Data Structures and Algorithms

CS141, Fall 2014

Instructor

- **Stefano Lonardi**
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- Office hours: Thursdays 11:10-12:10pm
General info

• Course homepage
  – http://www.cs.ucr.edu/~stelo/cs141fall14/
  – Syllabus, slides, homework & solutions

• iLearn for grades

• Piazza discussion board (sign up!)
  – piazza.com/ucr/fall2014/cs141
    (link from the course homepage)

Textbook (required)


Pre-print available at:
http://www.cs.berkeley.edu/~vazirani/algorithms/
Reference


Reference

Discussion Sessions and TA

Wednesday 5:10-6:00pm, PHY 2104, Zach  
Thursday 8:10-9:00am, WCH 142, Zach

Notes
• Attendance of discussion sessions is not mandatory but recommended
• Office hours held in WCH room 110, time TBA
• Discussions started this morning

Course Format

• Two 80-minute lectures
• One hour discussion
• Nine written assignments (homework); homework with the lowest score (out of 9) will be dropped from the average
• Three exams (in class, closed book/notes)
  – Two quizzes (week 5 and week 8)
  – One final (finals’ week)
Grading

- Best 8 homework ($h$) – 20%
- Quiz 1 ($q_1$) – 20%
- Quiz 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.

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 – 90</td>
<td>A+</td>
</tr>
<tr>
<td>85 – 89.999…</td>
<td>A</td>
</tr>
<tr>
<td>80 – 84.999…</td>
<td>A-</td>
</tr>
<tr>
<td>77 – 79.999…</td>
<td>B+</td>
</tr>
<tr>
<td>73 – 76.999…</td>
<td>B</td>
</tr>
<tr>
<td>70 – 72.999…</td>
<td>B-</td>
</tr>
<tr>
<td>67 – 69.999…</td>
<td>C+</td>
</tr>
<tr>
<td>63 – 66.999…</td>
<td>C</td>
</tr>
<tr>
<td>60 – 62.999…</td>
<td>C-</td>
</tr>
<tr>
<td>55 – 59.999…</td>
<td>D</td>
</tr>
<tr>
<td>0 – 54.999…</td>
<td>F</td>
</tr>
</tbody>
</table>

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
- QUIZ 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
- QUIZ 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)
- Solving recurrence relations
- Trees, graphs and directed graphs