**EE 308 – Homework 1**
Due 2-5-07

1. Consider the following 8-bit hexadecimal numbers as unsigned. Find their decimal equivalents:

(a) 0xA2
(b) 0x85
(c) 0x6C

2. Repeat Problem 1, considering the numbers as signed.

(a) 0xA2
(b) 0x85
(c) 0x6C

3. Do the operations indicated below. The operations are performed in an 8-bit accumulator. Find the 8-bit results for the operations. Indicate the state of the N, Z, C and V bits after each operation.

(a) 0x4C + 0x53
(b) 0x93 + 0x8A
(c) 0x8E + 0x72

4. Write an instruction sequence to subtract the 8-bit number stored in address $2010 from the 8-bit number stored in $2000, and store the 8-bit difference in $2005.

5. Consider the program below:

```
prog:   equ     $1000
        org     prog
        ldaa    #22
        movb    #53,$2002
loop: ldab      #127
        sba
        std     $2000
        beq     $loop
        swi
```

(a) Hand assemble the program. Determine the hex numbers which will be generated when this program is assembled, and at what locations they will be stored in the HC12.

(b) Determine the values of the N, Z, C, and V bits after each instruction in the above program. (Assume that all the bits are 0 before the execution of the first instruction.)

6. How many instruction cycles will it take the HCS12 to execute the following program? (Do not consider the swi instruction.) How many microseconds will this take the HCS12 with an 24 Mhz E-clock?

```
prog:   equ     $1000
        org     prog
        ldy     #20
loop1:  ldx     #500
loop2:  dex
        bne     loop2
        dey
        bne     loop1
        swi
```