

Computational Structures in Data Science

Wrap Up

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Announcements

- Ants – Main deadline tonight
 - Can request extensions if needed, but not beyond 12/8
 - Remember to add your partner in Gradescope.
- **Please complete the course feedback survey**
 - Extra Credit if you do. 😊 More EC if 70% fill it out!

Dead Week

- Double check the calendar / Ed 😊
 - <https://c88c.org/fa23/weekly-schedule.html>
- Will hold review sessions (led by TAs + Tutors) during class times
 - i.e. MW 2-3pm.
- My advice:
 - Finish up the HW/Projects. Then take a break for 1-2 days.
 - Then study for exams

Final Exam Information

- Time: Thurs 3-6pm
 - We'll be split in 3 rooms; emails to be sent next week
 - Confirmations on accommodations, alt times sent soon.
- Similar to Midterm!
 - Fall 2022 will be released as practice on Gradescope, but is very different. (Not sure if we have a solutions doc tho)
- Clobber Policy:
 - If you improve upon your midterm score, your midterm score goes up
 - Everything in class is in scope, but focus on post-midterm topics.

Is Your Brain Full Yet?

- Data: values, literals, operations,
- Functions
- Variables
- List, Tuples, Dictionaries
- Function Definition Statement
- Conditional Statement
- Iteration: list comp, for, while
- Lambda function expr.
- Higher Order Functions
- Higher order function patterns
 - Map, Filter, Reduce
- Recursion
- Abstract Data Types
- Mutation
- Class & Inheritance
- Exceptions
- Iterators & Generators
- SQL / Declarative Programming

Grading Updates

- <http://howamidoing.c88c.org/>
 - We will periodically update over the next weeks.
 - Sum everything up!
- Lecture Self-Checks
 - Basically everyone *should* 20/20 on the lecture self-checks. That's the point. 😊
 - Correctness *does* count! **Resubmit them, if you haven't gotten them right.** (No late penalty!) Lateness does not matter
 - There are 26 self-checks which means you could have skipped 6 lectures
 - There's a few "bonus" ones on Gradescope, just from different semesters that are optional practice, but can get you to 20 pts if you need.

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Review and Wrap Up

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CS88 Staff

• **Head TAs:**

- Hridhay Suresh
- Jessica Lin

• **TAs:**

- Ethan Yoo
- Karim Kaylani
- Michelle Chen
- John Teng
- Ramya Chitturi
- Rebecca Dang

• **Tutors:**

- Sean Yang
- Angela Bi
- Ananyaa Jain
- Christy Quang
- Liliana Gonzalez
- Miha Bhaskaran
- Morgan Dehdashti

CS88 Head TAs

Head Teaching Assistants



Hridhay Suresh [he/him]

cs88@berkeley.edu

Hello. I am an n-th year CS major with an emphasis in HCI and CS education. Outside of this class, I spend time solving rubik's cubes one-handed, playing Guitar Hero competitively, and studying for the GRE.



Jessica Lin [she/her]

linjessica@berkeley.edu

Hi friends! I'm a fourth year CS major from Southern California. I enjoy dancing, reading, doing crosswords, climbing, and weight lifting. Feel free to reach out to me for anything (:

CS88 TAs



Ethan Yoo [he/him]

ethanyoo7912@berkeley.edu

Hello! My name is Ethan and I am a third-year Applied Mathematics and Data Science major. My favorite activities are going out with friends and exercising (soccer, tennis, and hiking). Hope I can assist you all, and look forward to meeting you!



John Teng [he/him]

johnteng9@berkeley.edu

Hi, I'm John, a third year CS major from Pennsylvania. I like playing video games, soccer, and working out. Looking forward to this semester!



Karim El-Refai [he/him]

karim.el-refai@berkeley.edu

Fan of robots and philosophy and the philosophy behinds robots and soon the robots behind philosophy, but not the philosophy of the philosophy of robots but in fact the robots for the robots of philosophy. If you are confused, don't worry so am I :D



Michelle Chen [she/her]

michelle.chenn@berkeley.edu

im michelle, cs+econ junior from singapore. i<3 traveling, eating, snowboarding, photography and my students



Ramya Chitturi [she/her]

ramya.chitturi@berkeley.edu

Hi! I'm Ramya, a junior majoring in CS and minoring in linguistics. I enjoy sci-fi/fantasy books, trivia, crosswords, rock music, museums, civic technology, and more! Excited to get to know you this semester :)



Rebecca Dang [she/her]

rdang@berkeley.edu

Hey there! I'm a 3rd year EECS major from San Jose, CA. This is my first time as a TA and I'm super excited to meet you! Besides being on course staff, at Berkeley I'm involved in Computer Science Mentors. In my free time, I like to play guitar (and maybe record a few covers if I'm feeling brave) and fangirl about the latest book/movie/TV show/song I consumed. If you ever have any questions about 88, classes, clubs, or professional development, feel free to reach out :D

CS88 Tutors



Ananyaa Jain [she/her]
ananyaaain@berkeley.edu



Angela Bi [she/her]
angelabi2003@berkeley.edu

Hello! I'm Angela and I'm a junior majoring in Data Science and minoring in Political Economy from the bay area. In my free time, I like illustrating for the Daily Cal, playing volleyball, listening to music, and watching anime. Feel free to reach out and looking forward to a great semester!!



Christy Quang [she/her]
christyquang@berkeley.edu

Hi hi! My name is Christy and I'm a third year DS & CS major from the East Bay! In my (limited) free time, I enjoy destroying people in Word Hunt, watching basketball (Warriors) and kdramas, listening to kpop and baking! Excited for a fun semester in 88 and always feel free to reach out :D



Liliana Gonzalez [she/her]
liliana@berkeley.edu

hello!! my name is lily and i am a third year from sacramento, ca! i love listening to music, exploring the bay area with friends, collecting starbucks cups, and going to concerts! feel free to reach out with any questions - i am excited to meet everyone!



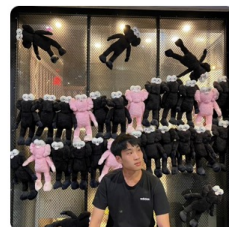
Miha Bhaskaran [she/her]
athmiha@berkeley.edu

Hello hello! I'm miha, a third year studying data science from the bay area. In my free time I love playing card games, eating good food and going on spontaneous road trips. Looking forward to a fulfilling semester :)



Morgan Dehdashti [she/her]
mdehdashti@berkeley.edu

Hi! My name is Morgan and I'm a junior from social majoring in Data Science and MCB. Looking forward to a fun semester!



Sean Yang [he/him]
sean_yang@berkeley.edu

Hi my name is Sean, I'm a third year studying data science. Nice to meet you!

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CONGRATULATIONS!!

THANK YOU!

COME JOIN COURSE STAFF!

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The One Big Thing...

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Abstraction

- Detail removal

“The act of leaving out of consideration one or more properties of a complex object so as to attend to others.”
- Generalization

“The process of formulating general concepts by abstracting common properties of instances”
- Technical terms: Compression, Quantization, Clustering, Unsupervised Learning



Henri Matisse "Naked Blue IV"

Keep on Programming

LOTS of Courses to Follow Up! [[Courses](#)]

- Explore all the DS connectors
 - Data 88E (Econ)
 - Stat 88 / DATA C88S
- Data 100: Principles of DS
- Data 101: Data Engineering
- Data 102: Data, Inference, and Decisions
- Data 104: Human Context and Ethics
- Data 140: Probability
- INFO – Course Schedule Varies!
 - INFO C103 in Spring: "History of Information"
 - Some Database courses, web development, etc.

CS Courses

- CS61B: (conventional) data structures, statically typed production languages.
- CS61C: computing architecture and hardware as programmers see it.
- CS70: Discrete Math and Probability Theory.
- CS170, CS171, CS172, CS174: “Theory” —analysis and construction of algorithms, cryptography, computability, complexity, combinatorics, use of probabilistic algorithms and analysis.
- CS161: Security
- CS162: Operating systems.
- CS164: Implementation of programming languages
- CS168: Introduction to the Internet
- CS160, CS169: User interfaces, software engineering
- CS176: Computational Biology

CS Courses Part 2

- * CS182, CS188, CS189: Neural networks, Artificial intelligence, Machine Learning
- CS184: Graphics
- CS186: Databases
- CS191: Quantum Computing
- CS195: Social Implications of Computing
- EECS 16A, 16B: Designing Information Systems and Devices
- EECS 126: Probability and Random Processes
- EECS149: Embedded Systems
- EECS 151: Digital Design
- CS194: Special topics. (e.g.) computational photography and image manipulation, cryptography, cyberwar.
- Plus graduate courses on these subjects and more.

EE Courses Are There Too

- EE105: Microelectronic Devices and Circuits.
- EE106: Robotics
- EE118, EE134: Optical Engineering, Photovoltaic Devices.
- EE120: Signals and Systems.
- EE123: Digital Signal Processing.
- EE126: Probability and Random Processes.
- EE130: Integrated Circuit Devices.
- EE137A: Power Circuits.
- EE140: Linear Integrated Circuits (analog circuits, amplifiers).
- EE142: Integrated Circuits for Communication.
- EE143: Microfabrication Technology.
- EE147: Micromechanical Systems (MEMS).
- EE192: Mechatronic Design.

Personal Course Recommendations

- INFO C103
- Computational Photography – especially if you like photoshop
- HCE Courses
- History, Poli Sci, Psychology
- LS110 Brilliance of Berkeley (Spring)
 - <https://curricularconnections.berkeley.edu/ls110/>
 - An 'experiment' of sorts, but seems cool

What's next? (Otherwise)

- Programming contests
- Hackathons
- More paradigms and languages: the web
- The open-source world: Go out and build something!
- Above all: Have fun!

And there's lots more to Python!

What can you do with Python?

- Almost anything!
- Webapp backends
- Web scraping
- Natural Language Processing
- Data analysis
- Machine Learning
- Scientific computing
- Games

What can you do with Python?

- Almost anything! Thanks to libraries!
- Don't try to memorize libraries, learn how to learn how to use them!
- Webapp backends (Flask, Django)
- Web scraping (BeautifulSoup)
- Natural Language Processing (NLTK)
- Data analysis (Numpy, Pandas, Matplotlib)
- Machine Learning (FastAi, PyTorch, Keras)
- Scientific computing (SciPy)
- Games (Pygame)

(Reminder) Peer Resources: Join Ed!

- <https://eecs.link/data001> - Data 001 Ed Group
- <https://eecs.link/eecs101> - EECS 101 Ed Group

Ask Us Anything!

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THANK YOU!

(Again!)

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