TEMPERATURE AND HUMIDITY SENSOR

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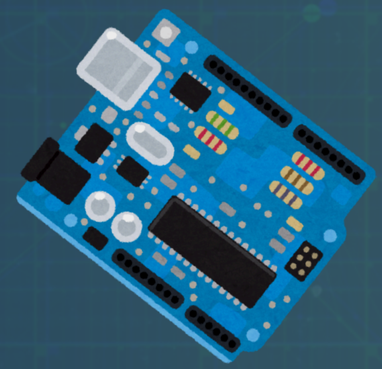
Start

INTRODUCTION

This project involves designing and implementing a simple temperature and humidity monitoring system using a digital sensor. The main objective is to measure ambient temperature and relative humidity, then display the data on an LCD.

COMPONENTS USED

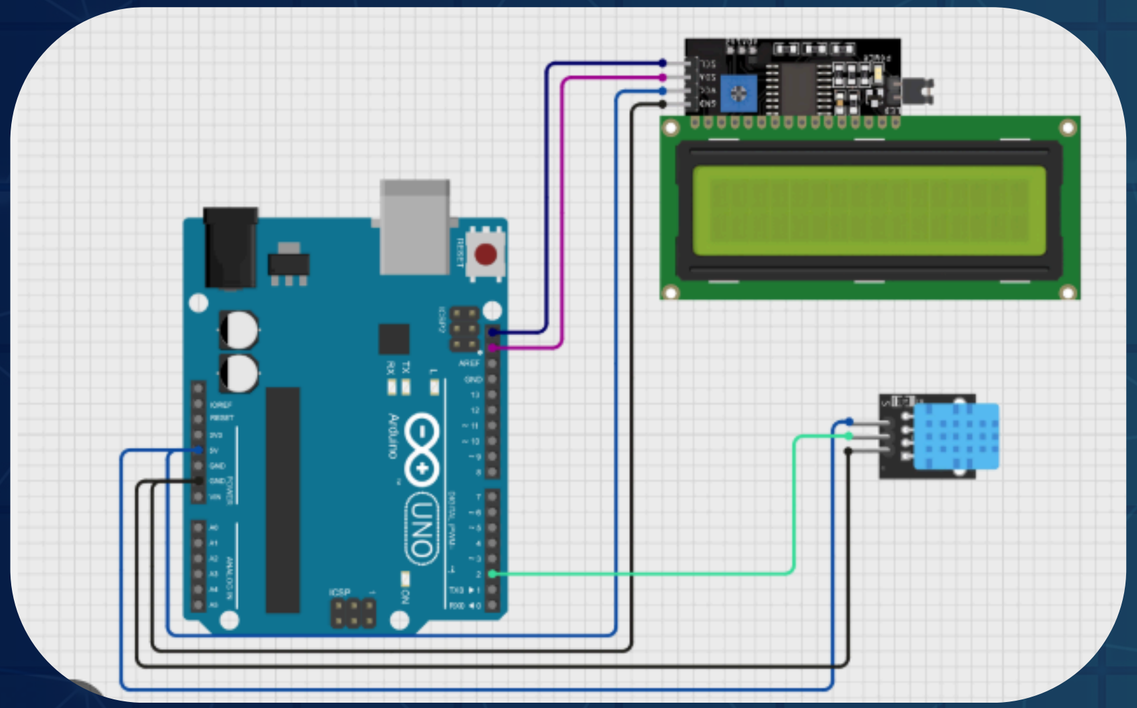


- DHT22 Temperature and Humidity Sensor
- Arduino Uno microcontroller
- 16x2 I2C LCD Display
- Jumper wires
- USB cable for programming

WORKING PRINCIPLE

The DHT22 sensor measures the surrounding air's temperature and humidity. The sensor uses a thermistor and a capacitive humidity sensor to sense the environmental conditions. It then sends the data as a digital signal to the Arduino, which processes and displays the readings.

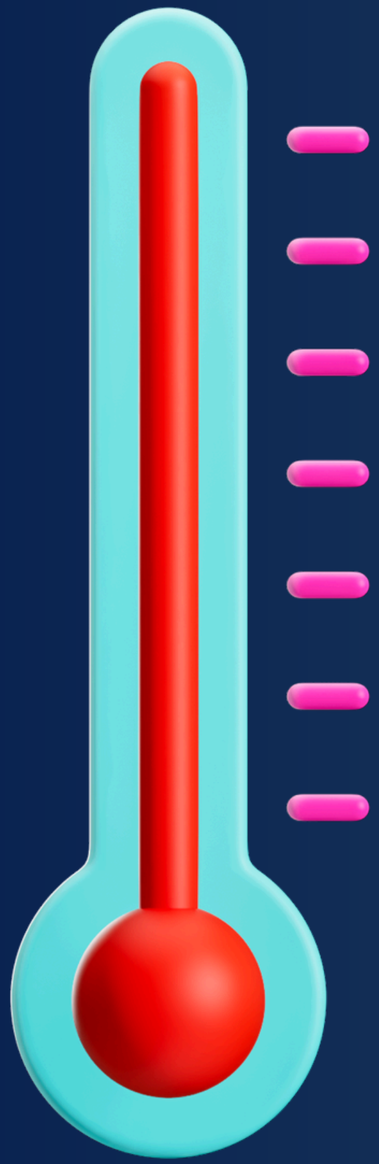
CIRCUIT DIAGRAM



- VCC of DHT22 to 5V on Arduino
- GND of DHT22 to GND on Arduino
- Data pin of DHT22 to digital pin 7 on Arduino
- LCD VCC to 3.3 v
- LCD GND TO GND
- LCD SDA to A4
- LCD SCL to A5

CODE

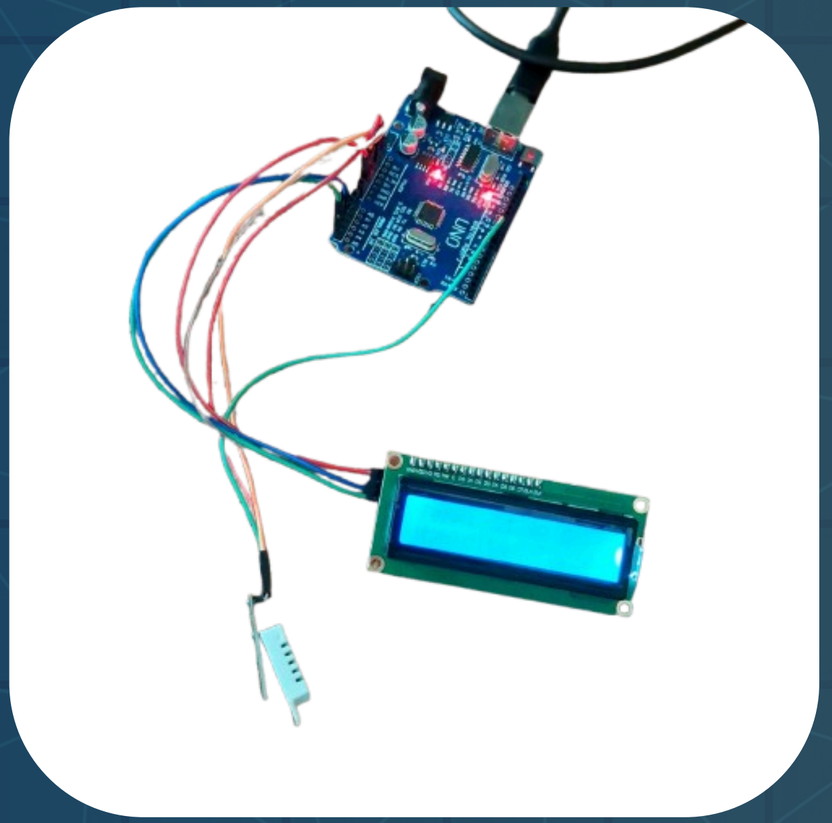
```
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
#include <DHT.h>
#define DHTPIN 7  // Connect DHT22 to pin 2
#define DHTTYPE DHT22
DHT dht(DHTPIN, DHTTYPE);
LiquidCrystal_I2C lcd(0x27, 16, 2); // Use your LCD I2C address
here
void setup() {
Serial.begin(9600);
dht.begin();
lcd.init();
lcd.backlight();
}
void loop() {
float h = dht.readHumidity();
float t = dht.readTemperature();

if (isnan(h) || isnan(t)) {
Serial.println("Failed to read from DHT sensor!");
lcd.clear();
lcd.setCursor(0, 0);
lcd.print("Sensor Error");
return;
}
```



```
Serial.print("Temp: ");
Serial.print(t);
Serial.print(" *C\t");
Serial.print("Humidity: ");
Serial.print(h);
Serial.println(" %");

lcd.clear();
lcd.setCursor(0, 0);
lcd.print("Temp: ");
lcd.print(t);
lcd.print(" C");

lcd.setCursor(0, 1);
lcd.print("Humidity: ");
lcd.print(h);
lcd.print(" %");

delay(2000);
}
```

RESULTS


GNDVDDVO RS RW E D0 D1 D2 D3 D4 D5 D6 D7ELA BLK
Temp: 33.90 C
Humidity: 75.30


GND

APPLICATIONS




- Home automation systems
- Greenhouse environment monitoring
- Industrial temperature and humidity regulation
- Weather stations

CONCLUSION

This mini-project successfully demonstrated the use of a DHT22 sensor interfaced with an Arduino to monitor temperature and humidity. The system is low-cost, simple to implement, and useful for various real-world applications.

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