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BSCpE-2A2

Laboratory Activity No. 1:

Topic: Introduction to Software Design, History, and Overview

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

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.

Objectives:

- **Install Python and Django on your system.**
- **Create a virtual environment to manage dependencies.**
- **Verify the installation by running a simple Django project.**

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.

Materials, Software, and Libraries:

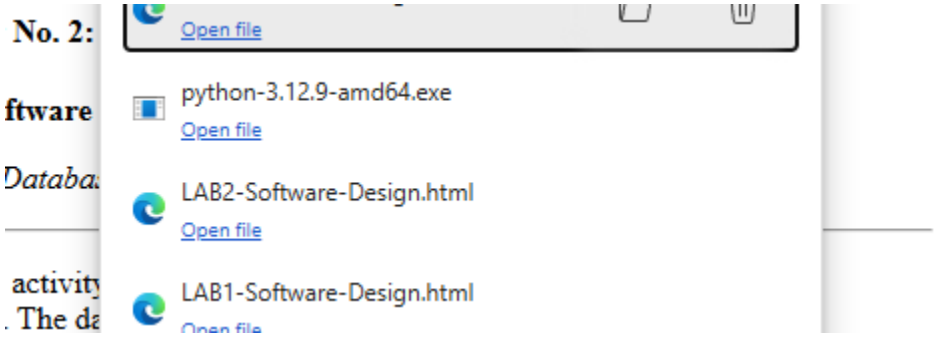
- **Python (version 3.8 or above)**
- **Django (version 4.0 or above)**
- **pip (Python package manager)**
- **Text Editor (Visual Studio Code or PyCharm)**

- **Database (SQLite – comes with Django by default)**

Time Frame: 1 Hour

Procedure:

1. **Install Python:**
    - **Go to python.org and download the latest version of Python.**
    - **Install Python by following the installation instructions for your operating system.**



2. **Install pip (Python package installer):**
    - **Open a terminal and type the following command:**

python -m ensurepip --upgrade

```
PS C:\Users\EB204_U06> pip install virtualenv
Collecting virtualenv
  Downloading virtualenv-20.29.1-py3-none-any.whl.metadata (4.5 kB)
Collecting distlib<1,>=0.3.7 (from virtualenv)
  Downloading distlib-0.3.9-py2.py3-none-any.whl.metadata (5.2 kB)
Collecting filelock<4,>=3.12.2 (from virtualenv)
  Downloading filelock-3.17.0-py3-none-any.whl.metadata (2.9 kB)
Collecting platformdirs<5,>=3.9.1 (from virtualenv)
  Downloading platformdirs-4.3.6-py3-none-any.whl.metadata (11 kB)
Downloading virtualenv-20.29.1-py3-none-any.whl (4.3 MB)
   ---------------------------------------- 4.3/4.3 MB 142.3 kB/s eta 0:00:00
Downloading distlib-0.3.9-py2.py3-none-any.whl (468 kB)
Downloading filelock-3.17.0-py3-none-any.whl (16 kB)
Downloading platformdirs-4.3.6-py3-none-any.whl (18 kB)
Installing collected packages: distlib, platformdirs, filelock, virtualenv
Successfully installed distlib-0.3.9 filelock-3.17.0 platformdirs-4.3.6 virtualenv-20.29.1

[notice] A new release of pip is available: 24.3.1 -> 25.0
[notice] To update, run: python.exe -m pip install --upgrade pip
```

3. **Install Virtual Environment:**
    - **Create a virtual environment for our project to avoid conflicts with global packages.**

pip install virtualenv

- **Create a new virtual environment:**

python -m venv library_env

- **Activate the virtual environment:**
- **On Windows:**

.\library_env\Scripts\activate

```
PS C:\Users\EB204_U06> python -m venv library_env
PS C:\Users\EB204_U06>
```

1. **Install Django:**
    - **After activating the virtual environment, install Django by running:**

    pip install django

```
PS C:\Users\EB204_U06> pip install django
Collecting django
  Downloading Django-5.1.5-py3-none-any.whl.metadata (4.2 kB)
Collecting asgiref<4,>=3.8.1 (from django)
  Downloading asgiref-3.8.1-py3-none-any.whl.metadata (9.3 kB)
Collecting sqlparse>=0.3.1 (from django)
  Downloading sqlparse-0.5.3-py3-none-any.whl.metadata (3.9 kB)
Collecting tzdata (from django)
  Downloading tzdata-2025.1-py2.py3-none-any.whl.metadata (1.4 kB)
Downloading Django-5.1.5-py3-none-any.whl (8.3 MB)
   ---------------------------------------- 8.3/8.3 MB 119.4 kB/s eta 0:00:00
Downloading asgiref-3.8.1-py3-none-any.whl (23 kB)
Downloading sqlparse-0.5.3-py3-none-any.whl (44 kB)
Downloading tzdata-2025.1-py2.py3-none-any.whl (346 kB)
Installing collected packages: tzdata, sqlparse, asgiref, django
Successfully installed asgiref-3.8.1 django-5.1.5 sqlparse-0.5.3 tzdata-2025.1

[notice] A new release of pip is available: 24.3.1 -> 25.0
[notice] To update, run: python.exe -m pip install --upgrade pip
```

2. **Verify the Django Installation:**
    - **Run the following command to verify if Django is installed:**

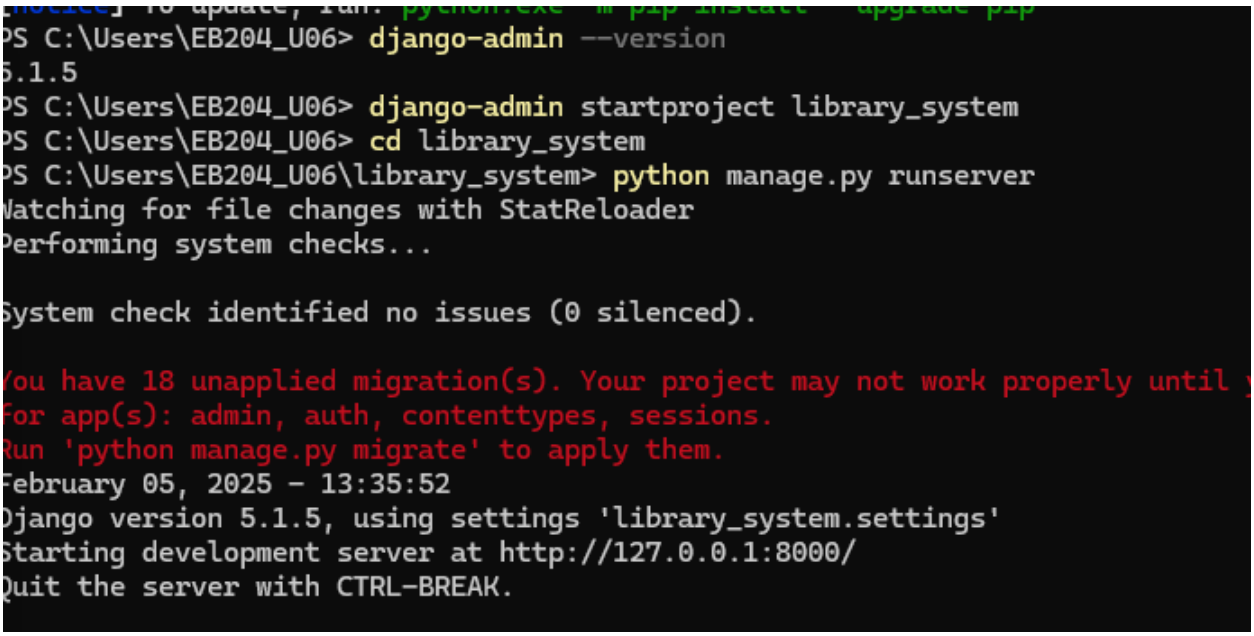
django-admin --version

3. **Create a New Django Project:**
    - **Create a new Django project called "library_system":**

django-admin startproject library_system

    - **Navigate into the project directory:**

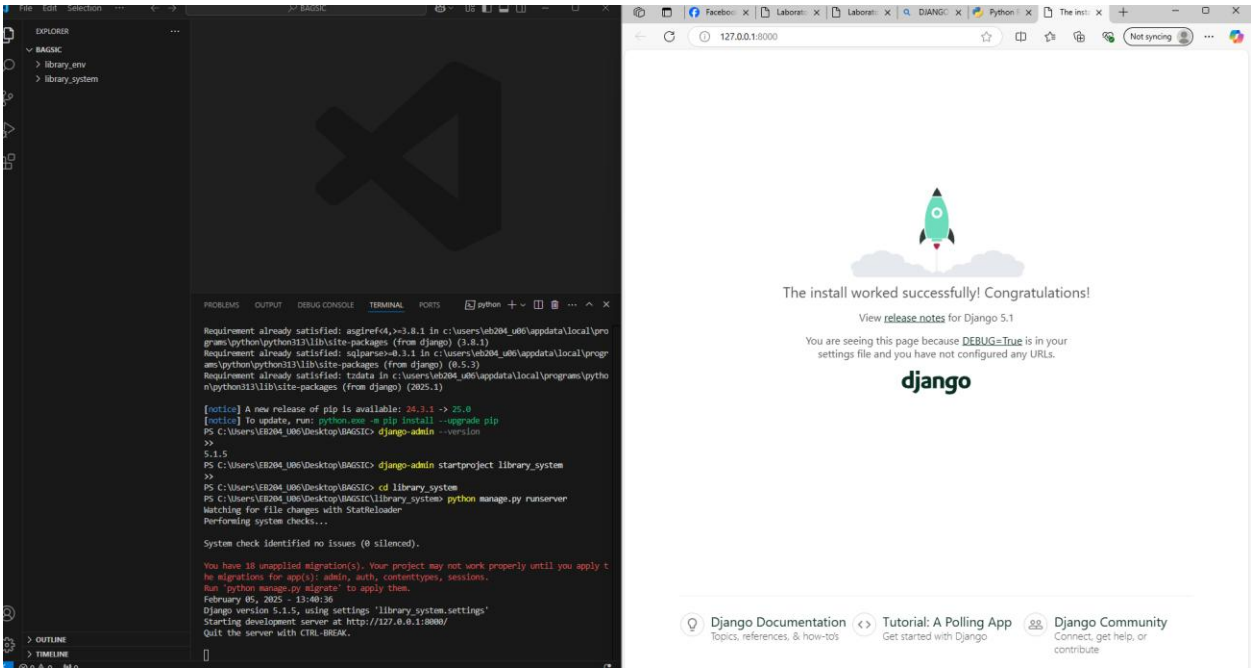
cd library_system



4. **Run the Django Development Server:**

- **Start the development server to verify everything is working:**

python manage.py runserver



- Open a browser and go to http://127.0.0.1:8000/. You should see the Django welcome page.

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?**

Ans. Virtual Environments in Django: Isolate project dependencies to prevent version conflicts and keep projects organized.

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

Ans. Advantages of Django: Built-in features, scalability, security, large community, and rapid development.

Findings:

The Django development environment was successfully set up, including Python and Django installation, virtual environment creation, and project initialization. The development server ran without issues, confirming a proper setup.

Summary:

This lab focused on setting up a development environment for Django, including installing Python, Django, and setting up a virtual environment. By following the steps, a basic Django project was successfully created and tested.

Conclusion

The activity was successful in setting up a Django development environment. This setup is essential for developing a Library Management System and ensures a smooth development process.