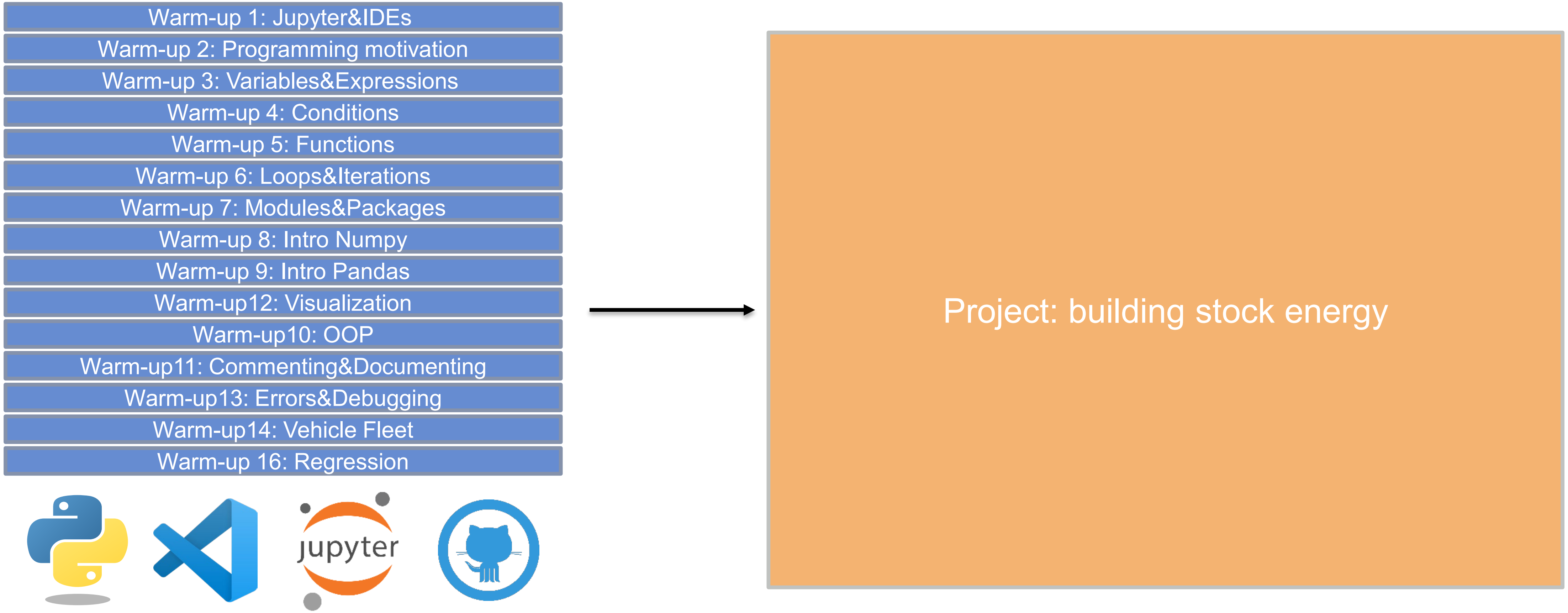
TEP4290 Introduction to exercises

Tools, Warm-ups, solution-oriented approach



Warm-up 1: Jupyter&IDEs

Warm-up 2: Programming motivation

Warm-up 3: Variables&Expressions

Warm-up 4: Conditions

Warm-up 5: Functions

Warm-up 6: Loops&Iterations

Warm-up 7: Modules&Packages

Warm-up 8: Intro Numpy

Warm-up 9: Intro Pandas

Warm-up12: Visualization

Warm-up10: OOP

Warm-up11: Commenting&Documenting

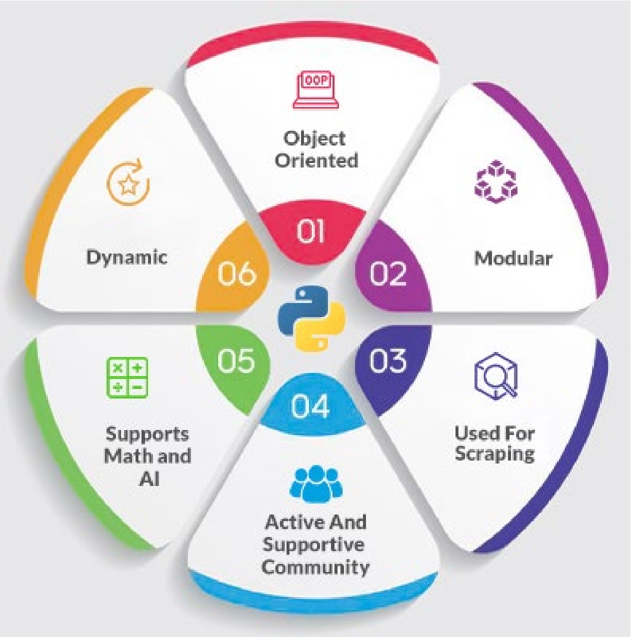
Warm-up13: Errors&Debugging

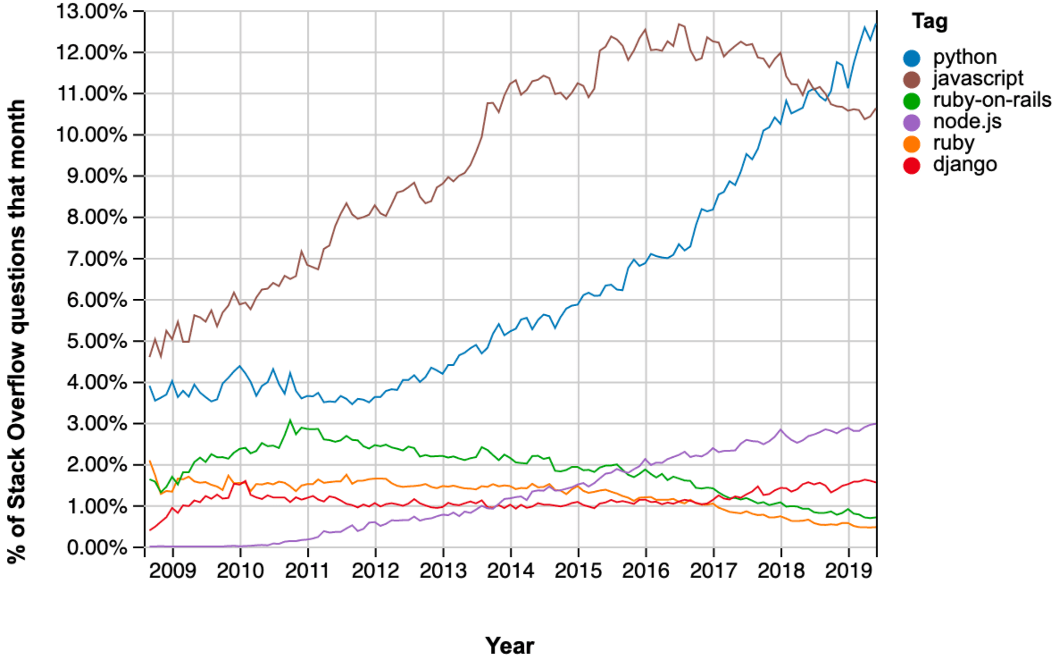
Warm-up14: Vehicle Fleet

Warm-up 16: Regression

Project: building stock energy

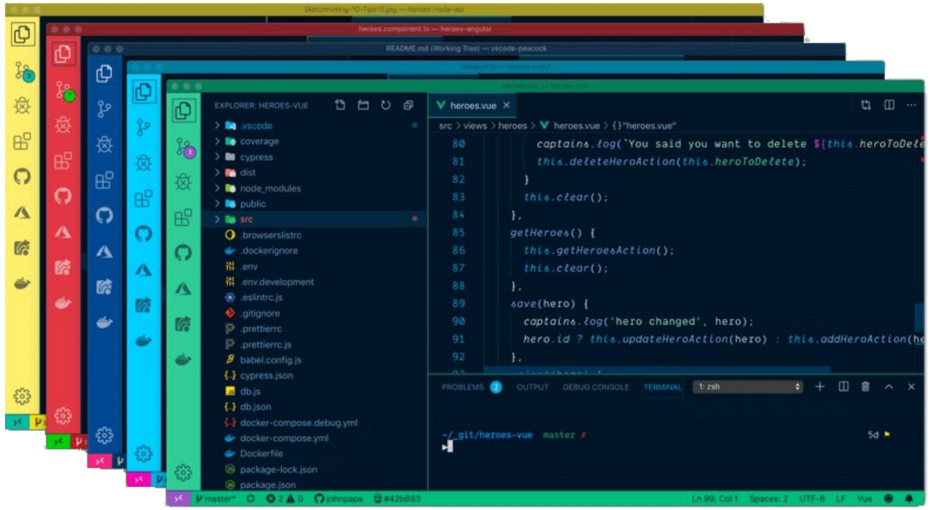
The tools we use





The tools we use

Popular, flexible, free, somewhat open-source, tons of plugins

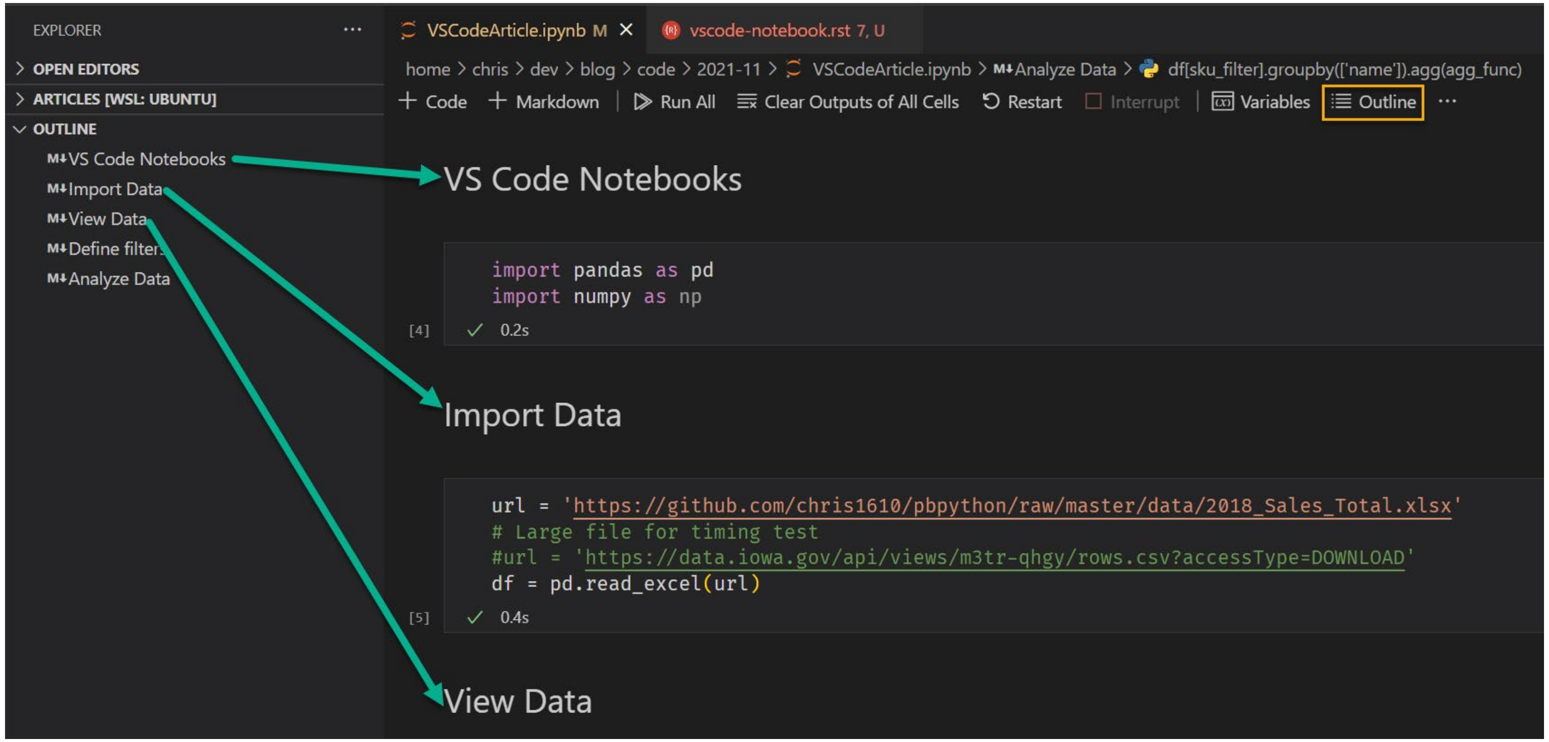


```
        captains.log(`You said you want to delete ${this.heroToDele
        this.deleteHeroAction(this.heroToDelete);
      }
      this.clear();
    },
    getHeroes() {
      this.getHeroesAction();
      this.clear();
    },
    save(hero) {
      captains.log('hero changed', hero);
      hero.id ? this.updateHeroAction(hero) : this.addHeroAction(he
    },
```

```
~/_git/heroes-vue  master ✗                                    5d
```

The tools we use

Organized, easy to use, great for presenting



VS Code Notebooks

```
import pandas as pd
import numpy as np
```

[4] ✓ 0.2s

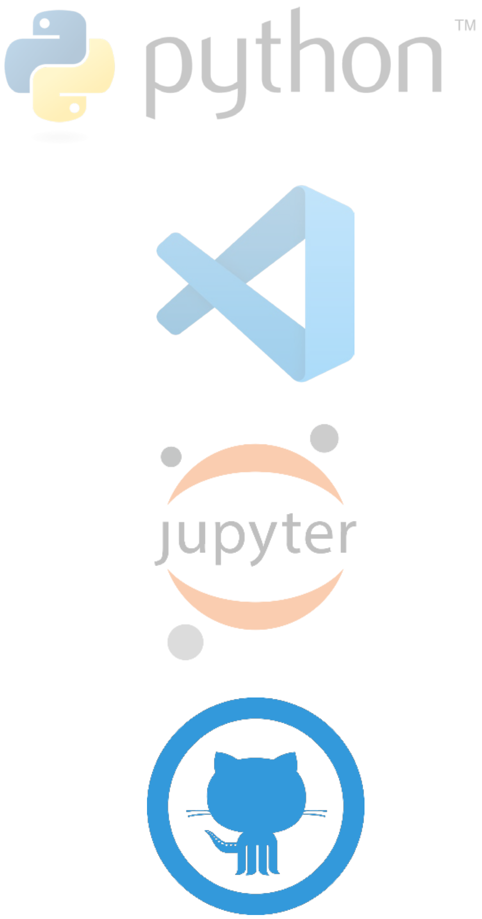
Import Data

```
url = 'https://github.com/chris1610/pbpython/raw/master/data/2018_Sales_Total.xlsx'
# Large file for timing test
#url = 'https://data.iowa.gov/api/views/m3tr-qhgy/rows.csv?accessType=DOWNLOAD'
df = pd.read_excel(url)
```

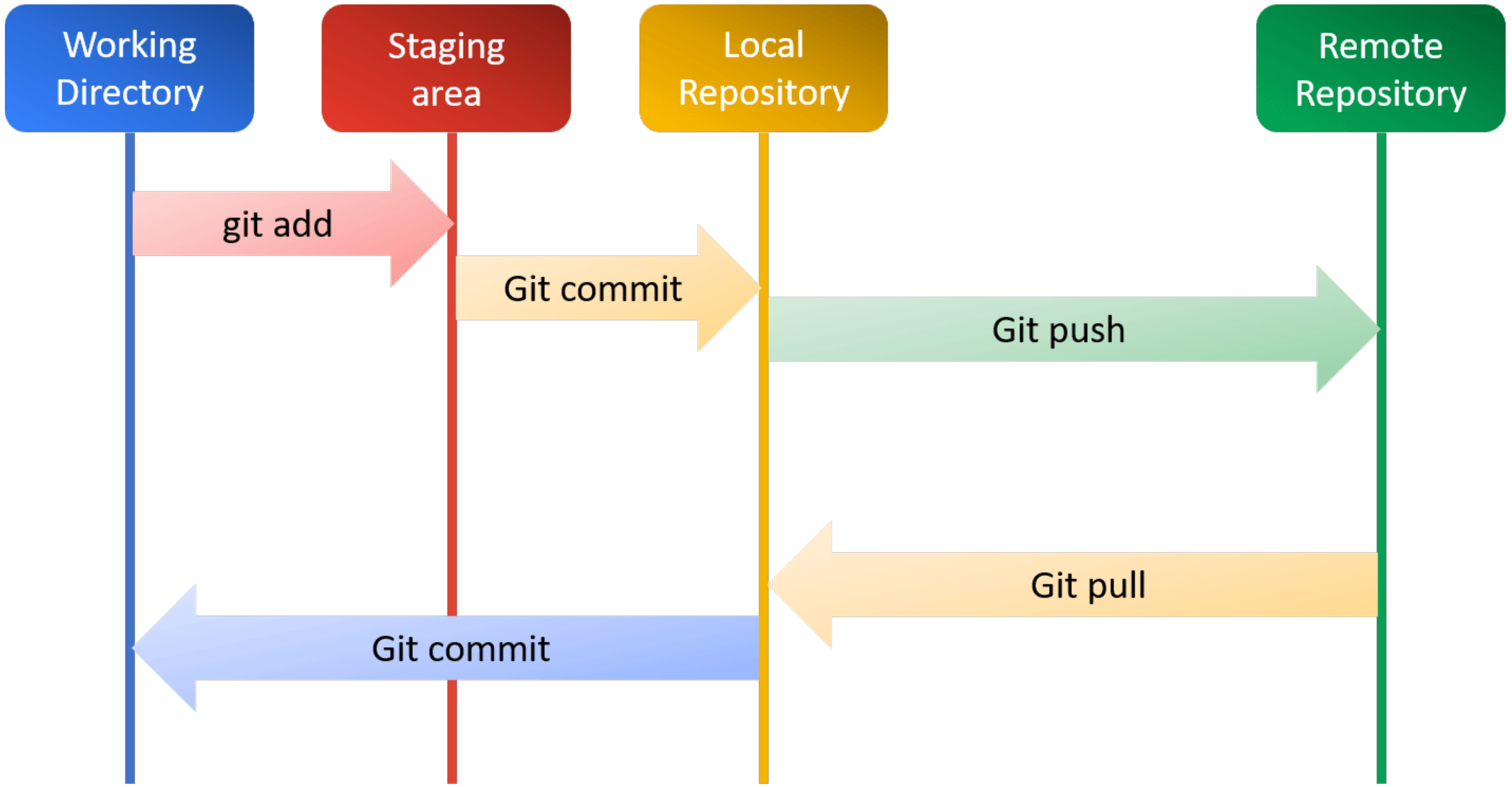
[5] ✓ 0.4s

View Data

The tools we use



Version control tool #1, open source, flexible



Working Directory

Staging area

Local Repository

Remote Repository

git add

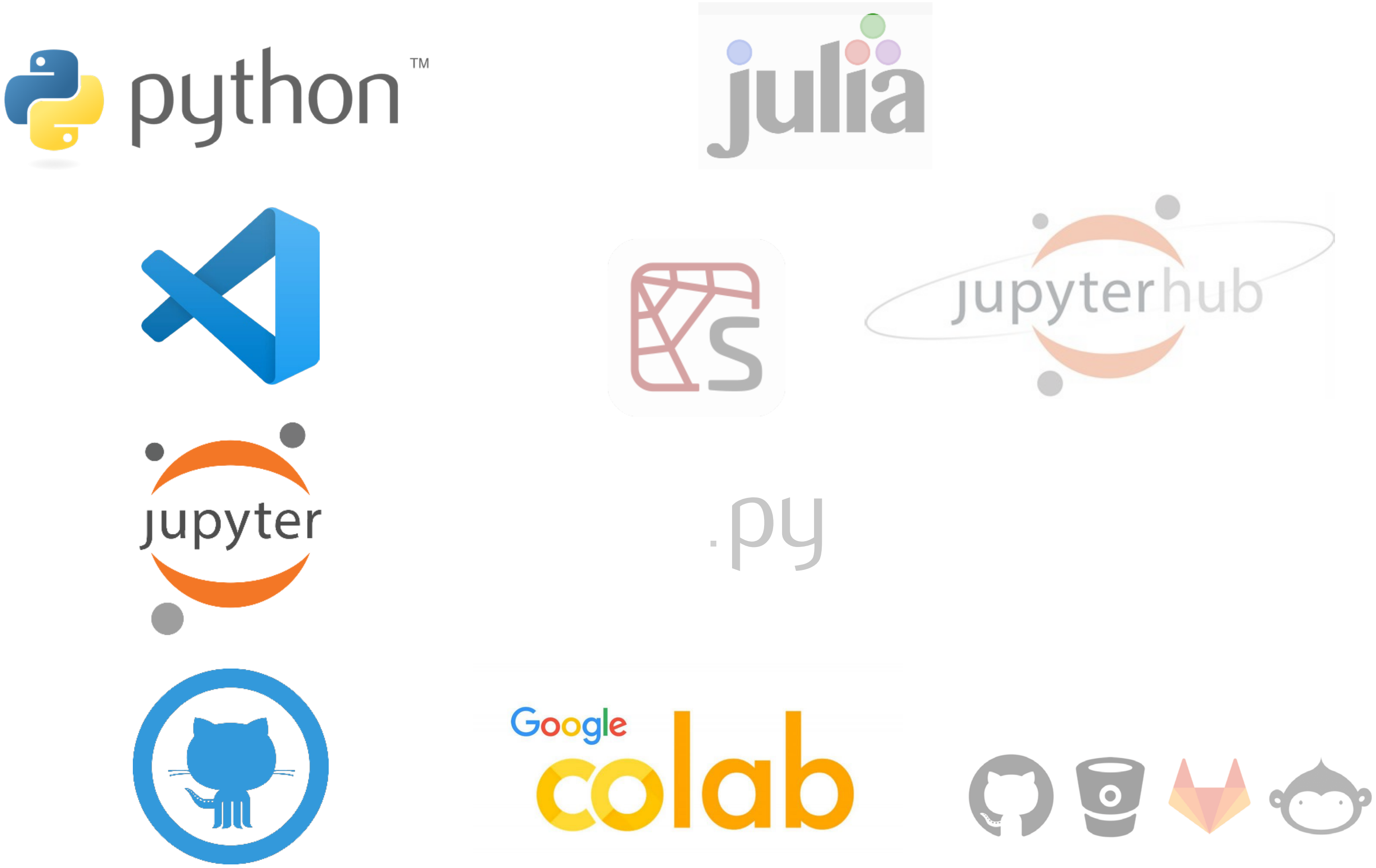
Git commit

Git push

Git pull

Git commit

The tools we use



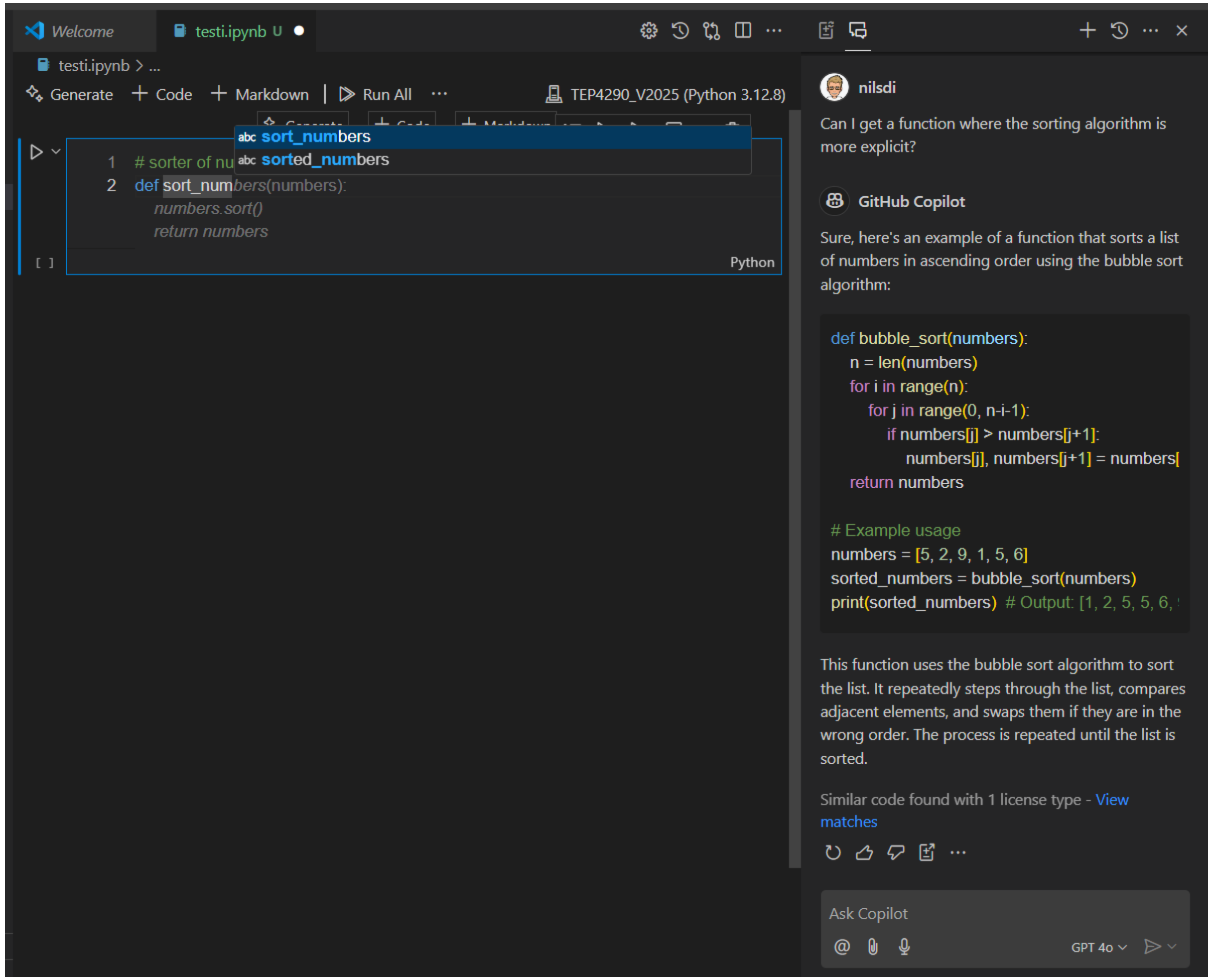
If you find others, let us know!

Generative AI in class: Copilot > ChatGPT

Use of GitHub Copilot

- Preferably in combination with a linter/formatter
- Helpful with inline suggestions and
- Chat function
- Cannot replace understanding what code does (but help with it)

=> We encourage the use, especially instead of asking us!



```
# sorter of nu
def sort_numbers(numbers):
    numbers.sort()
    return numbers
```

nilsdi

Can I get a function where the sorting algorithm is more explicit?

GitHub Copilot

Sure, here's an example of a function that sorts a list of numbers in ascending order using the bubble sort algorithm:

```
def bubble_sort(numbers):
    n = len(numbers)
    for i in range(n):
        for j in range(0, n-i-1):
            if numbers[j] > numbers[j+1]:
                numbers[j], numbers[j+1] = numbers[
    return numbers

# Example usage
numbers = [5, 2, 9, 1, 5, 6]
sorted_numbers = bubble_sort(numbers)
print(sorted_numbers)  # Output: [1, 2, 5, 5, 6,
```

This function uses the bubble sort algorithm to sort the list. It repeatedly steps through the list, compares adjacent elements, and swaps them if they are in the wrong order. The process is repeated until the list is sorted.

Similar code found with 1 license type - View matches

Warm-ups

- Warm-up 1: Jupyter&IDEs
- Warm-up 2: Programming motivation
- Warm-up 3: Variables&Expressions
- Warm-up 4: Conditions
- Warm-up 5: Functions
- Warm-up 6: Loops&Iterations

Programming basics

- Warm-up 7: Modules&Packages
- Warm-up 8: Intro Numpy
- Warm-up 9: Intro Pandas
- Warm-up12: Visualization
- Warm-up10: OOP
- Warm-up 11: Commenting&Documenting
- Warm-up 13: Errors&Debugging

Python specific warm-up

- Warm-up 14: Vehicle Fleet

Stock modeling with DSM

- Warm-up 15: Regression

How to extrapolate data

Set-up

Preliminary steps (probably familiar)

1. Install a Python interpreter: Miniconda, Anaconda, Python,…

2. Install + set up Visual Studio Code
   - Install extensions: Jupyter, Python,…

3. Create a conda environment for this course
   - You can wait until you synched via GitHub and use the yaml file we provide – go to the directory with the yaml and run “conda env create -f environment.yml -n env-name“

Set-up

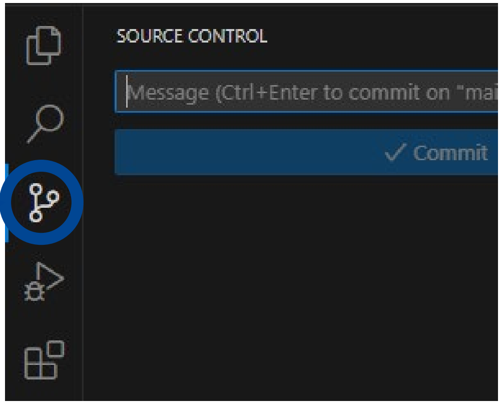
Getting started with Git

1. Create an account/sign in on github

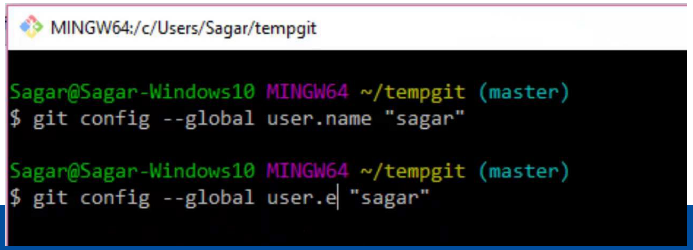
2. Install Git on your computer
   https://github.com/git-guides/install-git

3. Set up Git in VSCode

Go to ‘Source Control’ and follow the instructions



4. Configure Git User and Email (command line)



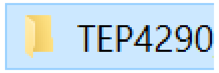
```
Sagar@Sagar-Windows10 MINGW64 ~/tempgit (master)
$ git config --global user.name "sagar"

Sagar@Sagar-Windows10 MINGW64 ~/tempgit (master)
$ git config --global user.e "sagar"
```

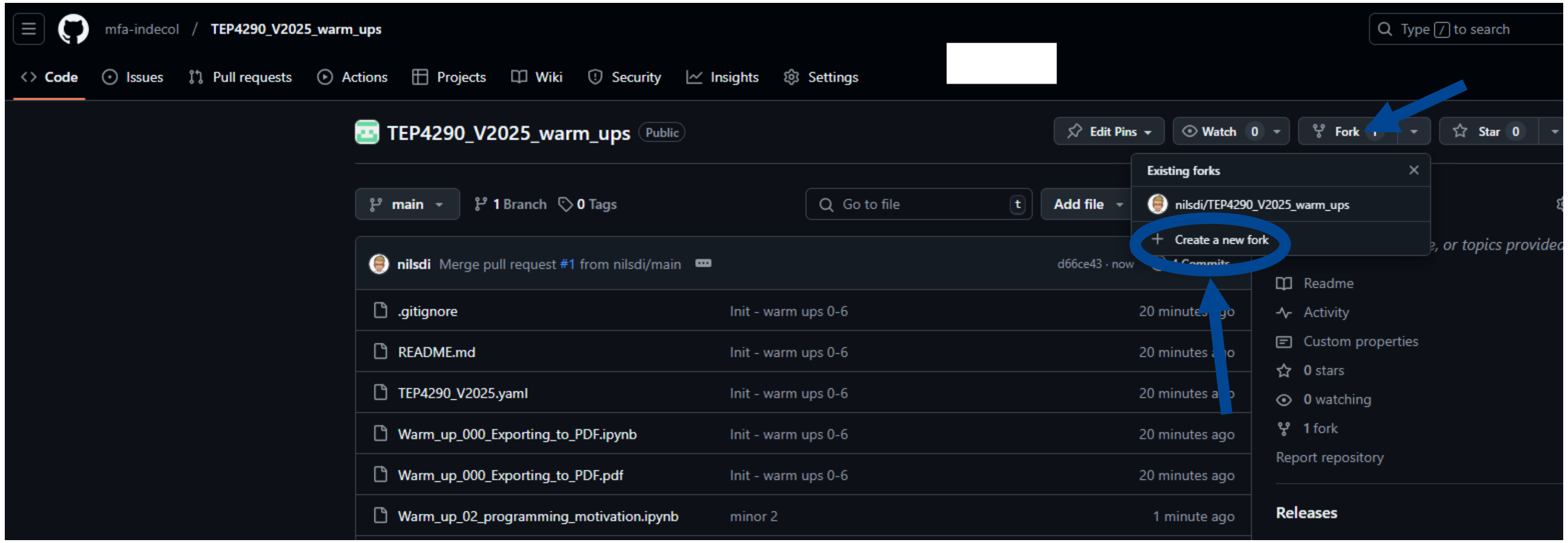
Set-up

Cloning the Warm-ups repository

1. Create a new folder on your computer ‘TEP4290’


TEP4290

2. Go to https://github.com/mfa-indecol/TEP4290_V2025_warm_ups
    1. Fork/create a new fork

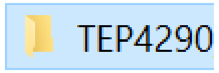


nilsdi Merge pull request #1 from nilsdi/main d66ce43 · now

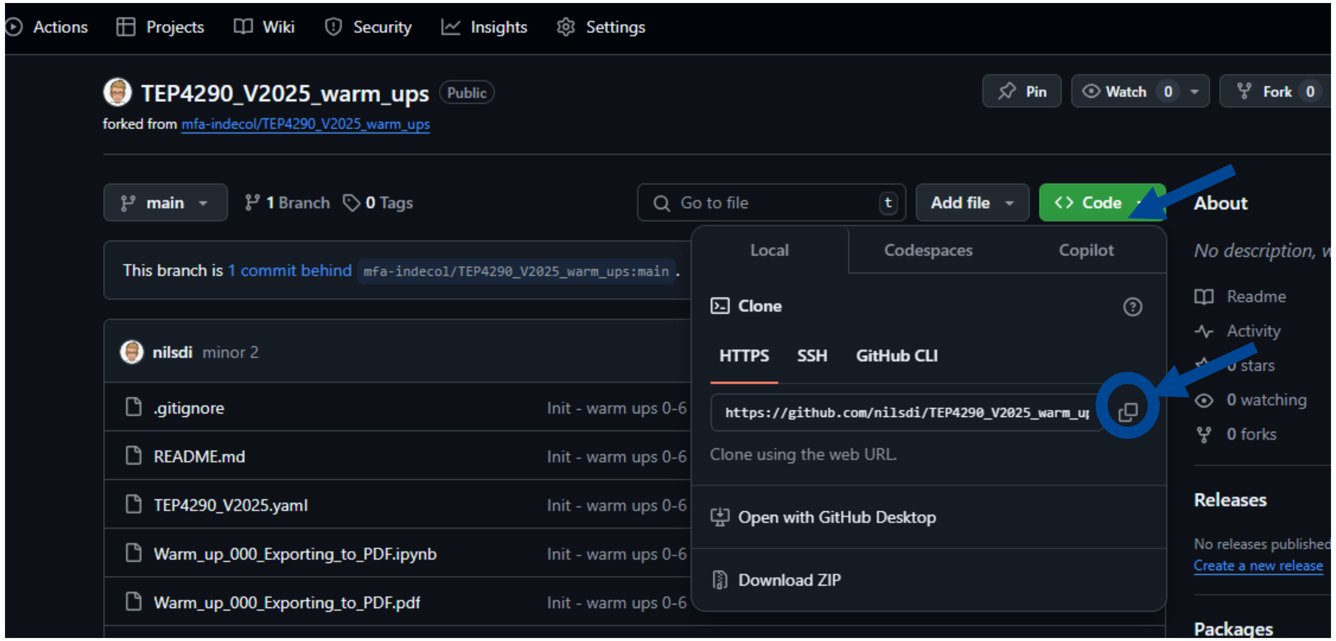
.gitignore	Init - warm ups 0-6	20 minutes ago
README.md	Init - warm ups 0-6	20 minutes ago
TEP4290_V2025.yaml	Init - warm ups 0-6	20 minutes ago
Warm_up_000_Exporting_to_PDF.ipynb	Init - warm ups 0-6	20 minutes ago
Warm_up_000_Exporting_to_PDF.pdf	Init - warm ups 0-6	20 minutes ago
Warm_up_02_programming_motivation.ipynb	minor 2	1 minute ago

Set-up

Cloning the Warm-ups repository



1. Create a new folder on your computer 'TEP4290'
2. Go to https://github.com/mfa-indecol/TEP4290_V2025_warm_ups
   1. Fork/create a new fork
3. Copy the url of your own fork



TEP4290_V2025_warm_ups Public

forked from mfa-indecol/TEP4290_V2025_warm_ups

This branch is 1 commit behind `mfa-indecol/TEP4290_V2025_warm_ups:main` .

nilsdi minor 2

.gitignore	Init - warm ups 0-6
README.md	Init - warm ups 0-6
TEP4290_V2025.yaml	Init - warm ups 0-6
Warm_up_000_Exporting_to_PDF.ipynb	Init - warm ups 0-6
Warm_up_000_Exporting_to_PDF.pdf	Init - warm ups 0-6

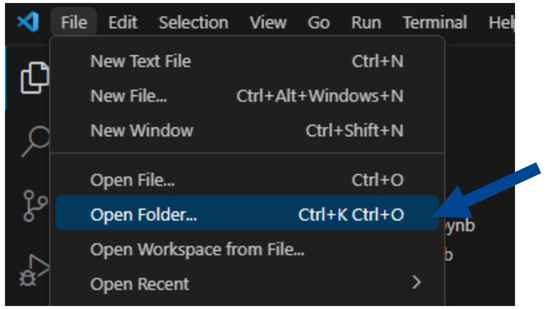
`https://github.com/nilsdi/TEP4290_V2025_warm_u`

Clone using the web URL.

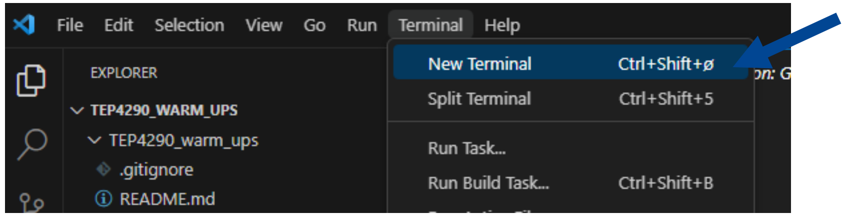
Set-up

Cloning the Warm-ups repository

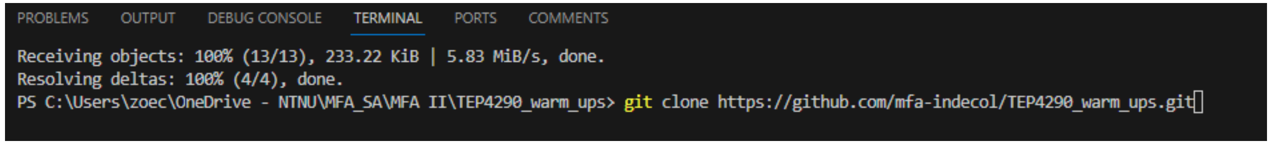
3. In VSCode, open your folder ‘TEP4290’



4. Open New Terminal



5. Write: git clone + [the URL you copied]



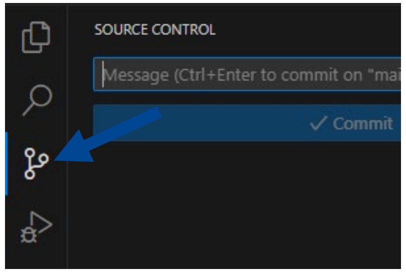
```
Receiving objects: 100% (13/13), 233.22 KiB | 5.83 MiB/s, done.
Resolving deltas: 100% (4/4), done.
PS C:\Users\zoec\OneDrive - NTNU\MFA_SA\MFA II\TEP4290_warm_ups> git clone https://github.com/mfa-indecol/TEP4290_warm_ups.git
```

Et voilà !

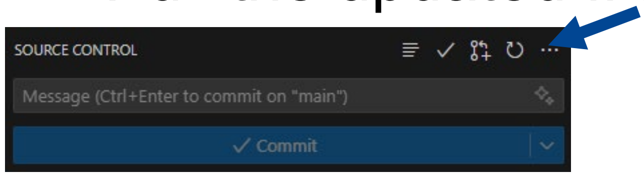
Set-up

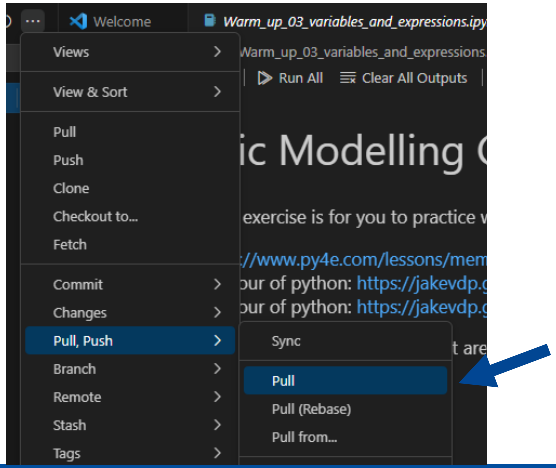
What happens if we update a warm-up/upload more ?

1. In VSCode, go to ‘Source control’



2. Pull the updated files from Github





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