

# Training: Python Academy Optimizing Python Programs



#### TRANING TERMS

2025-12-19 | 1 day | Warszawa / Virtual Classroom

### TRAINING GOALS:

**Python** is an interpreted language; Python source code is translate into portable byte code. This concept in combination with other design principles of Python makes many of advantages as compared to other languages possible. As a drawback the execution speed may be considerably slower for certain kinds of applications than with compiled languages. Optimization can often increase performance of Python programs substantially.

## CONSPECT:

- Guidelines for optimization.
  - Optimization strategies Pystone benchmarking concept, CPU usage profiling with cProfile, memory measuring with Guppy\_PE Framework. Participants are encouraged to bring their own programs for profiling to the course.
- Algorithms and anti-patterns
  - Examples of algorithms that are especially slow or fast in Python.
- The right data structure
  - Comparation of built-in data structures: lists, sets, deque and defaulddict.
  - Big-O notation will be exemplified.
- Caching
  - Deterministic and non-deterministic look on caching.
  - Developing decorates for caching purposes.
- The example we will use a computionally demanding example and implement it first in pure Python. Then we look at some algorithmic improvements to speed up the computation.
- Testing speed solution to measuring how fast a program really run in Python.
- Psyco 'just-in-time-complier' (JIT), allowing to translate parts of the byte code to machine code. Example are used to show different possibilities of using Psyco.
- Numerical calculations with Numpy basic possibilities of NumPy covered.
- Using multiple CPUS with Pyprocessing/multiprocessing.
- Combination of optimization strategies.

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• Overview of extensions to Python with other languages.

# **REQUIREMENTS:**

• Basic knowledge of **Python** language.

# Difficulty level

# **CERTIFICATE:**

The participants will obtain certificates signed by Python Academy.

# TRAINER:

Authorized Python Academy Trainer.

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