EE333 Microcontroller Engineering
Oregon Tech Portland, Fall 2012
Homework Assignment #1
Due October 2

1. The 68HCS12 has both RAM and ROM (in the form of EEPROM). In an application where would you find each of the following:

   a. Program code

   b. Data

   c. A table of constant values

2. What is the range of values that can be contained as:

   a. An unsigned byte 0 through 255 (solved as an example for you)

   b. A 2's complement signed byte

   c. An unsigned 16-bit word

   d. A 2's complement signed word

3. What is true about all 2's complement signed values that are negative?

4. A byte is used to hold boolean (true or false) values. How many values separate values can be held in a byte?

5. The last 4 digits of student IDs are to be stored in 2 byte (16 bit) variables. Convert the last 4 digits of your student ID to a 16 bit binary value. For instance, if your ID is 918012345, the last 4 digits are 2345, and the binary value is 0000 1001 0010 1001. Note: if the last 4 digits of your student ID is 2345, pretend it is 5432 for this problem.

6. List 5 I/O devices or interfaces that are in the 68HCS12 microcontroller we are studying.

7. List 5 I/O devices or interfaces that are in the Dragon12 board that are not in the 68HCS12.

8. Give an example that shows that an unsigned multiplication does not work for signed values. Then give an example that shows that a signed multiplication does not work for unsigned values.

9. The decimal value 10000 is stored in memory as a two-byte word starting at the address $1000. In the 68HCS12, what value will be in $1000? What value will be in $1001? Express the values in hexadecimal.

10. The signed byte value $f1 is to be stored in memory as a two-byte word starting at the address $1002. In the 68HCS12, what value will be in $1002? What value will be in $1003? Express the values in hexadecimal.