Task 2:   **Complete by 10/18/2007**

Task Purpose: **Familiarization with the IDE and programming process associated with the microcontroller board.**

Familiarization with the processor specific header file.

In the code directory of the course page you will find three files:

- mothertest2.c
- EESD.h
- EESDlib.c

Use the SourceBoost IDE and the MicroPro programmer to compile, link and program testprog.c into the microcontroller board.

Once you have successfully run the program in the microcontroller board, answer the following questions in a task report. The 18F4620 description document will be a necessary resource for answer some of these questions (18F4620.pdf which is in the course site).

1. There are 4 **#pragma data** statements in the source code that set configuration bits (also known as fuses). Describe what each of these configuration settings does.

2. Find the processor specific include file for the 18F4620. Note that if you right click on an include file name in the program listing, the IDE will give you the option of opening it. Including *system.h* includes a header file named *BoostCPic18.h*. A processor specific header file is included based on the target setting in the IDE. The name of the file is **PIC18F4620.h**.

    Locate the definitions of the configuration registers and the configuration bits in this file and answer the following:

    How is _CONFIG4L defined in the header file?

    How is _LVP_OFF_4L defined in the header file?

    What are the default values for the fuses in CONFIG4L as found in the data sheet for the 18F4620?

    If you look at the very end of the .asm file generated by the IDE, you will see what is actually being written into the fuse locations. Which bits are set to the default value and which are set to other than the default value? Comment on your last answer.

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3. There is a **#pragma CLOCK_FREQ** statement in the c code. Why is it necessary for the compiler to know the frequency at which the microcontroller is running?

4. The crystal on the microcontroller board is 10 MHz. The processor has a clock option that will multiply the crystal frequency by 4. How would you select this option so that the processor runs at 40MHz?

5. Based on the schematic of the microcontroller board, or the content of the library code, which I/O pins are used for control and data going to the LCD display?

6. Based on the previous answer, what is the purpose for the C statement:
    ```
    adcon1 = 0x0f;
    ```

7. In the infinite loop at the end of the code, there is the following C statement:

    ```
    LCD_cmd(0x18);  // shift display left
    ```

    The comment indicates that this makes the data in the display shift to the left. How would you change this statement to make the data shift to the right? (You will need to refer to the LCD controller spec that can be found in the technical documents section course site and is called HD4470U.PDF.