**ECE 1111: Engineering Computation I**

**Homework No. 5: Bitwise Operators and Masking**

**Goal:** Demonstrate that you understand how to do bit-level operations in C.

**Description:** There are two simple tasks in this homework assignment:

1. Write a program that reads any file of text and prints the bit values corresponding to each bit in each character. You can look up the decimal values of the characters using the ASCII chart we covered previously. You can access the individual bit values using bit shifting and/or masking.

Demonstrate that your code works by processing this file as a test case:

**nedc\_000\_[1]: more v.txt**

**a**

**b**

**c**

**0**

**1**

**2**

Your output should look like this:

**a => 00010100 (97) *(this isn't necessarily the correct bit sequence)***

**b => 00010100 (98) *(this isn't necessarily the correct bit sequence)***

**...**

1. Write a program that demonstrates how to mask the above data file with the bit pattern "0F". Demonstrate logical AND, OR, and XOR. Explain each step in your calculations and show they are correct by comparing to manually-derived results for several non-trivial test cases.

Submit your code into the directory:

/**data/courses/ece\_1111/current/homework/hw\_05/lastname\_firstname**

Create two directories: p01 and p02. Within these directories, submit two programs: p01.cc and p02.cc. *They should compile and link using a make file.*