(1)

Logical Commands

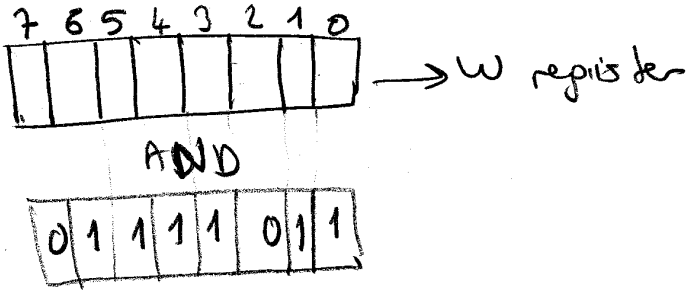
andlw k; → And Literal with W

↓ (W) ← (W) AND (k)

The contents of W register are ANDed with the eight-bit literal 'k'. The result is placed in the W register.

Ex: make the 2nd and 7th bits of W register '0'

andlw b' 01111011'



Logical AND operation is performed.

Ex:

andlw 0x0F

andlw 0xF0

(2)

andwf f,d → AND W with f

if d=0 (w) ← (w) AND (f)

if d=1 (f) ← (w) AND (f)

Ex:

```
movlw   b'11011111';
andwf   PORTA, W;
movwf   PORTB
```

Ex:

```
movlw   0x0F;
andwf   PORTA, W
```

Ex:

```
andwf   PORTB, F;
```

iorlw k; → inclusive OR Literal with W

↓

The content of the W register is OR'ed with the eight-bit literal 'k'. The results is placed in the W register.

(w) ← (w) OR k

(3)

Note OR operations

Ex 3

```
movlw  b'00000011';
iorlw  b'11000000';
movwf  PORTB;
```

iorwf f, d → inclusive OR w with f

if d=0 (w) ← (w) OR (f)

if d=1 (f) ← (w) OR (f)

Background information:

Exclusive OR operation

$x \oplus y = x'y + xy'$

x	y	x⊕y
0	0	0
0	1	1
1	0	1
1	1	0

If x & y have different values

then $x \oplus y = x'y + xy'$

$= 1$

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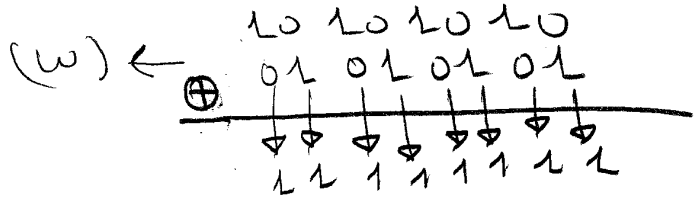
xorlw k; → Exclusive OR Literal with W

(W) ← (W) XOR k

Ex:

```
movlw b'10101010' ; (W) ← 10101010
xorlw b'01010101'
```



1 ⊕ 0 = 1

0 ⊕ 1 = 1

W contains 0XFF

xorwf f,d → Exclusive OR W with f

If d=0 (W) ← (W) XOR (f)

If d=1 (f) ← (W) XOR (f)

Note: a ⊕ a = 0

xorwf is used to check the content of a register and compare it to content of W register

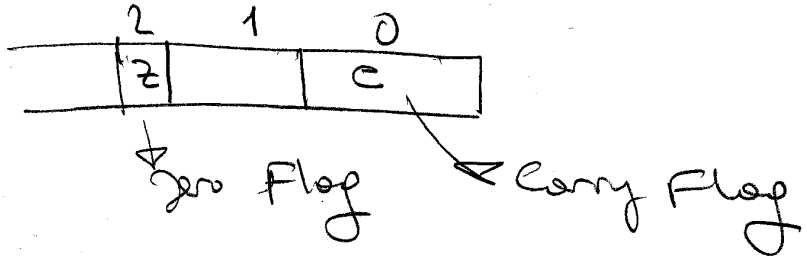
5

Ex: Check whether PORTA contains b'01010101' or not

Soln:

```
        movlw b'01010101';
test_PORTA
        xorwf PORTA, W;
        btfss STATUS, Z;
        goto test_PORTA;

        movf PORTA, W;
        movwf PORTB;
```



Ex: Using iorlw check whether W contains 0x00 or not

Soln:

```
        movlw 0;
loop    iorlw 0;
        btfss STATUS, 2
        goto loop;
```

(6) Ex: If the buttons connected to RA1 & RA2 are pressed, then LED connected to RB0 is turned ON.

Sh:

```
list p=16f84A
include "p16f84A.INC"
clrf PORTB;
bsf STATUS,RP0;
movlw 0xFF;
movwf TRISA;
clrf TRISB;
bcf STATUS,RP0;
test_PORTA  movlw b'00011001';
            xorwf PORTA,W;
            btfss STATUS,Z;
            goto test_PORTA;

            bsf PORTB,0;
loop        goto loop
```

5 bits are used in PORTA

Ex: write the above program using each of them

ANDLW k;
ANDWF f,d
XORWF f,d
XORLW k;