Python for econometrics and Operations Research: a crash course

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Getting started

- Start computer by pressing bottom-right button (below Intel vPRO sticker)
- Log in with your student number (e.g., u123456) and your password.

- Materials at: https://pskleer.github.io/eor-python-crash-course-2025/

Today:

- Cover introduction to packages + Chapter 5: Linear Algebra with Python!
- Packages: numpy and sympy (and cv2 and matplotlib)

Packages: what, why, how?

What: In a nutshell,

- Packages are functions written by other people to make our life easy

  (i.e., so that we do not have to write every code file from scratch in Python.)

Why:

- Vague answer according to ChatGPT: Organization and Modularity, Reusability, Scalability, Code distribution, Standardization
- Using standard packages makes code more readable.
- Reduces the risk of errors.
- Makes code (and coding) a lot faster!

Packages: what, why, how?

How:

- “import numpy as np”
- Here “numpy” is the package, “np” is the abbreviation that we will use
- Comment: “np” is the typical abbreviation for numpy, but any abbreviation works.

- Creating a numpy array: a = np.array([1,2,3,4])

Packages: what, why, how?

How: (Take 2)

- “import numpy”
- Here “numpy” is the package,

- Creating a numpy array: a = numpy.array([1,2,3,4])

Packages: what, why, how?

How:

- “import numpy”
- **Output**:
  - Traceback (most recent call last):
  - File "example.py", line 1, in <module>
  - import numpy
  - ModuleNotFoundError: No module named 'numpy’

- **Solution**:
- Open “Anaconda Prompt” application + execute “conda install numpy”
- Alternative (without Anaconda): execute “pip install numpy”

Packages: what, why, how?

How: (Take 3)

- “import numpy”
- “from numpy import linalg”

Allows even further abbreviation:

- A = np.array([[1, 2], [3, 4]])
- det = linalg.det(A)

Save your work!

⚠ **WARNING about files on university computer**

If you store a file on a (TiU) university computer, for example in the Downloads folder, it will typically be deleted when you log out. To avoid this, either:

- Copy the file onto a USB drive.
- E-mail the file to yourself.
- Store it on the M: drive (that is denoted by the drive that has your name) of the university computer, whose files are not deleted.

Next time you want to use a file, put it again in the Downloads folder to work on it (and make sure to back it up properly again afterwards).