COMP3711H

Honors Design and Analysis of Algorithms

Mordecai Golin

Fall 2014 – CSE@HKUST

Lecturer & TA

- Dr. Mordecai Golin
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- http://www.cse.ust.hk/~golin
- Room 3559
- Office Hours: After class & by appointment

- TA: Mr. QIN Bo
- bqin@cse.ust.hk
- Office Hours: TBA

Textbook and Lecture Notes

- Textbook: *Algorithms*
  - by Dasgupta, Papadimitriou, and Vazirani
  - Prepublication version available online
  - Will only follow loosely
- Lecture Notes
  - Sketches will be available on course web page

- Other References
  - *Introduction to Algorithms (3rd ed.)*
    - By Cormen, Leiserson, Rivest and Stein
  - *Algorithm Design*
    - by Kleinberg and Tardos
  - *Programming Pearls (2nd ed)*
    - by Bentley

Tentative Syllabus

- Sorting Algorithms
- Balanced Binary Search Trees
- Graph Algorithms
- Algorithmic Design Techniques
  - Divide-and-Conquer
  - Dynamic Programming
  - Greedy
- Network Flow
- Approximation & Randomized Algorithms

Prerequisites

We assume you know COMP2011/2012 & COMP2711

- Linked Lists, Stacks, Queues
- Binary Search Trees
  - Traversals
  - Searching (but not analysis)
  - not insertion/deletion

- O ( ) Notation
  - $O(f(n)),\ \theta(f(n)), \Omega(f(n))$

- Solutions to recurrences
  - T(n) = 2T(n/2) + O(n)   =>   T(n) = O(n log n)
  - T(n) = T(3n/4) + O(n)   =>   T(n) = O(n)

Question

- What have you learnt previously?
  - Class has students coming from many backgrounds
  - Hashing?
  - Min-Heaps, Heapsort?

Other Information

- Class: Rm 4502, 9:00 - 10:20 on Tuesday and Thursday

- Tutorial: Rm 2302, 12:00 - 12:50 on Thursday
  - No Tutorial first week (September 4th)

- Marking
  - (30%) Four assignments, each worth the same
    - Requires designing algorithms and analyzing correctness/run time
    - Each will take 10-14 days. First one assigned towards end of September
  - (30%) Midterm: Monday, October 27, 19:30-21:30 in Rm 4334
  - (40%) Final: time and venue to be determined by ARR.
  - Student participation in class/tutorials could help borderline grades
    - Won't hurt others since class will not be marked on a curve

Classroom Etiquette

- Turn off cell phone ringers
  - No phone conversations in room

- Latecomers should enter quietly

- No LOUD talking among selves during lectures

- Please ask questions and provide feedback

- Students are expected to uphold the
  HKUST Honor Code