

Experiment Number 2

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Subject ::	Embedded System Lab	CODE ::	CSD-333

1. Aim :

To study and analysis the Instruction Set of PIC18.

2. Task :

- Move working register to file register using instruction set .

3A. Theory :

- PIC WREG and ALU using literal value:
 - MOVLW
 - * MOVLW K ; move literal value K into WREG
 - * MOVLW 25H ; move value 25H into WREG (WREG=25H)
 - ADDLW
 - * ADDLW K ; add literal value K to WREG
 - * ADDLW 34H ; add value to W (W= W+34H)
- File Registers of PIC18:
 - MOVWF
 - * MOVLW 55H ; WREG =55H
 - * MOVWF PORTB ; copy WREG to PORTB (PORTB =55H)

- ADDWF fileReg,d :
 - * ADDWF 16H,W ; Add the contents at 16H location with W and store it in WREG ($W=W+\text{content at } 16H$)
- ADDWFC filereg,d:
 - * ADDWFC 5H,F ; Add the contents of 005 location with W and carry ($F=W+005H+C$)
- ANDWF filereg,d:
 - * ANDWF 5H,W ; It will perform AND operation the contents of WREG and file register and store in W ($W=W*\text{content at } 5H$, * is AND operation)
- IORWF filereg,d:
 - * IORWF 5H,W ; It will perform OR operation with the contents of WREG and file register and store in W ($W=W+\text{content at } 5H$, + is OR operation)
- SUBFWB filereg,d:
 - * SUBFWB 5H,W ; Subtract file register from WREG with borrow ($W=W-F-B$)
- SUBWF filereg,d:
 - * SUBWF 5H,W ; Subtract file register from WREG ($W=W-F$)
- SUBWFB filereg,d:
 - * SUBWFB 5H,W ; Subtract WREG from file register with borrow ($W=F-W-B$)
- XORWF filereg,d:
 - * XORWF 5H,W ; It will perform XOR operation with the contents of WREG and file register and store in W
- COMF filereg,d:
 - * COMF 05H,F ; Complement file register
- DECF filereg,d:
 - * DECF 05H,F ; Decrement file register

- DECFSZ filereg,d:
 - * DECFSZ 05H,F ; Decrement file register and skip if zero
- DECFSNZ filereg,d:
 - * DECFSNZ 05H,F ; Decrement file register and skip if not zero
- INCF filereg,d:
 - * INCF 05H,F ; Increment file register
- INCFSZ filereg,d:
 - * INCFSZ 05H,F ; Increment file register and skip if zero
- INCSNZ filereg,d:
 - * INCSNZ 05H,F ; Increment file register and skip if not zero
- INCSNZ filereg,d:
 - * INCSNZ 05H,F ; Increment file register and skip if not zero
- MOVF filereg,d:
 - * MOVF 05H,F ; Move file Registers
- NEGF filereg,d:
 - * NEGF 05H,F ; Negative file register (Find 2's complement)
- RLCF filereg,d:
 - * RLCF 05H,F ; Rotate file register left with carry
- RLNCF filereg,d:
 - * RLNCF 05H,F ; Rotate file register left with no carry
- RRCF filereg,d:
 - * RRCF 05H,F ; Rotate file register right with carry
- RRNCF filereg,d:
 - * RRNCF 05H,F ; Rotate file register right with no carry
- SWAPF filereg,d:
 - * SWAPF 05H,F ; Swap nibbles in file register
- BTG filereg,d:
 - * BTG 05H,F ; Bit Toggle file register

- MOVFF filereg,filereg:
 - * MOVFF 05H,04H ; Copy value from file register to file register
- CLRF; clear file register

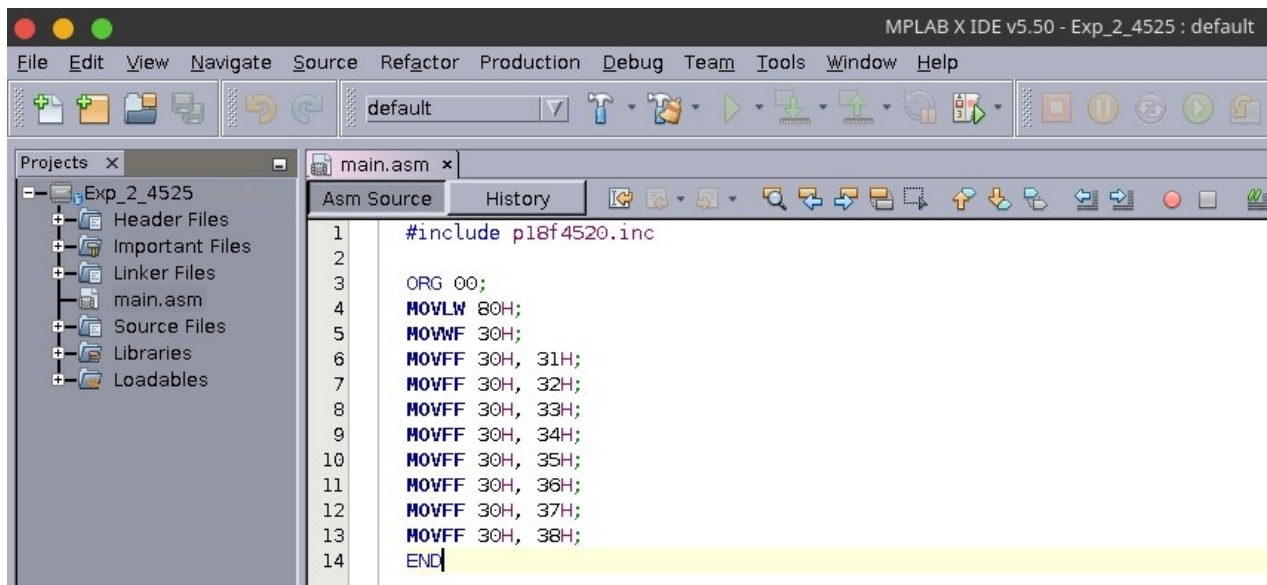
3B. Algorithm :

- Create a new asm file.
- Write the header file
- Write the starting location
- Move the literal value to the working register
- Move the working register to file register
- Move the file register to file register again and again until you move the working register to 38H.

4. Source Code :

```
#include p18f4520.inc

ORG 00;
MOVLW 80H;
MOVWF 30H;
MOVFF 30H, 31H;
MOVFF 30H, 32H;
MOVFF 30H, 33H;
MOVFF 30H, 34H;
MOVFF 30H, 35H;
MOVFF 30H, 36H;
MOVFF 30H, 37H;
MOVFF 30H, 38H;
END
```



5. Observations :

MPLAB X IDE v5.50 - Exp_2_4525 : default

File Edit View Navigate Source Refactor Production Debug Team Tools Window Help

default

Projects x

- Exp_2_4525
 - Header Files
 - Important Files
 - Linker Files
 - main.asm
 - Source Files
 - Libraries
 - Loadables

main.asm x

Asm Source History

```

1  #include p18f4520.inc
2
3  ORG 00;

```

Output File Registers x

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	ASCII
000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
010	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
020	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
030	80	80	80	80	80	80	80	80	80	00	00	00	00	00	00	00
040	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
050	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

MPLAB X IDE v5.50 - Exp_2_4525 : default

File Edit View Navigate Source Refactor Production Debug Team Tools Window Help

default

Projects x

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main.asm x

Asm Source History

```

1  #include p18f4520.inc
2
3  ORG 00;
4  MOVWF 00H;

```

Output File Registers SFRs x

Address	Name	Hex	Decimal	Binary	...
F9F	IPR1	0xFF	255	11111111	'Y'
FCB	PR2	0xFF	255	11111111	'Y'
FD5	TOCON	0xFF	255	11111111	'Y'
F92	TRISA	0xFF	255	11111111	'Y'
F93	TRISB	0xFF	255	11111111	'Y'
F94	TRISC	0xFF	255	11111111	'Y'
F95	TRISD	0xFF	255	11111111	'Y'
FF1	INTCON2	0xF5	245	11110101	'8'
FF9	PCL	0xEE	238	11101110	'T'
FA2	IPR2	0xDF	223	11011111	'B'
FF0	INTCON3	0xC0	192	11000000	'A'
FE8	WREG	0x80	128	10000000	'
FD0	RCON	0x5C	92	01011100	'V'
FB8	BAUDCON	0x40	64	01000000	'@'
FD3	OSCCON	0x40	64	01000000	'@'
FF9	PCLAT	0x000...	238	00000000 00000000...	'..T'
FF6	TBLPTR	0x000...	0	00000000 00000000...	'...'

Learning Outcomes :

- Learnt about the instruction set of PIC controller
- Learnt about the implementation of some basic PIC commands.
- Learnt new concepts of PIC controller.

S. No.	Parameters	Marks Obtained	Maximum Marks
1.			
2.			
3.			