CSci 242. Algorithms and Data Structure
Instructor: Dr. M. E. Kim Date: December 3rd (Thr.), 2019

A Study Guide: Final Exam

Date: Dec. 17th (Tue.) 10:00 AM – 12:00 PM, 2019.

Room: 324 HH

I. Topics:

- Chapters 1 – 6, 8 – 11: 40 – 50% (Topics of Exam 1 & 2)
- Chapters 13, 14, 15, 20: 50 – 60%
- Handouts 1 – 7
- HWs 1 – 8

II. Type of Questions:

- Shor Answer
- Problem Solving
- Algorithm Description
- Algorithm Analysis and Recurrence Equation

III. Concept, Problem Solving and Analysis:

- Definition/Description of a data structure, its properties, the various terminology and the Algorithm Design Paradigm, etc.
  e.g.) (a, b) tree, simple graph, minimum spanning tree, strongly connected component, B-tree, greedy method, divide and conquer, recurrence equation, forward edge, tree edge, full binary tree, the height of B-tree etc. etc.
- All of the algorithms that were studied and their running time.
- Design of a short algorithm for a problem solving based on the algorithm design paradigm: e.g.) an algorithm based on greedy method or on divide and conquer.
- Design of a short algorithm for a problem solving in the given running time:
  e.g.) an inversion algorithm in $O(n \log n)$, etc.
- Representation of the Running Time of Recursive algorithm in Recurrence Equation.
- Solving a recurrence equation by iterative substitution, recursion tree or Master's theorem.
- Application of the algorithms to the given problem: graph algorithms, B-tree algorithms, etc.

IV. Others:

- Representation of graph, data structures / algorithm design paradigm used in the algorithms, etc.
- Review the slides, the assignments, handouts and the previous tests.

V. Review all the materials: the **slides, HWs, handouts** and the previous **tests**.

Good Luck!