CSCI 421 Design and Analysis of Algorithms Spring 2019

Lecture 2 Activity 2

1. Apply the tree practical improvements on the merge sort algorithm. Compare the algorithms with various cutoff to insertion sort in terms of their running time. Say cutoff is set to 7, 12, 20, 25. You need to run the algorithms against large-size random arrays, say N=1000, 2000, 4000, 8000.
2. For the quicksort algorithm, its running time is different in best-case and worst- case scenarios depending on the pivot item in the partitioning stage.
3. Show the derivation to obtain the theoretical running time in best-case and worst-case scenarios.
4. Construct examples on best-case and worst-case, respectively. Compare the running time in both situations. You need to run the algorithm against large-size arrays, say N=1000, 2000, 4000, 8000.