

# Project Report: Full-Featured To-Do Application

## 1 Project Overview

This project is a full-featured To-Do application built using Django and Django REST Framework. The application offers task and employee management, code snippet highlighting, user authentication, and fine-grained permissions. It's designed for both usability and extensibility, making it suitable for real-world deployment or further development.

## 2 Key Features

### Task Management

- Users can create, view, update, and delete tasks.
- Each task includes title, description, status, due date, priority, tags, and associated code snippets.

### Employee Management

- All users can view the list of employees.
- Only superusers (e.g., `yassin mhiri`) can add, edit, or delete employee records.

### Code Snippets

- Snippets can be attached to tasks and are managed via the API.
- Integrated `Pygments` library provides syntax highlighting, rendering code as highlighted HTML.

## 3 Permissions & Authentication

- Only authenticated users can create, update, or delete tasks and snippets.
- Superuser-only access is enforced for modifying employees.
- Supported authentication methods: Session, Token, and Basic Authentication.

## 4 API Design

- A root API endpoint lists all available resources.
- All list views are paginated for performance.
- Uses Django REST Framework ViewSets and Routers for clean RESTful endpoints.

## 5 Admin Interface

- Full admin control over tasks, employees, and code snippets.
- Snippets are displayed inline with tasks for convenient editing and review.

## 6 Technical Highlights

- **Models:** Task, Employee, Snippet (with Pygments integration)
- **Serializers:** `HyperlinkedModelSerializer` for RESTful navigation
- **Views:** ViewSets for APIs and function-based views for selected functionality
- **Permissions:** Custom permission classes for access control
- **Pagination:** Page number-based for all list endpoints
- **Authentication:** Session, token, and basic authentication supported

## 7 User Experience

- Superusers can manage all resources.
- Regular users can manage tasks and snippets, but only view employees.
- Anonymous users can view tasks via the web interface.

## 8 Extensibility & Future Enhancements

- Task assignment to specific users
- Notifications (email or in-app)
- Advanced task filtering and search
- Production deployment options
- Optional frontend migration to modern JS frameworks

## 9 Conclusion

This project delivers a robust, secure, and user-friendly To-Do application with a RESTful API, syntax-highlighted code snippets, and role-based access control. It is ready for real-world use or further development into a more advanced productivity platform.