**CSE250, Spring 2014** **Assignment 10 (the last)** **Due Fri. 5/9**

`hardcopy only`

The **Final Exam** is **Wednesday, May 14**, **11:45am–2:45pm** in **Norton 112**. Unlike the prelims, it will be *open-book, open-notes*. It will cover the text chapters 1–11 up through the domain of this homework—in particular, the last lecture may touch on B-Trees but that topic is not considered covered. Supplementary posted lecture notes and code files *are* in the range of the final, which is *cumulative*—applying to the whole course.

**Reading:** For the last week, read Chapter 10 but skip bubble-sort, shell-sort, radix-sort, and bucket-sort—focus on quicksort as the one really new topic—and Chapter 11, skipping AVL Trees and just skimming the various kinds of B-trees. Note that the course webpage at the very bottom has a clarification/fix to what the text says about deletion in red-black trees, though only insertion will be covered on a problem. The following short set includes a quicksort problem rather than a further one about Project 2.

(1) Consider open-address hashing with the standard quadratic-probing rule that if the initial slot $k$ =`hashFun(item)` is occupied, the $i$-th retry is in slot $k + i^2$ (modulo the table size). Use the (admittedly poor) hash function that simply adds up the number values of letters a = 1, b = 2, etc.

(a) For table-size 8, attempt to insert the words `bad bed bid dad fed gag` in that order. Does your table get `fed` up? Or does it gag on `gag`?

(b) Now change the table size to the prime number 7 and try again. (9 pts. total)

(2) Text, section 10.9 of Chapter 10, "Self-Check Exercise 1" on p614, which asks you to diagram how `quicksort` partitions, recurses on, and sorts the array `[55 50 10 40 80 90 60 100 70 80 20]`. (9 pts.)

(3) Text, section 11.3 of Chapter 11, "Self-Check Exercise 1" on p656. This refers to a particular red-black tree built from the phrase "the quick brown fox jumps over the lazy dog," calling on you to show the changes (and node colors) after further inserting the words "apple," then "cat," then "hat." (Note: this will not be lectured on until Monday. 9 pts., for 27 points total on this last set)