University of Colombo School of Computing
SCS 1308 - Foundations of Algorithms
Tutorial-11

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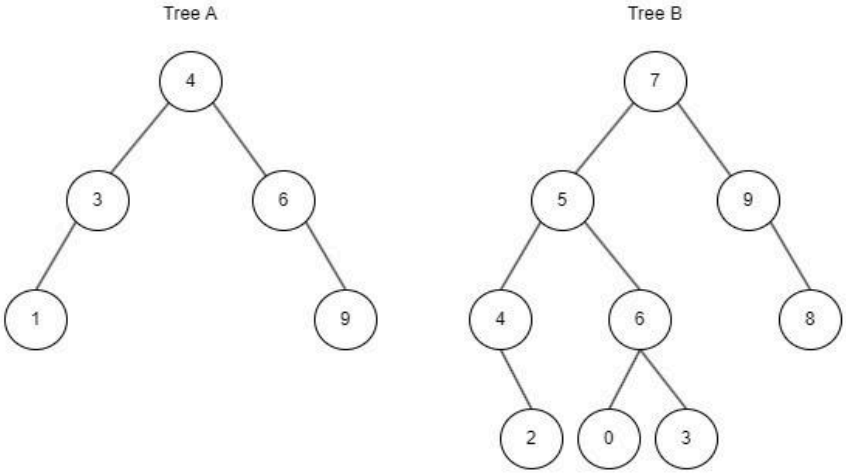
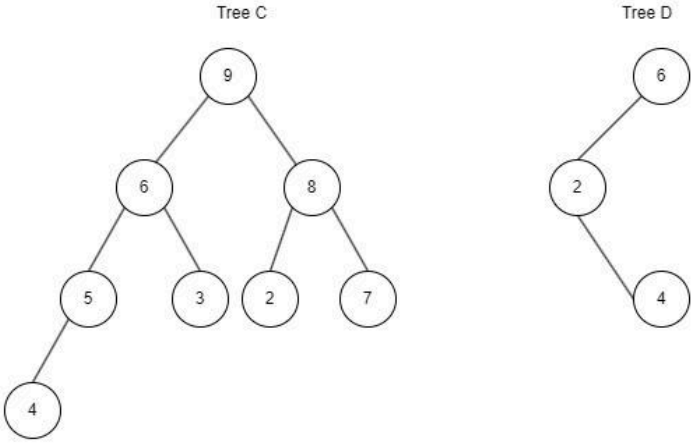
1. Answer questions about the trees below





I. List all the trees that are BSTs:

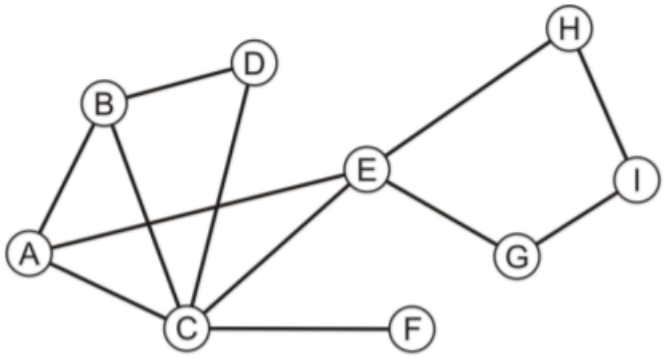
II. Write the pre-order traversal of Tree B.

III. Write the post-order traversal of Tree C.

IV. Write the in-order traversal of Tree A.

2. There are two main types of graph traversal algorithms:Breadth-first: behaves much like a level-order traversal of a tree, that requires a queue.Depth-first: behaves much like the preorder traversal of a tree, that requires a stack.

I. Determine the results of the Breadth-first traversal and Depth-first traversal for the following graph.



II. Explain why those two types of traversal (Breadth-first and Depth-first) require the use of extra structures (such as queues and stack).

III. How does the FIFO strategy of a queue and the LIFO strategy of a Stack help to create the necessary traversal of the graph?

3. What is a Data Structure? Explain it by giving examples of Data Structures.

I. You have given the in-order and preorder traversal of the binary tree. Construct a resulting binary tree from It.

Pre order - 10, 15, 25, 45, 50, 55, 60, 30, 20, 35, 40

In order – 45, 25, 55, 50, 60, 15, 30, 10, 35, 20, 40

II. Use the above constructed tree to answer the following questions,

a) write down the root node of this tree.

b) Write down the node(s) which is(are) the leaves of the tree.

c) Calculate the following properties.

i. Height of the tree

ii. Depth of the tree

iii. Degree of the node 30

d) Compute the length of the path 10-35