

Tutorial 5: CS21003 Algorithms I

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1. Show that the maximum height of an n -node AVL tree is $\mathcal{O}(\log n)$.
2. Show that the average depth of a node in an n -node binary search tree is $\mathcal{O}(\log n)$.
3. (a) Do in-order and pre-order traversals define a binary tree uniquely? If yes, then write an algorithm; otherwise provide counter-example.
(b) Do post-order and pre-order traversals define a binary tree uniquely? If yes, then write an algorithm; otherwise provide counter-example.
(c) Do in-order and post-order traversals define a binary tree uniquely? If yes, then write an algorithm; otherwise provide counter-example.
4. Design an algorithm to find the k -th smallest/largest algorithm in a binary search tree.