

Homework 3*

Data Structures
Fall 2019 CS203@IITG

- (1) (a) Using strong induction, prove that the inorder traversal of any BST T traverses nodes of T in sorted order of their key values.

(b) Devise an algorithm for finding the inorder predecessor of a given node in the input BST without ever comparing any pair of keys.

(c) Prove the correctness of BST split algorithm presented in class.
- (2) As part of the adversary argument for giving a worst-case lower bound on the number of comparisons in finding the maximum among n distinct integers, give a concrete example generated by the adversary when the algo terminates after $r < n - 1$ comparisons for $n = 6$.
- (3) Prove the correctness of the adversary argument for giving a worst-case lower bound on the number of comparisons in simultaneously finding the minimum and the maximum among n distinct integers. Especially, show that it is always possible for the adversary to adjust values where necessary in all the cases while being consistent with the earlier comparison outcomes the algorithm learned.

— more problems will be added —

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