FUTURE INSTITUTE OF ENGINEERING AND MANAGEMENT
Data Structure & Algorithm Lab Assignment
3rd Semester
CSE(DS)

DO NOT WRITE PRACTICE PROGRAM(S) IN LAB NOTEBOOK, ONLY WRITE DOWN ASSIGNMENT PROGRAM

Introduction to Array and Function,pointer
Assignment No. 1(Day :1)

Assignment:

a). **Write a program using function to arrange list of numbers in ascending order using Insertion sort algorithm.**

b) Search an element from array using binary search method.

Practices:

1. Write a program to delete an element in array at any position.
2. Write a program to generate Fibonacci series using function.
3. Find the k-th largest element in an array.
4. Create an array and then arrange the elements in ascending order using each of the following algorithms: **Bubble and Modified Bubble Sort , Selection Sort.**
5. Write a program to test a given matrix is sparse or not. If it is sparse then represent it as 3-tuple format.

Introduction to Stack ADT

Assignment 2 (Day :2)

Assignment

Write a program using structure to implement stack operations using switch case (push, pop, and display).

Practices:

6. Write a simple program to demonstrate the use and declaration of structure.
7. Write a program to reverse a string using stack.
8. Write a program to check the validity of an expression checking the parentheses.

Assignment 3(Day :3 & 4)

Assignment

a) **Write a program to evaluate the given postfix expression.**

b) **Using recursions solve the problem of Tower Of Hanoi.**

c) Using recursions implement Binary Search Method.

Practice:

9) Write a program to convert infix expression to postfix expression.

10) Write a program to find the min and max element using recursion.

Introduction to Queue ADT

Assignment 4(Day :5 & 6)

Assignment

a) **Write a program to implement linear queue data structure using structure.**

b) **Write a program to implement circular queue using array.**

Practice:

11) Write a program to implement Double Ended Queue using array.

Introduction to structure,Dynamic Memory Allocation and Linked List

Assignment 5(Day :7 & 8)

Assignment

a) **Write a program to insert an element in a *singly linked list***

i) at 1st position

ii) at last position

)

iii) at any position

b) **Write a program to delete an element from a *singly linked list***

i) from 1st position

ii)from last position

iii)from any position

c) **Write a program to reverse a *singly linked list.***

Assignment 6(Day :9 & 10)

Assignment:

a) Write a program to *insert* and *delete* an element in a *Singly Circular linked list*

i) 1st position

ii) last position

b) Write a program to insert and delete an element in a *Doubly linked list*

i) 1st position

ii) last position

Practice:

12. Write a program to access structure elements using pointer.
13. Write a program to create a single linked list (Self-referential structure) and display it. Then count the number of nodes in the list.
14. Write a program to insert an element in the created list and delete an element from the list and then display the list. Reverse the linked list and then display.
15. Write a program to add two polynomials using linked list and then display the newly created polynomial.
16. Write a program to create a double linked list and display it.
17. Write a program to merge two sorted linked list in sorted order.

Introduction to Tree and graph

Assignment 7(Day :11 & 12)

Assignment

***a)* Write a program to create a binary search tree and perform the following traversal algorithms:**

i)Pre-order ii) In-order iii)Post-order

b) Write a program to implement heap sort.

Practice:

18. Implement priority queue using heap sort.
19. Write a program to implement radix sort.
20. Write a program to create and represent a graph using adjacency matrix.
21. Write a program to create and represent a graph using adjacency list.

Sorting using Divide and Conquer

Assignment 8 (Day :13)

Assignment

a) Write a program to implement quick sort.

Practice:

22. Write a program to implement merge sort.

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