# Session 1 - Programming with Python Materials

### <https://swcarpentry.github.io/python-novice-inflammation/>

## Program

12:15 - Organizers/instructors/helpers in the Zoom meeting room to check last set ups, introductions etc

12:30 - Welcome and instructions of the day - @Paula

* Reminder Code of Conduct/How to get help
* Reminder on how to get help
* Programme of the day
* Roll call & Ice breaker

12:40 - First 5 mins to check that everybody installed Anaconda and download the datasets

“swc-python” folder on Desktop

$ conda --version

$ python --version  
 $ jupyter --version

12:45 - Introducing **Jupyter** (15 min)

Anaconda and Jupyter Lab/Notebooks (10 min) <https://www.anaconda.com/products/individual> - to download Anaconda

<https://swcarpentry.github.io/python-novice-inflammation/setup.html> - for Setup files

[Slides](https://drive.google.com/file/d/1-97iROruskn1DpYxxhh3CZ0wKpuyjnQZ/view?usp=sharing) on Jupyter Notebook features (10 min)

13:00 - **Python Fundamentals** (45 mins)

[*Lesson 1*](https://swcarpentry.github.io/python-novice-inflammation/01-intro/index.html)

*Variables and type*

[*Lesson 4*](https://swcarpentry.github.io/python-novice-inflammation/04-lists/index.html) *- lists*

*Slicing*

***Skipped: Nested lists, and append/pop***

13:45 - **BREAKOUT Session 1** (15 min)

[Exercises 1 and 2](https://drive.google.com/file/d/1-rH7lbpIgLF2G3WArkl2ivjQqrne5-V_/view?usp=sharing) (open in browser)

14:00 - **Coffee break** (15 min)

14:15 - **Loading and analysing data in Python** (30 mins)

#Required [files](https://swcarpentry.github.io/python-novice-inflammation/setup.html)

[*Lesson 2*](https://swcarpentry.github.io/python-novice-inflammation/02-numpy/index.html) *(original 60 mins)*

Import and NumPy and display data (15 mins)

Basic statistics on data (10 mins)

14:45 - **Visualizing Data** (45 mins)

[*Lesson 3*](https://swcarpentry.github.io/python-novice-inflammation/03-matplotlib/index.html) *(original 50 mins)*

Matplotlib (15 mins)

Plotting (15 mins)

Saving plots (10 min)

15:30 - **Coffee break**

15:45 - **Repeating actions with FOR Loops** (45 mins)

[*Lesson 5*](https://swcarpentry.github.io/python-novice-inflammation/05-loop/index.html) *(original 30 mins)*

[*Lesson 6*](https://swcarpentry.github.io/python-novice-inflammation/06-files/index.html) *(original 20 mins)*

Introducing For Loops

Analyzing data from multiple files

16:30 - **BREAKOUT Session 2** (20 min)

[Exercises 3 and 4](https://drive.google.com/file/d/1-rH7lbpIgLF2G3WArkl2ivjQqrne5-V_/view?usp=sharing) (open in browser)

16:50 - Final questions for the day + reminder feedback

17:00 - End

17:00 - Sharing Feedback Instructors/Helpers

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# Session 2 - Programming with Python

## Program

12:15 - Organizers/instructors/helpers in the Zoom meeting room to check last set ups, introductions etc

12:30 - Start workshop and let participants in! We should not need time to check installations as any remaining problems are addressed on day 3.

12:30 - Welcome and instructions of the day @ Paula

* Reminder Code of Conduct/How to get help.
* Programme of the day
* Ice breaker

12:40 - **Recap of Day 2** (5 minutes)

12:45 - **Making Choices** (20 minutes teaching + 5 minutes exercise)

[*Lesson 7*](https://swcarpentry.github.io/python-novice-inflammation/07-cond/index.html)

Plenary Exercises:

* Plenum: How many paths?  
  <https://swcarpentry.github.io/python-novice-inflammation/07-cond/index.html#how-many-paths>
* Inspect all datasets for suspicious data

13:15 - **Creating Functions** (20 minutes teaching + 5 minutes plenum exercises)

[*Lesson 8*](https://swcarpentry.github.io/python-novice-inflammation/08-func/index.html)

Skipping: Testing and Documentation

Plenary Exercises:

* Plenum: Mixing Default and Non-Default Parameters   
  <https://swcarpentry.github.io/python-novice-inflammation/08-func/index.html#mixing-default-and-non-default-parameters>

13:35 - **Breakout Session 1** (25 min)

[Exercise 7](https://drive.google.com/file/d/1-bbfypqV8iIzgwaY8g_fqBDhDs_LKzO9/view?usp=sharing) (open in browser)

These exercises can also be found on the SWC website:

* "Rescaling an Array"  
  <https://scw-ss.github.io/2021-03-16-tudelft-online-python-novice-inflammation/08-func/index.html#rescaling-an-array>
* "Testing and Documenting Your Function"  
  <https://swcarpentry.github.io/python-novice-inflammation/08-func/index.html#testing-and-documenting-your-function>
* Optional: Refine the rescale function via "Defining Defaults"   
  <https://swcarpentry.github.io/python-novice-inflammation/08-func/index.html#defining-defaults-1>

14:00: **Coffee Break I**

**ADDED part on modular code**

1. [Tidying-up](https://swcarpentry.github.io/python-novice-inflammation/08-func/index.html#tidying-up)
2. Create script called “processing.py”
3. Copy functions (visualize, detect\_problems) to script
4. Create new notebook called “inflammation\_analysis\_refactored”
5. Import (visualize, detect\_problems) in the new notebook and place in for-loop to analyse for all files
6. Questions in session:
   1. Do we still need to import numpy and matplotlib when we are importing them in the processing.py script? No
   2. What happens to the savefig in the loop. Currently, during each loop the file “imflammation.png” is overwritten. Solution for future sessions: We could add new savenames or leave the savefig out of the functions entirely for simplicity.

Resources on structuring python code:

* <https://realpython.com/absolute-vs-relative-python-imports/>
* <http://cicero.xyz/v3/remark/0.14.0/github.com/coderefinery/modular-code-development/master/talk.md/#1>

14:15: **Errors and Exceptions** (15 minutes teaching + 5 minutes exercise)

[*Lesson 9*](https://swcarpentry.github.io/python-novice-inflammation/09-errors/index.html)

Example plenum:

* SKIPPED: Reading Error Messages   
  <https://swcarpentry.github.io/python-novice-inflammation/09-errors/index.html#reading-error-messages>

14:40: **Defensive Programming** (20 min)

[*Lesson 10*](https://swcarpentry.github.io/python-novice-inflammation/10-defensive/index.html)

* Example for a pre-condition to find empty array
* Add precondition to inflammation\_analysis.ipynb
* Skipped: Replace previous conditional statements in `inflammation\_analysis.ipynb` by assertions
* Questions during session:
  + When would you use assert and when a conditional statement

15:05: **SKIPPED DUE TO LACK OF TIME!** **Debugging** (20 minutes teaching + 5 minutes exercise)

[*Lesson 11*](https://swcarpentry.github.io/python-novice-inflammation/11-debugging/index.html)

Exercises:

* Plenum: Not Supposed to be the Same <https://swcarpentry.github.io/python-novice-inflammation/11-debugging/index.html#not-supposed-to-be-the-same>

15:30: **Coffee Break II**

15:45: **Command-Line Programs** (45 min)

Use [history terminal](https://github.com/4TUResearchData-Carpentries/documentation/blob/master/command-history.md)

[*Lesson 12*](https://swcarpentry.github.io/python-novice-inflammation/12-cmdline/index.html)

16:30: **Breakout Session 2** (30 min)

[Exercise 9, 10 and (optional) 11](https://drive.google.com/file/d/1-bbfypqV8iIzgwaY8g_fqBDhDs_LKzO9/view?usp=sharing)

**Solutions are already present in the code folder (use code/reading\_06.py as starting point):**

Solution exercise 9: code/reading\_08.py

Solution exercise 10: code/reading\_09.py

Solution exercise 11: code/my\_ls.py

16:50 - Wrap up, Questions, etc.

17:00 - End

17:00 - Sharing Feedback Instructors/Helpers