PYTHON PROGRAMMING

"Python Programming: From Beginner to Pro"

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A1 Training Institute(Only Coding)

Module 1: Introduction to Python

- **1.1 Overview of Python**
  - What is Python?
  - Applications of Python
- **1.2 History of Python**
  - Development Timeline
  - Key Contributors
- **1.3 Features of Python**
  - Interpreted Language
  - Dynamic Typing
  - Extensive Libraries
- **1.4 Installing Python**
  - Installation Steps for Different Operating Systems
  - Verifying Installation
- **1.5 Setting Up the Development Environment**
  - Overview of Popular IDEs (PyCharm, VSCode, Jupyter)
  - Configuring the IDE for Python Development

Module 2: Basic Syntax and Data Types

- **2.1 Hello World Program**
  - Writing Your First Program
- **2.2 Variables and Constants**
  - Naming Conventions
  - Variable Scope
- **2.3 Data Types**
  - Overview of Basic Data Types: int, float, str, list, tuple, dict, set
- **2.4 Type Casting**
  - Converting Between Data Types
- **2.5 Basic Input and Output**
  - Using `input()` for User Input
  - Printing Output with `print()`

Module 3: Control Structures

- **3.1 Conditional Statements**
  - Using if, elif, and else
- **3.2 Loops**
  - for Loops and while Loops
- **3.3 Break and Continue Statements**

- Controlling Loop Execution
- **3.4 List Comprehensions**
  - Creating Lists Efficiently

Module 4: Functions and Modules

- **4.1 Defining Functions**
  - Syntax and Structure of Functions
- **4.2 Function Arguments**
  - Positional, Keyword, and Default Arguments
- **4.3 Return Statement**
  - Returning Values from Functions
- **4.4 Lambda Functions**
  - Anonymous Functions and Their Use Cases
- **4.5 Importing Modules**
  - Using Built-in and Custom Modules
- **4.6 Creating and Using Modules**
  - Structuring Your Code with Modules

Module 5: Data Structures

- **5.1 Lists and List Operations**
  - List Methods and Manipulations
- **5.2 Tuples and Tuple Operations**
  - Characteristics and Usage of Tuples
- **5.3 Dictionaries and Dictionary Methods**
  - Key-Value Pairs and Operations
- **5.4 Sets and Set Operations**
  - Unique Elements and Set Operations
- **5.5 Understanding Mutable vs. Immutable Types**
  - Differences and Implications in Python Programming

Module 6: File Handling

- **6.1 Reading and Writing Files**
  - Opening, Reading, and Writing Files in Python
- **6.2 Working with File Methods**
  - File Object Methods and Their Uses
- **6.3 Exception Handling with Files**

- Handling File I/O Errors Gracefully

Module 7: Object-Oriented Programming (OOP)

- **7.1 Classes and Objects**
  - Defining Classes and Creating Objects
- **7.2 Attributes and Methods**
  - Instance vs. Class Attributes
- **7.3 Inheritance**
  - Extending Classes and Overriding Methods
- **7.4 Encapsulation and Polymorphism**
  - Data Hiding and Dynamic Method Resolution
- **7.5 Magic Methods and Operator Overloading**
  - Using Special Methods in Classes

Module 8: Error and Exception Handling

- **8.1 Understanding Exceptions**
  - Common Python Exceptions
- **8.2 Try, Except, Finally Blocks**
  - Structured Exception Handling
- **8.3 Raising Exceptions**
  - Using `raise` to Trigger Exceptions

Module 9: Introduction to Databases

- **2.1 What is a Database?**
  - Types of Databases: Relational vs. Non-relational
- **2.2 Introduction to MySQL**
  - Overview of MySQL
  - Installing MySQL Server
  - Using MySQL Workbench

Module 10: Connecting Python to MySQL

- **3.1 Installing MySQL Connector for Python**

- Using `pip` to Install Connector

- **3.2 Establishing a Connection**
  - Connecting to a MySQL Database
  - Handling Connection Errors
- **3.3 Creating a Database and Tables**
  - SQL Syntax for Database Creation
  - Creating Tables with Different Data Types