COSC 2123/1285 Algorithms and Analysis
Tutorial 6
Transform and Conquer Algorithmic Paradigm

Objective

Students who complete this tutorial should:

- Be familiar with the three major variations of transform-and-conquer.
- Be able to apply transform-and-conquer strategies to different problem type

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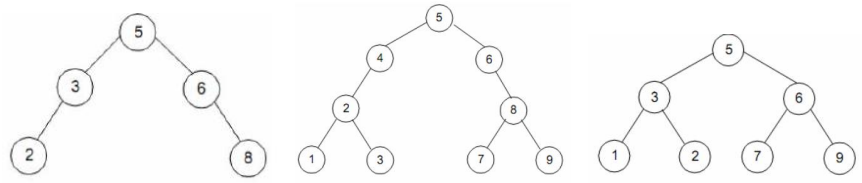
Questions

6.1.5 To sort or not to sort? Design a reasonably efficient algorithm for solving each of the following problems and determine its efficiency class.

a You are given n telephone bills and m checks sent to pay the bills ($n \geq m$). Assuming that telephone numbers are written on the checks, find out who failed to pay. (For simplicity, you may also assume that only one check is written for a particular bill and that it covers the bill in full.)

b You have a file of n student records indicating each student's number, name, home address, and date of birth. Find out the number of students from each of the 50 U.S. states.

6.3.1 Which of the following binary tress are AVL trees?



(a) (b) (c)

6.3.4 Construct an AVL tree for the list `3, 6, 5, 1, 2, 4`.

6.3.7a Construct a 2–3 tree for the list `C, O, M, P, U, T, I, N, G` (Use the alphabetical order of the letters and insert them successively starting with the empty tree.)

6.4.1 Construct a heap for the list `1, 8, 6, 5, 3, 7, 4` using the algorithm described in the lecture notes.

