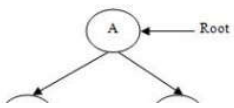
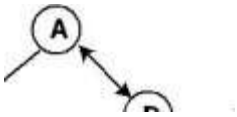
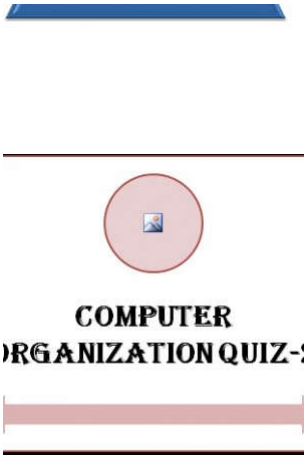
Difference between Trees and Graphs | Trees vs. Graphs

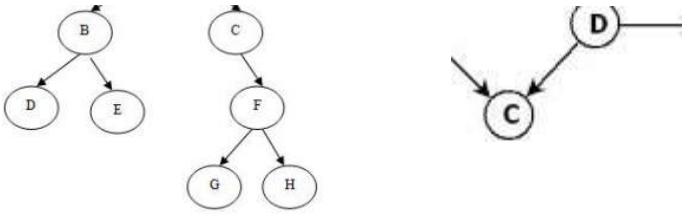
Poonam Dhanvani June 23, 2013 Difference Between

Difference between Trees and Graphs

	Trees	Graphs
Path	Tree is special form of graph i.e. **minimally connected graph** and having only one path between any two vertices.	In graph there can be more than one path i.e. graph can have uni-directional or bi-directional paths (edges) between nodes
Loops	Tree is a special case of graph having no **loops**, no **circuits** and no self-loops.	Graph can have loops, circuits as well as can have **self-loops**.
Root Node	In tree there is exactly one root node and every **child** have only one **parent**.	In graph there is no such concept of **root** node.

Parent Child relationship	In trees, there is parent child relationship so flow can be there with direction top to bottom or vice versa.	In Graph there is no such parent child relationship.
Complexity	Trees are less complex then graphs as having no cycles, no self-loops and still connected.	Graphs are more complex in compare to trees as it can have cycles, loops etc
Types of Traversal	Tree traversal is a kind of special case of traversal of graph. Tree is traversed in **Pre-Order**, **In-Order** and **Post-Order** (all three in DFS or in BFS algorithm)	Graph is traversed by **DFS: Depth First Search** and in **BFS : Breadth First Search algorithm**
Connection Rules	In trees, there are many rules / restrictions for making connections between nodes through edges.	In graphs no such rules/ restrictions are there for connecting the nodes through edges.
DAG	Trees come in the category of **DAG : Directed Acyclic Graphs** is a kind of directed graph that have no cycles.	Graph can be **Cyclic or Acyclic**.
Different Types	Different types of trees are : **Binary Tree , Binary Search Tree, AVL tree, Heaps**.	There are mainly two types of Graphs : **Directed and Undirected graphs**.
Applications	Tree applications : sorting and searching like Tree Traversal & Binary Search.	Graph applications : Coloring of maps, in OR (**PERT & CPM**), algorithms, Graph coloring, job scheduling, etc.
No. of edges	Tree always has **n-1** edges.	In Graph, no. of edges depend on the graph.
Model	Tree is a **hierarchical model**.	Graph is a **network model**.
Figure		





AVL tree, BFS, binary search, Binary Search Tree, Binary Tree, Breadth First Search, Cycles in Tree, DAG, Depth First Search, DFS, Difference between Trees and Graphs, Directed Acyclic Graphs, Directed and undirected graph, Edges, Graph Traversal, Graphs, Heaps., hierarchical model, In-order, Loops in Tree, minimally connected graph, network model, Post-Order, Pre-order, searching, Sorting, Tree Traversal, trees, Trees vs. Graphs, vertices

About Poonam Dhanvani

Assistant Professor in Master of Computer Application (MCA)

View all posts by Poonam Dhanvani →

« TED Steve Jobs | Steve Job in college

Difference between Array and Linked List | Array vs. Linked List »