# EE 308 – Homework 9

For all problems below assume your are using a MCS12DP256 chip with a 24 MHz bus clock and a 8 MHz oscillator clock.

**1.** Write some code which will enable the ATD1 A/D converter, put it into 10-bit right-justified mode, and convert the analog inputs on pins PAD12 through PAD15 continuously.

**2.** Write some code which will enable the A/D converter ATD1, put it into 10-bit right-justified mode, and convert the analog input on pin PAD11 eight times, then stop. Add some code which will wait until the eight conversions are completed.

**3.** Add some code to the above problem which will average the eight values of the conversions of PAD11.

**4.** The ADXL325 is a MEMS 3-axis accelerometer from Analog Devices. It puts out three analog voltages which are linear functions of the accelerations along the three axes X, Y and Z. When connected to a 3 V power supply, the sensor puts out 1.5 V for an acceleration of 0 g, and has a slope of about 174 mV/g. The three outputs are connected to three A/D inputs of an MC9S12. The MC9S12 ATD is running in 10 bit mode. VRL is connected to +1 V, and VRH is connected to +2 V.

(a) What is the smallest acceleration change which can be measured?

(b) What is the acceleration when the A/D output is 0x007C?

**5.** Assume an ADXL325 is connected is connected to A/D ports PAD9, PAD10 and PAD11. Write a program to read the voltage from these three pins, and convert them to accelerations.

**6.** Suppose that the 7-bit address of an I2 C slave is B'1001011. What is the 8-bit hex value to write data to this slave? What is the 8-bit hex value to read data from this slave?