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May 9, 2025

1 Python for Actuaries

1.1 Seminar Agenda

- Basics of Python
 - Variables, Control Structures, Functions, Objects
- Data Structures
 - Lists, Tuples, Sets, Dictionaries
- File Operations
- Data Analysis with Pandas (Data Manipulation)
- Data Visualization (Matplotlib)
- Introduction to Machine Learning

1.2 Instructors

Prof. Dr. Alexander Brandt

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1.3 Literature

- The Python Tutorial docs.python.org
- Eric Matthes, Python Crash Course, No Starch Press
- Wes McKinney, Python for Data Analysis, O'Reilly

1.4 Typical Unit

Some of the lectures will be provided and conducted in the form of Jupyter Notebooks (jupyter.org). The goal is to program together, and there will also be exercises for each unit that you will need to work on during the lecture.

1.5 Why Python?

Python ...

- is *interpreted*
- is *dynamically typed* (as opposed to statically typed)
- is *automatically memory-managed*

- supports *procedural*, *object-oriented*, *imperative*, and *functional* programming paradigms
- was (mostly) developed by a single person: [Guido van Rossum](#) (also known as the “benevolent dictator”), and therefore has a quite *opinionated* design
- has a single reference implementation (CPython)
- Version 3 (the latest version) is *not backward compatible* with Version 2, although the latter is still widely used
- has an interesting programming philosophy: “There should be one — and preferably only one — obvious way to do it.” (a.k.a. the “Pythonic” way) — see [The Zen of Python](#)

2 In case you are still wondering why:

<https://xkcd.com/353/>