

# CSE 332: Data Structures & Parallelism

## Lecture 23: Review



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# Announcements

- Reminder your final is on **two days**, Section 10/18, Lecture 10/19
  - Make sure to be in your correct quiz section on Thursday for pt1. of the exam! We will take attendance, so bring student ID to section
- Final Review Session: MOR 220 Wed 10/17 from 3:00-4:00pm
- Exam Topics and Practice Exams on the website!
  - Make sure to look at some past finals to practice!

# Class Survey!

- You should have received an email for a survey for this class!
  - It closes this Friday!
- I will give out 1 extra credit point to everyone who fills it out
  - It is anonymous, I will know if you filled it out but not what you said

# What Have We Done This Quarter?

- Data Structures
  - Classic structures (hash tables, balanced BSTs, binary heaps, etc.) that you'll be using library implementations of the rest of your career.
    - You now know deeply how these work, since you implemented many!
    - And you know how to analyze them with  $O$ ,  $\Omega$ ,  $\Theta$ .
  - And the ADTs (code patterns)
  - Analyze tradeoffs – there's not just one “right” answer!
- Parallelism
  - Exploit multiple processors
  - Fork-Join patterns (maps, reduces, prefixes, packs)
  - Concurrency: share resources safely

# What Have We Done This Quarter?

- Algorithms
  - Sorting algorithms (examples of Divide & Conquer)
  - Graph algorithms (examples of Greedy Algorithms)
  - Effectively using our data structures to solve problems more efficiently
- Practice mixing theory and practice
  - Big- $O$  analysis is the starting point, and you have more tools now (recurrences, worst- vs. best-case, amortization,...)
  - But in-practice constant factors, cache behavior, and a bunch of other things big- $O$  is bad at matter
  - Project writeups are good practice for going from theoretical ideas to real-world effective code.

# What's Next?

- EVERYTHING
- 332 is a prerequisite for more than a dozen CSE courses.
- If you loved P vs. NP or the sorting lower bound (what can't we do?)
  - Take CSE 431 (complexity)
- If you enjoyed shortest paths and MSTs
  - Take CSE 421 (algorithms)
- If your favorite part was writing and debugging code
  - CSE 331 has lots of code (including implementing Dijkstra's). 333 does too.
- If you liked parallelism
  - CSE 451 for how locks actually work
  - CSE 452 (distributed) for hard concurrency problems.

# Review

- See Ed board for topics survey
- We are going over 19Wi Final, but feel free to ask other questions