CMSC 351
Introduction to Algorithms

Summer 2017

Administration

- Class

- Webpage

- Syllabus

- Piazza
  - Ask questions (but do **not** ask if your answer or approach is correct)
  - Discuss issues

- Elms
  - Hand in homework
  - Get homework solutions
  - See grades

- Two in-class exams: **will start at about 8:45am**
  - Midterm: Wednesday, June 28
  - Final: Friday, July 7

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 homeworks: typically due Wednesday and Friday
  - NP-completeness homeworks: typically due Monday
  - Must be in PDF
  - Must be easy to read (your responsibility)
  - Late date: 25% off your actual grade. (One get-out-of-jail-free card.)
  - Your neighbor should understand your answers.
  - Do problems from book (and other books).

- Attendance
  - You are responsible for what is said in class

- Office hours: posted on Piazza

- Academic integrity

- Grading

Topics (tentative)

- Introduction, Ch. 1,2
- Quadratic sorting algorithms
- Mergesort, Ch. 2
- Summations, Appendix A
- 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
- Introduction to NP-completeness, Ch. 34

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

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.)

Example

Dorm room assignment.   (Think about at home.)