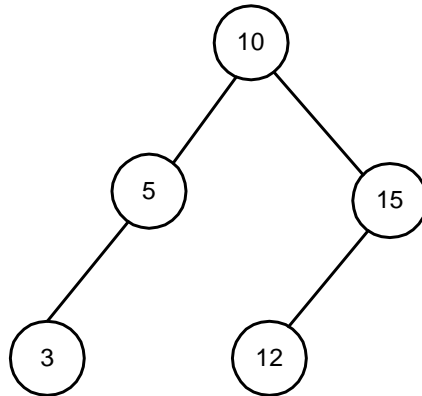


EEL 4851 - Homework 2

Due April 19, 2007

Problem 1 (AVL trees – 30 pts):

Consider the following AVL tree:



- (a) insert 2 in the tree, explain the operations and show the final tree
- (b) insert 14 in the tree resulting from point (a), explain the operations and show the final tree.

Problem 2 (Hash tables – 30pts):

Consider a Java class containing the name of the student and a three digit student id. We will represent it as (“Name”, 999). We consider the hashcode of this class to be the id modulo 10 – that is, the last digit of the student id. In our example, the hashcode will be 9.

Consider a hash table with 10 locations, which uses linear probing.

Trace the operation and show the state of the table for the following operations:

- (a) insert (“Joe”, 995)
- (b) insert (“Jane”, 716)
- (c) insert (“Bill”, 815)
- (d) lookup (“Bill”, 815)
- (e) remove (“Jane”, 716)
- (f) lookup (“Mary”, 105)

Problem 3 (Sorting – 40pts):

Consider the following array:

5 4 1 2 3 7 0

Trace the sorting of the array using the following algorithms:

- a) mergesort
- b) insertion sort
- c) shellsort (with the “divide with 2.2” decrement)
- d) quicksort