

Library Management API Integrations Projects - Task Description

Short Description:

The Library Management API facilitates the management of a library system where users (members) can view, borrow, and return books, while administrators can manage the collection of books. The system implements JWT authentication and role-based access control to ensure secure access.

Key Features Analysis

☒ **1. Authentication and Authorization**

- ☒ **JWT Authentication:** Users will authenticate through JSON Web Tokens (JWT) to ensure secure access.
- ☒ **Role-Based Access Control:**
- ☒ **Admin Role:** Full access to manage the library collection, including creating, reading, updating, and deleting (CRUD) book entries.
- ☒ **Member Role:**
 - ☒ Limited access to view available books and
 - ☒ perform borrowing and returning operations.

☒ **2. Book Management (Admin Only)**

- ☒ **CRUD Operations:**
 - ☒ **Create:** Add new books to the library.
 - ☒ **Read:** Retrieve details of existing books.
 - ☒ **Update:** Modify information of a book (title, author, availability status, etc.).
 - ☒ **Delete:** Remove books from the library.

☒ **3. Book Borrowing and Returning System**

- ☒ **Borrowing Books:** Logged-in members can borrow books from the library.
- ☒ **Returning Books:**
 - ☒ Members can return borrowed books,
 - ☒ which updates the availability status in the system.
- ☒ **Borrow Limit:** Each user can borrow a maximum of 5 books at any given time.

☒ **4. Automatic Book Return Deadline and Fine Calculation**

- ☒ **Return Deadline:** When a book is borrowed, an automatic return deadline is set (e.g., 14 days from the borrowed date).
- ☒ **Overdue Fines:** The system calculates fines for overdue returns based on predefined rates (e.g., 5 BDT per day).

☒ **Logic**

☒ **Role-Based Permissions**

- ☒ Implement role checks to ensure that:
 - ☒ Only admins can perform CRUD operations on books.
 - ☒ Only logged-in members can borrow and return books.

☒ **Book Borrowing System**

- ☒ Track borrowed books and their deadlines.
- ☒ Implement logic to enforce borrowing limits and check for available books.

☒ **Efficient Querying**

- ☒ Use optimized queries to fetch:
- ☒ Available books for borrowing.
- ☒ Details of borrowed books for each member.

☒ **Handling Concurrency**

- ☒ Implement mechanisms (e.g., database transactions) to prevent over-borrowing of the same book by multiple users simultaneously.

☒ **Technology Stack**

- ☒ Django
- ☒ Django Rest Framework (DRF)
- ☒ JWT for Authentication

API endpoints

API's	Sample input (for POST method)
Local: http://127.0.0.1:8000 deployed: https://library-management-api-bix8.onrender.com	
<ul style="list-style-type: none"> To register a new user - POST http://127.0.0.1:8000/accounts/register/	<pre>{ "username": "sohel", "first_name": "Md. Sohel", "last_name": "Rana", "email": "sdssayed24@gmail.com", "password": "sayed8901", "confirm_password": "sayed8901", "user_type": "member" }</pre>
<ul style="list-style-type: none"> To login - POST http://127.0.0.1:8000/accounts/login/	<pre>{ "username" : "sohel", "password" : "sayed8901" }</pre>
<ul style="list-style-type: none"> To logout - POST http://127.0.0.1:8000/accounts/logout/ N.B.: Need to provide JWT access token as the bearer token for authorization (for example, while trying this API from postman or frontend call)	Add this as the (member) bearer token: <pre>eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ0b2t1b190eXB1IjoiaWwzZXhwaWJoxNzM0NzIzODI1LCJpYXQiOiE3MzQ3MjIwMjUsImp0aSI6Ijc0Nzg5ODQxOGE2NTRlMWJiNDY3NjQ5YzZjNzZlMWE0IiwidXNlcl9pZCI6Mn0.1Tv2rb1CKtEWDV17D20JVhd0IFfnKDjTxtSuOnWwFk4</pre>
Admin Only Activity (N.B.: don't forget to add this as the (admin) bearer token:)	
Manage Category	
<ul style="list-style-type: none"> To add a category - POST To retrieve all categories - GET http://127.0.0.1:8000/library/categories/	<pre>{ "name": "Short Story" }</pre>
<ul style="list-style-type: none"> To get/ update/ delete the details of a category by its id - GET / PUT / PATCH / DELETE http://127.0.0.1:8000/library/categories/1/	
Manage Book	
<ul style="list-style-type: none"> To add a book - POST To retrieve all books - GET http://127.0.0.1:8000/library/books/	<pre>{ "title": "The Call of the Wild", "author": "Jack London", "description": "Set in the Yukon", "quantity": 10, "category": 1 }</pre>
<ul style="list-style-type: none"> To get or update or delete the details of a book by its id - GET / PUT / PATCH / DELETE http://127.0.0.1:8000/library/books/1/	
<ul style="list-style-type: none"> To retrieve the list of available books (by any user - Admin or Member) - GET http://127.0.0.1:8000/library/available_books/	
Member activity (N.B.: don't forget to add this as the (member) bearer token:)	
Book Borrow	
<ul style="list-style-type: none"> Borrow a book by book id - POST http://127.0.0.1:8000/activity/borrow/1/	
<ul style="list-style-type: none"> Get the list of all borrowed books for a particular member - GET http://127.0.0.1:8000/activity/borrowed_books/	
Return Book	
<ul style="list-style-type: none"> Return a book by book id - POST http://127.0.0.1:8000/activity/return/1/	

Sample Resources Books Data :

Book Name	Category	Author	Details
<input checked="" type="checkbox"/> Treasure Island	Adventure 1	Robert Louis Stevenson	A thrilling tale of pirates, treasure maps, and adventure on the high seas, as young Jim Hawkins embarks on a quest to find buried gold and confronts the treacherous Long John Silver.
<input checked="" type="checkbox"/> The Call of the Wild	Adventure 2	Jack London	Set in the Yukon during the Klondike Gold Rush, this novel follows Buck, a domesticated dog, as he reverts to his primal instincts and embarks on a journey of survival in the harsh wilderness.
<input checked="" type="checkbox"/> Around the World in Eighty Days	Adventure 3	Jules Verne	Phileas Fogg wagers that he can circumnavigate the globe in just eighty days, leading to a race against time filled with unexpected challenges, thrilling encounters, and the spirit of exploration.
<input checked="" type="checkbox"/> Dune	Science Fiction 1	Frank Herbert	A sweeping epic of politics, religion, and ecology set on the desert planet Arrakis, where the precious spice melange is mined and powerful factions vie for control.
<input checked="" type="checkbox"/> Neuromancer	Science Fiction 2	William Gibson	A groundbreaking cyberpunk novel that follows a washed-up computer hacker hired for one last job: to pull off the ultimate hack.
<input checked="" type="checkbox"/> The Martian	Science Fiction 3	Andy Weir	Stranded on Mars, astronaut Mark Watney must use his ingenuity and humor to survive alone while trying to signal to Earth that he is still alive.
<input checked="" type="checkbox"/> The Lottery	Short Story 1	Shirley Jackson	A chilling tale of a small town's annual ritual that reveals the dark side of human nature and the power of tradition.
<input checked="" type="checkbox"/> The Tell-Tale Heart	Short Story 2	Edgar Allan Poe	A gripping psychological thriller about a man driven to madness by the sound of his victim's beating heart.
<input checked="" type="checkbox"/> A Good Man Is Hard to Find	Short Story 3	Flannery O'Connor	A Southern Gothic story about a family's road trip that takes a horrifying turn when they encounter a criminal known as The Misfit.
<input checked="" type="checkbox"/> To Kill a Mockingbird	Novel 1	Harper Lee	A poignant novel set in the Deep South, focusing on themes of racial injustice and moral growth as seen through the eyes of young Scout Finch.
<input checked="" type="checkbox"/> Pride and Prejudice	Novel 2	Jane Austen	A classic romance that explores the manners and matrimonial machinations of British society, centered around the witty and independent Elizabeth Bennet.
<input checked="" type="checkbox"/> The Great Gatsby	Novel 3	F. Scott Fitzgerald	A tragic story of wealth, love, and the American Dream, following the mysterious and wealthy Jay Gatsby and his obsession with Daisy Buchanan.
<input checked="" type="checkbox"/> Watchmen	Comics 1	Alan Moore and Dave Gibbons	A deconstruction of the superhero genre set in an alternate history where vigilantes emerge to uncover a complex conspiracy that could change the world.
<input checked="" type="checkbox"/> Maus	Comics 2	Art Spiegelman	A Pulitzer Prize-winning graphic novel that portrays the Holocaust through the eyes of a survivor, using animals to represent different nationalities and races.