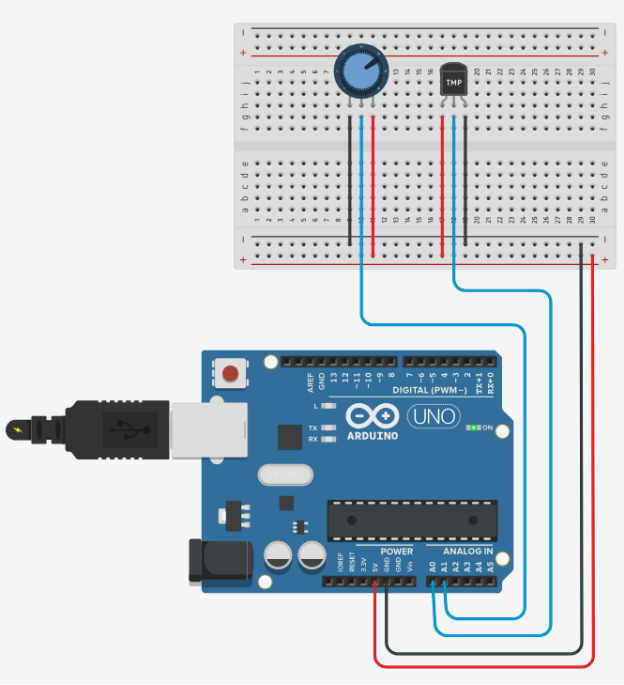
2. Introduction

The DHT11 sensor is a reliable solution for measuring temperature and humidity. It is widely used in various applications like weather monitoring, environmental studies, and smart homes. But in this experiment, we use a temperature sensor LM35 with Arduino to measure temperature, humidity and a potentiometer to demonstrate variable control.

3. Materials Used

- Arduino Uno
- Temperature Sensor LM35
- Potentiometer
- Breadboard
- Wires

4.Circuit Diagram



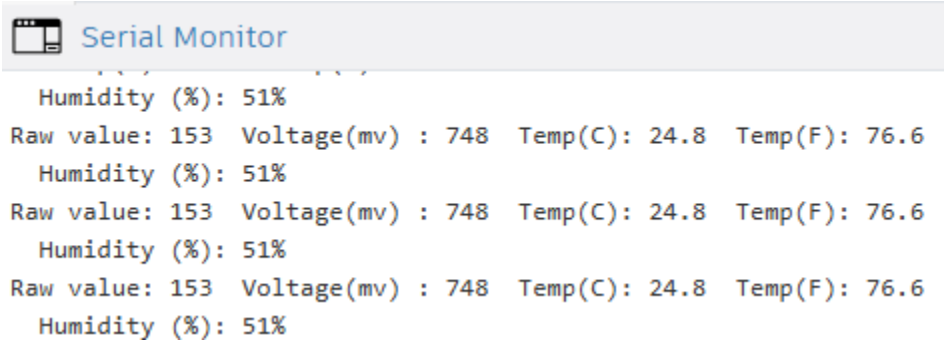
5. Source Code

```
const int tempPin = A0;
const int humidityPin = A1;

int tempRawValue = 0;
double tempVoltage = 0;
double tempC = 0;
double tempF = 0;
int humidityRawValue = 0;
int humidityPercent = 0;


void setup() {
  Serial.begin(9600);
  pinMode(humidityPin, INPUT);
}

void loop() {

  tempRawValue = analogRead(tempPin);
  tempVoltage = (tempRawValue / 1023.0) * 5000.0;
  tempC = (tempVoltage - 500.0) * 0.1;
  tempF = (tempC * 1.8) + 32.0;
  Serial.print("Raw value: ");
  Serial.print(tempRawValue);
  Serial.print("  Voltage(mv) : ");
  Serial.print(tempVoltage, 0);
  Serial.print("  Temp(C): ");
  Serial.print(tempC, 1);
  Serial.print("  Temp(F): ");
  Serial.println(tempF, 1);
  humidityRawValue = analogRead(humidityPin);
  humidityPercent = map(humidityRawValue, 0, 1023, 10, 70);
  Serial.print("  Humidity (%): ");
  Serial.print(humidityPercent);
  Serial.println("%");

  delay(1000);
}
```

6. Methodology

- Read the analog values from the LM35 sensor to calculate temperature.
- Read the potentiometer analog value to dynamically adjust a parameter.
- Use the potentiometer to control the threshold and trigger actions.

7. Result



The serial monitor displays real-time temperature in both Celsius, Fahrenheit, humidity percentage.

8. Conclusion

The project successfully integrates a temperature sensor, potentiometer and display temperature, humidity in serial monitor. The temperature sensor measures and displays accurate readings in both Celsius and Fahrenheit while the potentiometer allows dynamic adjustment of parameters such as temperature thresholds. Also the system displays real-time humidity levels percentage provide a overview of environmental conditions.