

Data Structure : Lab Assignments

Sorting:

1. Write a menu driven program to implement sorting algorithms. Arrange records in ascending and descending order using different functions for algorithms like:

- a. Selection Sort
- b. Bubble Sort
- c. Insertion Sort

2. Prepare powerpoint presentation to explain all sorting algorithms including time complexities of each.(best case, worst case and average case)

STACK:

1. Implement stack using array. Consider each element on stack is of type integer. Write functions to perform operations on stack

- a. push_element()
- b. pop_element()
- c. peek_element()
- d. is_stack_empty()
- e. is_stack_full()
- f. display_stack()

Declare array & top globally.

2.

(Achieve Reusability)

Implement all operations mentioned above for stack of integers. Create two stacks stack1 & stack2. Push no. Of elements in stack1 until it is not full. Pop all elements from stack1 one by one and push them in stack2. Peek element only from stack2 to understand which element is on top.

3. Implement postfix evaluation. Consider operand is of single digit.

QUEUE: (Achieve Reusability)

1. Implement linear queue using array. Write functions to perform operations on queue

- a. join_element()
- b. leave_element()
- c. traverse_queue()
- d. is_empty()
- e. is_full()

2. Implement circular queue to implement all operations mentioned above in Question no. 1

Linked List:

1. Write program to implement Singly Linear Linked list. Consider each node element data is of type integer. Write functions to perform operations on singly linear linked list:

- a. add node at first position
- b. add node at last position
- c. add node at given position
- d. delete node from first position
- e. delete node from last position
- f. delete node from given position
- g. reverse list
- h. traverse in forward direction
- i. display linked list in reverse order
- j. free all nodes from linked list

2. Write a program to implement singly circular linked list of integers to perform all operations mentioned in question 1.

3. Write a program to implement doubly linear linked list of integers to perform all operations mentioned in question 1.

4. Write a program to implement doubly circular linked list of integers to perform all operations mentioned in question 1.

5. Prepare powerpoint presentation to explain all linked list operations including time complexity of each functions.

TREE:

1. Write a program to implement binary search tree. Each node data will be of type integer. Write functions to perform operations on binary search

- a. Add node
- b. traverse tree (using Recursion)
 - i) inorder
 - ii) preorder
 - iii) post order