Homework 1

CSE 3442/5442 – Spring 2018
Embedded Systems 1

Due Date

- Thursday 2/15/2018 by 10pm
- Submit single .ASM file to BlackBoard
- Multiple submissions are allowed before due date (last one is the graded one)
- Neatly structured and thoroughly commented
- This is individual work; no pairs or groups
- Include your name and 1000-number commented at the top of .ASM file
- Name the file "HW1_LastName.asm"

Demo

- A demo is not required but if I cannot run your code's simulation fully on my machine, I will contact you about demoing your code's functionality in person

Resources and Tools

- PIC18F452 Datasheet and Specs: http://www.microchip.com/wwwproducts/en/en010296
- MPLAB X IDE Download: http://www.microchip.com/mplab/mplab-x-ide
- MPASM Assembler should automatically be included in MPLAB X IDE download
- Instruction Set: http://technology.niagarac.on.ca/staff/mboldin/18F_Instruction_Set/

Assignment

- In MPLAB X, write a simple **assembly** program that reads the binary value from input pin **RB2** and stores it in a file register variable (at a memory location of your choosing)
- Then determine if the variable (not the pin) has a value of 1 or 0
- If that variable is HIGH (1) then write a 1 to output pin **RB5** and a 0 to output pin **RD3**
- If that variable is LOW (0) then write a 0 to output pin **RB5** and a 1 to output pin **RD3**
- Accomplish the above using some combination of bit testing, branching, skipping, etc.
- Use MPLAB's stimulus tool to either apply a periodic (1 kHz, 5 kHz, etc.) external stimulus to toggle **RB2** automatically, or fire manually (Asynchronous firing a pin) for testing your code's correctness while employing breakpoints and stepping through
- Show **RB2**, **RB5**, and **RD3** pin values using the logic analyzer tool during your testing
- Your program/code should continuously loop forever

Notes

- Choose **PIC18F452** as your microcontroller and **MPASM** as your assembler (not XC8)
- Remember to choose **Simulator** as your Hardware Tool/Programmer/Debugger
- You may use any instruction within the PIC18 Assembly Instruction Set
- Feel free to use the sample .ASM programs off the class webpage as a starting point
- Your submitted .ASM file must be executable exactly how it is submitted (don't just include the "meat" of your code; submit the full file including #include, CONFIGs, etc.)