

### Extra Lab assignment for Practise - Data Structure

Problem No	Concept	Problem Statement
1	Array	for a given array , write a program to print all of its subarrays
2	Array	for a given array, write a program to print all of its subsequences
3	Searching & sorting	Write a program to implement Binary search.
4	Searching & sorting	A sorted array is rotated clockwise at arbitrary point. Ask user to enter a no which is need to be found. Apply binary search to find that number. If number is found return its index
5	Searching & sorting	Write a program to implement bubble sort.
6	Searching & sorting	Write a program to implement Selection sort.
7	Searching & sorting	Write a program to implement Insertion sort.
8	Searching & sorting	Write a Program to implement merge sort
9	Linked list	Write a program to implement <b>singly linked list</b> and perform the following operations a) Insert at beginning b) Insert at end c) Insert after specified node d) delete at beginning e) delete at end f) delete after specified node g) display h) search an element
10	Linked list	Write a program to generate a linked list. Using the head pointer of generated linked list, reverse it and update the head pointer accordingly. Print such reversed linked list just by using head.
11	Linked list	Write a program to implement <b>doubly linked list</b> and perform the following operations a) Insert at beginning b) Insert at end c)Insert after specified node d) delete at beginning e) delete at end f) delete after specified node g)display h)search an element
12	Linked list	Write a program to implement <b>circular singly linked list</b> and perform the following operations a) Insert at beginning b) Insert at end c) Insert after specified node d) delete at beginning e) delete at end f) delete after specified node g) display h) search an element
13	Linked list	Write a program to implement <b>circular doubly linked list</b> and perform the following operations a) Insert at beginning b) Insert at end c) Insert after specified node d) delete at beginning e) delete at end f) delete after specified node g) display h) search an element
14	GLL	WAP to Create A GLL of type A=(a,b, (c,d),e, (f,g)....). Perform COPY operation on it.
15	Queue	Write a program to implement <b>Linear queue</b> using array and perform the following operations a)Insert b)delete c)peek d)queue full() e)queue empty()

16	Queue	Write a program to implement <b>Circular queue</b> using array and perform the following operations a) Insert b) delete c) display rear d) display front d) queue full() e)queue empty()
17	Queue	Write a program to implement <b>Doubly ended queue</b> using array and perform the following operations a) Insert front b) Insert rear c) delete rear d) delete front
18	Queue	Write a menu-driven program that maintains a queue of passengers waiting to see a ticket agent. The program user should be able to insert a new passenger at the rear of the queue, display the passenger at the front of the queue, or remove the passenger at the front of the queue. The program will display the number of passengers left in the queue just before it terminates.
19	Queue	<p>There are n people in a line queuing to buy tickets, where the 0th person is at the front of the line and the (n - 1)th person is at the back of the line.</p> <p>You are given a 0-indexed integer array tickets of length n where the number of tickets that the ith person would like to buy is tickets[i].</p> <p>Each person takes exactly 1 second to buy a ticket. A person can only buy 1 ticket at a time and has to go back to the end of the line (which happens instantaneously) in order to buy more tickets. If a person does not have any tickets left to buy, the person will leave the line.</p> <p>Return the time taken for the person initially at position k (0-indexed) to finish buying tickets.</p> <p>Input: tickets = [2,3,2], k = 2</p> <p>Output: 6</p>
20	Stack	Write a program to push (), pop (), display (), peek (), stack full () and stack empty () operations on stack using array.
21	Stack	<p>Design a stack that supports push, pop, top, and retrieving the minimum element in constant time.</p> <p>Implement the MinStack class:</p> <p>MinStack() initializes the stack object.</p> <p>void push(int val) pushes the element val onto the stack.</p> <p>void pop() removes the element on the top of the stack.</p> <p>int top() gets the top element of the stack.</p> <p>int getMin() retrieves the minimum element in the stack.</p>
22	Stack	Write a Program to convert Infix to postfix expression Using Stack.
23	Tree	Write a Program to create a Binary Tree and perform following nonrecursive operations on it. a. Preorder Traversal b. Postorder Traversal c. Count total no. of nodes d. Display height of a tree.
24	Tree	Write a program to illustrate operations on a BST holding numeric keys.The menu must include: • Insert • Delete • Find • Show
25	Tree	Write a program to generate a binary tree. Then print the height of given tree by referring the root node

26	Tree	Write a program to generate a binary tree and then print the nodes levelwise
27	Graph	Write a Program to implement Dijkstra's algorithm to find shortest distance between two nodes of a user defined graph. Use Adjacency List to represent a graph.
28	Graph	Write a Program to accept a graph from user and represent it with Adjacency Matrix and perform BFS and DFS traversals on it.
29	Graph	Write a Program to implement Kruskal's algorithm to find minimum spanning tree of a user defined graph. Use Adjacency Matrix to represent a graph.
30	Graph	Write a Program to implement Prim's algorithm to find minimum spanning tree of a user defined graph. Use Adjacency Matrix to represent a graph.