



Information Technology Department

Vision: “To contribute to society through excellence in scientific & knowledgeable based education of computer science professional”.

Mission:

- To transform students into technically components, socially responsible & ethical computer science professionals
- To promote a creative teaching-learning process that will strive for academic excellence in the field of computer engineering.
- To enhance the technical expertise of students through workshop & industry-institute interaction

Subject Name: Data Structure Using C

Date :-19/07/2024

Assignment No :-1

Course Outcome:

- Perform basic operations on Array.
- Apply different Searching and Sorting techniques.
- Implement basic operations on Stack and Queue using array representation.
- Implement basic operations on Linked List.
- Implement program to create and traverse tree to solve problems.

Topic Name:-Introduction To Data Structure

- 1) What is Data and Information?
- 2) Define Data Structure.
- 3) What Abstract Data Type
- 4) Explain Linear and Non Linear Data Structure with example.
- 5) Describe anr four operations on data structure.

Date of Submission:-23/07/24

Assign By: - Mrs. Nutan Purkar.



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Subject Name: Data Structure Using C

Date :-

Assignment No :-2

Course Outcome:

- . Perform basic operations on Array.
 - a. Apply different Searching and Sorting techniques.
 - b. Implement basic operations on Stack and Queue using array representation.
 - c. Implement basic operations on Linked List.
 - d. Implement program to create and traverse tree to solve problems.

Topic Name:- Sorting And Searching

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1. What is searching? Explain linear search with suitable examples.
 2. Explain binary search . Write a C program for it.
 3. Find the position of element 29 using binary search method. $A = \{11, 5, 21, 3, 29, 17, 2, 43\}$.
 4. Define storing and state four techniques of sorting
 5. Sort the following number using bubble sort . 29,35,3,8,11,115,56,12,1,4,85,5.
 6. Describe the working of the selection sort method and write complexity of it .
 7. Describe Insertion sort and write a C program to insert an element in an array.
 8. State advantage and disadvantage of Quick sort
 9. Sort the following element using Radix sort.100, 204, 30,5,600,24,6
 10. Compare Quick sort and Radix sort with respect to working principle and time complexity

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Subject Name: Data Structure Using C

Date :-

Assignment No :-3

Course Outcome:

- e. Perform basic operations on Array.
- f. Apply different Searching and Sorting techniques.
- g. Implement basic operations on Stack and Queue using array representation.
- h. Implement basic operations on Linked List.
- i. Implement program to create and traverse tree to solve problems.

Topic Name:- Linked List

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11. Define Linked List. State the different types of linked lists
 12. Define Circular Linked List
 13. Explain the different operations on singly linked list
 14. Explain the following operations in a doubly linked list.
 - (i) Insert an element
 - (ii) Delete an element
 - (iii) Reverse the list
 15. Define the term node, address, null pointer, next and empty list for Linked list.
 16. Write an algorithm to insert a new node at the beginning of the Single linked list. Give example.
 17. Define Doubly Linked List.
 18. Compare singly linked list with circular linked list.
 19. Write an algorithm to insert a delete node from Doubly linked list

 20. Write an algorithm to count total number of nodes in singly linked list.

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Subject Name: Data Structure Using C

Date :-

Assignment No :-4

Course Outcome:

- j. Perform basic operations on Array.
- k. Apply different Searching and sorting techniques.
- l. Implement basic operations on Stack and Queue using array representation.
- m. Implement basic operations on Linked List.
- n. Implement program to create and traverse tree to solve problems.

Topic Name- Stacks

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1. Define Stack. What are the operations of the stack?
 2. What are the applications of stack?
 3. Write a C Function to perform PUSH operation on Stack
 4. Write a C Function to perform POP operation on Stack
 5. Convert the following infix expression into postfix expression $((A+B)*D) \wedge (E-F)$
 6. Evaluate the following Postfix expression: 5, 6, 2, +, *, 12, 4, /, -
 7. Write a C Program to implement PUSH and POP function in Stack as an array.
 8. Translate the given infix expression to postfix expression using Stack and show the details of stack at each step.

Expression: $((A+B)*D)|(E-F)$

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Subject Name: Data Structure Using C

Date :-

Assignment No :-5

Course Outcome:

- o. Perform basic operations on Array.
- p. Apply different Searching and Sorting techniques.
- q. Implement basic operations on Stack and Queue using array representation.
- r. Implement basic operations on Linked List.
- s. Implement program to create and traverse tree to solve problems.

Topic Name- Queue

1. Define queue with example.
2. What are the operations of a queue?
3. What are the types of queue? Define double ended queue
4. What are the applications of queue?
5. Write the C code for enqueue operation in circular queue.
6. Define Priority queue and Dequeue.
7. Differentiate stack and queue.
8. Define circular queue

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Subject Name: Data Structure Using C

Date :-

Assignment No :-6

Course Outcome:

- t. Perform basic operations on Array.
- u. Apply different Searching and sorting techniques.
- v. Implement basic operations on Stack and Queue using array representation.
- w. Implement basic operations on Linked List.
- x. Implement program to create and traverse tree to solve problems.

Topic Name- Tree

9. Define the term Tree and Advantages of tree.
10. Define the given tree terminology:
 - Degree of node
 - Leaf node
11. Define: i)Depth of tree ii)In-Degree and Out-Degree iii)Path
 - iv) Ancestor and Descendant Nodes
12. List types of trees and explain any one.
13. What is Binary Tree? Explain Binary Tree Applications.
14. What is Tree Traversal? List different Tree Traversal Techniques
15. What is a Binary Search Tree? Give one example?
16. Write an algorithm for in order traversal of binary tree.

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