

Q1. Create a new project **based** on the ESP8266 SDK example titled "hello\_world", and ensure that the code is sync'd with github. Adjust the example, using appropriate coding standards, so that:

- (a) Replace the "hello world" message with a message that includes your name and ID#.
- (b) Replace the number of seconds to restart with the last two digits of your ID# modulo 17. e.g. for ID#8169875234 the number of seconds would be 34 modulo 17 = 0.

Capture the output of this program into a file named "lab1\_q1\_XXXXXXXX.out" where XXXXXXXX is your ID#

*3 marks*

Q2. Create a new project **based** on the RTOS SDK example titled "gpio". This example is setup to use 4 pins, 2 inputs and 2 outputs. Adjust the example, using appropriate coding standards, so that:

- (a) Only a single input and a single output are specified, and the input and output pins selected are consistent with available pins on the ESP-01S
- (b) A single handler is installed and used for the input on the falling edge

Capture the output of this program with and without a falling edge trigger, into a file named "lab1\_q2\_XXXXXXXX.out" where XXXXXXXX is your ID#

*4 marks*

Q3. Create a new project **based** on the RTOS SDK example titled "i2c". This example is setup to use the MPU6050 - adjust the example, using appropriate coding standards, to use the ADS1115 by:

- (a) Configure the #defines associated with the SCL and SDA lines to be consistent with available pins on the ESP-01S and verify that the master\_init routine is appropriate.
- (b) Remove the #defines associated with the MPU6050, determine the I2C address of the ADS1115 and the ADS1115 registers to be configured/read/written on the ADS1115 to allow a single-sided analog input (with no explicit voltage reference lines) on channel 0, create new #defines and adjust the master\_device\_read, master\_device\_write, and master\_device\_init routines accordingly.
- (c) Replace i2c\_task\_example with an example task that will read and report the analog signal connected to channel 0 of the ADC at appropriate intervals.

Capture the output of this program into a file named "lab1\_q3\_XXXXXXXX.out" where XXXXXXXX is your ID#

*5 marks*

Q4. Based on the work you did, and your experience with this lab exercise, identify which (if any) of the following resources you made use of - whether your use was effective, and how you will leverage these resources in the future:

*3 marks*

- (a) coding standards
- (b) tool-chain features
- (c) debugging practices

**This exercise contains a total of 15 marks and contributes 5% to the course total.**