

The Ultimate Django Web Development Guide for AI & Data Science

1. Introduction to Django

Django is a high-level Python web framework that enables rapid development of secure and maintainable websites. It follows the MVT (Model-View-Template) architecture.

2. Setting Up the Environment

- Install Python
- Install pip
- Create virtual environment using `python -m venv env`
- Activate it and install Django: `pip install django`

3. Creating a Django Project

Run `django-admin startproject projectname`

Navigate into the project and run `python manage.py runserver` to start the server.

4. App Structure

Use `python manage.py startapp appname`

Apps are modular components. Understand `models.py`, `views.py`, `urls.py`, and `admin.py`.

5. URLs and Views

- Define URLs in `urls.py`
- Create views in `views.py`
- Connect them to render pages or handle logic.

6. Templates and Static Files

Use the `templates/` directory for HTML, and `static/` for CSS/JS.

Use template inheritance to avoid repetition.

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7. Models and Databases

- Define models in `models.py`
- Run `makemigrations` and `migrate`
- Use SQLite or integrate PostgreSQL/MySQL

8. Forms and User Input

Use Django Forms to handle user input securely.

Use `ModelForm` for CRUD operations.

9. Admin Panel

Customize Django Admin with `admin.py`

Register your models to view/edit data easily.

10. Authentication System

- Use built-in auth system: Login, Logout, Signup
- Protect views using decorators like `@login_required`

11. APIs with Django REST Framework

- Install DRF: `pip install djangorestframework`
- Build APIs for AI models and data interaction
- Use Serializers, ViewSets, Routers

12. Integrating AI Models

- Train AI model with scikit-learn, TensorFlow, or PyTorch
- Save using `joblib` or `pickle`
- Create a prediction view and connect via forms or APIs

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13. Deployment

- Use platforms like Heroku, Railway, or Render
- Use Gunicorn + Nginx for production
- Configure static/media files and environment variables

14. Project Ideas for AI + Django

- Job Predictor
- Resume Analyzer
- Chatbot App
- Image Classifier Web App
- Real-time Sentiment Dashboard

15. Tips & Best Practices

- Use virtual environments
- Separate dev and prod settings
- Use environment variables
- Keep code modular and DRY
- Always sanitize user inputs