Task 24 - Django "sticky_notes" App

Design Diagrams
"sticky_notes" project

Helder Paixao - “HP24010013265”

3rd June, 2024

Introduction

When reading this pdf.file, view it in “pageless” mode: The pageless format allows you to add wide images and tables, and consume content without the interruption of page breaks.

Use Case Diagram

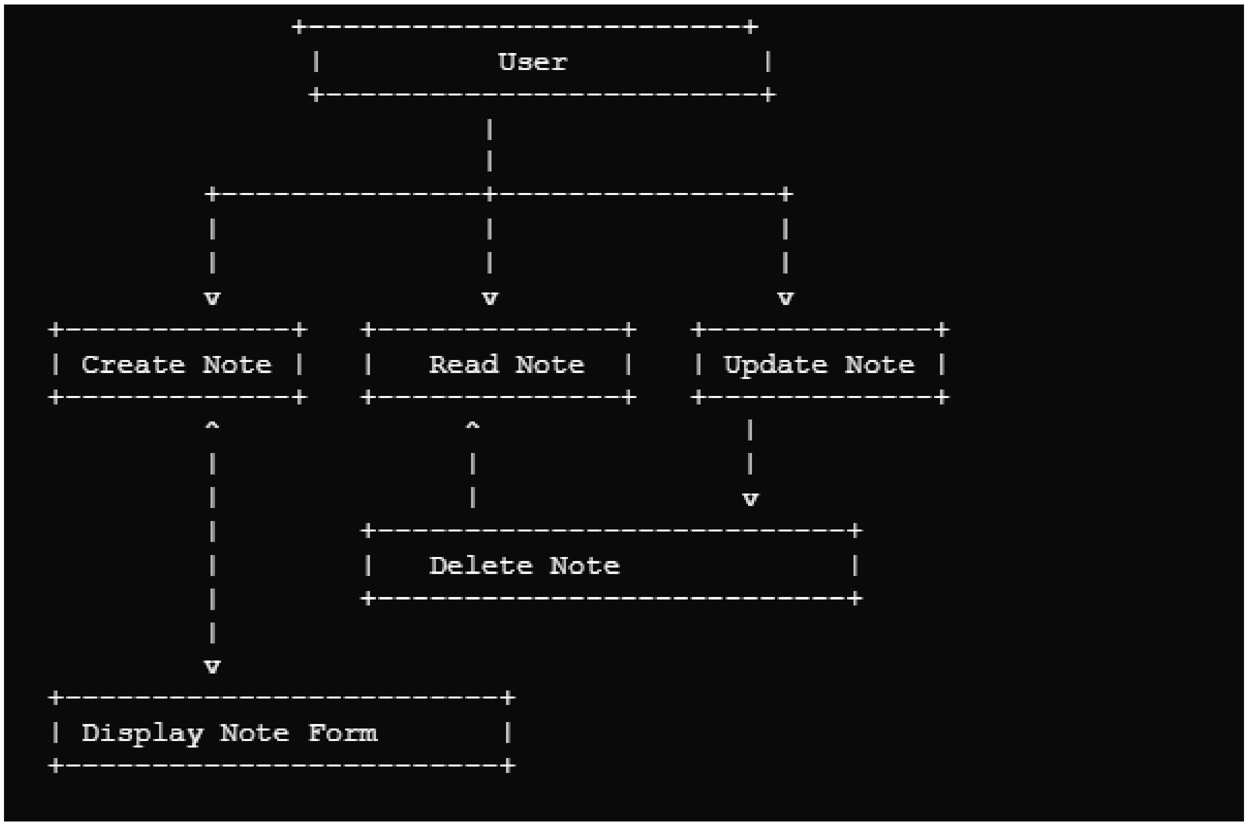
Actors:

- User: The primary actor who interacts with the sticky notes application.

Use Cases:

- Create Note: The user can create a new sticky note.
- Read Note: The user can view a list of notes and read the details of a specific note.
- Update Note: The user can edit the details of an existing note.
- Delete Note: The user can delete an existing note.

Diagram:



```
                +-------------------------+
                 |           User          |
                 +-------------------------+
                            |
                            |
           +----------------+----------------+
           |                |                |
           |                |                |
           v                v                v
+--------------+   +---------------+   +--------------+
| Create Note |   |   Read Note   |   | Update Note |
+--------------+   +---------------+   +--------------+
           ^               ^                |
           |               |                |
           |               |                v
           |       +-----------------------------+
           |       |   Delete Note               |
           |       +-----------------------------+
           |
           |
           v
+---------------------------+
| Display Note Form         |
+---------------------------+
```

Detailed Breakdown

1. Create Note:
   - Description: The user creates a new note by providing the title and content.
   - Interaction: User fills out and submits a form to create a note.
2. Read Note:
   - Description: The user views a list of all notes and can read the details of each note.
   - Interaction: User clicks on a note to view its details.
3. Update Note:
   - Description: The user edits the title or content of an existing note.
   - Interaction: User submits a form to update the note's details.
4. Delete Note:
   - Description: The user deletes an existing note.
   - Interaction: User confirms the deletion of a note.
5. Display Note Form:

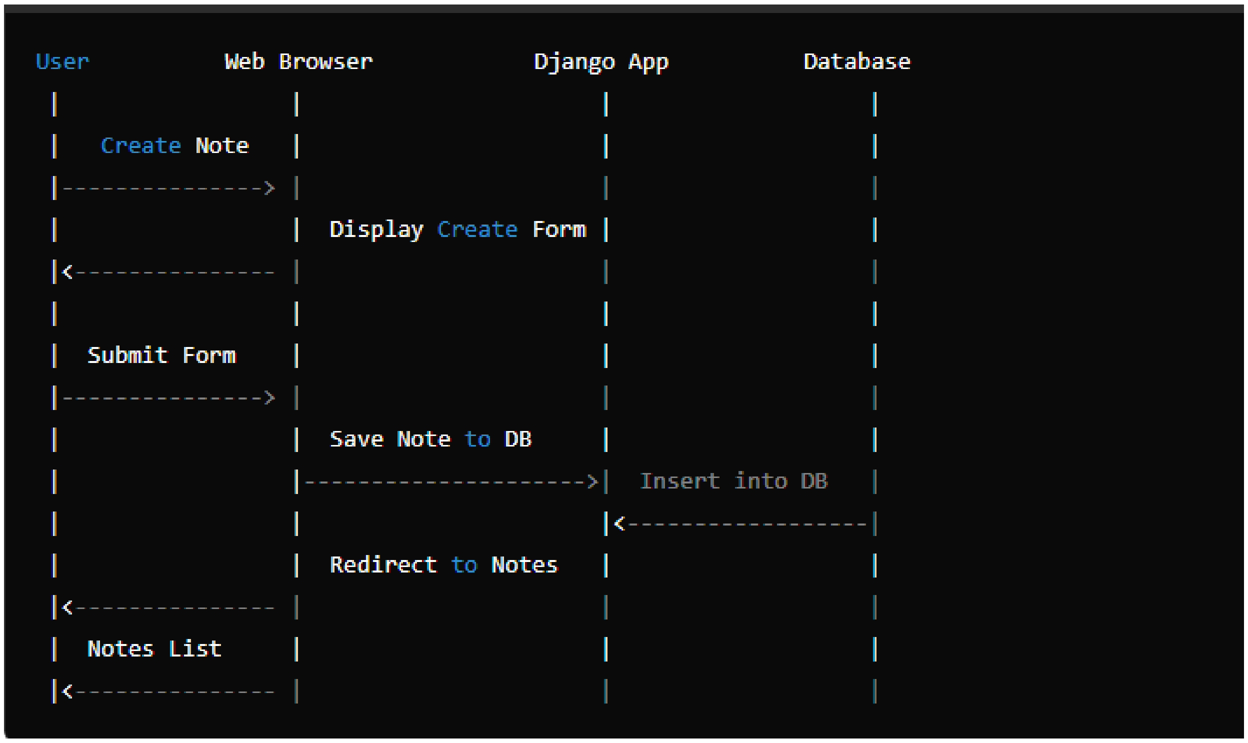
- Description: A form is displayed for creating or updating a note.
- Interaction: Form is used in both the create and update use cases.

The Use Case Diagram provides a high-level overview of how the user interacts with the "sticky_notes" Django project. Each use case represents a core functionality that the application provides, facilitating the creation, reading, updating, and deletion of sticky notes.

Sequence Diagram

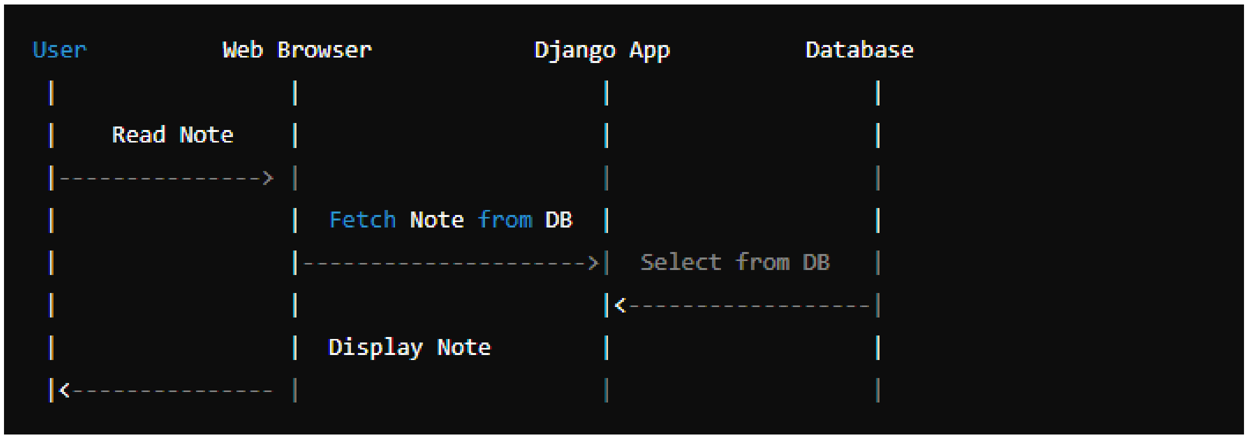
The sequence diagram shows the flow of interactions between the user and the system for each use case.

Create Note Sequence Diagram



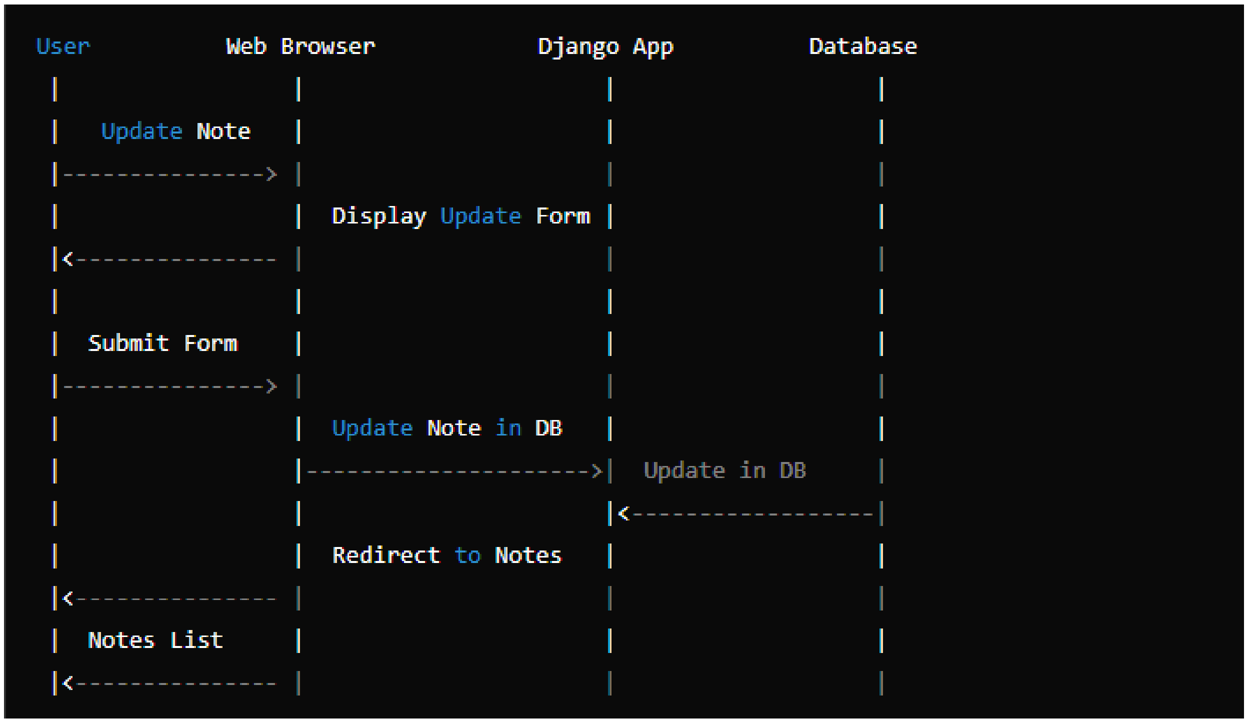
```
User          Web Browser            Django App          Database
 |                 |                      |                   |
 |   Create Note   |                      |                   |
 |---------------> |                      |                   |
 |                 |  Display Create Form |                   |
 |<--------------- |                      |                   |
 |                 |                      |                   |
 |  Submit Form    |                      |                   |
 |---------------> |                      |                   |
 |                 |  Save Note to DB     |                   |
 |                 |--------------------->|  Insert into DB   |
 |                 |                      |<------------------|
 |                 |  Redirect to Notes   |                   |
 |<--------------- |                      |                   |
 |  Notes List     |                      |                   |
 |<--------------- |                      |                   |
```

Read Note Sequence Diagram



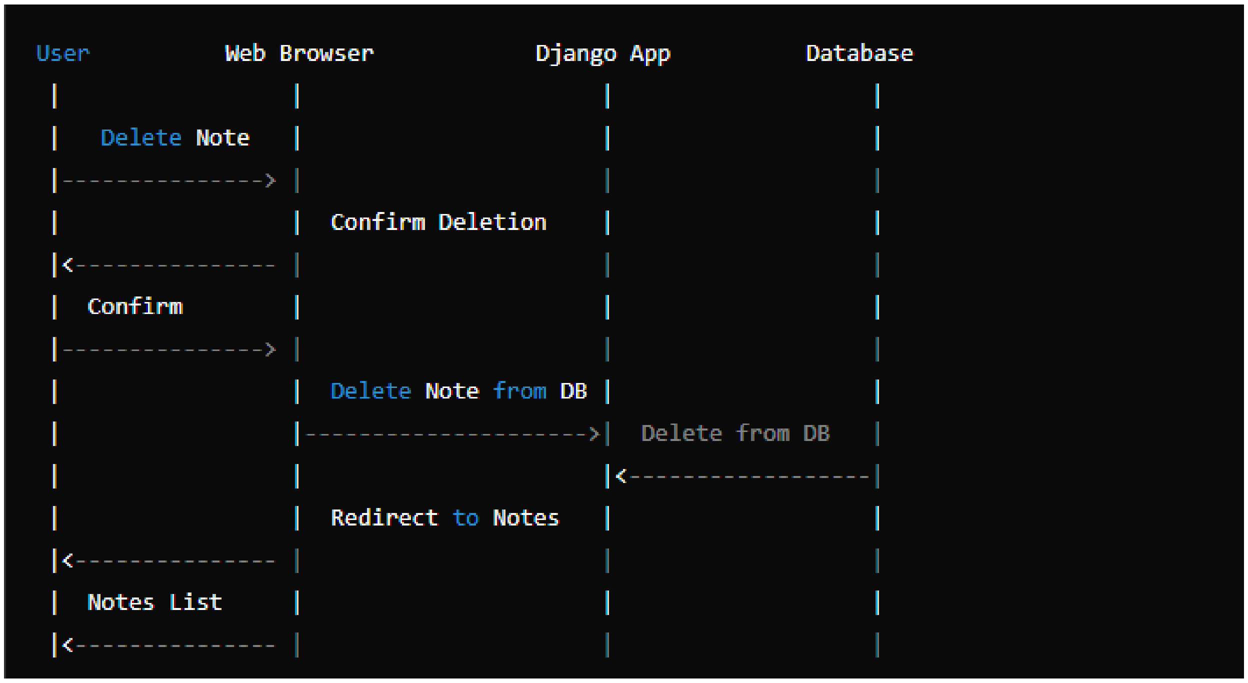
```
User          Web Browser           Django App          Database
 |                |                     |                   |
 |    Read Note   |                     |                   |
 |--------------> |                     |                   |
 |                |  Fetch Note from DB |                   |
 |                |-------------------->|   Select from DB  |
 |                |                     |<------------------|
 |                |  Display Note       |                   |
 |<-------------- |                     |                   |
```

Update Note Sequence Diagram



```
User          Web Browser           Django App          Database
 |                |                     |                   |
 |   Update Note  |                     |                   |
 |--------------> |                     |                   |
 |                |  Display Update Form|                   |
 |<-------------- |                     |                   |
 |                |                     |                   |
 |  Submit Form   |                     |                   |
 |--------------> |                     |                   |
 |                |  Update Note in DB  |                   |
 |                |-------------------->|   Update in DB    |
 |                |                     |<------------------|
 |                |  Redirect to Notes  |                   |
 |<-------------- |                     |                   |
 |  Notes List    |                     |                   |
 |<-------------- |                     |                   |
```

Delete Note Sequence Diagram


```
User           Web Browser            Django App          Database
  |                  |                       |                    |
  |   Delete Note    |                       |                    |
  |--------------->  |                       |                    |
  |                  |  Confirm Deletion     |                    |
  |<---------------  |                       |                    |
  |  Confirm         |                       |                    |
  |--------------->  |                       |                    |
  |                  |  Delete Note from DB  |                    |
  |                  |---------------------->|  Delete from DB    |
  |                  |                       |<-------------------|
  |                  |  Redirect to Notes    |                    |
  |<---------------  |                       |                    |
  |  Notes List      |                       |                    |
  |<---------------  |                       |                    |
```

Class Diagram

Diagram:

```
+--------------------------+
|       Note               |
+--------------------------+
| - id: Integer            |
| - title: CharField       |
| - content: TextField     |
| - created_at: DateTime   |
+--------------------------+
| + save()                 |
| + delete()               |
+--------------------------+

           ^
           |
           | 1
           |
           |
          1|
           v

+--------------------------+
|      NoteForm            |
+--------------------------+
| - Meta: ModelForm.Meta   |
+--------------------------+
| + is_valid(): bool       |
| + save()                 |
+--------------------------+

           ^
           |
           | 1
           |
           |
          1|
           v

+--------------------------+
|       Views              |
+--------------------------+
| + note_list(request)     |
| + note_detail(request,   |
|   pk)                    |
| + note_create(request)   |
| + note_update(request,   |
|   pk)                    |
| + note_delete(request,   |
|   pk)                    |
+--------------------------+
           ^
           |
           |  1
           |
           |
          1|
           v

+-------------------------+
|       URLConfig         |
+-------------------------+
| + urlpatterns: list     |
+-------------------------+
| + path()                |
| + include()             |
+-------------------------+

           ^
           |
           |  1
           |
           |
          1|
           v

+-------------------------+
|       Templates         |
+-------------------------+
| + base.html             |
| + note_list.html        |
| + note_detail.html      |
| + note_form.html        |
| + note_confirm_delete.html |
+-------------------------+
```

Detailed Breakdown

1. Note Model:
    - Represents the structure of a note in the database.
    - Fields:
        - `id`: Primary key, automatically added by Django.

        - `title`: CharField for the title of the note.
        - `content`: TextField for the note content.
        - `created_at`: DateTimeField automatically set when a note is created.
2. NoteForm:
    - A Django form used to create and update notes.
    - Based on the `Note` model.
    - Contains methods for form validation (`is_valid()`) and saving data (`save()`).
3. Views:
    - Functions to handle CRUD operations for notes.
    - `note_list(request)`: Displays a list of all notes.
    - `note_detail(request, pk)`: Displays the details of a single note.
    - `note_create(request)`: Handles the creation of a new note.
    - `note_update(request, pk)`: Handles the updating of an existing note.
    - `note_delete(request, pk)`: Handles the deletion of a note.
4. URLConfig:
    - Defines URL patterns and maps them to views.
    - `urlpatterns`: A list of URL patterns.
    - `path()`: Function to define individual URL patterns.
    - `include()`: Function to include other URL configurations.
5. Templates:
    - HTML templates used to render the views.
    - `base.html`: Base template extended by other templates.
    - `note_list.html`: Template for displaying the list of notes.
    - `note_detail.html`: Template for displaying note details.
    - `note_form.html`: Template for creating and updating notes.
    - `note_confirm_delete.html`: Template for confirming note deletion.

This class diagram provides a comprehensive overview of the components and their interactions within the "sticky_notes" Django project. Each class represents a key part of the Django framework, illustrating the Model-View-Template (MVT) architecture.

User Access Table Diagram

The table includes:

- User Types: Types of users that interact with the application (e.g., Admin, Registered User, Guest).
- CRUD Operations: Permissions for Create, Read, Update, and Delete operations on the sticky notes.

Table Structure

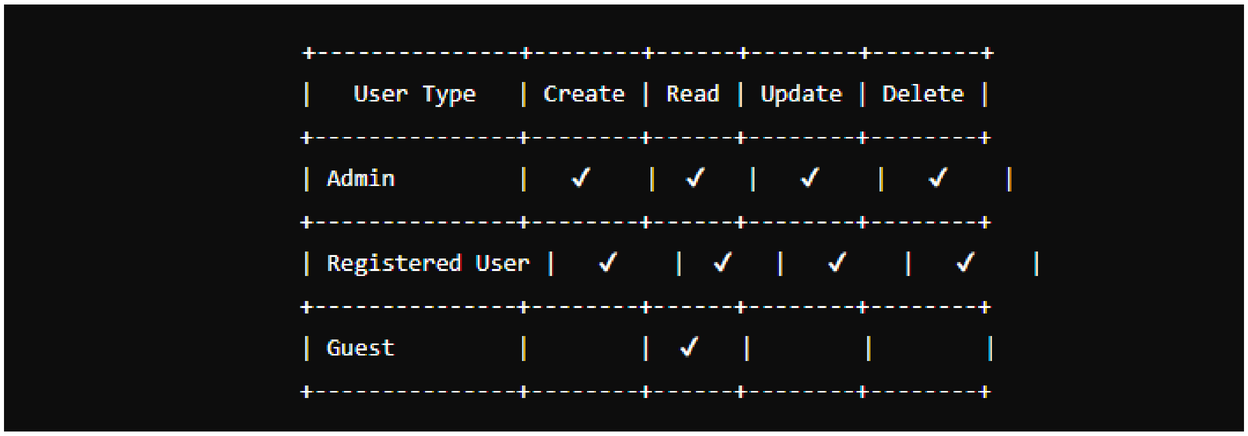
```
+---------------+--------+------+--------+--------+
|   User Type   | Create | Read | Update | Delete |
+---------------+--------+------+--------+--------+
| Admin         |   ✓    |  ✓   |   ✓    |   ✓    |
+---------------+--------+------+--------+--------+
| Registered User |   ✓    |  ✓   |   ✓    |   ✓    |
+---------------+--------+------+--------+--------+
| Guest         |        |  ✓   |        |        |
+---------------+--------+------+--------+--------+
```

Detailed Breakdown

1. Admin:
    - Create: Can create new sticky notes.
    - Read: Can read/view all sticky notes.
    - Update: Can update any sticky note.
    - Delete: Can delete any sticky note.
2. Registered User:
    - Create: Can create new sticky notes.
    - Read: Can read/view all sticky notes.
    - Update: Can update their own sticky notes.
    - Delete: Can delete their own sticky notes.
3. Guest:

- Create: Cannot create new sticky notes.
- Read: Can read/view all sticky notes.
- Update: Cannot update any sticky notes.
- Delete: Cannot delete any sticky notes.

Diagram



```
+---------------+--------+------+--------+--------+
|   User Type   | Create | Read | Update | Delete |
+---------------+--------+------+--------+--------+
| Admin         |   ✓    |  ✓   |   ✓    |   ✓    |
+---------------+--------+------+--------+--------+
| Registered User |   ✓    |  ✓   |   ✓    |   ✓    |
+---------------+--------+------+--------+--------+
| Guest         |        |  ✓   |        |        |
+---------------+--------+------+--------+--------+
```

Integration with Django

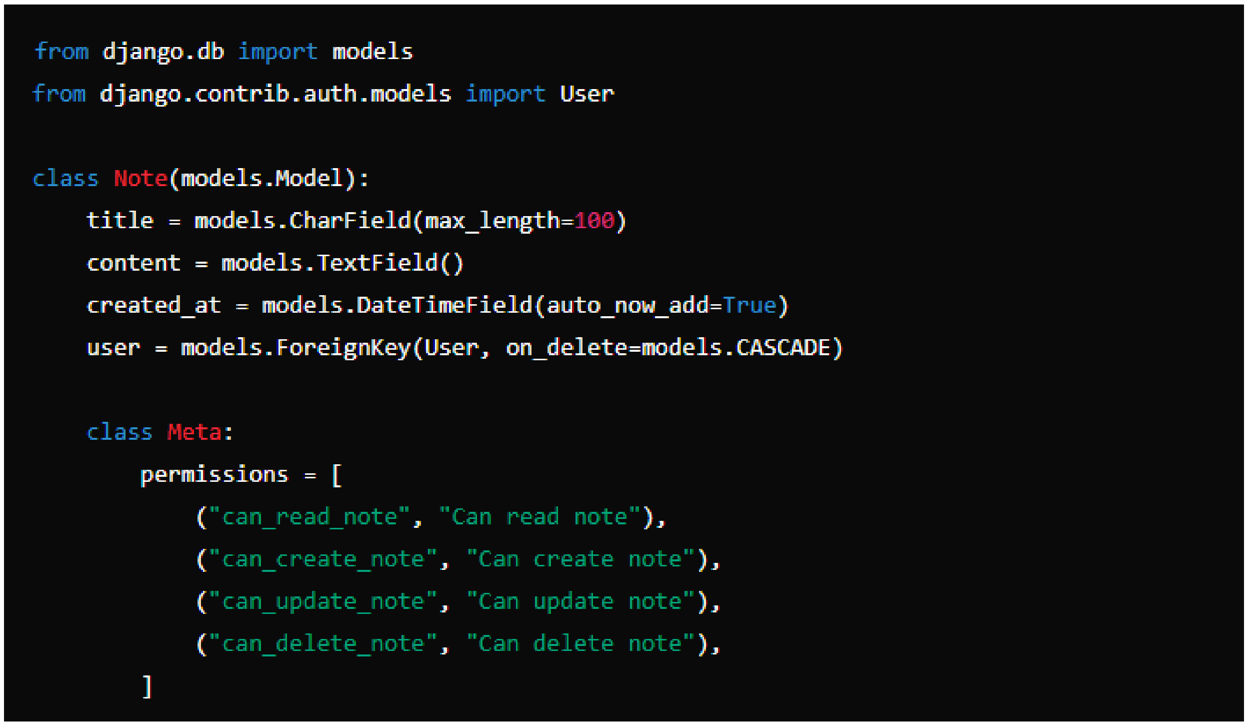
In Django, user access control can be managed using permissions and user groups. Here’s how this can be integrated into the project:

1. Admin: This user type is typically created using Django's admin interface. Admin users have all permissions.
2. Registered User: These users are authenticated users who can be given specific permissions to create, read, update, and delete their own notes.
3. Guest: These users are not authenticated and typically have limited access, such as only being able to read notes.

Implementation Example

You can implement this in your Django project using the `permissions` framework:

Model Example:

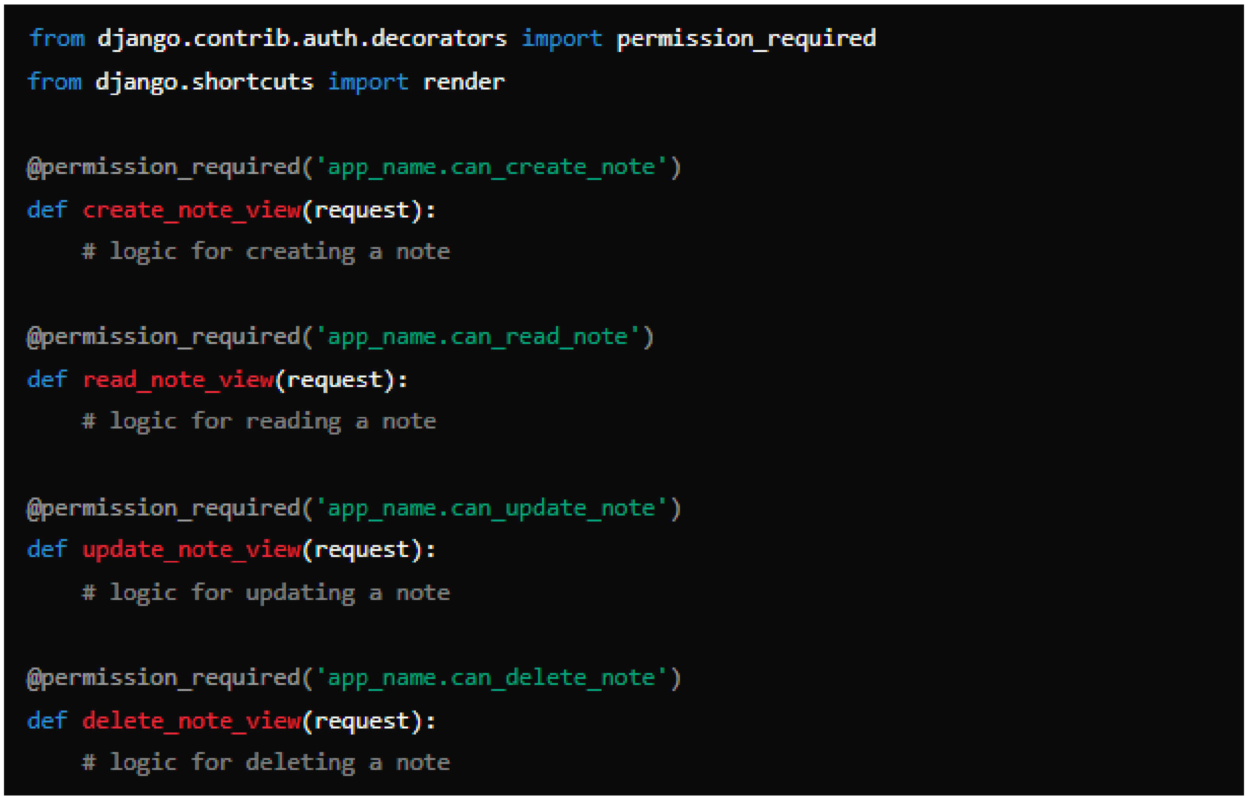


```python
from django.db import models
from django.contrib.auth.models import User

class Note(models.Model):
    title = models.CharField(max_length=100)
    content = models.TextField()
    created_at = models.DateTimeField(auto_now_add=True)
    user = models.ForeignKey(User, on_delete=models.CASCADE)

    class Meta:
        permissions = [
            ("can_read_note", "Can read note"),
            ("can_create_note", "Can create note"),
            ("can_update_note", "Can update note"),
            ("can_delete_note", "Can delete note"),
        ]
```

Example:



```python
from django.contrib.auth.decorators import permission_required
from django.shortcuts import render

@permission_required('app_name.can_create_note')
def create_note_view(request):
    # logic for creating a note

@permission_required('app_name.can_read_note')
def read_note_view(request):
    # logic for reading a note

@permission_required('app_name.can_update_note')
def update_note_view(request):
    # logic for updating a note

@permission_required('app_name.can_delete_note')
def delete_note_view(request):
    # logic for deleting a note
```

This setup ensures that only authorized users can perform specific actions, enhancing the application's security and usability.

Part 2 of Task

Unit tests

Here's the `note_post/tests.py` script with detailed comments explaining each part of the tests:

```
from django.test import TestCase
from django.urls import reverse
from .models import NotePost

class NotePostModelTest(TestCase):
    """
    Test case for the NotePost model.
    """

    def setUp(self):
        """
        Set up the test environment by creating a NotePost instance.
        """
        NotePost.objects.create(title='Test Post', content='Test Content', author='Test Author')

    def test_post_content(self):
        """
        Verify the content of the created NotePost instance.
        """
        post = NotePost.objects.get(id=1)
        expected_object_name = f'{post.title}'
        self.assertEqual(expected_object_name, 'Test Post')  # Check if title is 'Test Post'
        self.assertEqual(post.content, 'Test Content')  # Check if content is 'Test Content'
        self.assertEqual(post.author, 'Test Author')  # Check if author is 'Test Author'

    def test_post_str_method(self):
        """
        Ensure the __str__ method returns the post title.
        """
        post = NotePost.objects.get(id=1)
        self.assertEqual(str(post), post.title)  # Check if __str__ returns the title


class NotePostViewTest(TestCase):
    """
    Test case for the views related to NotePost.
    """

    def setUp(self):
        """
        Set up the test environment by creating a NotePost instance.
        """
        self.post = NotePost.objects.create(title='Test Post', content='Test Content',
author='Test Author')

    def test_index_view(self):
        """
        Test the index view to ensure it lists all posts.
        """
        response = self.client.get(reverse('index'))
        self.assertEqual(response.status_code, 200)  # Check if response status code is 200
        self.assertContains(response, 'Test Post')  # Check if response contains 'Test Post'
        self.assertTemplateUsed(response, 'note_post/index.html')  # Check if correct template
is used

    def test_add_post_view(self):
        """
        Test the add_post view to ensure a post can be added successfully.
        """
        response = self.client.post(reverse('add_post'), {
            'title': 'New Post',
            'content': 'New Content',
            'author': 'New Author'
        })
        self.assertEqual(response.status_code, 302)  # Check if redirect status code is 302
        self.assertEqual(NotePost.objects.last().title, 'New Post')  # Check if the new post is
created

    def test_view_post_view(self):
        """
        Test the view_post view to ensure it displays the correct post details.
        """
        response = self.client.get(reverse('view_post', args=[self.post.id]))
        self.assertEqual(response.status_code, 200)  # Check if response status code is 200
        self.assertContains(response, 'Test Post')  # Check if response contains 'Test Post'
        self.assertTemplateUsed(response, 'note_post/view_post.html')  # Check if correct
template is used

    def test_edit_post_view_get(self):
        """
        Test the edit_post view to ensure it displays the edit form correctly.
        """
        response = self.client.get(reverse('edit_post', args=[self.post.id]))
        self.assertEqual(response.status_code, 200)  # Check if response status code is 200
        self.assertTemplateUsed(response, 'note_post/edit_post.html')  # Check if correct
template is used
```

```
   def test_edit_post_view_post(self):
       """
       Test the edit_post view to ensure a post can be edited successfully.
       """
       response = self.client.post(reverse('edit_post', args=[self.post.id]), {
           'title': 'Updated Post',
           'content': 'Updated Content',
           'author': 'Updated Author'
       })
       self.assertEqual(response.status_code, 302)  # Check if redirect status code is 302
       self.post.refresh_from_db()  # Refresh the post instance from the database
       self.assertEqual(self.post.title, 'Updated Post')  # Check if the post title is updated
       self.assertEqual(self.post.content, 'Updated Content')  # Check if the post content is
updated
       self.assertEqual(self.post.author, 'Updated Author')  # Check if the post author is
updated
```

Explanation of the Comments

- **Model Tests**:
  - **`setUp` method**: Prepares the test environment by creating a `NotePost` instance.
  - **`test_post_content` method**: Checks if the `NotePost` instance has the correct title, content, and author.
  - **`test_post_str_method` method**: Verifies the `__str__` method returns the post title.
- **View Tests**:
  - **`setUp` method**: Prepares the test environment by creating a `NotePost` instance.
  - **`test_index_view` method**: Ensures the index view lists all posts and uses the correct template.
  - **`test_add_post_view` method**: Verifies a post can be added through the `add_post` view.
  - **`test_view_post_view` method**: Ensures the `view_post` view displays the correct post details.
  - **`test_edit_post_view_get` method**: Checks the `edit_post` view displays the edit form correctly.

- `test_edit_post_view_post` **method**: Verifies a post can be edited through the `edit_post` view.

These tests cover the core functionalities of the `note_post` application, ensuring that posts can be created, listed, viewed, and edited correctly. Run the tests using the Django test runner to validate your implementation.