

**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  $9740.53_{10}$  to binary and octal
  - (b) Convert  $3095.6_{10}$  to binary and hexadecimal
  
2. Perform the indicated conversions.
  - (a)  $1101101.1101_2$  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)  $10101 + 11011$