Modern Application Development – II

Library Management System

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Description

The Library Management System (LMS) is a comprehensive web application designed to facilitate efficient library management and provide a user-friendly interface for both librarians and users. The system supports various functionalities such as book management, user management, and request processing, utilizing modern web technologies like Flask, Vue.js, Celery, and Redis.

Problem Statement

1. **Efficient Management**: Streamline the management of e-books, sections, user requests, and user roles.

2. **User-Friendly Interface**: Provide a responsive and intuitive interface for users to interact with the library system.

3. **Automation**: Implement background tasks to automate reminders, activity reports, and data export using Celery and Redis.

4. **Security**: Ensure secure access to functionalities with role-based authentication and token management.
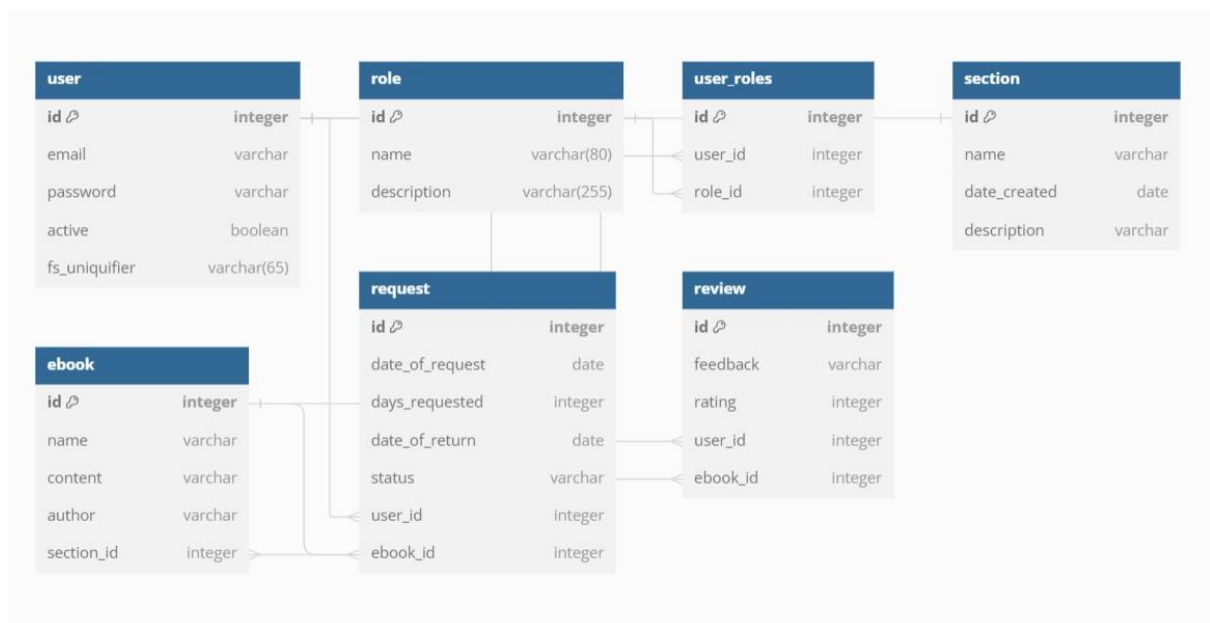
Frameworks and libraries used

1. **Backend**: Flask, Flask SQLAlchemy, Flask Security, Flask RESTful, Celery, Redis, SQLite.

2. **Frontend**: Vue.js with CDN, Bootstrap, Jinja2 Templating.

3. **Other Tools**: Celery-beat for scheduling tasks, dotenv for environment variable management, Flask-CORS for handling cross-origin requests.

Development Process:

1. The backend is implemented using Flask, with SQLAlchemy handling database operations and Flask-RESTful managing the API endpoints. The tasks.py file contains Celery tasks, and the celeryconfig.py file defines the Redis configurations.

2. The frontend is designed with Vue.js and Bootstrap, providing a modern, responsive interface. CRUD operations and user interactions are handled with Vue components, and the state is managed using localStorage.

3. User Authentication: Role-based authentication with Flask Security and token-based access.

Entity Relationship Diagram

Video Link:
https://drive.google.com/drive/folders/1gIjhKhYZQa3Ph8Vw5bIebSeEILhfEBNx?usp=sharing