ALGORITHM

ASSIGNMENT

Submitted by

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Section: O14

1.Full Tree Traversal

Ans: Traversal is a process of visiting each node in the tree exactly once in some order. By visiting the nodes means printing the nodes in some order. For tree traversal there are two algorithms.
• Breadth-First Search
• Depth-First Search
BFS can be called as level order traversal algorithm. By level means that in each level first to visit all the nodes in the same level than shift to next level. In DFS traversal there are three techniques to visit the nodes and those are,
• Pre-order Traversal
• In-order Traversal
• Post-order Traversal

2. Cycle Finding

Ans: In graph theory, a cycle graph or circular graph is a graph that consists of a single cycle, or in other words, some number of vertices connected in a closed chain. To determine the cycle in a graph we can implement DFS. rom every unvisited node. Depth First Traversal can be used to detect a cycle in a Graph. DFS for a connected graph produces a tree. There is a cycle in a graph only if there is a back edge present in the graph. A back edge is an edge that is joining a node to itself (self-loop) or one of its ancestor in the tree produced by DFS.

3. Articulation Points in a Graph

Ans: A vertex in an undirected connected graph is an articulation point (or cut vertex) if removing it (and edges through it) disconnects the graph. Articulation points represent vulnerabilities in a connected network – single points whose failure would split the network into 2 or more components. They are useful for designing reliable networks. For a disconnected undirected graph, an articulation point is a vertex removing which increases number of connected components. Following are some example graphs with articulation points encircled with red color.

4. Topological Sort

Ans: It is a linear ordering of its vertices such that for directed edge uv for vertex u to v, u comes before vertex v. The condition of topological sort is the graph must be DAF (Directed Acyclic Graph). In every DAG there should have at least one topological ordering. Steps of topological sort given below:

• Find out the in degree of given graph.

• Start with the vertex having 0 in degree.

• Store the vertex and remove the vertex from the graph along with its edges.

• After removing the vertex update the in degree for the remaining graph and repeat the above steps till the graph is not becomes empty.