

EE 2920 - Week 2 Lab: MSP Interfacing

1 dedicated lab period, 2 lab periods to complete

Name: _____

Objectives

- Interface to the MSP board
- Review C programming

Prelab

- Review Button, Switch, and LED operation from your EE1910 class
- Review blink.c from Lab 1
- Review the Debouncing notes
- Create a paper design connecting 3 external diodes to 3 digital pins on the MSP432 Launchpad board. Be sure to include any design equations and parametric limits.

What is the optimal resistance?

** Be prepared to show the paper design at the beginning of the lab

student
check off

Assignment

Part 1: Implement your prelab design and modify blink.c to flash 3 external LEDs. The blink pattern should be 1-2-3-1-2-3... at a 1 second blink rate.

3 lines for main
2 lines for pin setup fn
6 lines for sequence fn

Part 2: Add an external switch to your design. Use the switch to choose between two modes of operation. In mode 1 the circuit should operate as indicated in the basic design. In mode 2 the blink pattern should be 1-2-3-2-1-2-3-2...

7 lines for main
*2 lines for pin setup fn
3 lines for switch setup fn
*6 lines for sequence1 fn
* 8 lines for sequence 2 fn

Part 3: Add an external push button to your design. Use the push button to advance the LED pattern instead of advancing it automatically. Both modes from Part 2 should remain operational.

Note: You must debounce your button so that the LED pattern advances only one place with each button press.

8 lines for main
*2 lines for pin setup fn
*3 lines for switch setup fn
3 lines for button setup fn
10 lines for sequence1 fn
10 lines for sequence 2 fn
check_pin fn
12 lines for button press fn

Check Off

You must demonstrate your working design(s) prior to the end of the 2nd lab period

- Demo your Part 1 30% _____
- Demo your Part 2 25% _____
- Demo your Part 3 25% _____

Lab Report (informal)

- Due at 4:00 pm, 1 day after the second lab period – in the box outside my office
- Include this cover sheet
- Include a properly documented informal lab report. 20% _____

Strategy

**** Create a program Flow Diagram for each part ****

** I suggest you create 3 different programs – do not overwrite prog x to make prog y **

Part 1: Check to make sure your LEDs are hooked up correctly by using a wire to tie the LED input to your V+ on your proto-board. You can save some lines of code if you hook all three LED to the same MSP port.

Part 2: Get the switch to operate first – you can look at the input in debug or print it. Use the function for sequence 1 to create a function for sequence 2.

Part 3: Get the basic button to operate first – you can look at the input in debug or print it. Use the debounce code along with a low2high or high2low function to determine if the button has been pressed since the last check (increment a counter for example as a test). Replace the delays in your sequence functions with a test for a button push.