Welcome!

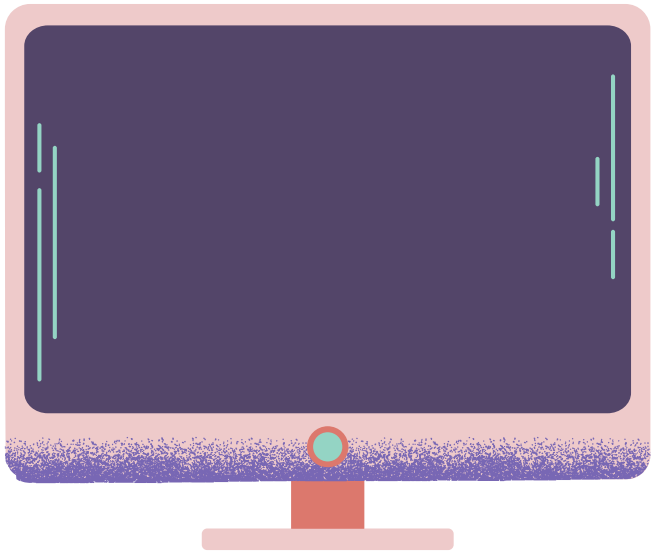
CMPSC 105 – Data Exploration

ALLEGHENY COLLEGE

Agenda for today

- Introductions: Getting to know me
- Course overview and expectations
- Class Survey: Getting to know you

The basics



Instructor: Hang Zhao

Office: Quigley Hall 208 & Alden Hall 105

Email: hzhao@allegheny.edu

Office hours:

T/Th 11:00am-12:30pm. Location: Alden Hall 105

w 10:00am-1:00pm. Location: Virtual

By appointment at https://calendar.app.google/PD6Ku9PSCZ716K5D7

A little about me

Visiting Assistant Professor
- Dep of Computer and Information Science

Education:
- **University of Connecticut**
- Doctor of Philosophy, Agricultural and Resource Economics
- **Boston University**
- Master of Science in Actuarial Science
- **University of Colorado**
- Bachelor of Arts, Major in Economics, Minor in Mathematics

Research Interests:
- Drug policies, the well-being of older adults, nutrition and health outcomes

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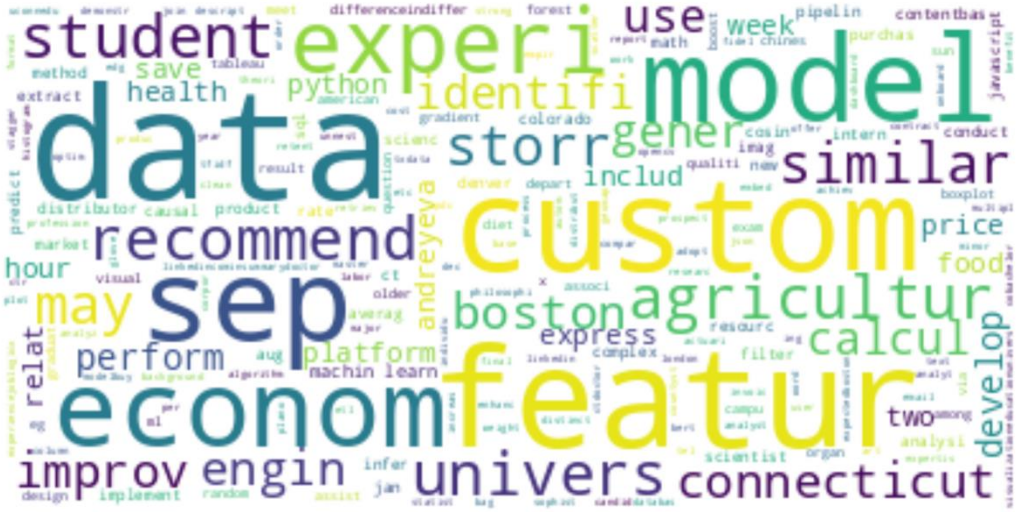
Resume



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OK

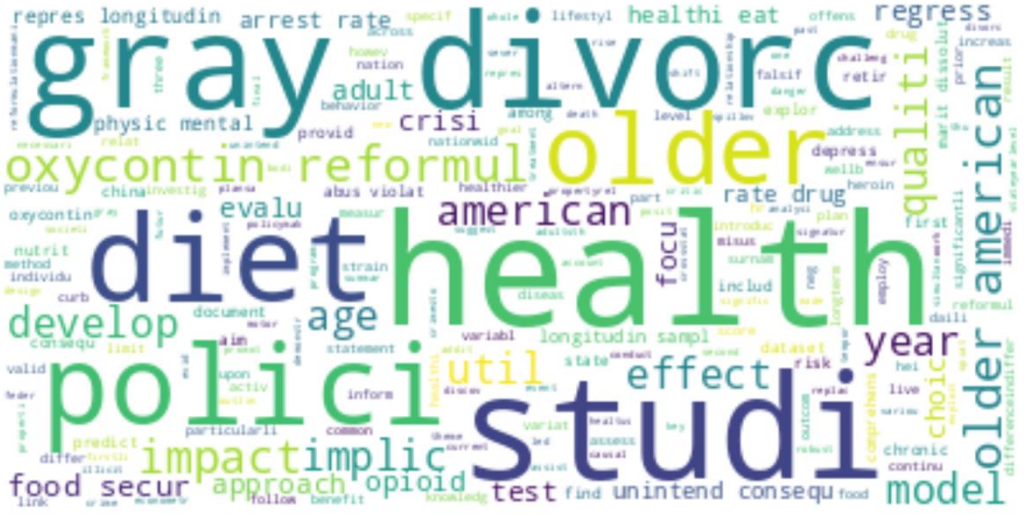
You Have A New Messages!

OK READ

OK

LOADING...

Research Statement



You Have A
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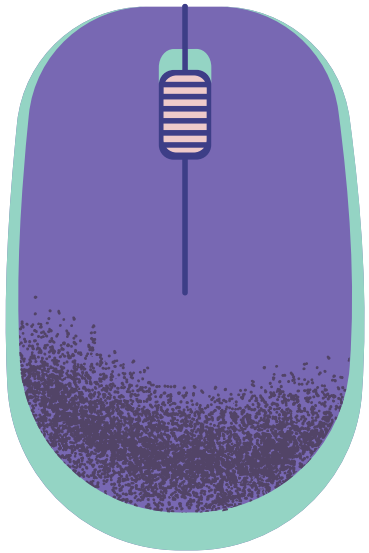
OK

OK



Course overview and expectations

What is this course about?

This course is for anyone interested in becoming familiar with:

- data display
- data gathering
- data analysis
- data storytelling

Learning Outcomes and Objectives

Objective 1: Identify and describe key elements in different types of data visualizations..

Objective 2: Visualize data on web-based platforms.

Objective 3: Develop hypotheses and find data to address hypotheses.

Objective 4: Calculate statistics and visualize key patterns in the data with Python.

Objective 5: Document data explorations in markdown.

Class Structure

- Lectures
- Activities
- Lab Assignments

classDocs/

- First stop for all materials
- Syllabus
    - Attendance
    - Tokens Policy
    - Using Artificial Intelligence
- Lecture slides

classDocs/ Continued

- GitHub for accessing and submitting assignments
- Google Colab or VScode for completing assignments
- Discord for announcements and participation
- Canvas for grades

Assessment

- Class Participation and Activities (30%)
- Lab Assignments (50%)
- Final Project (20%)

Course grades will approximately fall into the following ranges: A (93%), A- (90%), B+ (87%), B (83%), B- (80%), C+ (77%), C (73%), C- (70%), D+ (67%), D (63%), F(60%).

Other Syllabus Highlights

- Participation is a major part of participation (30% of overall grade)
- Participation includes:
  - Completing group work/activities
  - Quizzes on readings and other class materials
- Four tokens grant automatic extensions for one week
- After the first week, 2 absences will be excused before overall grade is impacted
  - three lates are equivalent to an absence

How to do well

- Attend lectures
- Come to office hours
- Study with your peers

Class Survey: Who are you?

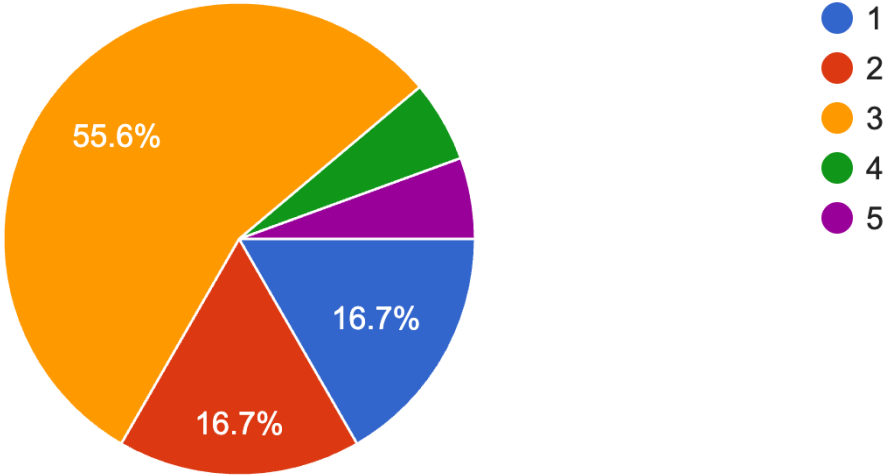
Class Survey

Name, where you are from, favorite sport, and some of your current favorite foods?

Class Survey: Who are you?

How comfortable are you in using Python programming languages? 1 = not comfortable, 5 = very comfortable

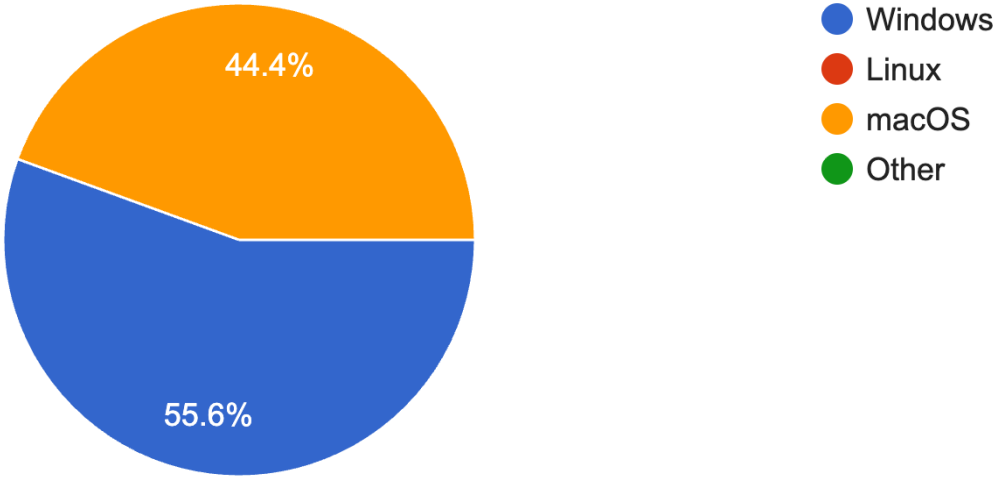
18 responses



Class Survey: Who are you?

What operating system do you primarily use?

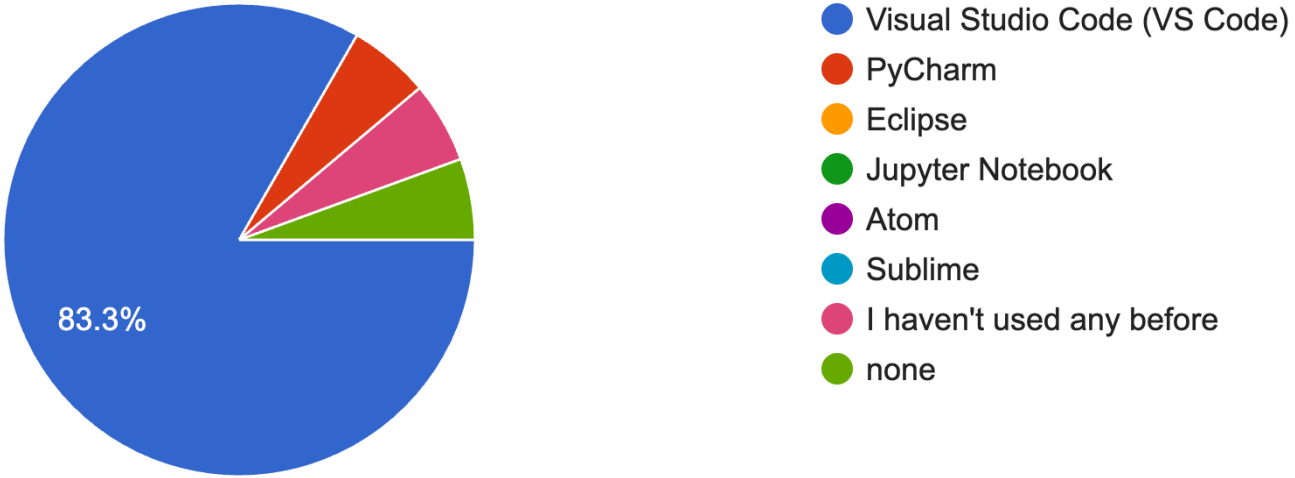
18 responses



Class Survey: Who are you?

What is your primary Integrated Development Environment (IDE) for programming?

18 responses



Setting Up

- bookmark the website
- bookmark the 105 Discord Channel
- bookmark notes that you take in Google Colab or elsewhere
- bookmark Canvas
- etc.

Google Colab

What is Google Colab?

- A cloud-based Jupyter Notebook environment from Google.
- No installation required, you just need a web browser and a Google account

How to Get Started

- Go to **colab.research.google.com** in your browser.
- Sign in with your Google account.
- Click **File → New notebook** to create a new Python notebook.
- Run code cells by clicking the play icon or pressing *Shift* + *Enter*.
- Save and exit. The .ipynb file will be saved in Google Drive under My Drive → Colab Notebooks.

Google Colab

Activity 01

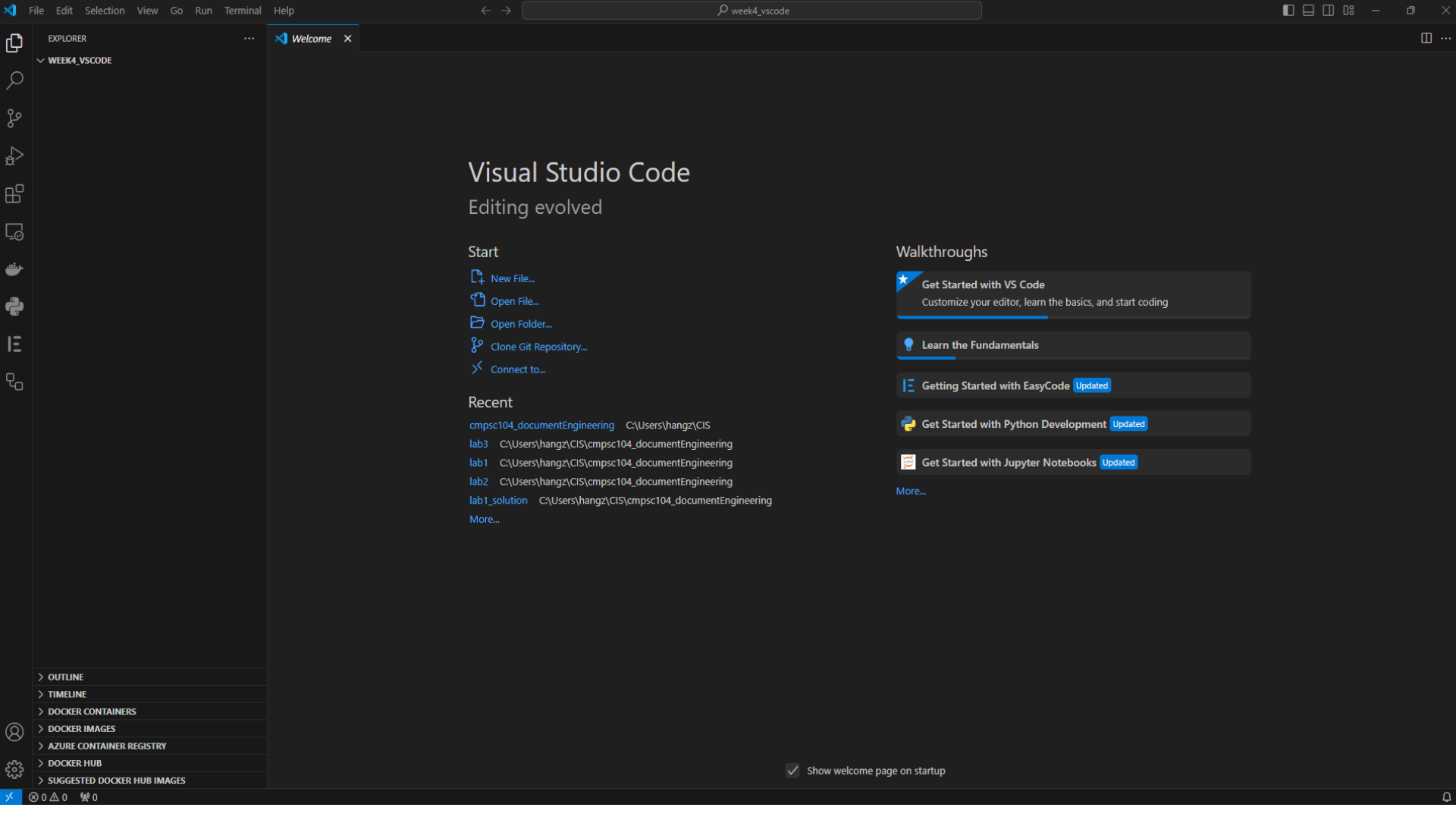
Visual Studio Code (VSCode)

A lightweight but powerful source code editor, a free code editor

- Cross-platform compatibility: available on Windows, macOS, and Linux.
- Extensive language support: JavaScript, Python, HTML, C++, C#, Java
- Rich extension ecosystem
- Integrated Git support: Directly manage your Git repositories within the editor.
- Debugging tools
- Built-in terminal

Setting up Visual Studio Code

- Download and install VS Code: https://code.visualstudio.com/download
- Verify VSCode Installation:
- Execute `code --version` in Command Prompt (CMD)/Terminal to confirm your VSCode installation.


File Edit Selection View Go Run Terminal Help
week4_vscode
EXPLORER
WEEK4_VSCODE
Welcome
Visual Studio Code
Editing evolved
Start
New File...
Open File...
Open Folder...
Clone Git Repository...
Connect to...
Recent
cmpsc104_documentEngineering C:\Users\hangz\CIS
lab3 C:\Users\hangz\CIS\cmpsc104_documentEngineering
lab1 C:\Users\hangz\CIS\cmpsc104_documentEngineering
lab2 C:\Users\hangz\CIS\cmpsc104_documentEngineering
lab1_solution C:\Users\hangz\CIS\cmpsc104_documentEngineering
More...
Walkthroughs
Get Started with VS Code
Customize your editor, learn the basics, and start coding
Learn the Fundamentals
Getting Started with EasyCode Updated
Get Started with Python Development Updated
Get Started with Jupyter Notebooks Updated
More...
Show welcome page on startup
OUTLINE
TIMELINE
DOCKER CONTAINERS
DOCKER IMAGES
AZURE CONTAINER REGISTRY
DOCKER HUB
SUGGESTED DOCKER HUB IMAGES

Setting Up Virtual Environment

- Create a project directory

```
mkdir projects
cd projects
```

- Create virtual environment using Python

```
python3 -m venv myenv
# see the file tree
find . -not -path '*/\.*'
```

- Activate myenv the virtual environment

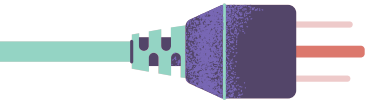
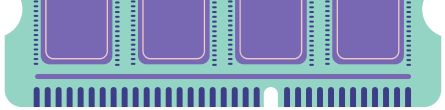
```
source myenv/bin/activate  # macOS/Linux
myenv\Scripts\activate     # Windows
```

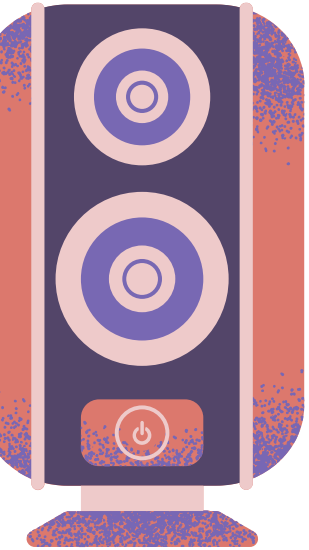
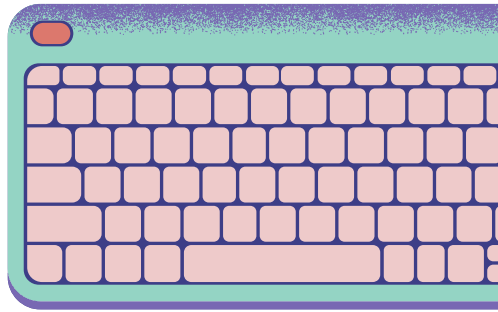
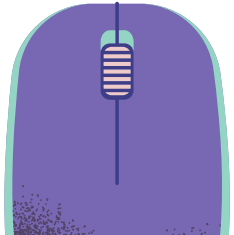
- Install Dependencies

```
pip install matplotlib
pip install numpy
```

Today's Lab

– Set up GitHub & Discord
– Practice Lab

THANKS