CS 141: [Intermediate]
Data Structures and Algorithms

Spring 2019

Instructor

- Stefano Lonardi
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- Office hours: Tuesdays 11am-12noon or by appointment
Course material, etc.

- Course homepage
  - http://www.cs.ucr.edu/~stelo/cs141spring19/
  - Syllabus, slides, homework & solutions
- Piazza discussion board
  - https://piazza.com/ucr/spring2019/cs141/
    (link from the course homepage)
- Gradescope for homework & grades
  - https://gradescope.com/
  - Entry Code: M2B7GD

Textbook (required)

Reference

Cormen, Leiserson, Rivest, Stein, 
*Introduction to Algorithms (3rd ed)*, 

Discussion Sessions and TA

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Location</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wed</td>
<td>9-10am</td>
<td>Watkins 1117</td>
<td>Anuja</td>
</tr>
<tr>
<td>Wed</td>
<td>1-2pm</td>
<td>Spieth 1222</td>
<td>Tanmay</td>
</tr>
<tr>
<td>Wed</td>
<td>8-9am</td>
<td>Chung 139</td>
<td>Lixiao</td>
</tr>
<tr>
<td>Wed</td>
<td>6-7pm</td>
<td>Olmsted 1133</td>
<td>Anujia</td>
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- Attendance of discussion sessions is not mandatory but strongly recommended
- Office hours held in WCH room 110, time TBA (check webpage)
- Discussions start next week (no discussion this week)
Course Format

• Two 80-minute lectures/week
• One hour discussion/week
• Seven written assignments (homework) every week except during midterms; homework with the lowest score will be dropped
• Three exams (in class, closed book/notes)
  – Two midterms (week 5 and week 8)
  – One final (during finals’ week)

Grading

• Best 8 homework \((h)\) – 20%
• Midterm 1 \((q_1)\) – 20%
• Midterm 2 \((q_2)\) – 20%
• Final \((f)\) – 40%

Given the scores \(h, q_1, q_2, f \in [0,100]\)

\[
G = \frac{20h + 20q_1 + 20q_2 + 40f}{100}
\]

Map \(G\) to the final grade using the following table.

\[
\begin{array}{c|c}
100 - 90 & A+ \\
85 - 89.999... & A \\
80 - 84.999... & A- \\
77 - 79.999... & B+ \\
73 - 76.999... & B \\
70 - 72.999... & B- \\
67 - 69.999... & C+ \\
63 - 66.999... & C \\
60 - 62.999... & C- \\
55 - 59.999... & D \\
0 - 54.999... & F \\
\end{array}
\]
Overview

• Week 1: Course overview
• Week 2: Discrete math for algorithm analysis
• Week 3: Analysis of recurrence relations
• Week 4: Divide and conquer
• Week 5: Greedy approach
• **MIDTERM 1** (in class, closed book, closed notes)
• Week 6: Dynamic programming
• Week 7: Graphs, directed graphs and weighted graphs
• Week 8: Graph traversal (DFS/BFS), connectivity
• **MIDTERM 2** (in class, closed book, closed notes)
• Week 9: Minimum cost spanning tree, single-source shortest path
• Week 10: All-pairs shortest path
• **FINAL** (closed book, closed notes)
CS 14 Background

- **Data Structures:** Arrays, Lists, Stacks, Queues, Dictionaries, Hash Tables, Search Trees, Priority Queues (heaps), Graphs
- **Algorithms:** Sorting, Searching

CS 111 Background

- Asymptotic notation (upper, lower, tight bounds)
- Proofs (direct, contradiction, induction)
- Recurrence relations
- Trees, graphs and directed graphs