MANIPAL UNIVERSITY JAIPUR

LIST OF EXPERIMENTS
Data Structure and Algorithms (IT2131)

Lab 1. Single Dimensional Array

- Write a program to search an element in an array using linear search technique. Write separate functions for reading the array, and for searching the element in the array.

- Write a program to search an element in an array using binary search technique. Write separate functions for reading the array, and for searching the element in the array.

- Write a program to insert an integer in an array of N integers. Write separate functions for reading the array, displaying the array and to insert the element in the array.

- Write a program to delete an integer in an array of N integers. Write separate functions for reading the array, displaying the array and to delete the element from the array.

- Write a program to sort an array of N integers using selection sort technique. Write separate functions for reading the array, sorting the array and to display the elements of the array.

- Write a program to sort an array of N integers using bubble sort technique. Write separate functions for reading the array, sorting the array and to display the elements of the array.

Lab 2 & 3. Two Dimensional Array

- Write a program to find the multiplication of two matrices. Write separate functions for reading the matrix, displaying the matrix and to find the multiplication of the matrices.

- Write a program to find the transpose of a matrix. Write separate functions for reading, displaying and to find the transpose of the matrix.

- Write a program to find check whether the matrix is upper triangular or not. Write separate functions for reading the matrix and to check whether the matrix is upper triangular or not.

- Write a program to find check whether the matrix is lower triangular or not. Write separate functions for reading the matrix and to check whether the matrix is lower triangular or not.

Lab 4.5 Stack

- Write a program to implement stack using array. Write separate functions for the following operations on stack : Push (inserting element), Pop (deleting element).
- Write a program to implement stack using linked list. Write separate functions for the following operations on stack : Push (inserting element), Pop (deleting element)
- Write a program to convert an expression from infix notation to postfix notation.
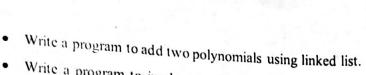- Write a program to evaluate an expression in postfix notation.

Lab 6. Queue

- Write a program to implement simple queue using array. Write separate functions for the following operations on queue : Enqueue (inserting element), Dequeue (deleting element).
- Write a program to implement simple queue using linked list. Write separate functions for the following operations on queue : Enqueue (inserting element), Dequeue (deleting element).
- Write a program to implement circular queue using array. Write separate functions for the following operations on queue : Enqueue (inserting element), Dequeue (deleting element).

Lab 7 & 8. Linked List

- Write a program to perform following operations on the singly linked list :
  Inserting a node (at the start, at the end, in between), deleting a node (starting node, last node, in between node), displaying information stored in the nodes.
  Write separate functions for each of the operations.
- Write a program to perform following operations on the circular linked list :
  Inserting a node (at the start, at the end, in between), deleting a node (starting node, last node, in between node), displaying information stored in the nodes.
  Write separate functions for each of the operations.
- Write a program to perform following operations on the doubly linked list :
  Inserting a node (at the start, at the end, in between), deleting a node (starting node, last node, in between node), displaying information stored in the nodes.
  Write separate functions for each of the operations.

- Write a program to add two polynomials using linked list.
- Write a program to implement circular queue using linked list. Write separate functions for the following operations on queue : Enqueue (inserting element), Dequeue (deleting element).

Lab 9 & 10. Trees

- Write a program to implement binary search tree. Write separate functions for each of the following operations on binary search tree: Creating Binary Search Tree, Inserting a node in the tree, Deleting a node from the tree and to search an element in the tree.
- Write a program to search a largest number in a binary search tree which is less than equal to N.
- Write a program to traverse a binary search tree in pre-order, post-order and in-order.
- Write a program to find the minimum value in a binary search tree.

Lab 11. Graphs

- Write a program to find the transitive closure of a directed graph.
- Write a program to find the minimum spanning tree using Prim's algorithm
- Write a program to implement BFS Algorithm
- Write a program to implement DFS Algorithm.

Lab 12. Sorting

- Write a program to sort an array of N integers using merge sort technique. Write separate functions for reading the array, sorting the array and to display the elements of the array.
- Write a program to sort an array of N integers using quick sort technique. Write separate functions for reading the array, sorting the array and to display the elements of the array.
- Write a program to sort an array of N integers using heap sort technique. Write separate functions for reading the array, sorting the array and to display the elements of the array.

In-Charge
Signature