**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 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". The program should accept a filename and a mask value from the command line. It should open the file, read it line by line, and process the first character value in each line. Demonstrate logical AND, OR, and XOR operations. Do this by printing the following (as an example):

ece-000\_[1]: p02.exe v.txt “0F”

mask = 0F

Input: a bits: 00010100 and: 00000100 or: 00010100 xor: 00011011

Input: b …

Input: c …

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.*