Python – Basic and Beyond Course Outline

Duration: 4 Days

Overview: Basic Python training teaches participant the skills they need to design, build, and test applications using various data structures, file IO, exception handling, network programming (telnet/sockets), threading, exceptions and debugging.

Pre-requisite: experience in any programming language.

Target Audience: Developers interested in learning a Python which would help in test automation.

Teaching Methodology:

Theory will be explained using a few slides. Most of the training time will be spent on writing code for use cases for each module delivered. The participants will code with the trainer at the same time to make sure all learn the syntax and semantics of Python by doing enough coding practice.

Learning outcome:

At the end of the 4 days training the participants would be able to understand and write Python scripts on the following:

- Use of Python Language Constructs and built-in Python functions.
- How to use data structures like Lists, Dictionaries, Tuples etc.
- How to use control statements like if, while, for, range, break and continue etc.
- How to create user defined functions. Passing parameters. Use of Global and return statement.
- How to create modules, use of namespace, loading modules, creating package, Using built in modules etc.
- Perform File I/O operations (read/write, search for data from input files).
- Understand and use Object oriented concepts like classes, objects, inheritance, multiple inheritance.
- Understand the role of exceptions, built in exceptions, creating and working with exception handling.
- How to use built in tools like debugger, distribution utilities.
- Usage of Telnet, socket programming.
- Use of threading

Syllabus

Day 1 (9:30 to 5:00 PM)

1. **General Python Introduction (20 minutes)**

- What is Python?
- Usage of Python in real world?
- Python in interactive mode.
- Python for Automation

2. **Using the Interpreter/IDE (PyCharm) (1 Hour)**

- How to create Python scripts
- How to run Python programs
- Command line options
- Using modules interactively and in scripts.
- Python 2 versus Python 3 (will cover important differences only)
- Python cheat sheet (will be provided to all participants)

3. **Basic statements (1.5 Hours)**

- Assignment, Expressions, Print, If selections, Python syntax rules, Truth tests While loops, Break, continue, pass, and the loop else, For loops, 'range' and counter loops

4. **Types and operators (1.5 Hours)**
- Boolean, Numbers, Strings, List Comprehension, Lists, Dictionaries, Tuples, Files, Python's type hierarchies. Immutable and non-immutable concepts, Sets and Frozen sets.

5. **Functions (1.5 Hour)**
- Function basics, Scope rules in functions
- Details on 'global' and 'return'
- Argument passing (default arguments, variable number of arguments, passing dictionary as parameters)
- Iterators and their usage
- Built-in functions map, Lambda, filter and reduce.

Day 2 (9:30 to 5:00 PM)

6. **Regular expression (30 Mins)**
Regular expression and building applications using RE

7. **File I/O: (2.5 Hours)**
- How to work with files?
- Reading and writing Data.
- Seek and Tell file positions.
- Building application.

8. **Modules and Packages (2.5 Hours)**
- Module basics
- Module files are a namespace, Name qualification
- Import variants
- Reloading modules
- How to create Modules and Packages.
- Understating LEGB rule for name resolution.
- Demonstrate modules Zlib, Urlib, CSV using examples.

9. **Python Collections: (1.5 Hours)**
- io.stringIO
- Counter
- Timeit
- Orderdict

Day 3 (9:30 to 5:00 PM)

10. **Telnet (2 Hours)**
- Telnet programming in Python and building application using the telnetlib module

11. **Socket programming (2 Hours)**
- sockets, socket modules, server and client socket methods
- Building client-server application using the socket module

12. **Exceptions (1 Hour)**
- Exception basics. Exception keywords (try, except, raise, finally). Building applications using existing exceptions. Creating user defined exceptions.

Day 4 (9:30 to 5:00 PM)

13. **Classes (75 Minutes)**
- Class Basics, Using the class statement, Using class methods, Customization via inheritance. Specializing inherited methods, Operator overloading in classes, OOP: inheritance and composition. Multiple inheritance.

14. **Multithreaded Programming (2 Hours)**
    - What is a thread.
    - How to build multithreaded applications.
    - Using the thread and threading module.
    - Thread Safety.
    - Handling non-responsive threads holding shared resources

15. **Comment line arguments (1 hour)**

16. **Built-in tools overview (1 hour)**
    - Using the pdb module to debug scripts. How to distribute python scripts using distutils.

TRAINER SHORT BIOGRAPHY

Trainer has a progressive experience approximately 15 years as IT trainer. Most of his experiences are in lecturing in colleges & Institutes of Higher Learning, conducting corporate trainings and develop training materials.

He has received his Higher Diploma in Information System (IDPM , UK 2000) Diploma in Computer Studies (NCC , UK 1989) and System Administration - SKM Level 2 (Sijil Kemahiran Malaysia , certificate of competency) , Ministry of Human Resources , 2004 and also is an HRDF approved trainer.

He is experienced in teaching PHP and MySql training, CompTIA Network+ certification training C++ Programming - MDEC Project, C++ Programming - MDEC Project, Open-source Programming PHP & MySQL & Joomla ASP training), ASP.NET Web development (using C#), Operating System OS : Windows 7, Application software: Ms Office 03/07/ 10/13 (Basic to Advance , macro programming using MS Office suite, VB application using Excel), Programming: VBasic.NET , C++/C# , PHP , Java , JavaScript , .NET framework, Website and portal development – Open source - Joomla CMS , ASP.NET , Java Web Development, CSS3, HTML 5, JQUERY, Database – MySQL , SQL & MS-Access.