CSCI 171: The Nature of Computers and Computing

2025 Spring, John Jay College

1 Basic Information

- **Instructor**: Yunhua Zhao
- **Email** : yzhao@jjay.cuny.edu
- **Class time and location:**
  - CISC171-02 MoWe 9:25AM - 10:40AM, New Bldg 6.61
- **Office hours**:
  - Wednesday: 10:40pm - 11:40pm
- **Location: New Bldg 6.63 Adjunct Office**

Or by appointment, either on campus or on Zoom.

Zoom link: at the document end

2 Course Description

This course introduces students to the process of transforming their ideas into simple but practical software through the study of a scripting language like Python. Students will learn to read and write data from various file formats, use basic data structures for data manipulation, and produce basic statistical information about the data. Programming skills will be developed through hands-on lab exercises, complemented by project-based assignments representative of current tasks in data science.

3 Units

3 Course Readings

All readings will come from free online sources, I will put the reading on BB before classes. Example sources:

- https://datascienceandengineering.github.io/cuny_ds_book_for_engr102/intro.htm
- https://www.inferentialthinking.com
- https://jakevdp.github.io/PythonDataScienceHandbook/

4 Grading:

The final course grade will be based on:

- Midterm exam: 30%
- Final exam: 40%
- Projects: 15%
- Homework: 15%

5 Required Services/Resources

Colab or Anaconda

Codelab Account: CUNY-32300-MMWS-63 (**Section Access Code for this class)**

6 Topics (tentative)

6.1 Basic Programming Concepts Covered

- Types (string, ints, floats, Booleans)
- variables
- Operations and assignment
- Importing libraries
- Scope
- Branching statements conditions
- Testing (assert)
- Files/directories basic file io
- Loops
- Functions
- Lists
- Dictionaries
- List comprehension (map)
- Optimization
- Objects/Classes

6.2 Data Science/Statics Concepts

• Reading in data

• Computing basic statistics (mean, median, std, max, min)

• Plotting histogram and bar graphs

• Probability Coin flip data

• Line plot (normal distribution)

• Stats: Statistical significance (testing empirically fair coin with simulation)

eg. modeling

• Permutation Test for Statistical Tests (A/B) condition

• Scatter Plots, Correlation

• Sampling vs Population

• Linear Regression

• Classification with K nearest neighbor

• Evaluation with cross validation

6.3 Schedule table

Academic Calendar:
chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.jjay.cuny.edu/sites/default/files/2024-10/Spring-2025-Academic-Calendar.pdf

I will email you before classes if there is a reschedule or class change based on the academic calendar.

Tentative schedule

date	content	note
Jan 27	Intro to Python	Python basic and Data science basic
Feb 3, 5	Variables, expression	
Feb 10	Conditions and loops	
Feb 12	Function and Recursion	
Feb 19	String, Lists	
Feb 24, Feb 26	Tuple, Set, Dictionary	
Mar 3	Files and Exceptions	Structuring Programs and

Mar 5	Object Oriented Programming	Analysis
Mar 10, Mar 12	Class	
Mar 17, 19	Algorithms	
Mar 24	Modules	
Mar 26, Mar 31	Numpy	
Apr 2, Apr 7, Apr 9	Midterm	
Apr 14	DataFrame, Statistics	Data and Statistics
Apr 16, Apr 21	Transforming, Grouping	
Apr 23	Randomness, Sampling	
Apr 28, Apr 30	Hypothesis Testing, Estimation	
May 5, May 7	Intro to ML, classification and regression	ML
TBD	Final Exam	

7 Course Outcomes:

Students should be able to:

1. Understand and apply basic computational thinking to solve problems
2. Build basic programs for data analysis using python and the python ecosystem
3. Understand and apply basic inferential thinking
4. Combine inferential and computational thinking to analyze and use data to solve problems

8 Other Notices

8.1 Academic Integrity

https://www.jjay.cuny.edu/about/governance-senior-leadership/academic-affairs/academic-integrity-office
chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://johnjay.jjay.cuny.edu/files/cunypolicies/JohnJayCollegePolicyofAcademicIntegrity.pdf

8.2 Disability-Related Accommodations

Please let me know if you need any accommodations, following
https://www.jjay.cuny.edu/student-life/wellness-center/accessibility-services

9 Zoom meeting:

Yunhua Zhao is inviting you to a scheduled Zoom meeting.

Topic: Yunhua Zhao's Zoom Meeting
Time: May 29, 2024 05:45 PM Eastern Time (US and Canada)
Every week on Mon, Wed, until Jul 3, 2024, 11 occurrence(s)
May 29, 2024 05:45 PM
Jun 3, 2024 05:45 PM
Jun 5, 2024 05:45 PM
Jun 10, 2024 05:45 PM
Jun 12, 2024 05:45 PM
Jun 17, 2024 05:45 PM
Jun 19, 2024 05:45 PM
Jun 24, 2024 05:45 PM
Jun 26, 2024 05:45 PM
Jul 1, 2024 05:45 PM
Jul 3, 2024 05:45 PM
Please download and import the following iCalendar (.ics) files to your calendar system.
Weekly:
https://ccny.zoom.us/meeting/tZEpduigqDIrH9xt-xdegQS51aFCphj5_xvW/ics?icsToken=98tyKuGtqjorEtKcsRyPRpwMBoj4d_zwplhcgvpFiFL9ByVUUzCjZ-NkEaJ3Go3v

Join Zoom Meeting
https://ccny.zoom.us/j/85411869158?pwd=yIMaMuYMQ4JaFuuyflqF91pae5JLpB.1

Meeting ID: 854 1186 9158
Passcode: 943431

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+16469313860,,85411869158#,,,,*943431# US

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• +1 646 931 3860 US
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• +1 305 224 1968 US
• +1 253 205 0468 US
• +1 253 215 8782 US (Tacoma)
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Passcode: 943431

Find your local number: https://ccny.zoom.us/u/kcoit1jidS