60-141
Intro to Algorithms & Programming II Winter 2014

Lab #1: Algorithm, Function
(Due at the end of the lab period)

Objectives:
- Practice designing/implementing algorithms
- Practice use of functions

Pre-requisite(s):
- Read chapter 1-5.

Code and document the following functions using **NON-RECURSIVE ITERATION** only.

Test the functions by calling them from a simple interactive **main()** function using a **menu,** with different values. Overall, you should have one C program (call it **Lab1.c**) containing one **main()** function and 5 other functions, where the functions are called based on an interactive user **menu**:

1	Summation: $\sum_{k=1}^{n} k = 1 + 2 + 3 + \cdots + n$ [Note that this sum is equal to n(n+1)/2]
2	Factorial(0) = 1; Factorial(n) = n * (n-1) * . . . * 2 * 1 Requirement: n >= 0
3	Fibonacci(0) = 0; Fibonacci(1) = 1; Fibonacci(n) = Fibonacci(n-1) + Fibonacci(n-2); Requirement: n >= 0
4	gcd (x, y) = x, if y=0 gcd (x, y) = gcd (y, x MOD y), if y > 0 Requirement: x and y both $\geq$ 0
5	Power(a,b) = a^b Requirement: a > 0, b $\geq$ 0, b is an integer

How to document functions?

```
/*
        Objective: Describe the function/its purpose briefly
        Input: Describe the input parameters, or the assumptions/requirements for the function.
        Output: Describe the output of the function. (What does it return? What does it print?)
*/
```

EVALUATION: Total 10 marks.
You need to show your instructor the complete program at the end of this lab. The marks you will receive for the lab are made of two parts: Lab work marks 8 and attendance marks 2.

Lab Work Mark: You will be evaluated based on your solution for the problem based on the following scheme:

0 mark = No work done.
2 marks = Incomplete code / does not compile, with no documentation / invalid documentation.
4 marks = Complete running program with no documentation / invalid documentation.
6 marks = Incomplete code / does not compile, with proper documentation.
8 marks = Complete running program with proper documentation.

Attendance Mark: You will receive 2 marks for attendance.

IMPORTANT:
ASK QUESTIONS IF YOU GET STUCK, BUT DO YOUR OWN CODE. ANY CODE SUSPECTED TO BE SIMILAR TO ANOTHER SUBMISSION WILL CAUSE BOTH SUBMISSIONS TO RECEIVE A ZERO MARK AND BE REPORTED FOR PLAGIARISM.