Python Bootcamp Training

Prerequisites: Knowledge of Programming

Week 1: Core Python Programming

Day 1: Python Basics and Environment Setup

- Introduction to Python (History, Installation, IDEs)
- Basic Syntax, Variables, and Data Types
- Operators (Arithmetic, Logical, Comparison)
- Hands-on Lab: Writing basic Python programs

Day 2: Control Flow and Functions

- Conditionals (if-else, nested conditions)
- Loops (for, while)
- Functions (defining, calling, parameters, return values)
- Hands-on Lab: Implementing control flows and functions

Day 3: Data Structures in Python

- Lists, Tuples, Sets, and Dictionaries
- List Comprehensions and Dictionary Comprehensions
- Hands-on Lab: Working with different data structures

Day 4: File Handling and Exception Handling

- Reading from and writing to files
- Handling exceptions (try, except, finally)
- Hands-on Lab: File operations and error handling

Day 5: Introduction to Modules and Libraries

- Importing Modules (built-in and custom)
- Standard Libraries Overview (os, sys, math, random)
- Hands-on Lab: Creating custom modules

Week 2: OOPS, Threading, and Multi-Processing

Day 6: Object-Oriented Programming (OOP) Concepts

- Classes and Objects
- Attributes and Methods
- Encapsulation and Abstraction
- Hands-on Lab: Creating classes and objects in Python

Day 7: Inheritance and Polymorphism

- Types of Inheritance
- Method Overriding and Polymorphism
- Hands-on Lab: Implementing inheritance in Python

Day 8: Python Threading

- Introduction to Threads and Processes
- Creating and Managing Threads
- Synchronization between Threads
- Hands-on Lab: Creating multithreaded programs

Day 9: Multi-Processing in Python

- Introduction to Multi-Processing
- Processes vs Threads
- Hands-on Lab: Writing Python programs using multi-processing

Day 10: Scheduling Jobs and Triggering Events

- Scheduling Jobs with schedule library
- Automating Tasks using Python (APScheduler)
- Hands-on Lab: Scheduling and triggering jobs programmatically

Week 3: Data Cleaning, Transformation, Pandas, and Numpy

Day 11: Data Cleaning Basics

- Handling Missing Data
- Removing Duplicates, Filtering Data

- Hands-on Lab: Cleaning datasets with Python

Day 12: Data Transformation Techniques

- Data Type Conversion
- Normalizing and Scaling Data
- Hands-on Lab: Transforming real-world datasets

Day 13: Introduction to Pandas

- DataFrames and Series
- Importing and Exporting Data (CSV, Excel, JSON)
- Hands-on Lab: Exploring and analyzing data with Pandas

Day 14: Advanced Pandas

- Merging, Joining, and Concatenating DataFrames
- GroupBy and Pivot Tables
- Hands-on Lab: Advanced data manipulation using Pandas

Day 15: Introduction to Numpy

- Understanding Numpy Arrays
- Array Operations (reshaping, slicing)
- Hands-on Lab: Performing array operations with Numpy

Week 4: Numpy, Regular Expressions, and Advanced Python

Day 16: Advanced Numpy

- Numpy Broadcasting
- Mathematical Operations with Numpy
- Hands-on Lab: Solving mathematical problems with Numpy

Day 17: Regular Expressions in Python

- Introduction to Regex (Pattern Matching)
- Search, Match, Replace using Regular Expressions
- Hands-on Lab: Applying regular expressions on text data

Day 18: Integrating Pandas and Numpy

- Working with Large Datasets using Pandas and Numpy
- Hands-on Lab: Combining Pandas and Numpy for advanced data analysis

Day 19: Python Performance Optimization

- Profiling and Optimizing Code
- Working with Memory Efficient Data Structures
- Hands-on Lab: Optimizing Python code for better performance

Day 20: Final Project and Review

- Complete a project that integrates all concepts (Pandas, Numpy, Threading, Scheduling, Data Cleaning, OOP)
- Review and Discussion of Best Practices
- Hands-on Lab: Completing the final project and presentation