

GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Computer Application

Subject Name : Programming Skills II(DS)

Subject Code : 620002

NOTE : Implement the program in 'C/C++'.

1. Write a program to perform the following operations on a stack.
(Implement the stack using array and linked list both)
 - i) PUSH
 - ii) POP
 - iii) ISEMPTY
 - iv) ISFULL
 - v) PEEP
2. Write a program to convert an infix arithmetic expression (parenthesize / unparenthesized) into postfix notation.
3. Write a program to evaluate a postfix expression.
4. Write a program to perform the following operation on a simple queue. (Implement the queue using array)
 - (a) Insert an element
 - (b) Remove an element
5. Write a program to perform the following operations on a simple queue.
(implement the queue using linked list)
 - (a) Insert an element
 - (b) Remove an element
6. Write a program to perform the following operation on a circular queue.
(implement the queue using array)
 - (a) Insert an element
 - (b) Remove an element
7. Write a program to perform the following operations on a priority queue.
 - (a) Insert an element
 - (b) Remove an element

8. Write a Program to implement Double ended queue (Input Restricted/Output restricted)
9.
 - (a) Write a program to create a singly linked list in LIFO fashion.
 - (b) Write a program to create a singly linked list in FIFO fashion.
 - (c) Write a program to create a sorted singly linked list.
 - (d) Cursor Implementation (Array implementation) Of Linked List.
 - (e) Write program perform the following operations on a singly linked list.
 1. Insert an element
 2. Delete an element
 3. Find the sum of elements of the list
 4. Count number of the nodes in the linked list
 5. Search a given elements in the linked list.
 6. Reverse the linked list.
 7. Make a copy of the given linked list
 8. Concatenate two linked list
 9. Merge two linked list.
 10. Find the union of the two given linked list
 11. Find the intersection of the two given linked list.
10. Write a program to add two polynomials in two variables.
11. Write a program to subtract two polynomials in two variables.
12. Write a program to multiply two polynomials in two variables.
13. Write a program to implement sparse Matrix (using Array & Linked-List)
14.
 - (a) Write a program to create a sorted doubly linked list.
 - (b) Write a program to create a doubly linked list in LIFO fashion.
 - (c) Write a program to create a doubly linked list in FIFO fashion.
 - (d) Write a program perform the following operations on a doubly linkedList.
 1. Insert an element
 2. Delete an element
 3. Find the sum of element of the list
 4. Count number of the nodes in the linked list
 5. Search a given element in the linked list.

6. Reverse the linked list
 7. Make a copy of the given linked list
 8. Concatenate two linked listed.
 9. Merge two linked list.
 10. Find the union of the two given linked list.
 11. Find the intersection of the two given linked list.
15. Write a program to swap two adjacent nodes by pointers (and not the data) of
 - (a) Singly linked list
 - (b) Doubly linked list
 16. Write a program to create a binary search tree and print it's elements in inorder (write iterative code).
 17. Write a program to create a binary search tree and print it's elements in preorder (write iterative code).
 18. Write a program to create a binary search tree and print it's elements in postrder (write iterative code).
 19. Write a program to delete an element from a binary search tree.
 20. Write a program to make another copy of a given binary search tree.
 21. Write a program to count no of leaf nodes in a given binary tree.
 22. Write a program to search an element in a given binary search tree.
 23. Write a program to Generate Min-heap and Max-heap (Insertion and Deletion)
 24. Write a program for Insertion of a node in m-way tree (B-Tree/B+-Tree)
 25. Write a program to create an inordered threaded binary tree. Traverse the tree in inorder.
 26. Write a program to create a graph in a adjacency matrix. Generate path matrix from the given matrix.
 27. Write a program to create a graph in a adjacency list structure.
 - (Node directory structure) traverse it in DFS.
 28. Write a program to create a graph in a adjacency list structure.
 - (Node directory structure) traverse it in BFS.
 29. Write a program to implement find shortest path using Dijkstra's algorithm
 30. Write a program to find minimal spanning tree for a given graph using
 - a. Prims algorithm
 - b. Kruskal's algorithm

31. Write program to sort a given list using

- (a) Bubble sort
- (b) Selection sort
- (c) Insertion sort
- (d) Shell Sort
- (e) Quick sort
- (f) Merge sort
- (g) Radix sort
- (h) Heap sort
- (i) Topological sort

32. Write program to search an element in a given list using

- (a) Linear search
- (b) Binary search (iterative/ recursive)

33. Write a Program to merge two given sorted arrays

34. Hashing and Collision Resolution

- a. Linear Probing
- b. Quadratic Probing
- c. Double Hashing
- d. Separate Chaining using Linked List
- e. Rehashing