COURSE: B.TECH-ECE. IV Sem

Data structure Using C

1. Determine the formula to find the address location of an element in three dimensions array, suppose each element takes four bytes of space & elements are stored in column major order?
2. How can a polynomial equation be represented through link list? Explain the method to add two given polynomial equations using linked list?
3. Define the double link list? Write an algorithm to delete an element from the existing link list?
4. What is Sparse Matrices? Write an algorithm to implement it?
5. Write a program with two function A) insertion of element in an array

   b) Deletion of element in an array
6. What is circular linked list? What is the advantage of it? Write a program to implement CLL?
7. Write a program to multiply two matrix of 3*3
8. Write a program to calculate transpose of a matrix?
9. Write a program to insert in middle in doubly linked list and Single linked list?
10. Write a program to add two polynomial equations.

(Stack)

Q1.What is stack? Give an implementation of stack in C language?

Q2. Explain the solution of the tower of Hanoi problem where the number of disks is 4 and Number of pegs are 3?

Q3.Write an algorithm to evaluate an expression given in postfix Notation?

A*(B+D)/E-F*(G+H/K)

Q5. Write an algorithm to convert an infix expression to postfix expression.

Q6. Define the recursion? Write a recursive and non-recursive program to calculate the factorial of the given number?

Q7. Explain the tower of Hanoi problem and write a recursive algorithm to solve it?

(Queue)

Q1. What do you mean by priority Queue? Explain the types to maintain the priority queue?

Q2.What is a circular Queue? Write a C Program to insert an item in the circular queue?

Q3. Define Queue? Formulate insertion and deletion algorithms for a circular queue?

(Linked List)

Q1.Give a dynamic implementation of singly linked list in C Language?

Q2. Define the double link list .Write an algorithm to delete an element from the existing Link list?

Q3. How a polynomial equation can be represented through link list? Explain the method to add two given polynomial equations using linked list?

Assignment:

1. Explain Height of tree?
2. Difference between Height and Depth of tree?
3. What is Time complexity?
4. Where we use BFS and DFS algo?
5. What is a complexity of Bubble sort?
6. What is a complete Binary tree?
7. What is average case and best case complexity of Bubble sort and Insertion sort?
8. Give one line difference between Warshall and Dijikstra algorithm?
9. Difference between preorder and post order?
10. What is IN order traversal?
11. Write an algorithm to determine the number of connected components in a given graph?
12. Explain Hashing ? Explain all methods of hashing?

13. Explain threaded binary tree? Write a function to traverse a threaded binary tree in preorder?

14. Explain all cases to delete a node in an existing binary search tree?

15. The Preorder and In-order traversal of binary tree is given below, construct the tree-

Preorder: FAEKCDHCB

Inorder : EACKFHDBG

Draw a tree T

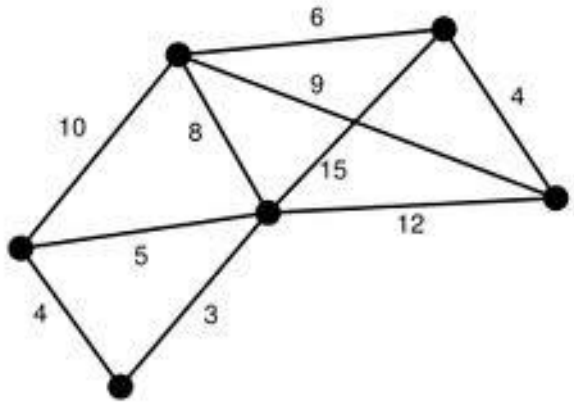
16. What is adjacency matrix? How we calculate path matrix using adjacency matrix

17. How a node is deleted from the binary search tree ? Explain the methods?

18. Explain B-Tree with the help of example?

19. Explain krushkal and prim's algorithm with the help of example.

20. Obtain the minimum cost spanning tree using Kruskal's algorithm for the given graph.



21. Write an algorithm of bubble sort and insertion sort. Explain their best case and worst case complexities.

22. Write an algorithm for the merge sort. Explain its complexities. Sort the following using merge sort method:

    85, 20,30,80,90,100,110,50,20,40

23. Write a C program to search an element in a sorted set of integers using binary search algorithm?

24. Define AVL tree. starting with an empty tree, build the AVL tree by following sequence of insertions:

    E,J,A,M,J,O,F,P

    Also label the rotations according to their types.

25. Write an algorithm for insertion in a Binary search tree. Show the binary search tree built from a sequence of insertions for the following sequence keys:

    9,18,11,16,6,3,17,18,13,1,5

26. Describe Huffman algorithm with the help of suitable example?

27. Write and Explain an algorithm of Heap sort with the help of suitable example?
28. Write an algorithm for sorting a set of positive integers in ascending order using Quick sort procedure. Give worst case and average case time complexity of the algorithm.

Illustrate this procedure for following keys:

60, 88,18,21,13,95,75,36

29. Write a C program to search an element in a unsorted set of integers using Linear Search algorithim.?

30. Inorder and postorder traversal of a Tree T is given as follows;

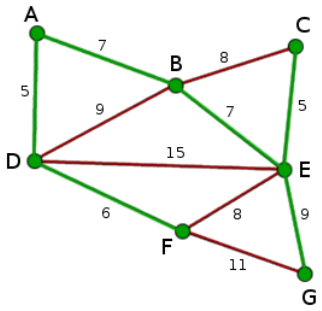
Inorder : B A E F D C G

Postorder : F F A B G C D

Draw the tree T

31. Determine in the terms of level 1 the maximum number of possible nodes at level 1 in the binary tree and also determine the maximum total number of possible nodes in a binary tree if the root node is at level 1.
32. How a node can be Inserted from the B-Tree? Explain the methods with example?

33. Write and explain the breadth first search and depth first search graph traversal algorithm? What are their complexities?
34. Describe the Dijikstra's algorithim algorithim for dinding shortest path with help of suitable example?
35. Define the spanning tree? Write the prim's algorithim to find the minimum cost spanning tree of the following:



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37. How a polynomial equation can be represented through link list? Explain the method to add two given polynomial equations using linked list?

38. Define the double link list? Write an algorithm to delete an element from the existing link list?

39. Write an algorithm to convert an infix expression to postfix expression? Convert the following infix expression into postfix expression?

A*(B+D)/E-F*(G+H/K)

40. Define the recursion? Write a recursive and non-recursive program to calculate the factorial of the given number?

41. Explain the Tower of Hanoi problem and write a recursive algorithim to solve it?

42. Write an algorithm to evaluate an expression given in postfix Notation?

43. What is stack? Give an implementation of stack in C language?