Today's topics: AVL trees contd.; algorithm analysis basics. § 19.4; Ch. 5.
Next class: §§ 19.5, 19.6. Reminder: Read material *before and after* class.

1. List the members of your group below. Underline your name.

2. Depict the *AVL tree* resulting from the insertion of the following keys, in the order listed, into an empty tree.

   $$8, 5, 21, 3, 9, 7, 1, 2, 11, 14$$

   Show all intermediate steps. In particular, depict the state of the tree immediately following each insertion, before and after any necessary balancing operations. Identify the type of each balancing operation used and the root of the subtree to which it is applied.

3. Depict the AVL tree resulting from the deletion of each of the following keys, in order, from the last tree of Question 2.

$$14, 7, 8, 1$$

4. Prove or disprove the following from first principles.

   (a) $\log n = O(n)$

   (b) $n^3 = o(2^n)$

5. Define *maximum contiguous subsequence (MCS)*.

6. Prove or disprove: Every sequence has a unique MCS.

7. Trace the MCS computation for the sequence $(2, -3, 4, 2, -1, 3)$ using the $O(n^2)$ algorithm from the textbook. Prove the $O(n^2)$ claim. Is the algorithm $\Theta(n^2)$? Explain.