# DATA203 Foundational Python (Prof. Maull) / Fall 2025 / HW1

| Points Possible | Due Date | Time Commitment (estimated) |
|---|---|---|
| 10 | Friday, September 19 @ midnight | *up to* 15 hours |

- **GRADING:** Grading will be aligned with the completeness of the objectives.
- **INDEPENDENT WORK:** Copying, cheating, plagiarism and academic dishonesty *are not tolerated* by University or course policy. Please see the syllabus for the full departmental and University statement on the academic code of honor.

## OBJECTIVES

- Explore JupyterHub Python *shell* commands inside cells
- Understand and use dictionaries for complex data.

## WHAT TO TURN IN

You are being encouraged to turn the assignment in using the provided Jupyter Notebook. To do so, make a directory in your Lab environment called `homework/hw1`. Put all of your files in that directory. Then zip or tar that directory, rename it with your name as the first part of the filename (e.g. `maull_hw1_files.zip`, `maull_hw1_files.tar.gz`), then download it to your local machine, then upload the `.zip` to Canvas.

If you do not know how to do this, please ask, or visit one of the many tutorials out there on the basics of using zip in Linux.

If you choose not to use the provided notebook, you will still need to turn in a `.ipynb` Jupyter Notebook and corresponding files according to the instructions in this homework.

## ASSIGNMENT TASKS

**(0%) Explore JupyterHub Python *shell* commands inside cells**

In the last time we learned to run the terminal console commands in JupyterLab, which is a great way to perform command-line tasks and is an essential tool for basic scripting that is part of a data scientist's toolkit. Last time we used a terminal console in the lab environment this time we familiarize ourselves with Jupyter *shell* escape commands **within** a notebook.

Study:

- Python Data Science Handbook: IPython and Shell Commands

for full documentation on *shell* … they are **very** useful!

**§ Task: Use Jupyter *shell* commands to perform the same commands as last time.**

Basic file operations go a long way to understand the way Linux works. In this part, you will understand folders, files and making revisions to a file. These files will be visible within Jupyter, which makes moving from one platform to another seamless. We will create a folder, file and make edits.

- type `!mkdir your_folder_name` to create a folder in filesystem *in the current folder where you are*
- create a file by type `touch README.md` the `touch` command creates a file if it does not already exist, otherwise it will change the timestamp of that file when it is "touched"
- edit the file in Jupyter with the text editor
- to see the contents of your file typing `!cat README.md`

**§ Task: Use *shell* command `wget` to quickly obtain remote files in Linux**

As before get a remote file this time it will be from the Internet Archive:

- in a cell type `!wget https://ia801306.us.archive.org/15/items/fouraddressesats00howa/fouraddressesats00howa`

- execute the cell
- verify the file was retrieved by opening it

**(100%) Understand and use dictionaries for complex data.**

We learned in lecture that function are necessary tools in Python.

I have provided a starter notebook for you to use, which will greatly enhance you ability to complete the assignment. See that in the folder here. The name of the notebook is `hw1/hw1_starter.ipynb`:

- https://github.com/kmhuads/f25_data203/tree/main/hw1/hw1_starter.ipynb

Look at this file and see what is in it – use it since in the notebook are some scaffolding code. You will need to study it and use it in the solutions being asked.

We learned in lecture that dictionaries are very flexible data structures in Python. The assignment will focus on the dictionary mapping type.

**§ Task: Use the starter notebook and answer write the Python code required to complete it.**