Python

SYLLABUS

Topics Covered

Introduction To Python

1. Overview of Python
2. Installing Python and setting up the environment
3. Introduction to Python IDEs (e.g., PyCharm, VSCode)
4. Basic syntax and programming concepts
5. Python’s history and use cases

Python Basics

1. Variables and data types
2. Operators and expressions
3. Basic input and output
4. Control flow (if statements, loops)
5. Functions and modularity
6. Error handling and exceptions

Data Structures

1. Lists and tuples
2. Dictionaries and sets
3. list comprehensions
4. Iterators and generators

Object-Oriented Programming (OOP)

1. Classes and objects
2. Inheritance and polymorphism
3. Encapsulation and abstraction
4. Methods and attributes
5. Magic methods and operator overloading

Modules and Packages

1. Importing modules and packages
2. Creating and using your own modules
3. Exploring Python Standard Library
4. Third-party libraries and package management (e.g., pip, virtualenv)

Data Handling and Manipulation

1. Working with data using libraries like NumPy and pandas
2. Data cleaning and preprocessing
3. Data visualization with libraries like Matplotlib and Seaborn

Web Development with Python

1. Introduction to web frameworks (e.g., Flask, Django)
2. Building and deploying a simple web application
3. RESTful APIs and web services

Database Connectivity

1. Introduction to databases
2. SQL basics and querying
3. Working with databases using SQLite and SQLAlchemy
4. ORM (Object-Relational Mapping) concepts

Testing and Debugging

1. Debugging techniques and tools
2. Writing and running unit tests
3. Test-driven development (TDD)

Advanced Topics

1. Concurrency and parallelism (e.g., threading, multiprocessing)
2. Networking and sockets
3. Working with APIs and web scraping
4. Asynchronous programming (e.g., asyncio)

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Best Practices and Coding Standards

1. Code style and PEP 8 guidelines
2. Documentation and comments
3. Version control with Git