**Week 8 Lab 5 Report**

**Name:**

**Student ID:**

**Lab Group:**

<You can remove anything in angle brackets, and please keep your report to 5 pages>

**Task 1:**

<Notice that there is a stray “b” attached to our Hello! message. Using Google or otherwise, explain what this “b” means and why it is present in our output. (2 marks)>

**Task 2:**

<Using Google or otherwise, modify your program so that this “b” no longer appears. Paste your code into the lab report. (3 marks)>

**Task 3:**

<Modify your pub.py python script to send some data to your ESP32. Detail your changes in your lab report. (2 marks)>

**Task 4:**

<Modify your ESP32 sketch and to send back temperature and humidity readings. You can use the topics “weather/temp” and “weather/humidity”. Paste your code into the lab report. (3 marks)>

**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)>

**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)>