

TUTORIAL #4: Applying *MPLAB SIM*

Objective:

To code a program using *Assembler* and to observe how data flows through the *WREG* to the file registers using *MPLAB SIM*.

Procedure:

1. Keep in mind the following program below:

- Use *asmTemplate.asm* as a "template" for the new program
- Use an appropriate amount of programmer's comments
- Use the "Step Into" function in *MPLAB SIM* (remember to Select *Debugger>Select Tool>1 MPLAB SIM*) to observe how data moves through the various registers.

Ensure you have the following symbols in your *Watch Window*:

- ⌚ *WREG*
- ⌚ Any file registers (i.e. *i*, *j*, *k*, *result*)
- ⌚ *STATUS Register*

2. ***asmANDWF***:

- Write a program called ***asmANDWF*** that will AND the contents of the 3 registers and place the result in a separate file register, named *result*

i=0xaf

j=0x3b

k=0xd4

3. Based on what you observed (in the *Watch* window) from simulating the program, fill out the chart below:

| <i>Address</i> | <i>Symbol Name</i> | <i>Hex</i> | <i>Decimal</i> | <i>Binary</i> |
|----------------|--------------------|------------|----------------|---------------|
| | <i>WREG</i> | | | |
| | <i>i</i> | | | |
| | <i>j</i> | | | |
| | <i>k</i> | | | |
| | <i>result</i> | | | |
| | <i>STATUS</i> | | | |

Conclusion:

1. Why is the address for *i*, 020 (remember this is 0x20 – i.e. hex20)?
2. What type of register is the *STATUS* register?
3. Reset your program and step through it again, paying close attention to the first 3 bits of the "STATUS Register" in your "Watch" Window. When does a change occur?
4. Explain why the Z bit has been affected?