CS 3510: Advanced Algorithms/Data Structures

Spring 2017 Assignment 2

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 Feb 7**

- 2.5(a, b, c, d, e) Use the master theorem, show comparison.

**Due Feb 9**

- 2.16 Find an algorithm, prove the runtime is $O(\log(n))$. The values stored are integers, not necessarily positive Hint: You should know how to find items in a sorted array in $O(\log(n))$.
- 2.12 Write down the recurrence relation and solve it.
- 2.5(f, g, h) Use the substitution method. Show the pattern and determination of k_max.

**Due Feb 14**

- 2.22 Find an algorithm, prove the runtime is $O(\log(m) + \log(n))$. Your algorithm might be $O(\log(m+n))$. Is this better than, worse than, or the same as $O(\log(m) + \log(n))$?
- 2.25(a) Fill in the missing code, give a recurrence relation, and solve it.
- 2.5(i, j, k) Use the substitution method. Show the pattern and determination of k_max.

**Due Feb 16**

- (NOT) 2.14 Find a divide-and-conquer algorithm, write the recurrence relation, solve it.
- (NOT) 2.25(b) Fill in the missing code, give a recurrence relation, and solve it.
- 2.4(A, B, C) Write down the recurrence relations. Solve each one by an appropriate method. Then, choose.
- 2.17 Find an algorithm, prove the runtime is $O(\log(n))$.

**Submission**

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