1. Suppose we changed the height-balance property, so that the heights of two subtrees may differ by at most 2 (instead of 1). Prove that this modified AVL tree must still have a height that is $O(\log n)$. Please make your proof clear and formal. HINT: I recommend using the proof of Theorem 3.2 (page 153) as a starting point.

2. Find an example of an AVL tree where deleting a single node will require at least 3 restructure operations in order to restore the height balance property. Draw the tree both before deleting the node and after deleting the node rebalancing. Your answer should consist of two trees, and both must satisfy the height balance property.

3. R-3.11.

4. R-3.14, parts (a) and (b).

5. C-3.20. (NOTE: You may assume Lemma 3.8 (page 192). You may also find it helpful to study the proof for Theorem 3.9.)