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Exp. 6: Implementing Instructions (II)

Objectives

1. To be familiar with assembly language programming and the Microchip PIC 16 series instruction set.
2. To see an application of macros and methods of utilizing them.
3. To use the debugging facility of the MPLAB IDE to fix program bugs.

Pre-lab Preparation:

1. Read chapter 7 of the PIC16F84 data sheet.
2. Review the Chapter 3 in the book
3. Study the assembly code listings of accompanying programs. (Very important).

Procedures:

1-Distribute students into five groups (each group four student)

2- Each student Write his name of on the EEPROM and programming it on PIC 16F48A.

3- Each student Write a test code to check the student's PIC and return the student name as a number displayed on 7-segment

4- Test the code on the test Kit.

1)Writing to the EEPROM Data Memory code

```
Movlw   0xFF
Movwf   EEADR
Movlw   A'H'
Bcf     STATUS,RP0
Movwf   EEDATA
Incf    EEADR,f
Bsf     STATUS, RP0
Bcf     INTCON, GIE
Bsf     EECON1, WREN
Movlw   0x55
Movwf   EECON2
Movlw   0xAA
Movwf   EECON2
Bsf     EECON1,WR
Bsf     INTCON, GIE
Test
Btfsc   EECON1,WR
Goto    Test
```

```
Movlw   A'I'
Bcf     STATUS,RP0
Movwf   EEDATA
Incf    EEADR,f
Bsf     STATUS, RP0
Bcf     INTCON, GIE
Bsf     EECON1, WREN
Movlw   0x55
Movwf   EECON2
Movlw   0xAA
Movwf   EECON2
Bsf     EECON1,WR
Bsf     INTCON, GIE
Test1
Btfsc   EECON1,WR
Goto    Test1
```

```
Movlw   A'S'
Bcf     STATUS,RP0
Movwf   EEDATA
Incf    EEADR,f
Bsf     STATUS, RP0
Bcf     INTCON, GIE
Bsf     EECON1, WREN
Movlw   0x55
Movwf   EECON2
Movlw   0xAA
Movwf   EECON2
Bsf     EECON1,WR
Bsf     INTCON, GIE
Test2
Btfsc   EECON1,WR
Goto    Test2
```

```
Movlw   A'H'
Bcf     STATUS,RP0
Movwf   EEDATA
Incf    EEADR,f
Bsf     STATUS, RP0
Bcf     INTCON, GIE
Bsf     EECON1, WREN
Movlw   0x55
Movwf   EECON2
Movlw   0xAA
Movwf   EECON2
Bsf     EECON1,WR
Bsf     INTCON, GIE
Test3
Btfsc   EECON1,WR
Goto    Test3
```

```
Movlw   A'A'
Bcf     STATUS,RP0
Movwf   EEDATA
Incf    EEADR,f
Bsf     STATUS, RP0
Bcf     INTCON, GIE
Bsf     EECON1, WREN
Movlw   0x55
Movwf   EECON2
Movlw   0xAA
Movwf   EECON2
Bsf     EECON1,WR
Bsf     INTCON, GIE
Test4
Btfsc   EECON1,WR
Goto    Test4
```

```
Movlw   A'M'
Bcf     STATUS,RP0
Movwf   EEDATA
Incf    EEADR,f
Bsf     STATUS, RP0
Bcf     INTCON, GIE
Bsf     EECON1, WREN
Movlw   0x55
Movwf   EECON2
Movlw   0xAA
Movwf   EECON2
Bsf     EECON1,WR
Bsf     INTCON, GIE
Test5
Btfsc   EECON1,WR
Goto    Test5
```

Exercise1: -

Modify the code in Ex.1 using modular programing technique to write your name in EEPROM data memory.

2)Test code to Reading from the EEPROM Data Memory code

```
Bcf     STATUS, RP0
Clrf    EEADR
Bsf     STATUS, RP0
Bsf     EECON1, RD
Bcf     STATUS, RP0
Clrf    Counter
Bsf     STATUS, RP0
Clrf    TRISB
Bcf     STATUS, RP0
Movlw   A'H'
Subwf   EEDATA,w
Btfsc   STATUS,Z
Goto    Finish
Incf    Counter,f
Movlw   A'M'
Subwf   EEDATA,w
Btfsc   STATUS,Z
Finish  Incf    Counter,f
Call    Look_Up
Movwf   PORTB
Loop
Goto    Loop
```

```
Look_Up
Movf    Counter,w
Addwf   PCL,f
Retlw   B'11000000'
Retlw   B'11111001'
Retlw   B'10100100'
Retlw   B'10110000'
Retlw   B'10011001'
Retlw   B'10010010'
```

Exercise2: - Write a test code to check the student's PIC and return the student name as a number displayed on 7-segment and initial All GPR with first letter of your name.