**BRAC University**

**Department of Computer Science and Engineering**

**CSE 220: Data Structures**

**Task 1**

Implement a recursive algorithm to find factorial of *n*.

**Task 2**

Implement a recursive algorithm to find the *n*-th Fibonacci number

**Task 3**

Implement a recursive algorithm of Binary search. (Input a sorted array)

**Task 4**

Implement a recursive algorithm that takes a decimal number *n* and converts *n* to its corresponding binary number.

**Task 5**

Implement a recursive algorithm to find the greatest common divisor (gcd) of 2 integers *m*and *n*. (See Wikipedia for help, not for code)

**Task 6**

Implement a recursive algorithm to find the m^n (m raised to the power n) in a linear fashion [linear recursive].

**Task 7**

Implement a recursive algorithm to find the m^n (m raised to the power n) by dividing the problem into two equal parts:

e.g.

m^n  =  m^(n/2) \* m^(n/2)

or

m^n  =  m^(n/2) \* m^(n/2) \* m [if n is odd]

**Task 8**

Implement a recursive algorithm to sort an array. (Hint, you **may** use another function that finds the minimum.) (or try recursive bubble sort)

**Task 9**

Implement task 1, 2 and 7again, this time with MEMOIZATION.