Python Programming

Duration: 40 Hours (5 Days)

Overview

The Python Programming course is a comprehensive python bootcamp course designed to introduce learners to the versatile world of Python, one of the most popular and in-demand programming languages today. This course covers everything from the basics of Python syntax and programming concepts to advanced topics like Object-oriented programming and GUI development.Starting with Module 1, learners will get acquainted with Python, how to install it across different operating systems, and explore Python IDLE for interactive and scripting modes of programming. As they progress, they will delve into Types, Variables, Flow control with if/else/elif statements, Loops, and data structures such as tuples, lists, and dictionaries. The course also covers Functions, File operations, Exception handling, and the principles of Object-oriented programming, which are essential for writing robust and maintainable code.Further, the course provides a deep dive into writing and using Modules, underscored by the importance of structuring code for reusability and maintainability. By the end of the bootcamp python course, learners will be equipped to develop graphical applications using Tkinter, emphasizing Event-driven programming to create interactive user interfaces.Structured to cater to both beginners and those looking to sharpen their programming skills, this Python bootcamp course is an excellent stepping stone towards becoming a proficient Python developer.

Audience Profile

Koenig Solutions' Python Programming course offers foundational to advanced skills for aspiring developers and IT professionals.

- Target Audience and Job Roles:
- Beginner software developers seeking to learn Python
- Data analysts who want to leverage Python for data manipulation and analysis
- IT professionals looking to automate tasks or develop scripts with Python
- Students and academic researchers requiring Python for scientific computing
- Quality assurance engineers interested in writing test scripts
- System administrators for scripting and automation
- Technical professionals transitioning into programming roles
- Web developers who intend to use Python for backend development
- Hobbyists and DIY enthusiasts looking to apply Python in hardware projects (e.g., Raspberry Pi)
- Professionals in data-intensive fields (finance, biology, etc.) looking for a powerful scripting language
- Educators and trainers teaching programming concepts
- Entrepreneurs and business owners needing to understand the technical aspects of their products or services

Course Syllabus

Module 1: Introduction to Python

- Introduction to Python
- Overview Python Based Applications
- Environment Setup

- Data Types
- Variables and its Scope
- Data Structure
- Operations on Data Structure
- Input and Output Operation
- Writing a Python Module

Module 2: Functions

- Define and use custom functions within a Python program.
- Types of function
- Types of Arguments.
- Map Function.
- Filter Function
- Reduce Function
- Naming conventions
- Using Imports
- Documentation
- Executing Modules as Scripts
- Extended Keyword Arguments (*args, **kwargs)
- Lambda Functions
- Decorators

Module 3: Iterables and Conditional Statement

- Definitions
- Sequences
- Unpacking Sequences
- Dictionaries
- The len() function Sets
- Conditional Statements
- Loops in Python
- break and continue
- The enumerate() Function
- Generators
- List Comprehensions
- Advanced List Comprhensions
- Collections Module
- Mapping and Filtering
- Mutable and Immutable Buitilin Objects
- Sorting
- Unpacking Sequences in Function Calls

Module 4: Modules

- What are modules
- General Format
- Importing Modules
- Executing functions from other modules
- The __name__ variable

Module 5: Python Strings

- Quotation Marks and Special Characters
- String Indexing
- Slicing Strings
- Concatenation and Repetition
- Common String Methods
- String Formatting
- Namespaces
- Formatted String Literals (f-strings and .format() method)
- Built-in String Functions

Module 6: Python Dates and Times

- Understanding Time
- The Time Module
- The datetime Module

Module 7: Math

- Airthmetic Operators
- Assignment Operators
- Built-in Math Functions
- The math Module
- The random Module

Module 8: File Processing

- Opening Files
- The os and os.path modules
- Reading files
- Writing into a file
- Appending data into a file

Module 9: Exception Handling

- Except Clauses
- The else clause
- The finally clause
- Using Exceptions For Flow Control
- Raising your own exceptions
- Exception Hierarchy

Module 10: OOPS in Python

- Introduction to Object-Oriented Python
- Creating Classes, Methods, and Objects
- Using Constructor and Attributes
- Using Class Attributes and Static Methods
- Understanding Object Encapsulation
- Private Attributes and Methods
- Controlling Attribute Access

- Creating and Accessing Properties

Module 11: Playing with Data

- Relational Databases
- CSV
- Getting Data from the Web
- JSON
- Overview of Data Serialization
- Importance of Data Interchange Formats
- Understanding JSON syntax and structure
- Encoding Python Data to JSON - Serialization
- Decoding JSON to Python Data – Deserialization
- Introduction to XML
- Parsing XML with xml.etree.ElementTree
- Best Practices in XML Processing
- Introduction to CSV Format
- Reading CSV data
- Writing Data into CSV files
- Best Practices for CSV Processing
- Integrating JSON, XML and CSV using advanced python library Pandas

Module 12: NumPy

- Introduction to NumPy
- Installation
- NumPy Arrays (numpy.array)
- Array Indexing and Slicing
- Array Shape and Reshaping
- Array Operations (Sum, Mean, etc.)
- numpy.arange and numpy.linspace
- Array Stacking and Splitting
- Data Type Promotion
- Formation of 1D, 2D and 3D arrays
- Exploring dimension type, shape and size of array
- Exploring dimension type, shape and size of array
- Indexing of NumPy Arrays
- Slicing of NumPy Arrays
- One’s Matrix and Zero’s Matrix
- Identity Matrix
- min() and argmin()
- max() and argmax()
- np.sort()
- np.argsort()
- Addition of matrices
- Multiplication of matrices

Module 13: Pandas

- Introduction to Pandas
- Series

- DataFrames
- Missing Data
- Merging Joining and Concatenating
- Operations
- Data Input and Output
- Groupby()
- Pivoting
- VLookup

Module 14: Tkinter

- Introduction to GUI Development
- Introduction to Tkinter
- First Step to creating Tkinter Applications
- Geometry Manager
- Grid Layout
- Develop an app based on Tkinter
- Project exercise on Tkinter

Module 15: Project

- Use Python to develop a bill generator for a shopping mall
- Pizza Ordering Kiosk using Tkinter
- Module 16: Testing and Debugging
- Testing for Performance
- The Unittest Module