EE4930 Advanced Embedded Systems

Section 011, Winter 2019/20

Draven Schilling

12-7-19

Lab 1 – Tool Time

# Objectives

The objective for this lab was really was to get refamiliarized with the MSP432 board if you had previously taken the EE embedded sequence, or in my case, become more familiar with the board because I had not taken the EE embedded sequence. In the process we also had to get the development environment setup and verify our LCD works as expected.

# Description

In this lab, I programmed the onboard pushbutton as a GPIO input that when toggled, causes the onboard LED (configured as GPIO Output) to light up. Additionally I printed out the status of the pushbutton along with my first/last name to the LCD and updated it accordingly as the pushbutton was pressed/released. The top line of the LCD contained the static course code, second line with the status of the LED (ON/OFF), and third line my first/last name.

# Conclusions

encountered and how you overcame them, any surprises you encountered, etc.

I think this lab was a good introduction to both the board, and the environment including the provided libraries. I got familiar with some of the provided functions as well as the pin naming scheme which will drastically help as we progress through the quarter. Finally, probably most important, I got more familiar with the documentation which includes interpreting how to do some required functions and where to find some basic info.

# Attachments

main.c

1// main.c

2// Runs on MSP432

3// Lab 1 - Tool Time

4// Draven Schilling

5// 12/7/19

6// display course number at the top of the lcd

7// when toggle pushbutton, turn on led and display last name

8// when pushbutton off, display first name and led off

9// \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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11#include <stdint.h>

12#include "msp.h"

13#include "msoe\_lib\_clk.h"

14#include "msoe\_lib\_lcd.h"

15#include "msoe\_lib\_delay.h"

16

17

18// initialize port P1.1 GPIO IN for pushbutton

19// initialize port 1.0 GPIO OUT for led

20void init\_gpio(void);

21

22int main(void){

23

1. if(Clock\_Init\_48MHz())
2. P3->OUT |= BIT5; // \*\*\*\*\*\*\* debug

26

27 // setup lcd 28 init\_gpio();

1. LCD\_Config();
2. LCD\_clear();
3. LCD\_home();
4. LCD\_contrast(10);

33

1. LCD\_print\_str("EE4930");
2. uint8\_t pushbutton = 0;

36

1. while(1){
2. pushbutton = (P1->IN & 0b10) >> 1;

39

1. if(pushbutton){
2. //print to lcd
3. LCD\_goto\_xy(0,1);
4. LCD\_print\_str("OFF ");
5. LCD\_goto\_xy(0,2);
6. LCD\_print\_str("Draven ");
7. P1->OUT &= ~0b1; // led off
8. } else {
9. //print to lcd
10. LCD\_goto\_xy(0,1);
11. LCD\_print\_str("ON ");
12. LCD\_goto\_xy(0,2);
13. LCD\_print\_str("Schilling ");
14. P1->OUT |= 0b1; // led on
15. }
16. }

56}

57

58void init\_gpio(void)

59{

1. // P1.0
2. P1->SEL0 &= ~0b1; // use GPIO function
3. P1->SEL1 &= ~0b1;
4. P1->DIR |= 0b1; // make output
5. P1->OUT &= ~0b1; // setup output low to start
6. // P1.1
7. P1->SEL0 &= ~0b10; // use GPIO function
8. P1->SEL1 &= ~0b10;
9. P1->DIR &= ~0b10; // make input
10. P1->REN |= 0b10; // allow pull up/down
11. P1->OUT |= 0b10; // setup as pull up
12. return;

72}

