

Introduction to Python Programming

ClearCut
IT TRAINING

Duration: 3 days

Python is a widely used general-purpose, high-level programming language and as such the Python training needs of programmers will vary quite greatly.

This Python course provides an introduction to Python programming and the core libraries providing the base functionality. You will learn everything from base data types, operators and expressions through to object orientation, database usage, modules and more.

Prerequisites

Delegates should have experience with another programming language and have a basic background in programming and knowledge of programming principals.

Overview

- History
- Python distributions
- Anaconda Distributions
- Windows and Python
- Linux and Python
- Mapping with Python
- On line documentation

Topics

An Introduction to Python

- Running programs using the interpreter
- Running programs using files
- Running programs using Spyder

Python base types, operators and expressions

- Built-in Types
- Python symbols
- Numeric Types
- Iterator Types
- Sequence Types
- Text Sequence Type
- Binary sequence types
- Set types
- Mapping types
- Context manager types
- Other types

Adding Transitions and Effects

- Creating cross dissolves
- Adding transitions to multiple clips
- Creating audio transitions
- Using the essential graphics panel
- Creating lower thirds and captions
- Adding logos and images to your sequences
- Saving graphics as templates to save time
- Fixing colour balance problems
- Altering the exposure and contrast
- Adding creative colour looks

Arrays using the Numpy module

- Numpy as the fundamental package for scientific computing with Python
- Data types supported by Numpy
- Numpy methods
- One d arrays in Numpy
- Two d arrays in Numpy
- Sections and slicing
- Shape manipulation
- On line documentation

Continued

Text in Python: Strings

- The python string methods
- Small set of examples illustrating basic string usage in Python

Control Structures

- Compound statements
- The if statement
- The while statement
- The for statement
- The try statement
- The with statement
- The pass statement

Functions

- Intrinsic maths functions
- Writing you own functions
- Parameter passing in Python
- Functional programming in Python

Object oriented programming and classes in Python

- Base class syntax in Python
- Classes using modules
- Inheritance and derived classes
- Polymorphism and dynamic binding in Python
- Object oriented programming and the Met Office station data

IO

- Basic file usage in Python
- Reading and writing with files
- Text and Binary files
- Network and internet file access
- CSV in Python and the csv module

An Introduction to Algorithms and the Big

- Basic background on algorithm performance
- Array and linked list performance

Operator overloading

- Short introduction to operator overloading in Python

Decimals, fractions, random numbers

- The Decimal module
- The fractions module
- The random numbers module

Databases and SQLite

- Introduction to database management systems
- SQL based systems and Python
- SQLite
- Several examples using environmental data
- Several examples using the Met Office data

Regular expressions and pattern matching

- Basic pattern matching and regular expression usage in Python

Built in exceptions

- Introduction to exception handling in Python
- The Exception hierarchy

Concurrent execution

- Thread based parallelism
- Examples illustrating thread based parallelism
- Process based parallelism
- Examples illustrating process based parallelism
- Other types of parallelism

Modules

- Small set of examples illustrating basic module usage

SciPy and Pandas

- Scipy
- Pandas
- Small set of Pandas examples illustrating basic usage

Windows programming in Python

- Introduction to Windows programming
- Tkinter
- Simple Tkinter usage
- Tkinter on line examples and resources
- Other options

Graphics programming in Python

- Graphics plotting with matplotlib
- Mapping in Python

Python performance comparison to other programming languages

- Python solution with timing
- C++ solution with timing
- Java solution with timing
- Fortran solution with timing

Calling external libraries from Python

- Calling the Nag library from Python