

## Introduction to APIs – Theory

### 1. What is an API?

An API is a set of rules that allows applications to communicate with each other.

### 2. Types of APIs: REST, SOAP

REST uses HTTP methods and supports JSON or XML.

SOAP uses XML, is secure, and used in enterprise systems.

### 3. Why are APIs important?

They connect frontend & backend, enable third-party integrations, and support scalable systems.

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## Requirements for Web Development – Theory

### 1. Understanding project requirements:

Gather features, user needs, and workflow.

### 2. Setting up environment:

Install Python, Django, DRF, and required packages.

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## Serialization in Django REST Framework – Theory

### 1. What is Serialization?

Converts Django models to JSON.

### 2. Converting QuerySets:

DRF serializers convert QuerySets to JSON.

### 3. Using serializers:

Serializer classes define fields and validations.

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## Requests & Responses in DRF – Theory

GET retrieves data.

POST creates data.

PUT updates data.

DELETE removes data.

Responses are returned in JSON via Response().

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## Views in DRF – Theory

FBVs use functions.

CBVs use classes and are more scalable.

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## URL Routing in DRF – Theory

URLs map to views. Routers auto-generate CRUD routes.

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## Pagination – Theory

Breaks data into pages. DRF provides PageNumber, LimitOffset, Cursor.

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## Settings Configuration – Theory

Configure database, static files, API keys, and installed apps.

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### Project Setup – Theory

Install Django/DRF, create project/app, add models, serializers, views.

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### Social Authentication & OTP – Theory

Google login uses OAuth via django-allauth.

Emails/OTPs use SendGrid, Twilio.

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### RESTful API Design – Theory

Follows statelessness, resource-based URLs, proper HTTP methods.

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### CRUD API – Theory

Create, Read, Update, Delete operations to manage data.

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### Authentication & Authorization – Theory

Authentication = identity check.

Authorization = permission check.

DRF uses tokens or JWT.

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### OpenWeatherMap API – Theory

Provides real-time weather using an API key.

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### Google Maps Geocoding API – Theory

Converts address -> latitude/longitude.

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### GitHub API – Theory

Used to create repos, get profile data, manage issues.

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### Twitter API – Theory

Used to fetch tweets, post tweets, get user data.

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### REST Countries API – Theory

Provides population, currency, language, capital, etc.

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### Email Sending APIs – Theory

SendGrid/Mailchimp send verification and transactional emails.

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### Twilio SMS – Theory

Used to send SMS/OTP using API keys.

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### Payment Integration – Theory

Stripe/PayPal enable online payments.

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Google Maps API – Theory

Displays maps, markers, and calculates distances.