



# LIBRARY MANAGEMENT SYSTEM

## GROUP MEMBERS:

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# Library Management System – Key Functionalities

A web-based system using **PostgreSQL** for primary database operations and **Firebase** for real-time backups.

## 1. Book Management

- Add, update, delete books
- Track title, author, genre, quantity

## 2. User & Librarian Management

- Register users/librarians
- Role-based access and secure login

## 3. Book Issuance

- Issue/return tracking
- Fine calculation for overdue books

## 4. Admin Tools

- Monitor transactions
- Manage librarians
- Track overdue books

## 5. Database Features

- Relational design with foreign keys
- Secure password hashing
- Optimized queries & indexing

## 6. Backup System (Firebase)

- Timestamped, structured backups
- Metadata logging and integrity checks

## 7. Performance & Security

- Batch processing, connection pooling
- Prepared statements, secure sessions

# ERD DIAGRAM AND SCHEMA MAPPING

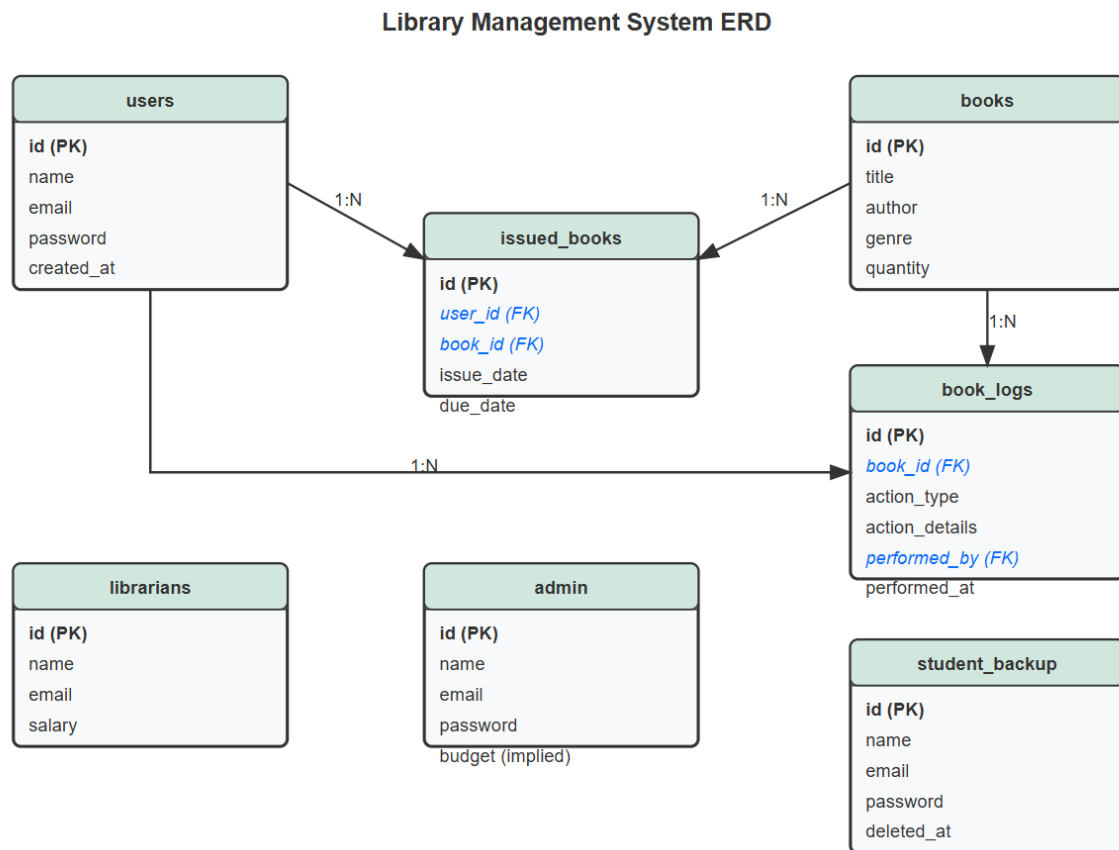


Figure 1 ERD DIAGRAM

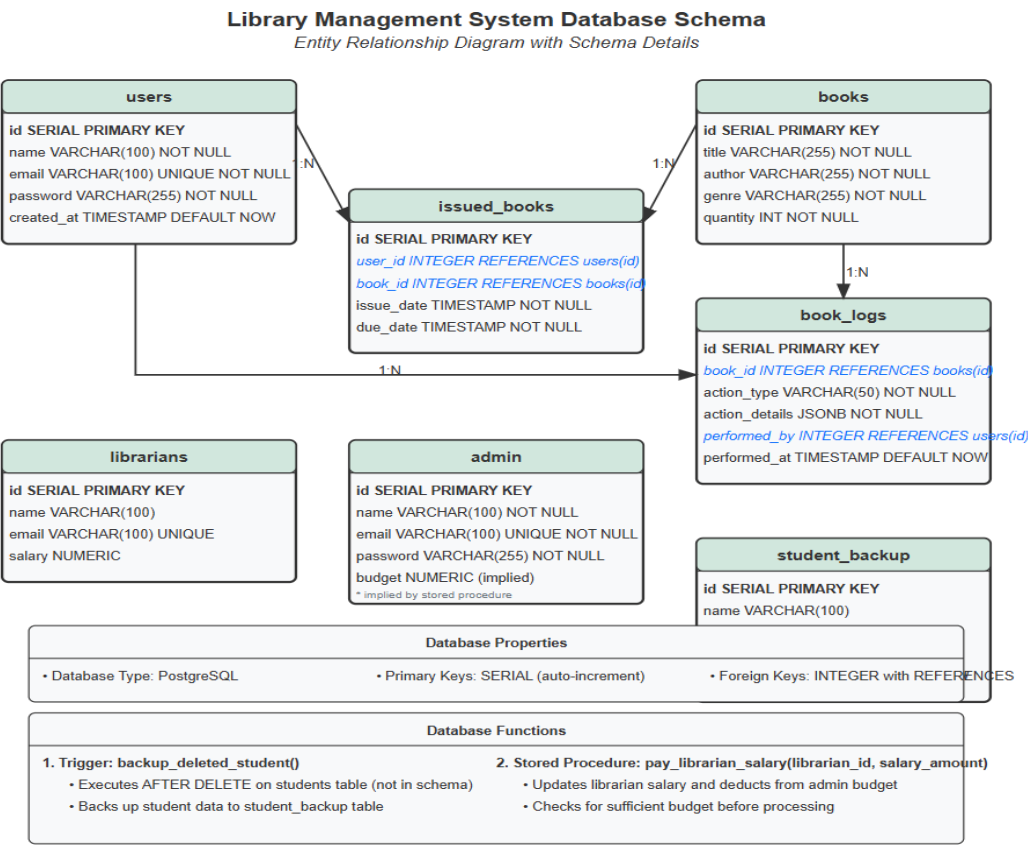


Figure 2 SCHEMA MAPPING

# PICTURES

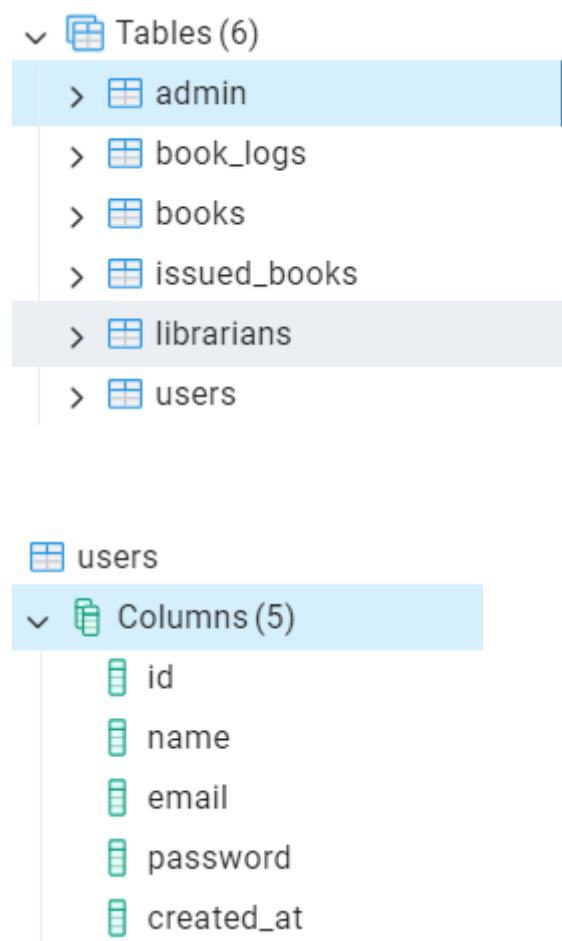


Fig1a: Users Table

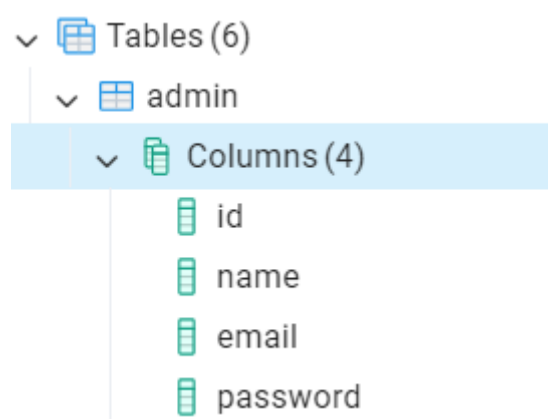


Figure 3 ADMIN TABLE











 issued_books
▼  Columns (8)
 id
 user_id
 book_id
 issue_date
 due_date
 return_date
 fine
 returned

Figure 4 ISSUED BOOKS TABLE

# Books in the Library

Title	Author	Genre	Quantity	Status	Actions	
Alchemist	Paulo Coelho	Fiction	10	Available	Edit	Remove
Pride and Prejudice	Jane Austen	Classic Literature	15	Available	Edit	Remove
To Kill a Mockingbird	Harper Lee	Classic Literature	20	Available	Edit	Remove
1984	George Orwell	Classic Literature	25	Available	Edit	Remove
The Great Gatsby	F. Scott Fitzgerald	Classic Literature	18	Available	Edit	Remove
Lord of the Flies	William Golding	Classic Literature	12	Available	Edit	Remove
The Catcher in the Rye	J.D. Salinger	Classic Literature	15	Available	Edit	Remove
Brave New World	Aldous Huxley	Classic Literature	20	Available	Edit	Remove

Figure 5 BOOKS IN LIBRARY

books

Columns (5)

id

title

author

genre

quantity

Figure 6 BOOKS TABLE

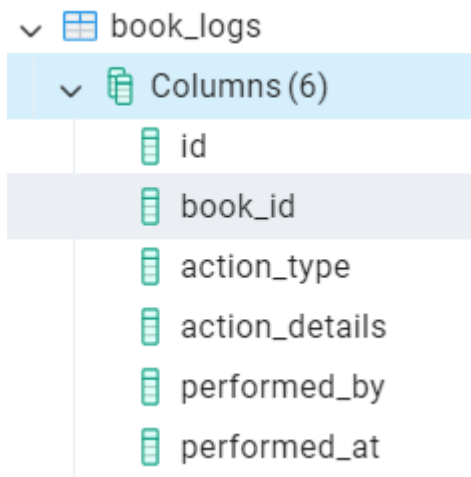


Figure 7 BOOK LOGS TABLE

## My Borrowed Books

Title	Borrow Date	Return Date	Status	Action
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Figure 8 BORROWED BOOKS

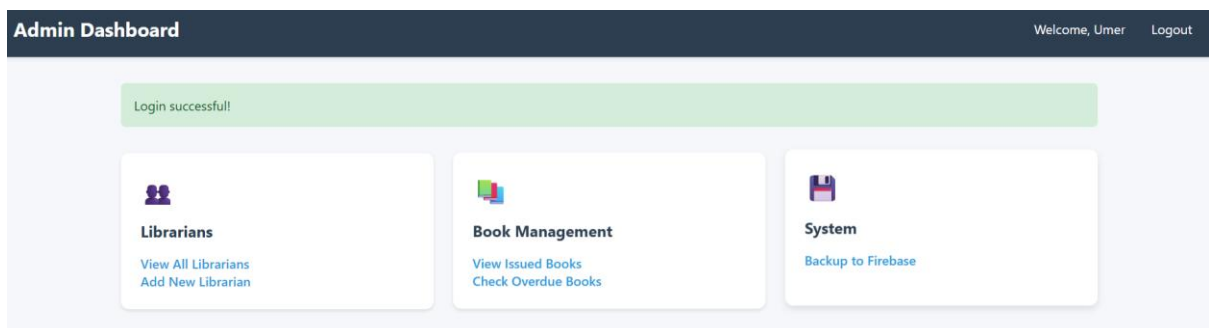


Figure 9 ADMIN DASHBOARD



# Librarian List

Name	Email	Salary	Actions
Babar	babar@email.com	12000	<div>Update Salary</div>

Add New Librarian

Figure 10 LIBRARIAN LIST

Library Dashboard

Browse Books

Logout

AVAILABLE BOOKS

101

BOOKS BORROWED

0

OVERDUE BOOKS

0

Your Borrowed Books

You haven't borrowed any books yet.

Browse Books

View History

View Fines

Figure 11 USER DASHBOARD

My Fines

You have no outstanding fines.

← Back to Dashboard

Figure 12 FINES

Overdue Books

Back to Dashboard

No overdue books found.

Figure 13 OVERDUE BOOKS

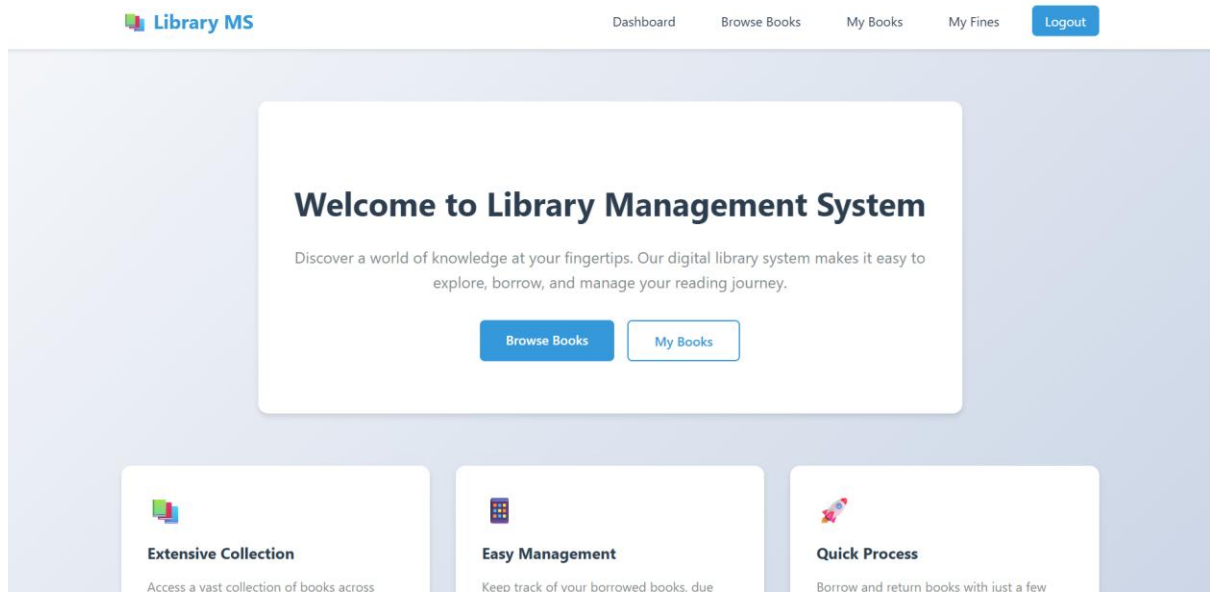


Figure 14 HOME PAGE

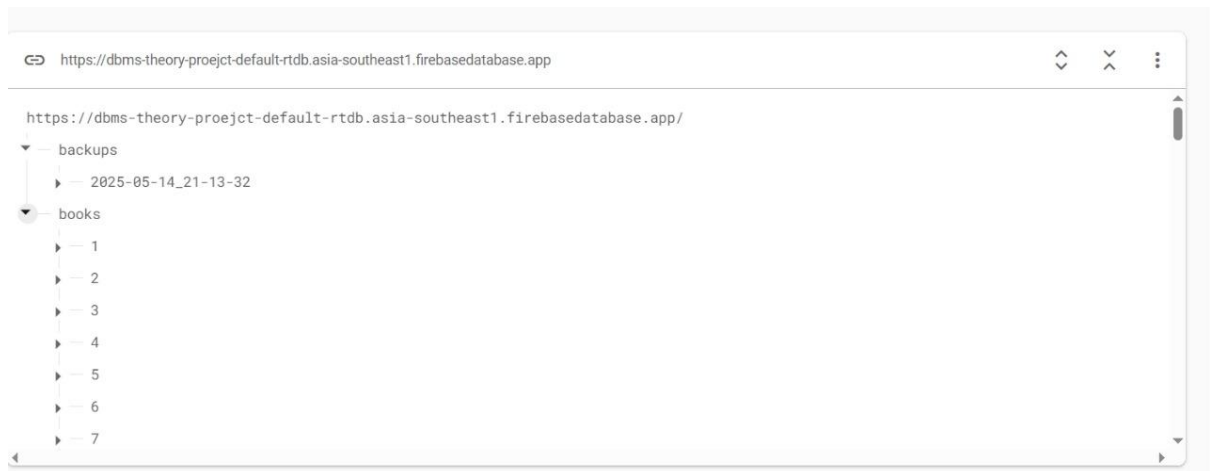


Figure 15 FIREBASE REALTIME DATABASE