



Project Report: Library Management System

DECIPHA V1

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Overview

DECIPHA V1 is an innovative Library Management System designed to digitize the conventional library experience. Utilizing modern web technologies, the application allows for seamless management of e-book circulation within a learning environment. It caters to multiple user roles, including administrators and general users, offering a personalized dashboard, book and section management, and a robust search feature. DECIPHA V1 transforms library interactions into a simple, efficient, and accessible digital experience.

Technology Stack

- Frontend: HTML5, CSS3, and Bootstrap for responsive design, along with JavaScript for dynamic interactions.
- Backend: Flask, a lightweight WSGI web application framework in Python, is used to handle requests, server-side logic, and web page rendering.
- Database: SQLite, an embedded SQL database engine, for data persistence without the need for a separate server.
- Templates: Jinja2 templates integrate with Flask to render dynamic content on the frontend.
- Data Visualization: Matplotlib for Python is utilized to create statistical graphs for the admin dashboard.
- Security: Flask-Bcrypt for password hashing and Flask-Login for user session management.
- API: A comprehensive RESTful API designed with Flask-Restful, enabling CRUD operations on books and sections, and facilitating external interactions with the library system.
- Configuration Management: Utilizes YAML, a human-readable data serialization standard, for configuration, allowing easy adjustments and deployments.

Database Schema

The core of DECIPHA V1 revolves around its robust database schema, essential for managing data integrity and relationships between different entities such as Books, Sections, Users, and Administrators. Here are the critical tables:

- Users: Stores details such as username, email, roles, and encrypted passwords.
- Sections: Contains information like section ID, title, and description.
- Books: Holds records for book ID, title, author, content, release date, genre, price, and an optional PDF field for storage paths.
- Requested Books: Logs book requests, issues, revokes, and returns, along with associated timestamps.

Folder Structure and Routes

The application follows MVC (Model-View-Controller) architecture within a Flask framework, which defines the folder and file structure:

- Static: Houses static files like images, CSS, and client-side JavaScript.
- Templates: Contains HTML files structured with Jinja2 for dynamic data rendering.
- Models: Defines the data structure and relations.
- Forms: Handles form creation and validation logic.
- Views/Controllers: Represented by routes in lib.py and user.py, these control application logic, including admin and user functionalities.
- The routes provide a broad range of functionalities, from user authentication to CRUD operations on books and sections. A detailed RESTful API further enables interaction with book and section data programmatically.

Functionality Overview

- **Admin Dashboard**
Accessible via /admindashboard, the admin can oversee books, sections, and users. CRUD operations on books and sections are integral parts, including issuing and revoking book access.
- **User Dashboard**
Located at /userdashboard, it allows users to view available books and sections, request books, provide feedback, and download e-books.
- **Search Functionality**
The app features a search mechanism that lets users and administrators filter books and sections based on various criteria like title and author.

Conclusion

DECIPHA V1 is a comprehensive Library Management System that facilitates efficient e-book distribution within an educational institution. It strikes a balance between user-friendliness and functionality, thereby enhancing the learning experience for all stakeholders.

Video Link: [📺 MAD 1: Decipia V1](#)