

Department of Information Technology
Data Structures and Algorithms Lab
Semester-III (July-Nov 2023)

Course Code: - IT2131

Credit: - [0 0 1 1]

List of Experiments

Lab 1: Single Dimensional Array

- Write a program to insert an element in an array. Write separate functions for reading the array.
- Write a program to delete an element in an array. Write separate functions for reading the 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.

Lab 2: Two Dimensional Array

- Write a program to find the addition 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 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.

Lab 3: Sorting Algorithm

- 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.
- 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 insertion sort technique. Write separate functions for reading the array, sorting the array and to display the elements of the array.

Lab 4 & 5: 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 (traversing the list). 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), deleting a node (starting node, last 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.

Lab 6 & 7: 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.

Lab 8: Queue

- Write a program to implement simple and circular queue using array. Write separate functions for the following operations on queue: Enqueue (inserting element), Dequeue (deleting element).
- 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.
- Write a program to traverse a binary search tree in pre-order, post-order and in-order.

Lab 11 & 12: Graphs

- Write a program to store the graph using adjacency matrix and adjacency list, display the vertices and edges of the graphs.
- Write a program to implement BFS and DFS Algorithm.