

CMSC 351
Introduction to Algorithms

Spring 2017

Administration

- Webpage
- Syllabus
- Piazza
 - ▶ Ask questions
 - ▶ Discuss issues
- Elms
 - ▶ Hand in homework
 - ★ Must be in PDF
 - ★ Must be easy to read
 - ▶ See grades
- Two evening midterms
 - ▶ Wednesday, March 8
 - ▶ Monday, April 3
- Final exam
 - ▶ Tuesday, May 16, 4-6pm

If any of the exam dates are a problem for you, get in touch with Professor Elman. **NOW.**

Administration (continued)

- Textbook (on reserve at McKeldin Library)
 - ▶ Cormen, Leiserson, Rivest, and Stein, *Introduction to Algorithms* (3rd ed., 2009). MIT Press. (Any edition is fine.)
- Homework
 - ▶ Regular: Due (mostly) every week.
 - ▶ NP-completeness: Due (mostly) every other week.
 - ▶ Do problems from book (and other books).
- Class attendance
- Office hours
 - ▶ Special office hours this week (See Piazza for more details.)
 - ★ Thursday, 5:30-7pm
 - ★ Friday 10-11am, 12-4pm
- Academic integrity
- Grading

Topics (tentative)

- Introduction, Ch. 1,2
- Quadratic sorting algorithms
- Mergesort, Ch. 2
- Summations, Appendix A
- Growth of Functions, Ch. 3
- Recurrences, Ch. 4
- Heapsort, Ch. 6
- Quicksort, Ch. 7
- Sorting in Linear Time, Ch. 8
- Medians and Order Statistics, Ch. 9
- Graphs and Trees, Appendix B
- Minimum Spanning Trees, Ch. 23
- Shortest Paths: Dijkstra's algorithm, Ch. 24.3
- Brief introduction to NP-completeness, Ch. 34

What is an algorithm?

Definition

An *algorithm* is a finite list of step-by-step instructions for solving a problem.

Efficiency

- Time
- Space

Example

Tournament assignment. (Think about at home.)

Why learn this material?

- Algorithms are everywhere in Computer Science (and elsewhere).
- Useful for later courses
- Useful for computer programming
 - “Micro-algorithms”
- Useful to get a job
- Useful on the job