**Week 8 Lab 5 Report**

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**Task 1:**

“b” indicates that our Hello! message string is in bytes literal format, it means that the string is represented as a sequence of bytes.

**Task 2:**

def on\_message(client, userdata, message):

    print("Received message " + message.payload.decode())

**Task 3:**

I modified the HelloToMyself.ino:

char \*subscribeTopic = "hello/world";

char \*publishTopic = "hello/esp";

By changing the subscribeTopic in the HelloToMyself.ino, such that it subscribes to the topic “hello/world”, the data would then be sent to the ESP32 from the pub.py python script.

**Task 4:**

ESP32 sketch:

char \*publishTempTopic = "weather/temp";

char \*publishHumidTopic = "weather/humidity";

struct measurements {

  float temperature;

  float humidity;

};

void loop()

{

    struct measurements mmts = dht11\_loop(); // collects data DHT11 sensor.

    mqttClient.publish(publishTempTopic, String(mmts.temperature), 0, false);

    mqttClient.publish(publishHumidTopic, String(mmts.humidity), 0, false);

    delay(2000);

}

mqtt.py python script:

def on\_connect(client, userdata, flags, rc):

    print("Connected with result code: " + str(rc))

    # client.subscribe("hello/#")

    client.subscribe("weather/temp")

    client.subscribe("weather/humidity")

def on\_message(client, userdata, message):

    if message.topic == "weather/temp":

        print(f"Received message: {message.payload.decode()} °C on topic: {message.topic}")

    else:

        print(f"Received message: {message.payload.decode()} % on topic: {message.topic}")

**Task 5:**

<What is the average power consumption of the ESP32 when in Deep Sleep mode, modem-sleep, and when it is in active mode (you can assume it is transmitting/receiving wifi)? Assuming an ideal battery of 200mAh, how long would the device last in each state? Hint: look at the tech sheet. (2 marks)>

States:

* Deep Sleep mode has power consumption of 150 µA. The device would last ???.
* Modem-sleep mode has power consumption of 27mA to 44mA . The device would last for ???.
* Active mode has power consumption of 240mA. The device would last for ???.

**Task 6:**

<Write a program (sketch) that connects to wifi, sends an MQTT message, prints something to the serial, and then puts the ESP32 device into deep-sleep for 20 seconds. Explain and include this program in your report. (3 marks)>

**Task 7:**

<Write a function in our mqtt.py python script to classify the temperature and send back the classification result. (1 mark)>

**Task 8:**

<Write a program (sketch) that reads in the DHT sensors, connects to wifi, publishes the DNT sensor readings, waits for a classifier response, actuates appropriately, and then puts the ESP32 device back into deep-sleep for 20 seconds. Explain and include this program in your report. (4 marks)>