

DATA STRUCTURES LAB**Exercise 1:**

Write recursive program which computes the n^{th} Fibonacci number, for appropriate values of n . Analyze behavior of the program Obtain the frequency count of the statement for various values of n .

Exercise 2:

Write recursive program for the following

- a) Write recursive and non recursive C program for calculation of Factorial of an integer
- b) Write recursive and non recursive C program for calculation of GCD (n, m)
- c) Write recursive and non recursive C program for Towers of Hanoi: N disks are to be transferred from peg S to peg D with Peg I as the intermediate peg.

Exercise 3:

- a) Write C program that use both recursive and non recursive functions to perform Linear search for a Key value in a given list.
- b) Write C program that use both recursive and non recursive functions to perform Binary search for a Key value in a given list.
- c) Write C program that use both recursive and non recursive functions to perform Fibonacci search for a Key value in a given list.

Exercise 4:

- a) Write C program that implement Bubble sort, to sort a given list of integers in ascending order
- b) Write C program that implement Quick sort, to sort a given list of integers in ascending order
- c) Write C program that implement Insertion sort, to sort a given list of integers in ascending order

Exercise 5:

- a) Write C program that implement heap sort, to sort a given list of integers in ascending order
- b) Write C program that implement radix sort, to sort a given list of integers in ascending order
- c) Write C program that implement merge sort, to sort a given list of integers in ascending order

Exercise 6:

- a) Write C program that implement stack (its operations) using arrays
- b) Write C program that implement stack (its operations) using Linked list

Exercise 7:

- a) Write a C program that uses Stack operations to Convert infix expression into postfix expression
- a) Write C program that implement Queue (its operations) using arrays.
- b) Write C program that implement Queue (its operations) using linked lists

Exercise 8:

- a) Write a C program that uses functions to create a singly linked list
- b) Write a C program that uses functions to perform insertion operation on a singly linked list
- c) Write a C program that uses functions to perform deletion operation on a singly linked list

Exercise 9:

- a) Adding two large integers which are represented in linked list fashion.
- b) Write a C program to reverse elements of a singly linked list.
- c) Write a C program to store a polynomial expression in memory using linked list
- d) Write a C program to represent the given Sparse matrix using arrays.
- e) Write a C program to represent the given Sparse matrix using linked list

Exercise 10:

- a) Write a C program to Create a Binary Tree of integers
- b) Write a recursive C program for traversing a binary tree in preorder, inorder and postorder.
- c) Write a non recursive C program for traversing a binary tree in preorder, inorder and postorder.
- d) Program to check balance property of a tree.

Exercise 11:

- a) Write a C program to Create a BST
- b) Write a C program to insert a node into a BST.
- c) Write a C program to delete a node from a BST.