Subject: Data Structures
Class: S.E. E&TC/Electronics

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Unit 6. Graphs

Topic: Operations on graphs: Traversing a graph
Prepared By: Prof. C.D. Bhos, Dr. S.B. Rahane (Amrutvahini COE, Sangamner)

Sr. No.	Question	Bloom's Taxonomy Level
1.	Write a recursive C function for Depth First Search (DFS) traversal of a graph implemented using adjacency matrix.	2 (Understand)
2.	Write a non-recursive C function for Depth First Search (DFS) traversal of a graph implemented using adjacency matrix.	2 (Understand)
3.	Write a C function for Breadth First Search (BFS) traversal of a graph implemented using adjacency matrix.	2 (Understand)
4.	What is graph traversal? Explain any one algorithm for graph traversal.	2 (Understand)
5.	Demonstrate with an example, how a breadth first search algorithm can be used to traverse a graph.	3 (Apply)
6.	Compare depth first search and breadth first search traversal of graph with an example.	4 (Analyze)
7.	Use depth first search algorithm to traverse a following graph in Fig. 1.	3 (Apply)
8.	Use breadth first search algorithm to traverse a following graph in Fig, 1.	3 (Apply)

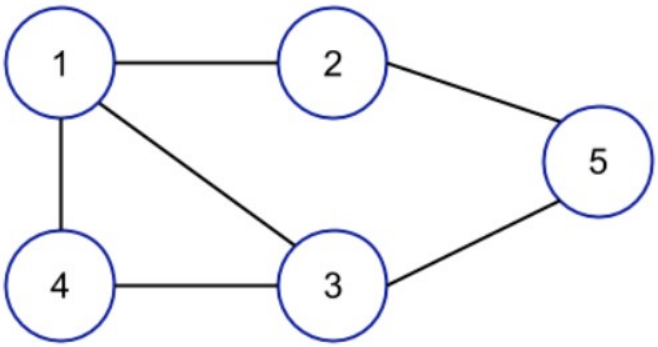


Fig. 1

Question Bank - Ankush Pawar

Q.1.Define minimum cost spanning tree.

Q.2.Discuss Kruskal's Algorithm with an example.

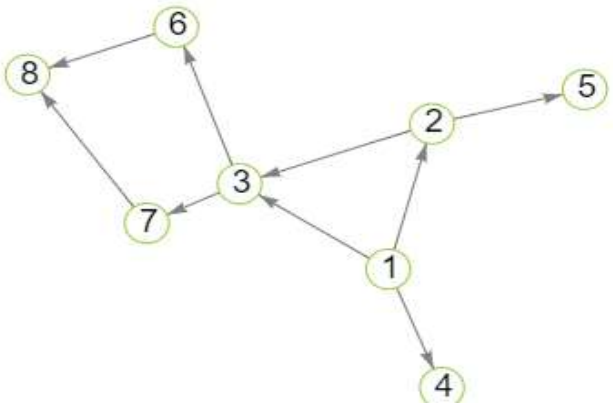
Q.3.Explain Prim's Algorithm with an example.

Q.4.Write Prim's Algorithm

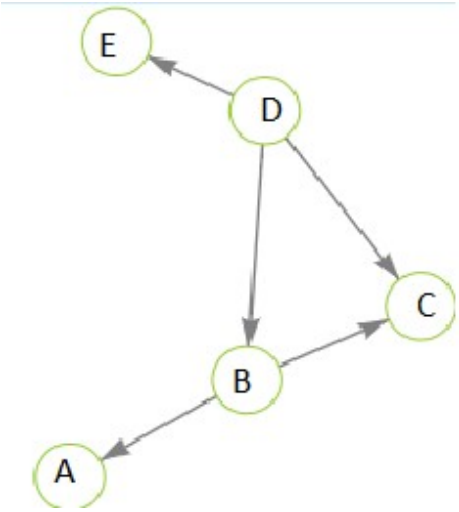
Q.5.Explain the method to determine cost of a spanning tree

Q6.Discuss the steps of Kruskal's Algorithm

1. Explain BFS and DFS traversal of Graph with suitable example.
2. Write C function to implement Depth First Search traversal of a graph implemented using adjacency matrix
3. Write C function to implement Breadth First Search traversal of a graph implemented using adjacency matrix
4. Compare between DFS and BFS
5. Perform DFS with source node as 1



6. Perform BFS with source node as D



Questions on Unit 6

Compiled by: Prof. V.R.Lele

Asst. Prof., E&TC department

KKWIEER, Nashik

1. Suppose that in a group of 5 people: A, B, C, D, and E, the following pairs of people are acquainted with each other. **BT Level: 4** (6 marks)
   - A and C • A and D• B and C• C and D• C and E

   a) Draw a graph G to represent this situation.

   b) List the vertex set, and the edge set, using set notation. In other words, show sets V and E for the vertices and edges, respectively, in G = {V, E}.

   c) Draw an adjacency matrix for G.

2. Consider a simple undirected weighted graph G(V, E) with 10 vertices and 45 edge, assume (u, v) are two vertices weight of a edge is =4lu- vl then the minimum cost of the spanning tree of G_ ? **BT Level: 6** (4 marks)
3. Consider an undirected random graph of eight vertices. The probability that there is an edge between a pair of vertices is 1/2. Identify the expected number of unordered cycles of length three. **BT Level: 3** (4 marks)
4. Can Prim's and Kruskal's algorithm yield different minimum spanning trees? Justify your answer. **BT Level: 5** (6 marks)
5. Compare tree with graph. Is it possible to draw tree from graph? Justify your answer. (6 marks) **BT Level: 4**

Unit 6:

Graph: Basic Concepts & terminology. Representation of graphs: Adjacency matrix, Adjacency list - Pramod Aswale

1. What is Graph? Explain matrix and linked list representation of a graph. Also give the application of Graph.

2. Discuss following with reference to graphs. (i) Directed graph (ii) Undirected graph (iii) Degree of vertex (iv)Null graph (v) Acyclic Graph

3. Draw a directed graph with five vertices and seven edges. Exactly one of the edges should be a loop, and do not have any multiple edges.

4. Describe application of graph in data structure.