

CSC 362 Homework Assignment #1  
Due Date: Wednesday, September 2

Word Processor all answers (figures or answers that are too awkward to type can be hand-written or hand-drawn). Each problem (e.g., 1a, 1b, 2a, 3b, etc) is worth 5 points. Show your work for a chance at partial credit – if you don't show your work and you get an answer wrong, you get it all wrong! NOTE: remember to include minus signs for any negative numbers.

1. Convert 11000100 to decimal assuming the number is stored in each of the following representations:
  - a. Unsigned magnitude
  - b. Signed magnitude
  - c. One's complement
  - d. Two's complement
2. Convert -13332 from decimal to each of the following
  - a. 16-bit signed magnitude
  - b. 16-bit one's complement
  - c. 16-bit two's complement
3. Using the 14-bit floating point representation from chapter 2 (figure 2.2) where exponents are represented using excess-16, convert the following
  - a. 01011011000011 to decimal
  - b. -14.375 to binary
  - c. 10111010101000 to decimal
  - d. 1.9 to binary
4. Given the binary number 11100000, provide the results of the following as an 8-bit value.
  - a. Left shift by 1 bit.
  - b. Right shift by 2 bits.
  - c. Arithmetic right shift by 1 bit.
5. Perform the operation  $01010101 - 00110011$  by converting the second number to its two's complement negation and adding. Show your work.
6. Do the following binary multiplication and division problems. Use the **tabular approach** (as covered in class, see the sample problems on the web site and power point notes). If you do not show the work via the tabular approach, you will get no credit. For a, d & e, the numbers are unsigned magnitude. For b & c, the numbers are two's complement. The multiplication problems use 5-bit numbers and the division problems use 6-bit numbers.
  - a.  $10111 * 11001$  (use the unsigned multiplication algorithm)
  - b.  $01011 * 11001$  (use Booth's algorithm)
  - c.  $11010 * 10110$  (use Booth's algorithm)
  - d.  $111100 / 000101$  (use the unsigned division algorithm)
  - e.  $101101 / 001101$  (use the unsigned division algorithm)