

What is a Web Framework?

A web framework, or web application framework (WAF), is a software framework that helps developers build web applications. It provides a standard way to build and deploy web applications on the World Wide Web. A web framework aims to make it easier for developers to build complex web applications by providing a structured approach to application development. Web app frameworks for both front-end and back-end development promote best practices and standardized processes, allowing developers to improve code quality and maintainability.

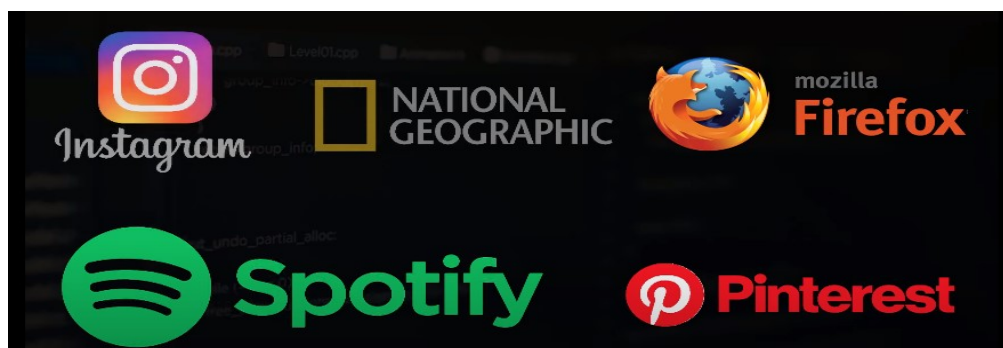
What is a Django?

Django is a high-level Python web framework that enables rapid development of secure and maintainable websites. Built by experienced developers, Django takes care of much of the hassle of web development, so you can focus on writing your app without needing to reinvent the wheel.

Django is a web framework written in Python. A web framework is a software that supports the development of dynamic websites, applications, and services. It provides a set of tools and functionalities that solves many common problems associated with web development, such as security features, database access, sessions, template processing, URL routing, internationalization, localization, and much more.

Why Django Web Framework?

First of all, it is a Python web framework, which means that you can benefit from a wide range of open-source libraries out there. This popular web framework also offers a standalone web-server for development and testing, caching, and middleware system. Moreover, it provides the ORM (object-relational mapper) library, the template engine, form processing, and an interface with Python's unit testing tools.



Key features of Django include:

- **Object-Relational Mapper (ORM):** Provides an interface for interacting with databases using Python code.
- **Routing:** Defines URL patterns and maps them to specific views.
- **Templating engine:** Enables dynamic HTML generation.
- **Forms:** Simplifies the process of creating and validating user input forms.
- **Admin interface:** Automatically generates a user-friendly interface for managing data.
- **Security features:** Protects against common web vulnerabilities.

Advantages of Django:-

- Rapid Development.
- Secure.
- Scalable.
- Fully loaded.
- Versatile.
- Open Source.
- Vast and Supported Community

Rapid Development

It takes less time to build web application. The project implementation phase is a very time taken but Django creates it rapidly.

Secure

Django takes security seriously and helps developers to avoid many common security mistakes, such as SQL injection, cross-site scripting, cross-site request forgery etc. Its user authentication system provides a secure way to manage user accounts and passwords.

Scalable

Django is scalable in nature and has ability to quickly and flexibly switch from small to large scale application project.

Fully loaded

Django includes various helping task modules and libraries which can be used to handle common Web development tasks. Django takes care of user authentication, content administration, site maps, RSS feeds etc.

Versatile

Django is versatile in nature which allows it to build applications for different-different domains. Now a days, Companies are using Django to build various types of applications like: content management systems, social networks sites or scientific computing platforms etc.

Open Source

Django is an open source web application framework. It is publicly available without cost. It can be downloaded with source code from the public repository. Open source reduces the total cost of the application development.

Vast and Supported Community

Django is an one of the most popular web framework. It has widely supportive community and channels to share and connect.

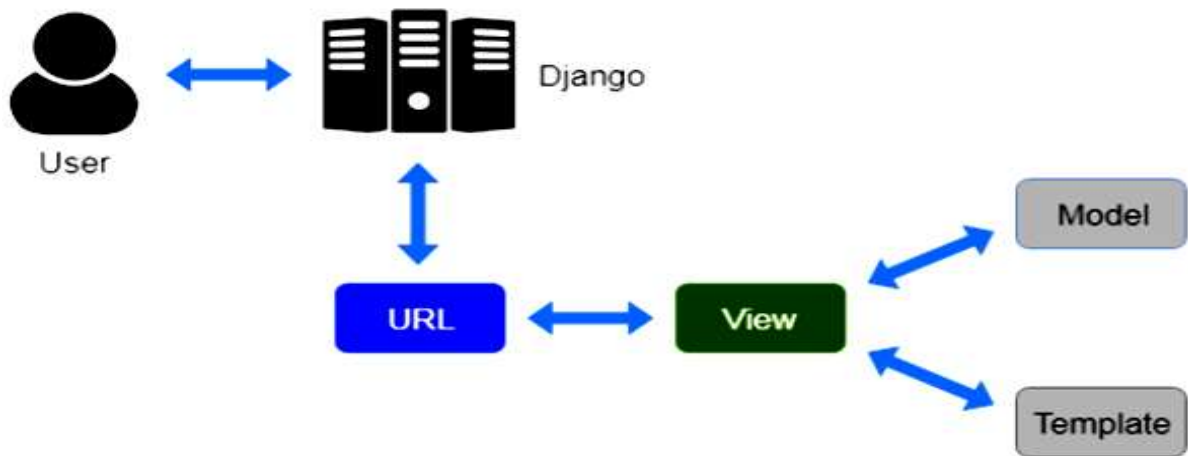
Disadvantages of using Django:

- 1. Higher memory usage:-** Django is known to use more memory than other frameworks, such as Flask or Pyramid. This can be an issue for projects with high traffic or memory constraints.
- 2. Monolithic structure:-** Django follows a monolithic structure, which means that all the components of an application are tightly coupled. This can make it difficult to customize or extend an application, and it can also lead to performance problems for large applications.
- 3. Not suitable for smaller projects:-** Django is a large and complex framework, which can make it overkill for smaller projects. There are other frameworks, such as Flask or Pyramid, that are better suited for smaller projects.
- 4. Limited support for non-relational databases:-** Django primarily supports relational databases, such as PostgreSQL and MySQL. While there is some support for non-relational databases, such as MongoDB, it is not as comprehensive as the support for relational databases.

Django works in MVT-pattern:-

The MVT (Model View Template) is a software design pattern. It is a collection of three important components Model View and Template. The Model helps to handle database. It is a data access layer which handles the data.

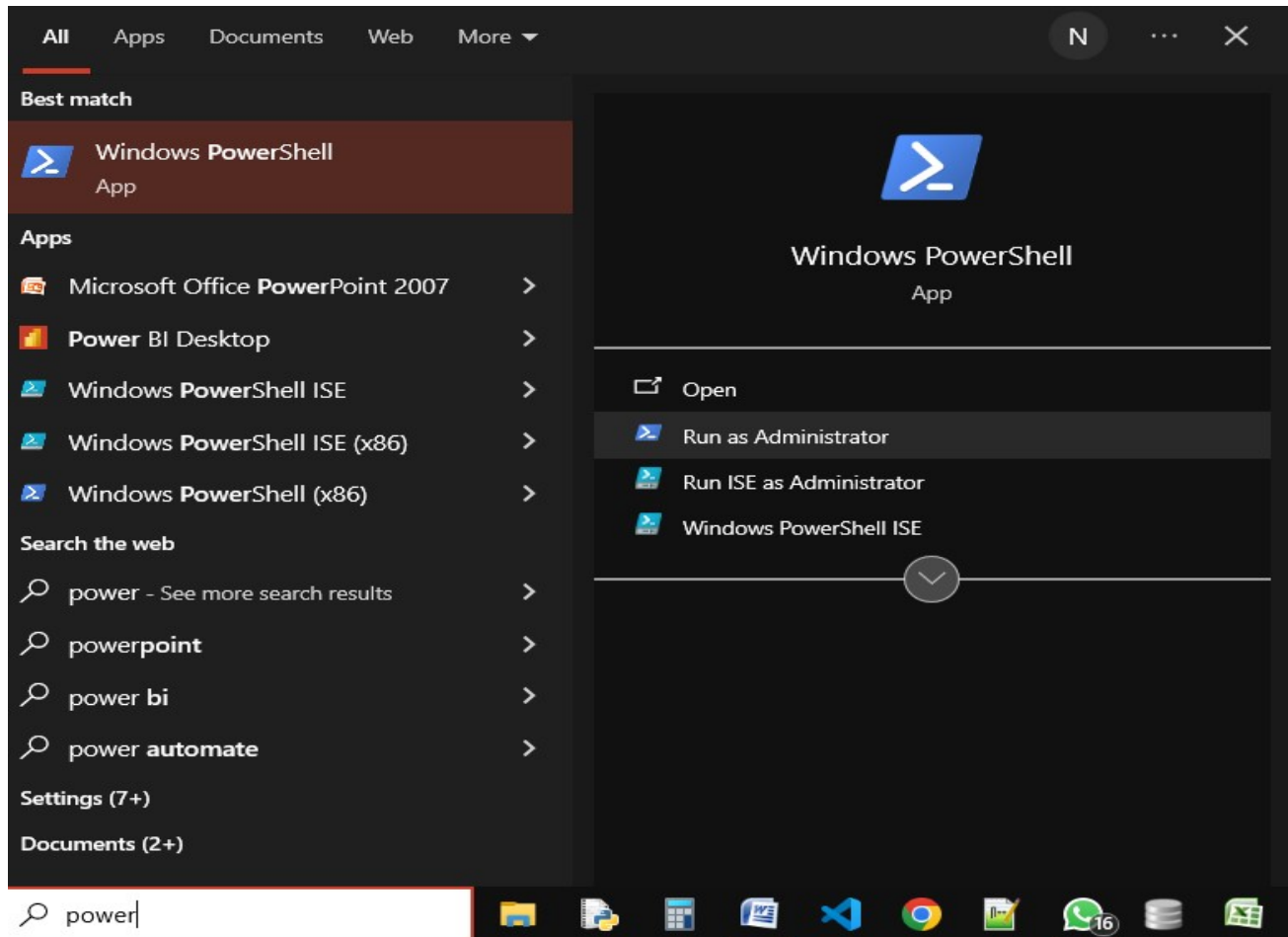
The Template is a presentation layer which handles User Interface part completely. The View is used to execute the business logic and interact with a model to carry data and renders a template.



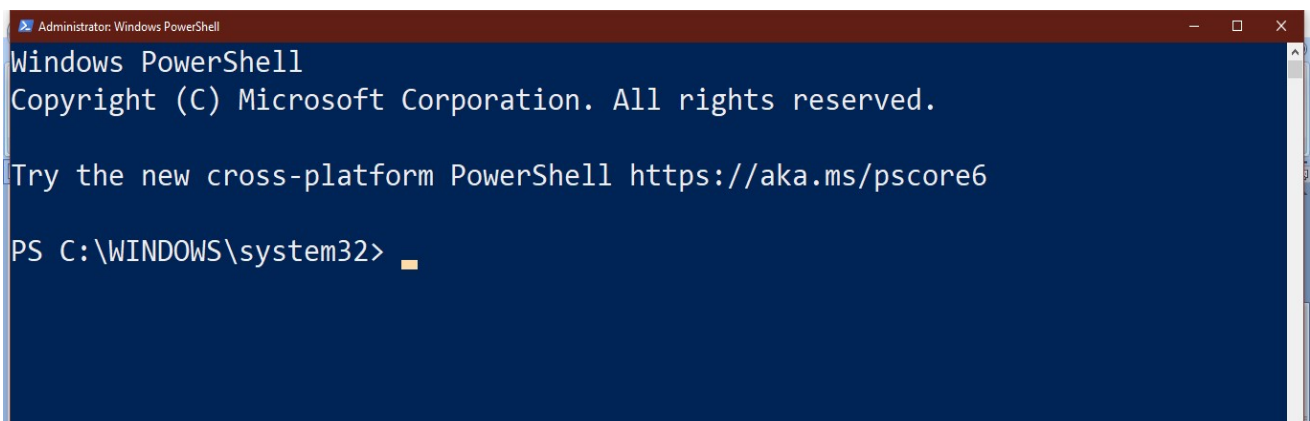
One of the most significant differences lies in how user interactions are managed. In MVT, the Template is mainly for presentation, while the View handles data and user interactions. In MVC, the Controller is responsible for handling user interactions and updating the Model, which in turn updates the View.

Enable Scripting from windows power-shell

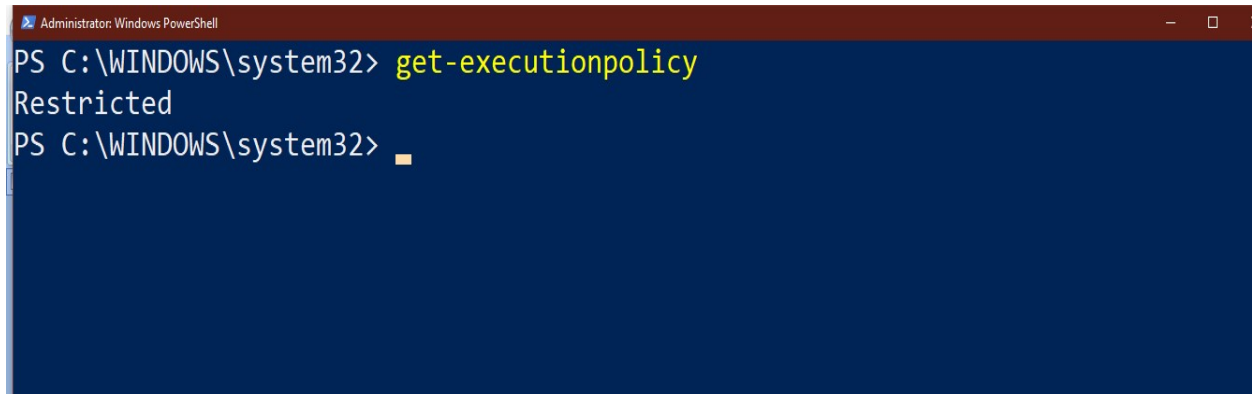
Step 1:- Open Windows powershell



Step 2:- Click on Run as Administrator

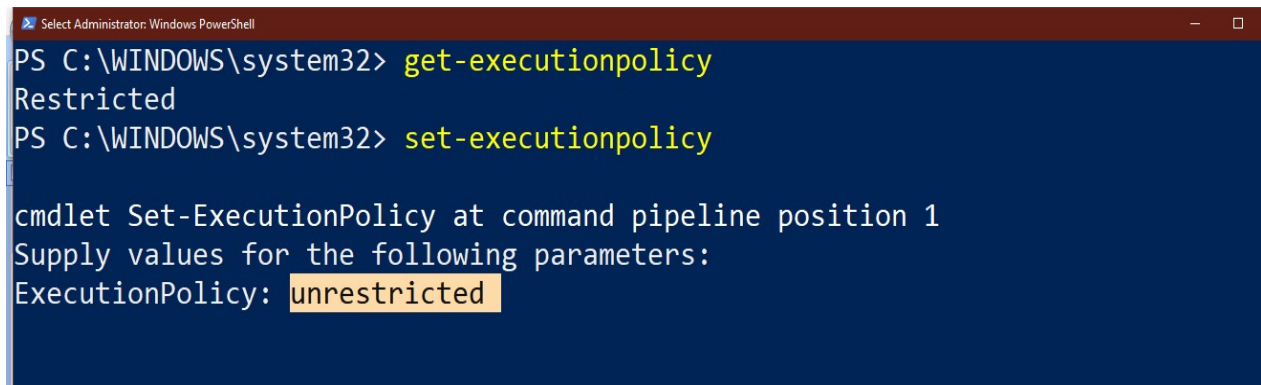


Step 3 :- Check current executionpolicy



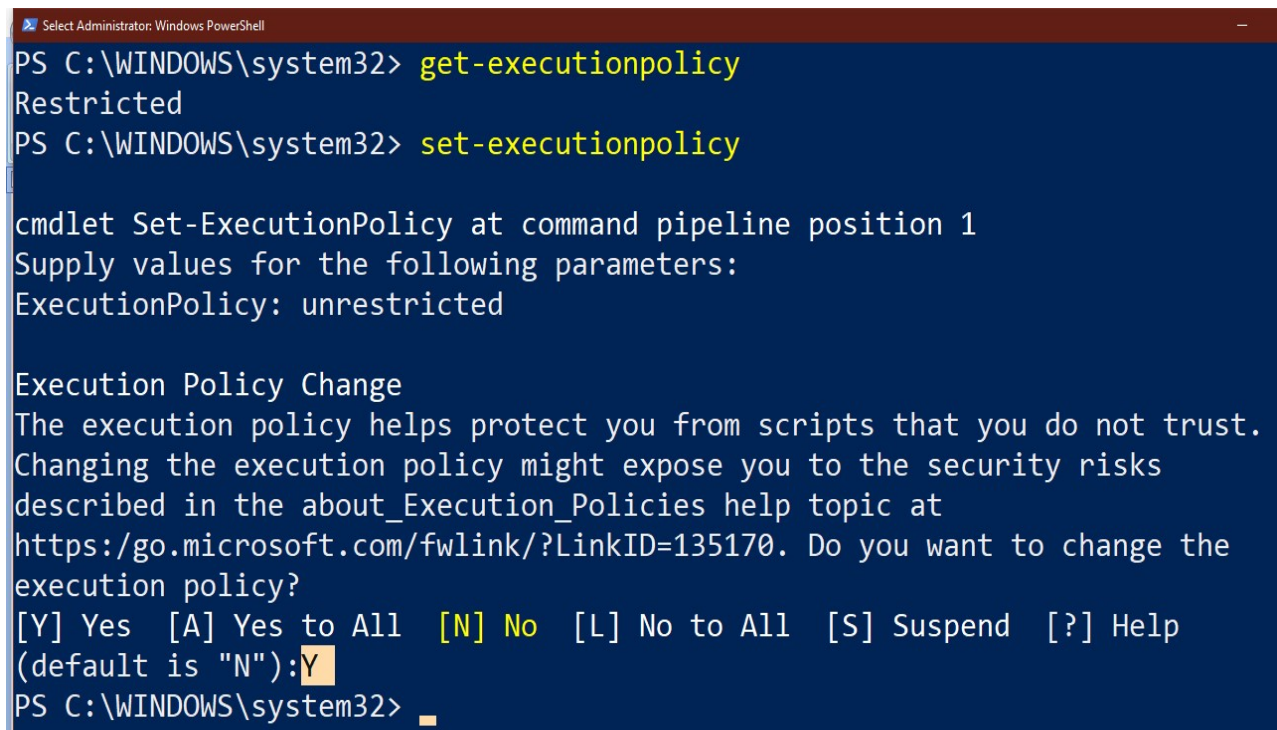
```
Administrator: Windows PowerShell
PS C:\WINDOWS\system32> get-executionpolicy
Restricted
PS C:\WINDOWS\system32> █
```

Step 4:- Change current execution policy



```
Select Administrator: Windows PowerShell
PS C:\WINDOWS\system32> get-executionpolicy
Restricted
PS C:\WINDOWS\system32> set-executionpolicy

cmdlet Set-ExecutionPolicy at command pipeline position 1
Supply values for the following parameters:
ExecutionPolicy: unrestricted
```

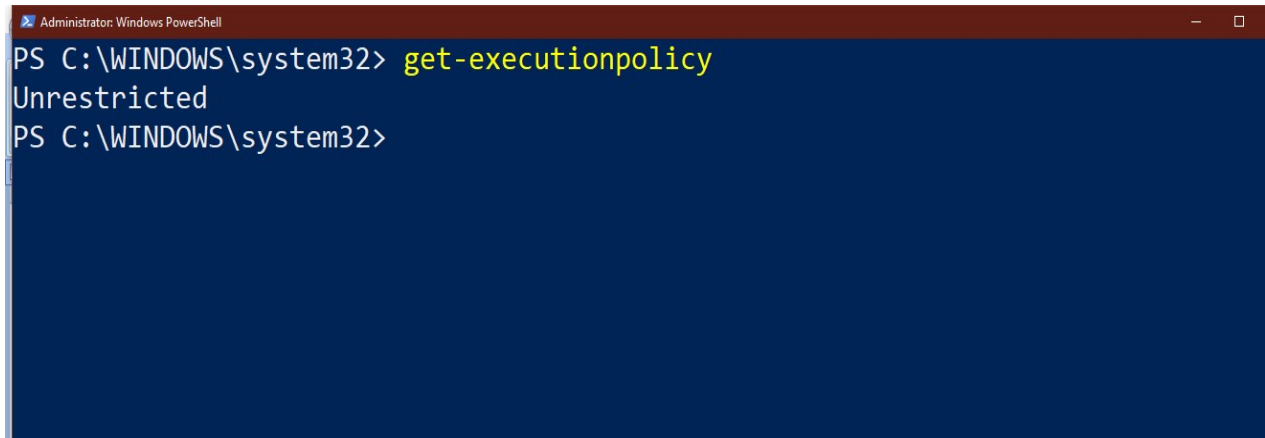


```
Select Administrator: Windows PowerShell
PS C:\WINDOWS\system32> get-executionpolicy
Restricted
PS C:\WINDOWS\system32> set-executionpolicy

cmdlet Set-ExecutionPolicy at command pipeline position 1
Supply values for the following parameters:
ExecutionPolicy: unrestricted

Execution Policy Change
The execution policy helps protect you from scripts that you do not trust.
Changing the execution policy might expose you to the security risks
described in the about_Execution_Policies help topic at
https://go.microsoft.com/fwlink/?LinkID=135170. Do you want to change the
execution policy?
[Y] Yes [A] Yes to All [N] No [L] No to All [S] Suspend [?] Help
(default is "N"):Y
PS C:\WINDOWS\system32> █
```

Step 5:- Again check current executionpolicy

A screenshot of a Windows PowerShell window titled "Administrator: Windows PowerShell". The command prompt shows the command `get-executionpolicy` being executed, which returns the output `Unrestricted`. The prompt then shows the command `PS C:\WINDOWS\system32>` again.

```
Administrator: Windows PowerShell
PS C:\WINDOWS\system32> get-executionpolicy
Unrestricted
PS C:\WINDOWS\system32>
```

Virtual Environment:--

What is a Virtual Environment?

A virtual environment is a tool that helps to keep dependencies required by different projects separate by creating isolated Python virtual environments for them. This is one of the most important tools that most Python developers use.

Why do we need a virtual environment?

Imagine a scenario where you are working on two web-based Python projects one of them uses Django 4.0 and the other uses Django 5.0 (check for the latest Django versions and so on). In such situations, we need to create a virtual environment in Python that can be really useful to maintain the dependencies of both projects.

How to create **Virtual Environment**:

Step 1:- Open cmd

Step 2:- `python -m venv env / py -m venv my_env`

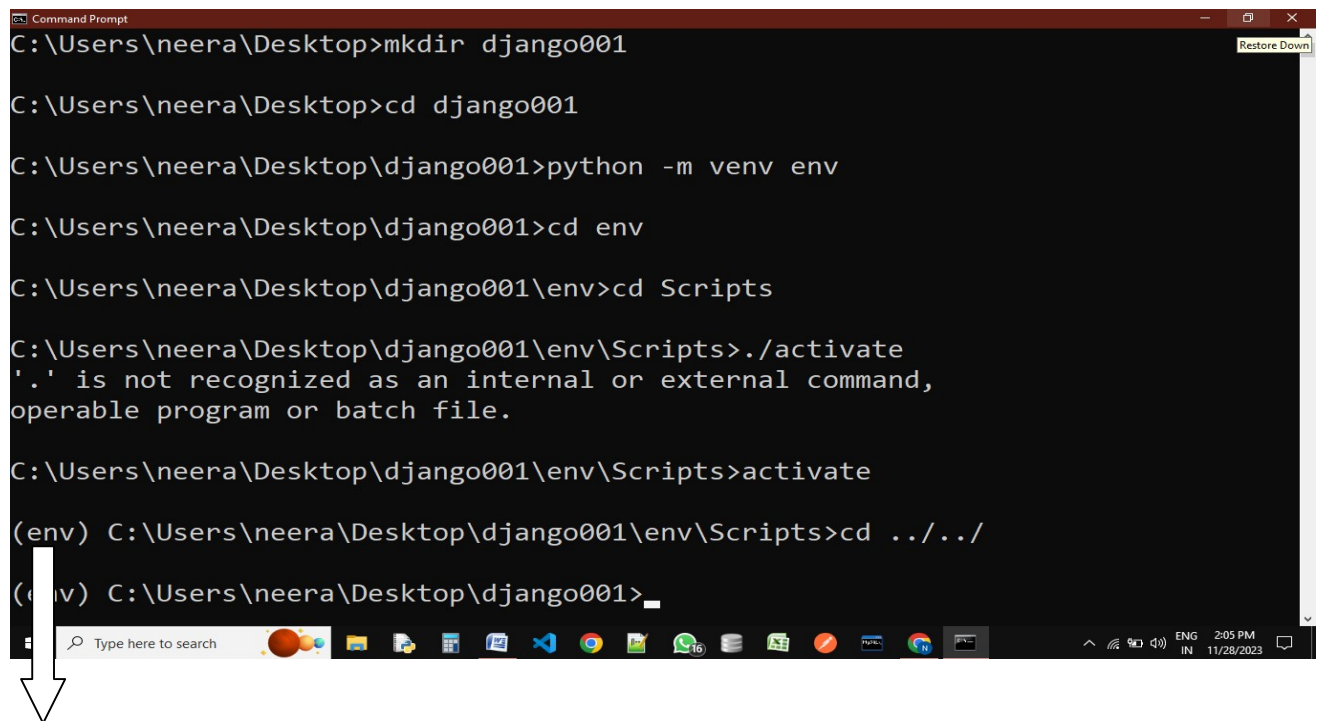
(In Python, the -m flag is used to run a module as a script. When you execute `python -m <module_name>`, Python will execute the specified module as the main program.)

Step 3:- `cd env/Scripts/`

Step 4:- `./activate`

Step 5:- `cd ../..`

Now, we create and activate virtual environment.



```
C:\Users\neera\Desktop>mkdir django001
C:\Users\neera\Desktop>cd django001
C:\Users\neera\Desktop\django001>python -m venv env
C:\Users\neera\Desktop\django001>cd env
C:\Users\neera\Desktop\django001\env>cd Scripts
C:\Users\neera\Desktop\django001\env\Scripts>./activate
'.' is not recognized as an internal or external command,
operable program or batch file.
C:\Users\neera\Desktop\django001\env\Scripts>activate
(env) C:\Users\neera\Desktop\django001\env\Scripts>cd ../../
(env) C:\Users\neera\Desktop\django001>
```

A white arrow points from the final prompt line to the text below.

This indicates that you create and activate virtual environment.

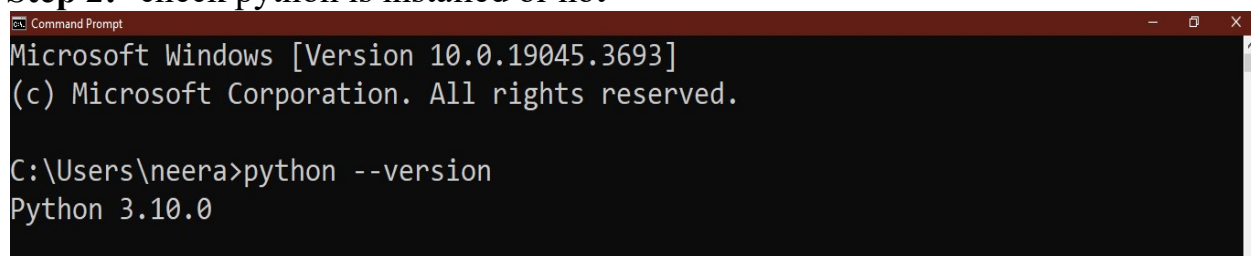
How to Install Django

Prerequisites for Installing Django

Check if Python is installed in the system by using the following command:

Step 1:- Open cmd prompt.

Step 2:- check python is installed or not



```
Microsoft Windows [Version 10.0.19045.3693]
(c) Microsoft Corporation. All rights reserved.

C:\Users\neera>python --version
Python 3.10.0
```

Step 3: If Python is not installed in your system, then install it through this <https://www.python.org/> web page.

Step 4:- After installing python again check python installed or not through cmd.

Step 5:- In cmd **pip install django.(pip install django==4.2.5)**

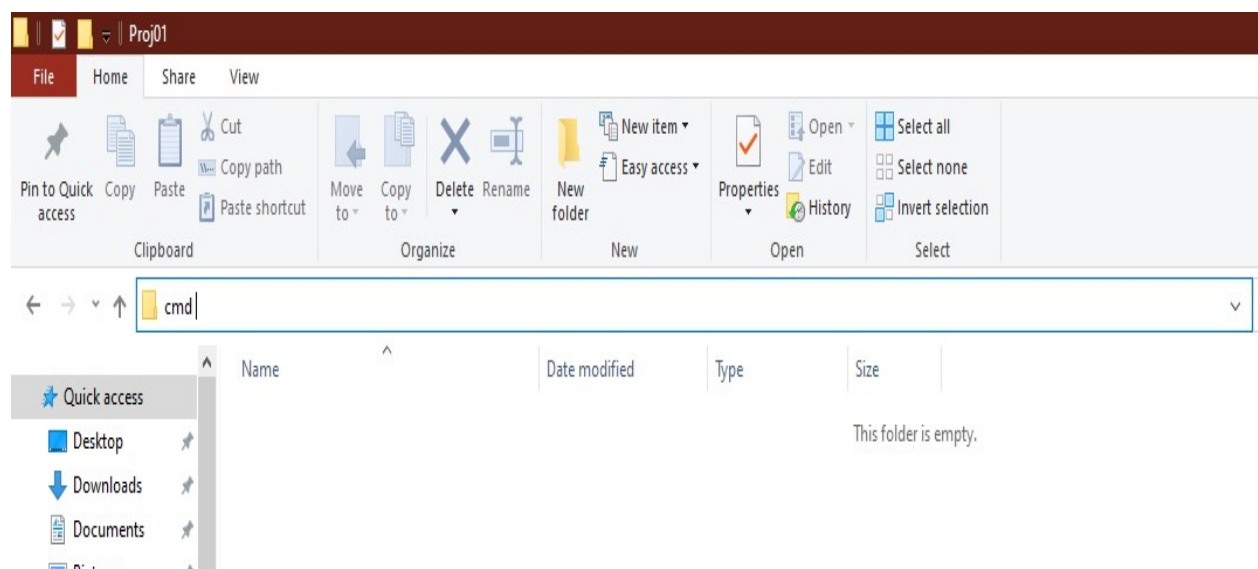
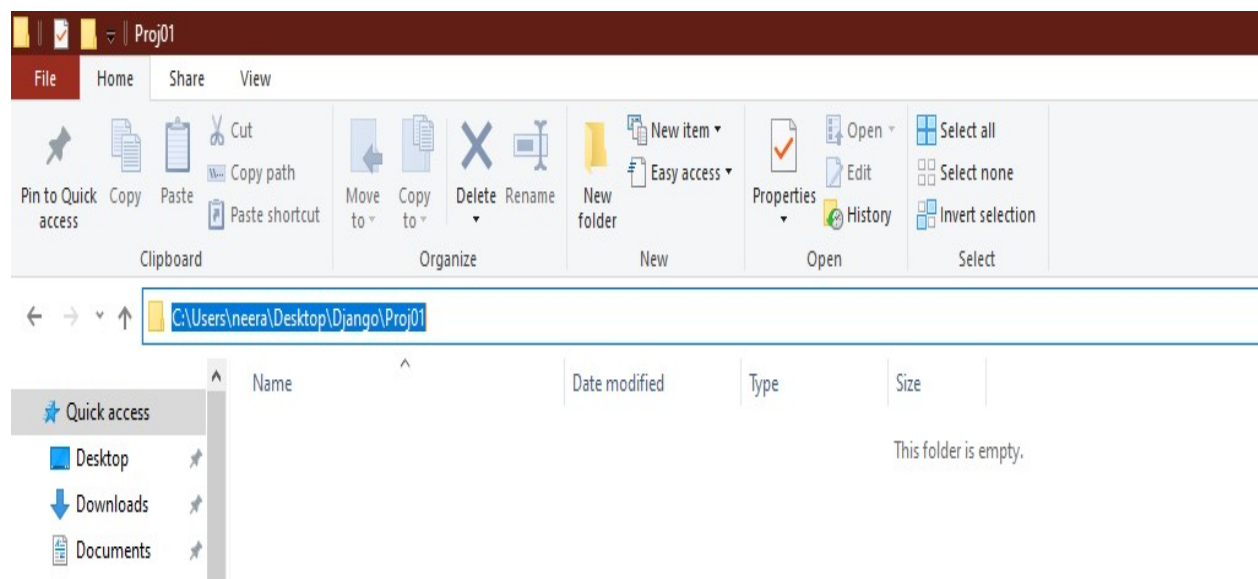
Step 6:- check django install or not through **Django-admin --version** in cmd prompt.

```
Microsoft Windows [Version 10.0.19045.3693]
(c) Microsoft Corporation. All rights reserved.

C:\Users\neera>python --version
Python 3.10.0

C:\Users\neera>Django-admin --version
4.2.5
```

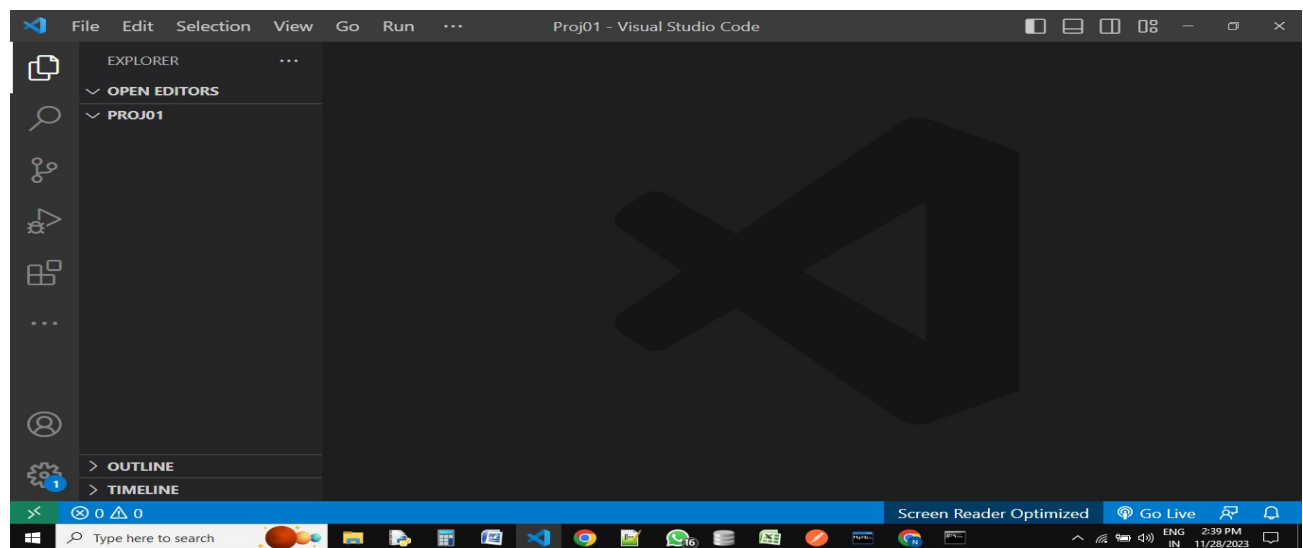
Create first Django Project:



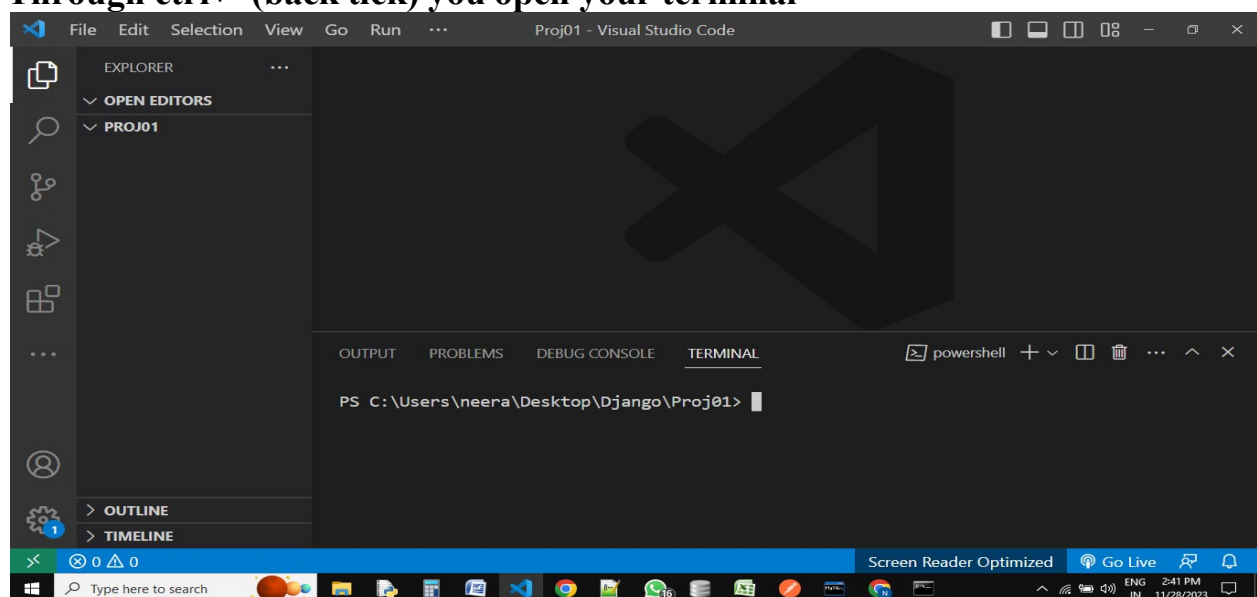
```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.19045.3693]
(c) Microsoft Corporation. All rights reserved.

C:\Users\neera\Desktop\Django\Proj01>code .
```

After that it directly open VS-Code:



Through ctrl+' (back tick) you open your terminal



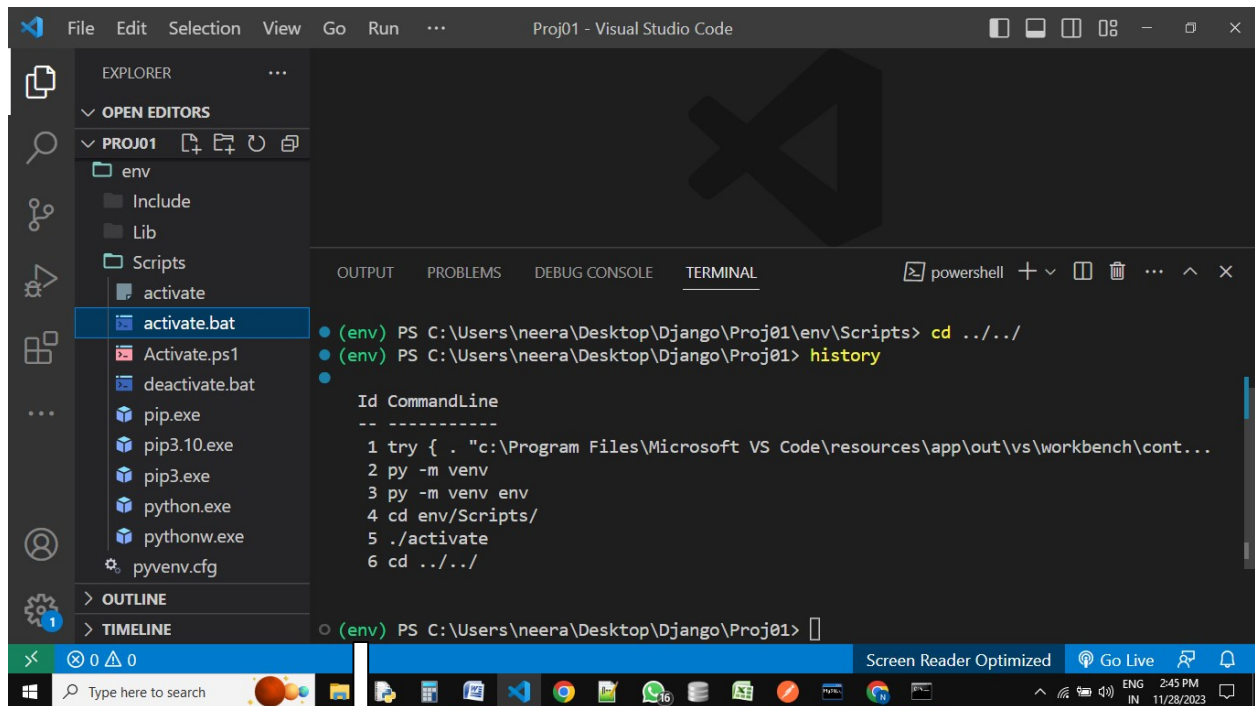
Create and activate virtual environment through following steps:

Step 1:- `py -m venv env` -----enter

Step 2:- `cd env/Scripts/` -----enter

Step 3:- `./activate` -----enter

Step 4:- `cd ../../` -----enter



The screenshot shows the Visual Studio Code interface with a terminal window open. The Explorer panel on the left shows the project structure: `env` folder containing `Include`, `Lib`, `Scripts`, `activate`, `activate.bat`, `Activate.ps1`, `deactivate.bat`, `pip.exe`, `pip3.10.exe`, `pip3.exe`, `python.exe`, `pythonw.exe`, and `pyvenv.cfg`. The terminal window shows the following commands and output:

```
(env) PS C:\Users\neera\Desktop\Django\Proj01\env\Scripts> cd ../../
(env) PS C:\Users\neera\Desktop\Django\Proj01> history

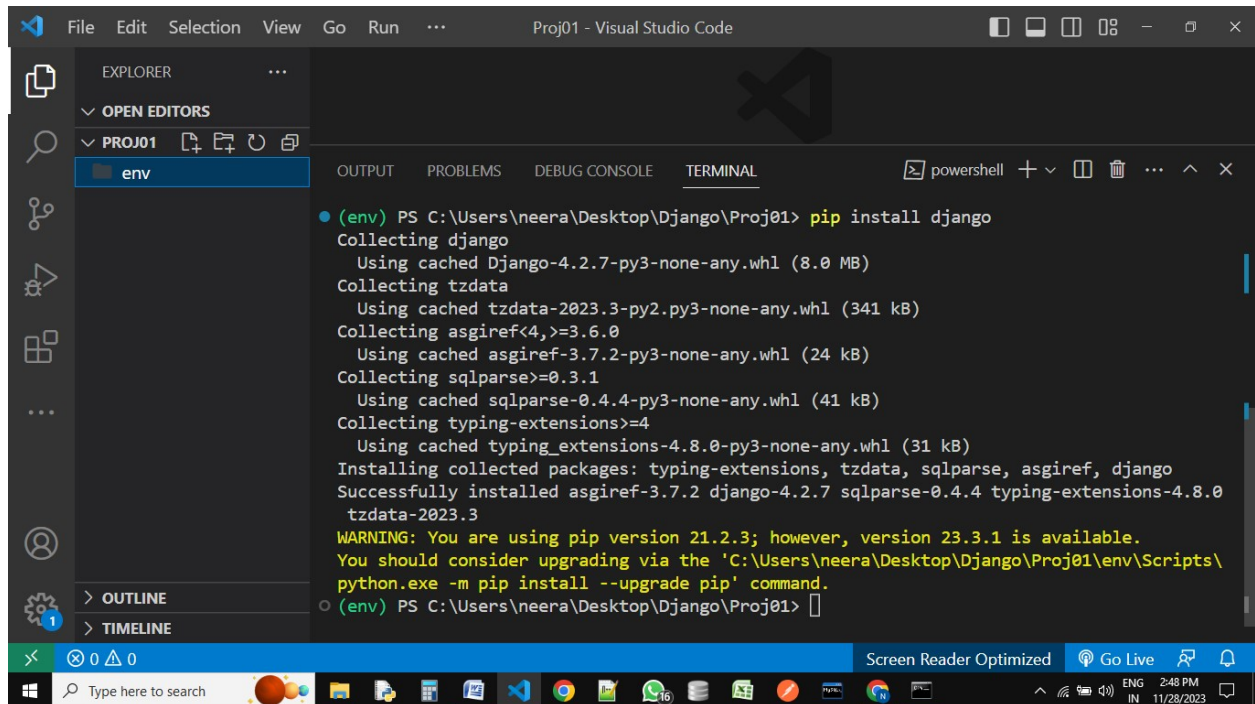
Id CommandLine
-----
1 try { . "c:\Program Files\Microsoft VS Code\resources\app\out\vs\workbench\cont...
2 py -m venv
3 py -m venv env
4 cd env/Scripts/
5 ./activate
6 cd ../../

(env) PS C:\Users\neera\Desktop\Django\Proj01>
```

This indicates that your virtual env is created and successfully activated.

Install django and create new project

Step 1:- pip install django

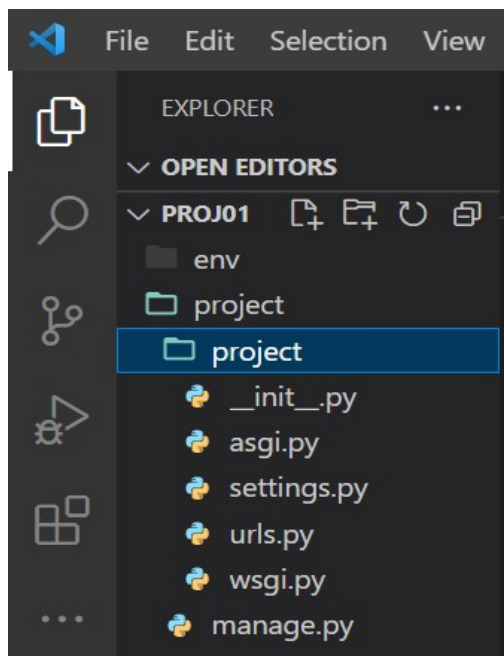


```
File Edit Selection View Go Run ... Proj01 - Visual Studio Code

EXPLORER
  OPEN EDITORS
  PROJ01
    env

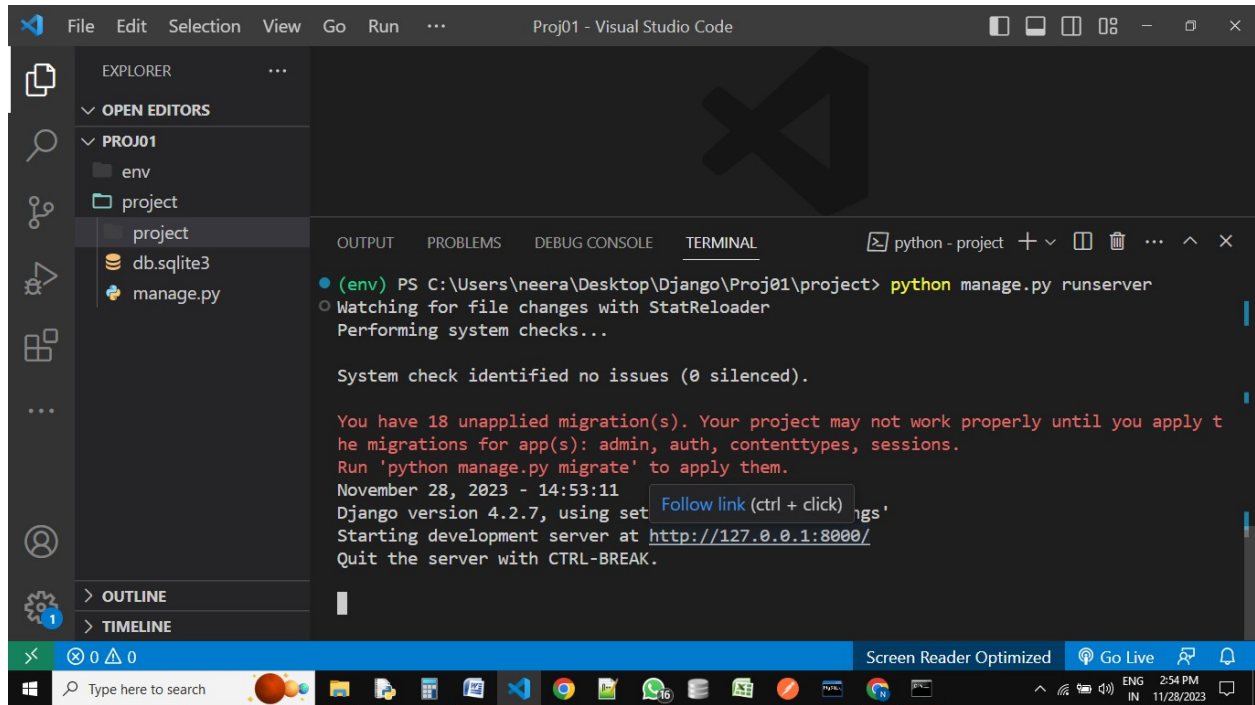
OUTPUT PROBLEMS DEBUG CONSOLE TERMINAL powershell + - x
  (env) PS C:\Users\neera\Desktop\Django\Proj01> pip install django
  Collecting django
  Using cached Django-4.2.7-py3-none-any.whl (8.0 MB)
  Collecting tzdata
  Using cached tzdata-2023.3-py2.py3-none-any.whl (341 kB)
  Collecting asgiref<4,>=3.6.0
  Using cached asgiref-3.7.2-py3-none-any.whl (24 kB)
  Collecting sqlparse>=0.3.1
  Using cached sqlparse-0.4.4-py3-none-any.whl (41 kB)
  Collecting typing_extensions>=4
  Using cached typing_extensions-4.8.0-py3-none-any.whl (31 kB)
  Installing collected packages: typing_extensions, tzdata, sqlparse, asgiref, django
  Successfully installed asgiref-3.7.2 django-4.2.7 sqlparse-0.4.4 typing_extensions-4.8.0 tzdata-2023.3
  WARNING: You are using pip version 21.2.3; however, version 23.3.1 is available.
  You should consider upgrading via the 'C:\Users\neera\Desktop\Django\Proj01\env\Scripts\python.exe -m pip install --upgrade pip' command.
  (env) PS C:\Users\neera\Desktop\Django\Proj01>
```

Step 2:- Django-admin startproject project (Creating new django project)—
Inside Django project we found one inner project folder that contains:--



Step 3:- cd project

Step 4:- python manage.py runserver (Running the Django Project)



The screenshot shows the Visual Studio Code interface with a terminal window open. The terminal output is as follows:

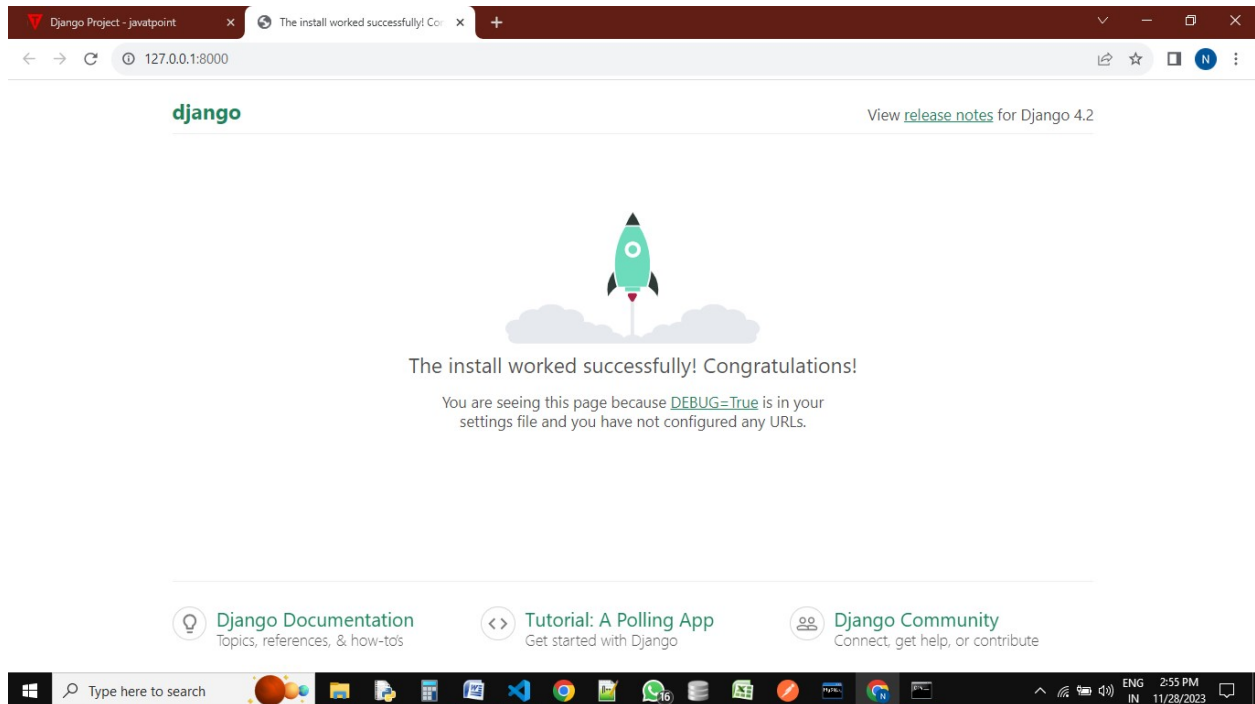
```
(env) PS C:\Users\neera\Desktop\Django\Proj01\project> python manage.py runserver
Watching for file changes with StatReloader
Performing system checks...

System check identified no issues (0 silenced).

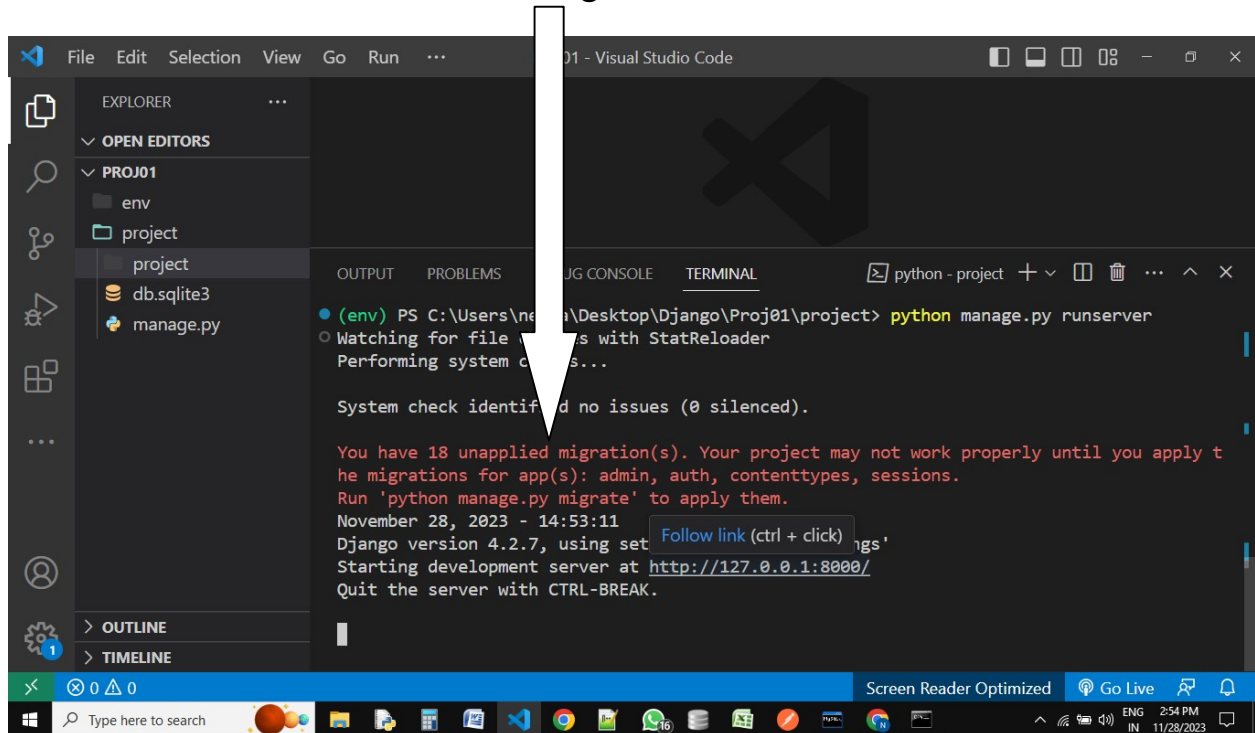
You have 18 unapplied migration(s). Your project may not work properly until you apply the migrations for app(s): admin, auth, contenttypes, sessions.
Run 'python manage.py migrate' to apply them.
November 28, 2023 - 14:53:11
Django version 4.2.7, using settings 'project.settings'
Starting development server at http://127.0.0.1:8000/
Quit the server with CTRL-BREAK.
```

A tooltip "Follow link (ctrl + click)" is visible over the URL <http://127.0.0.1:8000/> in the terminal output.

Step 5:- click Follow link



Remove Red colour error that coming from runserver O/P:--



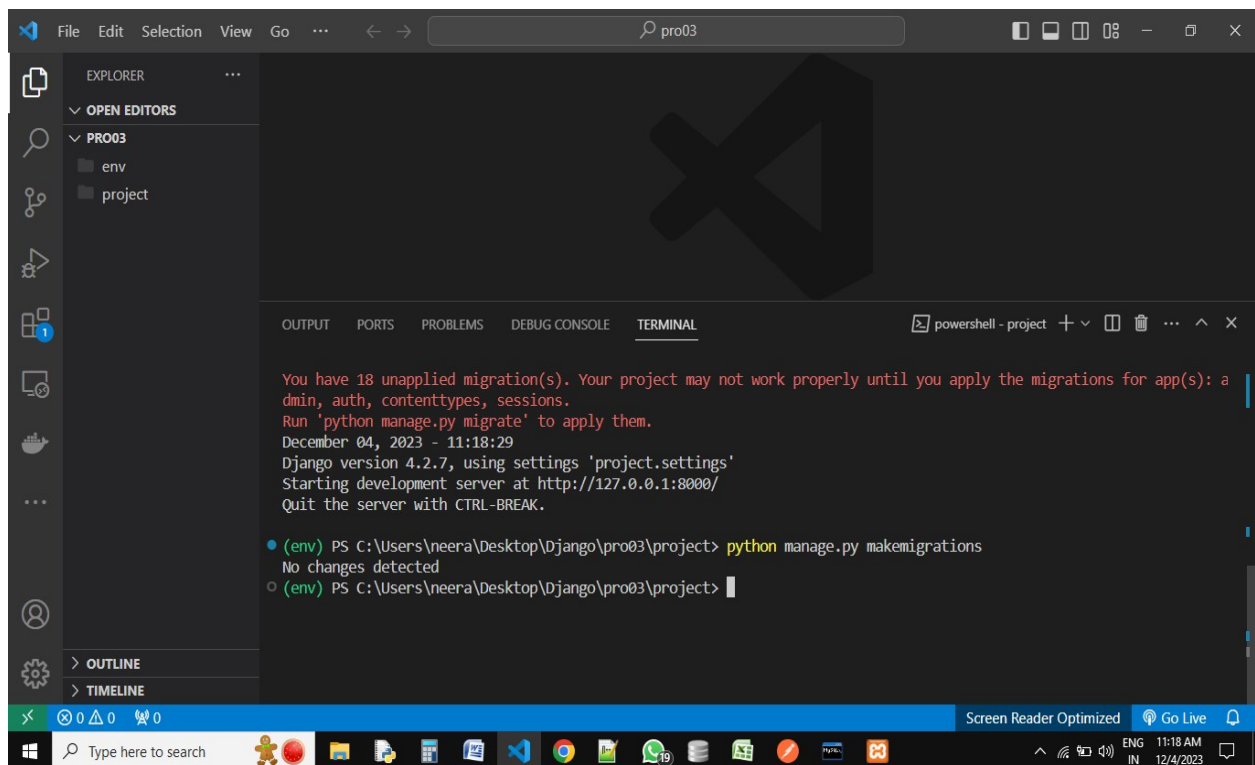
The screenshot shows the Visual Studio Code interface with a terminal window open. The terminal is running the command `python manage.py runserver` in a virtual environment. The output shows that the system check passed, but there are 18 unapplied migrations. The red text indicates that the project may not work properly until the migrations are applied. The terminal output is as follows:

```
(env) PS C:\Users\neera\Desktop\Django\Proj01\project> python manage.py runserver
Watching for file changes with StatReloader
Performing system checks...

System check identified no issues (0 silenced).

You have 18 unapplied migration(s). Your project may not work properly until you apply the migrations for app(s): admin, auth, contenttypes, sessions.
Run 'python manage.py migrate' to apply them.
November 28, 2023 - 14:53:11
Django version 4.2.7, using settings 'project.settings'
Starting development server at http://127.0.0.1:8000/
Quit the server with CTRL-BREAK.
```

Step 6:- python manage.py makemigrations (it responsible to create query file)

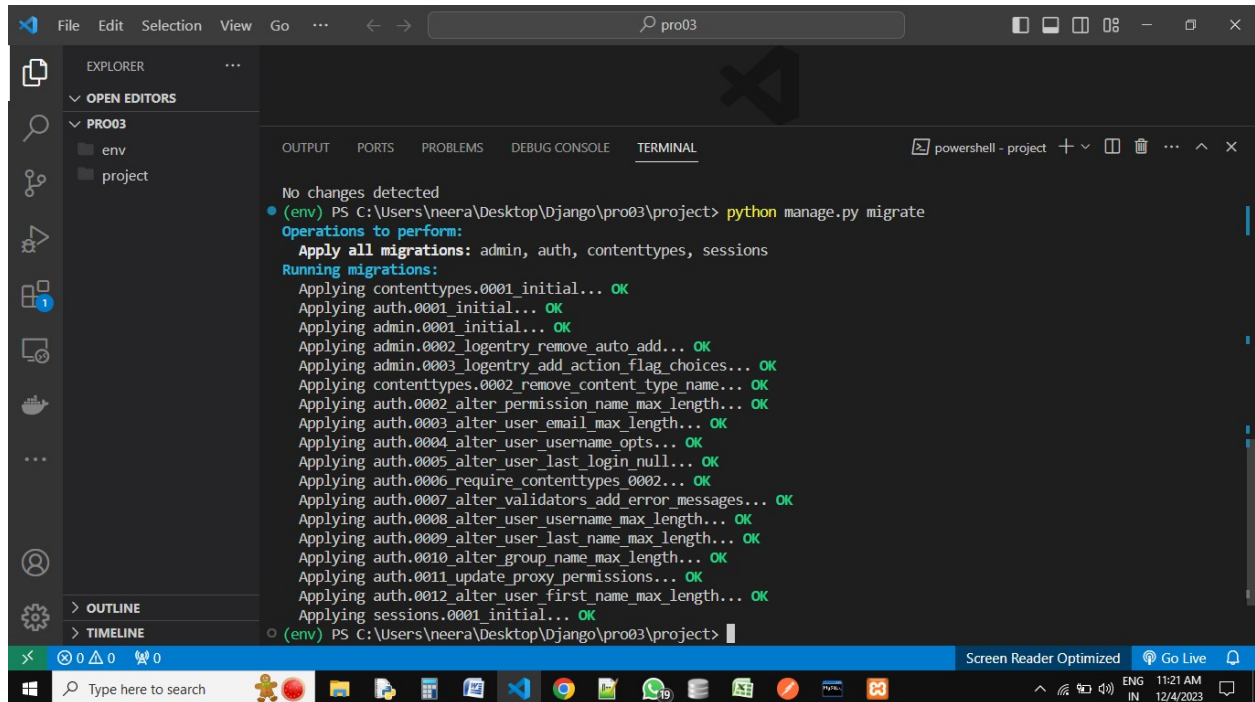


The screenshot shows the Visual Studio Code interface with a terminal window open. The terminal is running the command `python manage.py makemigrations` in a virtual environment. The output shows that there are 18 unapplied migrations and that the command has been executed successfully. The terminal output is as follows:

```
You have 18 unapplied migration(s). Your project may not work properly until you apply the migrations for app(s): admin, auth, contenttypes, sessions.
Run 'python manage.py migrate' to apply them.
December 04, 2023 - 11:18:29
Django version 4.2.7, using settings 'project.settings'
Starting development server at http://127.0.0.1:8000/
Quit the server with CTRL-BREAK.

(env) PS C:\Users\neera\Desktop\Django\pro03\project> python manage.py makemigrations
No changes detected
(env) PS C:\Users\neera\Desktop\Django\pro03\project>
```

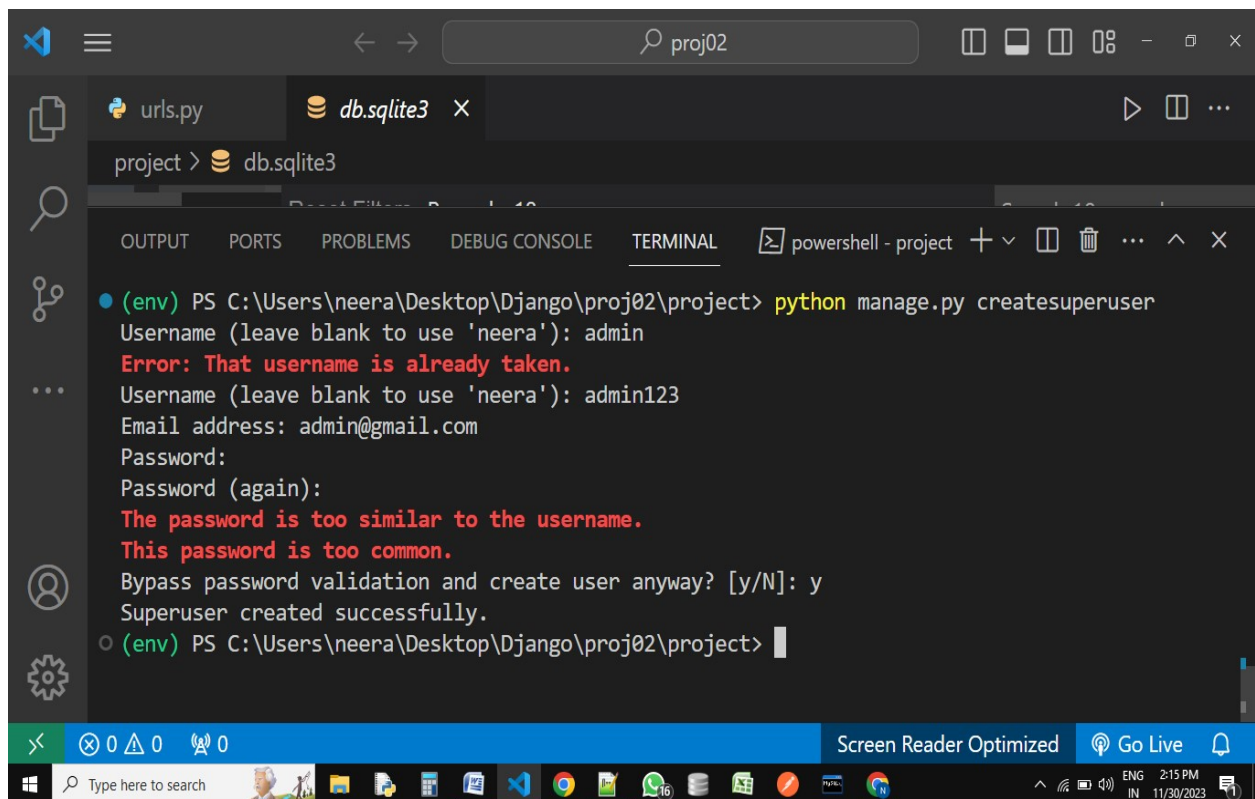
Step 7:- python manage.py migrate (it will generate table in database)



The screenshot shows a Visual Studio Code window with a terminal open. The terminal is running a PowerShell session in a project directory. The command `python manage.py migrate` has been executed, and the output shows that no changes were detected. The terminal then lists the operations to perform, which are to apply all migrations for the `admin`, `auth`, `contenttypes`, and `sessions` apps. The migrations are then applied, and the output shows that all migrations were applied successfully. The terminal output is as follows:

```
No changes detected
(env) PS C:\Users\neera\Desktop\Django\proj03\project> python manage.py migrate
Operations to perform:
  Apply all migrations: admin, auth, contenttypes, sessions
Running migrations:
  Applying contenttypes.0001_initial... OK
  Applying auth.0001_initial... OK
  Applying admin.0001_initial... OK
  Applying admin.0002_logentry_remove_auto_add... OK
  Applying admin.0003_logentry_add_action_flag_choices... OK
  Applying contenttypes.0002_remove_content_type_name... OK
  Applying auth.0002_alter_permission_name_max_length... OK
  Applying auth.0003_alter_user_email_max_length... OK
  Applying auth.0004_alter_user_username_opts... OK
  Applying auth.0005_alter_user_last_login_null... OK
  Applying auth.0006_require_contenttypes_0002... OK
  Applying auth.0007_alter_validators_add_error_messages... OK
  Applying auth.0008_alter_user_username_max_length... OK
  Applying auth.0009_alter_user_last_name_max_length... OK
  Applying auth.0010_alter_group_name_max_length... OK
  Applying auth.0011_update_proxy_permissions... OK
  Applying auth.0012_alter_user_first_name_max_length... OK
  Applying sessions.0001_initial... OK
(env) PS C:\Users\neera\Desktop\Django\proj03\project>
```

Step 8:- python manage.py createsuperuser



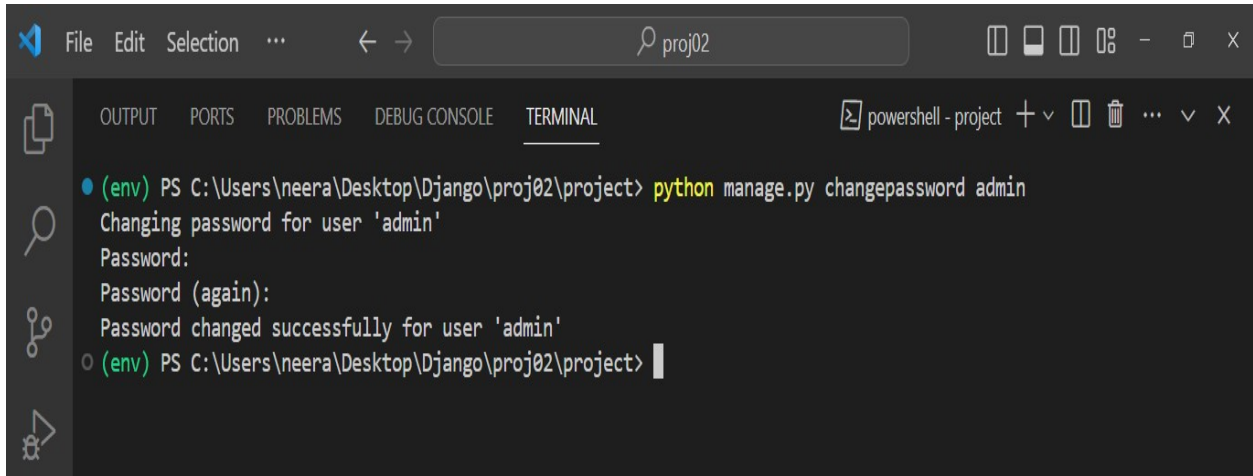
The screenshot shows a Visual Studio Code window with a terminal open. The terminal is running a PowerShell session in a project directory. The command `python manage.py createsuperuser` has been executed, and the output shows that the superuser creation process is underway. The user is prompted to enter a username, email address, and password. The password is rejected because it is too similar to the username and too common. The user is then prompted to bypass password validation and create the user anyway, which they do by entering `y`. The superuser is then created successfully. The terminal output is as follows:

```
project > db.sqlite3
(env) PS C:\Users\neera\Desktop\Django\proj02\project> python manage.py createsuperuser
Username (leave blank to use 'neera'): admin
Error: That username is already taken.
Username (leave blank to use 'neera'): admin123
Email address: admin@gmail.com
Password:
Password (again):
The password is too similar to the username.
This password is too common.
Bypass password validation and create user anyway? [y/N]: y
Superuser created successfully.
(env) PS C:\Users\neera\Desktop\Django\proj02\project>
```

Fields:---

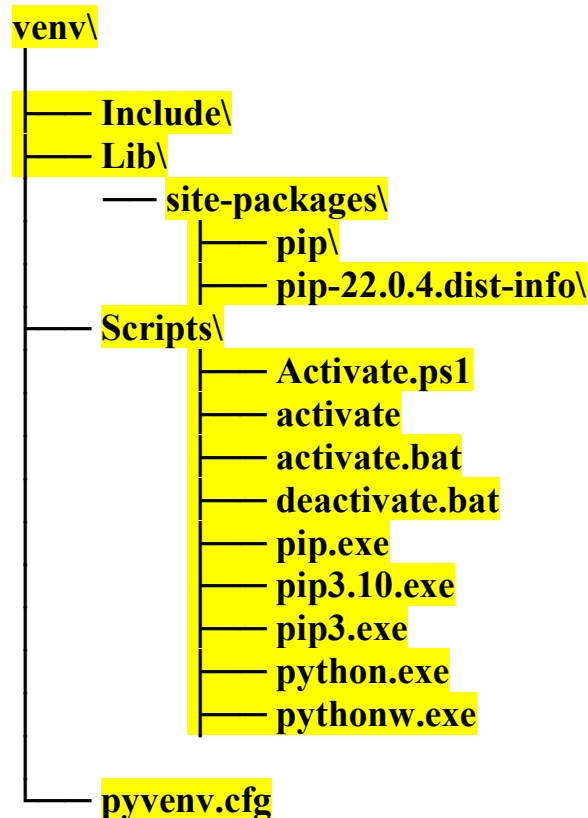
| | |
|--------------------------|----------------------------------|
| Username * | required |
| Email address | Optional |
| Password * | required (always in hidden form) |
| Password(again) * | required (always in hidden form) |

Step 9:- python manage.py changepassword user_name*)



```
File Edit Selection ... proj02
OUTPUT PORTS PROBLEMS DEBUG CONSOLE TERMINAL powershell - project
(env) PS C:\Users\neera\Desktop\Django\proj02\project> python manage.py changepassword admin
Changing password for user 'admin'
Password:
Password (again):
Password changed successfully for user 'admin'
(env) PS C:\Users\neera\Desktop\Django\proj02\project>
```

Virtual Environment Folder structure:--



- **Include** is an initially empty folder that Python uses to include C header files for packages you might install that depend on C extensions.
- **Lib** contains the site-packages\ folder, which is one of the main reasons for creating your virtual environment. This folder is where you'll install external packages that you want to use within your virtual environment. By default, your virtual environment comes preinstalled with two dependencies, pip and set up tools.
- **Scripts** contains the executable files of your virtual environment. Most important files are the Python interpreter (python.exe), the pip executable (pip.exe), and the activation script for your virtual environment, which comes in a couple of different flavors to allow you to work with different shells.
- **pyvenv.cfg** is a crucial file for your virtual environment. It contains only a couple of key-value pairs that Python uses to set variables in the sys module that determine which Python interpreter and which site-packages directory the current Python session will use.

Project Folder structure:-- (Django-admin startproject project)

project(outer project folder structure)

```

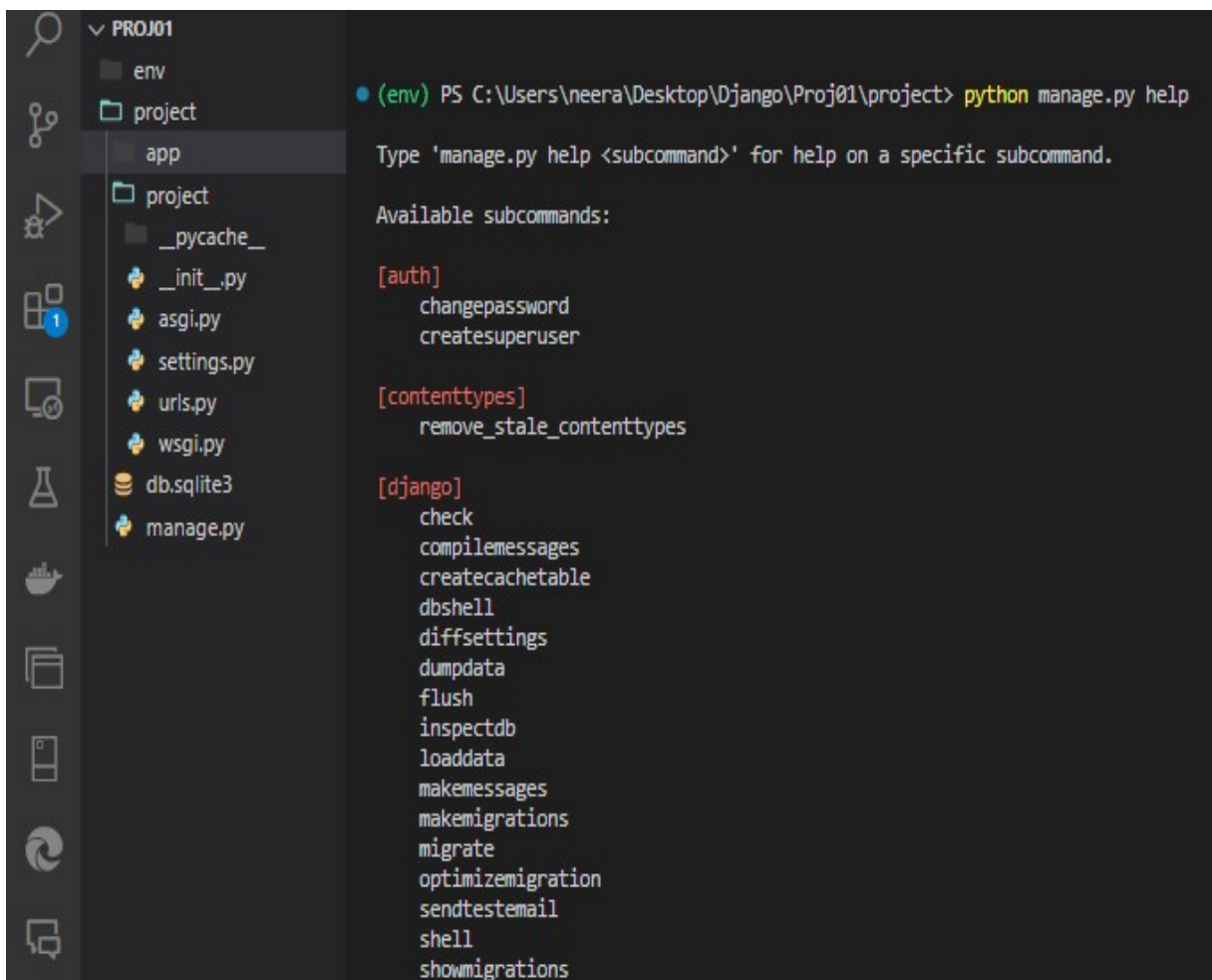
---- project/(inner project folder structure)
|
|      ---- __pycache__ /
|      ---- __init__.py
|      ---- asgi.py
|      ---- settings.py
|      ---- urls.py
|      ---- wsgi.py
---- db.sqlite3
---- manage.py

```

1. **manage.py**: django-admin is **Django's command-line utility tools for administrative tasks**. Or It is a command-line utility which allows us to interact with the project in various ways and also used to manage an application.
2. **__init__.py** : It is an empty file that tells to the Python that this directory should be considered as a Python package.
3. **settings.py** : This file is used to configure application settings such as database connection, static files linking etc.

4. **urls.py** : This file contains the listed URLs of the application. In this file, we can mention the URLs and corresponding actions to perform the task and display the view.
5. **wsgi.py(Web Server Gateway Interface)** : Web Server Gateway Interface (WSGI) is a mediator responsible for conveying communication between a web server and a Python web application. It is an entry-point for WSGI-compatible web servers to serve Django project.
6. **asgi.py(Asynchronous Server Gateway Interface)** : Unlike WSGI, ASGI allows multiple, asynchronous events per application. Plus, ASGI supports both sync and async apps. You can migrate your old, synchronous WSGI web apps to ASGI, as well as use ASGI to build new, asynchronous web apps.

With the help of manage.py we can perform specific task with the help of below mention commands:-----



The screenshot shows a code editor with a file explorer on the left and a terminal on the right. The file explorer displays the project structure for 'PROJ01', including folders 'env' and 'project', and files 'app', 'project', '__pycache__', '__init__.py', 'asgi.py', 'settings.py', 'urls.py', 'wsgi.py', 'db.sqlite3', and 'manage.py'. The terminal shows the command `python manage.py help` being executed, resulting in the following output:

```
(env) PS C:\Users\neera\Desktop\Django\Proj01\project> python manage.py help

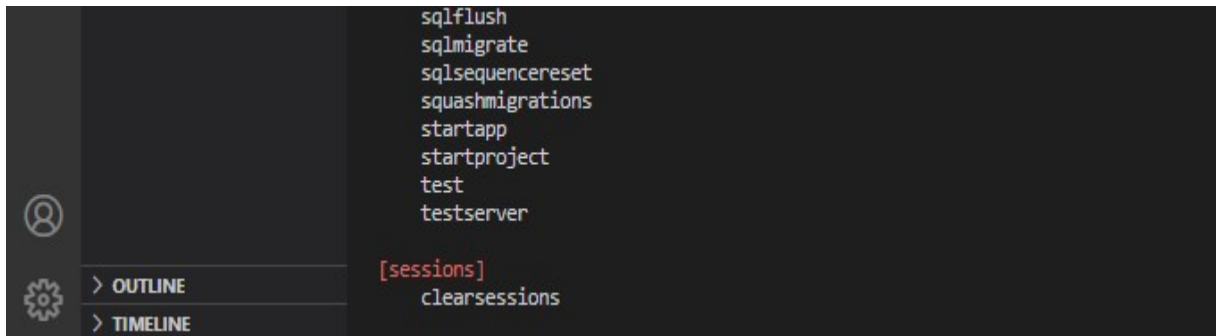
Type 'manage.py help <subcommand>' for help on a specific subcommand.

Available subcommands:

[auth]
  changepassword
  createsuperuser

[contenttypes]
  remove_stale_contenttypes

[django]
  check
  compilemessages
  createcachetable
  dbshell
  diffsettings
  dumpdata
  flush
  inspectdb
  loaddata
  makemessages
  makemigrations
  migrate
  optimizemigration
  sendtestemail
  shell
  showmigrations
```



With the help of Django-admin we use below mention commands to perform specific task.

Project vs app in django:---

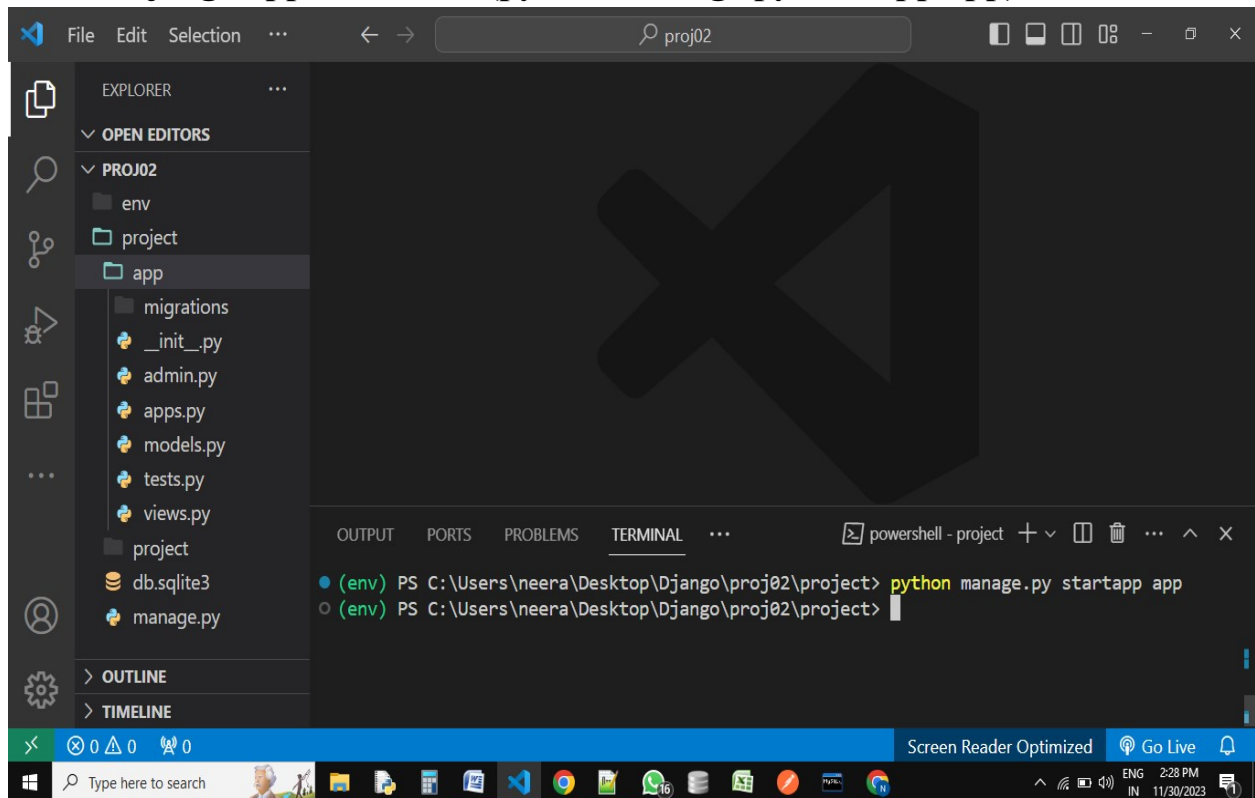
Project in Django

- A project in Django is a python package that represents the whole web application.
- A project in Django basically contains the configuration and setting related to the entire website.
- A single project can also have multiple apps in it that can be used to implement some functionality.

App in Django

- An app in Django is a sub-module of a project, and it is used to implement some functionality.
- Now, you can refer to an app as a standalone python module that is used to provide some functionality to your project.
- We can create multiple apps within a single Django project. And these apps can be independent of one another. Theoretically, we can use an app from one Django project to another without making any changes to it.

Create Django applications:-- (python manage.py startapp app)



Folder structure of Django-App

```
app/  
|  
|----- __init__.py  
|----- admin.py  
|----- apps.py  
|----- models.py  
|----- views.py  
|----- test.py
```

1. `__init__.py`

This file provides the same functionality as that in the `__init__.py` file in the Django project structure. It is an empty file and does not need any modifications. It just represents that the app directory is a package.

2. admin.py

Admin.py file is used for registering the Django models into the Django administration. It is used to display the Django model in the Django admin panel. It performs three major tasks:

- a. Registering models
- b. Creating a Superuser (python manage.py createsuperuser ----enter)
- c. Logging in and using the web application

3. apps.py

Apps.py is a file that is used to help the user include the application configuration for their app. Users can configure the attributes of their application using the apps.py file. However, configuring the attributes is a rare task a user ever performs, because most of the time the default configuration is sufficient enough to work with.

4. models.py

Models.py represents the models of web applications in the form of classes. It is considered the most important aspect of the App file structure. Models define the structure of the database. It tells about the actual design, relationships between the data sets, and their attribute constraints.

5. views.py

Views are also an important part when we talk about the Django app structure. Views provide an interface through which a user interacts with a Django web application. It contains all the views in the form of classes. We use the concept of Serializers in Django Rest_Framework for making different types of views. Some of these are CustomFilter Views, Class-Based List Views, and Detail Views.

6. tests.py

Tests.py allows the user to write test code for their web applications. It is used to test the working of the app. Its working is quite complex. We will discuss it in more detail in the upcoming articles.

Installed app:-----

1. `django.contrib.admin`

- **Purpose:** It gives you a ready-made, web-based dashboard to manage your website's data easily.
- **Functionality:** With this dashboard, you can create, view, update, and delete data (like blog posts, user profiles, etc.) through a simple interface. It also lets you customize how things look and work in the admin panel.
- **Usage:** This tool is mainly used by the people who run the website to manage everything, like content, users, and settings, without needing to write any code.

2. `django.contrib.auth`

- **Purpose:** It helps your website handle user login, registration, and permissions.
- **Functionality:** It provides the tools needed to manage users, their passwords, who can access what (permissions), and user groups. This includes everything from signing up and logging in to resetting passwords and controlling who can see or do certain things on the site.
- **Usage:** It's used to keep your website secure by controlling who can access different parts and features, making sure only the right people can do certain actions.

3. `django.contrib.contenttypes`

Purpose: Enables generic relationships between models.

- **Purpose:** It lets different parts of your website connect with each other in a flexible way.
- **Functionality:** It provides tools that allow one type of data (like a comment) to link to any other type of data (like a blog post, product, or user) without being tied to just one specific type. This is useful for things like tagging, comments, or activity feeds that can be connected to various kinds of content.

- **Usage:** You use it when you need to create connections between different types of data on your site, making it easy to relate different models to each other without restrictions.

4. `django.contrib.sessions`

- **Purpose:** Manages user sessions, which track the state of a user across multiple requests.
- **Functionality:** Stores session data on the server-side, typically in the database, using a session key that is stored in a user's cookie. Sessions allow you to persist information (like user login status, shopping cart contents, etc.) across different requests from the same user.
- **Usage:** Used to maintain state between requests, which is essential for implementing features like user login, shopping carts, and other personalized experiences.

5. `django.contrib.messages`

- **Purpose:** Provides a framework for sending temporary, one-time messages to the user.
- **Functionality:** Integrates with the request/response cycle to display messages (such as success, warning, or error messages) to users after certain actions, like form submissions. Messages are typically displayed on the next page the user visits.
- **Usage:** Used to inform users of the results of their actions, such as confirming successful form submissions, warning about errors, or providing informational messages.

6. `django.contrib.staticfiles`

- **Purpose:** Manages the serving and collection of static files (CSS, JavaScript, images) for your application.
- **Functionality:** Handles the storage and retrieval of static files during development and production. It provides commands for collecting static files from various apps and locations into a single directory for easier deployment.
- **Usage:** Used to manage and serve static content required by your application, ensuring that these files are correctly handled across different environments (development, staging, production).

Summary of Differences:

- **django.contrib.admin:** Focuses on providing a graphical interface for managing your application's data and models.
- **django.contrib.auth:** Manages user authentication and authorization, including login, registration, and permissions.
- **django.contrib.contenttypes:** Enables dynamic, model-agnostic relationships using generic foreign keys.
- **django.contrib.sessions:** Manages session data, allowing for user state persistence across requests.
- **django.contrib.messages:** Provides a system for displaying one-time messages to users, often after form submissions or other actions.
- **django.contrib.staticfiles:** Handles static file management, including collecting, storing, and serving CSS, JavaScript, and images.

Each of these components plays a unique role in building a robust and functional Django application, covering a wide range of common web development needs.

Django Life-Cycle :----

