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Lab 6 Report

a) **Problem We're Trying to Solve:**
   We're trying to figure out if it takes more time to implement the insert, remove, and find function for the balanced binary tree or unbalanced tree.

b) **Tests we ran:**
   We're comparing trees that have 10000, 15000, and 20000 nodes. We're finding how long it takes to implement the insert, remove, and find functions for balanced and unbalanced trees for these 3 values.

   We found 5,000 for 10,000 nodes.
   We found 7,500 for 15,000 nodes.
   We found 10,000 for 20,000 nodes.

   We removed 4,425 for 10,000 nodes.
   We removed 5,000 for 15,000 nodes.
   We removed 7,000 for 20,000 nodes.

c) **Draw conclusions:**
   We concluded implementing the insert for the balanced tree takes much less time than an unbalanced tree.
   For our find, the balanced trees took more time but the reason for this could be the way the values in the tree were inserted. We also noticed the find for the unbalanced and balanced for 20,000 nodes took less time when theoretically it should have taken more time.

   For the remove, we found that balanced and unbalanced were increasing. Balanced took more time than unbalanced. This could be because of the way we inserted the values. The times were very close to each other except for unbalanced for 20,000. It only took about 3 seconds for it to run.

   The graphs we created are displayed below:

Insertion Balanced Vs Unblanced Trees

Find Balanced vs Unblanced Tree

Remove Balanced vs Unblanced Tree