

Lab Manual

Data Structures and Algorithms

1. Write a Program to construct stack of integers and to perform the following operations on it:
 - a. Push
 - b. Pop
 - c. Display

The program should print appropriate messages for stack overflow, stack underflow, and stack empty.

2. Write a Program to simulate the working of a queue of integers using an array. Provide the following operations:
 - a. Insert
 - b. Delete
 - c. Display

3. Write a Program to simulate the working of a Circular queue and Deque of integers using an array. Provide the following operations:
 - a. Insert
 - b. Delete
 - c. Display

4. Write a Program to construct a singly linked list and to perform the following operations on it:

- a) The insertion operation
 - i. At the front of a list
 - ii. At the back of the list
 - iii. At any position in the list

- b) The deletion operation
 - i. At the front of a list
 - ii. At the back of the list
 - iii. At any position in the list

- c) Displaying all the nodes in the list

5. Write a Program to construct a stack of integers using singly linked list and to perform the following operations:
 - a. Push
 - b. Pop
 - c. Display

The program should print appropriate messages for stack overflow and stack empty.

6. Write a program to construct a queue of integers using singly linked list and to perform the

following operations:

- a.** Insert
- b.** Delete
- c.** Display

7. Write a Program to construct a doubly linked list and to perform the following operations on it:

- a)** The insertion operation
 - i. At the front of a list
 - ii. At the back of the list
 - iii. At any position in the list

- b)** The deletion operation
 - i. At the front of a list
 - ii. At the back of the list
 - iii. At any position in the list

c) Displaying all the nodes in the list

8. Write a Program to construct a Circular (Singly & Doubly) linked list and to perform the following operations on it:

- a)** The insertion operation
 - i. At the front of a list
 - ii. At the back of the list
 - iii. At any position in the list

- b)** The deletion operation
 - i. At the front of a list
 - ii. At the back of the list
 - iii. At any position in the list

c) Displaying all the nodes in the list

9. Write a program to create and display a polynomial.

10. Write a program to print the middle element of a given linked list (There is an odd number of elements in list).

11. Write a program to Count the number of nodes of a given linked.

12. Write a program to Sort the element of linked list.

13. Write a program to Search a particular data in a singly linked list.

14. Write a Program:
 - a. To construct a binary search tree of integers.
 - b. To traverse the tree using all the methods i.e., inorder, preorder and postorder.
 - c. To display the elements in the tree.
15. Implement Linear search algorithm.
16. Implement Binary search algorithm.
17. Implement Selection sort algorithm.
18. Implement Bubble sort algorithm.
19. Implement Quick sort algorithm.
20. Implement Insertion sort algorithm.