Tips for LAB3 (LCD, timer and interrupt for Tiva C)

1. Read the document lcd-control.pdf.
2. If you have read the document then you will know what will the following commands do:

   * command(0x38); // function set command
   * command(0x0f); // display switch command
   * command(0x06); // input set command
   * command(0x01); // clear screen command
   * command(0x80); // Set cursor to second line starting

3. The following is the basic algorithm for writing to LCD:

   (a) Set En = 0.
   (b) Set RS = 1/0 for data/command write to LCD.
   (c) Set R/W = 1/0 for read and write operation.
   (d) Put your data on data lines.
   (e) Make En = 1.
   (f) Give delay $>$ 20ms.
   (g) Make En = 0.

4. Steps (d) and (e) can be interchanged. It works in both the cases.
5. For now, ignore LCD busy checking flag before any operation to LCD. (Not recommended)
6. The enable (EN) pulse width must be at least 20ms* for successful write to LCD.

VDD(+ve) should be connected to 5V. (Vbus on Tiva board)
VE(Contrast Voltage) should be connected to gnd.
Backlight Anode(+ve) can be connected to either 3.3V/5 V.

Figure 1: 16x2 LCD Pinout

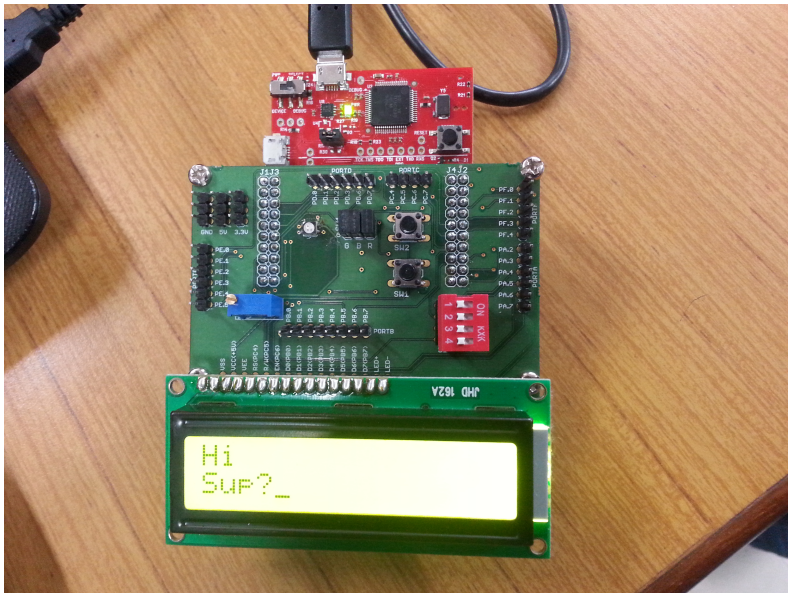

Figure 2: LCD connection to Tiva Board

7. For generating delay, timer can be used. For timer configuration add the following lines to your hardware_init():

    * SysCtlPeripheralEnable(SYSCTL_PERIPH_TIMER2); // Enable Timer 2 peripheral clock
    * TimerConfigure(TIMER2_BASE, TIMER_CFG_PERIODIC); // Configure Timer 2 mode - periodic
    * ui32Period = (SysCtlClockGet() /50); // Period = CPU clk div 50
    * TimerLoadSet(TIMER2_BASE, TIMER_A, ui32Period); // Set Timer 2 period
    * IntEnable(INT_TIMER2A); // Enable Timer 2 interrupt
    * TimerIntEnable(TIMER2_BASE, TIMER_TIMA_TIMEOUT); // Enable Timer 2 to interrupt CPU
    * IntMasterEnable(); // Enable master interrupt
    * TimerEnable(TIMER2_BASE, TIMER_A); // Enable Timer 2