

CMP302: Algorithms



Lecture 00: Introduction

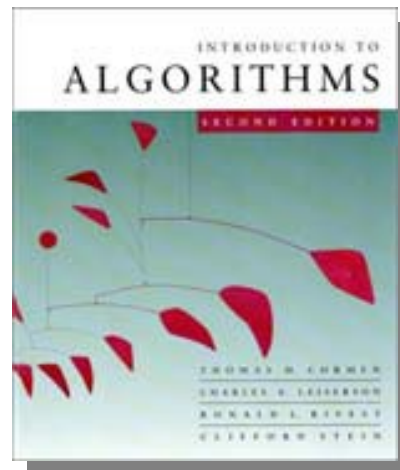
Mohamed Alaa El-Dien Aly
Computer Engineering Department
Cairo University
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Agenda

- Course Information
- Topics covered
- Logistics

Course Information

- Course will be divided into two tracks:
 - 1) Class lectures
 - Talk about algorithm analysis and design in general
 - More theoretical
 - Some mathematics
 - Quick review of basics (first year) and try to cover new territory
 - You will be responsible for reading the book as well as the lecture for the topics covered
 - Text: *Introduction to Algorithms*. Cormen, Leiserson, Rivest, and Stein. (CLRS)

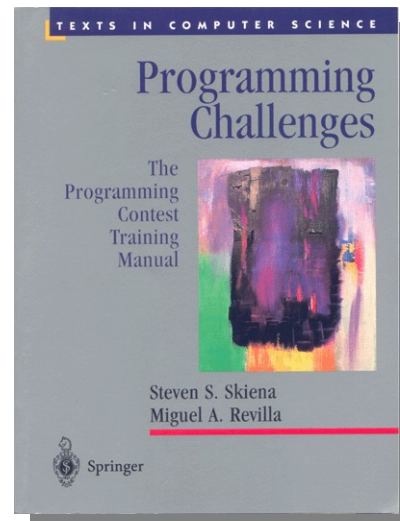


Course Information

- Course will be divided into two tracks:

2) Sections/Labs

- Focus on ACM ICPC (International Collegiate Programming Competition)
- Weekly problem sets submitted to online judge
- Some mathematics
- Problems to be solved using C++ under Linux with Eclipse, Emacs, or Vim.
- Text: *Programming Challenges*, Skiena and Revilla. (SR)



Class Topics

- Algorithm Analysis (1)
- Sorting (Insertion, Merge, Quick, Heap, Radix) (2)
- Searching (Hash tables, Binary Search Trees) (2)
- Dynamic Programming (3)
- Greedy Algorithms (1)
- Graph Algorithms
 - Breadth First, Depth First (1)
 - Minimum Spanning Trees (1)
 - Shortest Paths (2)
 - Maximum Flow (1)
- P, NP, and NP-Completeness (3)

Section Topics

- Data Structures
- Strings
- Sorting
- Arithmetic & Algebra
- Combinatorics
- Number Theory
- Backtracking
- Graph Traversal
- Graph Algorithms
- Dynamic Programming
- Grids
- (Computational) Geometry

Logistics

- Homeworks
 - 4-5 homeworks
 - 10 points
- Weekly programming assignments
 - 30 points
- Labs
 - 10 points
- Midterm
 - 2 points bonus
- Final
 - 75 points
- NO late homeworks accepted

Logistics

- Honor Code
 - NO collaboration on the programming assignments
 - Collaboration OK for homeworks, but write up your OWN code/solution
 - DO NOT search the internet for solutions
 - Copying results in ZERO grade in the homework. No exceptions!

Resources

- Class
 - Textbook: Introduction to Algorithms.
 - Slides and homeworks posted to website and Moodle.
- Section
 - Textbook: Programming Challenges.
 - <http://www.programming-challenges.com>
 - <http://uva.onlinejudge.org/>
 - <http://www.topcoder.com/>

Questions?