Program 8: Balancing Trees

Submit Assignment

Due Sunday by 11:59pm **Points** 15 **Submitting** a file upload **File Types** h **Available** after Oct 13 at 12am

Your job is to optimize the AVL algorithm in the file provided.

As written, it is O(2^n). That is Bad. First, whenever a change in the tree happens, it tries to balance every node in the tree. O(n). But we know that all potential balance issues are on the path we took so we don't need to check everything. O(log n)

Next, before and after balancing it updates the height of every node. Since a call to set the height recursively calls Set Height on both children, it's exponential. "For each node, tell every node to tell every node to tell every node to update."

So two big tasks here.

1. Starting from the node added or deleted, loop through all the parents above you
2. For each node on the path, update its height and check it for balance.

And:

1. Update heights in an Add or Remove or Rotate, as you go along the path part one is using
2. (A good hint is wherever parents are changed the height might change)

Basically, draw a picture. And use the great pictures in the textbook.