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BSCPE 2-1

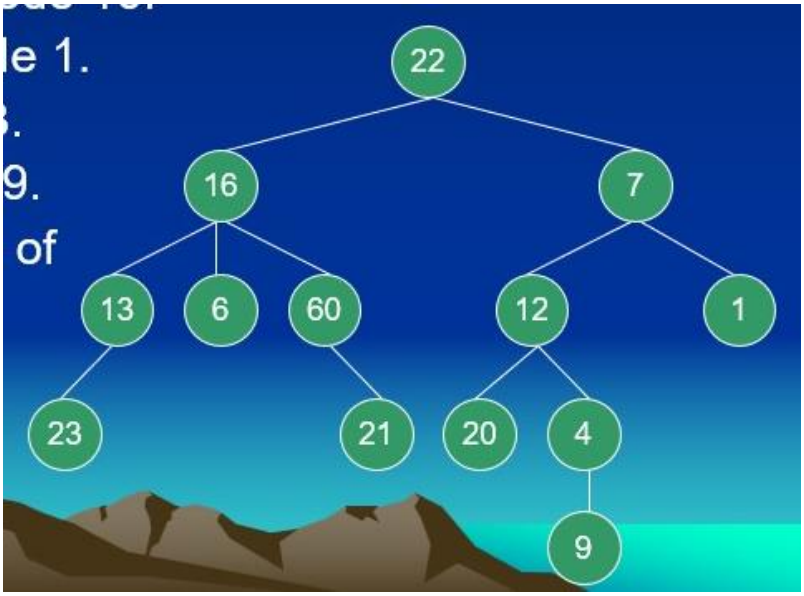
1. Name three properties of a tree.
   Connected, acyclic (no cycle), and undirected graph

2. Is a tree a forest?
   Yes

3. What do you call the special designated node in a tree?
   Root

4. What is the minimum number of nodes in a tree?
   1 node

5. Can a tree have no subtrees at all?
   Yes



Given the three, identify the following:

6. Children of node 16.
   13, 6, 60

7. Parent of node 1.
   Node 7

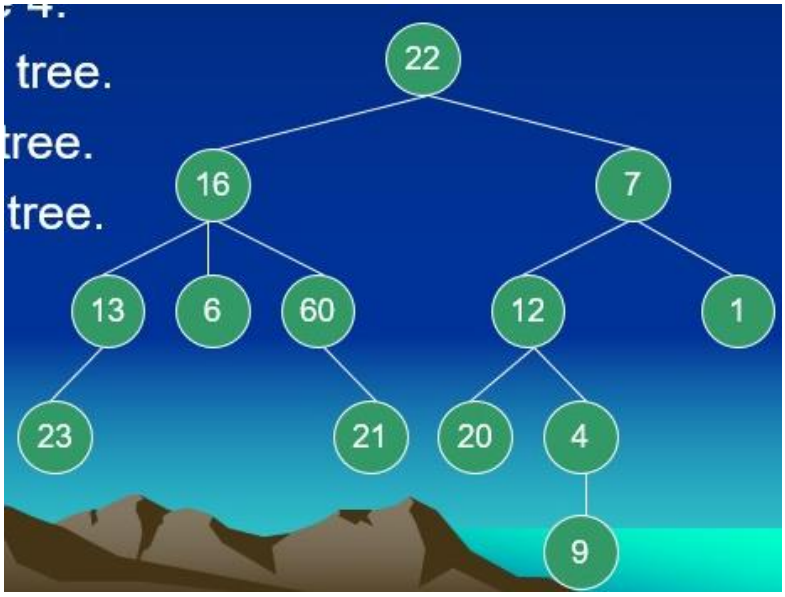
8. Siblings of 23.
   None

9. Ancestors of 9.
   4, 12, 7, 22

10. Descendants of 16.
    13, 6, 60

11. Leaves.
    23, 6, 21, 20, 9, 1

12. Non-leaves.
    22, 16, 7, 13, 60, 12, 4



Given the three, identify the following:

13. Depth of node.
    Depth 3

14. Degree of the tree.
    Degree 3

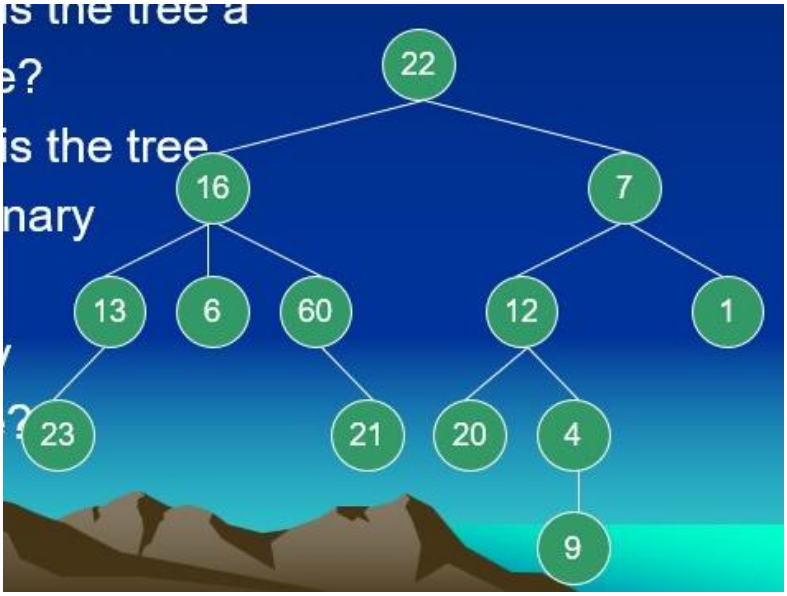
15. Height of the tree.
    Height 4

16. Weight of the tree.

6

17. Is the tree a binary tree?

No



Given the three, identify the following:

18. Removing 6, is the tree a full binary tree?

No

19. Removing 6, is the tree a complete binary tree?

No

20. Is a full binary tree complete?

No

21. Is a complete binary tree full?

Yes

22. How many leaves does a complete n-ary tree of height h have?

n^h

23. What is the height of a complete n-ary tree with m leaves?

$log_n m$

24. What is the number of internal nodes of a complete n-ary tree of height h?

$$\frac{n^h - 1}{n - 1}$$

25. What is the total number of nodes a complete n-ary tree of height h have?

$$n^h - 1$$