

Tutorial 5: CS21003 Algorithms I

Prof. Partha Pratim Chakrabarti and Palash Dey
Indian Institute of Technology, Kharagpur

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- Do in-order and pre-order traversals define a binary tree uniquely? If yes, then write an algorithm; otherwise provide counter-example.
 - Do post-order and pre-order traversals define a binary tree uniquely? If yes, then write an algorithm; otherwise provide counter-example.
 - Do in-order and post-order traversals define a binary tree uniquely? If yes, then write an algorithm; otherwise provide counter-example.
- Design an algorithm to find the k -th smallest/largest element in a binary search tree.
- Present a Heap data structure that efficiently performs each of the following operations in $\mathcal{O}(\log n)$ time — insert, remove-min, remove-max. Analyze the time and space complexity.
- Present efficient methods to implement a data structure where blocks of inserts and remove-Mins alternate, that is we get a bunch of inserts followed by a bunch of delete-Mins and again a bunch of inserts and so on.