3) USE A TEMPERATURE SENSOR TO READ AND DISPLAY TEMPERATURE DATA ON AN LCD OR SERIAL MONITOR

ANS: project using a **temperature sensor** (like LM35 or DHT11) with **Arduino Uno** to **read and display temperature data** on an **LCD or Serial Monitor**.

**🎯 Objective:**

* Read temperature using a sensor.
* Display temperature on **16x2 LCD** (I2C) or **Serial Monitor**.

**🧰 COMPONENTS REQUIRED**

| **Component** | **Quantity** |
| --- | --- |
| Arduino Uno | 1 |
| LM35 / DHT11 sensor | 1 |
| 16x2 LCD with I2C module (optional) | 1 |
| Breadboard + Jumper wires | As needed |

Choose either **LM35 (Analog)** or **DHT11 (Digital)** as your sensor.

**🔌 CIRCUIT DESIGN**

**✅ If using LM35 (Analog temperature sensor):**

| **LM35 Pin** | **Arduino** |
| --- | --- |
| VCC | 5V |
| GND | GND |
| OUT | A0 |

**✅ If using DHT11 (Digital sensor):**

| **DHT11 Pin** | **Arduino** |
| --- | --- |
| VCC | 5V |
| GND | GND |
| DATA | D2 |

**🧠 ARDUINO CODE**

#include <Wire.h>

#include <LiquidCrystal\_I2C.h>

LiquidCrystal\_I2C lcd(0x27, 16, 2); // Check address: 0x27 or 0x3F

const int tempPin = A0;

void setup() {

lcd.begin();

lcd.backlight();

}

void loop() {

int sensorValue = analogRead(tempPin);

float voltage = sensorValue \* (5.0 / 1023.0);

float temperatureC = voltage \* 100;

lcd.setCursor(0, 0);

lcd.print("Temp: ");

lcd.print(temperatureC);

lcd.print(" C");

delay(1000);

}

Option B: LM35 with Serial Monitor

const int tempPin = A0;

void setup() {

Serial.begin(9600);

}

void loop() {

int sensorValue = analogRead(tempPin);

float voltage = sensorValue \* (5.0 / 1023.0);

float temperatureC = voltage \* 100;

Serial.print("Temperature: ");

Serial.print(temperatureC);

Serial.println(" C");

delay(1000);

}

**Option C: DHT11 with LCD/Serial**

Add the DHT library:  
**Go to Arduino IDE → Library Manager → Search “DHT” → Install "DHT sensor library by Adafruit".**

#include "DHT.h"

#define DHTPIN 2

#define DHTTYPE DHT11

DHT dht(DHTPIN, DHTTYPE);

void setup() {

Serial.begin(9600);

dht.begin();

}

void loop() {

float temp = dht.readTemperature(); // Celsius

if (isnan(temp)) {

Serial.println("Failed to read from DHT sensor!");

return;

}

Serial.print("Temperature: ");

Serial.print(temp);

Serial.println(" °C");

delay(2000);

}

**OUTPUT DEMONSTRATION**

**🔹 LCD Display**

* Shows temperature like: Temp: 28.56 C

**🔹 Serial Monitor**

* Outputs every 1 or 2 seconds:

Temperature: 29.38 C