A PROJECT REPORT

On

BOOKNEST

(Simplifying Book Management Online)

By

VUNNAM SIRISHA
(22FE1A4261)

TIRUVIDHI SAI KUMAR
(22FE1A4256)

UDDANDAM CHANDRA LEKHA
(22FE1A05H2)

UMESH CHOWDARY KUNTAMUKKALA

Under the guidance of

Ganesh M

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ABSTRACT

BookNest is a full-stack web application designed to serve as a personal digital library for users to organize, manage, and purchase books online. With a user-friendly interface and robust backend, BookNest enables users to register, log in, and maintain a customized collection of books, categorized by genre and reading status (Read/To-Read). The platform offers key functionalities including book search, profile management, cart and checkout operations, and automated purchase ID generation after transactions.

Built using the MERN (MongoDB, Express.js, React.js, Node.js) stack, BookNest ensures a seamless and responsive user experience across devices. Secure authentication is implemented via JWT tokens to manage user sessions and protect data. The project emphasizes usability, performance, and scalability, making it suitable for students, book enthusiasts, and casual readers looking to digitize their personal book collection.

INTRODUCTION

In the modern digital world, managing personal book collections has become a growing need for students, readers, and book enthusiasts. Traditional methods like physical shelves and handwritten lists often fall short when it comes to accessibility, organization, and efficiency. To address this gap, BookNest offers a centralized, digital platform where users can easily store, categorize, and interact with their personal book libraries.

BookNest is a full-stack web application developed using the MERN (MongoDB, Express.js, React.js, Node.js) stack. The platform provides essential features such as user registration, secure login, book entry and editing, genre categorization, reading status tracking (Read/To-Read), and search functionality. Additionally, users can add books to a cart and proceed with a simplified checkout process, during which a unique purchase ID is generated to ensure transaction tracking.

The frontend, built with React.js, offers a responsive and smooth user interface that adapts well across devices. On the backend, Node.js and Express.js handle API requests, while MongoDB ensures flexible and scalable data storage. User sessions and authentication are managed securely using JSON Web Tokens (JWT), reinforcing data privacy and application security.

Overall, BookNest aims to enhance the personal reading experience by combining simplicity, utility, and performance in one seamless application. It is designed to be useful for both casual readers and avid book collectors who want to maintain their digital bookshelf with convenience and control.

ARCHITECTURE OVERVIEW

The architecture of BookNest is based on the MERN stack, a robust full-stack JavaScript solution that supports scalable, efficient, and responsive web applications. The architecture is divided into three main layers: Frontend, Backend, and Database, each interacting through RESTful APIs.

◈ Frontend (React.js)

The frontend is built using React.js, providing a dynamic and responsive user interface. It uses component-based architecture for modularity and reusability. Key features include:

- Single Page Application (SPA) behavior for smooth navigation
- State management with React hooks
- API integration using Axios for data fetching
- Routing with React Router for seamless page transitions
- Form validation and UI feedback using libraries like Formik/Yup

◈ Backend (Node.js + Express.js)

The backend is developed with Node.js and Express.js, acting as the intermediary between the frontend and database. It exposes a set of secure RESTful APIs to handle:

- User registration, login, and profile management
- Book CRUD operations (Create, Read, Update, Delete)
- Cart operations and order checkout
- Token-based authentication with JWT
- Input validation and error handling

◈ Database (MongoDB + Mongoose)

MongoDB is used as the NoSQL database for storing application data, including users, books, and orders. The Mongoose ODM (Object Data Modeling) library is used for schema definition and database operations. Collections include:

- users – storing user credentials and profile info

- books – storing book details, genre, and status
- carts – managing items added to cart by each user
- orders – storing checkout and purchase information

◈ Authentication & Security

- JWT (JSON Web Tokens) is used for secure user authentication.
- Passwords are hashed using bcrypt before storage.
- Role-based access control (if needed) can be extended for user/admin separation.
- Environment variables and CORS policies are implemented for security.

◈ API Communication Flow

1. User performs an action (e.g., login, add book) via the frontend.
2. Frontend sends a request to the backend API.
3. Backend processes the request and interacts with MongoDB.
4. The result is returned as a JSON response to the frontend.
5. Frontend updates the UI based on the API response.

SETUP INSTRUCTIONS

This guide walks you through setting up the **BookNest** project locally using **Node.js**, **Express.js**, **Tailwind CSS**, **MongoDB**, and **Mongoose**.

◈ 1. Prerequisites – Install These First

Make sure the following tools are installed:

Tool	Install Command / URL
Node.js	Download Node.js
MongoDB	Download MongoDB or use MongoDB Atlas
Git	Download Git

🔷 2. Setup Backend (Node + Express + Mongoose)

1.cd server

2.npm init -y

3.npm install express mongoose dotenv cors jsonwebtoken bcryptjs

Create a .env file in the /server folder:

1.PORT=5000

2.MONGO_URI=your_mongodb_connection_string

3.JWT_SECRET=your_jwt_secret

To run the backend server:

node server.js

Or if you use nodemon (optional for auto-restart):

npm install -g nodemon

nodemon server.js

🔷 3. Setup Frontend (React + Tailwind CSS)

1.cd ../client

2.npx create-react-app .

Install Tailwind CSS:

1.npm install -D tailwindcss postcss autoprefixer

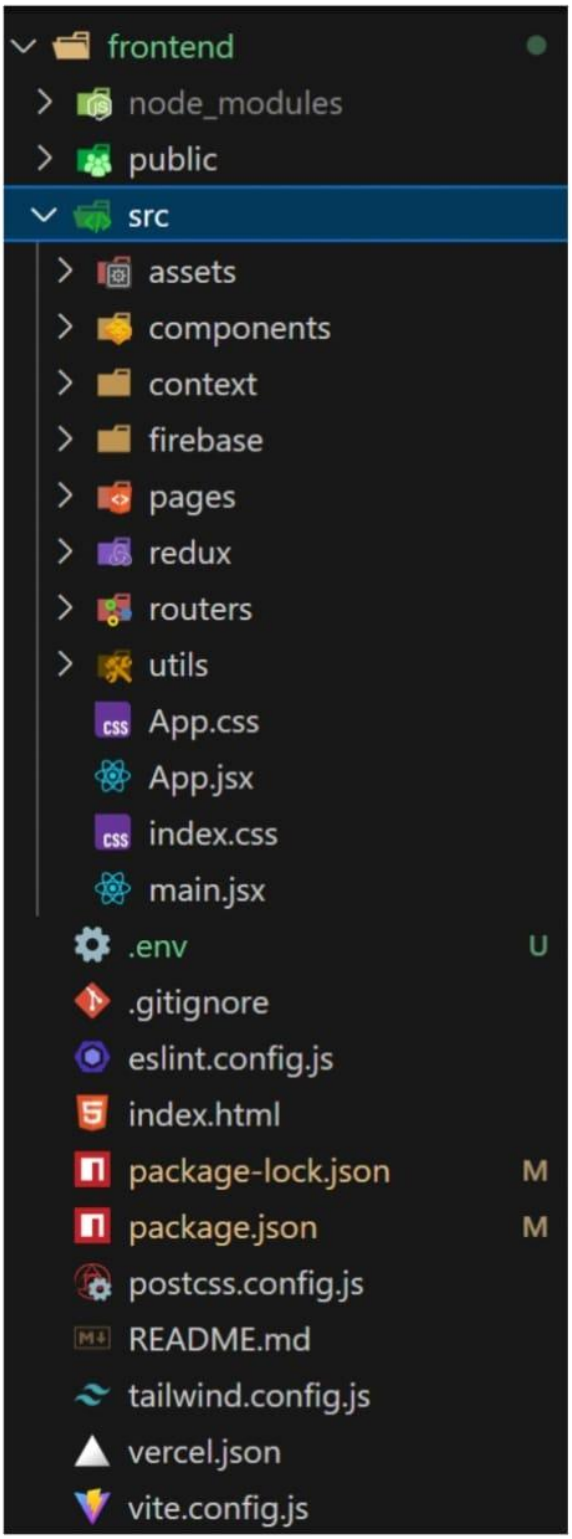
2.npx tailwindcss init -p

To run the React frontend:

1.npm start

This will start the app at: http://localhost:3000

For the Frontend Files Structure:



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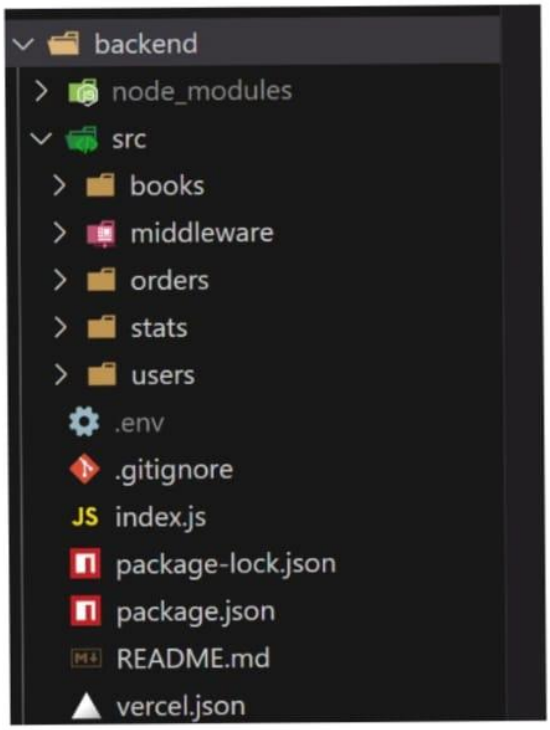
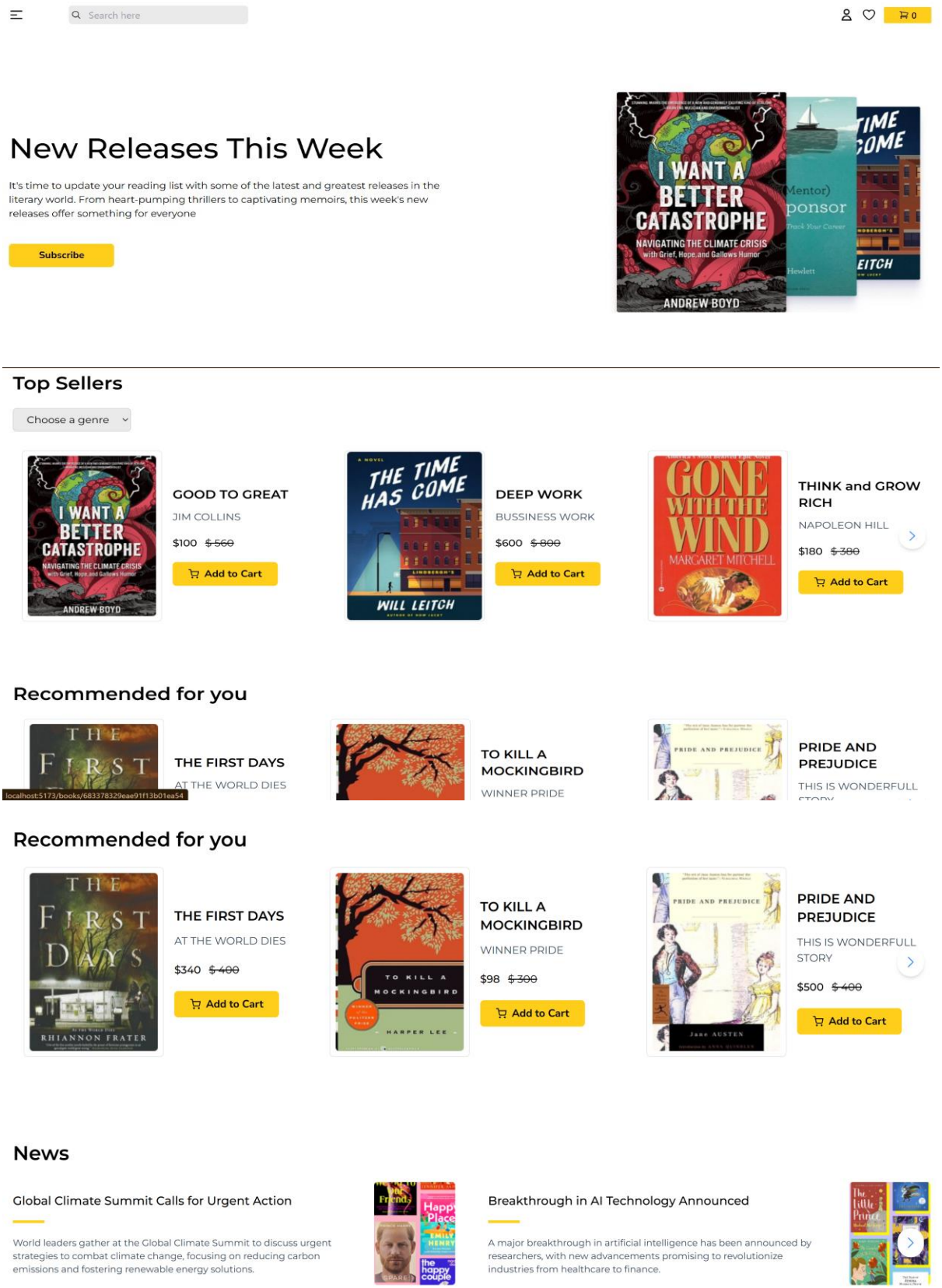


API DOCUMENTATION

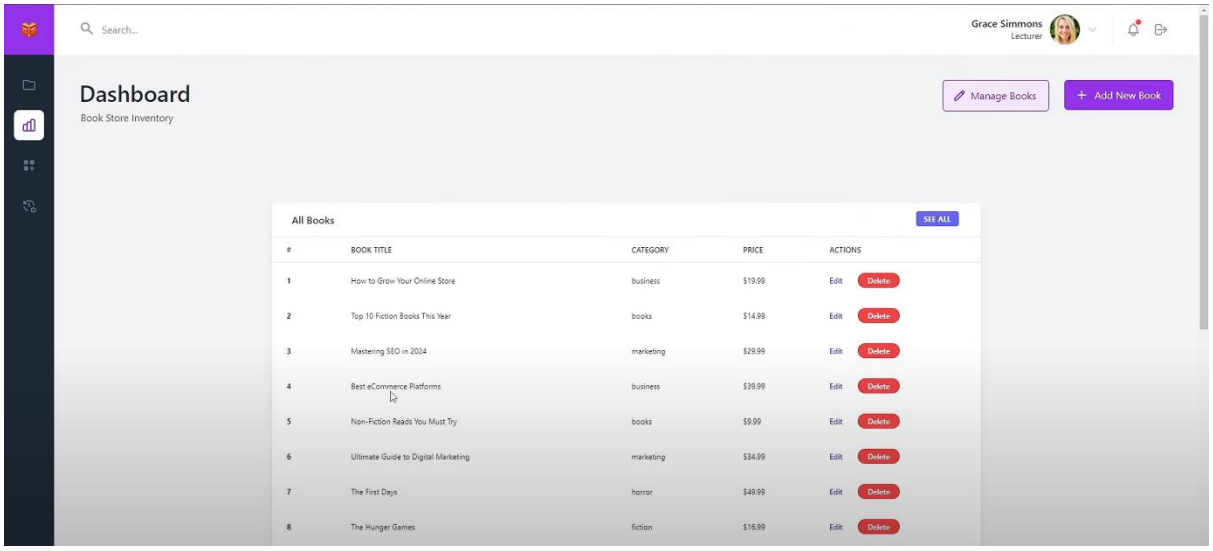
Method	Endpoint	Description
POST	/api/auth/signup	Register user
POST	/api/auth/login	Login user
GET	/api/books	Get all books
POST	/api/books	Add new book
PUT	/api/books/:id	Update book
DELETE	/api/books/:id	Delete book
POST	/api/cart	Add to cart
POST	/api/checkout	Checkout and purchase

USER INTERFACE

USER VIEW: -



ADMIN VIEW: -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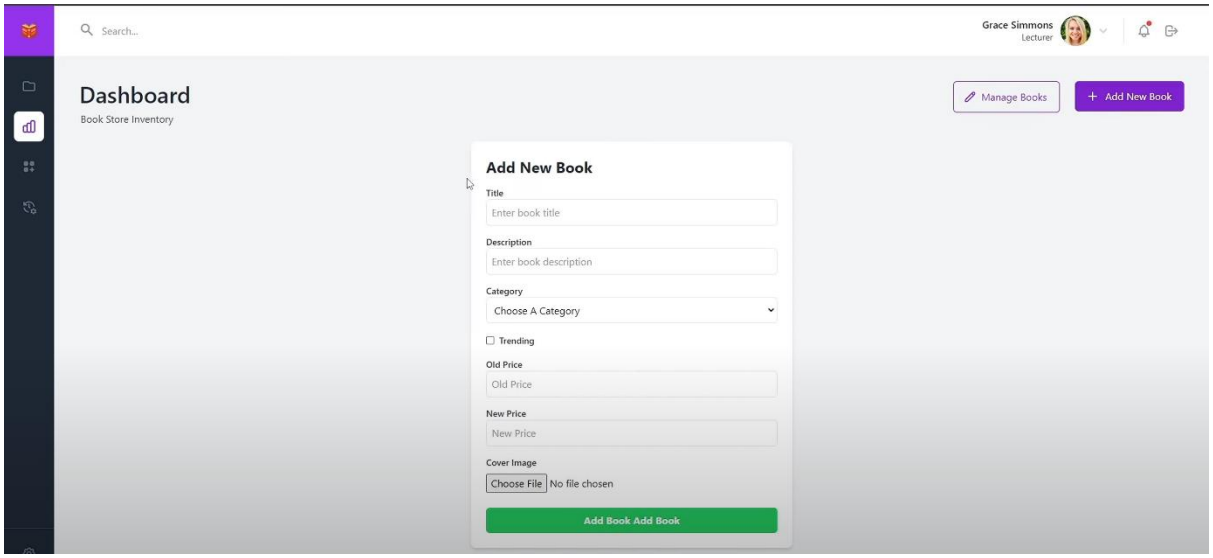
8 The Hunger Games fiction $16.99 Edit Delete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New Price
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Add Book Add Book

TESTING

Testing is a crucial phase of the development process to ensure the functionality, performance, and reliability of the FreelanceFinder platform. Both manual and automated testing methods were employed to validate the frontend and backend components.

Manual Testing:

• Frontend:

Conducted using various user roles (freelancer, client, admin) to verify correct rendering of pages, input validation, and user interactions (login, project bidding, message exchange, etc.).

• Backend:

Used Postman to test all API endpoints with valid and invalid inputs to ensure proper request/response handling and error management.

• Responsiveness:

Manually tested the UI across different screen sizes (mobile, tablet, desktop) to ensure a consistent and responsive user experience.

Automated Testing (Planned / Partial):

- Frontend (React):
  Integration of Jest and React Testing Library was initiated to test components like forms, buttons, and API responses.
- Backend (Node.js+Express):
  Planned to integrate Mocha, Chai, and Supertest to automate endpoint testing and simulate various edge cases.

• Key Areas Tested:

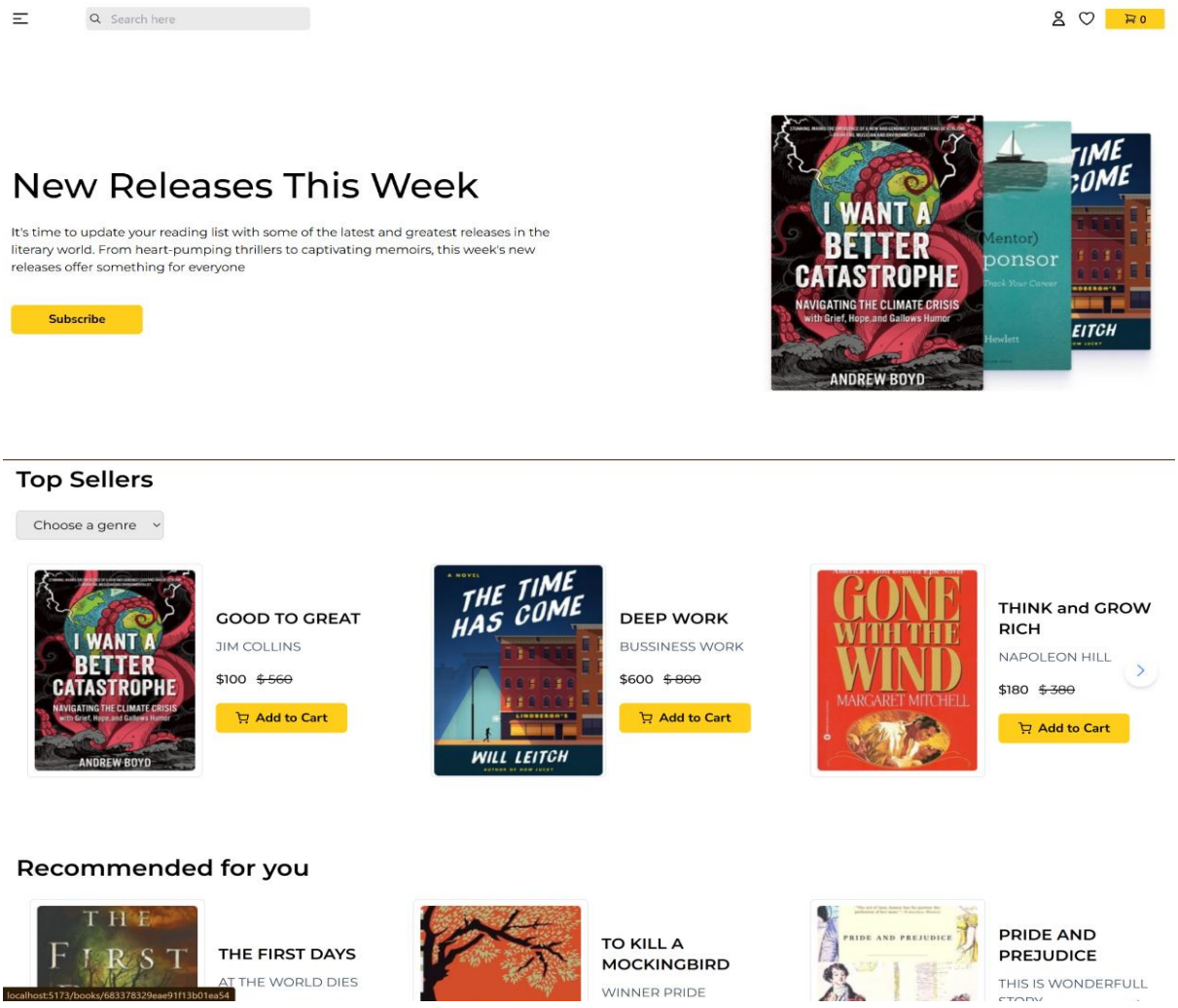
- User registration and login with proper validation
- Project creation, listing, and bidding flows
- Role-based access control for pages and APIs
- Chat and messaging logic
- Error and alert handling in both UI and server

RESULT

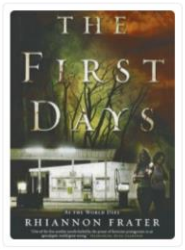
To demonstrate the functionality and user experience of BookNest, a working demo and key UI screenshots have been provided:

- Project Demo: Demo Video
- GitHub Link: GitHub Link

Sample Screenshots:



Recommended for you

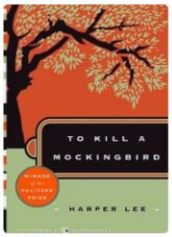


THE FIRST DAYS

AT THE WORLD DIES

$340 ~~$400~~

Add to Cart

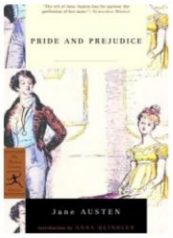


TO KILL A MOCKINGBIRD

WINNER PRIDE

$98 ~~$300~~

Add to Cart



PRIDE AND PREJUDICE

THIS IS WONDERFULL STORY

$500 ~~$400~~

Add to Cart

News

Global Climate Summit Calls for Urgent Action

World leaders gather at the Global Climate Summit to discuss urgent strategies to combat climate change, focusing on reducing carbon emissions and fostering renewable energy solutions.

Breakthrough in AI Technology Announced

A major breakthrough in artificial intelligence has been announced by researchers, with new advancements promising to revolutionize industries from healthcare to finance.

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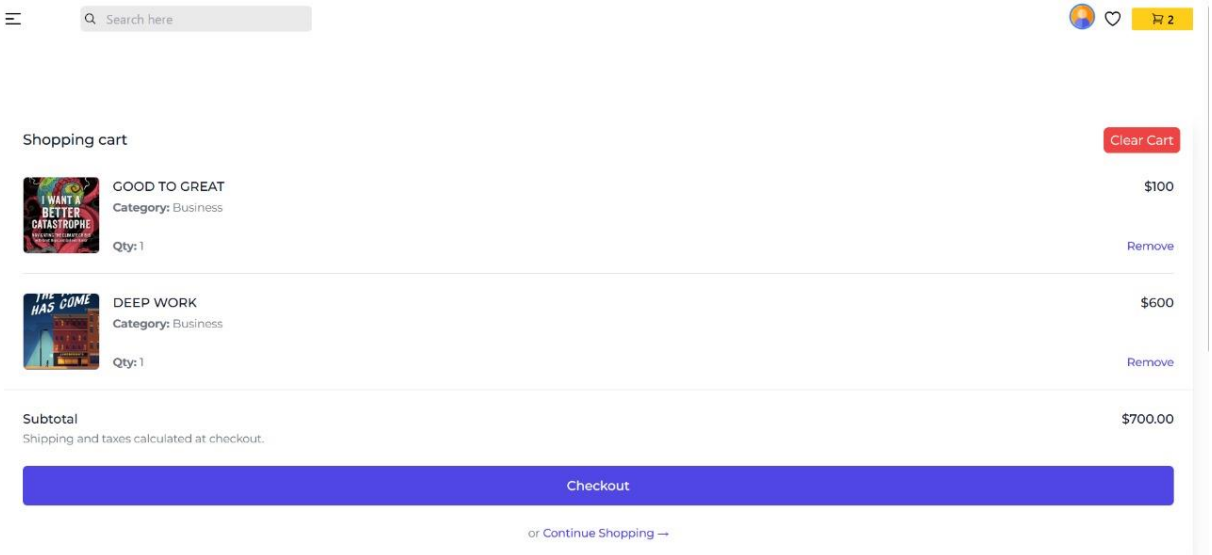

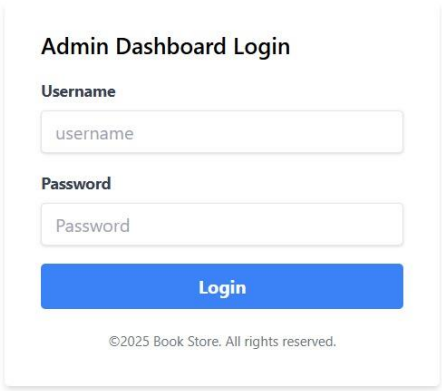
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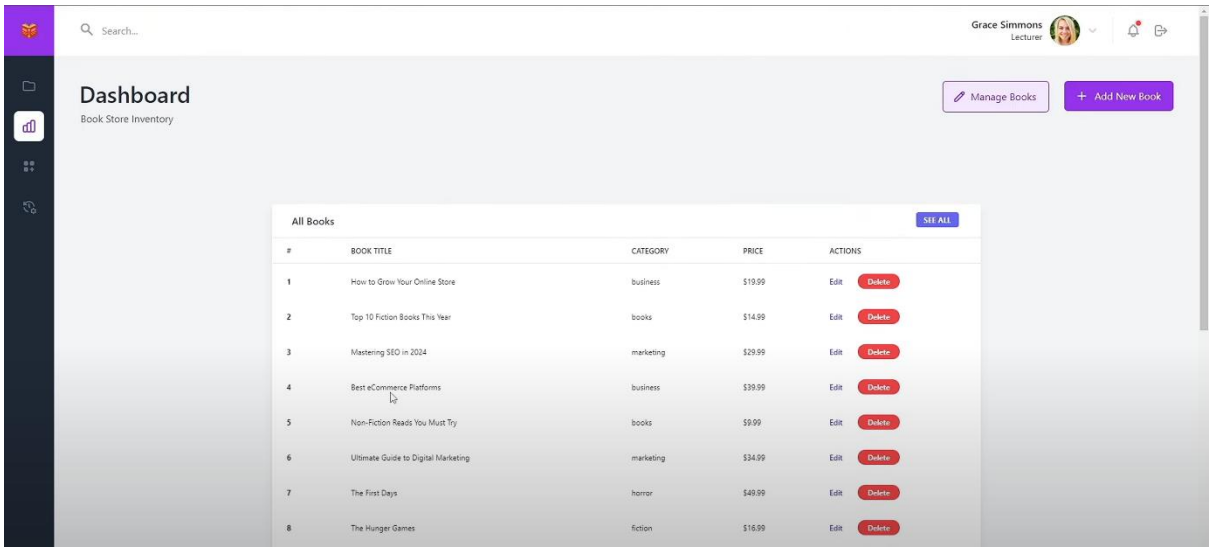
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Lecturer
Dashboard
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SEE ALL
BOOK TITLE CATEGORY PRICE ACTIONS
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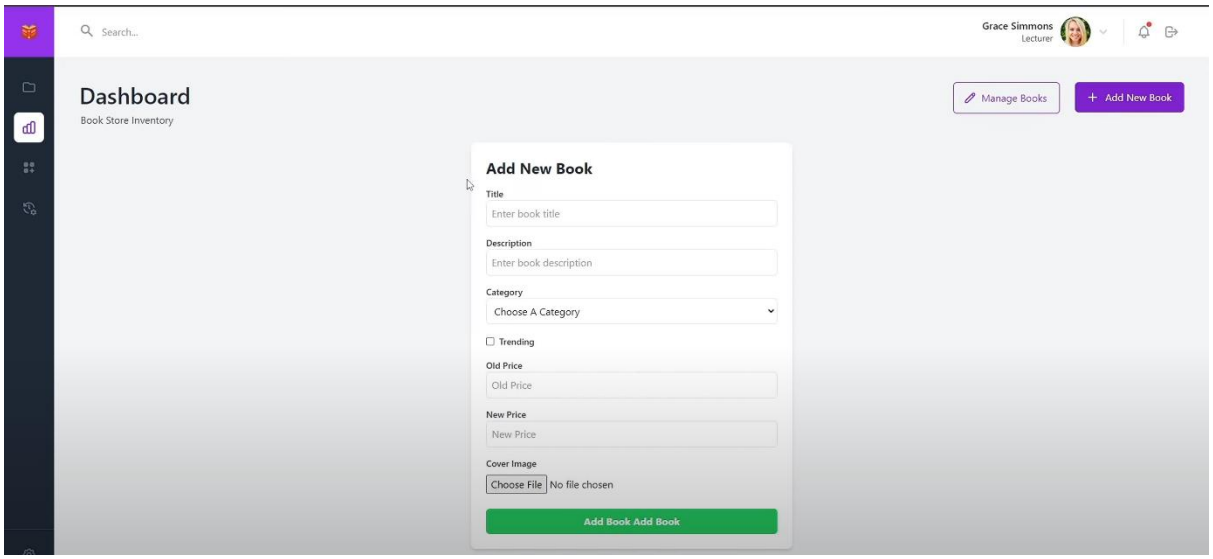
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Lecturer
Dashboard
Book Store Inventory
Manage Books
Add New Book
Add New Book
Title
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Category
Choose A Category
Trending
Old Price
Old Price
New Price
New Price
Cover Image
Choose File No file chosen
Add Book Add Book

FUTURE ENHANCEMENTS

1.Book Reviews & Ratings

Allow users to leave reviews and rate books, helping others make informed reading choices.

2.Advanced Search & Filters

Implement smart filters like author, publication year, language, and price range for better book discovery.

3.Mobile App Integration

Develop a mobile version of BookNest using React Native for on-the-go access.

4.Book Recommendations

Use machine learning to recommend books based on user reading history, ratings, and genres.

5.Social Sharing Features

Let users share their favourite books, reading lists, and collections with friends or on social media.

6.Role-Based Access Control

Implement roles such as Admin, Editor, and Reader with specific permissions and access levels.

7.User Analytics Dashboard

Provide users with a dashboard to view stats like total books read, average time per book, etc

8.Notifications & Remainders

Notify users about book suggestions, cart reminders, or reading goals via email or in-app alerts.

9.Backup & Sync

Enable automatic cloud backups and multi-device sync to preserve user data and settings.

CONCLUSION

The BookNest project successfully demonstrates the development of a full-stack web application tailored to meet the needs of modern readers and book enthusiasts. By leveraging the MERN (MongoDB, Express.js, React.js, Node.js) stack, the application provides users with a seamless experience to manage their personal book collections, track reading progress, and perform book-related operations in an intuitive digital environment.

Throughout the development process, key functionalities such as user authentication, book management, cart and checkout systems, and responsive design were implemented to ensure usability, security, and efficiency. The application structure supports scalability and can easily be extended with additional features like reviews, recommendations, and payment integration.

BookNest not only addresses common issues in book organization and accessibility but also sets a foundation for future improvements that can enhance the user experience even further. The project illustrates the practical application of web development skills and showcases the potential of building smart, user-centric solutions using modern technologies.