AA Assignment 3

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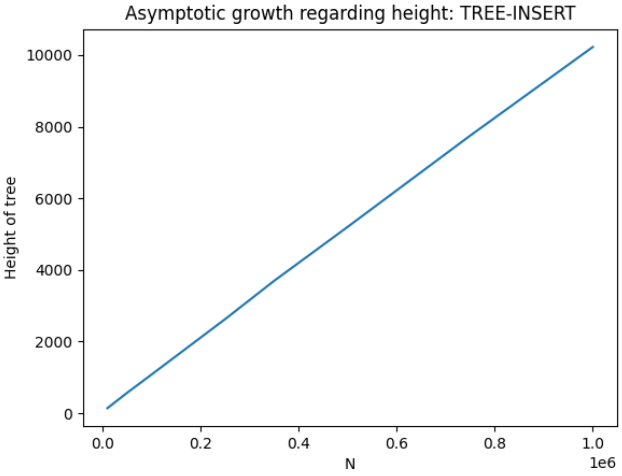
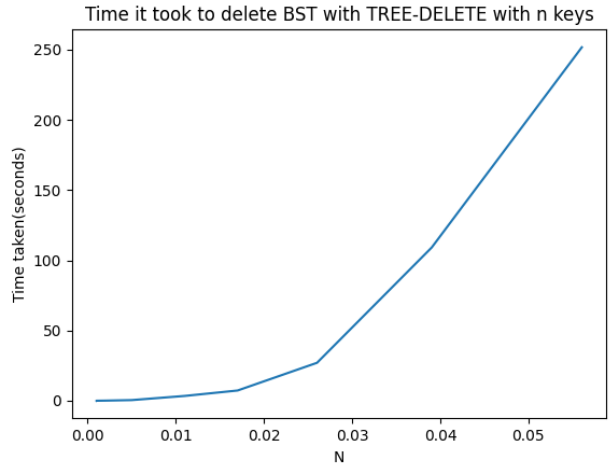
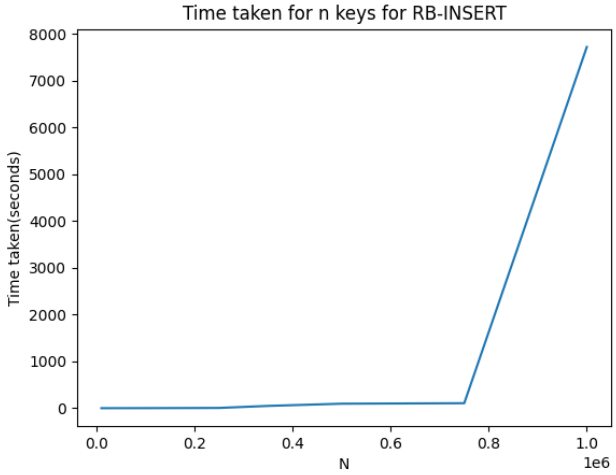
1 Graphs of running times







1.1 Graphs Description on how it was Obtained

Binary Search Tree: After coding up the algorithms needed to create the binary tree, insert nodes and to delete nodes, a series of experiments were ran to test the asymptotic growth of the height as the list dimension increases.Each experiment was runned using the TREE-INSERT and TREE-DELETE algorithms, with a loop that loops over an array containing the different list dimensions.The dimensions were 10000, 25000, 50000, 100000, 250000,350000,500000,750000 and 1000000.The list contains keys of type int and each key is a random number between 1 and 100.The execution times for the Delete and insert functions were calculated,as well as the height of of each N key tree and then stored in a csv file called data.csv for later use in plotting the graphs.

Red Back Tree: The same process was followed for the red black tree implementation except it was only asked to insert nodes(create the tree) and get the average height.The same dimensions and execution time measurement was used as above.I was unable to get the function for determining the height of the red black tree to work.The data that was used for plotting gets written to a csv file called rbt.csv
Plotting: Python 3 and matplotlib.pyplot was used for plotting, the data was read in from both csv's and then plotted according to what was needed.