CSE530: EOSI - ASSIGNMENT 3 SETUP INSTRUCTIONS

Part 1

Sushant Trivedi (1213366971) and Ravi Bhushan (1214347783)

SPI DEVICE DRIVER FOR LED STRIP (WS2812)

Files Included:

1. spi_device.c
2. spi_driver.c
3. led_test.c (This is the user level test program)
4. Makefile

Steps to Setup

1. Connect the LED Strip to its respective pins as mentioned below:

IO11 (SPI MOSI) → DI

5V → 5V

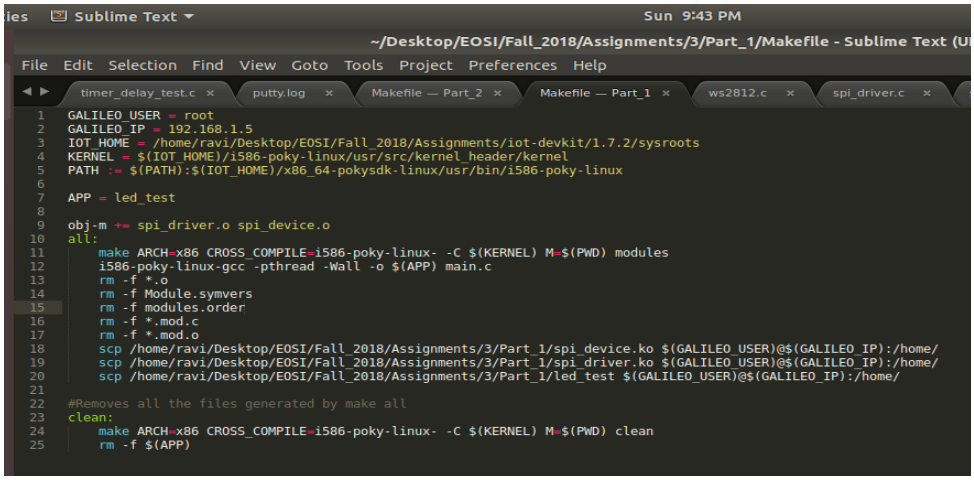
GND → GND

2. Update the makefile as per the following instructions

GALILEO_USER → Enter the user name. Default “root”

GALILEO_IP → Enter Galileo IO. Default “192.168.1.5”

IOT_HOME → Enter sysroots address



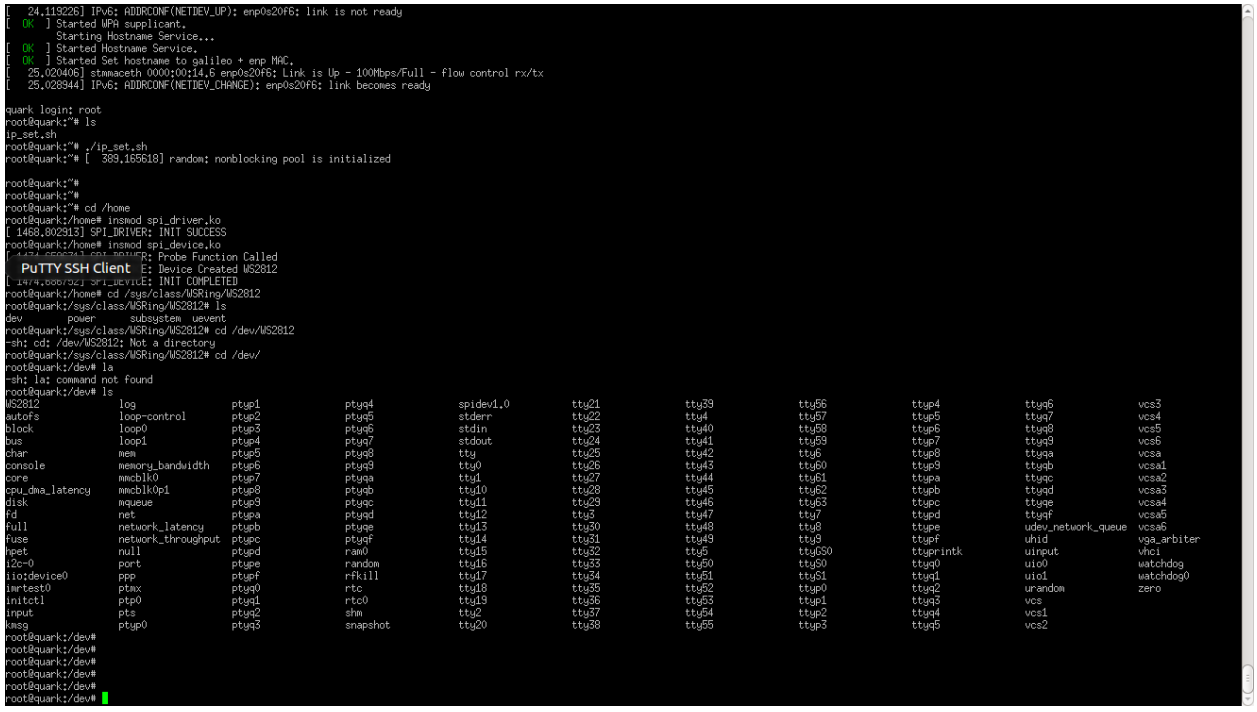
3. Insert the modules loaded on the /home directory onto kernel using the following commands in any order. Please see the image for the expected output

cd /home

insmod spi_device.ko

insmod spi_driver.ko

NOTE: Please remove any earlier inserted modules which may be requesting the same GPIOs as this will cause our module to fail.



As can be seen, in the above image the WS2812 device has been created in the /sys/class/WSRing/ and /dev/ directory

4. <u>User Level Test Code</u>: Run the ./led_test command from /home directory. This would ask you to input the following entries:

- No of LEDs to switch on currently
- No of times you want the pattern to run in circles
- Led color for each led that you want to light up

As can be seen in the image above, we were asked for the choices as explained earlier.

Upon successful user input, it successfully calls WS_WRITE function from the driver file_operations datastructures. This is evident by the printing as shown below.

The LED Ring looks as follows for the color inputs chosen by me.