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**FACULTATEA DE AUTOMATICĂ ȘI CALCULATOARE  
DEPARTAMENT CALCULATOARE**

# **Project**

Object Oriented Programming

## **Book Review Site**

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**Group : 30425**



## **Contents:**

### **1. Introduction**

### **2. Analysis of User Requirements**

### **3. The Data Model and its Description**

### **4. Implementation Details**

### **5. Further Upgrades**



## **1. Introduction:**

This documentation provides an in-depth exploration of my Book Review site, a dedicated platform designed for the critical analysis and discussion of literary works. As a book review site, it offers users a curated space to engage with literature, providing both readers and authors with a comprehensive understanding of the reception and evaluation of various written works.

Throughout the following sections, this documentation will elucidate the key features and functionalities that define the website. It aims to serve as a comprehensive reference, offering users a clear and concise guide on navigating the platform, participating in discussions, and leveraging the tools available for effective book reviews.

As we delve into the intricacies of my Book Review Site it becomes apparent that this platform is more than a repository of reviews—it is a dynamic space that fosters thoughtful discourse and contributes to the broader literary landscape. Without further ado, let us embark on an analytical journey through the features and functionalities that make it a distinctive hub for literary critique.

## **2. Analysis of user requirements**

To ensure a streamlined and user-centric experience on the book review site, specific user requirements have been identified. Each user is mandated to possess a unique identity on the platform, necessitating a username, email address, password, and age during the registration process. These foundational components are crucial for creating a secure and personalized environment that allows users to engage with the site while maintaining distinct individual profiles.

User registration serves as a gateway for individuals to actively participate in core platform activities, namely, reviewing books and engaging in discussions through comments on existing reviews. The establishment of a robust user account system ensures traceability



and attribution of user contributions to their respective profiles, enhancing the overall integrity of the platform.

The book review functionality empowers users to express their insights and evaluations of literary works, fostering a diverse range of perspectives on each book. Complementarily, the commenting feature encourages dynamic exchanges of ideas, creating a communal space where users can actively participate in meaningful conversations, offer feedback, and contribute to the collaborative nature of the site.

This analysis underscores the importance of user-centric design, highlighting the necessity for a straightforward and secure registration process. By incorporating features that enable users to actively participate in the site's core activities—book reviewing and collaborative discussions—the platform aims to provide an enriching and purposeful environment for individuals passionate about literature.

### **3. The Data model and it's description**

The data model of the book review site is structured around several key entities, each represented by a corresponding table. This relational schema is designed to efficiently organize and manage the diverse information integral to the platform's functionality.

#### **User Table:**

- Holds essential user information such as user ID, username, email, password, and age.
- Serves as the foundation for user authentication and profile management.

#### **Role Table:**

- Defines the roles associated with users, such as "USER" or "ADMIN."
- Establishes permissions and access levels for different user categories.

#### **Book Table:**

- Stores details about individual books, including book ID, title, description, and publisher ID.
- Forms the core dataset for book-related activities on the platform.



**Author Table:**

- Contains information about book authors, linking to the book table through a many to many relationship through the book\_authors table.
- Enables the association of books with their respective authors.

**Genres Table:**

- Lists various literary genres that can be attributed to books through the book\_genres table.
- Allows for the categorization and classification of books based on their genre.

**Review Table:**

- Captures user reviews for specific books, connecting to the user and book tables.
- Includes attributes such as review ID, user ID, book ID, and the review text and date.

**Comment Table:**

- Stores user comments on reviews, linking to the user, review.
- Facilitates interactive discussions and feedback on book reviews.

**Publisher Table:**

- Contains information about book publishers, including publisher ID and name.

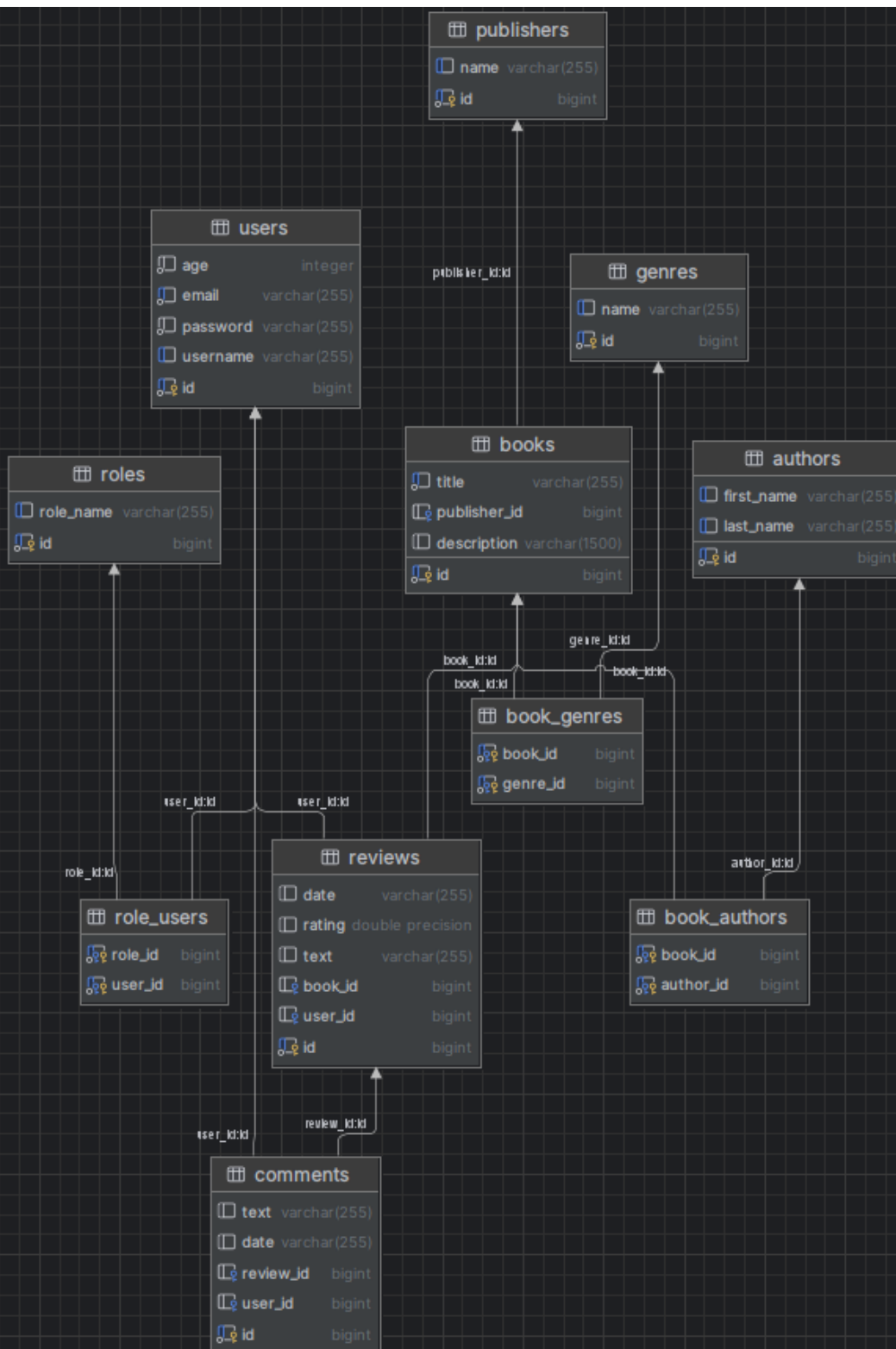
Establishes connections with the book table to associate publishers with specific books.



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This relational structure allows for efficient data retrieval and maintenance, ensuring a coherent and interconnected representation of the book review site's information. Relationships between tables are established through foreign keys, enabling seamless navigation and retrieval of relevant data for various platform functionalities, such as user authentication, book management, and interactive discussions.

## **Used Technologies**

### **Data base**

PostgreSQL, an open-source relational database management system, provides a versatile and extensible platform for handling complex data structures. Its support for advanced data types, indexing mechanisms, and transaction control made it an ideal choice for the intricate relationships inherent in the book review site's data model.

The utilization of PostgreSQL allowed for the seamless implementation of the relational schema comprising tables such as User, Role, Book, Author, Genres, Review, Comment, and Publisher. The robust support for foreign key constraints in PostgreSQL facilitated the establishment of meaningful connections between tables, ensuring data integrity and efficient retrieval.

Additionally, PostgreSQL's support for advanced indexing mechanisms, including B-trees and Hash indexes, contributed to optimized query performance. This was particularly crucial in scenarios where the system needed to retrieve data for specific users, books, or genres promptly. The extensible nature of PostgreSQL also allowed for the incorporation of custom functions and stored procedures, enhancing the overall functionality of the database.

Furthermore, PostgreSQL's commitment to ACID (Atomicity, Consistency, Isolation, Durability) compliance ensured the reliability of the database, vital for maintaining data consistency and integrity in the dynamic environment of a book review site.

The utilization of PostgreSQL in the project not only facilitated efficient data management but also provided a foundation for potential scalability and future enhancements. Its active community support and continuous development further



solidified the decision to leverage PostgreSQL as the database management system, contributing to the overall robustness and performance of the book review site.

## 4. Implementation Details

### a. Used technologies:

#### Java Spring Boot

In the development of the book review site, Java Spring Boot was employed as the core framework for building the backend infrastructure. Leveraging the capabilities of Spring Boot provided a structured and efficient approach to developing a robust web application.

#### 1. RESTful API Development:

Spring Boot facilitated the creation of a RESTful API architecture, enabling seamless communication between the frontend and backend components of the application. RESTful endpoints were defined to handle various operations such as user authentication, book retrieval, review submission, and comment interactions.

```
@PostMapping("/login")
public ResponseEntity<?> login(@RequestBody UserRequest userRequest) {
    String username = userRequest.getUsername();
    String password = userRequest.getPassword();

    if (userService.authenticateUser(username, password)) {
        // Generate and return a response indicating successful login
        return ResponseEntity.ok(body: "Login successful");
    } else {
        return ResponseEntity.badRequest().body("Invalid credentials");
    }
}
```

#### 2. Dependency Injection and Inversion of Control (IoC):

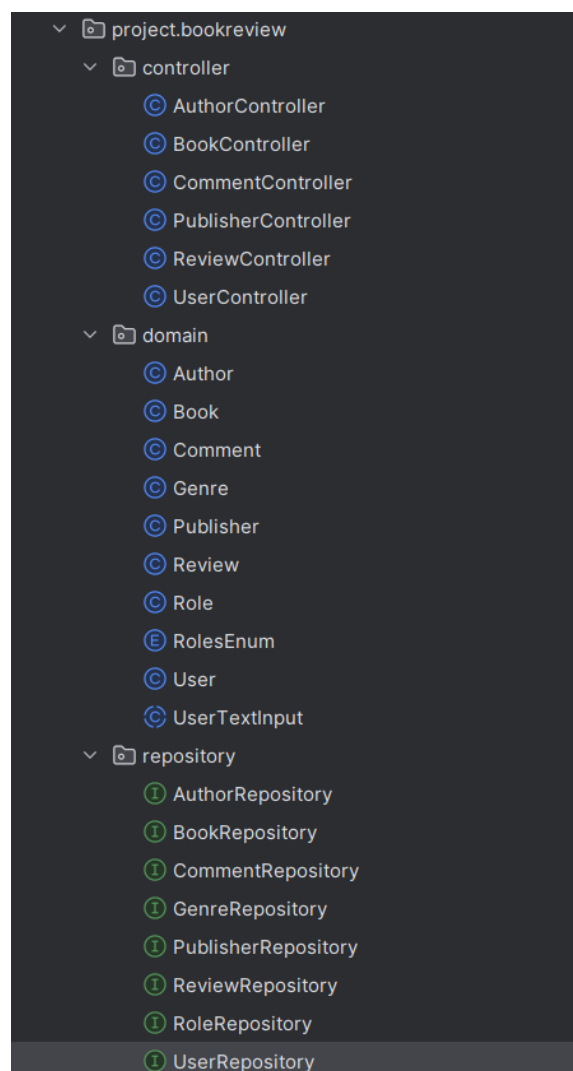
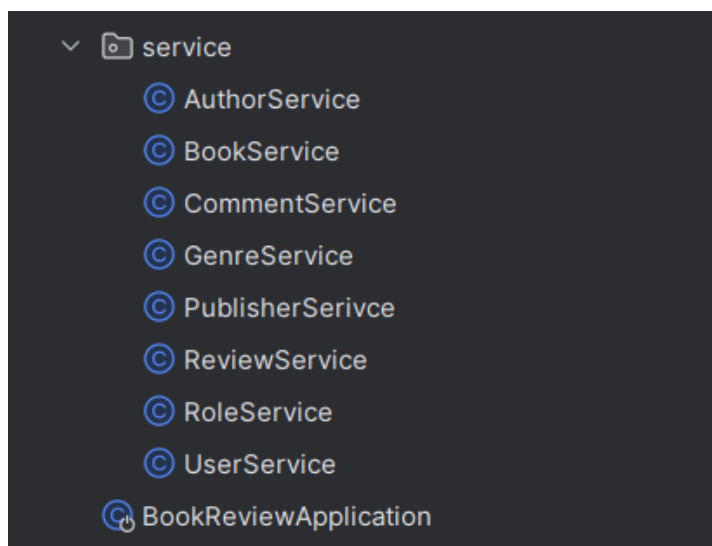




Spring Boot's dependency injection and IoC containers simplified the management of components within the application. This approach enhanced modularity, making it easier to maintain and test individual components. Dependencies were injected into classes, reducing tight coupling and promoting code readability. For example, Spring Web, PostgreSQL driver, SpringJPA and Lombok.

### 3. MVC Architecture:

The Model-View-Controller (MVC) architectural pattern provided by Spring Boot facilitated the organization of code into modular components. Controllers were responsible for handling incoming requests, Services managed the business logic, and Repositories interfaced with the database. This separation of concerns promoted code clarity and maintainability.





#### 4. Data Access with Spring Data JPA:

Spring Boot seamlessly integrated with Spring Data JPA to simplify data access and persistence. Entities representing database tables were defined as Java objects, and repositories provided a high-level abstraction for performing database operations. This abstraction reduced boilerplate code and enhanced the readability of data access logic.

```
3 usages
7  @Repository
8  public interface UserRepository extends JpaRepository<User, Long> {
9
10     2 usages
11     User findByUsername(String username);
12     1 usage
13     User findByEmail(String email);
14 }
```

#### b. Functional description of the modules:

##### 1. Domain:

The domain represents the core business entities and logic of the application. It consists of POJOs (Plain Old Java Objects) or entity classes that model the essential components of the system, such as User, Book, Review, etc. The domain objects encapsulate the state and behavior relevant to the business domain.



```
17 usages
@Getter
@Setter
@AllArgsConstructor
@NoArgsConstructor
@Entity
@Table(name = "reviews")
public class Review extends UserTextInput{

    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    private Long id;

    @ManyToOne
    @JoinColumn(name = "user_id")
    private User user;

    @ManyToOne
    @JoinColumn(name = "book_id")
    private Book book;

    private Double rating;

    private String text;

    private String date;

}
```

## 2. Repository:

Repositories, often created using Spring Data JPA, manage the interaction between the application and the database. They provide a high-level abstraction for performing CRUD (Create, Read, Update, Delete) operations on the database entities defined in the domain. Repositories extend the `JpaRepository` interface and handle data access and persistence logic.



```

3 usages
@Repository
public interface ReviewRepository extends JpaRepository<Review, Long> {

    1 usage
    List<Review> findByBook_Id(Long id);
}

```

### 3. Service:

Services contain the business logic of the application. They orchestrate the flow of data and operations between the controllers and the repositories. Services encapsulate complex business rules, transaction management, and other application-specific logic. They promote the separation of concerns by isolating business logic from the controllers, fostering modularity and maintainability.

```

1 usage
public Review updateReview(Long reviewId, Review updatedReview) {

    return reviewRepository.findById(reviewId)
        .map(existingUser -> {
            existingUser.setText(updatedReview.getText());
            existingUser.setRating(updatedReview.getRating());

            return reviewRepository.save(existingUser);
        })
        .orElse(other: null); // Handle not found scenario
}

1 usage
@Transactional
public void deleteReview(Long reviewId) {
    Optional<Review> optionalReview = reviewRepository.findById(reviewId);
    if (optionalReview.isPresent()) {

        List<Comment> comments = commentRepository.findByReview_Id(reviewId);
        for (Comment comment : comments) {
            commentRepository.deleteById(comment.getId());
        }
        // delete user
        reviewRepository.deleteById(reviewId);
    }
}

```



#### 4. Controller:

Controllers handle the incoming HTTP requests, interact with the services to process the requests, and return appropriate HTTP responses. They serve as the entry point for external communication with the application. Controllers are responsible for routing requests to the appropriate service methods, handling input validation, and orchestrating the overall flow of the application. They play a crucial role in implementing the web layer of the application, facilitating the interaction between the user interface and the backend services.

```
@PutMapping("/{reviewId}")
public ResponseEntity<Review> updateReview(@PathVariable Long reviewId, @RequestBody Review updatedReview) {
    Review updated = reviewService.updateReview(reviewId, updatedReview);

    if (updated != null) {
        return ResponseEntity.ok(updated);
    } else {
        return ResponseEntity.badRequest().body(null);
    }
}

>DeleteMapping("/{reviewID}")
public ResponseEntity<String> deleteReview(@PathVariable Long reviewID) {
    try {
        reviewService.deleteReview(reviewID);
        return ResponseEntity.ok(body: "Review deleted successfully");
    } catch (Exception e) {
        return ResponseEntity.badRequest().body(e.getMessage());
    }
}
```

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**Login Page:** The login page allows registered users to enter their credentials for secure access to the book review site. It employs robust security measures and, upon successful authentication, grants users personalized access to the platform's features.

**Login**

Username:

Password:

Login

Create Account

[Continue without an account](#)

**Create Account Page:** The create account page enables users to register by providing a unique username, valid email, secure password, and age. Validation checks ensure accurate data entry, and upon submission, the user gains a distinct identity on the platform, facilitating active participation in the community-driven exploration of literary works.



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## Create Account

Username:

Email:

Age:

Password:

Confirm Password:

Create Account

Back to login

[Continue without an account](#)

**The AppBar:** The AppBar allows the user to navigate between the site's views.

HOME   ADD BOOK   BOOK LIST

SIGN UP   LOGIN



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If the user is logged in, he can access his profile or log out.

PROFILE LOGOUT

**The Home Page:** Displays hardcoded information for now.

## Book Review Site

Welcome to our book review platform!

### Upcoming Releases

#### The Art of Time Travel

Author: Kate Aron

A fascinating exploration of time travel theories and their impact on culture.

#### Beyond the Stars

Author: Alex Celestial

An intergalactic adventure that takes readers on a journey through distant galaxies.

### About Us

Welcome to Book Review Site, your go-to platform for insightful book reviews and literary discussions. Our mission is to connect book enthusiasts, share diverse perspectives, and inspire a love for reading.

At Book Review Site, we believe in the power of storytelling to broaden minds and foster empathy. Whether you're a seasoned reader or just starting your literary journey, you'll find a community of like-minded individuals who share your passion for the written word.

**The Add Book Form:** Lets users create books which are added into the database.



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Title:	<input type="text"/>	Author's First Name:	<input type="text"/>	Authors:	
Publisher:	<input type="text"/>	Author's Last Name:	<input type="text"/>	<input type="text" value="Author 1 first name last name"/>	<input type="text" value="Author 2 first name last name"/>
Description:	<input type="text" value="Write a brief description (maximum 1500 characters)"/>			<input type="button" value="Add Author"/>	
	Genre:	<input type="text"/>	<input type="button" value="Add Genre"/>	<input type="text" value="Genre 1"/>	<input type="text" value="Genre 2"/>
<input type="button" value="Add Book"/>					

**The Book List:** Shows all the books from the database or just the ones that want the user wants. Books can be sorted by Title and rating, ascendingly or not ascendingly, also can be filtered by Publishers and Authors, which are dinamically updated when a new one is added in the database. Every book has a page that can be accessed.

**Book List**

<input type="text" value="Search by name or author"/>			<input type="button" value="Search"/>	<input type="button" value="Reset"/>
Sort By: <input type="text" value="None"/>				
Filter By Publisher: <input checked="" type="checkbox"/> All <input type="checkbox"/> Humanitas <input type="checkbox"/> Scholastic <input type="checkbox"/> George Allen & Unwin <input type="checkbox"/> Charles Scribner's Sons <input type="checkbox"/> Penguin Books <input type="checkbox"/> Random House <input type="checkbox"/> HarperCollins <input type="checkbox"/> Knopf Doubleday <input type="checkbox"/> Hachette Book Group	<b>Harry Potter and the Sorcerer's Stone</b> Authors: Joanne Rowling Publisher: Scholastic Average Rating: 7.4 (2)	<b>Enemy Of My Enemy</b> Authors: Melissa Mayberry, Travis Casey Publisher: Humanitas Average Rating: 9.5 (1)	<b>The Great Gatsby</b> Authors: Francis Scott Key Fitzgerald Publisher: Charles Scribner's Sons Average Rating: 9.0 (2)	
Filter By Author: <input checked="" type="checkbox"/> All Authors <input type="checkbox"/> Francis Scott Key Fitzgerald <input type="checkbox"/> Stephen King <input type="checkbox"/> Douglas Adams <input type="checkbox"/> Aldous Huxley <input type="checkbox"/> Stieg Larsson <input type="checkbox"/> C.S. Lewis <input type="checkbox"/> Travis Casey <input type="checkbox"/> Melissa Mayberry <input type="checkbox"/> Joanne Rowling <input type="checkbox"/> John Ronald Reuel Tolkien	<b>The Hobbit</b> Authors: John Ronald Reuel Tolkien Publisher: George Allen & Unwin Average Rating: 8.6 (2)	<b>The Lord of the Rings</b> Authors: John Ronald Reuel Tolkien Publisher: George Allen & Unwin Average Rating: 7.2 (1)	<b>The Hitchhiker's Guide to the Galaxy</b> Authors: Douglas Adams Publisher: Random House Average Rating: 8.4 (2)	
	<b>The Chronicles of Narnia</b> Authors: C.S. Lewis	<b>The Shining</b> Authors: Stephen King	<b>Brave New World</b> Authors: Aldous Huxley	Activate Windows Go to Settings to activate Windows.



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**The Individual Book Page :** Presents the book details to the user, also allows the user to review the book and even comment on all the reviews. If the logged in user has admin privileges he can delete the book and could edit the book in the future.

[Back to Books](#)

### The Great Gatsby

Author: Francis Scott Key Fitzgerald

Publisher: Charles Scribner's Sons

Genres: Short Stories, Fiction

Description: The Great Gatsby, F. Scott Fitzgerald's third book, stands as the supreme achievement of his career. This exemplary novel of the Jazz Age has been acclaimed by generations of readers. The story of the fabulously wealthy Jay Gatsby and his love for the beautiful Daisy Buchanan, of lavish parties on Long Island at a time when The New York Times noted "gin was the national drink and sex the national obsession," it is an exquisitely crafted tale of America in the 1920s. The Great Gatsby is one of the great classics of twentieth-century literature.

**Reviews:**

User: Julien2429
Date: 10/05/2024

Rating: 9  
A must-read!  
[Show Comments](#)

[Edit Book\(soon\)](#)
[Delete Book](#)

**Add a Review:**

Rating:

Review:

[Submit Review](#)

User can even edit or delete their own reviews. The edit review form appears if the edit button is pressed on a review.

robot; Veet Voojagig, a former graduate student who is obsessed with the disappearance of all the ballpoint pens he bought over the years. Where are these pens? Why are we born? Why do we die? Why do we spend so much time between wearing digital watches? For all the answers stick your thumb to the stars. And don't forget to bring a towel!

**Reviews:**

User: cos
Date: 02/01/2024

Rating: 8  
Page-turner!  
[Hide Comments](#) [Edit Review](#) [Delete Review](#)

**Comments:**

- Read it a 2nd time, just wow! - 20/01/2024 by cos

Add a Comment:

[Submit Comment](#)

**Edit Review:**

Rating:

Review Text:

Page-turner!

[Cancel](#) [Save Changes](#)

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**The Profile Page:** Presents all of the user's details to him and allows him to update it's credentials or even delete the account. If he wants to edit the account an account editing form will automatically appear or if he wants to delete the account a confirmation pop up will appear.

## My Profile

[Edit Profile](#)[Delete Account](#)

Username: cos

E-mail: cox@gmail.com

Password: \*\*\*\*\*

[Show Password](#)

Age: 20

Roles: ADMIN, USER

## My Profile

[Delete Account](#)

Username

cos

E-mail

cox@gmail.com

Password

cos

Age

20

[Cancel](#)[Save Changes](#)



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Are you sure you want to delete your account?

**5. Further upgrades:**

The ability of an user to message another user, create a wishlist using the existing books and a read books list.

More details added to the entities.

Improve site security.