

Problem 60

Ryan Burmeister

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An advantage of inserting at a leaf node as opposed to entering with some probability as a root of the tree or a subtree is that insertions do not require the casting aside of the current tree architecture. When inserting a node as a root to a subtree, the rest of the tree must be restructured based on the same insertion algorithm that was performed prior to the insertion of the new root.

Two scenarios of inputs which could lead to a deviation of expected $O(\log n)$ height include when the numbers are in increasing or decreasing order. In creating a normal binary search tree, a degenerate binary search trees would form with these inputs. Although randomly bubbling up with probability 0.5 will help, the tree will tend to always grow to the left or right based on the input.