EECS 2032

Lab 7
Fall 2019

This lab is two parts. In part 1 you will be introduced to the FRDM-KL43Z board and the MCUXpresso SDK and you will write a simple program to control the two LED's on the board. In the second part you will write a piece of code to deal with the AD/DA part of the microcontroller.

Pre Lab

Watch the 2 videos on tophat part III (Microcontrollers) chapter I (Introduction to microcontrollers) and read the board user manual and quick start guide. Also refer to the lecture slides regarding FRDM KL43Z board.

This lab should be done in groups of 2

Part 1

In this part, you will write a small program to control the LED's on the board. Review the GPIO in the book and the lecture slides.
The board has two switches, SW1 and SW3. Two LED's the green LED LEDG and the red LED LEDR.
Write a program to do the following
1. Initial state before you press any switch, the two LED's are OFF
2. If you press SW1 and SW3 is not pressed, both LED's are ON
3. If you press SW3 and SW1 is pressed, LEDG is ON, LEDR is OF
4. If both are not pressed, LED's are OFF
5. If both are pressed, releasing any switch will make LEDG OFF, LEDR ON

You must include a finite state machine in your report for this part.

Part 2

FRDM-KL43Z has an on-board light sensor. In this lab, you will get the output of the light sensor to the input of the ADC. Convert it to digital value, and display that value on the monitor.
During the demo, you will show the TA that by changing the light (using a flash light or partially covering the sensor using you hand) the displayed value will change accordingly.

You have to check the schematics to see what pin the light sensor is connected to, what ADC channel you are using (that is a part of the lab report).

Follow the 9 steps in the slides to use ADC0

Deliverable, Demo your code to the TA (both partners should demo the code) and submit a report by the following Wednesday as usual

Your report should contain the problem statement, diagrams or schematics if needed, your code, and your design. The design could be written in pseudo code, state diagram, to explain your design.