Syllabus
Projects in Programming & Data Science
TECH-UB 24, Spring 2022
1/24/2022 thru 5/9/2022

Course Information

- When: Tuesdays, 4:55 pm - 7:30 pm
- Where: TBA

Professor Information

- Prof. Alex Siegman
- Email: alex.siegman@nyu.edu
- Office: n/a
- Office Hours: By appointment

Teaching Fellow

- TF: TBA
- Email: TBA

Course Description

This course is intended for students who are already familiar with programming in Python and SQL and want to apply this knowledge to a topic of their interest.

In the first half of the semester this course will follow a cadence whereby each class meeting will begin with a lecture, and will end with students practicing that which they have learned during the lecture.

The second half of the semester will focus entirely on the students' final project. The goal of students' final projects will be to build an end-to-end data solution to an identified business problem.

Students are highly encouraged to talk to their classmates and the instructor about the evolution of their own project and get feedback on what techniques, technologies, and datasets would be helpful to move the project forward. That said, we will attempt to address the following topics throughout the semester:

- Data Science in Business

The first class will cover how to identify opportunities to leverage Data Science in business and how to pitch solutions to those opportunities to senior stakeholders.

- Web API's

  Web APIs are a critical component of accessing data from 3rd parties, whether they be other companies, government agencies, or open-source databases. Students should leave this lesson knowing:

  - What a Web API is,
  - How to retrieve and process data via a Web API,
  - How to schedule a pull job from a Web API

- Regular Expressions

  Regular Expressions are like the Command+F of data science, but with far more flexibility and utility. Students should leave this lesson knowing:

  - How to use regular expressions to extract data from a source,
  - How to use regular expressions to prepare and clean data

- Web Crawling

  Similar to Web APIs, Web Crawling is another way to garner information from the web and pull it into a database. Students should leave this lesson knowing:

  - How to parse an RSS feed using BeautifulSoup,
  - How to identify and parse desired content from an HTML page

- Descriptive Data Analysis

  It's one thing to have data in a database, but just as (if not more) important is to tell a story with that data. Students should leave this lesson knowing:

  - How to leverage Python's Pandas library to:
    - Read data from a variety of sources,
    - Manipulate data,
    - Clean and prepare data for analysis,
    - Conduct a time-series analysis,
    - Work with spatial data

- Text Mining

Text Mining (Natural Language Processing, in particular) takes Regular Expressions to the next level, allowing you to not only read, but "understand" text pulled from the web. Students should leave this lesson knowing:

    - How to leverage NLP (Natural Language Programming) to identify and parse desired content from a variety of sources

- Data Visualization

  Oftentimes data visualization is a great way to tell the story of your data. Students should leave this lesson knowing:

    - How to map and visualize data to tell a story

- Building a Data-Driven Website

  Last but not least, we will use Flask to build a data-driven website that pulls information from a backend database for real-time querying by a user.

Prerequisites

Students should have taken INFO.UB.0023 (Introduction to Programming for Data Science), or have equivalent experience. Please note that this is NOT an introductory course.

Grading

- 75% – Final project
- 20% – Assignments
    - *Assignments are pass/fail. Students who fail an assignment may resubmit for 50% credit.
- 5% – Participation

Please note that assignments will be communicated no later than 24 hours after each class, and will be due before 4pm prior to the following class.

Late Assignment Submission Policy

Students will incur a 3% penalty on their grade for each day an assignment is late. After 7 days, an assignment will receive a 0.

Exceptions will be considered for health reasons or other major life events on a case-by-case basis.

Grading FAQ

Q: What is the likely grade distribution?

A: Students can expect roughly 50% A/A-'s with the rest being B+/B's and, in some cases, Cs'.

Q: How is the class graded?

A: I expect most students to do well in the assignments. Assignments are mainly for practice, and to help you better understand the material. As expected by the name of the class, the majority of your grade depends on the project. Projects are roughly rank-ordered whereby the top projects get an A, and the worst projects get B's. In some cases, projects may receive a C if students do not meet expectations.

Q: How do you grade the projects?

A: Projects are stack-ranked based on a combination of factors. There is also a peer-evaluation component.

Attendance, Religious Observances and Other Absences

NYU's Calendar Policy on Religious Holidays states that members of any religious group may, without penalty, absent themselves from classes when required in compliance with their religious obligations. You must notify me in advance of religious holidays or observances that might coincide with exams, assignments, or class times to schedule mutually acceptable alternatives. Students may also contact religiousaccommodations@nyu.edu for assistance.

NYU Stern is committed to ensuring an equitable educational experience for all students regardless of identity or circumstances and strives to recognize the obligations its students have outside of Stern. Please review all class dates at the start of the semester and review all course requirements to identify any foreseeable conflicts with exams, course assignments, projects, or other items required for participation and attendance. If you are aware of a potential conflict, please contact me as soon as possible to discuss any potential conflicts to determine whether/how they can be accommodated.

Student Accessibility

If you will require academic accommodation of any kind during this course, you must notify me at the beginning of the course (or as soon as your need arises) and provide a letter from the Moses Center for Student Accessibility (212-998-4980, mosescsa@nyu.edu) verifying your registration and outlining the accommodations they recommend. For more information, visit the CSA website: https://www.nyu.edu/students/communities-and-groups/student-accessibility.html

Student Wellness

Classes can get stressful. I encourage you to reach out if you need help. The NYU Wellness Exchange offers mental health support. You can reach them 24/7 at 212 443 9999, or via the "NYU Wellness Exchange" app. There are also drop in hours and appointments. Find out more at:
http://www.nyu.edu/students/health-and-wellness/counseling-services.html

Name Pronunciation and Pronouns

NYU Stern students now have the ability to include their pronouns and name pronunciation in Albert. I encourage you to share your name pronunciation and pronouns this way. Please utilize this link for additional information: Pronouns & Name Pronunciation

Inclusion Statement

This course strives to support and cultivate diversity of thought, perspectives, and experiences. The intent is to present materials and activities that will challenge your current perspectives with a goal of understanding how others might see situations differently. By participating in this course, it is the expectation that everyone commits to making this an inclusive learning environment for all.