**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 which return the index of an element, given the value for a non-dummy headed singly linked sequential list. It will return -1 if the value is not found in the Linked List. Note: you’ll need a Singly Node class for this 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 a recursive algorithm which returns a String that contains all the elements of a non-dummy headed **singly** linked sequential list in reversed order.

Example: if the linked list contains 10, 20, 30 and 40, the method will return “40 30 20 10”.

Note: you’ll need a Singly Node class for this code.