**ECE 1111: Engineering Computation I**

**Homework No. 10: Function Calls**

**Goal:** The C programming language supports a variety of function call styles including recursion. The goal of this assignment is to help you understand how to design modular code using functions.

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

1. Implement the function xy where x and y are integers. Implement this function two ways: using a for loop and using recursion. Do not use the math library function! Do this using a program that takes command line arguments:

**p01.exe 2.0 3.0**

**For Loop: pow(2.0000 \*\* 3.0000) = 8.0000**

**Recursion: pow(2.000 \*\* 3.0000) = 8.0000**

**p01.exe 2.0 -3.0**

**For Loop: pow(2.0000 \*\* -3.0000) = 0.1250**

**Recursion: pow(2.000 \*\* -3.0000) = 0.1250**

**p01.exe -2.0 3.0**

**For Loop: pow(-2.0000 \*\* 3.0000) = -8.0000**

**Recursion: pow(-2.000 \*\* 3.0000) = -8.0000**

Your output must match the above **\*exactly\***. Both examples should be implemented using functions. The interfaces for these functions are:

**float mypow\_for(float x, long y);**

**float mypow\_rec(float x, long y);**

1. Write a function that converts a binary number passed as a character string (e.g., “110110111”) to its decimal value. The interface for this function should be:

**double binary\_to\_decimal(char\* str);**

Your main program should implement the following interface:

**p02.exe 110110111**

**input binary number: 110110111**

**output decimal number: 439**

The number of bits should be variable (e.g., “0”, “01”, “101”, …, “1010101111111”).

You must demonstrate that you can compile and link your programs using make files. In both cases, you are to put your code in a library called “libfuncts.a” and demonstrate that you can compile and link both of your programs with this one library. You must use make files to implement both tasks.

Submit your well-commented and well-documented code in the usual location:

**/data/courses/ece\_1111/current/homework/hw\_10/lastname\_firstname**