MCKV Institute of Engineering
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Paper Name- Data Structures and Algorithms, CSE (Data Science) ***Paper Code-*** **PC-CS391**

Array

1. Write a menu driven C program to implement the following operations in a 1-D array.
   a) Find maximum and minimum element from array along with their position.
   b) Insert an element to a given position.
   c) Remove an element from the array.
   d) Display the array at any particular instance.
2. Write a C program to represent a sparse matrix in three tuple format.

Extra Assignment

E-1 Write a C program which takes input three tuple representation of sparse matrix and generate the corresponding sparse matrix.

Recursion

3. Write a C program to solve the Tower of Hanoi problem for n disks (n should be taken as keyboard input) using recursion.
4. Write a C program to display the Fibonacci sequence for n terms using recursion.

Extra Assignment

E-2 Write a C program to display first n non- Fibonacci sequence using recursion.

Stack

5. Write a menu driven C program to implement a stack operation (Push, Pop, and Display) using array.
6. Write a C program to evaluate a postfix expression using stack.

Extra Assignment

E-3 Write a C program to convert infix expression to corresponding postfix expression.

Queue

7. Write a menu driven program to implement a Linear Queue using array.
8. Write a menu driven program to implement a Circular Queue using array.

Extra Assignment

E-4 Write a C program to implement input and output restricted deques.

Linked List

9. Write a menu driven C program to insert and delete element at following positions (BEGIN, END, AFTER GIVEN VALUE,) of a linked list and also reverse the same.
10. Write a menu driven C program to implement insertion and deletion operations of a doubly linked list.

Extra Assignment

E-5 Write a menu driven C program to implement insertion and deletion operations of a circular linked list.

E-6 Write a C program to delete the smallest number in the doubly linked list.

E-7 Write a C program to delete duplicate elements from a given singly linked list. Retain the earliest entries.

Sorting

11. Write a C program to sort a list on n numbers using the following sorting technique:
    a. Selection sort.
    b. Insertion Sort.
    c. Quick sort.
    d. Merge Sort.

Extra Assignment

E-8 Write a C program to implement Radix Sort algorithm.

Searching

12. Write a C program to search an element in an array using linear search technique.
13. Write a C program to search an element in an array using binary search technique.

Extra Assignment

E-9 Write a C program to search an element in an array using interpolation search technique.

Tree

14. Write a C program to form a binary search tree and traverse it in In-order, Post-order and Pre-order fashion using recursion.

Extra Assignment

E-10 Write a non-recursive C program to form a binary search tree and traverse it in In-order, Post-order and Pre-order fashion.

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