AVL Assignment

1) Can you give me a quick summary of what I have to do for this assignment
   A:You have to insert, do rotations, rebalance, and use the breadth function to display level by level

2) How do I populate the tree?
   A: You will use a text file that contains a series of numbers separated by some kind of white space. The numbers can appear in any random order. You can be guaranteed that they will all be integers and there is no error checking that needs to be done.

3) Can I use my own algorithm for balancing the tree?
   A: You must use the algorithm that I have provided

4) How do I display the tree in print level format
   A: In the lecture notes, you will find a document called print level. There are 2 algorithms that are available to you. One uses 2 queues and the other uses only one queue. You can use either algorithm to display the tree level by level. Please note that you don't have to worry about the children lining up with the parents. Each level will be on its own separate line. The numbers can be separated by spaces. As long as the numbers are sitting on the proper level, you are good.

5) How are the heights being updated
   A: You will insert a node at the leaf position with the height of 0 and will climb up to connect the newly created node to a parent node. During the climb up, you call the balance function which will update the height. Given this height, we calculate the new balance and check to find out if we have to rotate. Inside the rotate function, we update the height again since nodes are moving to different places. We return back to the balance function, which will in turn go back to the insert function, which then continues to climb back up. This process is continued until it reaches the root.

   So the quick answer is the balance function along with the rotate functions both update the heights. When the new node is created at the leaf position, its height is automatically assigned to 0

6) You can try a few different datasets to test your code
   Set 1) 9 5 3 (single right rotation)
   Set 2) 3 5 7 (single left rotation)
   Set 3) 9 5 7 (Double rotation 1) left 2) right)
   Set 4) 3 5 4 (Double rotation 1) right 2) left)
   Set 5) 10 15 6 3 8 9 (Double rotation 1) left 2) right)

7) Can I redirect my output to the screen instead of a file

A: Yes

8) Do I have to worry about deletes?
   A: No, you don't have to worry about deletes

9) Here is a good site to check your AVL tree visually
   https://www.cs.usfca.edu/~galles/visualization/AVLtree.html