Training: Python Academy
Fast Code with the Cython Compiler

TRAINING GOALS:

The Python programming language has been used successfully in a large number of application domains. Even performance critical applications, such as scientific computation frameworks or text processing applications, have been realized using Python in order to benefit from short development cycles and highly maintainable code.

However, the interpreted language also has its weaknesses. Tight algorithms in numerical computations and character processing often suffer from the overhead of object operations in arithmetic expressions or memory copies in string slicing. In high performance applications, the optimizations that can be performed at the language level may not be sufficient.

This is where the Cython programming language shows its strength. Cython is a general purpose programming language that forms a best-of-both-worlds cross between the Python language and the ubiquitous datatypes of the C/C++ language. It comes with an optimising compiler that translates Python code into C code for Python extension modules, and tightly adapts the generated code to the available static type information.

Cython code can be written as high-level Python code and manually optimised in well selected hot-spots by statically declaring data types or calling directly into external code written in C, C++ or compatible languages. This makes the entire range from simple, expressive Python code down to highly optimised, low-level C code available for programming in a single language.

The objective of this course is to get to know the Cython language, and to learn how to use it to speed up Python code by orders of magnitude. You will also learn how to wrap external C libraries to efficiently and comfortably use them from Python.

CONSPECT:

- Using pyximport to quickly (re-)build extension modules.
- Using cython.inline() to compile code at runtime.
- Building extension modules with distutils.
- Fast access to Python's builtin types.
- Fast looping over Python iterables and C types.
- String processing.
- Fast arithmetic.
- Incrementally optimizing Cython code.

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- Multi-threading outsife od the GIL(Global Interpreter Lock).
- Calling into external C libraries.
- Building against C libraries.
- Writing Python wrapper APIs.
- Calling C functions across extension module boundaries.

REQUIREMENTS:

- Knowledge of Python and C language.

Difficulty level



CERTIFICATE:

The participants will obtain certificates signed by Python Academy.

TRAINER:

Authorized Python Academy Trainer.

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