CSE 163
Victory Lap & Next Steps

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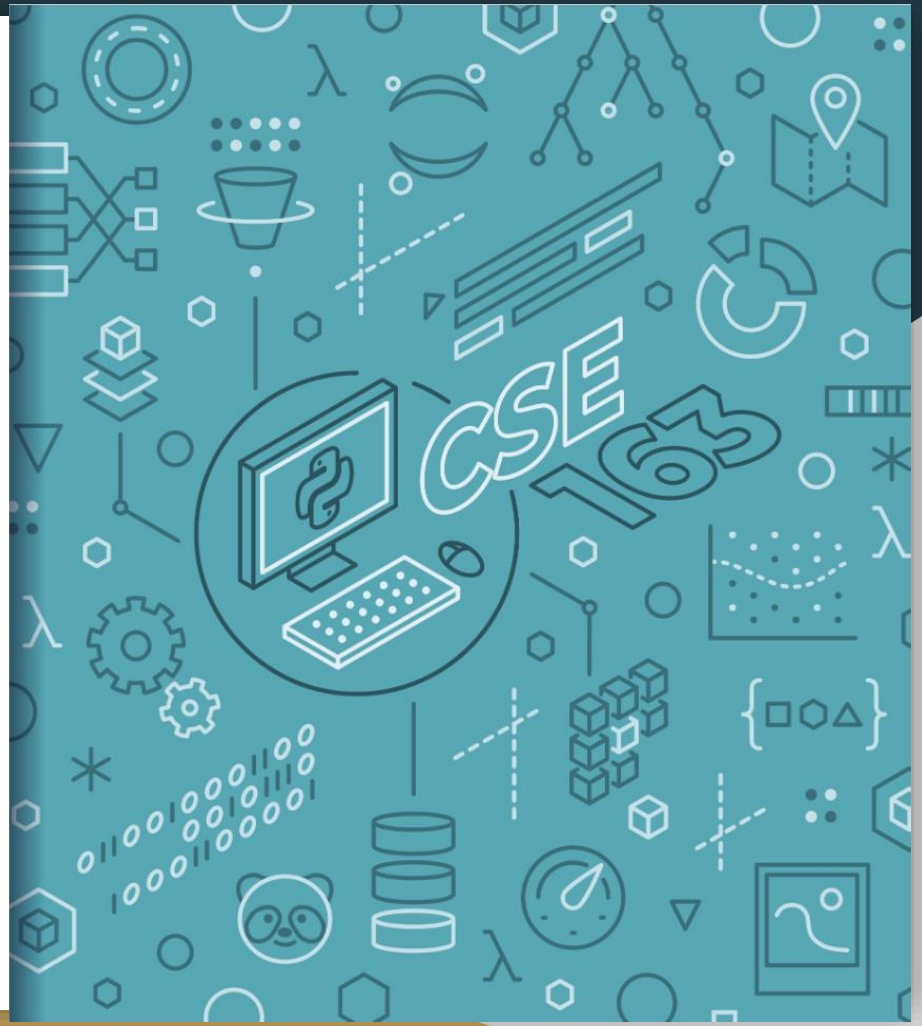
Spring 2026

💭 Icebreaker (discuss with neighbors):
How are you planning on explore data programming after this course?

slido.com
#cse163



Announcements

- **Lesson 28 Quiz** due tonight at 11:59pm
  - Your final lesson quiz!
- **Project Part 3 (Final Deliverables)** due June 5th at 11:59pm on Gradescope!
- **Project Part 5 (Peer Feedback)** due June 7th at 11:59pm on Gradescope
- **Presentations** tomorrow during Section and Friday's lecture (June 5th, if needed)
  - Make sure you have signed up for a presentation time
  - Order will be determined by last time modified!
- **Resubmission Cycle 7** due Sunday, June 7th at 11:59pm
  - Only THA 5 technical component is eligible
- **Resubmission Cycle 8** due Sunday, June 7th at 11:59pm
  - Any **technical OR creative component** from any THA
- **Final Reflection** on Monday, June 8th at 8:30am in KNE 220

You did it!!

Class Overview

- ***More advanced programming concepts*** than CSE 122 or CSE 160 including how to write bigger programs with multiple classes and modules.
- How to ***work with different types of data***: tabular, text, images, geo-spatial, etc.
- ***Ecosystem of data science tools*** including Jupyter Notebook and various ***data science libraries*** including scikit image, scikit-learn, and pandas data frames.
- Basic concepts related to ***code complexity, efficiency*** of different types of data structures, and ***memory management.***
- Foundations of ***data literacy and technical communication*** for critical and conscientious data science

Competency 1

- ***More advanced programming concepts*** than CSE 122 or CSE 160 including how to write bigger programs with multiple classes and modules.

- Testing code
- Data structures: Lists, sets, dictionaries, tuples
- Classes and Objects
- Modules and Packages
- Anonymous functions (lambdas) and functional programming

Competency 2

- How to ***work with different types of data***: tabular, text, images, geo-spatial, etc.

- Tabular (table)
- Unstructured text
- Geo-spatial
- Images
- Joining data from multiple sources

Competency 3

- ***Ecosystem of data science tools*** including Jupyter Notebook and various ***data science libraries*** including scikit image, scikit-learn, and pandas data frames.

- Jupyter Notebooks
- Pandas
- Seaborn / Matplotlib
- Scikit-learn
- Geopandas
- Numpy
- Imageio

Competency 4

- Basic concepts related to ***code complexity, efficiency*** of different types of data structures, and ***memory management.***
- Algorithmic efficiency
- Python language quirks
- Computer memory, objects, and references
- Terminal

Competency 5

- Foundations of ***data literacy and technical communication*** for critical and conscientious data science

- Reading assignments
- Peer reviews in creative components
- Write ups and reflection posts
- Ethics discussion and case studies
- Humanistic computing
- Final Project/Portfolio
- Final Reflection (on Monday!)

Data Programming's Interface with Data Science

While this course is focused as a course in programming, we have a close relationship with the analysis done in data science. We have explored how to support data science in many of our discussions of programming and its impact.

- Principles of data visualization
- Data literacy and communication
- Machine learning
  - Neural networks
  - Convolutions
- Positive/Negative impacts of data science and society
- Privacy
- Algorithmic Fairness
- Statistics, hypotheses, and research

What Next?

Future Classes

- Machine Learning
  - CSE/STAT 416 - Intro to Machine Learning
  - STAT 435 - Intro to Statistical Machine Learning
  - INFO 371 - Advanced Methods in Data Sciecne
- Societal Implications of Data Science
  - SOC 225 - Data and Society
  - STAT 303 - Intro to the Ethics of Algorithmic Decision Making
- Data Management
  - CSE 414 - Intro to Database Systems (non-majors)
  - INFO 430 - Database Design and Management
- Data Visualization
  - CSE 412 - Intro to Data Visualization (non-majors)
  - INFO 474 - Interactive Information Visualization
  - HCDE 411 - Information Visualization

Online Resources

The internet is filled with tutorials and online classes that teach topics in data science and data processing!

- Coursera
- Allen School Course Catalog
- Berkeley Data8 and DS100
- Towards Data Science (on Medium, hit or miss)
- Codeacademy

Projects

It’s not really possible to list all the things you can do with what you’ve learned in this class but learning a new tool through a project is a good way to continue building your skill set

- Learn a new library
  - Data Visualization: Bokeh or Altair
  - Natural Language Processing: NLTK or spaCy
  - Machine Learning: Tensorflow, Keras, PyTorch
  - Images: Open-CV
- Learn a new Language!
  - R - Numerical Processing
  - Scala - Compatible with Java, nice syntax
  - Julia - New and up-and-coming language
  - Javascript - Language of the web
- Contribute to open-source libraries or projects!

Research

You are all in the very unique experience of having some real marketable skills for doing undergrad research!

- You have learned the language and the tools used by many researchers across the university
- Research opportunities can be found on Interfolio, Handshake, or by cold-emailing or reaching out to professors.
    - Please be respectful of their time and don’t be discouraged if they do not reply
- You can also pursue projects of your own, in whatever area is interesting to you!
    - What problems, questions, or topics excite you?
    - What skills do you want to develop?

Become a CSE 163 TA!

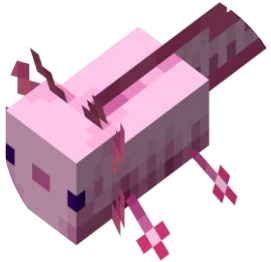
- Teaching is one of the best ways to learn!
- You don’t have to be an expert in Python to be a TA
- Keep an eye out for the application deadlines!
- Reach out to me or any of your TAs for more advice on preparing for the application and/or interviews!

Thank you to the TAs! 🎉

Skyler Choi

Alexis Destefano

Shaurya Jain



Kaiyuan Liu

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Kellen Rodriguez

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