PRACTICAL 5 : Temperature on LCD

Aim : To interface a 16x2 LCD with Arduino and display temperature readings.

Overview :

In this project, a temperature sensor is interfaced with an Arduino and a 16x2 LCD to display real-time temperature readings. This practical helps in learning about LCD interfacing, data communication between components, and the importance of real-time monitoring in IoT systems.

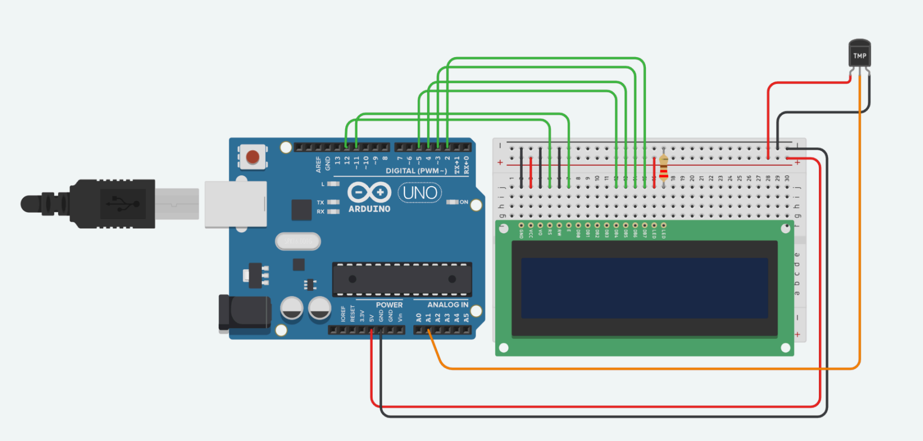
Materials Required :

- Arduino Uno R3
- 1 x 220 Ω Resistor
- LCD 16x2
- Temperature Sensor (TMP36)
- Jumper Wires
- Arduino IDE (Installed on your Computer)

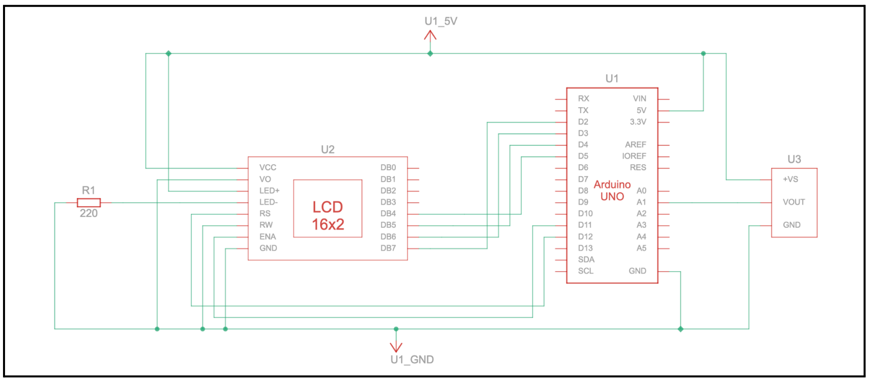
Circuit Connection and Steps :

1. **Connect the TMP36 Temperature Sensor :**
    - VCC → 5V, GND → GND, VOUT → A5 (Arduino).
2. **Connect the 16x2 LCD Display :**
    - RS → D7, E → D8, D4-D7 → D9-D12 (Arduino).
    - VSS, RW, K → GND, VDD, A → 5V.
    - V0 → Potentiometer (Middle Pin) for contrast control.
3. **Connect the Potentiometer:**
    - One side → 5V, Other side → GND, Middle → V0 (LCD).
4. **Power Connections:**
    - 5V → Positive Rail, GND → Negative Rail on Breadboard.

Circuit Diagram :



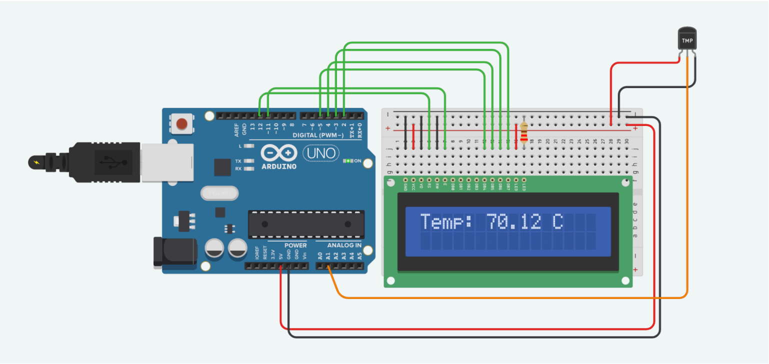
Schematic Diagram :



Code :

```
#include<LiquidCrystal.h>
const int rs = 12, en = 11, d4 = 5, d5 = 4, d6 = 3, d7 = 2;
LiquidCrystal lcd(rs, en, d4, d5, d6, d7);
float celsius;
int temp = A1;
void setup(){
      pinMode(temp,INPUT);
}
void loop(){
      celsius = analogRead(temp)*0.004882814;
      celsius = (celsius - 0.5) * 100.0;
      lcd.setCursor(0,1);
      lcd.print("⟶ Temp : ");
      lcd.print(celsius);
      lcd.print(" C");
      delay(1000);
      lcd.clear();
}
```

Results :



Conclusion :

This project successfully demonstrates how to interface a 16x2 LCD with an Arduino to display real-time temperature readings. It reinforces the concepts of sensor integration and data visualization, providing a crucial step toward developing more complex IoT applications involving real-time monitoring systems.