Author

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I am a final year B.Tech student working in developing skills in the domain of data science and machine learning.

Description

For a good user experience the library management system should be easy to use and have a simple structure so the user can intuitively start using the application without any training.

Technologies used

The main frameworks used in the project are-

- Vue3: For making the frontend
- Redis and Celery: For scheduled tasks and caching jobs
- Flask: For application code
- Flask-RESTful: For making a REST API
- Flask-SQLAlchemy: For connecting to the database
- Flask-Security-too: For role and token-based authentication
- Matplotlib: For making graphs for summary page
- Bootstrap: For styling
- SQLite: For database management

DB Schema Design

Role-User Schema (helper table for roles and users)

Column Name	Column Type	Constraints
ru_id	Integer	Primary Key
ru_user_id	Integer	Foreign Key (User.id)
ru_role_id	Integer	Foreign Key (Role.id)

Role Schema

Column Name	Column Type	Constraints
id	Integer	Primary Key
name	String(25)	Unique, Not Null
description	String(255)	Unique, Not Null

User Schema

Column Name	Column Type	Constraints
Id	Integer	Primary Key, Auto-increment
name	String(25)	Unique
email	String(25)	Unique, Not Null
password	String(25)	Unique, Not Null
active	Boolean	
fs_uniquifier	String(25)	Unique, Not Null

Section Schema

Column Name	Column Type	Constraints
sec_id	Integer	Primary Key, Auto-increment

sec_name	String(25)	Not Null
sec_create_date	DateTime	Not Null
sec_description	String(525)	
sec_user_id	Integer	Foreign Key (User.id), Not Null

Request Schema

Column Name	**Column Type**	**Constraints**
req_id	Integer	Primary Key, Auto-increment
req_user_id	Integer	Foreign Key (User.id), Not Null
req_book_id	Integer	Foreign Key (Book.book_id), Not Null
req_create_date	DateTime	Not Null
req_start_date	DateTime	Not Null
req_end_date	DateTime	Not Null
req_active	Boolean	Default: True

Book Schema

Column Name	**Column Type**	**Constraints**
book_id	Integer	Primary Key, Auto-increment
book_name	String(25)	Not Null
book_content	String(125)	
book_author	String(25)	
book_link	String	Default: 'https://www.isibang.ac.in/~athreya/psweur/'
book_create_date	DateTime	Not Null
book_available	Boolean	Default: True
book_user_id	Integer	Foreign Key (User.id)
book_sec_id	Integer	Foreign Key (Section.sec_id), Not Null

Feedback Schema

Column Name	**Column Type**	**Constraints**
feed_id	Integer	Primary Key, Auto-increment
feed_user_id	Integer	Foreign Key (User.id), Not Null
feed_book_id	Integer	Foreign Key (Book.book_id), Not Null
feed_rating	Integer	Not Null
feed_content	DateTime	Not Null

API Design

CRUD operations implemented for user, book, section, request and feedback models which take their id to return a json object. An api for summary creates graphs and returns books deadlines. Role and token-based authentication have been setup using flask security-too and caching using flask-caching.

Architecture and Features

The root folder has two folders inside called application which contains the python code and frontend which contains the vue js templates and four python files out of which two are for configuration and the rest are for initial set up of the application.

The librarian has the ability to add, update and delete sections and books. He can check requests and book status as well as revoke book privileges and users. He can also check the reports of the library as a whole. The user can request, view and return a book and search them as well. He can give feedback as well as check his visit information in 'user summary'.

Video

https://drive.google.com/file/d/1p-MdQFH3QKamoeNtZg_q5uFfgCOt1GgO/view?usp=sharing