CS 3510: Advanced Algorithms/Data Structures

Spring 2017 Assignment 0

Problems due as noted.

Assignment

Problems identified by x.y(z) denote the problem “y”, in chapter “x” of the textbook, with part “z”. If “z” is not noted, then the entire problem is required.

Due Jan 12

- 0.1(a, b, c, d, e, f) In each case, quote the rule that applies, or show derivation.
- 0.2(b) Show your derivation.

Due Jan 17

- 0.1(g, h, i, j, k, l) In each case, quote the rule that applies, or show derivation.
- 0.2(a) Show your derivation.
- Experimentally determine the running time of the \( \text{fib1} \) algorithm for calculating the Fibonacci sequence. Time the calculation of each number from the 1st through the 40th. Create a table and a graph of your results for the algorithm. The x-axis of the graph should be which Fibonacci number (1-40), and the y-axis of the graph should be the number of seconds to calculate the number. In the graph, also display sample theoretical limits, normalized for comparison.

Due Jan 19

- 0.1(m, n, o, p, q) In each case, quote the rule that applies, or show derivation. Prove o, don’t just quote the known result. Don’t spend too much time on q.
- 0.2© Show your derivation.
- Experimentally determine the running time of the \( \text{fib2} \) algorithm for calculating the Fibonacci sequence. Add the \( \text{fib2} \) data to the table and graph of results for the \( \text{fib1} \) algorithm. In the graph, display sample theoretical limits, normalized for comparison.

Submission

- At the beginning of class on the due dates, submit paper copies of your solutions, tables and graphs.