CpSc 8400: Design and Analysis of Algorithms

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Handout 4: Homework #2, Due Tuesday 2/2/16

Spring 2016
TTh 12:30-1:45
McAdams 119

Some of the questions in this assignment ask you to "describe" an algorithm. You should generally do this in a clear, concise fashion in English, although you can also use pseudocode *if this adds clarity to your presentation*. Diagrams are also recommended if they help to clarify the operation of your algorithm. Any time you describe an algorithm, you should also say a few words about why it is correct (especially if this involves subtle or non-obvious observations) and also analyze its running time. Your write-ups generally do not need to be too lengthy as long as all the important details are present. Don't forget that typesetting is required, and do not forget to list your collaborators.

For the problems from the draft of the textbook, please check the course website for the most recent version, since it may be subject to frequent updates. Make sure the problem title below matches the problem in the book you are solving, since occasionally an update to the book will cause the problem numbers to shift slightly.

2-1. Practice Solving Recurrences. Please do problem 13 in the draft course textbook (chapter 2).

2-2. Sorting Fractions. Please do problem 48 (chapter 3).

2-3. In-Place Merge Sort. Please do problem 44 (chapter 3).

2-4. Counting Distant Pairs. Please do problem 51(k) (chapter 3). For simplicity, you only need to worry about the special case where $a = b = n/2$ to obtain full credit (although you should feel welcome to try the problem in its full generality if you would like a challenge).