BST

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April 2024

Binary Search Tree Insertion Time Complexity

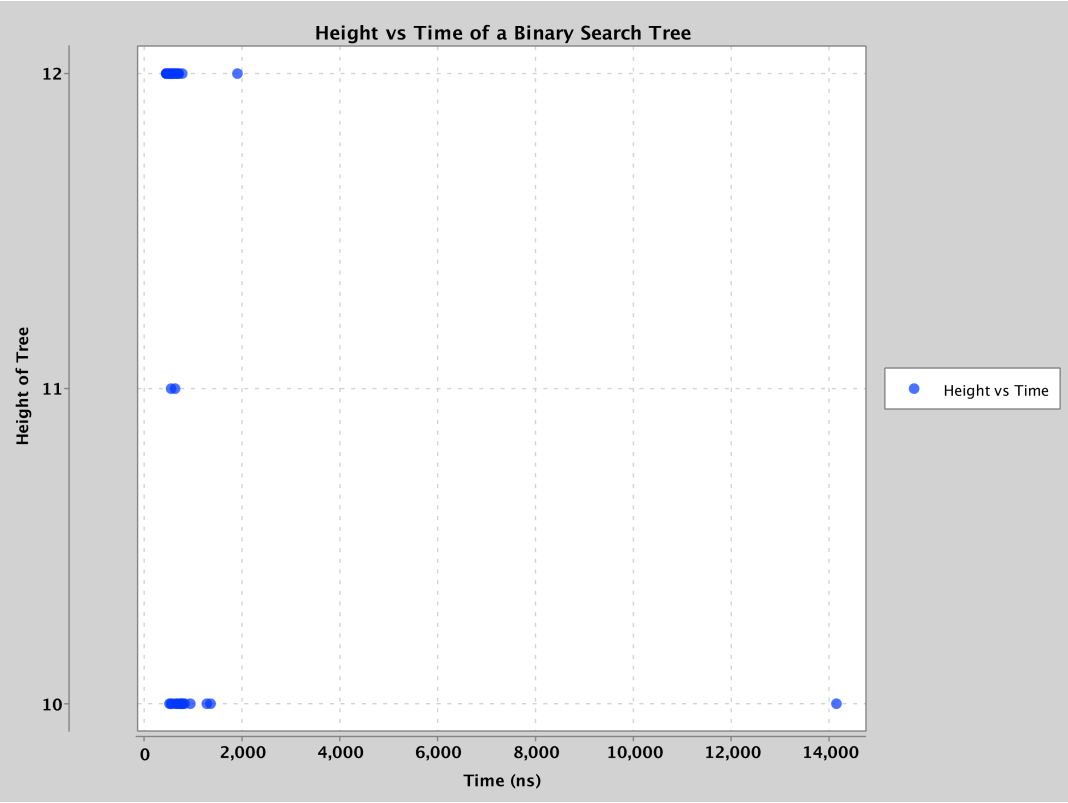

Figure 1: BST Graph

The time complexity of the worst case scenario of insertion in a binary search tree is O(n) or O(h) where n is the number of nodes and h is the height of the tree. This is because in the worst case the tree is like a linked list and we have to traverse through ever node. The average case is O($logn$). Each time we traverse the tree we reduce the number of nodes in half because it is either greater than or less than the current node. The graph above excluding any outliers shows that the graph is not a linked list because when we input 50 new elements we only get a height that differs by 3. If the graph was a linked list we would see the height be upwards of 50. Therefore the graph shows it is O($logn$).