

## **Data Structure and Algorithm Lab**

### **Lab Sheet-3**

**Lab schedule: September 9, 2021**

**Submission deadline: September 15, 2021, 11.59 PM**

Q1. A positive integer is entered through the keyboard; write a recursive function to obtain the prime factors of that integer. Also, analyse the time and space complexity of your algorithm.

Q2. Design a recursive algorithm to search a sorted array a for an element x between a[low] and a[high]. If no element is found it returns -1. Also, analyse the time and space complexity of your algorithm.

Q3. WAP to implement the Linear linked list. Perform the following operations on the linked list:

- Creating an empty linked list
- Adding the numbers at the beginning of the linked list.
- Addition of numbers after a particular location.
- Counting the no of nodes.
- Displaying the linked list.

Q4. Write a program that inserts 25 random integers from 0 to 100 in sorted order in a linked list. The program should calculate the sum of the elements and the floating-point average of the elements.

Example:

The list is: 6 12 14 20 27 31 31 34 37 38 56 59 63 66 72 73 73 76 77 79 88 94 95 96 97 \*

The sum is: 1414

The average is: 56.560000