Honors 1000: Productive Data Manipulation in Python and SQL
Mondays 9.30 to 10.20, Room 223, 100 Auburn

Fall 2022

Course Syllabus

Instructor

Raj Sunderraman, Professor of Computer Science (raj@gsu.edu)
Office Location: Room 629, 1 Park Place
Office Hours: 11 to Noon on Mondays; or by appointment (send me an email)

Course Description

An introduction to the basics of creating and maintaining data and generating reports from data using computer programming and relational databases. Students will learn how to write code in Python and SQL to perform data manipulation tasks to increase productivity. Basics of Data Science practices and approaches will be covered.

Learning Outcomes

1. The student will be able to write short Python programs to read data from a variety of formats, perform calculations and generate output. The student will also be able to compute various statistical measures, aggregations, and summaries of data as well as visualize the data.
2. The student will be able to create and maintain a relational database in MySQL. They will also be able to write SQL queries to extract relevant data from the database and perform analysis as well as generate reports.

College to Career Competencies

The course addresses the following identified competencies:

Critical Thinking/Problem Solving:
        Mine and analyze data, Analyze visual data

Teamwork/Collaboration
        Collaborate in team-project, participate in collaborative writing

Digital Technology
        Design creative digital solutions, translate data

Prerequisite

None

Textbooks and Course Materials

There will be no required textbook. We will use the following online tutorials and tools from the Web:

1. https://www.learnpython.org/
2. https://www.tutorialspoint.com/sql/index.htm
3. https://pypi.org/project/beautifulsoup4/

Schedule

<u>Weeks 1-5 (Python)</u>

Python Basics – Literals, Variables, Expressions, Assignment Statement
Python Data Types/Structures - Strings, Lists, Sets, and Dictionaries
Conditional Statement, For Loop, While Loop
Functions
Beautiful Soup (Python HTML/XML Scraper Library) – if time permits and needed
2 programming assignments

<u>Weeks 6-10 (Relational Databases and SQL)</u>

Relational Database Concepts
SQL – Data Definition (create table/drop table)
SQL – Data Manipulation (insert/delete/update)
SQL – Querying
MySQL
2 assignments

<u>Weeks 11-14 (Project Discussions and Presentations)</u>

Groups of 2-4

<u>Participate in the Life of the Honors College</u> Attend co-curricular programs offered in the Honors College, for example our Lunch and Learn, Dine and Discover, and Research Essentials series, as well as guest speakers and co-sponsor events. Submit a short one or two paragraph summaries of what you learned in at least 3 events.

Grading

4 programming assignments   40 points
Project (groups of 2 to 4)   40 points
Attendance/Participation   20 points (10 for attendance and 10 for Summaries)

S Grade: >= 80
U Grade: < 80