Welcome to Data C88C!

Lecture 24: Conclusion
Tuesday, August 5th, 2025
Week 7
Summer 2025
Instructor: Eric Kim (ekim555@berkeley.edu)

Announcements

- End-of-semester surveys [link]
  - If 65% or more students complete both surveys by Friday August 15th at 11:59 PM, then everyone will receive 0.5 point of extra credit! If this goal is not met, nobody will receive the extra point.
  - If 75% or more students complete both surveys by Friday August 15th at 11:59 PM, then everyone will receive 0.5 additional point of extra credit.
- No lab this week!
- Today is the final lecture
  - Good luck studying for the final :)

Final Exam Logistics

- Please read this Ed post very carefully: [link]
- Final exam: Tuesday August 12th, 3:00pm-5:00pm PT
- Alternate times
  - Tuesday, August 12th, 7:00 pm-9:00pm PT
  - Wednesday, August 13th, 8:20am-10:20am PT
- Gradescope online exam, Zoom proctoring
  - Two page handwritten cheatsheet allowed (see Ed post for details)
  - Final exam reference sheet: [link]
  - (same setup as the Midterm)
- If you can't make any of these times, please fill out the form linked in the above Ed post and let us know **ASAP**
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Lecture Overview

- AMA
- Conclusion
-

AMA Questions

C88C Question: Sorry, I still find myself struggling with this. Would you be able to quickly go over nested lambda and a way you'd recommend reading or visualizing them? Like understanding what something like f = lambda x: lambda x is conceptually and how it would be used. (SP24 WWPD Inspired)

AMA Questions

What's it like working in a data science/ML position on a typical day? Is it more of fixing/maintaining current code/models or lots of prototyping with new ideas? Thanks!

AMA Questions

I'm curious are there any interesting fields of Data Science / CS I should delve into after this course (that I can still apply what I've learned in Data C88C to understand or to advance my knowledge) Plus I also love things related to art, specifically movies, painting or architecture (but I'm not good at drawing actually, just love finding out about them). Is there any way to fuse what I've learned in this course and the art that I love?

AMA Questions

How does one go about doing ML in industry without graduate degrees?

Any thoughts on when everyday phone cameras will be able to accurately measure Z-depth?

AMA Questions

Favorite part about teaching C88C?

Are there any other courses you'd like to teach?

AMA Questions

Were there any courses from your time studying as an undergraduate at UC Berkeley (both within CS and outside of the department) that still stick with you today?

Do you have a favorite or preferred programming language, for any reason, and what was the most fun to learn?

AMA Questions

Any considered career paths outside of academia/tech?

AMA Questions

What music genres do you like? Favorite artists and albums? Any specific instruments you would most like to learn how to play?

Data C88C: a retrospective

- Data: values, literals, operations,

- Functions

- Variables

- List, Tuples, Dictionaries

- Function Definition Statement

- Environment Diagrams

- Conditional Statement

- Iteration: list comp, for, while

- Lambda function expr.

- Higher Order Functions

- Recursion

- Mutation

- Class & Inheritance

- Linked Lists

- Trees

- Iterators

- SQL / Declarative Programming
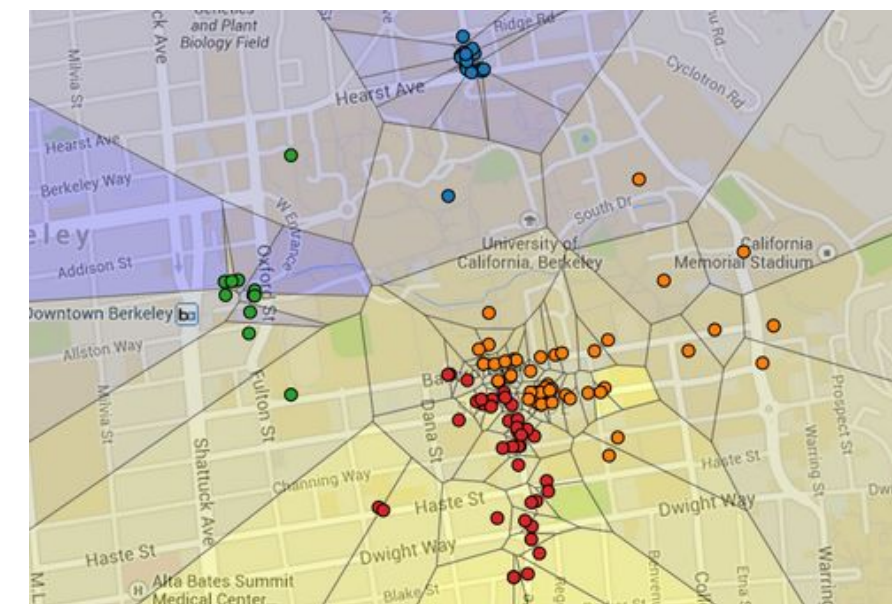
Maps: applied unsupervised (k-means) and supervised (linear regression) learning methods to a Yelp dataset!

Ants: implemented the backend game logic for a tower defense game!

11 HWs, 12 Labs, 2 projects, and a midterm+final (phew!)

Data C88C: a retrospective

- My hope: you have developed a solid programming foundation that will empower you in your future studies and projects.
- I don't expect you all to be 100% ready to work on production Python codebases. And that's 100% OK
  - With more practice and experience, you will continue to learn and grow
- **"Coding fluency"**: ability to quickly and naturally translate your thoughts into well-organized, readable code
- Tip: learning the first 1-2 programming languages is the hardest part. Beyond this, you'll pick up new languages very quickly
  - Your first language: Python!
  - Good second language: Java/C++ (eg some statically typed, compiled language)
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What can I do with a CS/DS degree?

- Almost anything!
- Engineering focus:
  - Standard software engineering (frontend/backend, web/mobile)
  - Data engineering
    - Ex: building and maintaining big-data pipelines. Very popular right now!
  - ML infrastructure
    - Ex: building and maintaining ML model training and serving (eg with GPUs). Popular!
- Modeling/analysis focus
  - ML engineer/researcher
  - Data scientist/analyst
- Entrepreneurial focus
  - Create your own AI/ML/DS startup, recruit a team, pitch to investors, etc.
- Applications of AI/ML/DS are endless
  - BigTech, HealthTech, AdTech, e-commerce, entertainment industry, etc.

Topics in AI/ML that people are excited about in 2025

- Large language models (LLM's)
  - (lots of) prompt engineering, chain of thought reasoning, etc.
  - LLM finetuning. "Emergent" behavior.
- Generative AI
  - Generate text, images, and/or videos
  - Hot topic: provide context/guidance to the model to "steer" generated outputs towards desired result
- Computer vision. "How to teach computers to see and understand the visual world"
- Natural language processing. "How to teach computers to understand human text."
- Multimodal models (eg text+image models, including visual-LLM models)
- Large-scale model training
  - training a model using hundreds of GPUs on a distributed GPU cluster requires a lot of ML infra people
- Representation learning.
  - How to learn effective representations of images/text/videos/users that capture their semantics?

CS/DS courses that I think are neat

- Modeling
  - CS 189: Introduction to Machine Learning
  - CS/Data 182: Designing, Visualizing and Understanding Deep Neural Networks
  - Data 100: Principles and Techniques of Data Science
- Computing
  - CS 161: Computer Security. Learn how hacking actually works!
  - CS 162: Operating Systems and Systems Programming.
  - CS 164: Programming Languages and Compilers.
- Data Engineering
  - CS 186: Introduction to Database Systems. Learn how SQL engines work!
- Computer Vision/Graphics
  - CS 184: Foundations of Computer Graphics. Learn how 3d-animated movies like Pixar films are rendered!

Parting thoughts

- Prioritize growth and learning
  - For both "hard" technical skills (eg Python), and "soft" skills like: working well with others, dealing with stress and interpersonal conflicts, being organized and detail-oriented, communication skills, etc.
  - A positive, growth-oriented mindset will take you far in both industry and academia
- How to navigate a university degree / career in ML/DS/CS?
  - During undergrad: be curious! Learn some things about a lot of things ("breadth")
  - (optional) Grad school: Learn a lot of things about a (somewhat) narrow focus ("depth")
    - How to work on problems with significant ambiguity
  - Industry:
    - How to work effectively on production codebases and systems
    - How to work on projects involving multiple (possibly many!) people
    - How to work on problems with significant ambiguity
- In 2025, in my opinion it's still worth learning how to code and how AI/ML/DS techniques work
  - Even in the world of LLM's / ChatGPT, we still need solid software developers, ML/DS engineers/researchers, etc

Thank you to the course staff!

TA's

Mia Lopez she/her/hers

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☕ hello! My name's Mia and I'm a 4th year studying CS! I'm into more indie music, like Childish Gambino or TV Girl. My favorite movies are Arrival and Lego Batman, but I also have a thing for Wes Anderson movies! This is my 3rd semester on CS61A staff, so feel free to reach out whenever! ☕

Aneesh Durai he/him/his

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Mira Wagner she/her/hers

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Hi! I am a junior majoring in data science and linguistics. I love reading, especially mysteries, swimming and baking! Excited for this semester :)

Satleen Gill she/her/hers

satleen@berkeley.edu

Hello! I am a rising senior double majoring in Data Science and Computer Science. I love to read, paint, go to concerts, and travel! Excited for the summer session!

Tutors

Haoming Chen he/him/his

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Hi everyone, I am Haoming, a rising sophomore interested in soccer, data science, hiking, science fiction, machine learning in Physics, and reach out to me to talk about any of these or anything in between!

Philip Ngo he/him/his

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Hi everyone! I'm Philip, a rising 3rd year majoring in Data Science and Linguistics from Long Beach, CA. I love summers in SoCal; some of my favorite summer activities are the going to the beach, karaoke, and concerts (saw grentperez and Malcom Todd this summer, seeing Laufey this fall!). Looking forward to seeing you all this summer!

Learn more about your TA's + Tutors here: https://c88c.org/su25/staff/

Thank you!

Congratulations on being (nearly) done with Data C88C, and good luck with the final!