If you're building a multimodal IoT setup using:

* Raspberry Pi
* Temperature sensor (like DHT11/DHT22)
* LED (for alerts)
* LCD Display (like 16x2 with I2C)

Here’s the full step-by-step breakdown and wiring plan for you.

🔧 Components Needed:

* Raspberry Pi (any model with GPIO)
* DHT11 or DHT22 temperature & humidity sensor
* 1x LED (any color)
* 220Ω resistor (for LED)
* 16x2 LCD display with I2C module
* Jumper wires
* Breadboard
* 10kΩ resistor (for DHT sensor)

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⚙️ Step-by-Step Wiring & Pin Placement

1. DHT Sensor
   * VCC → Pin 1 (3.3V)
   * GND → Pin 6 (GND)
   * DATA → Pin 7 (GPIO4)
   * 10kΩ resistor between VCC and DATA (same row on breadboard)
2. LED
   * Anode (long leg) → GPIO17 (Pin 11) via 220Ω resistor
   * Cathode (short leg) → GND (Pin 9)
3. LCD (16x2 with I2C Module)
   * GND → Pin 6 (GND)
   * VCC → Pin 2 (5V)
   * SDA → Pin 3 (GPIO2 - SDA)
   * SCL → Pin 5 (GPIO3 - SCL)

🖼 Would you like a complete circuit diagram? I can generate that for you in seconds.

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🧠 Python Library Requirements:

Install these on your Pi:

bash

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pip3 install Adafruit\_DHT

pip3 install RPLCD

pip3 install smbus2

OR, if using I2C LCD (highly recommended):

bash

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sudo apt-get install python3-smbus i2c-tools

pip3 install RPLCD

Enable I2C:

bash

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sudo raspi-config → Interfacing Options → I2C → Enable

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💻 What Will the Code Do?

* Read temperature and humidity from DHT sensor
* Display data on LCD
* Turn LED ON if temperature exceeds a threshold

Would you like me to generate the complete Python code and the wiring diagram? Just say the word!

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**You said:**

Read temperature and humidity from DHT sensor Display data on LCD Turn LED ON if temperature exceeds a threshold

**ChatGPT said:**

Perfect! Let’s build a complete Python project that:

✅ Reads temperature & humidity from a DHT11 sensor  
✅ Displays it live on a 16x2 LCD with I2C  
✅ Turns ON an LED if temperature crosses a set threshold (e.g., 30°C)

📦 What You Need:

* Raspberry Pi (any model with GPIO)
* DHT11 or DHT22 sensor
* 16x2 LCD display with I2C module
* LED (any color)
* 220Ω resistor
* 10kΩ resistor (for DHT pull-up)
* Breadboard + jumper wires

🛠 Wiring Recap:

📌 DHT11 Sensor:

* VCC → Pi Pin 1 (3.3V)
* DATA → Pi Pin 7 (GPIO4)
* GND → Pi Pin 6 (GND)
* 10kΩ resistor between VCC and DATA

📌 LED:

* Anode (long leg) → Pi Pin 11 (GPIO17) through 220Ω resistor
* Cathode → Pi Pin 9 (GND)

📌 LCD with I2C:

* VCC → Pi Pin 2 (5V)
* GND → Pi Pin 6
* SDA → Pi Pin 3 (GPIO2 / SDA)
* SCL → Pi Pin 5 (GPIO3 / SCL)

📦 Python Libraries to Install:

Run these in terminal:

sudo apt update sudo apt install python3-pip i2c-tools pip3 install Adafruit\_DHT pip3 install RPLCD smbus2

🎯 Final Python Code:

Save as monitor.py

python import Adafruit\_DHT import smbus2 import time from RPLCD.i2c import CharLCD import RPi.GPIO as GPIO

**Constants**

TEMP\_THRESHOLD = 30.0 # Celsius DHT\_SENSOR = Adafruit\_DHT.DHT11 DHT\_PIN = 4 # GPIO4 LED\_PIN = 17 # GPIO17

**GPIO Setup**

GPIO.setmode(GPIO.BCM) GPIO.setup(LED\_PIN, GPIO.OUT)

**LCD Setup (I2C)**

lcd = CharLCD('PCF8574', 0x27) # Common I2C address is 0x27

try: while True: humidity, temperature = Adafruit\_DHT.read\_retry(DHT\_SENSOR, DHT\_PIN)

python

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if humidity is not None and temperature is not None:

print(f"Temp: {temperature:.1f}°C Humidity: {humidity:.1f}%")

lcd.clear()

lcd.write\_string(f'Temp: {temperature:.1f}C\n')

lcd.write\_string(f'Hum: {humidity:.1f}%')

# Control LED

if temperature >= TEMP\_THRESHOLD:

GPIO.output(LED\_PIN, GPIO.HIGH)

else:

GPIO.output(LED\_PIN, GPIO.LOW)

else:

print("Failed to read from DHT sensor.")

lcd.clear()

lcd.write\_string("Sensor error!")

time.sleep(2)

except KeyboardInterrupt: print("Exiting...") lcd.clear() GPIO.cleanup()

🙋‍♂️ Want a full circuit diagram now? I can generate one for you showing where every wire goes on the Pi and breadboard. Just say yes!