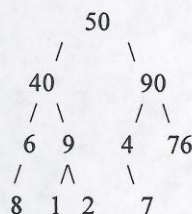


Trees (15 points)

3. Parts (a), (b), and (c) refer to the binary tree:



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- (a) List the data that would be accessed by a pre-order traversal on the given tree by writing out the values in the nodes as they would be accessed, separated by commas. (3 points)

50, 40, 6, 8, 9, 1, 2, 90, 4, 7, 76

- (b) List the data that would be accessed by an in-order traversal on the given tree by writing out the values in the nodes as they would be accessed, separated by commas. (2 points)

8, 6, 40, 1, 9, 2, 50, 4, 7, 90, 76

- (c) List the data that would be accessed by a post-order traversal on the given tree by writing out the values in the nodes as they would be accessed, separated by commas. (2 points)

8, 6, 1, 2, 9, 40, 7, 4, 76, 90, 50

- (d) In general, if a binary tree is perfectly balanced (unlike the tree pictured here) and the tree is of height h then how many leaves will the tree have? (4 points) 2^h

- (e) In general, if a ternary tree (with a maximum of three children per node) is perfectly balanced and the tree is of height h then how many leaves will the tree have? (2 points) 3^h

- (f) What is the runtime complexity of the in-order traversal? (1 point) $\Theta(N)$

- (g) What is the runtime complexity of the level-order traversal? (1 point) $\Theta(N)$

