Training: Python Academy
Optimizing Python Programs

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.
- Overview of extensions to Python with other languages.

Compendium Education Center Ltd.
ul. Tatarska 5, 30-103 Kraków, tel.: (12) 298 47 77
ul. Postępu 18B, 02-676 Warszawa, tel.: (22) 417 41 70
BNP Paribas Bank Polska S.A.
EUR: PL 79 1600 1462 1853 6451 3000 0006
USD: PL 52 1600 1462 1853 6451 3000 0007

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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