**IECS 103 Introduction to Computer Science Lab I**
**Lab 9**

1. Write a recursive function to calculate N!. Also write a main program which calls the function with the parameter N.

2. Write a recursive function to calculate a * b as defined below. Also write a main program which calls the function to verify it.

   a * b = a  if b = 1

   a * b = a + a * (b – 1)  otherwise

3. The Fibonacci sequence, Fib(n), is defined as

$$\text{Fib}(n) = \begin{cases} 0 & \text{if } n=0 \\ 1 & \text{if } n=1 \\ \text{Fib}(n-1)+\text{Fib}(n-2) & \text{if } n>1 \end{cases}$$

   Write a recursive function to calculate the value of Fib(n).

4. Write a recursive function power(base, exponent) that when invoked returns base $^{power}$

5. Write a recursive function to find the greatest common divisor (gcd) of two integers using the following definition.

$$\text{gcd}(x, y) = \begin{cases} x & \text{if } y=0 \\ \text{gcd}(y, x \% y) & \text{otherwise} \end{cases}$$