**TEMPERATURE MONITORING SYSTEM**

**Project Overview**

This project demonstrates how to use a temperature sensor (DS18B20) to read temperature data and display it on both an LCD and serial monitor using an Arduino board.

**Circuit Design**

**Components Needed:**

* Arduino Uno (or compatible board)
* DS18B20 temperature sensor
* 16x2 LCD with I2C interface
* 4.7kΩ resistor
* Breadboard
* Jumper wires

**Circuit Connections:**

**DS18B20 Connections:-**

- VCC (Red wire) → 5V on Arduino

- DATA (Yellow wire) → Digital pin 2 on Arduino

- GND (Black wire) → Ground on Arduino

- 4.7kΩ resistor between VCC and DATA lines

**LCD Connections (I2C):-**

- GND → Ground

- VCC → 5V

- SDA → A4 on Arduino

- SCL → A5 on Arduino

**Output Demonstration**

**Expected Serial Monitor Output:-**

Temperature Monitoring System Initialized

Temperature: 25.50 °C | 77.90 °F

Temperature: 25.62 °C | 78.12 °F

Temperature: 25.75 °C | 78.35 °F

**Expected LCD Display:-**

Temperature:

25.50 C (77.90 F)

Additional Notes

1. **Library Installation**:
   * Install the following libraries through Arduino Library Manager:
     + One Wire
     + Dallas Temperature
     + LiquidCrystal\_I2C
2. **DS18B20 Variations**:
   * If using a waterproof version, the wire colours might be different (typically red=VCC, black or blue=GND, yellow or white=DATA)
3. **I2C LCD Address**:
   * The default I2C address is often 0x27, but some displays use 0x3F. Use an I2C scanner sketch if the LCD doesn't work.
4. **Troubleshooting**:
   * If you get strange temperature readings (-127°C), check your wiring and ensure the 4.7kΩ pull-up resistor is properly connected.
   * Make sure the sensor is properly connected to the correct digital pin (pin 2 in this example).