

1. (a) Assume you have an alphabet of letters from “a” through “g” plus “s” and “t”. Illustrate the operation of radix sort on the following list of English words:
 sass, base, ebbs, test, tats, tete, cast, acts, tact, sate
(b) Use “sate” and “tete-a-tete” in an English sentence that shows that you understand the meaning of both. (Do NOT write two sentences. Do NOT define them. Do NOT pass GO. Do NOT collect \$200.)
2. Consider the recursive selection algorithm from Problem 4 on Homework 4. Remove the tail recursion from algorithm in the Homework solution, as we did in class for Selection. Give the pseudo-code. Although your algorithm will be non-recursive, you should not get the same code as in the solution to Problem 2 on Homework 3. In particular, there should not be a FOR loop.
3. Consider the triangle enclosed by the three lines $y = x + 2$, $y = -x + 2$, and $x = 2$. Assume that n points are uniformly distributed randomly inside it. (The n points can be represented by n pairs of real numbers $(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)$.)
 - (a) Show that you can sort the points by their distance to the y -axis in average-case linear time. You can assume that bucket sort works in average-case linear time.
 - (b) Give the pseudo-code for your algorithm.
4. (**Bonus problem, 20 points.**) Consider the triangle enclosed by the three lines $y = x + 2$, $y = -x + 2$, and $x = 2$. Assume that n points, where n is even, are uniformly distributed randomly inside it. (The n points can be represented by n pairs of real numbers $(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)$.)
 - (a) Show that you can sort the points by their distance to the x -axis in average-case linear time. You can assume that bucket sort works in average-case linear time.
 - (b) Give the pseudo-code for your algorithm.