

CS62 Class 24: Wrap up!



Agenda

- What did we learn?!
- Course evals
- Logistics for the rest of the semester
- Checkpoint 3 review
 - Groups come up with checkpoint style questions
 - Do each others' problems
 - If I like the problem, I might put it on the checkpoint!

Course thirds

1 Java & Basic DS

- Java Syntax/basics
- New OOP concepts
 - Inheritance
 - Interfaces, generics
- Basic data structures (DS):
 - ArrayLists
 - Run time & affordance analysis
 - Linked lists (single & doubly)
 - Stacks & queues

2 Sorting & Searching

- Algorithms:
 - Selection & insertion sort
 - Mergesort
 - Quicksort
 - Heapsort
- Data structures:
 - Trees (binary search, 2-3, red-black...)
 - Priority queues, heaps
 - Dictionaries
 - Hashtables
 - Abstract data types

3 Graphs & SWE

- Data structures:
 - Graphs
 - Directed Acyclic Graphs
- Algorithms:
 - Shortest path in a graph
 - Minimum spanning trees
- Final SWE project
 - Human-centered design methods for software engineering

Learning goals

- Understand how data structures work and how to implement them yourself
- Understand the time-complexity analysis of algorithms, as well as affordance analysis to understand their ethical trade offs and their history
- Be able to write long, complex, modular, understandable programs (> 1k lines of code) in the OOP (object-oriented programming) paradigm
- Be able to choose the best data structure for an open-ended, real world problem and implement a working solution (*final project*)

Course evals

Last logistics (Lecture 24 wrap-up)

- **Checkpoint 3 Wednesday** (12/3). Not cumulative; from LLRBs up to DAGs. Bring your cheatsheet.
 - CP3 corrections will be due next Tuesday (12/9) 11:59pm.
- **Final project** due Fri 12/12 11:59pm. No extensions!
- **Lab** Wednesday night **final project check-ins**. They can be fast and you just have to show up for your meeting time, not the whole lab. Ideally have 1 feature implemented, or at least get started on implementing it.
 - Sign up for a time with your group (at least 2 people have to make it; ideally everyone) here: <https://calendly.com/jingyili/cs62>
- You are welcome to also stay in lab to work/get help from the TAs and treat it as set project work time

Checkpoint 3 practice

- Count off. In a small group, grab a whiteboard and come up with an exam level question(s) for the topic of your number and solve it. When you're done, show me and copy it onto a whiteboard around the room. Then do each others' questions!

1. LLRB

Kinds of questions:

2. Separate chaining hash tables

- Conceptual (true/false, write a reason why...)

3. Open addressing hash tables

- Do this algorithm (construct an LLRB given these numbers, run BFS given this graph...)

4. Graphs, DFS/BFS/general

- Counterfactual: Change one part of this algorithm, how does the result change? (e.g. stopping halfway, different kind of input)

5. Graphs, Shortest paths

- Code writing

6. Graphs, MSTs

7. DAGs

If you're done early, do the checkpoint 3 review slide problems! Or work on your final project!