Laboratory assignment seven
Arbitrary sequence detector with animated display
ECE 203

Lab checked on 28 May
Prepared by Robert Dick

In this laboratory assignment, you will be writing an assembly language program to detect an input sequence and display LED animation.

Please show your work in your lab report.

1   Assignment

Please take advantage of the example debounced up/down counter code and references available on the course website. They will help you get started with assembly language programming. Links to the Linux and Windows PIC16C74A assembler and simulator can also be found at the course website. Please consider button S2 to have the value 0 and button S3 to have the value 1 when entering sequences. Be sure to properly debounce all button presses and releases.

1. Write an assembly language program for the PIC16C74A that does the following:

   (a) Upon reset, turn on all display LEDs, and accept a sequence of three button presses, remember this sequence, then turn off all display LEDs.

   (b) Accept button presses. If the most recent three presses match the remembered sequence, respond by cycling a single light to the right, wrapping around when it reaches the end, i.e., output the following repeating sequence: 10000000, 01000000, 00100000, 00010000, 00001000, 00000100, 00000010, 00000001 then repeat. There should be a delay of 50 ms between each transition.

   (c) If any button is pressed, return to the initial condition.

2. Assemble and simulate the program.

3. Bring a USB drive, CD-ROM, or floppy disk containing the assembly and hex files to your lab check. There, you will write the program into the electrically programmable read-only memory (EPROM) of the PIC16C74A microcontroller and run your program on the prototyping board.

2 Requirements

Please include you laboratory report, on the following topics, in comments lines at the start of your program. Please prepare a hardcopy to give the TA and me a place to mark.

1. A problem statement or objective for the laboratory assignment

2. The work you used in achieving this objective

3. The listing for your assembly language program

4. Comments and observations, including perceived problems and strengths of this lab assignment (I do pay attention to these)

The lab will be graded as follows:

Component	Weight
Program functionality	4
Code organization	2
Observations/report	2
Showing work	2