CSCI 112 (Spring 2015) HW #1 25 pts Due: Feb. 03 (Tue)

1. Convert numbers in different radix systems.

(a)	$(\quad 11111011110\ )_2$	$= (\quad\quad)_{16}$	$= (\quad\quad)_{10}$
(b)	$(\quad\quad)_2$	$= (\quad 6BD5\ )_{16}$	$= (\quad\quad)_{10}$
(c)	$(\quad\quad)_2$	$= (\quad\quad)_{16}$	$= (\quad 4219\ )_{10}$

2. ASCII code for char/string data
   (a) Show ASCII codes for the following string:
   January 1 is New Year's Day.
   (b) What would be displayed from the following ASCII codes?
   243338392E3435

3. Signed/unsigned number systems
   (a) Find the word length 2's complement representation of decimal number 844.
   (b) Find the double-word length 2's complement representation of decimal number -100.
   (c) Consider hexadecimal number 98C2417D, and show the corresponding decimal values under unsigned-number system and signed-number system (2's complement).

4. Perform the following operations on word-size numbers and write answer in hexadecimal numbers. Also, convert your computations in decimal numbers under both unsigned and signed (2's complement) number systems.
   Show that the unsigned interpretation is correct when there is no carry_out from sign bit (borrow for subtraction) and the signed interpretation is correct when there is no overflow.
   (a) 2A44 + D9CC
   (b) 8AD0 + EC78
   (c) 791C - EBBC

5. Number systems more
   (a) Express $(-44)_{10}$ as a word-length 1's complement number.
   (b) Express $(43.5)_{10}$ in IEEE single-precision floating-point number.

6. Computer system
   (a) Suppose that you buy a 32-bit PC with 512 MB of RAM. What is the eight-hex-digit address of the "last" byte of installed memory?
   (b) Suppose that you discover that RAM addresses 000C0000 to 000C7FFF are reserved for a PC's video adapter in a 32-bit computer. How many bytes of memory is this?