Lab 4: LCD Display

Reference
Hitachi HD44780 Datasheet.

Introduction
This lab introduces the use of the liquid crystal display and the use of the 'Enter Key' to control program execution. With the enter key, you can have several different modes of operation of your PIC board, controllable by an external push button. The LCD display provides a cost effective way to communicate information from the microcontroller to a user.

Task 1: run lcd2.c
Lcd2.c provides an example of the use of the liquid crystal display with a PIC. This program, which is downloadable from the course web site, provides several important subroutines which must be called from your BarIntensity program for it to have LCD display capabilities. These subroutines include InitLCD, DisplayC, and clear_display.

First, download lcd2.c and main.c from the web site to a clean folder, then make a new project named lcd2. Add both lcd2.c and main.c to your project. After compiling and downloading the program to your board, confirm that the letters UL and UR appear in the upper row of your LCD display and LL and LR appear in the lower row of your display. If this does not happen, ask for help!

Once this is working, single step through the program and observe the operation of the new subroutines.

Task 2
Create a new lab 4 project and copy lcd2.c into it. Also copy bar_intensity.c from lab3 into a new file called lcd_display.c. Now, copy the InitLCD() and DisplayC() calls from main.c into the appropriate places in lcd_display.c. If everything is working correctly, your program should now display the characters on the screen while simultaneously allowing you to control your LEDs in number and intensity. You will also need to copy the function declarations into lcd_display.c

Task 3
Once you have this working, modify the main loop to use the Enter Key to control the messages displayed on the screen. When the board initially comes on and whenever no key is
pressed, the screen should read 'Press Enter' centered on the first row. Whenever the enter key is
depressed it should display your name on the first row, and U of CONNECTICUT on the
second row.

Since “Press Enter” is only on the first row, and the other text will be on both rows, you will
need to clear the display before writing “Press Enter”. This can be accomplished by calling the
clear_display() function before printing “Press Enter”. However, you will need to make sure that
you only call this once, or the screen will continuously flash.

Once again use a watch window to single step through your program while observing how critical
variables change as these operations are carried out.

**Task 4**
Demonstrate your project and show the waveform in class and hand in your well-commented C
code by end of class next week. Also, hand in a one paragraph description of the operation of the
LCD module particularly how data is sent to the LCD module.