Homework 3

Note: HW is due at the end of class meeting.

1. Discuss the advantages of using a relocatable assembler versus an absolute assembler.

2. Describe the operation of a two-pass assembler.

3. What is a cross-assembler?

4. What function does a linker program provide?

5. Define what is meant by assembly-time, link-time, load-time and run-time.

6. What is the difference between a trace and a breakpoint?

7. Why must the stack pointer be initialized as one of the first things done in a program?

8. Give four ways to specify each of the following constants. Show two ways for a. & c.
   a. The ASCII character X.
   b. The ASCII character x.
   c. $100_{10}$
   d. $64_{16}$

9. What assembler pseudo-operation is used to allocate memory for data variables?

10. What assembler pseudo-operation is used to define strings of ASCII characters?

11. What assembler pseudo-operation is used to define byte constants in ROM memory?

12. What assembler pseudo-operation is used to set the assembler's location counter?

13. Your hardware designer tells you that the microcontroller will have ROM located at addresses $E000$ to $FFFF$ and RAM at $0800$ to $0FFF$. Show how to inform the assembler so that it locates its code and data areas properly.

14. Give the addressing mode and the effective address for each of the following instructions:
   a. LDAA #5
   b. LDAA $5$
   c. LDAA $5$, X
   d. STAA $081A$
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6812 Program:

1. You are given a vector of signed 8 bit numbers beginning at address $801$ Hex and the length of the vector at address $800$.

2. Create a program starting at $900$ that counts the number of positive numbers in the vector. Store this count at $B00$. Now count the number of negative numbers in the vector and store the result at $B01$.

3. Code & data should be easily re-locatable.

4. Hand in a list file & simulate with dummy data to make sure it executes correctly.

(Hint: Data test instructions TST, TSTA, TSTB can be used to determine whether a signed number is a positive or negative number. See Freescale manual for details)