Question Bank

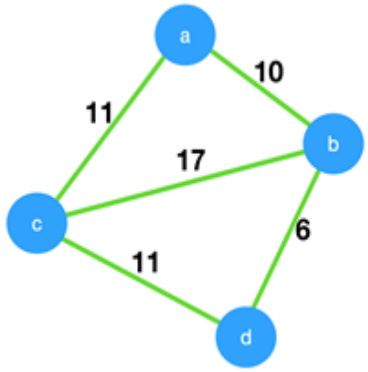
Data Structure

- What do you mean by data structure? Explain your answer with a suitable example.
- What do you mean by the LIFO structure? Support your answer with real-life examples.
- Enlist a few of the fields where you feel a stack is used in real life.
- What are the basic operations that can be performed on the stack?
- What are the underflow and overflow conditions?
- Write steps on how you implement stack?
- Write a function in C to push an element into the stack.
- Write a C function to delete an element from the stack.
- Write C-structure for implementing Stack using an array. Using this structure, write functions for push and pop operations.
- Write a C function to display the stack elements.
- Write a function to inspect an element from the stack.
- Vedika has created a dictionary containing names and marks as key-value pairs of 5 students. Write a program, with separate user-defined functions to perform the following operations:

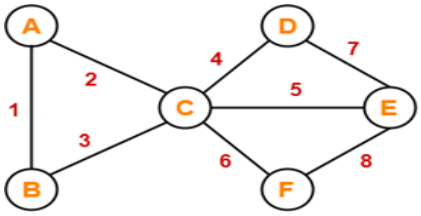
  (a)Push the keys (name of the student) of the dictionary into a stack, where the corresponding value (marks) is greater than 70.

  (b)Pop and display the content of the stack.
- Infix Expression is as: (AX * (BX * (((CY + AY) + BY) * CX))), find out corresponding Postfix Expression & Prefix Expression.
- How will you represent a linked list in a graphical view?
- How many types of Linked List exist? Give brief description for each.
- How many pointers are necessary to implement a simple Linked List?

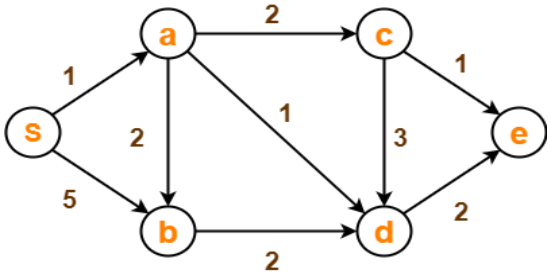
- What are the main differences between the Linked List and Linear Array?
- How can you insert a node to the beginning of a singly linked list?Write appropriate algorithm.
- How can someone insert a node in a random location of the Linked List?
- How can we delete any specific node from the linked list? Write appropriate algorithm.
- Write a C program to reverse a singly linked list?
- Where will be the free node available while inserting a new node in a linked list?
- Define tree. What is a subtree? Define the following terms. children nodes, siblings, root node, leaves level and degree of tree .
- What is the weight of the minimum spanning tree using the Prim's algorithm,starting from vertex a?



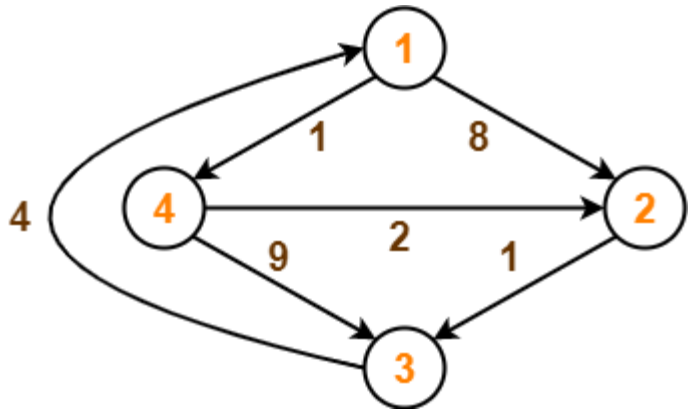
- What is the weight of the minimum spanning tree using the Kruskal's algorithm,starting from vertex A ?



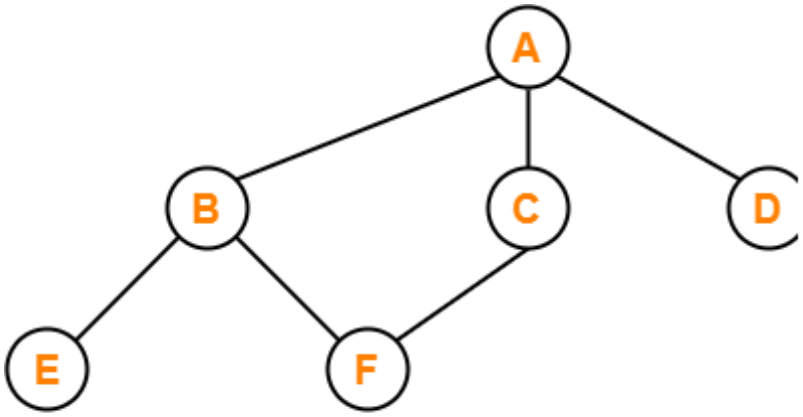
- Using Dijkstra's Algorithm, find the shortest distance from source vertex 'S' to remaining vertices in the following graph-



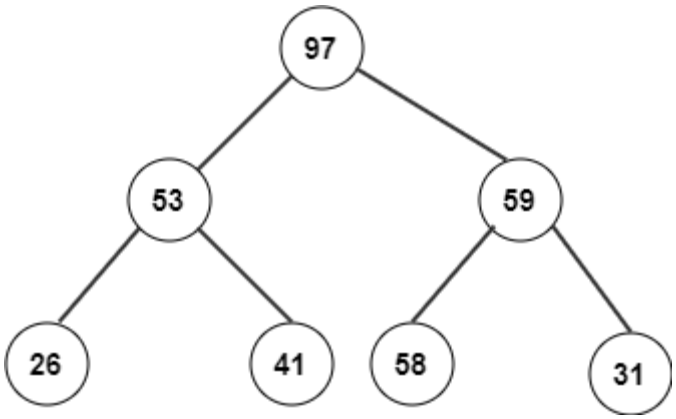
❖ Using Floyd Warshall Algorithm, find the shortest path distance between every pair of vertices.



❖ Find out The breadth first search traversal and depth first traversal order of this graph –



❖ Consider the following heap after buildheap phase. What will be its corresponding array?



- How many arrays are required to perform deletion operation in a heap?
- What is the average number of comparisons used in a heap sort algorithm?
- In what time can a binary heap be built?
- What do you mean by complete binary tree ,almost complete binary tree.
- Define AVL tree with operations.