ENGR-355
Lab 9

The goal of lab 9 is to design and implement the core software for the class project.

There are a few requirements to meet regarding how you structure and implement the software for your project:
 0) Design your core software before coding it.

 1) As expected, you are to use the PIT to pace A/D conversion. The pit should trigger an A/D conversion every millisecond and upon completion of the conversion the ADC will trigger an interrupt. Note: a conversion will be done every millisecond whether new data is needed at that moment or not.
 2) The ADC interrupt handler will read a value from the ADC and if at the current millisecond data is to be stored it will write data to memory and also send the data value to the DAC. It will also set a flag that indicates new data is ready. Note that the if the sample rate is set to 1000 then every millisecond data will be stored. If sample rate is set to 100 then every 10 milliseconds data will be stored etc. I.e, the ADC interrupt handler keeps track of elapsed milliseconds.
 3) Responding to key presses, updating the display, calculating heart rate, etc. will be done using routines that are organized similar to the examples in chapter 3 of the textbook. There will be a simple scheduler that will call tasks.
 4) The calculation of heart rate and responding to button presses to set data rate, capture data, change mode, etc will be done by tasks coordinated by the scheduler. Tasks do not need to be preemptive.
 5) In some part of your software you will implement a finite state machine.

To turn in:
    As in past labs, submit your main.c file and a zipped file of all the .c and .h files you used for this lab to D2L dropbox. Also submit a copy of your design, either to the drop box or if on paper to the instructor.