COMP3711H
Honors Design and Analysis of Algorithms

Mordecai Golin
Fall 2014 – CSE@HKUST
Lecturer & TA

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- Room 3559
- Office Hours: After class & by appointment

- TA: Mr. QIN Bo
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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
  - $T(n) = 2T(n/2) + O(n)$  $\Rightarrow$  $T(n) = O(n \log n)$
  - $T(n) = T(3n/4) + O(n)$  $\Rightarrow$  $T(n) = O(n)$
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 4\textsuperscript{th})

• 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