Laboratory 6
(Due date: November 25th)

OBJECTIVES

- ✓ Learn to use the Analog-to-Digital Conversion Module on the HCS12DG256 device.
- ✓ Learn to read voltages values from the on-board potentiometer and from an external input.
- ✓ Use the HD44780-compatible Liquid Crystal Display (LCD) to display results.

FIRST ACTIVITY (100/100)

- In this activity, write a C code that reads and continuously displays analog voltages from:
  - ✓ The on-board potentiometer VR2 connected to the AN7 (PAD7) analog input. The voltage will be between 0 and 5 v.
  - ✓ The output of a waveform generator connected at AN2 (PAD2). Make sure that your signal stays between 0 and 5 v. Note that the frequency of your signal should be slow enough so that the variation can be observed on the LCD.

- The values to be displayed on the LCD <u>must use one integer digit and two fractional digits</u>. Example: If the reading is 4.375 v, the LCD should display 4.37 v. If the reading is 2.5 v, the LCD should display 2.50 v.
- The bit 0 of SW1 controls whether to display the potentiometer values (SW1(0)=0) or the external analog input values (SW1(0)=1).
- **Demonstrate that your code works to the TA and submit the working code to the Moodle Submission page.**

TA signature: _____   Date: _____

EXTRA CREDIT ACTIVITY (25/100)

- Based on the analog reading, generate different audible frequencies on the Dragon-12 Light Buzzer. At 0 v, a low frequency sound. At 5v a high frequency sound.
- **Demonstrate that your code works to the TA and submit the working code on Moodle Submission page**

TA signature: _____   Date: _____

HINTS

- To turn the on-board potentiometer, bring a small screwdriver. *It will NOT be provided in the lab*.
- The on-board potentiometer only turns less than one full turn. Be gentle so as to not to accidentally rotate the potentiometer too far in one direction which may jam it.