



Exercise Week 1

Introduction to Scientific Python



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Warm-up Quiz

Go to

<https://menti.com>

Enter the code

6436 4597



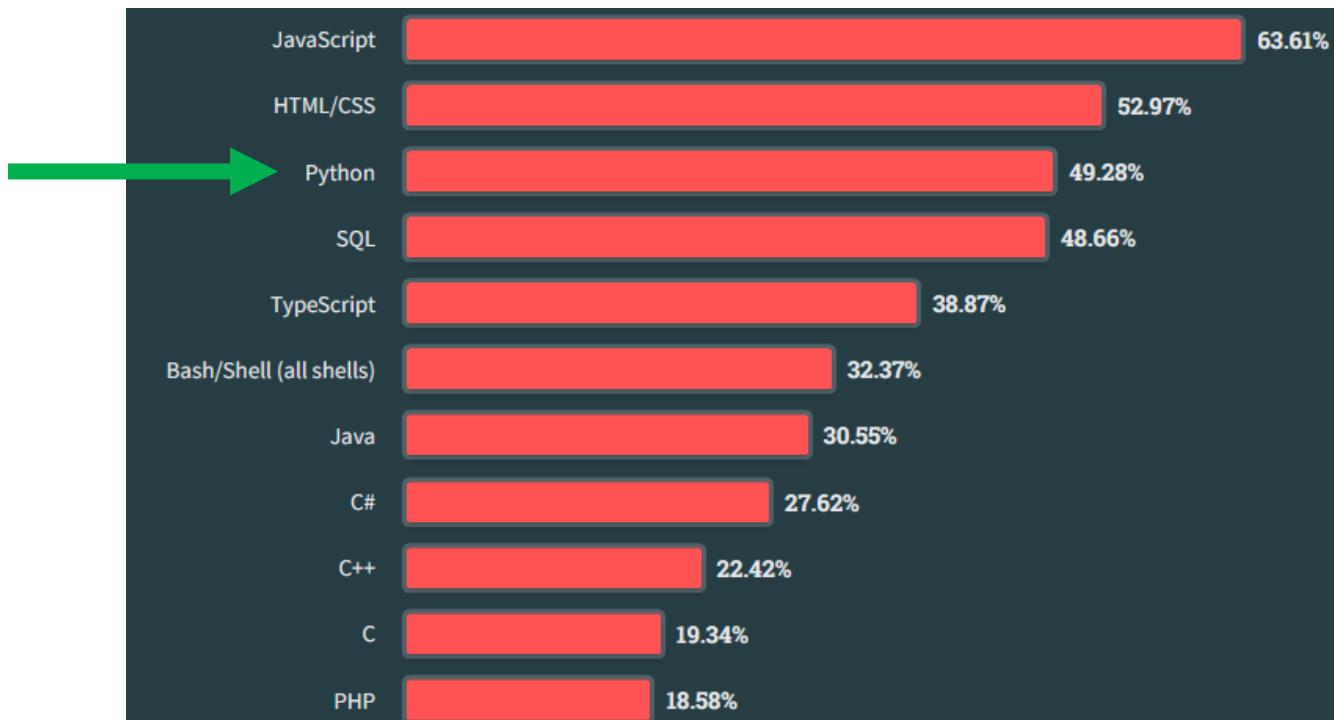
Python is great

- Very popular
- Versatile, flexible, easy to get started
- Widely used for data science
- Active community



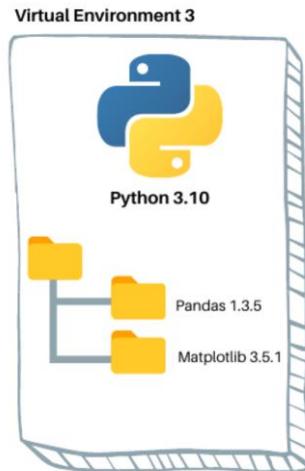
But ...

- Performance can be limited
- Mistakes can arise quickly
- Complex projects can get messy



[Stack Overflow Developer Survey 2023](#)

Virtual Environment



Version Control



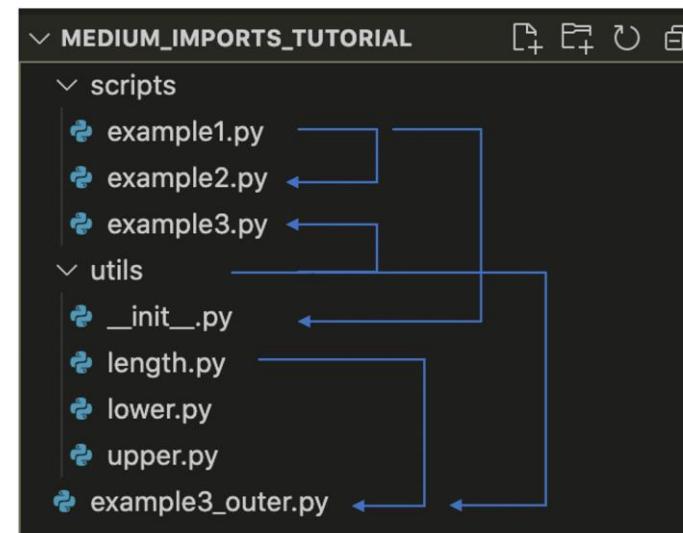
gitlab.epfl.ch

Consistent Coding Style

Function	function, my_function
Variable	x, var, my_variable
Class	Model, MyClass
Method	class_method, method
Constant	CONSTANT, MY_CONSTANT, MY_LONG_CONSTANT
Module	module.py, my_module.py
Package	package, mypackage

[PEP8 style guide](#)

Packages & Modules



[Modules in Python](#)

Documentation

```
def connect_to_next_port(self, minimum: int) -> int:
    """Connects to the next available port.

    Args:
        minimum: A port value greater or equal to 1024.

    Returns:
        The new minimum port.

    Raises:
        ConnectionError: If no available port is found.
    """

```

1. Download Python via an Miniconda (recommended)

- On Windows: keep the default installation options
- On macOS: run `~/miniconda3/bin/conda init zsh` after installation in a terminal
- On Linux: run `~/miniconda3/bin/conda init bash` after installation in a terminal



2. Create the conda virtual environment

1. Open a new terminal (**Anaconda Prompt** on Windows, default terminal on macOS / Linux)

2. `conda create --name civil-332 python=3.12`

Only needed once for the whole course

3. `conda activate civil-332`

Run this **everytime** you open a new terminal to work with this env.

4. `pip install numpy matplotlib scipy pandas jupyterlab --upgrade`

5. `pip install black librosa --upgrade`

`pip install` commands are only required once for the whole course

1. I installed the packages but Python says they are missing

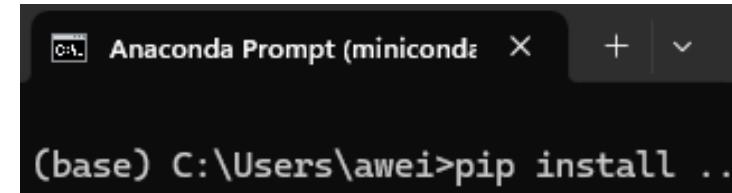


```
PowerShell 7.4.5
PS C:\Users\awei> pip install ...
```

BAD ! You don't have `conda` active in the terminal.

Windows: use Anaconda Prompt

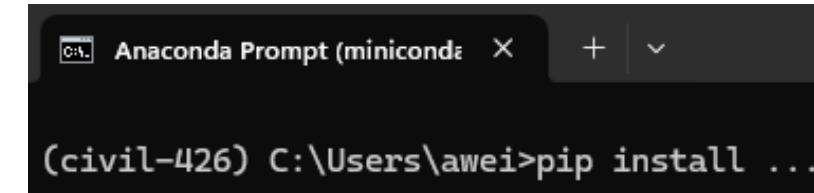
macOS/Linux: run the `init` command (step 1 on prev. slide)



```
Anaconda Prompt (miniconda)
(base) C:\Users\awei>pip install ...
```

BAD ! Your virtual environment is not activated.

Run the following command:
`conda activate civil-332`



```
Anaconda Prompt (miniconda)
(civil-426) C:\Users\awei>pip install ...
```

GOOD ! Your virtual environment is activated. You can now install the required packages.

2. I cannot access my virtual env. in the terminal

This should only happen on Windows. It's expected. Use Anaconda Prompt instead.

<https://noto.epfl.ch/hub/>

EPFL's online JupyterLab hub for notebooks, but ...

- No GPU resources
- Limited control over the environment
- Limited code editor

Recommendation:

Learn to setup and use your own environment



<https://moodle.epfl.ch/course/view.php?id=17141>

Civil Engineering (GC) / GC - Bachelor

Data Science for infrastructure condition monitoring

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 Announcements

■ Basics

- [The Python Tutorial](#)
- [General Introduction to Programming](#)
- [General Introduction to Python](#)

■ Practical tutorials

- [Learn Pandas Tutorials](#)
- [Learn Data Visualization Tutorials](#)
- [Learn Data Cleaning Tutorials](#)
- [General Introduction to Machine Learning](#)



Questions