

COMP 550, Spring 2015

Assignment 4

DUE: 9:05 Feb 23, 2015

- 1) (40') Stable sorting algorithms maintain the relative order of records with equal keys (i.e. values). That is, a sorting algorithm is stable if whenever there are two records R and S with the same key and with R appearing before S in the original list, R will appear before S in the sorted list.
 - (a) (18') Which of the following sorting algorithms are stable: insertion sort, merge sort, heapsort, selection sort, counting sort, radix sort.
 - (b) (10') Show that quicksort is not stable.
 - (c) (12') Modify quicksort and make it stable. (Hint: You need new comparison rule for two elements with the same value)
- 2) (12') CLRS Exercise 8.3-4 on page 200
- 3) (24') CLRS Exercise 9.3-1 on page 223
- 4) (24') CLRS 9-1 on page 224

Rules for ALL HWs (in addition to the statements in the syllabus):

You are encouraged to discuss the problem sets and study together in group, but when it comes to formulating/writing solutions you must work alone independently; i.e., you should be able to explain your answer clearly to anyone else. Note that this says discuss in group — copying homework solutions from another student, from the Internet, solution sets of friends who have taken this course or one similar to it previously, or other sources will be considered **cheating** and referred to the student attorney general. You must include a **signed honor statement** with each submission explicitly listing the people you worked with and stating that you completed the assignment in accordance with these rules.