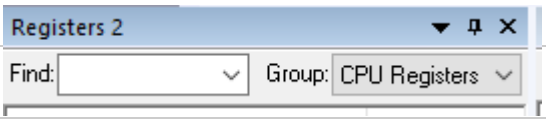
LAB 01 _ Component Identification

Lab # 1 Instructions

Instructions:
Start IAR Embedded Workbench and load workspace simple asm loop.eww and project simple asm loop.
Project and workspace are available as assignment lab #1 on Learn
Start simulating the program by clicking the "Download and Debug" button on the toolbar.
Project → Download and Debug
View the CPU registers by selecting Register from the View menu. 
During this entire lab, you will be "single stepping" through the program and executing one instruction at a time.
This is accomplished by clicking on the "Step Into" button or pressing F11.
For each step, indicated by the step number shown in the comments, indicate the value of all registers or memory locations in the column headings that have changed.
Registers with values that have changed are indicated in Red in the register window.
Proceed through the loop twice for a total of 35 steps.
Questions:
For each register, memory location, or status bit indicated below describe why the value would change. (Use your notes). Then find two examples (step #'s) where it did change and provide a reason why you think it changed. Fictitious Example: Example 1: Carry Flag changed to 0 Step: 23 Reasoning: 0x0001 (R5) + 0x0002 (R6) resulted in 0x0003 and no carry was produced.

Stack Pointer (SP) -
Example 1
Step: **4** (Value 0x0280)
Reasoning: Construction main: mov.w to # 0x0280 so SP Initialize Stack Pointer to change Reg
Example 2
Step: **11** (value 0x027e)
Reasoning: Construction loop : push.w # 0x0000 so SP Initialize Stack Pointer to change Reg
Program Counter (PC) -
Example 1
Step : **1** (Value 0xf802)
Reasoning: Construction main: mov.w to # 0x0000 so Initialize loop counter to zero Register PC change Reg
Example 2
Step : **5** (Value 0xf80c)
Reasoning: Construction Loop: inc.w R5 so Initialize loop counter ; Register PC change Reg
Carry Flag (C) -
Example 1
Step : **6**
Reasoning : Loop: inc.w R5; Register SR change Reg (0x0003), Carry Flag (C) change from **0** to **1**
Example 2
Step : **7**
Reasoning : Loop: add.w to # 0x0001, R5; Register SR change Reg (x0000), Carry Flag (C) change from **1** to **0**
Zero Flag (Z) -
Example 1
Step : **6**
Reasoning : Loop: inc.w R5; Register SR change Reg (0x0003), Zero Flag (Z) change from **0** to **1**
Example 2
Step : **10**
Reasoning : Loop: sub.w R5, R6 ; Register SR change Reg (0x0004), Zero Flag (Z) change from **1** to **0**

Negative Flag (N) -
Example 1
Step : **10**
Reasoning : : Loop: sub.w R5, R6 ; Register SR change Reg (0x0004), Negative Flag (N) change from **0** to **1**
Example 2
Step : **15**
Reasoning : My function : inc.w R7 ; Register SR change Reg (0x0000), Negative Flag (N) change from **1** to **0**