CMSC 351 Introduction to Algorithms

Summer 2018

Administration

Webpage

- Get homework assignments
- Syllabus
- Other documents

Piazza

- Ask questions (but do not ask if your answer or approach is correct)
- Discuss issues
- ELMS
 - Get homework solutions
 - See grades
- Gradescope
 - Hand in homework
 - See graded homeworks and exams

Administration (continued)

• Textbook (bookstore/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.
- Study groups.
- Must write up solutions yourself.
- Do problems from book (and other books).

Administration (continued)

• Two in-class exams: will start at about 8:45am

- Midterm: Wednesday, June 27
- Final: Friday, July 6
- Class
 - Attendance
 - Recordings
 - You are responsible for what is said in class
 - Break
- Office hours: TBA
- 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
- 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.)