2021-AIML 3SEM DSDA Theory & Lab
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Binary Trees Properties - Proofs

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100 points Due Jan 9, 11:59 PM

1 class comment

Dear all,

Submit the hand-written copy of the proofs (Proof by Mathematical Induction) of the following theorems on or before 9/01/2023.

1.
The height of a complete, balanced tree of n nodes is log(n+1)

2. The number of leaves in a full binary tree is number of internal nodes + 1

3. The number of nodes in a perfect binary tree n = 2^(h+1) -1, where h is the height

4. A binary tree
with n internal nodes
has n + 1 external
nodes

5. For any non-empty binary tree with n0 leaf nodes
and n2 nodes of
degree 2, n0 = n2 + 1.

6. The height of a binary tree with n internal nodes is
at least log2(n + 1) and at
most n − 1.

7. The number of leaves in a binary tree of
height h is at most 2^h.

8.
Any rooted tree with n nodes has n − 1 edges

9.
A binary tree of depth d has at most 2^d − 1 vertices.

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