

# Python DB and Framework

## 1. HTML in python

- Introduction to embedding HTML within Python using web frameworks like Django or Flask.
  - Web frameworks like Django and Flask allow you to build websites using Python.
  - To display content on a web page, you need to use HTML.
  - These frameworks make it easy to combine Python code (for logic) with HTML code (for design and layout).
  - This is done using templates.
  - Templates are HTML files that can include dynamic content from Python.
  - You use special tags (like `{{ }}` for variables) to insert Python data into the HTML.
  - In Flask, you use `render_template()` to send data from Python to an HTML file.
  - In Django, you use the `render()` function to connect a view to an HTML template.
- Generating dynamic HTML content using Django templates.
  - Django uses templates to create dynamic HTML pages.
  - A template is an HTML file that can display data from Python code.
  - To show dynamic content, Django uses special tags:
    - `{{ }}` – To show variables (like names, numbers)
    - `{% %}` – To add logic (like if, for loops)
  - In the view, we pass data to the template.
  - The template shows that data inside the HTML.
  - This helps create web pages that change based on the user or data from the database.

## 2. CSS in Python

- Integrating CSS with Django templates.

- To style your web pages in Django, you can use CSS.
- CSS files are placed in a folder called static.
- Django uses the `{% static %}` tag to link CSS files in HTML templates.
- Steps:

Create a static folder in your app.

Add your CSS file (e.g., `style.css`) inside it.

Load the static files in your HTML using:

`{% load static %}`

Link the CSS file in the `<head>` section:

`<link rel="stylesheet" href="{% static 'style.css' %}">`

- How to serve static files (like CSS, JavaScript) in Django.

- In Django, static files are files like CSS, JavaScript, and images that are used to design and add functionality to web pages.
- These files do not change often, so they are called static.
- To use static files in Django:
  - You must place them in a special folder called static.
  - Django uses the `{% static %}` tag to include these files in HTML templates.
  - You must also tell Django where to find these files by setting a path in the `settings.py` file.
- Django automatically serves static files during development (when `DEBUG = True`).
- In production, you need to set up a web server to serve them.

### 3. JavaScript with Python

- Using JavaScript for client-side interactivity in Django templates.
- JavaScript is used in Django templates to make web pages interactive on the client side (in the browser).
- It can be used for things like showing alerts, handling button clicks, form validation, or updating content without reloading the page.
- In Django:
  - JavaScript files are stored in the static folder.
  - You load them into your HTML template using the `{% static %}` tag.
  - The JavaScript code runs in the browser, not on the server.
- By linking JavaScript in Django templates, you can make your web pages more dynamic and interactive, such as responding to user actions without refreshing the page.

- Linking external or internal JavaScript files in Django.
- In Django, you can use JavaScript files to add interactivity to your web pages.
- These files can be either internal (written by you) or external (from a CDN like jQuery or Bootstrap).
- 1. Internal JavaScript Files:
  - Save your .js file (e.g., main.js) in the static folder of your Django app.
  - In your HTML template:
 

Load static files:

```
{% load static %}
```

Link the JS file:

```
<script src="{% static 'main.js' %}"></script>
```
- 2. External JavaScript Files:
  - Use the full URL of the JavaScript file (e.g., from a CDN).
  - Directly add in your template:
 

```
<script src="https://code.jquery.com/jquery-3.6.0.min.js"></script>
```

## 4. Django Introduction

- Overview of Django: Web development framework.
- Django is a high-level Python web framework used to build secure, fast, and scalable web applications.
- It helps developers build websites by providing a structure and reusable components.
- Key Features:
  - MVC Pattern (MVT in Django):
 

Django follows the Model-View-Template architecture to separate logic, data, and design.
  - Built-in Admin Panel:
 

Automatically provides an admin interface to manage your database.
  - ORM (Object-Relational Mapping):
 

Allows you to work with databases using Python code instead of SQL.
  - URL Routing:
 

Easily map URLs to views (functions or classes that handle requests).
  - Security:
 

Protects against common attacks like SQL injection, XSS, and CSRF.

- Reusable Apps:  
You can build and reuse modular apps across multiple projects.
- Advantages of Django (e.g., scalability, security).
  - Scalability:  
Django can handle large projects and high traffic.  
It's used by big companies like Instagram and Pinterest.
  - Security:  
Django protects against common security threats like:
    - SQL injection
    - Cross-site scripting (XSS)
    - Cross-site request forgery (CSRF)
  - Rapid Development:  
Django includes many built-in features (like admin panel, forms, authentication), so you can build web apps quickly.
  - Reusability:  
Apps and code written in Django can be reused in other projects, making development efficient.
  - Built-in Admin Interface:  
Django provides an automatic admin panel to manage data, users, and models without writing extra code.
  - Clean and Organized Code (MVT Architecture):  
Django uses the Model-View-Template (MVT) pattern, which helps keep the code clean and separated.
  - Large Community & Documentation:  
Django has strong community support and excellent documentation, making it easier to learn and troubleshoot.
- Django vs. Flask comparison: Which to choose and why.

Feature	Django	Flask
Type	Full-stack web framework	Micro (lightweight) web framework
Built-in Features	Many (Admin panel, ORM, auth, forms, etc.)	Minimal (You add what you need)
Architecture	MVT (Model-View-Template)	MVC (Model-View-Controller)
Flexibility	Less flexible, follows Django way	Highly flexible, developer's choice

Learning Curve	Moderate	Easy and beginner-friendly
Development Speed	Fast (due to built-in tools)	Depends on developer's setup
Community Support	Large and mature	Large and active

## 5. Virtual Environment

- Understanding the importance of a virtual environment in Python projects.
  - A virtual environment in Python is a self-contained folder that contains its own version of the Python interpreter and its own set of installed packages.
  - It allows developers to create an isolated environment for each Python project.
  - This is important because different projects may require different versions of the same packages, and using a virtual environment avoids conflicts between them.
  - By using a virtual environment:
    - You can install and manage packages without affecting other projects.
    - You keep your global Python installation clean and stable.
    - It helps ensure that the project works the same way on different systems or when shared with others.
- Using venv or virtualenv to create isolated environments.
  - In Python, we use tools like venv or virtualenv to create isolated environments for each project.
  - These tools help manage project-specific packages without interfering with the global Python setup.
  - venv (Built-in)
    - venv is included with Python 3.3 and above.
    - It creates a folder that contains a separate Python environment.
    - Example:
 

```
python -m venv myenv
```
  - virtualenv (External tool)
    - virtualenv works like venv but supports older versions of Python and has more features.
    - You install it using pip.

- Example:  
    `pip install virtualenv`  
    `virtualenv myenv`

## 6. Project and App Creation

- Steps to create a Django project and individual apps within the project.
- Here's a step-by-step guide to creating a Django project and individual apps within the project:

- Step 1: Install Django

- If you haven't installed Django yet, use pip:  
    `pip install django`

- Step 2: Create a New Django Project

- Run the following command to create a Django project (e.g., myproject):  
    `django-admin startproject myproject`
- Navigate into the project directory:  
    `cd myproject`
- This creates a directory structure like:

```
myproject/  
├── manage.py  
└── myproject/  
    ├── __init__.py  
    ├── settings.py  
    ├── urls.py  
    ├── asgi.py  
    └── wsgi.py
```

- Understanding the role of `manage.py`, `urls.py`, and `views.py`.

- `manage.py`

It's a command-line utility that helps interact with your Django project.

**Responsibilities:**

- Runs server: `python manage.py runserver`
- Applies migrations: `python manage.py migrate`

- Creates migrations: `python manage.py makemigrations`
- Creates superuser: `python manage.py createsuperuser`
- Runs tests: `python manage.py test`

#### ➤ `urls.py`

Maps URLs (web addresses) to views.

##### **Responsibilities:**

- Routes incoming requests to the correct view function.
- Organizes the navigation paths of your app or project.

#### ➤ `views.py`

Contains the logic for processing requests and returning responses.

##### **Responsibilities:**

- Fetch data from models.
- Render templates (HTML pages).
- Return HTTP responses (like JSON or HTML).

## 7. MVT Pattern Architecture

- Django's MVT (Model-View-Template) architecture and how it handles request-response cycles.

#### ➤ 1. Model (`models.py`)

- Handles data and business logic
- Communicates with the database (create, retrieve, update, delete records)
- Each model typically maps to a table in your database

```
class Student(models.Model):
```

```
    name = models.CharField(max_length=100)
```

```
    roll_no = models.IntegerField()
```

#### ➤ 2. View (`views.py`)

- Contains the logic of your app
- Fetches data from the model and sends it to the template
- Returns an HTTP response (could be HTML, JSON, redirect, etc.)

```
def show_students(request):

    students = Student.objects.all()

    return render(request, 'students.html', {'students': students})
```

#### ➤ Template (.html files)

- Deals with presentation
- Renders the dynamic data passed by views into HTML

```
<!-- students.html -->

<h2>Student List</h2>

<ul>

    {% for student in students %}

        <li>{{ student.name }} (Roll No: {{ student.roll_no }})</li>

    {% endfor %}

</ul>
```

## 8. Django Admin Panel

- Introduction to Django's built-in admin panel.

#### ➤ What is Django Admin Panel?

Django admin is a ready-made web interface that lets you view, add, update, and delete data from your database — without writing any extra code.

#### ➤ Why is it Useful?

- Saves time — no need to build your own backend UI
- Helps manage your app's data easily
- Only accessible to authorized users (like superusers)

#### ➤ How to Use It (Steps)

- Create a Django project and app
- Run migrations → `python manage.py migrate`
- Create superuser → `python manage.py createsuperuser`



- Run server → `python manage.py runserver`
- Open admin panel → Go to <http://127.0.0.1:8000/admin>
- Login using superuser credentials

➤ Show Your Models in Admin

In your app's `admin.py` file:

```
from .models import Student
admin.site.register(Student)
```

- Customizing the Django admin interface to manage database records.

➤ What is Admin Customization in Django?

Customizing the Django admin interface means changing how your model data is displayed and managed in the admin panel.

➤ Why Customize?

- To show important fields
- To make searching and filtering easier
- To make the admin panel more user-friendly

➤ Basic Customization Options

- You do this in your app's `admin.py` file using a class like this:  

```
class StudentAdmin(admin.ModelAdmin):
    list_display = ('name', 'roll_no')    # shows these columns
    search_fields = ('name',)            # adds a search box
    list_filter = ('course',)            # adds filter options
```
- Then register it:  

```
admin.site.register(Student, StudentAdmin)
```

➤ Result:

- A table with name and roll number
- A search box to search students by name
- A sidebar filter by course

## 9. URL Patterns and Template Integration

- Setting up URL patterns in `urls.py` for routing requests to views.

- In Django, `urls.py` is used to map URLs (web addresses) to view functions.
- It tells Django what code to run when a user visits a specific URL.
- Without URL patterns, Django wouldn't know which view should handle a request like `/home/` or `/students/`.

#### ➤ Basic Setup

- Step 1: Import Required Modules

```
from django.urls import path
from . import views
```

- Step 2: Define URL Patterns

```
urlpatterns = [
    path('', views.home, name='home'), # root URL
    path('about/', views.about, name='about'), # /about/
]
```

Here:

`'about/'` is the URL path

`views.about` is the function that will handle the request

`name='about'` lets you refer to this URL in templates

#### ➤ How It Works

When a user visits <http://127.0.0.1:8000/about/>:

- Django looks in `urls.py`
- Finds `path('about/', views.about)`
- Calls the `about()` function in `views.py`

- Integrating templates with views to render dynamic HTML content.

- Templates are HTML files used to display data dynamically in Django.
- They allow you to combine HTML with Python variables.

#### ➤ Why Use Templates?

- To create dynamic webpages
- To show data from the database (like names, posts, etc.)
- To separate design (HTML) from logic (Python code)

#### ➤ How to Integrate Templates with Views

- 1. Create a Template File

Inside your app folder, make a folder named `templates`, then another folder with your app name:

`myapp/`

```
└─ templates/
    └─ myapp/
        └─ home.html
home.html
<h1>Hello, {{ name }}!</h1>
```

- 2. Write a View That Uses the Template

In views.py:

```
from django.shortcuts import render
```

```
def home(request):
    return render(request, 'myapp/home.html', {'name':
        'Alice'})
```

'myapp/home.html' is the path to the template

{'name': 'Alice'} is the data passed to the template

- 3. Add URL Pattern

In urls.py:

```
from django.urls import path
from . import views
```

```
urlpatterns = [
    path("", views.home, name='home'),
]
```

## 10. Form Validation using JavaScript

- Using JavaScript for front-end form validation.
- It's the process of checking if the user's input is correct before the form is submitted to the server.
- Why Use JavaScript for Validation?
  - Gives instant feedback to the user
  - Helps avoid unnecessary server requests
  - Improves user experience
- Common Checks with JavaScript
  - Required fields are not empty

- Email is valid
- Password is strong enough
- Numbers are in the correct range

#### ➤ Simple Example

- HTML Form:

```
<form onsubmit="return validateForm()">
  Name: <input type="text" id="name"><br>
  Email: <input type="email" id="email"><br>
  <button type="submit">Submit</button>
</form>
```

- JavaScript Validation:

```
<script>
function validateForm() {
  const name = document.getElementById("name").value;
  const email = document.getElementById("email").value;

  if (name === "") {
    alert("Name is required");
    return false;
  }

  if (!email.includes("@")) {
    alert("Enter a valid email");
    return false;
  }

  return true; // Allow form submission
}
</script>
```

## 11.Django Database Connectivity (MySQL or SQLite)

- Connecting Django to a database (SQLite or MySQL).

- Connecting Django to a database is a key step in setting up your project.
- By default, Django uses SQLite, but you can switch to MySQL or other databases easily. Here's how you can connect to both:

➤ Option 1: Using SQLite (default)

- SQLite is the default database Django uses.
- It requires no setup—just make sure this is in your settings.py:

```
# settings.py
```

```
DATABASES = {
    'default': {
        'ENGINE': 'django.db.backends.sqlite3',
        'NAME': BASE_DIR / "db.sqlite3",
    }
}
```

➤ Option 2: Using MySQL

- 1. Install MySQL and Python Connector

Install the MySQL server and the Python MySQL client:

```
pip install mysqlclient
```

If you're on Windows and mysqlclient doesn't work, you can use PyMySQL as an alternative:

```
pip install pymysql
```

And add this in your `__init__.py` of your main project folder (next to settings.py):

```
import pymysql
pymysql.install_as_MySQLdb()
```

- 2. Configure settings.py

Update the DATABASES setting like this:

```
# settings.py
```

```
DATABASES = {
    'default': {
        'ENGINE': 'django.db.backends.mysql',
        'NAME': 'your_database_name',
        'USER': 'your_mysql_user',
        'PASSWORD': 'your_mysql_password',
        'HOST': 'localhost', # or your database server IP
        'PORT': '3306',
    }
}
```

- Using the Django ORM for database queries.
- ORM (Object-Relational Mapping) is a programming technique that allows you to interact with a database using object-oriented code instead of SQL.
- In Django, the ORM lets you:
  - Create, retrieve, update, and delete records in the database using Python.
  - Map Python classes to database tables.
  - Avoid writing raw SQL queries.
  - Switch databases (e.g., from SQLite to MySQL) without changing your application logic.
- Key Concepts in Django ORM
  - Model -> A class that defines the structure of a database table.
  - Field -> A class attribute in a model representing a column in the table.
  - Object -> A single record in the table, represented as a Python object.
  - QuerySet -> You get a QuerySet when using queries like `all()`, `filter()`, etc.
- Read Records
  - `Student.objects.all()`                      # All records
  - `Student.objects.get(roll_number=1)`      # Single record by condition
  - `Student.objects.filter(is_active=True)`   # Multiple records by condition
  - `Student.objects.first()`                    # First record
  - `Student.objects.last()`                    # Last record

## 12.ORM and QuerySets

- Understanding Django's ORM and how QuerySets are used to interact with the database.
- What is Django ORM?
  - Django's Object-Relational Mapper (ORM) is a powerful tool that allows you to communicate with your database using Python instead of writing SQL queries.
  - Each model (class) maps to a database table.
  - Each field in the model maps to a column.
  - Each instance of the model represents a row in the database.

➤ What is a QuerySet?

A QuerySet is a collection of database records (rows) that match a query.

It is similar to a list of objects, but it's lazy and optimized for database operations.

➤ Example: Define a Model

```
# models.py
from django.db import models

class Student(models.Model):
    name = models.CharField(max_length=100)
    roll_number = models.IntegerField(unique=True)
    email = models.EmailField()
    is_active = models.BooleanField(default=True)
```

➤ Using QuerySets to Interact with the Database

- 1. Retrieve Data

```
# Import the model
from myapp.models import Student
```

Action	Query	Description
Get all students	<code>Student.objects.all()</code>	Returns a QuerySet of all students
Filter students	<code>Student.objects.filter(is_active=True)</code>	Get students with specific conditions
Get one student	<code>Student.objects.get(roll_number=1)</code>	Returns one object
Check if exists	<code>Student.objects.filter(name="Ali").exists()</code>	Returns True or False

- 2. Create Data

```
Student.objects.create(name="Ali", roll_number=1,
email="ali@example.com")
```

- 3. Update Data

```
student = Student.objects.get(roll_number=1)
student.name = "Alicia"
student.save()
```

- 4. Delete Data
 

```
student = Student.objects.get(roll_number=1)
student.delete()
```

## 13. Django Forms and Authentication

- Using Django's built-in form handling.
  - Forms are used to collect input from users—like name, email, passwords, comments, etc.
  - In Django, forms are Python classes that:
    - Create HTML form elements
    - Validate user input
    - Process data easily and securely
  - Types of Forms in Django
    - forms.Form – For general purpose forms (not linked to models).
    - forms.ModelForm – Automatically creates a form from a Django model (saves data directly to the database).
  - How Form Handling Works in Django
    - 1. Create the Form Class

Example using forms.Form:

```
from django import forms
```

```
class ContactForm(forms.Form):
    name = forms.CharField(max_length=100)
    email = forms.EmailField()
    message = forms.CharField(widget=forms.Textarea)
```

Or using forms.ModelForm (connected to a model):

```
from django import forms
from .models import Student
```

```
class StudentForm(forms.ModelForm):
    class Meta:
        model = Student
        fields = ['name', 'roll_number', 'email']
```



- 2. Use the Form in a View

```
from django.shortcuts import render, redirect
from .forms import StudentForm
```

```
def student_register(request):
    if request.method == 'POST':
        form = StudentForm(request.POST)
        if form.is_valid():
            form.save() # Saves to the database
            return redirect('success_page') # Redirect after saving
        else:
            form = StudentForm() # Empty form

    return render(request, 'register.html', {'form': form})
```

- 3. Create the HTML Template

```
<!-- register.html -->
<h2>Student Registration</h2>
<form method="post">
    {% csrf_token %}
    {{ form.as_p }}
    <button type="submit">Register</button>
</form>
```

- Implementing Django's authentication system (sign up, login, logout, password management).

➤ Django has a built-in system to manage:

- User registration (sign up)
- User login/logout
- Password hashing and checking
- Password change/reset
- Access control (permissions, user roles)

➤ Main Features

- Sign Up (User Registration)  
This allows new users to create an account by entering a username, password, and other details.
- Login

This lets existing users log in to the site using their username and password. Django automatically handles session creation for logged-in users.

- Logout

This logs the user out and ends their session. It's important for security and privacy, especially on shared devices.

- Password Change

Logged-in users can change their password through a secure form. Django makes sure the old password is verified before updating.

- Password Reset

If users forget their password, they can reset it using their email. Django sends a reset link that lets them create a new password.

➤ How It Works

- Django uses a User model to store and manage user details.
- It provides ready-made forms and views for common tasks like login and signup.
- It also handles security (like password hashing and CSRF protection) automatically.
- You can customize how users register or what happens after login/logout.

## 14. CRUD Operations using AJAX

- Using AJAX for making asynchronous requests to the server without reloading the page.
- AJAX stands for Asynchronous JavaScript and XML.
- AJAX lets your web page talk to the server in the background without refreshing the entire page.
- It helps improve user experience by making the web app faster and smoother.
- What Can AJAX Do?
- Submit a form without reloading the page
  - Load new data (like search results or messages) without refreshing
  - Update a part of the page (like a table or a div)
  - Check something live (like username availability)

- How AJAX Works in Django
  - User interacts with the page (like clicking a button or submitting a form).
  - JavaScript (AJAX) sends a request to the Django server.
  - Django view processes the request and returns data (usually as JSON).
  - JavaScript receives the data and updates the page dynamically.
- AJAX = Send/receive data without reloading the page
- In Django, AJAX works with views that return JSON responses
- Frontend uses JavaScript or jQuery to make AJAX calls
- Great for fast, dynamic, and user-friendly web apps

## 15. Customizing the Django Admin Panel

- Techniques for customizing the Django admin panel.
- The Django admin panel is a built-in web interface that allows you to:
  - Add, edit, and delete data from your models
  - Manage users, content, and more
  - Handle all this through a friendly UI
- Ways to Customize the Admin
  - Change List Display
 

You can choose which fields show in the list view of your models.  
Example: Instead of showing all fields, only show name and date.
  - Search and Filter
 

Add search boxes and filters to quickly find records.  
This is helpful if you have lots of data and want to narrow it down easily.
  - Field Grouping (Fieldsets)
 

Group related fields into sections, so forms are cleaner and easier to fill.  
Useful for organizing long forms into neat sections.
  - Read-Only Fields
 

Make certain fields non-editable in the admin.  
This is helpful for fields like "created date" or "user ID" that should not be changed.
  - Custom Admin Actions
 

You can create buttons that perform bulk actions, like marking multiple items as "active" or "approved."

This saves time when managing many entries.

- Custom Templates and CSS

You can even override the admin's default look and feel using your own HTML/CSS.

This is used when you want the admin to match your company's design.

- Inline Editing

You can manage related models directly inside the parent model's admin page.

For example, manage a product and its reviews on the same page.

## 16.Payment Integration Using Paytm

- Introduction to integrating payment gateways (like Paytm) in Django projects.

➤ A payment gateway is a service that processes online payments securely between your website and the customer's bank (or wallet).

➤ Popular examples include:

- Paytm
- Razorpay
- Stripe
- PayPal

➤ Basic Flow of Payment Integration

- User clicks "Pay Now" on your website.
- Django app sends payment details (amount, order ID, etc.) to the payment gateway.
- Gateway redirects user to its payment page.
- User completes the payment (with card, UPI, etc.).
- Gateway sends a response back to your Django server (success or failure).
- You verify the response and update the order status in your database.

➤ What You Need to Integrate Paytm in Django

- Merchant Account on Paytm (with API key and merchant ID)
- A Django view to handle payment requests
- A callback view to handle the gateway's response
- Checksum generation & verification (Paytm provides helper code)
- Optionally: a payment success/failure page

## 17. GitHub Project Deployment

- Steps to push a Django project to GitHub.
- Create a GitHub Repository
  - Go to <https://github.com>
  - Click “New” to create a new repository
  - Name your repo (e.g., my-django-project)
  - You can leave it empty (no README, .gitignore, etc.)
  - Click “Create repository”
- Initialize Git in Your Django Project Folder
  - In your project directory on your computer:  

```
cd path/to/your/project/  
git init
```
  - This sets up Git to track your project.
- Add Files to Git

```
git add .
```

This stages all files for commit.
- Make Your First Commit

```
git commit -m "Initial commit"
```

This saves your changes with a message.
- Connect to GitHub Repository
  - Use the link provided by GitHub (HTTPS or SSH).
  - Example:  

```
git remote add origin https://github.com/your-username/my-django-project.git
```
- Push Your Code to GitHub

```
git branch -M main # Rename to main if needed  
git push -u origin main
```

This uploads your code to GitHub.
- Add a .gitignore File
  - To avoid uploading unnecessary files (like migrations, .pyc, or \_\_pycache\_\_), create a .gitignore file:  

```
# .gitignore
```

```
*.pyc
__pycache__/
db.sqlite3
.env
/static/
```

- Or use a pre-made Django .gitignore template.
- Then:

```
git add .gitignore
git commit -m "Add .gitignore"
git push
```

## 18.Live Project Deployment (PythonAnywhere)

- Introduction to deploying Django projects to live servers like PythonAnywhere.
  - Create an Account  
Sign up at [pythonanywhere.com](https://pythonanywhere.com)
  - Upload Your Project  
Use GitHub or manually upload your Django project.
  - Set Up Virtual Environment  
Create and activate a virtual environment.  
Install your project's required packages.
  - Setup Web App on PythonAnywhere  
Go to the Web tab and create a new web app.  
Choose Manual Configuration and select your Python version.
  - Configure WSGI File  
Tell PythonAnywhere where your project is and how to run it.
  - Apply Migrations & Collect Static Files  
Run `python manage.py migrate`  
Run `python manage.py collectstatic`
  - Reload Website  
Click the Reload button in the Web tab.

## 19.Social Authentication

- Setting up social login options (Google, Facebook, GitHub) in Django using OAuth2.
- Use a Library

We use social-auth-app-django to connect Django with social login providers like Google, Facebook, and GitHub.
- Add Provider Keys

We register on Google, Facebook, or GitHub to get a Client ID and Secret Key.
- Connect Django with Social Sites

Add login URLs and settings in Django to use those keys.  
Add social login buttons on your website.
- User Clicks Login

When the user clicks "Login with Google", they are redirected to Google to give permission.
- Login Success

If permission is granted, the user is logged into your site.

## 20.Google Maps API

- Integrating Google Maps API into Django projects.
- Google Maps API lets you display maps, markers, routes, etc., on your website.
- Django shows the map by loading JavaScript from Google Maps in your HTML.
- You need an API key from Google to use the Maps services.
- Get Google Maps API Key
  - Go to Google Cloud Console
  - Create a project
  - Enable Maps JavaScript API
  - Get your API key
- Use the API Key in Your HTML Template

In your Django template (template.html):  
<!DOCTYPE html>

```

<html>
<head>
  <title>My Map</title>
  <script
src="https://maps.googleapis.com/maps/api/js?key=YOUR_API_KEY"></script>
  <script>
    function initMap() {
      var location = {lat: 28.6139, lng: 77.2090}; // Example: Delhi
      var map = new google.maps.Map(document.getElementById('map'), {
        zoom: 10,
        center: location
      });
      var marker = new google.maps.Marker({
        position: location,
        map: map
      });
    }
  </script>
</head>
<body onload="initMap()">
  <h1>Google Map Example</h1>
  <div id="map" style="height:500px; width:100%;"></div>
</body>
</html>

```

➤ Connect This Template in Django View

- In your views.py:
 

```

from django.shortcuts import render

def map_view(request):
    return render(request, 'template.html')

```
- In your urls.py:
 

```

from django.urls import path
from . import views

urlpatterns = [
    path('map/', views.map_view, name='map'),
]

```