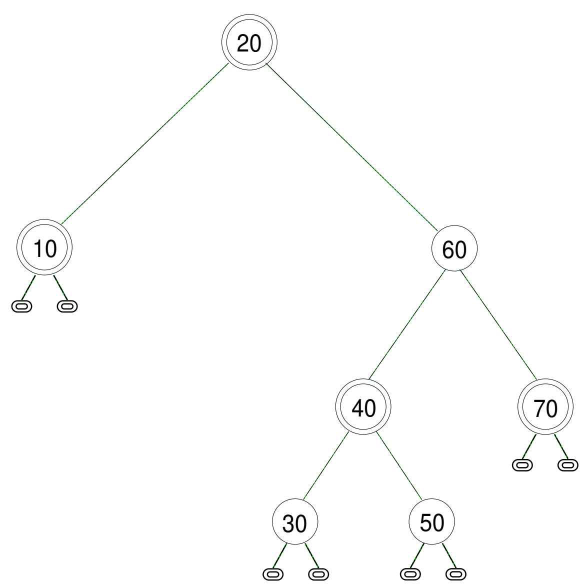
CS 410 Summer 2000
Homework 6
Due 11:30 AM, Friday August 4

Important notes about all exercises for this course:
- No late homework will be accepted.
- Justify your answers. Answers without brief (but adequate) justification may be considered incomplete.
- You may use pseudocode, Java, C, or C++ to write your algorithms. You do not need to compile or run your code for written exercises.
- When presenting algorithms, also provide a brief English description of the pseudocode and an explanation of why the algorithm (and your analysis of it) is correct.

Reading
You should already have read CLR chapter 17.3.
Read CLR chapters 23, 25.1, 25.2

Written Exercises

1. Insert 15 and 35 into the red-black tree shown below. The insertions should be independent; 15 should not be in the tree 35 is inserted into. Show all steps (insertion, rotations, color changes, etc).
   Double circles indicate black nodes, single circles indicate red nodes.



2. CLR 19.3-1.

3. CLR 17.3-1.

4. CLR 17.3-7.

5. Given a set S of k strings, we want to find every string in S that is a substring of some other string in S. Let the total length of all the strings be n. Give an $O(n)$-time algorithm to solve this problem. You may assume we have a linear-time algorithm for building a standard suffix tree.

6. CLR 23.2-3.

7. CLR 23.2-8.

8. CLR 23.3-4.

9. CLR 23.3-6.

10. CLR 23.4-1.

11. CLR 23.5-4.

12. CLR 25.1-2.

13. CLR 25.2-2.

14. CLR 25.2-4.