Homework 4

CS 581 Algorithms, Spring 2016

1. Assume you are operating a card sorting machine, as we’ve discussed in class (also mentioned on page 197 in the book). After collecting the cards from the bins for the next pass, you trip on the way back to the input section of the machine and drop the stack of cards. If you know which column was just processed, should you just reorder the cards according to that column and continue with the sorting process? Why or why not?

2. Assuming you know the largest possible key value, explain how radix sort can be used to sort a list in exactly $n$ steps, where $n$ is number of keys in the list. What is the downside of this approach?

3. Sort the following list of integers in nondecreasing order using heapsort. Use a min-heap, and show the state of the heap after each step.

   \[2, 7, 3, 10, 2, 4, 8\]


5. Exercise 7.4-1 in the book.