

# **Python Modern Application Development**

## **Module 1: Python Basics**

- Running Python
- Hello, World!
- Literals
- Python Comments
- Variables
- Writing a Python Module
- print () Function
- Collecting User Input
- Getting Help

## **Module 2: Functions and Modules**

- Defining Functions
- Variable Scope
- Global Variables
- Function Parameters
- Returning Values
- Importing Modules

## **Module 3: Math**

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

## **Module 4: Python Strings**

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

## **Module 5: Iterables: Sequences, Dictionaries, and Sets**

- Definitions
- Sequences
- Unpacking Sequences
- Dictionaries
- The len() Function
- Sets
- \*args and \*\*kwargs

## **Module 6: Flow Control**

- Conditional Statements
- Loops in Python
- break and continue
- The enumerate() Function
- Generators
- List Comprehensions

## **Module 7: Class and Objects**

- Attributes
- Behaviors
- Classes vs. Objects
- Attributes and Methods
- Private Attributes
- Properties
- Documenting Classes
- Inheritance
- Static Methods
- Class Attributes and Methods
- Abstract Classes and Method

## **Module 8: NumPy – Python for Data Analysis**

- Introduction
- ND array Object
- Data Types
- Array Attributes
- Array Creation Routines
- Array from existing data
- Numerical ranges
- Array Indexing and Slicing

- Advanced Indexing
- Iterating over Array
- Array Manipulation
- Arithmetic Operators
- Binary Operators
- String Functions
- Mathematical Functions
- Statistical Functions

## **Module 9: Pandas – Python for Data Analysis**

- Introduction to Pandas
- Series
- DataFrames
- Missing Data
- Group by
- Merging Joining and Concatenating
- Operations
- Data Input and Output
- Pivot Table
- Pivot Table Filtering

## **Module 10: Seaborn**

- Introduction to Seaborn
- Importing Dataset
- Seaborn Vs Matplotlib
- Using Seaborn with Matplotlib
- Loading a built-in Seaborn data
- Loading a Pandas Dataframe
- LinePlot
- Distplot
- BarGraph
- ScatterPlot
- JointPlot (KDE)
- StripPlot
- Box
- Point Plot
- FacetGrid
- Pair Grid

- CatPlot

## **Module 11: Matplotlib**

- Introduction to Matplotlib
- Exploring Data using Python
- Matplotlib with Jupyter
- Load data
- How to pyplot Works
- Troubleshooting issues
- Line Chart
- Multi Line Plot
- Fill Plot
- Bar Chart
- Pie Chart
- Histogram
- Scatterplot
- Themes
- Scatter
- Subplot
- 3d plot
- Grid
- Save Image
- Legend