Mini 11

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Due: 11:20am on March 18^{th}, 2019

1. **Assume we have a tree of height 10. We insert a node at the 11^{th} level. Is it possible for only the root node to be unbalanced? A yes or no answer is sufficient, no justification is needed.**

   No

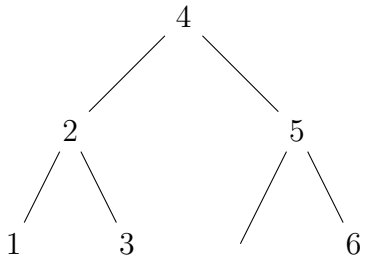
2. **Can inserting a node cause more than 1 rotation (single or double)? Provide some justification to back up your answer.**

   Yes because each time a node is balanced, the pointers that are changing could cause a chain reaction that would cause each node above it to become unbalanced. If you think about the tree as a rigid structure, (as we usually do), we can just imagine that some elements are pulled up, while others are pushed down (which would require a chain of rotations that go up the tree).

3. **Can removing a node cause more than 1 rotation (single or double)? Provide some justification to back up your answer.**

   Yes. Just as I stated above, moving around the pointers of a group of nodes can create a chain reaction that goes back up the tree.

4. **What does the AVL tree look like if we add 1 through 6 into the tree in that order?**



Note: The extra branch off of node 5 is there so 6 is more clearly shown as the right child 5.