Project Report for Modern Application Development II

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Description:

The topic for my project was to develop Library Management System V2, a multi-user app for issuing, granting/revoking, and maintaining e-books across various sections, similar to an online library. My approach to the problem was as follows:
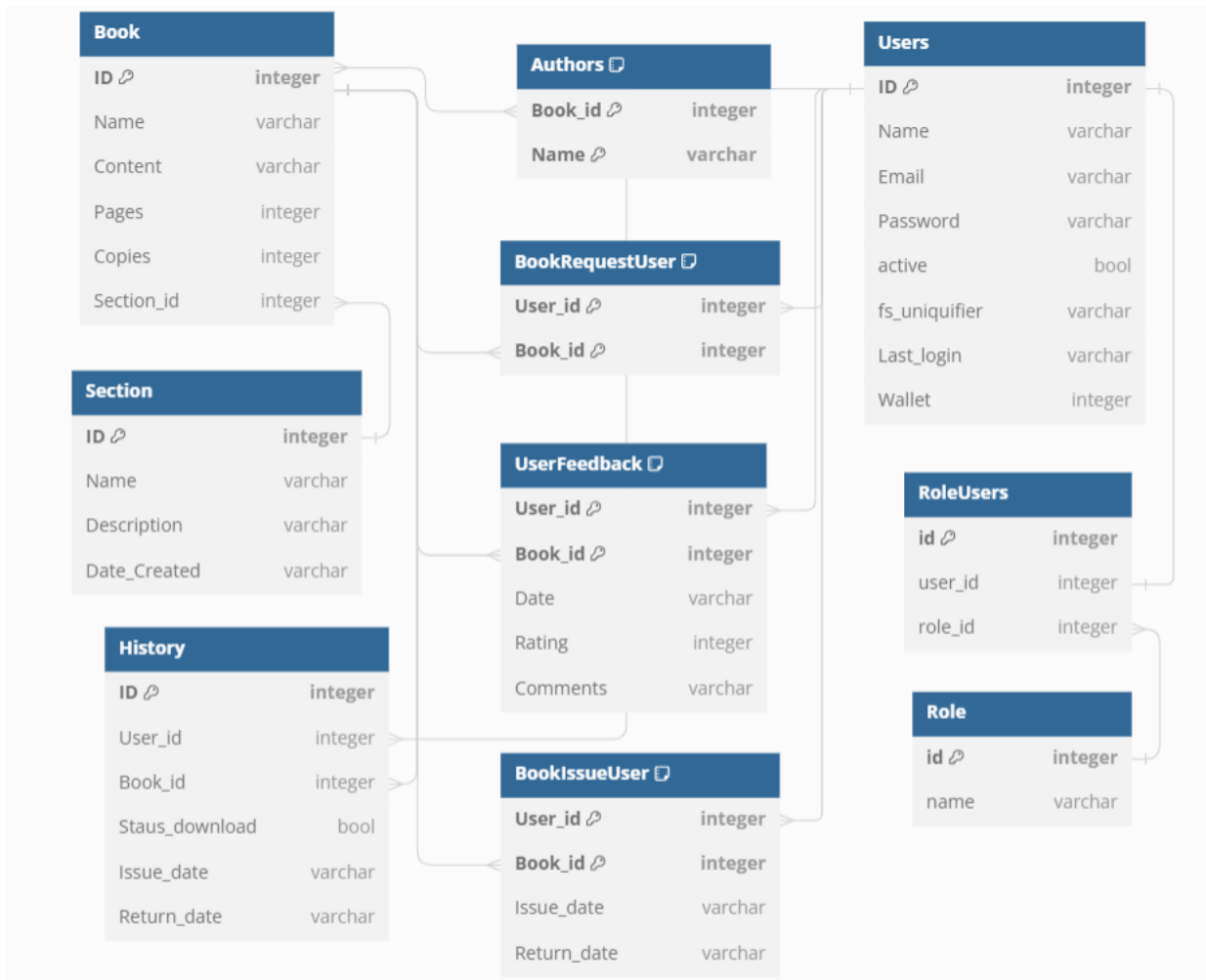
First, I conducted a comprehensive analysis of the problem statement. Following that, I sketched a rough ER Diagram on paper to conceptualize my backend structure. Next, I devised the business logic for my application and wrote the *model.py* file. After that, I created all the necessary API endpoints. For the frontend, I used Vue.js 2 in CDN form and wrote the frontend code. Then I set up and installed all the necessary requirements for Celery tasks and set up my Redis server. Finally, I completed all the backend tasks and implemented caching for improved performance of my application.

Frameworks and libraries used:

- o Flask: A core web Framework for building web applications in Python.
- o Flask-RESTful: An extension for Flask that simplifies building REST APIs.
- o Flask-Caching: A caching extension in Flask to improve performance.
- o Flask-SQLAlchemy: An ORM (Object-Relationship Mapping) Library in Flask.
- o Flask-Security: Provides security features like authentication, authorization and user management in Flask applications.
- o smtplib: A python library used for sending emails using Simple Mail Transfer Protocol (SMTP).
- o fpdf: A PHP class for generating PDF files programmatically.
- o Datetime: A python library for manipulating dates and times.
- o pyexcel: A python library for reading. Writing and manipulating Excel files.
- o Celery: An asynchronous task manager for running and managing backend jobs.
- o Redis: An in-memory data structure store used as database, cache and message broker.
- o Vue.js: An open-source JavaScript frameworks for building user interfaces.
- o Bootstrap: An open-source CSS framework used for developing visually appealing and mobile responsive websites.

- o Chart.js: A JavaScript library for creating interactive charts in HTML canvas.
- o crontab: A time-based job schedular for automating tasks.

ER Diagram:

API Resource Endpoints:

- o Book Management (/book, /book/<int: book_id>): CRUD on Books
- o Section Management (/section,/section/<string: section_name>) : CRUD on Sections
- o Profile Management (/profile/<int:user_id>): Read and Update Profile

Presentation Video Link:

https://drive.google.com/file/d/1tCXzmpF-czn40GD24tWFAP0gICmbB1cD/view?usp=drive_link