

Homework 4 Serial RPC and WiFi MQTT

1. eRPC

- This is the new update lab report, I misunderstood the assignment and just called the function from python but my input was like location and which number to print was in the MBED.
- How I set up this lab is that I was using one of the XBee (usbserial-AC00CJUO) plug into my pc and another XBee connected to the mbed board and to my pc. Since there are two grounds in the mbed one will be used to connect i2c text and the other one for the xbee. For VCC, I use a circuit board to connect both xbee and i2c to 5v.
 - D0 to RX
 - D1 to Tx
 - For i2c, SCL will be D15 and SDA will be D14.
- In my main is basically similar to lab 9 by first initialize the RPC server, connect to it and call the service, in my code i use "rpc_server.addService(&led_service);"
After this just run the RPC server. if nothing goes wrong it will say Running server in the serial monitor. I also have void location and print text . These two functions basically locate the cursor like where it starts and print text just print.
- Since we want to generate the shim code for ERPC. we need to first declare the function in led-service.erpc (I use the same name as lab9) . In this file, I declare the function printtext and location
 - printtext(in uint8 c) -> void
 - location(in uint8 col, in uint8 row) -> void
- Then in the terminal uses "~/Downloads/erpcgen led-service.erpc " to generate 4 files, we delete the client.cpp one cause it will make our MBED not working.
- For the client side(python) I named it led_test.client.py(I uses the same name as lab9). I also generate ERPC for the python file too. Using " ~/Downloads/erpcgen led-service.erpc"
- From there use client.location(3,1) so now I basically declare where i want the location to be in the python and I want to print number from 0 to 8 in text lcd so I use a for loop and called client.printtext(i)

```

HW4.1 -- -bash-- 80x24
Last login: Wed Dec 7 18:54:10 on ttys002

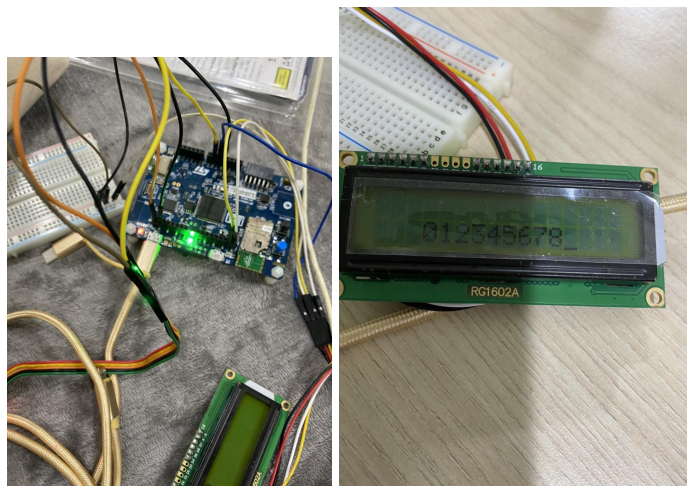
The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208850.
Davis-2:~ davis$ cd ~/Mbed Programs/HW4.1/
Davis-2:HW4.1 davis$ python3 led_test_client.py /dev/cu.usbserial-AC00C3U0
LCD locate
LCD print 0
LCD print 1
LCD print 2
LCD print 3
LCD print 4
LCD print 5
LCD print 6
LCD print 7
LCD print 8
Davis-2:HW4.1 davis$

```

```

Initializing server.
Adding server.
Running server.
LCD locate 3 , 1
LCD print 0
LCD print 1
LCD print 2
LCD print 3
LCD print 4
LCD print 5
LCD print 6
LCD print 7
LCD print 8

```



2. MQTT through WiFi to transfer

- a. For this homework we only need the mbed board and our pc
- b. 3 library will be added and use
 - i. Import ISM43362 library for MQTT part
 - ii. Import MQTT library for MQTT part
 - iii. BSP library for yaw,roll,pitch
- c. Command needed are
 - i. `python3 mqtt_client.py` (to run python run in /Mbed Programs/ hw4.2/)
 - ii. `/usr/local/opt/mosquitto/sbin/mosquitto -c ~/Mbed\ Programs/mosquitto.conf`
 1. To run mosquitto (run in from the root directory)
- d. I implement the program so that it will connect to SSID, then connect to TCP network..., then IP ADD, and Port. If everything works properly then Successfully connected! Will be printed. I use two threads in the program, one for roll, pitch, and yaw. And the other one for sending the message to the python program. When the button falls it will start recording, I didn't know when it will stop recording so it will record forever. When the button is raised it will trigger publish message and send the roll, pitch, and yaw to mqtt and it will print. If either of the angle is bigger than 10 it will print a publish message and the three values , the python will reply back with the

value. Else the program will print the degree is less than 10 and the python won't be replying back.

```
Connecting to Davis...
Connecting to TCP network...
address is 172.20.10.2/1883
Successfully connected!
```

if everything work properly

```
Connecting to Davis...
Connecting to TCP network...
address is 172.20.10.2/1883
Successfully connected!
Puslish message: -51.594470/39.317543/-0.364951

python reply -51.594470/39.317543/-0.364951
```

The button is press when the degree is more than 10 so it was send to the python and it reply

```
Birds-MacBook-Pro:hw4.2 birdhsieh$ python3 mqtt_client.py
Connecting to 172.20.10.2/Mbed
Connected rc: 0
Subscribed OK
[Received] Topic: Mbed, Message: b'start receiving!\n'
[Received] Topic: Mbed, Message: b'-51.594470/39.317543/-0.364951\n\x00'
```

when i run the python program and it connect, this is after it receive the first message sendd

```
Successfully connected!
Puslish message: -51.594470/39.317543/-0.364951

python reply -51.594470/39.317543/-0.364951

the degree is less than 10
Puslish message: -56.849608/40.608744/-43.655472

Puslish message: -56.849608/40.608744/-43.655472

Puslish message: -56.849608/40.608744/-43.655472

Puslish message: -56.849608/40.608744/-43.655472

Puslish message: -47.845268/36.493246/-43.959436
```

This is when the degree is less than 10 it won't reply back

```
Subscribed OK
[Received] Topic: Mbed, Message: b'start receiving!\n'
[Received] Topic: Mbed, Message: b'-51.594470/39.317543/-0.364951\n\x00'
[Received] Topic: Mbed, Message: b'\4\x00'
[Received] Topic: Mbed, Message: b'-56.849608/40.608744/-43.655472\n\x00'
[Received] Topic: Mbed, Message: b'-56.849608/40.608744/-43.655472\n\x00'
[Received] Topic: Mbed, Message: b'-56.849608/40.608744/-43.655472\n\x00'
[Received] Topic: Mbed, Message: b'-56.849608/40.608744/-43.655472\n\x00'
[Received] Topic: Mbed, Message: b'-47.845268/36.493246/-43.959436\n\x00'
```

It did receive a signal but then it won't print out the number