Week #1 Lab Assignment
Covering the Basics: Using your Development Environment

Objective: The goal for this week is to get your own development environment set up and then use it to acclimate yourself to the PIC24F microcontroller and the MPLAB C compiler. When you have completed your lab this week you will have installed the MPLAB design environment (MPLAB-X IDE Integrated Design Environment and the MPLAB-XC16 C-compiler) and started your exploration of the PIC24 microcontroller family.

Pre-Lab Activities: Complete the following tasks

➢ **Download and install the MPLADX-IDE and the MPLAB XC16 design tools from the microchip website (links provided on the Blackboard Resources Page).**

➢ **Establish access to the datasheets and userguides for the PIC24 microcontroller family and the Explorer 16 Development Board (some available on the Blackboard Resources Page and some available directly from Microchip (www.microchip.com)**

Procedure: Use your textbook "Programing 16-Bit Microcontrollers in C: Learning to Fly the PIC24" as a guide to working with the MPLAB development tools and the Explorer 16 development board. Complete the following steps:

➢ **Read and work through chapter 1-6 in the textbook.**

➢ **To demonstrate your understanding of the material complete/document the following tasks:**

  ➢ **Chapter 1: Display a different value on the LED array**

   Display the binary equivalent of:
       1 + (M# mod 253)
   Note: this should be a value between 01H and FEH thus there should be atleast 1 LED on and atleast 1 LED off.

   Document that this has been accomplished by including in your write-up a picture of the board displaying the value for your M#.

  ➢ **Chapter 2: Display a rotating LED pattern instead of flashing on/off.**

   Make the pattern displayed for chapter #1 rotate through the LED display.

   Document that this has been accomplished by taking a video clip that shows your LED pattern rotating. Upload the video to an online video service such as YouTube and then include a link to the video in your write-up.

- ➢ **Chapter 3: Display your name**
  - **Modify the LED pattern to display your First Name.**
  - **Document that this has been accomplished by including a link to a video clip that shows your name in lights.**
- ➢ **Chapter 4: Relative performance of Division**
  - **Repeat the creation of Table 4.3 for the division operation.**
- ➢ **Chapter 5:**
  - **Rewrite the RTCC interrupt Example to use the *rtcc.h* library and blink an M# generated pattern at 1 Hz.**
  - **Document that this has been accomplished by including a link to a video clip that shows your blinking LED pattern.**
- ➢ **Chapter 6:**
  - **Write a string manipulation program that takes as input a constant string that is your full name and extracts from that string your 6+2 into an 8 character variable.**
  - **Document that this has been accomplished by taking a screen dump showing the variable string in the watch register.**

Grading: Grading will be based on your write up and the program codes you provide. Remember to use good documentation practices. For each chapter include the following for grading purposes

- ➢ **A brief write up describing**
  1. **A description of the objectives/concepts explored in the chapter.**
  2. **A discussion of your implementation of the demonstration task and description of your results. (insert images in the discussion and include separate video files as described above)**
  3. **The program code for programs written to achieve the demonstration tasks.**
  4. **A brief discussion of what you learned from the chapter and demonstration task.**

All files associated with the write up for lab this week should be put into a single .zip file and submitted by uploading the file through blackboard.

NOTE: It is helpful if you to use the following naming convention when you name your .zip file:

Last Name_First Initial_Lab1.zip

For example Dr. Beyette's assignment would be submitted as

Beyette_F_Lab1.zip