

## PYTHON TRAINING COURSE CONTENT

### SECTION 1: INTRODUCTION

- What's python?
- Why do people use python?
- Some quotable quotes
- A python history lesson
- Advocacy news
- What's python good for?
- What's python not good for?
- The compulsory features list
- Python portability
- On apples and oranges
- Summary: why python?

### SECTION 2: USING THE INTERPRETER AND TEXT EDITOR

- Introduction to Sublime & Pycharm
- Config Pycharm for Python Project
- How Python Runs Programs
- How You Run Programs
- Configuration Details
- Module Files: A First Look
- The Idle Interface
- Other Python Ides
- Time To Start Coding
- Lab Session 1

### SECTION 3: TYPES AND OPERATORS

- A First Pass
- The 'Big Picture'
- Numbers
- Dynamic Typing Interlude
- Strings
- Lists
- Dictionaries
- Tuples
- General Object Properties
- Mutable vs Immutable

- Summary: Python's Type Hierarchies
- Built-In Type Gotchas
- Lab Session 2

#### **SECTION 4: BASIC STATEMENTS**

- Introduction to Reserved Keywords
- General Syntax Concepts
- Expressions
- Print
- If Selections
- Python Syntax Rules
- Documentation Sources Interlude
- Truth Tests
- While Loops
- Break, Continue, Pass, And The Loop Else
- For Loops
- Comprehensions And Iterations
- Loop Coding Techniques
- Comprehensive Loop Examples
- Basic Coding Gotchas
- Preview: Program Unit Statements
- Lab Session 3

#### **SECTION 5: FUNCTIONS**

- Function Basics
- Scope Rules In Functions
- More On "Global" (And "Nonlocal")
- More On "Return"
- More On Argument Passing
- Special Argument Matching Modes
- Odds And Ends
- Generator Expressions And Functions
- Function Design Concepts
- Functions Are Objects: Indirect Calls
- Function Gotchas
- Optional Case Study: Set Functions
- Lab Session 4

#### **SECTION 6: MODULES**

- Module Basics
- Module Files Are A Namespace
- Name Qualification
- Import Variants
- Reloading Modules

- Package Imports
- Odds And Ends
- Module Design Concepts
- Modules Are Objects: Metaprograms
- Module Gotchas
- Optional Case Study: A Shared Stack Module
- Lab Session 5

## **SECTION 7: GETTING STARED WITH DOCKER**

- Oop: The Big Picture
- Class Basics
- A More Realistic Example
- Using The Class Statement
- Using Class Methods
- Customization Via Inheritance
- Specializing Inherited Methods
- Operator Overloading In Classes
- Namespace Rules: The Whole Story
- Oop Examples: Inheritance And Composition
- Classes And Methods Are Objects
- Odds And Ends
- New Style Classes
- Class Gotchas
- Optional Case Study: A Set Class
- Summary: Oop In Python
- Lab Session 6

## **SECTION 8: EXCEPTIONS**

- Exception Basics
- First Examples
- Exception Idioms
- Exception Catching Modes
- Class Exceptions
- Exception Gotchas
- Lab Session 7

## **SECTION 9: BUILT-IN TOOLS OVERVIEW**

- The Secret Handshake
- Debugging Options
- Inspecting Name-Spaces

- Dynamic Coding Tools
- Timing And Profiling Python Programs
- File Types And Packaging Options
- Development Tools For Larger Projects
- Summary: Python Tool-Set Layers
- Lab Session 7 Continued

## **SECTION 10: SYSTEM INTERFACES**

- System Modules Overview
- Running Shell Commands
- Arguments, Streams, Shell Variables
- File Tools
- Directory Tools
- Forking Processes
- Thread Modules And Queues
- The Subprocess And Multiprocessing Modules
- Ipc Tools: Pipes, Sockets, Signals
- Fork Versis Spawnv
- Larger Examples
- Lab Session 8

## **SECTION 11 : GUI PROGRAMMING**

- Python Gui Options
- Introduction of Tkinter
- The Tkinter 'Hello World' Program
- Adding Buttons, Frames, And Callbacks
- Getting Input From A User
- Assorted Tkinter Details
- Building Guis By Subclassing Frames
- Reusing Guis By Subclassing And Attaching
- Advanced Widgets: Images, Grids, And More
- Designing UI using QT4 Designer
- Introduction to PySide2
- Converting UI into Application Using PySide
- Larger Examples
- Tkinter Odds And Ends
- Lab Session 8 Continued

## **SECTION 12: DATABASES AND PERSISTENCE**

- Databases and Persistence
- Object Persistence: Shelves
- Storing Class Instances
- Pickling Objects Without Shelves

- Using Simple Dbm Files
- Shelve Gotchas
- Zodb Object-Oriented Database
- Python Sql Database Api
- Persistence Odds And Ends
- Lab Session 9

### **SECTION 13: TEXT PROCESSING**

- String Objects: Review
- Splitting And Joining Strings
- Regular Expressions
- Parsing Languages
- Regular Expressions
- Lab Session 10

### **SECTION 14: INTERNET SCRIPTING**

- Using Sockets In Python
- The Ftp Module
- Email Processing
- Other Client-Side Tools
- Building Web Sites With Python
- Writing Server-Side Cgi Scripts
- Jython: Python For Java Systems
- Active Scripting And Com
- Other Internet-Related Tools
- Lab Session 10



### **SECTION 15: ADVANCED TOPICS**

- Unicode Text And Binary Data
- Managed Attributes
- Decorators
- Metaclasses
- Context Managers
- Python 3.X Changes
- Lab Session 13

### **LABORATORY EXERCISES**

- Lab 1: Using The Interpreter
- Lab 2: Types And Operators
- Lab 3: Basic Statements
- Lab 4: Functions
- Lab 5: Modules
- Lab 6: Classes
- Lab 7: Exceptions And Built-In Tools

- Lab 8: System Interfaces And Guis
- Lab 9: Persistence
- Lab 10: Text Processing And The Internet
- Lab 11: Decorators And Metaclasses

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