

CPS 130 Homework 7

Linear time sorting

due Mon May 27th

*Write and justify your answers in the space provided.*¹

1. (CLRS 8.3-1) Illustrate the operation of LSD RADIX-SORT on the following list of English words: COW, DOG, SEA, RUG, ROW, MOB, BOX, TAB, BAR, EAR, TAR, DIG, BIG, TEA, NOW, FOX.

2. (CLRS 8.3-2) Which of the following sorting algorithms are stable: insertion sort, merge sort, quicksort? Give a simple scheme that makes any sorting algorithm stable. How much additional time and space does your scheme entail?

¹Collaboration is allowed, even encouraged, provided that the names of the collaborators are listed along with the solutions. Students must write up the solutions on their own.

3. (CLRS 8.3-4) Show how to sort n integers in the range 1 to n^2 in $O(n)$ time.

4. (CLRS 8.4-1) Illustrate the operation of BUCKET-SORT on the array

$$A = [.79, .13, .16, .64, .39, .20, .89, .53, .71, .42]$$