

Homework Assignment #6

Reading Assignment: (see instructor's web page)

Lecture notes
 Reference: 68HC11 Instruction Set
 Reference: 68HC11 Reference Manual
 Handout: Using the AS11 Assembler and the Wookie Simulator

Problem Assignment:

1) Determine the contents of registers A and B (in hexadecimal form) at the end of each assembly language program listed below.

A) LDAA #\$05 STAA \$30 LDAA #\$15 ADDA \$30 LDAB #\$30 SUBB \$30	C) LDAA #\$2E STAA \$20 LDAA #\$10 STAA \$21 LDAB \$21 L1 LDAA \$20 INCB DECA STAA \$20 SBA BNE L1 LDAA \$20 L2 BRA L2
B) LDAA #\$14 STAA \$42 LDAA #\$12 STAA \$41 LDAA #\$10 STAA \$40 ADDA \$41 SUBA \$42 LDAB \$40 SUBB \$41 SUBB \$42	D) LDAA #\$10 STAA \$06 LDAA #\$30 STAA \$07 LDAB \$06 L1 LDAA \$07 ADDB #\$02 SBA BNE L1 STAB \$08 L2 BRA L2

- 2) Assume that three non-negative integers are stored in memory locations M[\$00], M[\$01], and M[\$02]. Write an assembly language program (with lots of comments) that will determine the largest of the three stored values and store the value in M[\$03].
- 3) Assume that x is stored in M[\$A0] and y is stored in M[\$A1] where $x > y$. Write an assembly language program (with lots of comments) to form the sum $y + (y+1) + (y+2) + \dots + x$ and store the sum in M[\$A2]. In other words, continue incrementing y and adding it to a sum until y reaches x.
 Example: if $x = 10_{10}$ and $y = 5_{10}$, then $\text{Sum} = 5 + 6 + 7 + 8 + 9 + 10 = 45_{10}$.
- 4) Write an assembly language program (with lots of comments) such that if the value stored in M[\$10] is -6 or greater, it is replaced with 0. Otherwise, it is not changed.

- 5) Write an assembly language program (with lots of comments) such that if the value stored in M[\$10] is -6 or greater and is +4 or less, it is replaced with 0. Otherwise, it is not changed.

- 6) Assume that the three angles for a triangle are stored in memory locations M[\$00], M[\$01], and M[\$02]. Write an assembly language program (with lots of comments) that will determine if the triangle is a right triangle (i.e., if one of the three values equals 90). If the triangle is a right triangle, store 1 in memory location M[\$03], otherwise store a 2 in the memory location.
- 7) Assemble your program for Problem 2 and include a printout. Use the Wookie Simulator to test the program for 3 cases: a) M[\$00] has the largest value b) M[\$01] has the largest value c) M[\$02] has the largest value Note that you can enter values into the memory locations using the Wookie simulator. For each case, capture the screen showing the initial memory values and then run the simulation and capture the screen showing that the correct value has been stored in M[\$03]. Paste the 6 screen captures into a Word document (along with the assembled code) and print the document.
- 8) Assemble your program for Problem 6 and include a printout. Use the Wookie Simulator to test the program for 4 cases:
 - a) $M[\$00] = 90_{10}$, $M[\$01] = 60_{10}$, $M[\$02] = 30_{10}$
 - b) $M[\$00] = 60_{10}$, $M[\$01] = 90_{10}$, $M[\$02] = 30_{10}$
 - c) $M[\$00] = 30_{10}$, $M[\$01] = 60_{10}$, $M[\$02] = 90_{10}$
 - d) $M[\$00] = 50_{10}$, $M[\$01] = 60_{10}$, $M[\$02] = 70_{10}$For each case, capture the screen showing the initial memory values and then run the simulation and capture the screen showing that the correct value has been stored in M[\$03]. Paste the 8 screen captures into a Word document (along with the assembled code) and print the document.

Selected Answers:

Might be added later!