ELC 343 - PROJECT #1

PART I

In this design project the students are to copy the program attached, and enter it into the MPLAB editor.

You are to:

1. Build the program to get a .HEX file.

2. Download the .HEX file to the development board.

3. Demonstrate that the program runs by looking at the output pin with an oscilloscope and capture different outputs for different delays.

4. Produce a technical report as if you were in industry.

5. The report is to include, but not limited to the following:

    a. Introduction.

    b. Discussion of results including development of any equations, detailed graphs and schematics, oscilloscope pictures, and any other component that you think helps you to explain what, why and how you did what you did.

    c. The report must be understandable to another engineer or supervisor not working on this project.

    d. A conclusion of your results and discussion of anything you found especially interesting or not expected from you work on this project.

6. This report is a group report and is due to me no later than the class period discussed in class.

PART II

In this design project the students are to write a program that will input a 4 bit BCD coded signal and light a seven segment LED display with the correct decimal number or letter as given below. The input

will be on a Port and the output will be on a different Port. The input will be from a switch board that will supply a 5 VDC signal for a 1 and a 0 VDC signal for a 0.

BCD	SEVEN SEGMENT DISPLAY
0000	0
0001	1
0010	2
0011	3
0100	4
0101	5
0110	6
0111	7
1000	8
1001	9
1010	A
1011	B
1100	C
1101	D
1110	E
1111	F

SYSTEM REQUIREMENTS

1. The system will start up with the seven segment display dark for 5 seconds.

2. After 5 second the system will display what is inputted to the input PORT.

3. The program will display this for 5 seconds.

4. The program will then determine if a different signal is present on the input PORT.

5. If there is a different signal the system/ program will display the new output for 5 seconds.

6. If there are no changes on the input PORT, the program will continue to display the original signal.

7. The system / program will repeat steps 2-6 until it is terminated.

8. The program will display all the letters as upper case.

9. The program will terminate by any appropriate input that your group designates.

10. The program **cannot terminate** until all BCD codes have been displayed.

You are to:

1. Write the program in Assembly language, with appropriate comments.

2. Build the program.

3. Produce a .lst file for review.

4. Download the .HEX file.

5. Debug the program very carefully; include portions of the debug in your report.

6. Demonstrate the operational program to the instructor.

REPORT FORMAT: Free form, but it must comply with the following:

    a. One report per team

    b. Have a cover sheet with identification: Title, Class, Your Names, etc.

    c. Include all the deliverables previously mentioned.

    d. COMPLETELY word-processed

    e. Double spaced

    f. 12 pt Times New Roman font

    g. Fully justified (optional)

```
#include  "CS110000.h"
#define W 0
#define F 1
#define I 0
#define C 1

void main(void)
{
// TYPE YOUR CODE HERE AFTER THIS LINE
// Assembly code
  _asm

            MOVLW  16
            MOVWF  I,        ACCESS

            BCF    TRISE, 1, ACCESS

            BCF    LATE,  1, ACCESS

    LOOP:   CALL   DELAY, 0
            BCF    LATE,  1, ACCESS
            CALL   DELAY, 0
            BSF    LATE,  1, ACCESS
            BRA    LOOP

    DELAY: MOVFF  I,      C
    D:     DECFSZ C,      F, ACCESS
            BRA    D
            RETURN 0

  _endasm

}
```