ECE 376 - Homework #2

Assembler & Flow Charts - Due Monday, January 22nd

Assembler Programming

1) Determine the contents of registers W, A, and B after each assembler command:

Command	W	A	B
; Start	12	9	3
addwf A,W			
addwf B,F			
iorwf A,W			
andwf B,F			
movlw 6			
subwf A,F			

2) Convert the following C code to assembler (8-bit operations)

```
unsigned char A, B, C;

A = 2*B + 3*C + 4;
```

3) Convert the following C code to assembler: (16-bit operations)

```
unsigned int A, B, C;

A = 2*B + 3*C + 4;
```

4) Convert the following C code to assembler (if-statements)

```
unsigned char A, B;

A = A & 0x07;
if(A == 0) B = B + 1;
if(A == 1) B = B + 3;
if(A == 2) B = B + 5;
if(A == 3) B = B + 7;
```

5) The flow chart on the left is for turning your PIC into a stoplight

- Every second press RB0 (keeps track of timing)
- For five counts, the stoplight is green (PORTB = 0x03)
- For the next two counts, the stoplight is yellow (PORTB = 0x0C)
- For the last five counts, the stoplight is red (PORTB = 0x30)
- The process then repeats every 12 button presses.

Write the corresponding assembly code

6) The flow chart to the right has a PIC receive data using SPI protocol:

- The PIC waits for a rising edge on RB0 (CLK)
- Once detected, it checks Chip Select (RB1)
- If CS=0, 4then PORTC is shifted left with
- RC0 being determined by the DATA line (RB2)

Write the corresponding assembly code