

Computational Structures in Data Science

Lecture 1: Welcome to CS88!



CS88 Team –Michael

- Michael Ball
 - ball@Berkeley.edu – You're best off by using Ed! 😊
 - 784 Soda Hall
 - <http://michaelball.co> – I don't update this much...
 - It was great procrastination when I was a CS student.
 - Office hours: tentatively Monday afternoon.
- Things I do:
 - Intro CS Research (Tools, curriculum)
 - Training TAs
 - Building Educational Software (Snap!, former Gradescope)
 - Tools for web accessibility



Head Teaching Assistants



Hridhay Suresh [he/him]

hsuresh@berkeley.edu

Coming Soon

Jessica Lin Photo



Jessica Lin

linjessica@berkeley.edu

Coming Soon

CS88 Team

Teaching Assistants



Ethan Yoo [he/him]

Office Hours: TBD

ethanyoo7912@berkeley.edu

Hello! My name is Ethan and I am a second-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]

Office Hours: TBD

johnteng9@berkeley.edu

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



Karim El-Refai [he/him]

Office Hours: TBD

karim.el-refai@berkeley.edu

Big fan of robots and philosophy, and the philosophy behind robots. Really excited to get to help you all learn this sem!



Michelle Chen [she/her]

Office Hours: TBD

michelle.chenn@berkeley.edu

hi! im michelle a sophomore studying cs+econ. some things i love doing: eating, traveling, photography/videography, baking, arts and crafts, exploring new things & ofc meeting my students. feel free to reach out :)

CS88 Team



Ramya Chitturi [she/her]

Office Hours: TBD

ramya.chitturi@berkeley.edu

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



Rebecca Dang [she/her]

Office Hours: TBD

rdang@berkeley.edu

Hey there! I'm a 2nd year EECS major from San Jose, CA. This is my first time as a tutor and I'm super excited to meet you! Besides being on course staff, at Berkeley I'm involved in CSM and Codebase. 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

Tutors

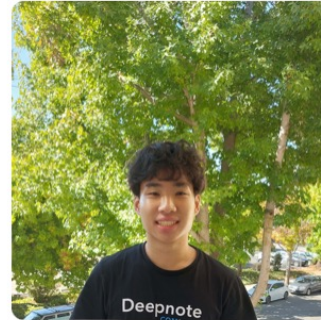
Angela Bi Photo



Angela Bi [she/her]

Office Hours: TBD

angelabi2003@berkeley.edu



Sean Yang [he/him]

Office Hours: TBD

sean_yang@berkeley.edu

Hi, I'm Sean, a 2nd year Data Science Major from LA. I enjoy playing games, taking walks, and talking to new people. Looking forward to meeting you all!

In The News

[Israeli Co. Uses AI to Save Bees](#)
[The Jerusalem Post \(Israel\)](#)

Zachy Hennessey

August 10, 2023

Israeli agricultural technology company BeeHero has introduced the Pollination Insight Platform to monitor pollinating bees, enhance pollination efficiency, and improve crop production. The platform uses in-field sensors to track pollinator activity for various crops in real time, for inclusion in the world's largest dataset on bee behavior. Artificial intelligence-driven analytics convert the data into insights that inform decision-making by growers that can augment crop yields. BeeHero developed the platform in collaboration with Israel-based global vegetable seeds company Hazera, and has deployed it in the U.S., Europe, and Israel. Hazera's Avi Gabai said, "The introduction of this in-field sensing solution marks a significant milestone in the agricultural industry's ongoing efforts to address the challenges posed by declining bee populations."



Computational Structures in Data Science

Computer Science and Data Science



Computer Science

The study of...

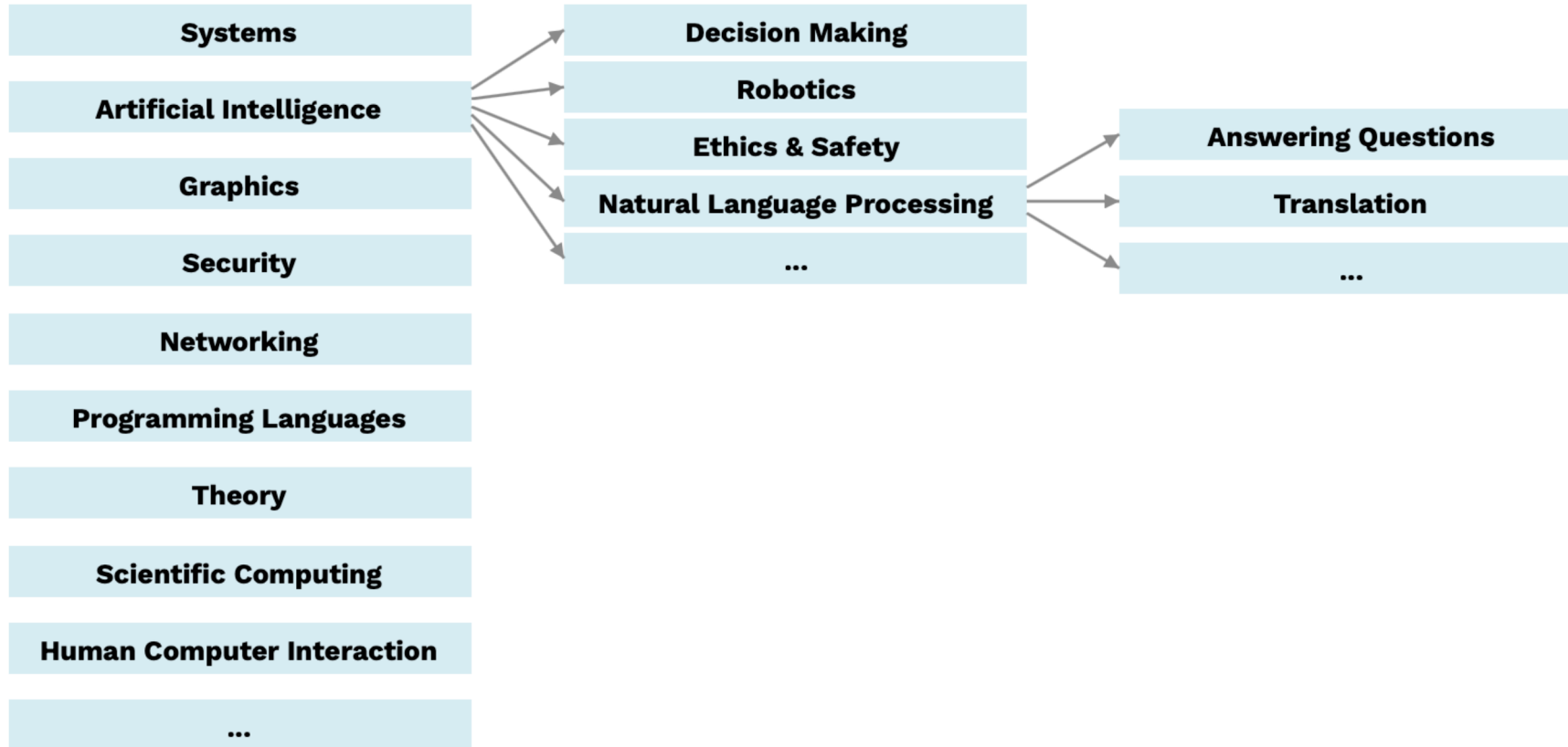
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graph LR; A[The study of...] --- B[What problems can be solved using computation]; A --- C[How to solve these problems]; A --- D[What techniques lead to effective solutions];
```

What problems can be solved using computation

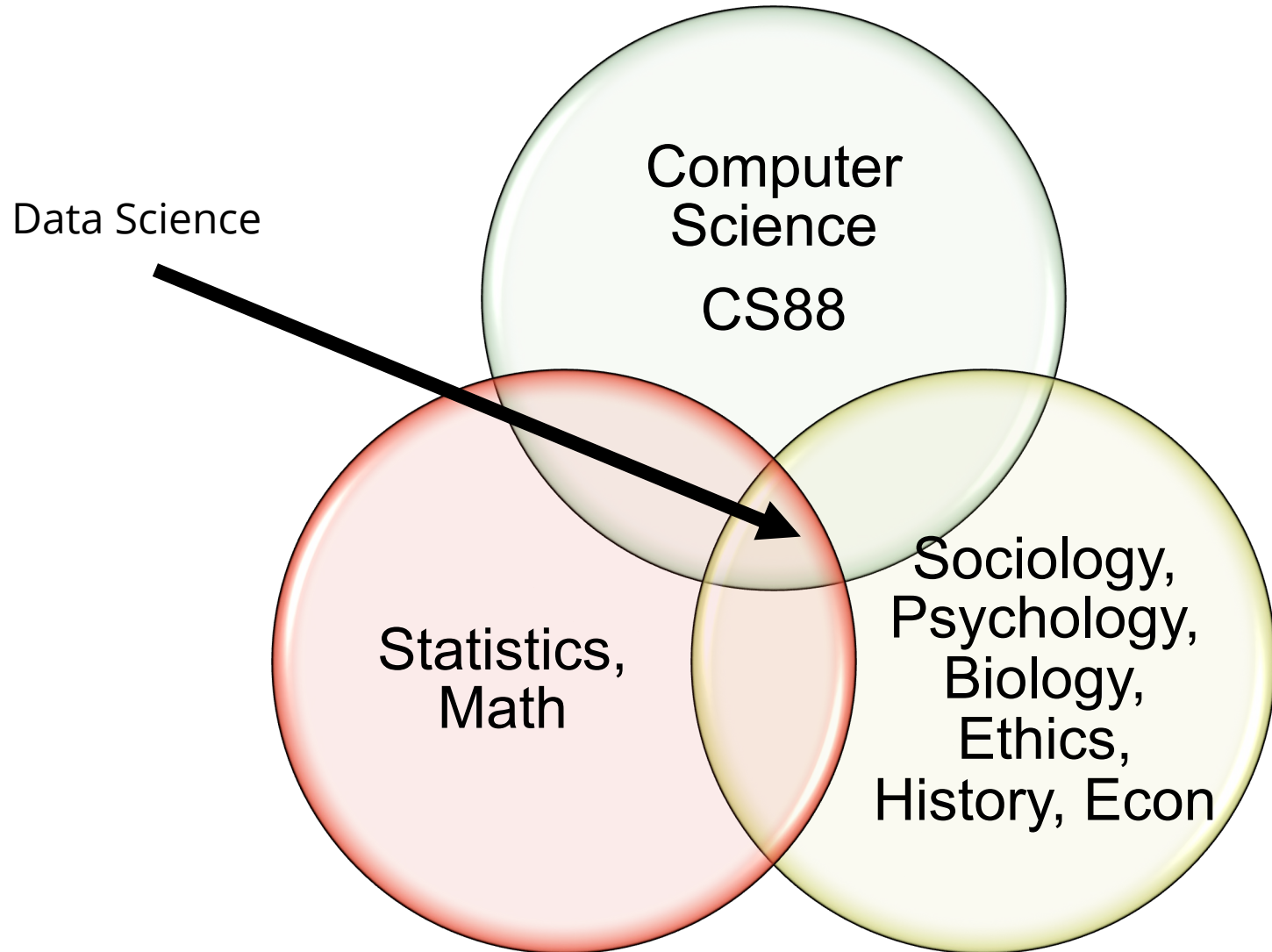
How to solve these problems

What techniques lead to effective solutions

Computer Science, Some Ideas...Definitely Not Exhaustive!

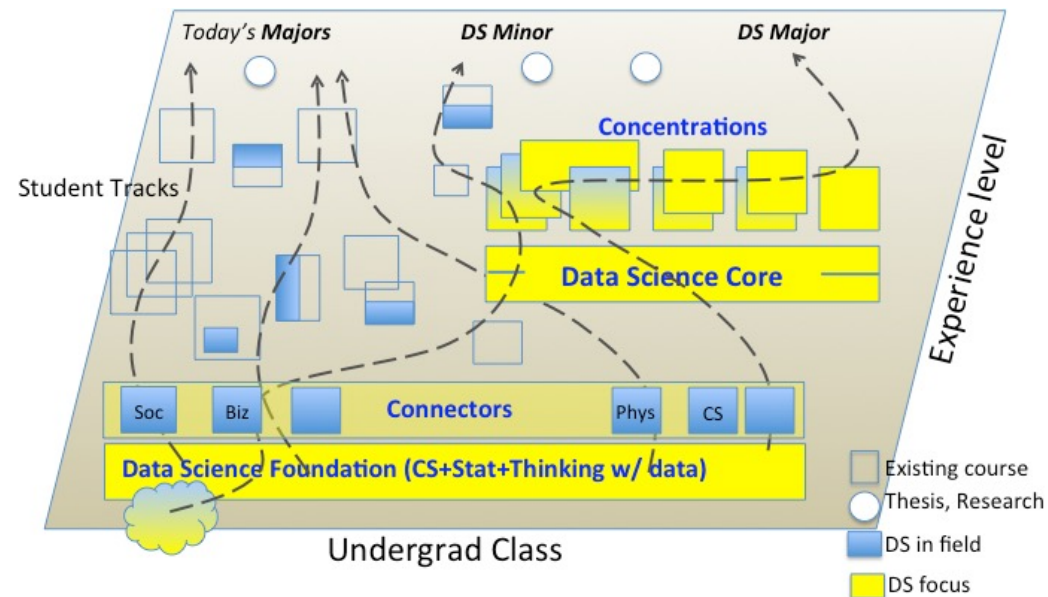


Computer Science & Data Science (One View)



Data 8 – Foundations of Data Science

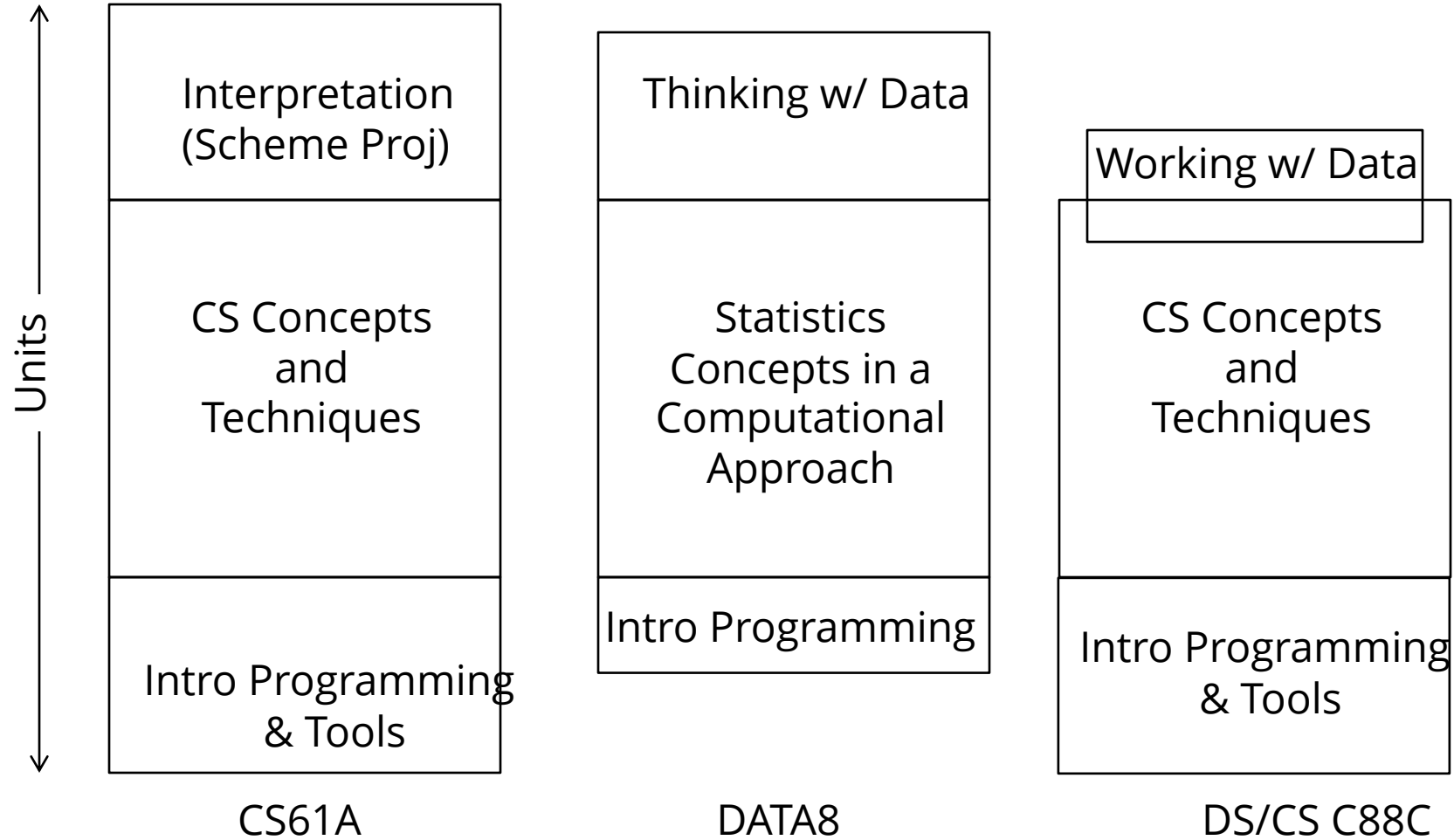
- Computational Thinking + Inferential Thinking in the context of working with real world data
- Introduce you to several computational concepts in a simple data-centered setting
 - Authoring computational documents
 - Tables
 - A LOT of statistics



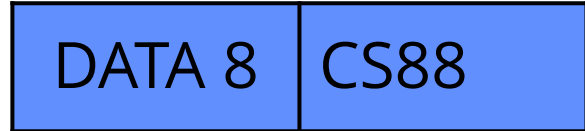
CS88 – Computational Structures in Data Science

- Deeper understanding of the computing concepts introduced in DATA8
 - Hands-on experience => Foundational Concept
 - How would you create what you use in DATA 8?
- Extend your understanding of the structure of computation
 - What is involved in interpreting the code you write?
 - Deeper CS Concepts: Recursion, Objects, Classes, Higher-order Functions, Declarative programming, ...
 - Managing complexity in creating larger software systems through composition
- Create complete (and fun) applications
- In a data-centric approach

How does C88C relate to CS61A?



Opportunities for students



DS Minor



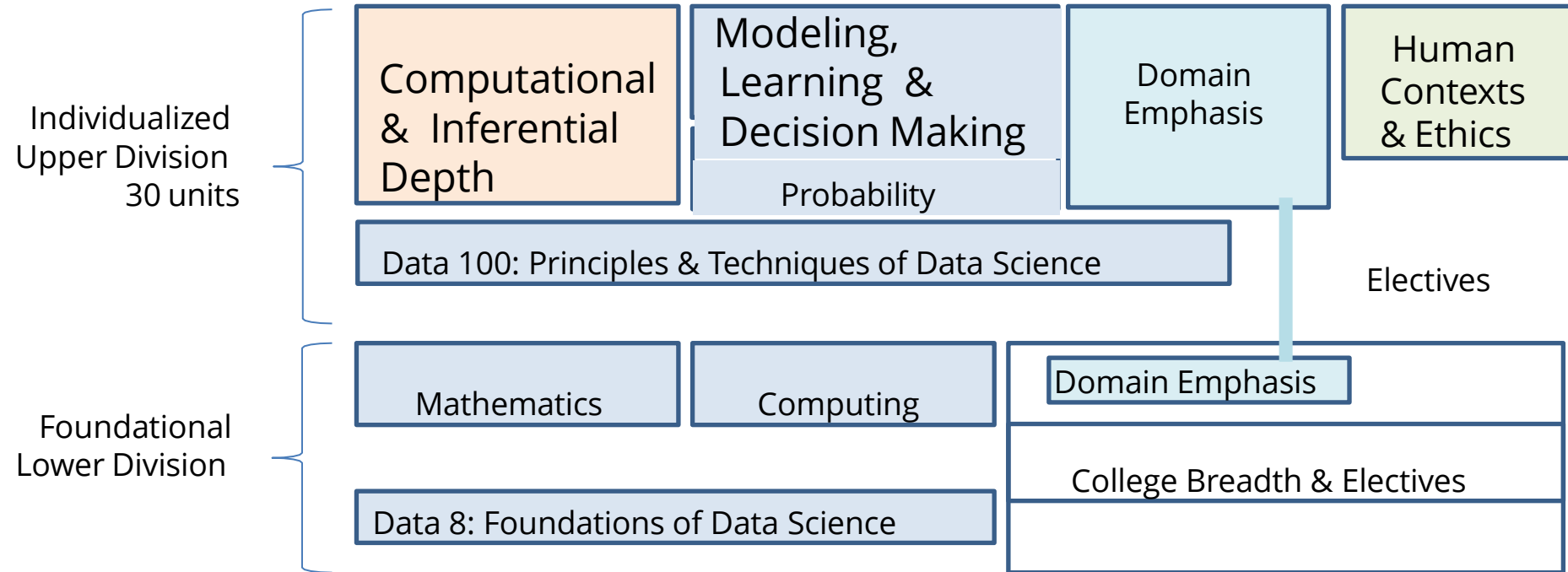
CS minor & DS Major



CS major:
CS47A path is not
recommended, but there if you
change your mind.



The Data Science Major



Computational Structures in Data Science

Success In C88C



Course Culture

- Learning
- Community
 - **Collaboration**
 - Peer Instruction
- Respect
- A supportive course staff & environment
 - Lots of outside community, CS Mentors, HKN, others.

Collaboration

- Asking questions, discussing topics, helping each other is always encouraged!
 - When you're working with a partner, you are expected to share in the work.
- Collaboration has limits
 - Please don't read someone else's code
 - except if you have already turned in the assignment, or a TA/staff member is present.
 - You can help others, but not give the solutions.
- We have a very particular set of skills and we will use them.

So...We Know About ChatGPT

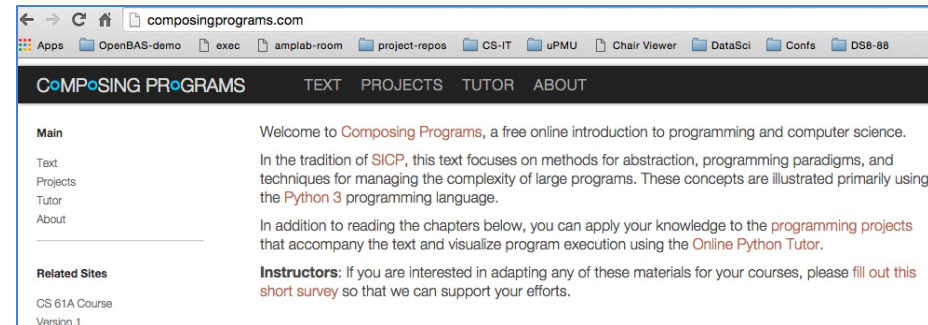
- You *may* use ChatGPT (and other tools) like a **tutor**
- **You may not ask about specific questions assigned to you!**
- Remember: It's a bot.
 - Bots are fallible!
 - Check its advice.
- Good Example:
 - "When would I prefer a for-loop over a while loop in Python?"
 - "What is a higher order function?"
- **Bad Example:**
 - "Provide a solution to the Fibonacci sequence using recursion"

Course Structure

- 2 lectures, 1 lab each week
- Lecture introduces concepts (quickly!), answers why questions.
- Lab provides concrete detail hands-on
- Homework (11) cements your understanding
- Projects (2) put your understanding to work in building complete applications

- Maps

- Ants vs Some Bees



- Readings: <http://composingprograms.com>

- Same as cs61a

Class Format

- Mon and Weds Lectures:
 - Each lecture has a series of short self-check questions
 - Lectures go quickly
- Labs are paced throughout the week. See the Ed post to pick a time.
- Labs are HANDS ON – Get help as you're trying the lab.
 - Labs are active
 - Find and make friends!
 - Do not ask for more lectures
 - Ask *why* something doesn't make sense.

Class Format: Assignments

- Lecture Quizzes, 1 point, max 20.
 - 1 per lecture, “due” in ~4 days. (Partial credit after)
 - <https://go.c88c.org/1>
- Lab Work: 4 points, 11 labs, 1 drop
 - Start them during lab! You can probably finish some labs in 2 hours. Will be Python + some interactive questions.
- Homework: 8 points, 11 HW, 1 drop
 - Start early!
- Projects: 100 points between 2 projects
 - Start early! “Checkpoint” assignments
 - Maps & Ants

Class Format: Assignments

- Slip Days: 9 total
 - Use up to 3 on any assignment
 - We apply them in the order that's most beneficial!
 - i.e. use them on projects if you need!
 - Can be used for homework, labs, projects, but not project checkpoints.
- Slip Days take care of almost all special circumstances!
- We will release an exceptions / extensions request form.
- What if you go over slip days?
 - 25% deduction for each day over. Mathematically you can still earn 25% if you turn in something 3 days late.

Class Format: Exams

- 1 midterm and 1 final exam, in person
 - remote, backup options
 - Remote exams proctored via Zoom
 - Required verification for alternate exams.
- Midterm 2 hours, early October
- Exam will be during the slot assigned by campus.
 - 8 handwritten cheat sheets double-sided.
- **You don't actually need 8 sheets!**

Ed For Class Discussion: Try it!

The screenshot displays the Ed discussion interface for CS 88 Fall 2020. The browser address bar shows the URL `us.edstem.org/courses/2362/discussion/111922`. The top navigation bar includes a search bar and a 'New Thread' button. The left sidebar lists courses and categories. The main content area shows a 'Welcome' post by Michael Ball, an instructor, with 881 views. Below the post is a 'Short List Week 1 Tasks' section with a list of tasks. At the bottom, a video player displays a 'Welcome to CS88' video.

ed CS 88 – Discussion

[New Thread](#) Search Filter

COURSES

- Berkeley CS Sandbox 8
- CS302
- CS 61BL 3277
- CS 88 3**
- CS 169 3

CATEGORIES

- General
- Lectures
- Social
- Labs
- Homework
- Projects
- Exams

Welcome

Michael Ball INSTRUCTOR
2 days ago in [General](#)

UNPIN STAR WATCHING 881 VIEWS

Hi everyone,

Welcome to CS88 Fall 2020!!

We're just getting things setup, so you'll find some stuff is less than perfect. Please bear with us! (Bad pun intended. If you're allergic to bad puns I might recommend another course. No hard feelings.)

A Short List Week 1 Tasks:

- Please attend any lab section this week! We will be sending out a welcome survey as well as form to sign up for permanent section times. Labs in CS88 are part lab, part discussion. They're a time to meet peers and your TA. They are challenging, but hopefully interesting and engaging. There's plenty of times to get questions answered!
- [Please checkout this short welcome video and let us know how you're feeling about the course.](#)

recording for live lecture and lab
General Anonymous 15h 1

CS88
General Dat Le 18h 2 (1 new)

Lecture Zoom Link?
Lectures Anonymous 20h 1

Test Staff Post
General Michael Ball INSTRUCTOR 20h 8

1 unit GSI course?
General Anonymous 21h 2

Lab times

Welcome to CS88
Computational Structures in Data Science
Fall 2020
Berkeley UNIVERSITY OF CALIFORNIA

0:00 / 6:19

Where will we work?

- Your laptop
 - Using an editor and a terminal
- okpy – okpy.org
- c88c.org
- gradescope.com – HW, Lab, Lecture Self-Checks
- Ed Discssion: edstem.org
 - Can write and run (!!)

Computational Structures in Data Science

Demo?



Take Things 1 Step at a Time

- We interact with Python via the *Terminal*
- We type *programs* into files and into other programs.
- Everything you do in this class is safe!
- **Try and experiment!**

Your Tasks

- Lecture 1 Quiz On Gradescope
- Watch Ed for info about section signup.
- Attend Lab 0:x

Welcome, and Good luck!

Questions?