Advanced Python3: Object-oriented programming, databases and visualisation

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Welcome

Day 1:

09:00 - 09:30 Welcome and practicalities

09:30 - 15:00 Object-oriented programming

15:00 - 16:00 Relational databases

Day 2:

09:00 - 12:00 Communicating with databases

13:00 - 16:00 Advanced Visualisation

All lectures include hands-on practice sessions and exercises

Lectures

L01 Object-oriented programming

    L01-0 Introduction to OOP

    L01-1 Objects, classes, methods, attributes

    L01-2 Inheritance and polymorphism

L02 Relational databases:

    L02-0 Introduction to relational databases and SQL

    L02-1 Object Relational Mapping: SQLAlchemy

    L02-2 Web apps using Django (demo)

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Lectures

L03 Advanced Visualisation

      L03-0 Object-oriented plots using Matplotlib

      L03-1 Interactive visualisation using Plotly

      L03-2 Interactive visualisation in the browser using Bokeh

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Course material

The course material is available as Jupyter Notebooks:

Either via direct download of the release:
https://github.com/akdiem/sc_sintef_advanced_python_course/releases/tag/1.0.0

Or by cloning the repository:
https://github.com/akdiem/sc_sintef_advanced_python_course

Software

Required:

- Matplotlib

- Plotly

- Bokeh

- PostgreSQL

- SQLAlchemy

- Psycopg2

- Django

- Numpy

- Pandas

Optional but recommended:

- Anaconda*

- JupyterLab

- Plotly/widget extension for JupyterLab

- IPython Kernel

* technically optional, but if you do not use Anaconda and have problems with installing any of the required libraries, it is practically impossible to help you

Software

We will use two separate conda environments for the visualisation and database parts of the courses. I strongly recommend always creating new environments for separate tasks/projects.

```
user$ conda create -n python-course          user$ conda create -n db
user$ conda activate python-course           user$ conda activate db
user$ conda install -c conda-forge jupyterlab ...
user$ conda install -c conda-forge numpy
user$ conda install -c conda-forge pandas
user$ conda install -c conda-forge matplotlib
user$ conda install -c plotly plotly
user$ conda install -c bokeh bokeh
user$ conda install -c conda-forge nodejs
user$ conda install -c conda-forge ipywidgets
```

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JupyterHub

We have created a JupyterHub that includes all required software and Jupyter Notebooks. Please use JupyterHub for all exercises during the course.

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