

Complex Systems - Project

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I wanted to create a simple and user-friendly internet application to borrow books in the library. To do it I used React technology because I know it well. Then I decided to use Node.js to build the backend of my application, and MongoDB to store my data. In the database there 4 tables: books, genres, rentals, and users. In users, I store name, email, hashed password, and the information if a user is an admin or a boss. Admin is able to delete rows in the books table, where I store the title, author, the number in stock, daily rental rate, and genre. Moreover, the admin and boss can put or post some rows to the books table. Every user can borrow some book (of course if the number in stock is not equal to zero) and then I append the information about a user (name, id) and book (title, author, daily rental rate, id) to the rentals table. Then every user can look into his borrowed book. Admin and boss are able to see all of the rentals and they can choose one user to see his rentals. In the database, there is a genre table that contains information about genres. To make my app safe I used JSON Web Tokens to authorize users.

Library	Books	Your books	Rentals	MatilUser	Logout
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All Genres
Action
Comedy
Romance
Thriller

Showing 12 books in the database.

Title ^	Author	Genre	Stock	Rate	
Beautiful Disaster	Jamie McGuire	Romance	6	2	Borrow
Deep Sleep	Steven Konkoly	Action	3	2	Borrow
My Life	Paddy McGuinness	Comedy	7	2	Borrow
Not a Happy Family	Shari Lapena	Thriller	3	2	Borrow

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Figure 1: All users can borrow books. It is possible to sort it or search something or select some genre.

Library	Books	Your books	MatiUser	Logout
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User	Title	Author	Rate	Day Out
MatiUser	My Life	Paddy McGuinness	2	2022-01-30T23:59:38.083Z
MatiUser	Not a Happy Family	Shari Lapena	2	2022-01-30T23:59:37.024Z
MatiUser	Not a Happy Family	Shari Lapena	2	2022-01-30T23:59:35.381Z
MatiUser	Not a Happy Family	Shari Lapena	2	2022-01-30T23:59:33.557Z
MatiUser	Beautiful Disaster	Jamie McGuire	2	2022-01-30T23:59:31.930Z
MatiUser	Beautiful Disaster	Jamie McGuire	2	2022-01-30T23:59:29.569Z
MatiUser	Not a Happy Family	Shari Lapena	2	2022-01-30T23:57:52.150Z
MatiUser	Not a Happy Family	Shari Lapena	2	2022-01-30T23:57:51.011Z
MatiUser	My Life	Paddy McGuinness	2	2022-01-30T23:57:47.932Z
MatiUser	Deep Sleep	Steven Konkoly	2	2022-01-30T23:43:49.024Z
MatiUser	Deep Sleep	Steven Konkoly	2	2022-01-30T23:42:13.647Z
MatiUser	Beautiful Disaster	Jamie McGuire	2	2022-01-30T23:42:05.800Z
MatiUser	Not a Happy Family	Shari Lapena	2	2022-01-30T23:32:23.436Z
MatiUser	My Life	Paddy McGuinness	2	2022-01-30T23:32:22.138Z
MatiUser	Beautiful Disaster	Jamie McGuire	2	2022-01-30T23:32:19.629Z
MatiUser	Not a Happy Family	Shari Lapena	2	2022-01-30T23:32:12.506Z

Figure 2: All users can see they rentals.

Library	Books	Your books	Rentals	MatiAdmin	Logout
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All Genres

Action

Comedy

Romance

Thriller

New Book

Showing 12 books in the database.

Search...

Title ^	Author	Genre	Stock	Rate		
Beautiful Disaster	Jamie McGuire	Romance	6	2	Borrow	Delete
Deep Sleep	Steven Konkoly	Action	3	2	Borrow	Delete
My Life	Paddy McGuinness	Comedy	7	2	Borrow	Delete
Not a Happy Family	Shari Lapena	Thriller	3	2	Borrow	Delete

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2

3

Figure 3: Admin can delete books and append some new book to the database.

Library
Books
Your books
MatiAdmin
Logout

Book Form

Title

Author

Genre

Number in Stock

Rate

Save

Figure 4: Book form unable for admin and boss.

Library
Books
Your books
Rentals
MatiAdmin
Logout

	User	Title	Author	Rate	Day Out
All Users	MatiUser	My Life	Paddy McGuinness	2	2022-01-30T23:59:38.083Z
MatiUser	MatiUser	Not a Happy Family	Shari Lapena	2	2022-01-30T23:59:37.024Z
	MatiUser	Not a Happy Family	Shari Lapena	2	2022-01-30T23:59:35.381Z
	MatiUser	Not a Happy Family	Shari Lapena	2	2022-01-30T23:59:33.557Z
testCustomer	MatiUser	Beautiful Disaster	Jamie McGuire	2	2022-01-30T23:59:31.930Z
	MatiUser	Beautiful Disaster	Jamie McGuire	2	2022-01-30T23:59:29.569Z
	MatiUser	Not a Happy Family	Shari Lapena	2	2022-01-30T23:57:52.150Z
	MatiUser	Not a Happy Family	Shari Lapena	2	2022-01-30T23:57:51.011Z
	MatiUser	My Life	Paddy McGuinness	2	2022-01-30T23:57:47.932Z
	MatiUser	Deep Sleep	Steven Konkoly	2	2022-01-30T23:43:49.024Z
	MatiUser	Deep Sleep	Steven Konkoly	2	2022-01-30T23:42:13.647Z
	MatiUser	Beautiful Disaster	Jamie McGuire	2	2022-01-30T23:42:05.800Z
	MatiUser	Not a Happy Family	Shari Lapena	2	2022-01-30T23:32:23.436Z
	MatiUser	My Life	Paddy McGuinness	2	2022-01-30T23:32:22.138Z
	MatiUser	Beautiful Disaster	Jamie McGuire	2	2022-01-30T23:32:19.629Z
	MatiUser	Not a Happy Family	Shari Lapena	2	2022-01-30T23:32:12.506Z
	testCustomer	Sto lat samotności	Gabriel Garcia Marquez	5	2022-01-30T14:16:06.000Z

Figure 5: Admin and boss can see all the rentals and choose only one user to see his rentals.