ECE353 In-Class Exercise

SPI - LCD

Problem Objectives

- Determine the GPIO pins used to control the EADOGS102W-6 LCD on the ECE353 carrier card
- Configure SSI0 to be in Freescale SPI, mode 3, with a 25MHz SPI clock
- Draw an image on the EADOGS102W-6 LCD

1. Modify main.c

Fill out the #defines found at line 55 used to configure SSI0 to be a SPI interface. You can see how these macros are used in the lcd_init() function that immediately follows. The functions that are used to configure the GPIO pins have been provided as part of a compiled library.

a. Set the `LCD_GPIO_BASE` to be the base address of the GPIO port connected to the LCD
b. Set the SPI Base to be the base address for SSI0
c. Set `LCD_CLK_PIN, LCD_CS_PIN, and LCD_MOSI_PIN` to be a bit mask that indicates which pin for the given port the signal is connected to. The LCD does not provide any data to the MCU, so we will not configure the MISO.

```
// If the SPI clock were connected to PA0
//( it is not, but this is just an example.)
#define   LCD_CLK_PIN         PA0
```

d. Set the values of the Port Control Register. Use the macros found in `gpioPort.h`.
e. Set `GPIO_LCD_CD_BASE` to be the GPIO base address of the PIN connected to the LCD command pin.
f. Set `LCD_CD_PIN` to be a bit mask that represents which PIN number the command pin is connected to.
g. Set `GPIO_LCD_RST_N_BASE` to be the GPIO base address of the PIN connected to the LCD reset pin.
h. Set `LCD_RST_N_PIN` to be a bit mask that represents which PIN number the reset pin is connected to.

2. Modify spi.c

Copy your `spi.c` from last week's exercise into the driver's directory. Modify `spi.c` so that it configures the SSI peripheral passed into `initialize_spi` to run at 25MHz. Make sure to set the SPI mode correctly!

The project has been built with a validation routine that will examine if you have configured SSI0 and the GPIO ports. You can view the output of the serial debug port to see if you configured the SPI and GPIO ports correctly.

3. Modify lcd.c

Complete the following functions found in `lcd.c`. Make sure to read the datasheet and examine the comments for each function. Page 5 of the EADOGS102W-6 data sheet will contain the information that you need.

```
dogs102_assert_reset

dogs102_deassert_reset

dogs102_assert_cmd_mode

dogs102_deassert_cmd_mode

dogs102_set_page

dogs102_set_column

dogs102_write_data
```

4. Observe LCD

Program the board and press the reset button. If your code is functional, you should see an image displayed on the LCD.

5. What to Turn In

Turn in **`lcd.c`** to the dropbox on the course website.