## 🌡️ Project Title: Digital Thermometer using Arduino and LCD

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### 📄 Short Note / Description:

This project demonstrates a **Digital Thermometer** built with **Arduino Uno**, **LCD (16x2)**, and **TMP36 Temperature Sensor**. It reads analog temperature values using the sensor, processes the readings to display real-time **Celsius and Fahrenheit** values on the LCD screen.

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### 🔌 Main Components Used:

| Component | Description |
|---|---|
| **Arduino Uno** | Microcontroller to read sensor data and control LCD display. |
| **TMP36** | Analog temperature sensor. |
| **LCD 16x2** | For displaying the temperature in °C and °F. |
| **220Ω Resistor** | Used for LED backlight of LCD. |
| **Breadboard + Jumper Wires** | For connections. |

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### 🧠 Working Principle:

- The **TMP36** sensor outputs an analog voltage corresponding to the ambient temperature.
- Arduino reads this analog voltage (0–5V) using its **analog pin (A0)**.
- The voltage is converted to temperature using:
    - TMP36's scale factor: **10 mV/°C**
    - Offset correction: **Subtract 0.5V (or 500mV)**
- Temperature in Fahrenheit is calculated using the formula:

$$T(°F) = T(°C) \times \frac{9}{5} + 32$$

- Output is displayed on an LCD.

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