CS 3510: Advanced Algorithms/Data Structures

Spring 2019 Assignment 3

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.

**Assignment 3a, Due Feb 2**

- 3.2 (b) DFS with pre/post numbers and edge type identification.
- 3.12 Prove means give a convincing argument. Counter example means a single concrete example that proves the statement is false.
- 3.28(a,b) Show all satisfying truth assignments, and show why your formula is unsatisfiable.

**Assignment 3b, Due Feb 5**

- 3.4 (i)(a,b,c,d) (i) is the first graph in the problem.
- 3.22 The algorithm is a simple extension of one in the chapter.
- 3.28 (part c) This means draw the graphs that result from the example and your example.
- 3.28 (d) The hint should give it away.

**Assignment 3c, Due Feb 7**

- 3.11 Give an algorithm, argue correctness, analyze runtime
- 3.28(e,f) For f, prove that the runtime is linear.

**Assignment 3z, Due Never (optional)**

- 3.15 (a) Describe a graph problem that represents this problem, and the graph algorithm that will answer the question in linear time.
- 3.15 (b) Describe a graph problem that represents this problem, and the graph algorithm that will answer the question in linear time.
- 3.18 Give the preprocessing algorithm, and the query algorithm. Analyze their complexity.
- 3.24 The algorithm is a simple extension of one in the chapter.

**Submission**

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