CSE 450/598
Design and Analysis of Algorithms

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Textbook and Course Outline

Text: Algorithm Design by Kleinberg & Tardos

Note: A significant amount of course material will come from sources other than the textbook. As such, class attendance is absolutely essential.

- Introduction (1)
  - Growth of functions
  - Complexity of computation
  - Recurrence relations

- Divide and Conquer (2)
  - MaxMin in a sequence
  - Binary search
  - Quicksort
  - Mergesort
  - Strassen’s matrix multiplication

- Dynamic Programming (2)
  - Matrix chain multiplication
  - Optimal polygon triangulation
  - Optimal binary tree
  - Longest common subsequence
  - Traveling Salesman Problem

- Greedy Algorithms (2)
  - Chromatic number
  - Knapsack
  - Set cover
  - Minimum spanning tree
  - Event scheduling

- Network Flows (1)
  - Max-flow Min-cut Theorem
  - Ford-Fulkerson Algorithm

- Backtracking (1)
  - N-Queens Problem

- Branch and Bound (1)
  - Traveling Salesman Problem

- NP-Completeness (2)
  - Problem transformation
  - No-wait flow shop scheduling
  - 3-Satisfiability
  - Traveling Salesman Problem
  - Node Cover

- Approximation Algorithms (2)
  - Node Cover
  - Bin Packing
  - Scheduling
  - Steiner Trees

- Probabilistic Algorithms (1)

*** The course outline may be modified if necessary, depending on progress in class.
Grading Policy for CSE 450

- There will be one mid-term and a final. In addition, there will be two quizzes and programming and homework assignments.

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<thead>
<tr>
<th>Assignment</th>
<th>CSE 450</th>
<th>CSE 598</th>
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<tbody>
<tr>
<td>Mid-term</td>
<td>20%</td>
<td>15%</td>
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<tr>
<td>Final</td>
<td>30%</td>
<td>25%</td>
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<tr>
<td>Quizzes 1 &amp; 2</td>
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<tr>
<td>Programming Assg.</td>
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<td>Homework Assg.</td>
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<td>Project</td>
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- 90% will ensure A, 80% will ensure B, 70% will ensure C and so on.

- Loss of points due to late submission of assignments:
  - 1 day 50%
  - 2 days 75%
  - 3 days 100%