

CSE220: Midterm Practice Questions

Instructor: Saswati Sarkar

Exam Rules: You can bring an A4 page of formulas, algorithms, or whatever else you would like to remember with you. Everything there should be in your own hand-writing.

Problem 1 Consider the list 3, 21, 9.5, 0.5, 4.5, 6, 2, 1. Sort this by quick-sort. Show the intermediate sequences.

Problem 2 Practice order notations, e.g., Is $n^{\log \log n} O(n^{\log n})$ or $n^{\log \log n} o(n^{\log n})$.

Problem 3 Your friend guesses an integer between 0 and N . You can ask questions like is the number less than 100? He will give YES NO answers. How many questions can your friend force you to ask, if you are a smart person?

Problem 4 Suppose your smart friend gives you a technique for merging two sorted arrays into one sorted array in constant time. Analyze the complexity of merge sort using your friends technique.

Problem 5 Suppose you choose the median element in quicksort each time such that you divide in two halves of one-third and two-third. What would the complexity of quick sort be?

Problem 6 I would like to find all elements less than x in an AVL tree. How do we go about it? Analyze the complexity.