

ENGR-355

Lab 7

Here are the goals for this lab:

- 1) Create a function for initializing the ADC:
 - Single ended input on channel zero
 - Trigger conversions from the PIT
 - 12 bit resolution
 - hardware average on, 4 samples per average
 - set up for interrupts but don't turn on interrupts
 - Create a function to turn on the ADC interrupts
 - Create an ADC IRQ (contents will vary depending on application)
- 2) Create a lab7 application program that will sample an analog input signal with the ADC and recreate the input waveform using the DAC. Sample rate is to be 1 KHz.
- 3) Add functionality to your lab7 program to measure the period of the sampled waveform in units of milliseconds. Display measured period on the LCD display in milliseconds as either a Hex value or Decimal value, your choice. Validate operation using a 5 hz, 10hz, and 15hz sine wave that has 2 volt p-p amplitude.

Set the system clock rate to have a 24Mhz bus clock (48Mhz core clock) by placing this statement at the top of the system_MKL25Z.h file:

```
#define CLOCK_SETUP 1
```

The clock rate into the PIT timer will then be 24Mhz. Use that rate when you calculate the value you load into the PIT.

Make sure you fully fill out a "header" comment area at the top of each source file you create with the information specified in the document Required Source Code Formatting etc. located on the class web page (note: in that document dashes rather than stars, as shown below, are used. Take your pick, either is ok).

Within your source files, each function you create must have something like this at its start:

```
//*****************************************************************************
//   ADC initialization function                                     Your Name
//*****************************************************************************
```

The two slashes plus stars should be 78 characters long (character position of the cursor when editing is shown at lower right of the edit window). If you use a function from another person but modify it for your use cite the person who originated it.

This lab, and future labs, will get scores of zero if the above formatting and information is not found for each function as well as the "header" of each .c file

Keep in mind use of a debug output pin to show entering and leaving sections of code as you confirm proper operation of your program.

To Turn In

In the comment "header" of your main file clearly state the results of this lab

Turn in your main.c file and any other .c file you used to the D2L dropbox
Then zip up the .c and .h files (if used) for your lab and submit that as well.