

CMSC 351  
Introduction to Algorithms

Summer 2019

# 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 final 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 for regular homeworks and one for NP homeworks.)
  - ▶ Your neighbor should understand your answers.
  - ▶ Study groups.
  - ▶ Must write up solutions yourself.
  - ▶ Do problems from book (and other books).

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*Because nobody reads it.*

# Administration (continued)

- Two in-class **exams**: will start at about **8:45am**
  - ▶ Midterm: Wednesday, June 26
  - ▶ Final: Friday, July 5
- Class
  - ▶ Attendance
  - ▶ You are responsible for what is said in class
  - ▶ Break
- Office hours:
  - ▶ Kruskal: MTWTF 11:00am-12:00pm.
  - ▶ TA's: MTWT 2:00pm-5:00pm.
- 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.)