

## Laboratory Activity No. 1

### Laboratory Activity No. 1:

**Topic:** Introduction to Software Design, History, and Overview

**Title:** *Setting Up the Development Environment for Django Project*

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**Introduction:** This activity will guide you through the process of setting up your development environment to start building the Library Management System (LMS) in Django. The process involves installing necessary software, setting up Python and Django, and verifying the installation.

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### Objectives:

- Install Python and Django on your system.
  - Create a virtual environment to manage dependencies.
  - Verify the installation by running a simple Django project.
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**Theory and Detailed Discussion:** To develop the Library Management System, we will use the Django framework. Django is a high-level Python web framework that allows developers to create robust web applications quickly and efficiently. Before we can start developing, we need to set up the development environment.

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**Program/Code:** The code here is focused on setting up the environment. The following commands should be run in the terminal:

```
python -m venv library_env
```

```
source library_env/bin/activate # or .\library_env\Scripts\activate on Windows
```

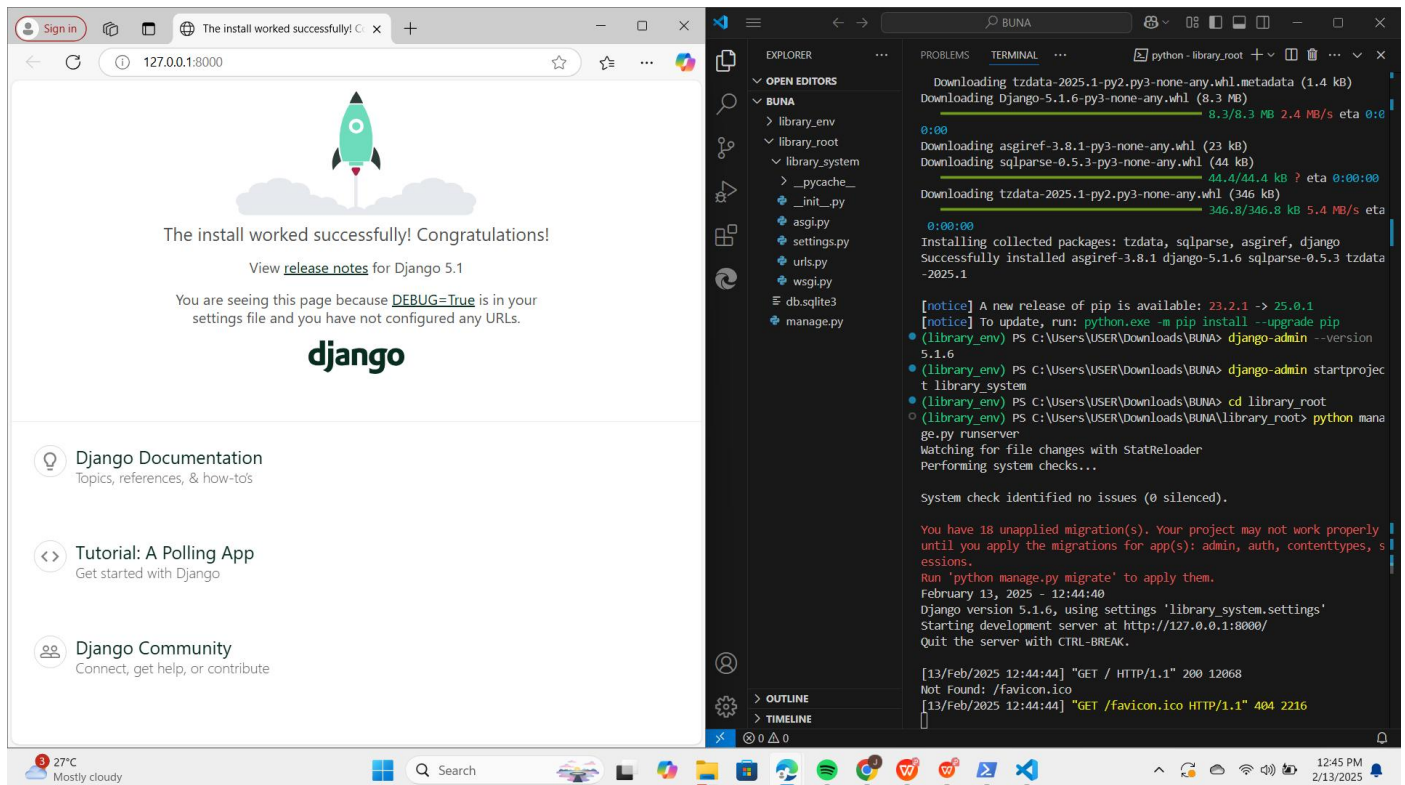
```
pip install django
```

```
django-admin startproject library_system
```

```
cd library_system
```

```
python manage.py runserver
```

## Results: (print screen the result and provide the github link of your work)



## Follow-Up Questions:

1. What is the role of a virtual environment in Django development?

**Answer:** A virtual environment in Django development acts as a dedicated workspace where project-specific dependencies (such as Django versions and third-party libraries) are installed. This isolation prevents conflicts between different projects requiring different package versions.

### Benefits:

- Ensures dependency segregation, avoiding compatibility issues.
- Enables multiple Django projects to run different library versions.
- Maintains a structured and organized development setup.
- Facilitates smooth deployment by maintaining consistency between development and production environments.

2. What are the advantages of using Django for web development over other frameworks?

**Answer:** Django is a high-level Python framework designed for fast development and a clean, pragmatic approach. Such as:

**Comprehensive Features:** Comes with built-in tools like authentication, ORM, admin interface, and security mechanisms.

**Enhanced Security:** Offers protection against SQL injection, CSRF, XSS, and clickjacking by default.

**Scalability:** Efficiently handles large applications with caching, middleware, and load-balancing support.

**Faster Development:** Features like Django Admin and generic views accelerate project completion.

**ORM (Object-Relational Mapping):** Simplifies database interactions by abstracting SQL queries.

**Strong Community & Documentation:** Extensive resources, tutorials, and third-party packages support developers.

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## Findings:

- Virtual environments enable isolated package management, preventing dependency conflicts across projects.
  - Without a virtual environment, version mismatches can cause compatibility issues.
  - Django follows a "batteries-included" approach, offering essential tools like ORM, authentication, and an admin panel.
  - Compared to frameworks like Flask, Django emphasizes scalability, security, and efficiency.
  - Django's vast documentation and active community make it suitable for both beginners and large-scale applications.
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## Summary:

Django is a robust web framework that streamlines development by providing essential features out of the box. A virtual environment is crucial for managing dependencies, ensuring projects remain organized and conflict-free. With its emphasis on security, scalability, and ease of use, Django outperforms many other frameworks.

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## Conclusion:

Utilizing Django within a virtual environment improves development efficiency and project structure. Its extensive feature set and security-focused design give it a significant edge over other frameworks. For projects requiring rapid development, scalability, and strong security, Django remains a top choice.