

# Python Django Web Development

## 1. Introduction to Django

- 1.1 Introduction to Django Framework
- 1.2 Setting up the Development Environment (Python, Django, IDE)
- 1.3 Creating a Django Project and Application
- 1.4 Understanding the MVC (Model-View-Controller) Architecture in Django
- 1.5 Creating and Configuring a Virtual Environment

## 2. Building a Basic Django Application

- 2.1 Creating Django Models (Database Tables)
- 2.2 Defining URL Patterns and Views
- 2.3 Templating with Django Templates
- 2.4 Static Files and Media Files
- 2.5 Django Admin Interface for Data Management
- 2.6 Django Forms for User Input

## 3. Working with Databases

- 3.1 Configuring Database Settings (SQLite, PostgreSQL, MySQL)
- 3.2 Creating and Migrating Database Models
- 3.3 Querying the Database using Django's ORM
- 3.4 Django Database API (CRUD operations)



## 3.5 Working with Query sets and Filters

## 4. Authentication and Authorization

- 4.1 User Authentication with Django's Built-in Authentication System
- 4.2 User Registration and Login
- 4.3 User Permissions and Groups
- 4.4 Custom User Models
- 4.5 Implementing Role-Based Access Control (RBAC)

## 5. RESTful APIs with Django

- 5.1 Introduction to RESTful APIs
- 5.2 Django REST Framework (DRF) Overview
- 5.3 Creating API Views and Serializers
- 5.4 Handling CRUD Operations with APIs
- 5.5 Authentication and Permissions for APIs
- 5.6 Testing and Documenting APIs

## 6. Advanced Django Features

- 6.1 Django Signals and Asynchronous Tasks
- 6.2 Django Middleware for Request and Response Processing
- 6.3 Caching in Django
- 6.4 Internationalization and Localization
- 6.5 Django Debugging and Error Handling
- 6.6 Security Best Practices

## 7. Frontend Integration

- 7.1 Integrating Frontend Frameworks (e.g., React, Angular) with Django
- 7.2 Consuming RESTful APIs in the Frontend
- 7.3 Building Responsive and Dynamic Web Pages
- 7.4 Using JavaScript and AJAX in Django Applications
- 7.5 Web sockets and Real-time Features

## 8. Deployment and Scaling

- 8.1 Preparing for Deployment (Static and Media Files, Database Configuration)
- 8.2 Hosting Django Apps (Heroku, AWS, Digital Ocean, etc.)
- 8.3 Setting up Continuous Integration and Continuous Deployment (CI/CD)
- 8.4 Load Balancing and Scaling Django Apps
- 8.5 Monitoring and Debugging in Production

## 9. Best Practices and Optimization

- 9.1 Code Optimization and Profiling
- 9.2 Security Best Practices
- 9.3 Performance Tuning (Caching, Database Optimization)
- 9.4 Testing (Unit, Integration, Functional)
- 9.5 Version Control with Git and Collaboration (GitHub, GitLab)

## 10. Final Project

- 10.1 Building a Full-Featured Django Application
- 10.2 Project Presentation and Review
- 10.3 Deployment of the Final Project

