CPE 187L Embedded Systems Design

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Section #2

Lab 4 Report

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Introduction

The purpose of this lab is to go through a simple debug process. The program and code is already setup so we will need to figure out why our expected output is not correct. Below is the table of expected outcomes when we press switches on the board.

Switch Input	LED Output
Both switches SW1 and SW2 are pressed	The LED should be blue
Just SW1 switch is pressed	The LED should be red
Just SW2 switch is pressed	The LED should be green
Neither SW1 or SW2 is pressed	The LED should be off

Table 2.1. Specifications for Lab 4. SW1 is on PF4 and SW2 is on PF0.

Debug In Simulation

Switch Input	Desired LED Output	Actual LED Output
Both are pressed	Blue	Off
Just SW1	Red	Green
Just SW2	Green	Red
Neither is pressed	Off	Blue

The results show that our SW1 and SW2 are mixed up. This may also be causing the both and neither inputs to be backwards. My hypothesis is that the switches are declared and initialized incorrectly or the output values are signed improperly.

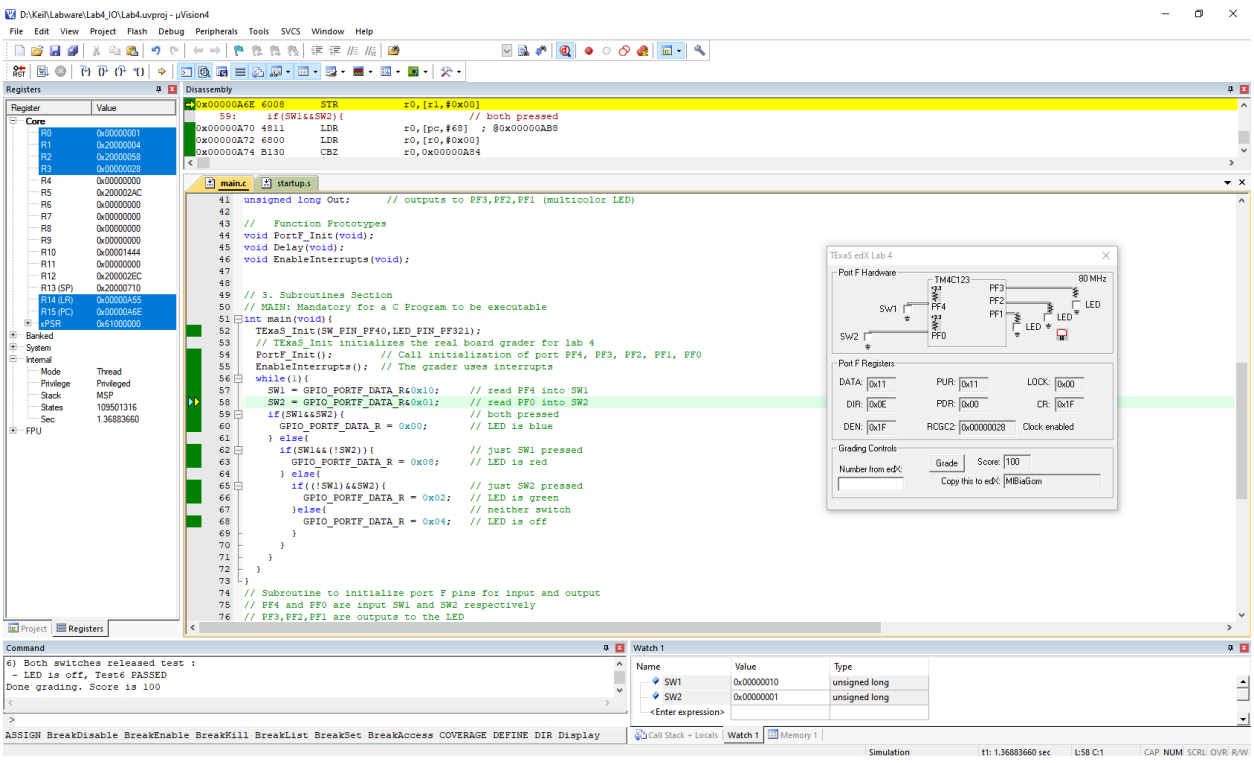
After reviewing the main code it seems the switches and ports are iniatalized correctly. The color code for the LEDs are giving at the bottom, but its possible this could be wrong. For a simple fix I recorded the color outputs for each conditionand and reassigned them to the correct condition.

BLUE = 0x04 → 0x00

RED = 0x02 → 0x08

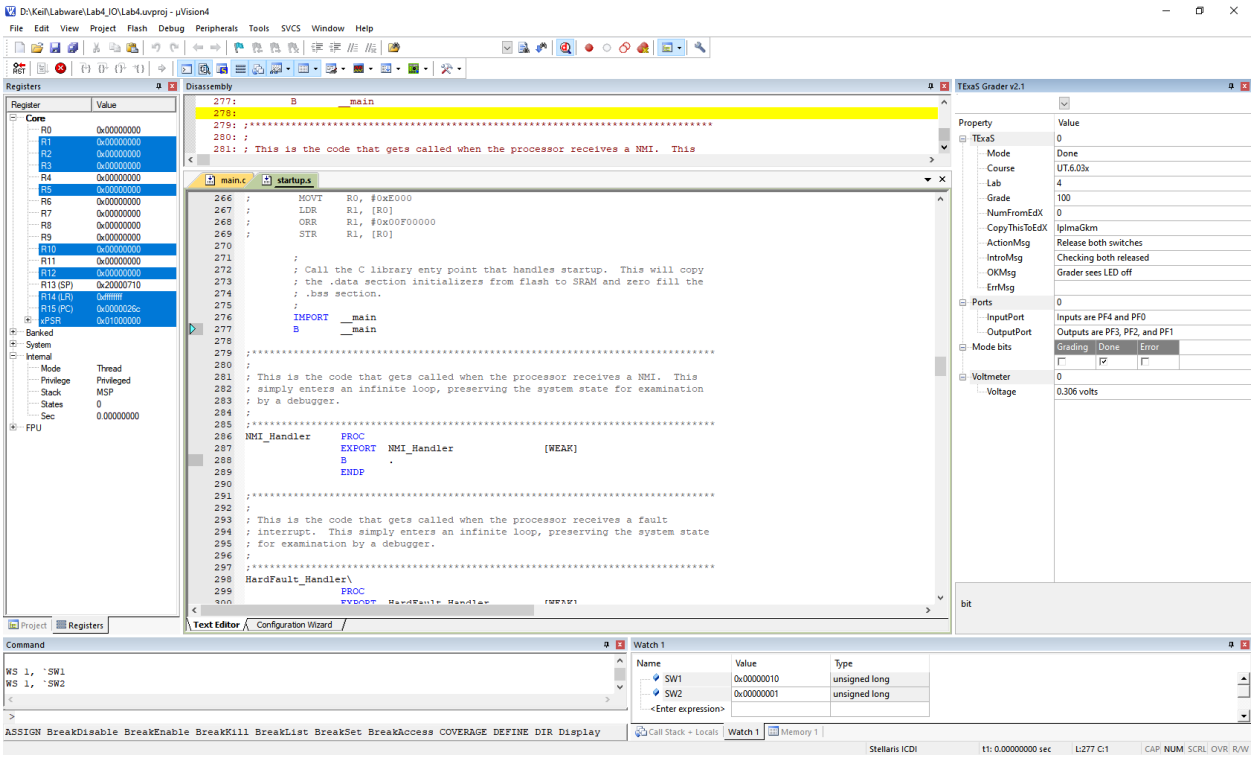
GREEN = 0x08 → 0x02

Off = 0x00 → 0x04



Debug On The Real Board

The code was already corrected on the simulation so to run it on the real board all we need to do switch the options to debug on the hardware, build the target again, flash it to the board, and run the debugger.



Questions

0) Download and open the data sheet for the TM4C123 microcontroller

1) Look at the Tiva TM4C123GH6PM Microcontroller High Level Block Diagram to see how much SRAM and Flash ROM are available. (10 Points)

The Microcontroller has 32KB of SRAM and 256 KB of Flash ROM.

2) Lookup in the relevant chapter to see how many GPIO (General Purpose Input/Output) pins are supported. (10 Points)

There are 43 GPIO pins.