CSE 121 Lesson 19: Final Exam Review & Victory Lap

Matt Wang & Brett Wortzman

Autumn 2024

sli.do #cse121

TAs:

Abby	Afifah	Ailsa	Alice	Aliyan	Arohan
Chloë	Christopher	Dalton	Derek	Elizabeth	Ethan
Hanna	Hannah	Heather	Hibbah	Janvi	Jasmine
Judy	Julia	Kelsey	Lucas	Luke	Mahima
Maitreyi	Maria	Merav	Minh	Neha	Ronald
Ruslana	Sahej	Sam	Samrutha	Sushma	Vivian
Yijia	Zachary				

Today's playlist:
121 24au lecture tunes

Announcements, Reminders

- R7 (+ extra resub) due **Thu, Dec 12th** – all assignments eligible!
- today is the last day for IPL + instructor office hours
- Final Exam: **Wednesday, Dec 11th from 12:30-2:20 in KNE 120 + 130**
- TA-led Review Session: **Monday, Dec 9th from 2:30-4:00 in SMI 120**
- other exam reminders:
  - please look at seating charts and let us know ASAP if you're not there!
  - review Exam page of website (which includes many resources)

Evaluations and Awards

Please give us feedback!

- Course Evals are due **Sunday, Dec 8th at 11:59 PM**
  - A Section evaluation link
  - B Section evaluation link
- TA Evals are *also* due **Sunday, Dec 8th at 11:59 PM**

Bob Bandes TA Award nominations open! (nominate your fave TAs!)

Exam Review Preamble

Acknowledging: live exam review can be stressful (and feel rushed)!

Today's goal:

- practicing a **strategy** for starting a programming problem
- *not* writing code (though, I'll do a bit of that anyways)

I'll give you about 5 minutes with a spec: all I want you to think about is *how* you'd solve this problem. **Do not write any code!**

Applications of CS

or "What can I do with what I learned?" – outside of just "write code":

- *Detect and prevent toxicity online & recognize disinformation*
- *Help deaf & hard-of-hearing people identify sounds*
- *Develop a programming language that celebrates the world's languages*
- *Build battery-free robots & put them on insects (and... track murder hornets?)*
- *Computational knitting & carpentry*
- *Create an interactive atlas of millions of refugee experiences*
- *Fix Olympic badminton & identify cheating in chess*
- *and so much more!*

… including your projects! (1/2)

- Computational Biology & Medicine (P2, P3)
  - fun fact: Matt did some DNA sequencing (P3+++) in grad school at UCLA!
  - at UW: Chris Thachuk, Linda Shapiro, Sara Mostafavi, Su-In Lee; BIME & Med!
- Computational Art (C0, C1)
  - UW CSE has many unique intersections of CS + art!
  - e.g. "Cultural-Centric Computational Embroidery" (CSE + iSchool)
  - e.g. "Computational Illusion Knitting" and "How to Knit Objects Weird" (CSE)
  - e.g. "WasteBanned: Supporting zero waste fashion design" (CSE)

… including your projects! (2/2)

- Games & Graphics (C1, C3):
  - at UW: many labs in CSE and iSchool's GAMER group
  - fun fact: Foldit (from UW) is a crowd-sourced game for protein folding!
    - David Baker shared this year's Nobel Prize in Chemistry, in part for this work!
- Social Computing (P1, C2):
  - at UW: Amy Zhang's Social Futures Lab + so much of iSchool!
- and many side quests (in lecture, section, PCM): accessibility (e.g. UW CREATE), weather forecasting, chatbots, software tools, and lots of math

“Closing” the loop on P3 reflections (1/x)

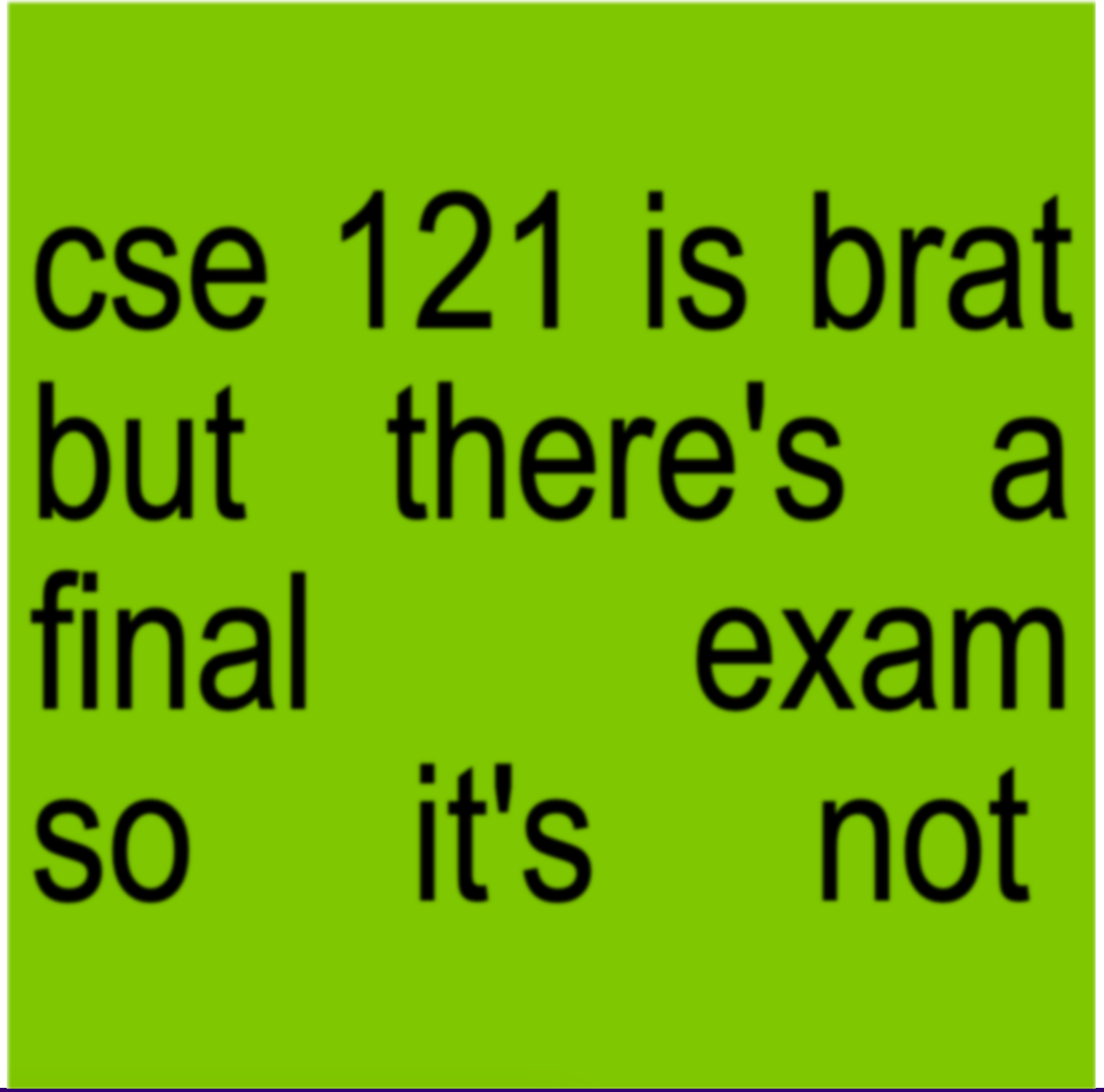
Y’all listed many other applications of CS too! Some common themes:

- environmental and climate science
  - this is a fascinating and important topic – especially with AI & e-waste
- history & archaeology
  - spicy: the Vesuvius challenge (reconstruct scrolls from volcanic remains)
- astronomy and astrophysics
  - how did we take a picture of a black hole? (see: Katie Bouman!)
- sports analytics
  - particularly famously, baseball & sabermetrics

“Closing” the loop on P3 reflections (2/x)

“For example, computer science is used in Charli XCX's "Brat" because there is a substantial amount of autotune involved in the album. Computer science is used in mixing new sounds and using the recorded audio to generate an auto-tuned version of the song.”

CS + music is actually *huge* and very fascinating – Matt’s first-ever internship was implementing audio processing filters. Super cool!!


cse 121 is brat
but there's a
final exam
so it's not

“Closing” the loop on P3 reflections (3/x)

We also asked you to reflect on your journey learning CS!

Impossible to adequately summarize them all, but the biggest theme was **combating myths about computer science:**

- what programming & computer science is
- what makes computer science hard (it’s not just syntax!!)
- what you need to be a “good” programmer (not always math!!)
- what programmers & computer scientists look like
- **that one bad experience means you’ll *always* be bad at it**

“Closing” the loop on P3 reflections (4/x)

We also chuckled at some of your answers:

“I thought computer science would be really boring and I did not want to take it, but it was required for my degree.

… However, after being in this course and having amazing professors who made it more fun, I think computer science is a lot more fun.”

“Closing” the loop on P3 reflections (5/x)

“pretty rad, W TA's”

“it was nice. it made me stay up some nights and dream about the solution to some projects (also known as nightmares)”

“… from creating art, to helping patients, and unsuccessfully trying to get Matt Laufey tickets, this class demonstrates everyday uses for computer science."

“Closing” the loop on P3 reflections (6/x)

“Had a good time, assignments are genuinely fun to do, professors are fun people as well. Easy to talk to. Surprisingly, not scary.”

“The professors and the TAs [..] looked like they wanted to be there, which is appreciated when I really didn't want to go to class or was unmotivated to finish my homework and I could just imagine Matt being all sad.”

“sad to say goodbye to matt and brett, but i will never forget this! o7"

Future Courses

or "What can I do next?"

Non-majors

Course	Overview
CSE 154	Intro. to web programming (several languages)
CSE 160	Intro programming, data analysis (Python)
CSE 163	Intermediate programming, data analysis (Python)
CSE 180	Introduction to data science (Python)
CSE 373	Data structures and algorithms (in Java)
CSE 374	Low-level programming and tools (C/C++)
CSE 412	Intro to Data Visualization
CSE 416	Intro. to Machine Learning

More 12X!

Course	Overview
CSE 122	Introduction to Computer Programming II
CSE 123	Introduction to Computer Programming III

Majors

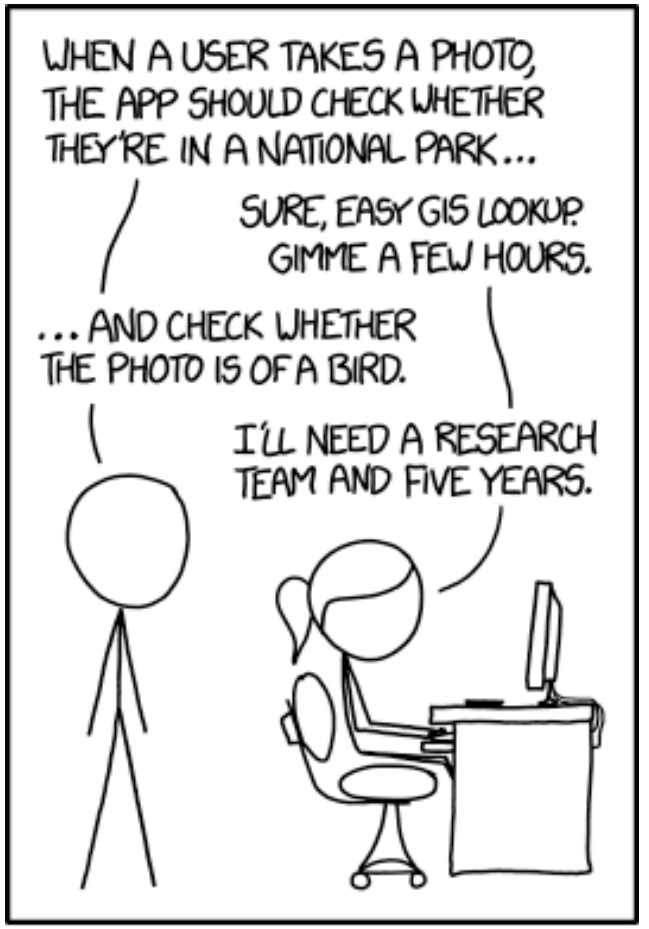
Course	Overview
CSE 311	Mathematical foundations
CSE 331	Software design/implementation
CSE 340	Interaction programming (mobile apps)
CSE 341	Programming languages (!!)
CSE 351	Low-level computer organization/abstraction

Other tech-related majors:
Informatics, ACMS, HCDE, Electrical & Computer Engineering, …

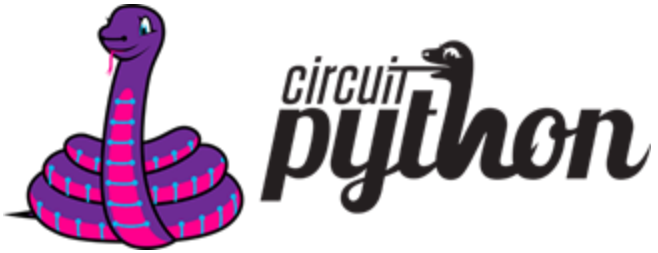
See: https://www.cs.washington.edu/academics/ugrad/current-students and https://www.cs.washington.edu/academics/ugrad/nonmajor-options/nonmajor-courses

Frequently Asked Questions

- *How can I get better at programming?*
  - Practice!
- *How can I learn to X?*
  - Search online, read books, look at examples :)
- *What should I work on next?*
  - Anything you can think of! (Here are some ideas)
  - Beware: it's hard to tell what's easy and what's hard.
- *Should I learn another language? Which one?*
  - That depends–what do you want to do?
- *What's the best programming language?*
  - 😠 (take CSE 341 or CSE 413)



Aside: Cute Programming Language Logos



Winter Project: Tic Tac Toe (1/2)

Build your own Tic Tac Toe game and "AI"! (one of the TA's choice ideas)

1. How would you represent a Tic Tac Toe game in Java?

   (hint: arrays will be very, very helpful!)
2. Write a method that tells you if a Tic Tac Toe game is won (or playable).
3. Write a method that gets input from the user and "makes" a move.
4. Wrap it all up – into a nice two-player game!

Winter Project: Tic Tac Toe (2/2)

Wait, there's more!

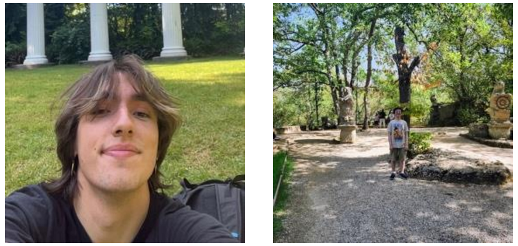
Make some "AI" that…

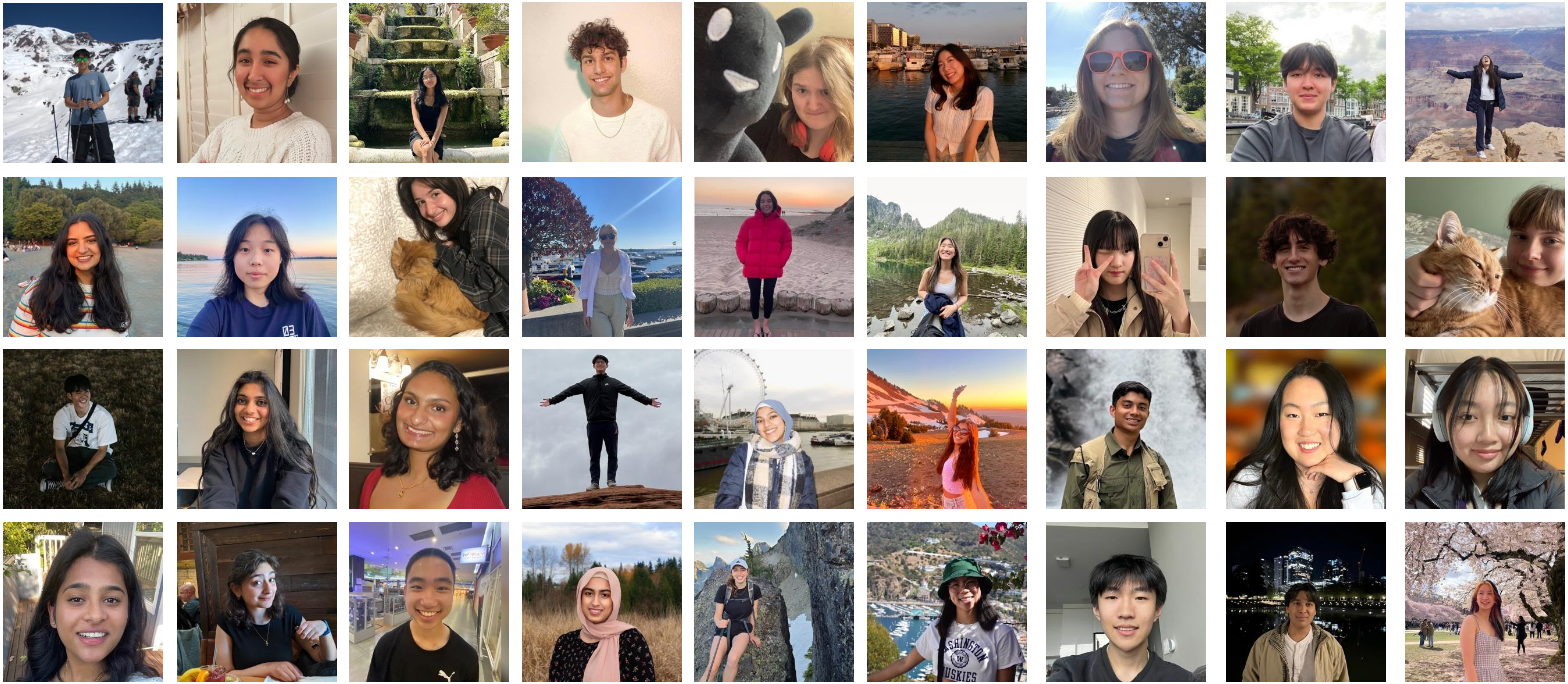
- just makes a random valid move (you should be able to beat this!)
- tries to make a "good" move (~ some if statements)
- never loses
  - Tic Tac Toe is a "solved game": a perfect player will never lose.

Or, extend this idea to other grid-based games!

- similar-ish: connect four, checkers, battleship
- much harder: sudoku, chess, go, othello

Thank your lovely TAs!!!!!!





Thank you!

Ask Us (Almost) Anything!

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