

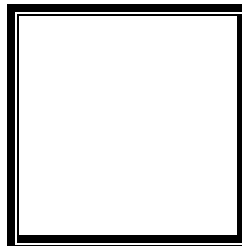


Republic of the Philippines
CAVITE STATE UNIVERSITY
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DATA STRUCTURES AND ALGORITHM

Short Quiz

TREES



Score

Submitted by:

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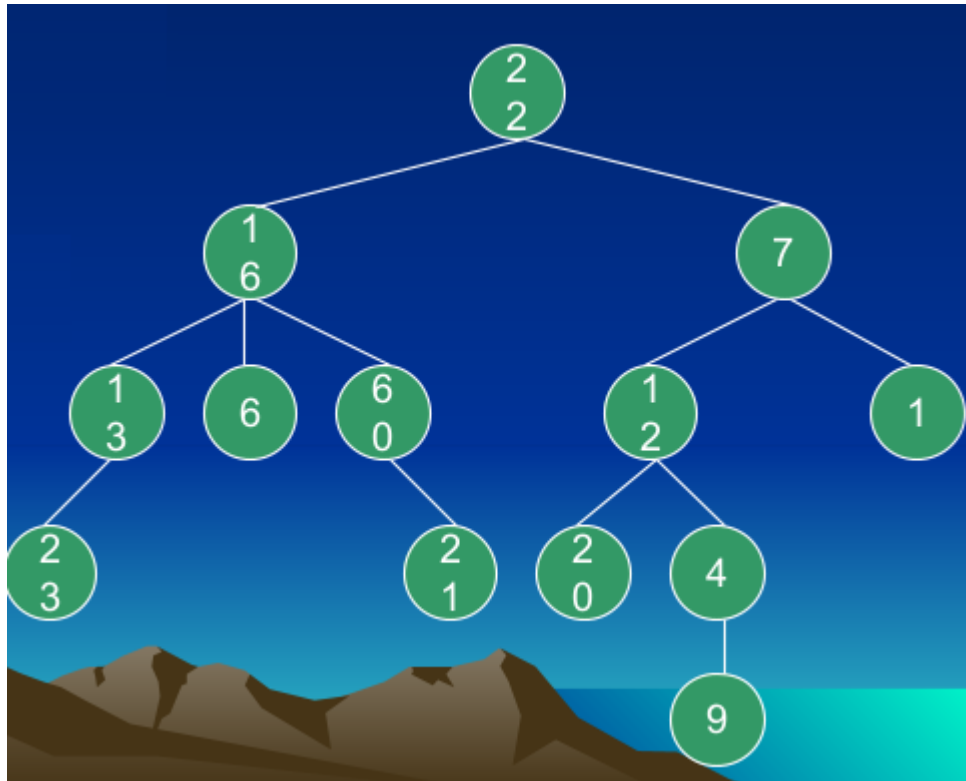
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Date Submitted

16-01-2023

Submitted to:

Engr. Maria Rizette H. Sayo



6. Children of Node 16.

Answer: 13, 6, 60

7. Parent of node 1.

Answer: 7

8. Siblings of 23.

Answer: No Siblings.

9. Ancestors of 9.

Answer: 22, 7, 12, 1, 20, 4

10. Descendants of 16.

Answer: 13, 6, 60, 23, 21

11. Leaves.

Answer: 23, 6, 21, 20, 9, 1



12. Non-leaves.

Answer: 22, 16, 7, 13, 60, 12, 4

13. Depth of node 4.

Answer: Depth 3

14. Degree of the tree.

Answer: 3

15. Height of the tree.

Answer: 4

16. Weight of the tree.

Answer: 6

17. Is the tree a binary tree?

Answer: No

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

Answer: No

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

Answer: No

20. Is a full binary tree complete?

Answer: A full binary tree can be a complete binary tree, but a complete binary tree does not have to be a full binary tree.

21. Is a complete binary tree full?

Answer: A complete binary can or cannot be full.

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

Answer: The number of leaves does a complete n -ary tree of height h have is n^h



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

Answer: The height of a complete n -ary tree with m leaves is $\log_n m$.

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

Answer: The number of internal nodes of a complete n -ary tree of height h is:

$$1 + n + n^2 + \dots + n^{h-1} = \sum_{i=0}^{h-1} n^i = \frac{n^h - 1}{n - 1}$$

25. In order for us to get the total number of nodes of a complete n -ary tree of height h , we need to combine the number of leaves and the number of internal nodes of the tree.

Answer:

$$T = n^h + \frac{n^h - 1}{n - 1} ; \text{Where } T = \text{total number of nodes in a complete } n - \text{ary tree}$$

