

# Effective Programming Practices for Economists

## Basic Python

### Tracebacks

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# Topics

- What are Exceptions and Tracebacks?
- The Anatomy of a Python Traceback
- Reading long tracebacks
- Asking for help

# Motivation

- We sometimes told you that you cannot do certain things:
  - Example: Can only use hashable objects as dictionary keys
- Now we will discuss what happens if you do it anyways
  - Exception: What class of error?
  - Traceback: Detailed report that helps you to localize the error
- Pro tip: Read the traceback!

# Example Traceback

```
>>> d = {"a" : 1}
>>> d[[1, 2, 3]] = "b"
>>> d["c"] = 3
```



- The code on the left has a problem
- Traceback tells us everything we need:
  1. What type of Exception occurred: `TypeError`
  2. Where did it occur: In line 2 of `some_file.py`
  3. What exactly happened: Used an unhashable type where we should not
- Tracebacks can get very long!
- Always look for these three things!

# Common sources of errors

- `ValueError`: You called a function with something invalid
- `KeyError`: You have a typo in a variable name or a dictionary key
- `TypeError`: You called the function with something that has the wrong type
- `ImportError`: You have a typo in an import
- `ModuleNotFoundError`: You did not activate the environment or need to install a package

# How not to ask for help

- "I wanted to do the exercise but it does not work"
- "Python does not work on my computer"
- "My code does not work, here is a screenshot"

# What to keep in mind

- We do not remember what task 3 in exercise 5 is
- We like to see that you tried on your own
- We like to see that you tried to reduce the amount we have to read
- We like well formatted and copy pastable examples

# A better way (for a hypothetical task)

In the task where we should query the iris dataset (exercise 2, Task 8), the following line gives me a `KeyError`:

```
iris.query("sepal_lenght <= 5")
```

The message was

```
KeyError: 'sepal_lenght'
```

I tried to run the query with different variables and it works, but with `sepal_length` it doesn't.

I attach the entire traceback as `.txt` file ...