COE/EE 243
Homework Assignment #1
Due Friday Jan. 31 by 5:00pm

Show your work on all of the problems below. If you want to see sample problems with solutions go to http://www.ddpp.com/student/student.html

1. Perform the indicated conversions.
   (a) Convert $974_{10}$ to binary and octal
   (b) Convert $3095_{10}$ to binary and hexadecimal

2. Perform the indicated conversions.
   (a) $1101101_2$ to octal and to hexadecimal
   (b) $253.24_8$ to decimal and to hexadecimal

3. Perform the indicated arithmetic operations in binary.
   (a) $1011101 + 1101$  (b) $11011 + 10101$  (c) $101011 - 1101$  (d) $110110 \times 10101$

4. Write the 8-bit signed-magnitude, two’s-complement, and one’s-complement representations for each of the decimal numbers: 0, -0, 128, 127, -127, -128, -15, 25.

5. Perform the following arithmetic operations on the two’s-complement numbers given below. Indicate whether an overflow occurs or not. The first bit in each number is a sign bit.
   (a) $10110 + 11001$  (b) $11001 + 11000$

6. Perform the following arithmetic operations on the one’s-complement numbers given below. Indicate whether an overflow occurs or not. The first bit in each number is a sign bit.
   (a) $10110 + 11001$  (b) $10101 + 11011$