Python Full Stack

Python

Duration: 6 Months

Introduction To Python
- Why Python
- Application areas of python
- Python implementations
  - Cpython
  - Jython
  - Ironpython
  - Pypy
- Python versions
- Installing python
- Python interpreter architecture
  - Python byte code compiler
  - Python virtual machine(pvm)

Writing and Executing First Python Program
- Using interactive mode
- Using script mode
  - General text editor and command window
  - Idle editor and idle shell
- Understanding print() function
- How to compile python program explicitly

Python Language Fundamentals
- Character set
- Keywords
- Comments
- Variables
- Literals
- Operators
- Reading input from console
- Parsing string to int, float

Python Conditional Statements
- If statement
- If else statement
- If elif statement
- If elif else statement
- Nested if statement

Looping Statements
- While loop
- For loop
- Nested loops
- Pass, break and continue keywords

Standard Data Types
- Int, float, complex, bool, nonetype
- Str, list, tuple, range
- Dict, set, frozenset

String Handling
- What is string
- String representations
- Unicode string
- String functions, methods
- String indexing and slicing
- String formatting

Python List
- Creating and accessing lists
- Indexing and slicing lists
- List methods
- Nested lists
- List comprehension

Python Tuple
- Creating tuple
- Accessing tuple
- Immutability of tuple

Python Set
- How to create a set
- Iteration over sets
- Python set methods
- Python frozenset

Python Dictionary
- Creating a dictionary
- Dictionary methods
- Accessing values from dictionary
- Updating dictionary
- Iterating dictionary
- Dictionary comprehension

Python Functions
- Defining a function
- Calling a function
- Types of functions
- Function arguments
  - Positional arguments, keyword arguments
  - Default arguments, non-default arguments
  - Arbitrary arguments, keyword arbitrary arguments
- Function return statement
- Nested function
- Function as argument
- Function as return statement
- Decorator function
- Closure
- Map(), filter(), reduce(), any() functions
- Anonymous or lambda function

Modules & Packages
- Why modules
- Script v/s module
- Importing module
- Standard v/s third party modules
- Why packages
- Understanding pip utility

File I/O
- Introduction to file handling
- File modes
- Functions and methods related to file handling
- Understanding with block

Regular Expressions(Regex)
- Need of regular expressions
- Re module
- Functions /methods related to regex
- Meta characters & special sequences

Object Oriented Programming
- Procedural v/s Object Oriented Programming
- OOP Principles
- Defining a Class & Object Creation
- Inheritance
- Encapsulation
- Polymorphism
- Abstraction
- Garbage Collection
- Iterator & Generator

Exception Handling
- Difference Between Syntax Errors and Exceptions
- Keywords used in Exception Handling
  - try , except , finally , raise , assert
- Types of Except Blocks
- User-defined Exceptions

GUI Programming
- Introduction to Tkinter Programming
- Tkinter Widgets
- Layout Managers
- Event handling
- Displaying image

Multi-Threading Programming
- Multi-processing v/s Multi-threading
- Need of threads
- Creating child threads
- Functions /methods related to threads
- Thread synchronization and locking

SQL Using MySQL

Introduction to RDBMS
- What is Relational Database Package
- Difference between SQL & Database
- Installing MySQL Server database

SQL Basic
- DDL: Create, Alter, Drop, etc.
- DML: Insert, Update, Delete ,etc.
- DQL : Select
- Autoincrement field
- SQL Comments
- SQL Aliases
- Savepoint & rollback

SQL Constraints
- Not NULL, Unique key
- Primary key, Check
- Default, Foreign key

- Conditional operators
- Like, between, in operators

SQL Clauses
- Order by
- Where
- Limit/top
- Group by
- having

SQL Joins
- Inner Join
- Left Join
- Right Join
- Full Join

SQL View
- creating view
- updating view
- fetching data from view

SQL Functions
- String functions
- Aggregate functions
- Date & time functions

Stored Procedures & Functions
- Understanding stored procedures and their key benefits
- Working with stored procedures
- Studying user-defined functions

Working with CSV Files:
- How to write result to csv file
- How to read csv file

Python Database Connectivity
- Database Drivers and connectors
- Creating connection object
- Understanding cursor object
- Executing SQL statements using cursor
- Fetching records from cursor
- Storing and retrieving Date and Time

MONGODB

Introduction To MongoDB
- Understanding NoSQL DB
- NoSQL vs. SQL DB
- Understanding Mongo DB
- Downloading & Installation
- Introduction of MongoDB shell and Compass
- Understanding database, collection & document

Crud Operations
- Insert Document
- Delete Document
- Update Document
- Query Document

Operators In MongoDB
- Query and Projection operators
- Update operator
- Aggregation Pipeline operators

Methods In MongoDB
- limit and sort
- bulk methods
- other methods

Indexing And Relationships
- Types of Indexes
- Creating an Indexes
- Dropping an Indexes
- Defining Relationships between Documents

Python Connectivity With MongoDB
- Introduction to pymongo
- Installing pymongo module
- MongoClient
- Getting database and collection
- CRUD operations
- Range Queries

Front End

Introduction to WEB
- What are web applications?
- Static v/s dynamic web applications
- Web application Architecture
  - Front End
  - Back End

HTML
- Introduction to HTML 5
- Parts in HTML Document
- Head Section
- Meta Information
- Body Section
- Heading &Paragraph
- HTML FORMS
- Anchors, Images
- HTML Comments
- HTML Table
- DIV Section

CSS
- Introduction CSS3
- Inline CSS
- Internal CSS
- External CSS
- Styling Text
- Styling Fonts
- CSS Borders
- Selectors

- Backgrounds and Borders
- Text Effects
- Margin & Padding

JavaScript

- What is Script?
- Introduction to JavaScript
  DOM and BOM
- Comments and Types of Comments
- Popup Boxes
- Variables & Operators JavaScript
- Functions and Events Conditional
- Statements Looping Control
- Types of Errors
- Exception Handling
- Java Script Objects
- Browser Objects
- Validations in JS

Typescript

- Why Typescript
- Basic Types
- Class and Interfaces
- Modules

Bootstrap

- Introduction to Bootstrap4
- Bootstrap CDN & Local
- Bootstrap Classes
- Bootstrap Forms
- Bootstrap Buttons
- Bootstrap Colors
- Bootstrap Grid System

Introduction To React Js

- What is React JS?
- What is SPA?
- DOM vs Virtual DOM
- Advantages and Disadvantages
- Key Features

Environmental Setup

- Node | NPM
- Installation of CLI
- Setup Project
- Directory Structure
- Code Editors
- How React JS Application Boot

Basic Features Of React Js

- React Concepts
- JSX and TSX
- Render Elements
- Function and Class Components
- Props and State

- Handling Events
- Dynamic Data Rendering
- Property Binding

Key Features Of React Js

- Conditional Rendering
- List and Keys
- Forms Handling
- Forms Validations

Component Lifecycle Hook

- Understanding component lifecycle
- All Lifecycle Hooks

Event Handling React

- Understanding React Event System
- Passing arguments to event Handlers

Network Call

- Fetch
- Axios

Custom Services

- Introduction to Services
- Building a Service

Local data storage

- Local Storage
- Session Storage
- Cookies

Routing With React Router

- Setting up React Router
- Configuring route with Route Component
- Making routes dynamic with Route Params
- Working with nested routes
- Link and NavLink
- Redirect Routes

UI Components

- Angular Material
- PrimeNG

Introduction To Redux

- Why Redux
- Install and setup
- Store ,Reducer , actions
- Dispatcher
- High order Components
- mapStateToProps and mapDispatchToProps usage

Advance Redux

- Async Actions
- Middleware
- Redux Thunk and Redux Saga

React Hooks

- Why We Need Hooks.
- Different Types Of Hooks
- Using State And Effect Hooks
- Usereducer , Useref Etc.
- Custom Hooks
- Rules Of Hooks

Third Party Modules
- Social Login
- Pagination
- Search
- Filter
- JWT Token
- File Upload
- Many More

Django

Getting Started With Django
- Language v/s Framework
- What is Django Framework?
- Django Versions
- Installing Django

Understanding Django Project
- Creating Django Project
- Creating Django App
- Understanding Directory Structure of Project
- UrlMappings, Views,manage.py
- HttpRequest and HttpResponse Objects
- Registering App in settings.py
- Django Development Server
- Control flow of request processing
- MVT Design Pattern

Django Templates (Presentation Logic)
- Built-in Templates Tags & Filters
- Template Variables
- Template Inheritance
- Building custom template tag
- Integration of Static Contents
    - How to display static images
    - How to use CSS and bootstrap
    - Loading static data to template

Understanding Django Views (Business Logic)
- Why this Component?
- Types of Views
    - Function Based
    - Class Based
- How Views interact with other components
- How to get request data in views
- How to generate response in other formats

Understanding Django Forms

- Why this Component?
- Form class &Field Types
- GET and POST methods
- Form Validations
- How to render django form to template
  - as table
  - as paragraph
  - as li
- How to use Form in views

Django Models (ORM)

- Why this component?
- SQL v/s ORM approach
- Model class and Field Types
- Understandingmakemigrations and migrate
- Performing CRUD operations
  - create (insert)
  - read (select)
  - update
  - delete
- Fetching Records from database
  - Understanding QuerySet
  - Fetching all records
  - Fetching records based on conditions
  - Fetching Data in an order
  - Data Slicing
- Understanding Association Mappings
  - one to one
  - one to many
  - many to one
  - many to many
- Integration with MySQL database

Django Admin Interface

- How to create super user
- How to access admin site
- Registering models with admin
- Managing users in the admin

Django State and Session Handling

- Why maintain state?
- Understanding stateless behavior of http protocol
- State management techniques
  - Cookies
  - URL-Rewriting (query strings)
  - Hidden form fields
  - Session

- Understanding Sessions in Details
  - Enable / Disable Session
  - Get and set data with session
  - Using session in template
  - Session Expiry

Django Middleware
- Why middleware?
- Understanding built-in middleware
- Creating custom middleware
  - Function based
  - Class based
- How to enable custom middleware

Django User Authentication
- Working with User objects
- Permissions and authorization
- Authentication in web requests
- Managing users in the admin
- Extending the existing User Model

Developing Web Services(APIs)
- What is a Web API?
- Difference between SOAP and RESTful APIs
- Django REST Framework for developing RESTful APIs

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- Difference between SOAP and RESTful APIs
- Django REST Framework for developing RESTful APIs
- Understanding JSON response
- How to consume RESTful API
  - requests   package
  - get and post
  - how to parse JSON

Miscellaneous

- Sending email using django library
- Pagination
  - Function based
  - Class based

Project Deployment (Making Project LIVE)

- Understanding domain and hosting
- Hosting Providers
- Deploy the project

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