

Activity Title: Displaying DHT11 Temperature on OLED & Sending Data via MQTT Using ESP32

Objective:

Display real-time temperature from the DHT11 sensor on an OLED display and transmit temperature & humidity data to MQTT.fx using the HiveMQ broker.

MQTT Broker Details:

- **Broker:** `broker.hivemq.com`
- **Port:** 1883
- **Topic:** `esp32/dht11/data`

Task:

- Read temperature & humidity data from the DHT11 sensor.
- Display the temperature on the OLED screen.
- Publish temperature & humidity data to MQTT.fx via HiveMQ broker.

Expected Outcome:

- **OLED Display:** Shows real-time temperature.
- **MQTT.fx Client:** Receives temperature & humidity data from ESP32.

Homework Questions:

1. **MQTT:** What is the role of the topic in MQTT communication?
2. **OLED:** How can you modify the display to show both temperature and humidity?
3. **Error Handling:** How would you indicate a Wi-Fi or MQTT disconnection on the OLED?
4. **Challenge:** Add a visual alert on the OLED if the temperature exceeds 30°C.