

# **Effective Programming Practices for Economists**

## **Basic Python**

### **File paths with pathlib**

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- How to get a path to the current directory in Python
- Working with pathlib `Path``s
- Rules for working with file paths

# Motivation

- There are many ways to work with file paths in Python
- Some are not portable
- We want to give you one way that is guaranteed to work!

# An example



- ``epp_project``, ``exercises`` and ``datasets`` are directories
- ``exercise_1.ipynb``, ``exercise_2.py``, and ``data.csv`` are files
- Want to load ``data.csv`` in two different scenarios:
  - from ``exercise_1.ipynb``
  - from ``exercise_2.py``

# How not to do it

```
import pandas as pd
path = "C:\\Users\\MyName\\epp_project\\datasets\\data.csv"
data = pd.read_csv(path)
```

- This only works on one Computer
- Backslashes (\\) only work on Windows
- **Warning:** This is what you get when you copy a path from your file explorer

# Goal

- Start paths relative to the root folder of the project
- Only make assumptions about directory structure inside the project
- Define the path in a way that is portable across operating systems

# Get a path to the project root

## In a notebook

The following is in `exercise_1.ipynb`

# Get a path to the project root

```
from pathlib import Path

# get a path to the current directory
this_dir = Path(".")
print(this_dir)

# make it absolute for readability
this_dir = this_dir.resolve()
print(this_dir)

# move up to epp_project/
root = this_dir.parent
print(root)

---

.  
/home/janos/Dropbox/epp_project/exercises  
/home/janos/Dropbox/epp_project
```

- `Path(".")` gives a relative path to current directory
- `resolve()` makes it absolute for readability
- `.parent` moves up one file/directory
- The output differs on every computer!
- No assumptions made on usernames or folders outside the project



# Get a path to the project root

In a `.py` file

The following is in `exercise_2.py`

# Get a path to the project root

```
from pathlib import Path

# get a path to the current file
this_file = Path(__file__)
print(this_file)

# move up to epp_project/
root = this_file.parent.parent
print(root)
```

---

```
/home/janos/Dropbox/epp_project/exercises/exercise_
/home/janos/Dropbox/epp_project
```

- In a `.py` file `Path()` would lead us to the current directory of the shell from which the file was executed
- The `__file__` variable is a magic variable with the path to the current file
- Have to use `.parent` twice!

# From the project root to the data file

```
>>> from pathlib import Path
>>> # .py-file version in one line
>>> root = Path(__file__).parent.parent
>>> print(root)
/home/janos/Dropbox/epp_project

>>> # go to data file
>>> data_path = root / "datasets" / "data.csv"
>>> print(data_path)
/home/janos/Dropbox/epp_project/datasets/data.csv

>>> print(data_path.exists())
True
```

- Once `root` is defined, the rest works the same in notebooks and `.py` files
- Concatenate different path snippets with `/`
- Resulting path works on all platforms!

# Debugging tips

- Use `path.resolve()` to get full information about your path
- Use `list(path.iterdir())` to list everything in in `path`
- Build up paths one folder at a time and use `path.exists()` to catch typos

# File path rules

1. Always use pathlib `Path` objects instead of strings
2. Do not hardcode any parts of a path outside of the project's directory
3. Always concatenate paths with `/`

## Remember:

If you copy paste a path from your Windows File Explorer, all three rules are violated!