Book Store Project

Database Systems Fall 2025

Team Members

Name	ID	Role
Mohamed Atef	8660	Customer Management & Security
Eyad Mohamed	8744	Frontend Development
Abdelrahman Reda	8716	Backend: Books Management & Publisher Orders
Omar Adel	8746	Backend: Cart & Customer Order Management

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1 Introduction

This report documents the design, implementation, and feature set of the Online Bookstore System, developed as a comprehensive project for the Database Systems course. The system is architected to support two distinct user hierarchies: Administrators and Customers.

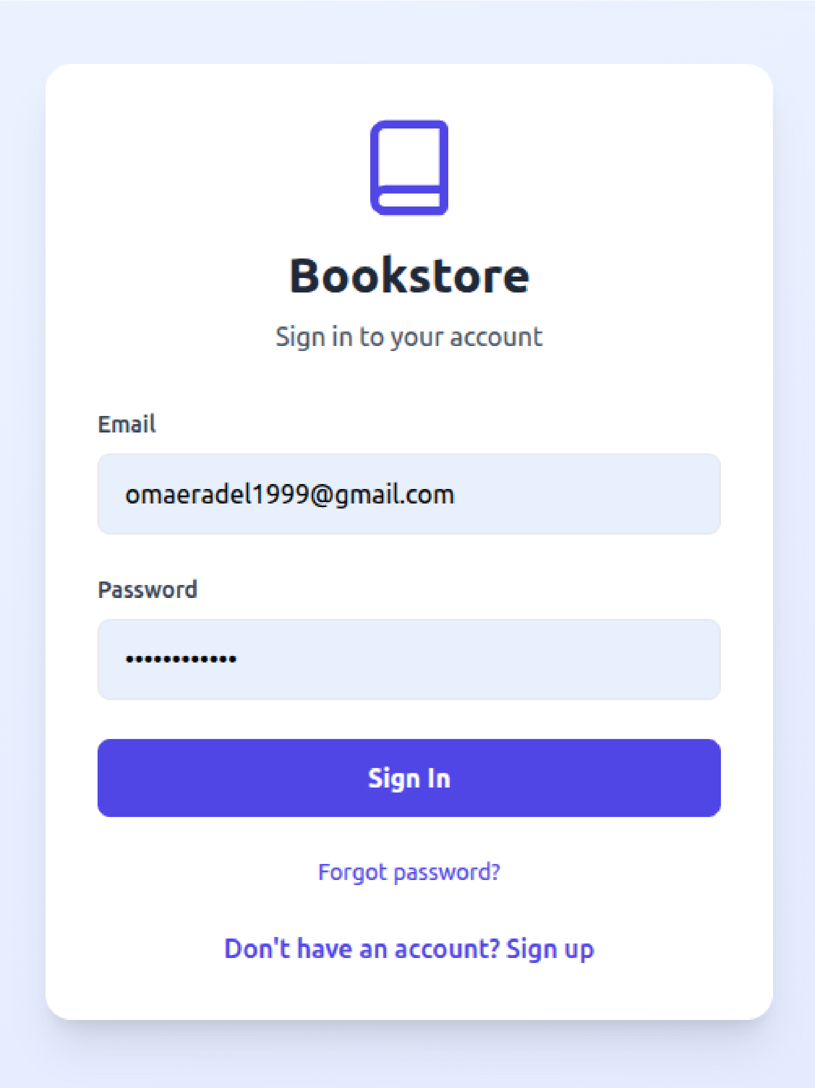
It manages core relational entities including Books, Publishers, Stock Inventory, Orders, Sales Transactions, and User Accounts. A key focus of the implementation was ensuring data integrity and automating business logic through the use of **Database Triggers, Stored Procedures, and Integrity Constraints**.

2 Feature Implementation & Logic Analysis

2.1 1. User Authentication & Security

Developer: Mohamed Atef (8660)

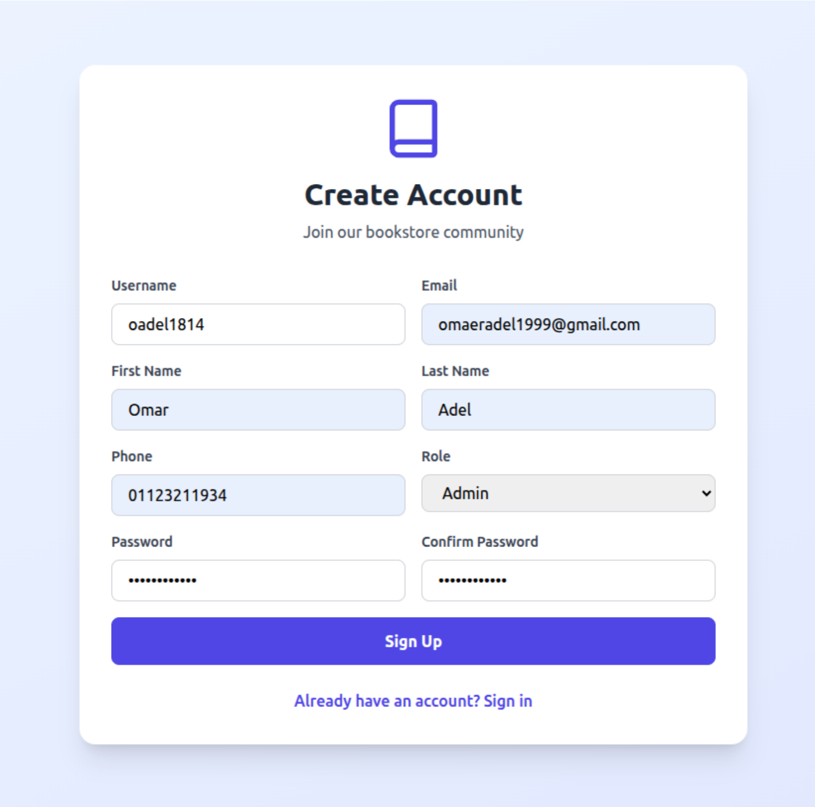
The system implements a secure authentication layer. Access is strictly role-based, ensuring Customers cannot access Admin dashboards.



Email: omaeradel1999@gmail.com

Password: ••••••••••••

Figure 1: User Login Interface



Create Account

Join our bookstore community

Username
oadel1814

Email
omaeradel1999@gmail.com

First Name
Omar

Last Name
Adel

Phone
01123211934

Role
Admin

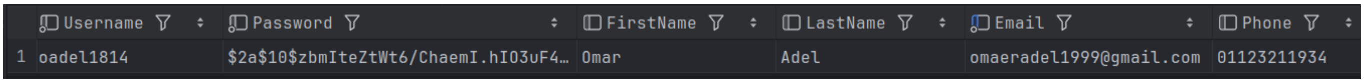
Password
••••••••••••

Confirm Password
••••••••••••

Figure 2: Customer Registration Form

Detailed Logic Description:

- **Registration Logic:** The system captures user data (Username, Email, Password, Address). Before insertion, it executes a check against the `Customer` table to ensure the `Email` and `Username` are unique.
- **Security:** Passwords are not stored in plain text; they are hashed before being committed to the database.
- **Session Management:** Upon successful login, a session token is generated containing the user's ID and Role, which persists across their browsing session.



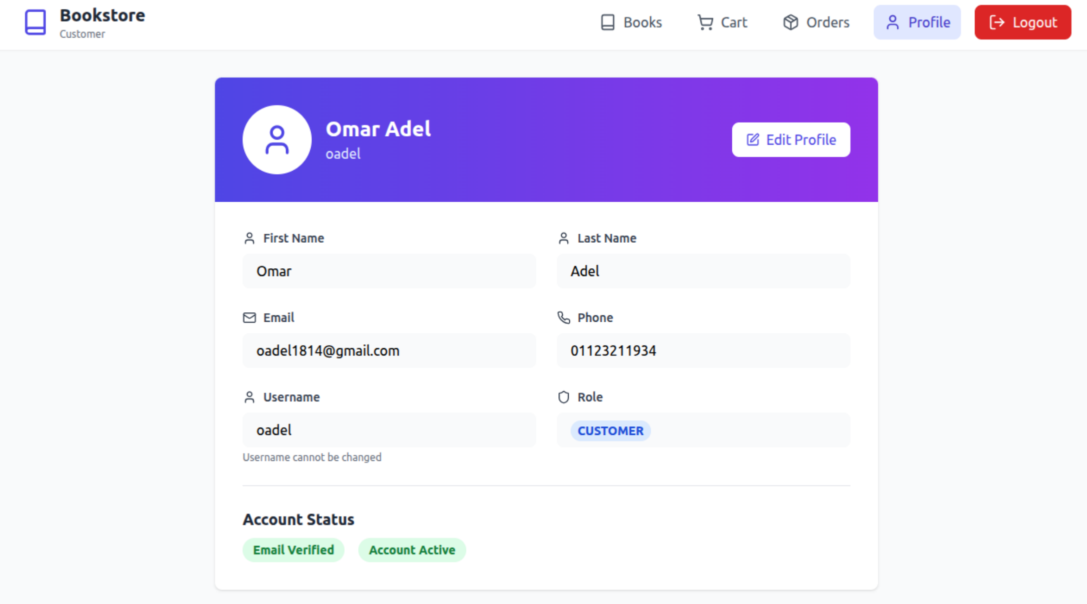
	Username	Password	FirstName	LastName	Email	Phone
1	oadel1814	$2a$10$zbmIteZtWt6/ChaemI.hIO3uF4…	Omar	Adel	omaeradel1999@gmail.com	01123211934

Figure 3: Database Verification: Customer Record Insertion

2.2 2. Customer Profile Management

Developer: Mohamed Atef (8660)

Users have full CRUD (Create, Read, Update, Delete) capabilities over their personal data, excluding their unique Username.

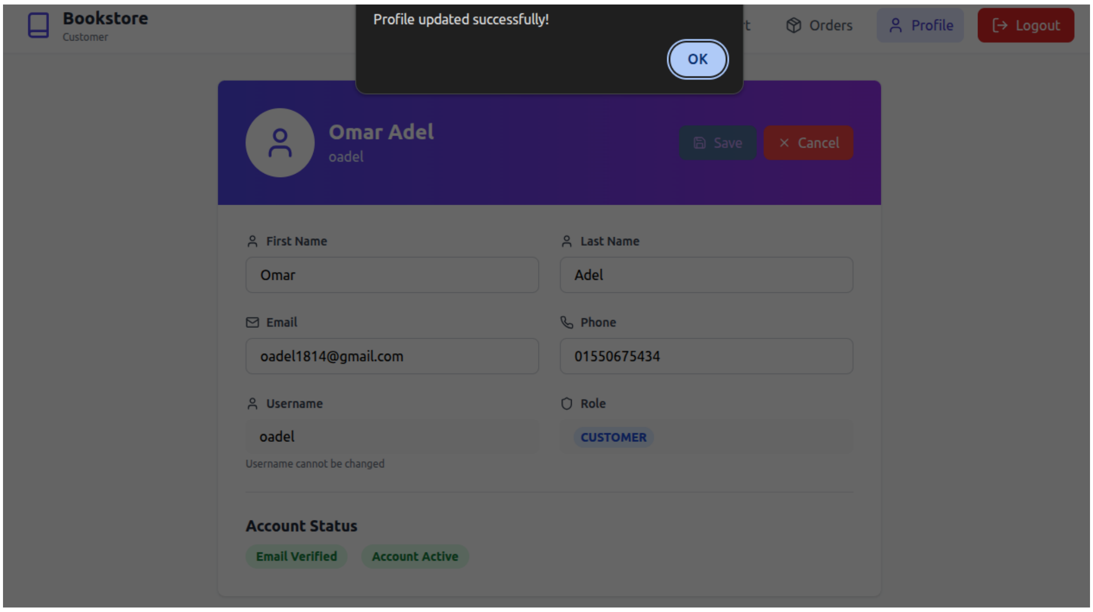


Omar Adel
oadel

First Name: Omar
Last Name: Adel
Email: oadel1814@gmail.com
Phone: 01123211934
Username: oadel
Username cannot be changed
Role: CUSTOMER

Account Status
Email Verified
Account Active

Figure 4: User Profile Overview



Profile updated successfully!

Omar Adel
oadel

First Name: Omar
Last Name: Adel
Email: oadel1814@gmail.com
Phone: 01550675434
Username: oadel
Username cannot be changed
Role: CUSTOMER

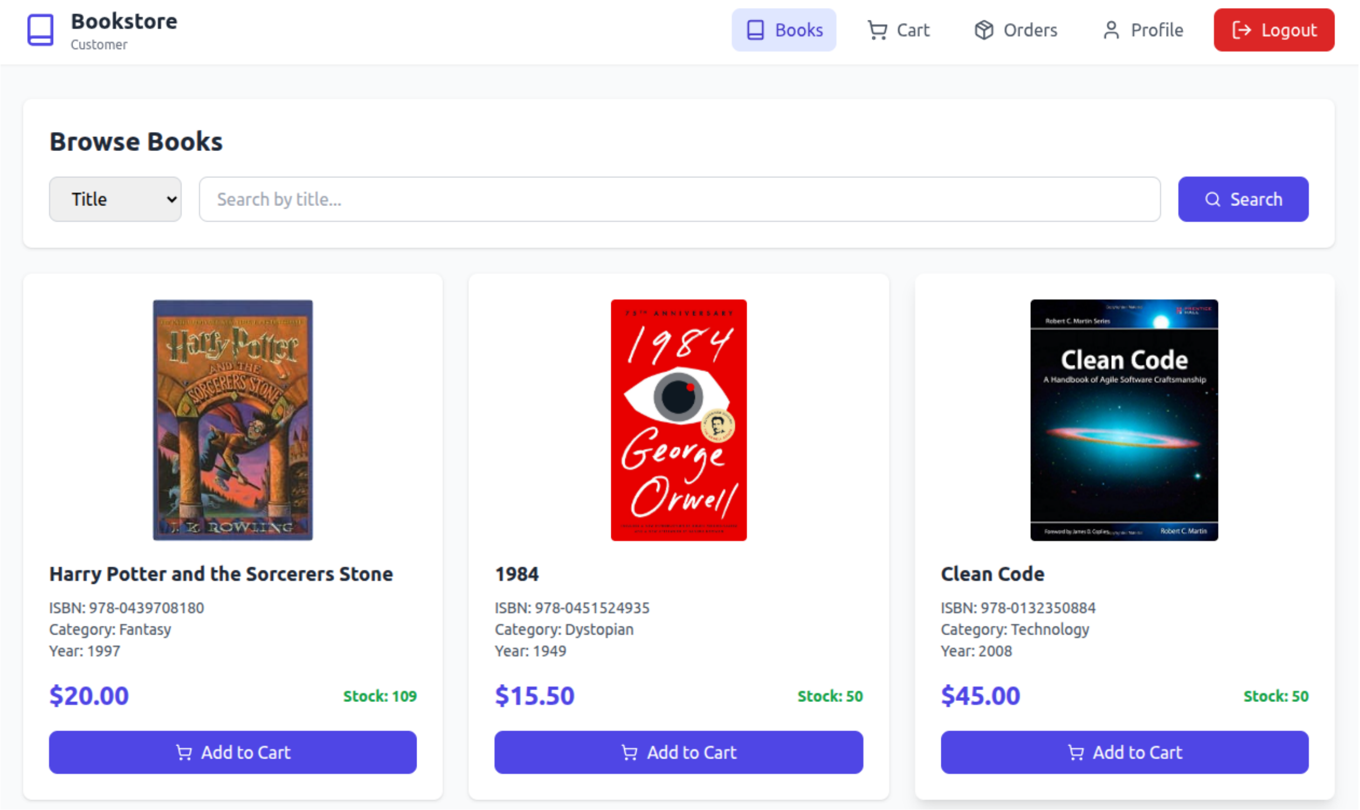
Account Status
Email Verified
Account Active

Figure 5: Edit Profile Interface

2.3 3. Book Search and Dynamic Browsing

Developer: Eyad Mohamed (8744)

The frontend provides a responsive interface for querying the database.



Bookstore
Customer

Books | Cart | Orders | Profile | Logout

Browse Books

Title ▾ | Search by title... | Search

Harry Potter and the Sorcerers Stone
ISBN: 978-0439708180
Category: Fantasy
Year: 1997
$20.00 Stock: 109
Add to Cart

1984
ISBN: 978-0451524935
Category: Dystopian
Year: 1949
$15.50 Stock: 50
Add to Cart

Clean Code
ISBN: 978-0132350884
Category: Technology
Year: 2008
$45.00 Stock: 50
Add to Cart

Figure 6: Book Search and Browsing Interface

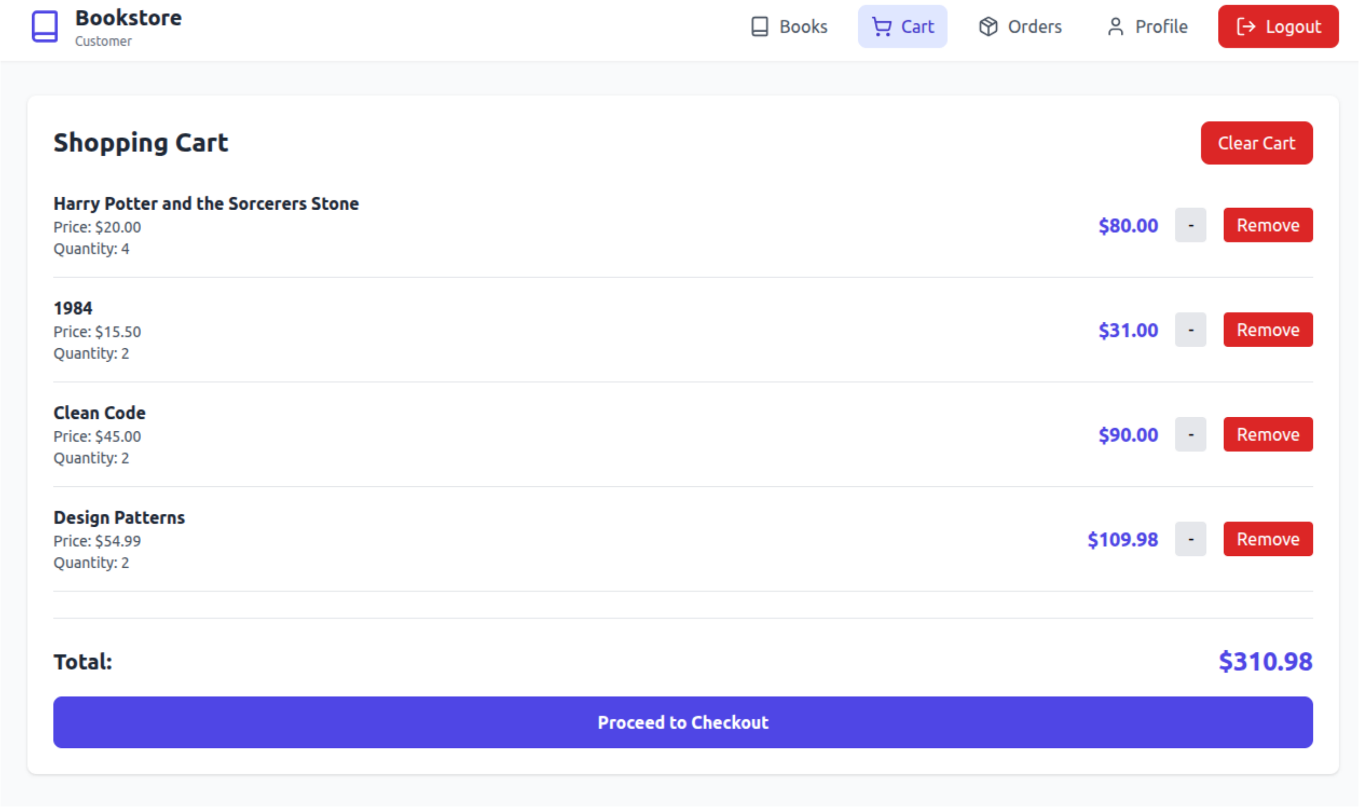
Detailed Logic Description:

- **Query Construction:** The search bar inputs are sanitized and converted into SQL `LIKE` queries (e.g., `SELECT * FROM Books WHERE Title LIKE '%query%'`).
- **Real-time Availability:** The interface binds directly to the `Stock_Quantity` column. If stock is 0, the "Add to Cart" button is disabled via frontend logic, reducing unnecessary server requests.

2.4 4. Shopping Cart & Order Management

Developer: Omar Adel (8746)

The shopping cart module manages the temporary state of selected items before the final transaction.



Shopping Cart

Harry Potter and the Sorcerers Stone
Price: $20.00
Quantity: 4
$80.00

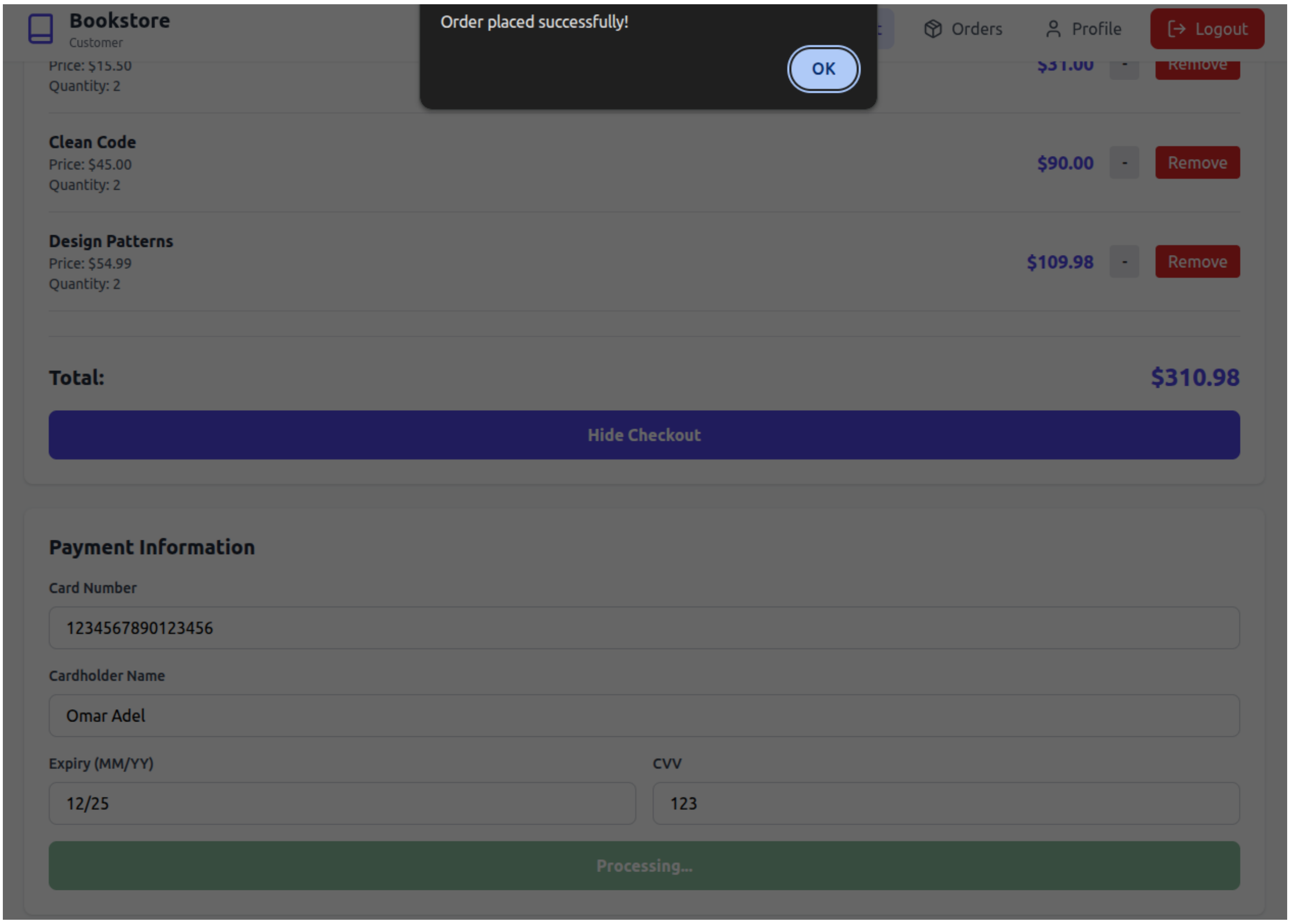
1984
Price: $15.50
Quantity: 2
$31.00

Clean Code
Price: $45.00
Quantity: 2
$90.00

Design Patterns
Price: $54.99
Quantity: 2
$109.98

Total: $310.98

Figure 7: Shopping Cart with Dynamic Total Calculation



Order placed successfully!

Price: $15.50
Quantity: 2
$31.00

Clean Code
Price: $45.00
Quantity: 2
$90.00

Design Patterns
Price: $54.99
Quantity: 2
$109.98

Total: $310.98

Payment Information

Card Number: 1234567890123456

Cardholder Name: Omar Adel

Expiry (MM/YY): 12/25

CVV: 123

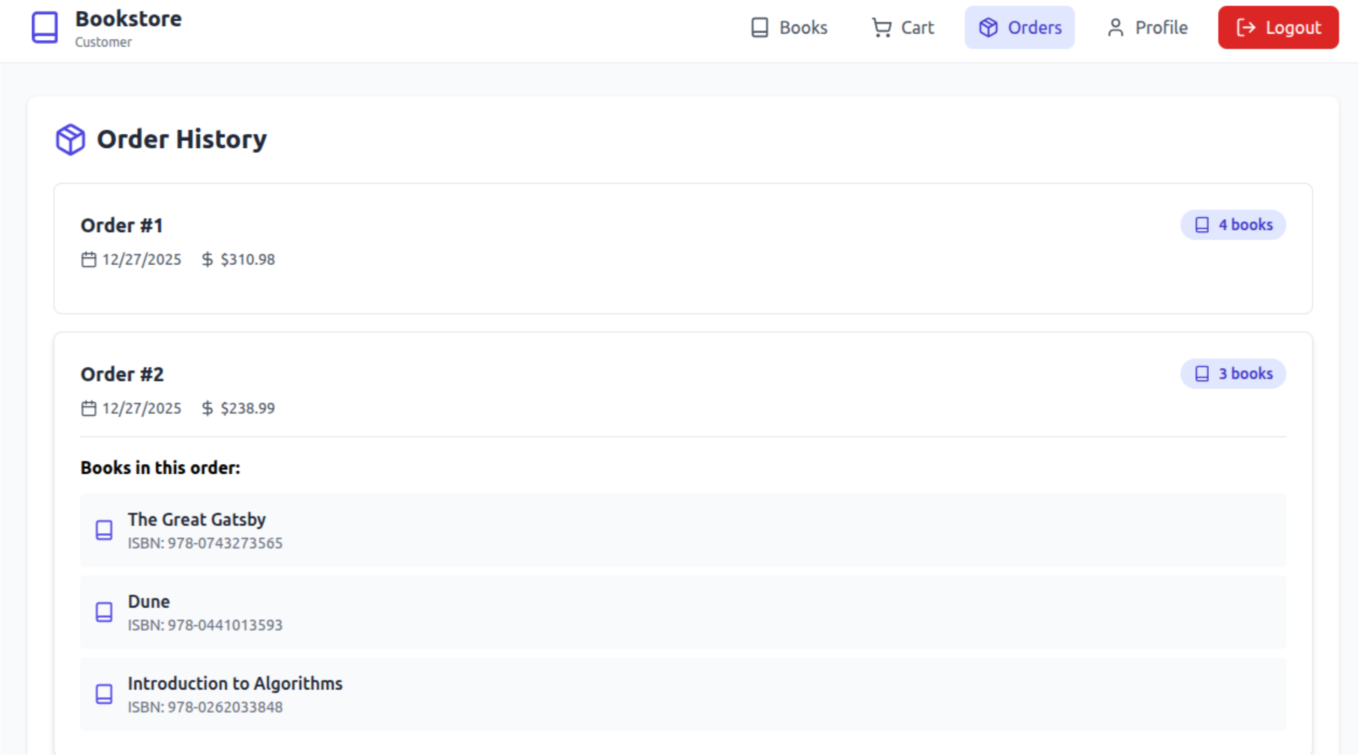
Figure 8: Checkout Payment Interface

Detailed Logic Description:

- **Transaction Atomicity (ACID):** The checkout process is wrapped in a database transaction. It performs two critical operations:
  1. Inserts records into the `Sales` table.
  2. Updates the `Books` table: `SET Stock = Stock - Qty`.
- **Constraint Enforcement:** A database `CHECK` constraint ensures `Stock_Quantity >= 0`. If a purchase attempts to buy more books than available, the database throws a violation, and the backend rolls back the entire transaction, ensuring no partial sales occur.

2.5 5. Order History Analysis

Developer: Omar Adel (8746)



Order History

Order #1
12/27/2025 $310.98
4 books

Order #2
12/27/2025 $238.99
3 books

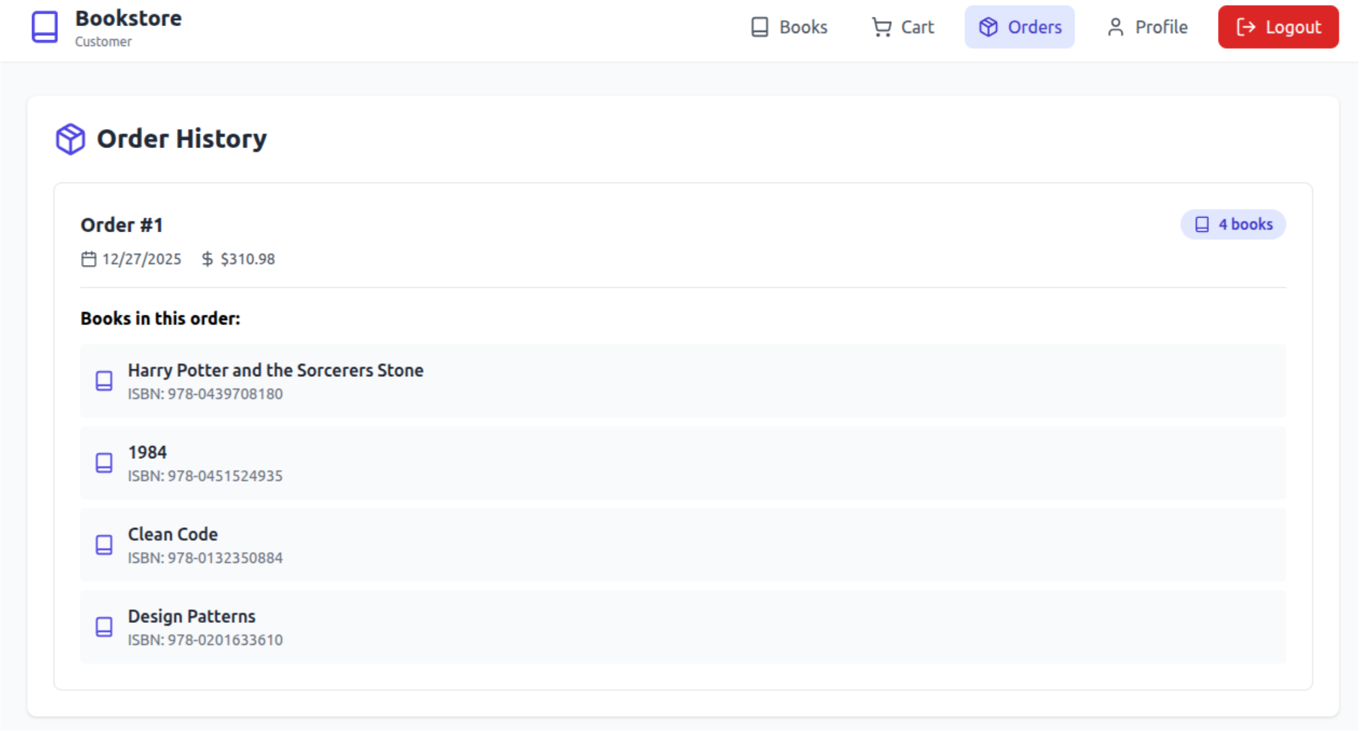
Books in this order:

The Great Gatsby
ISBN: 978-0743273565

Dune
ISBN: 978-0441013593

Introduction to Algorithms
ISBN: 978-0262033848

Figure 9: Customer Order History Summary



Order History

Order #1
12/27/2025 $310.98
4 books

Books in this order:

Harry Potter and the Sorcerers Stone
ISBN: 978-0439708180

1984
ISBN: 978-0451524935

Clean Code
ISBN: 978-0132350884

Design Patterns
ISBN: 978-0201633610

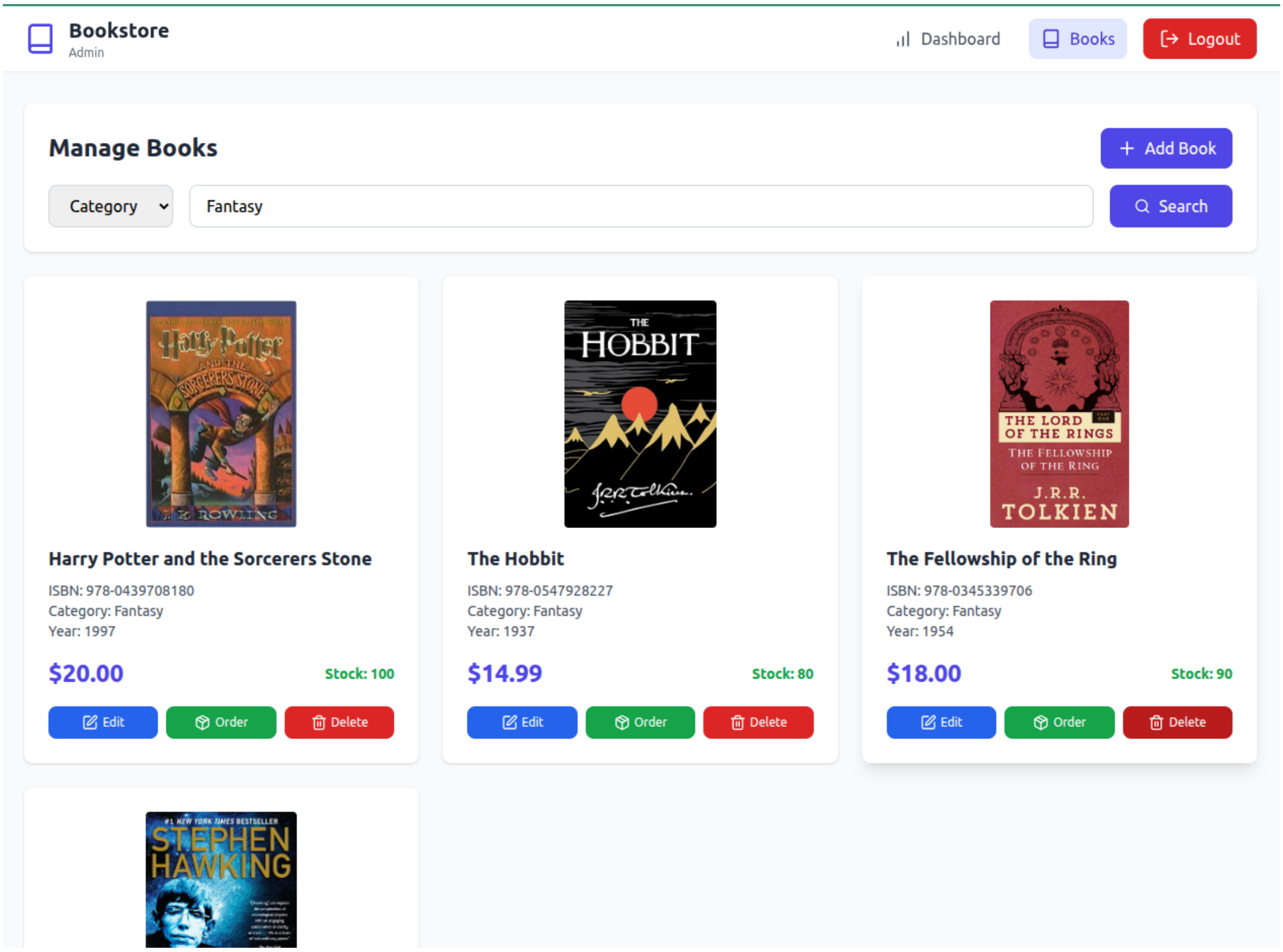
Figure 10: Detailed View of a Specific Order

Logic: This view performs a `JOIN` operation between the `Sales`, `Books`, and `Customer` tables to reconstruct the historical data of a specific transaction.

2.6 6. Admin Books Management

Developer: Abdelrahman Reda (8716)

The admin dashboard provides high-level control over the bookstore's inventory.



Manage Books

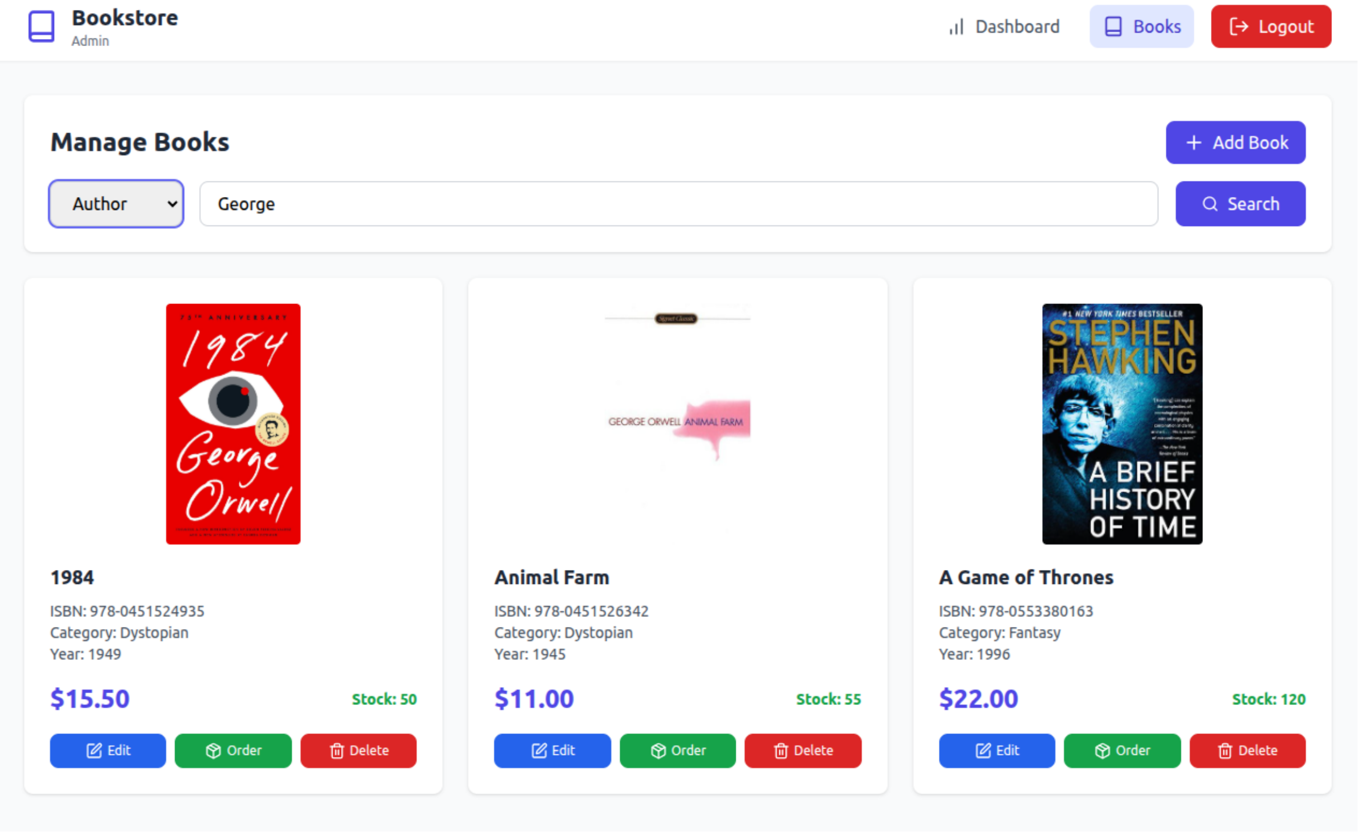
Category: Fantasy

Harry Potter and the Sorcerers Stone
ISBN: 978-0439708180
Category: Fantasy
Year: 1997
$20.00 Stock: 100

The Hobbit
ISBN: 978-0547928227
Category: Fantasy
Year: 1937
$14.99 Stock: 80

The Fellowship of the Ring
ISBN: 978-0345339706
Category: Fantasy
Year: 1954
$18.00 Stock: 90

Figure 11: Admin Dashboard: Filtering by Category



Manage Books

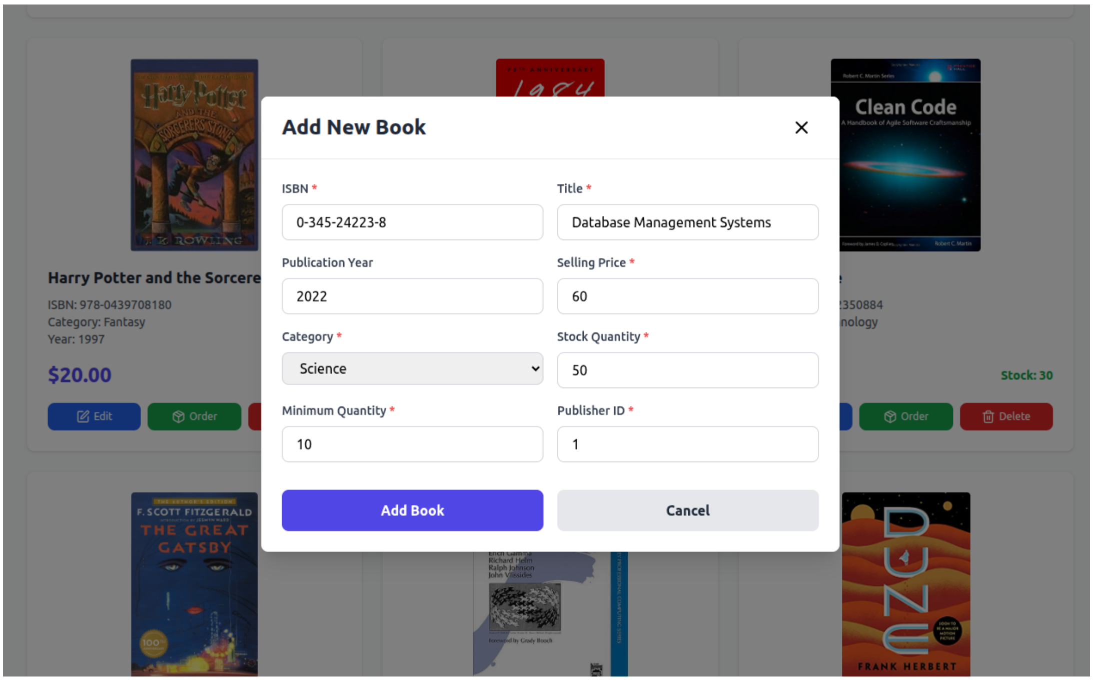
Author: George

1984
ISBN: 978-0451524935
Category: Dystopian
Year: 1949
$15.50 Stock: 50

Animal Farm
ISBN: 978-0451526342
Category: Dystopian
Year: 1945
$11.00 Stock: 55

A Game of Thrones
ISBN: 978-0553380163
Category: Fantasy
Year: 1996
$22.00 Stock: 120

Figure 12: Admin Dashboard: Searching by Author



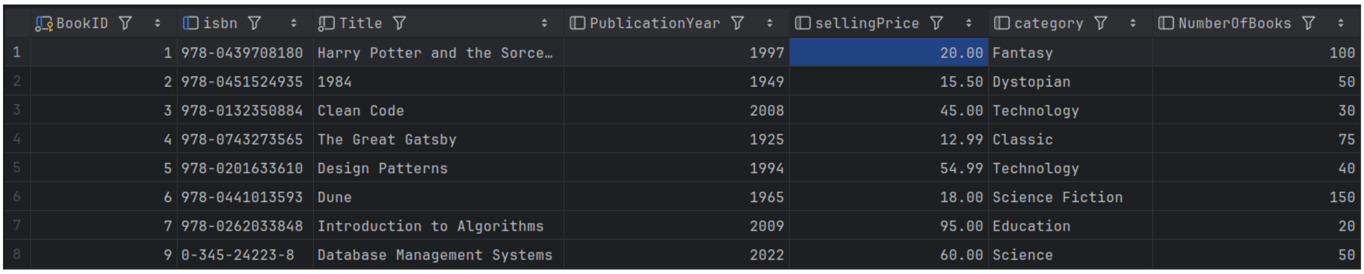
Add New Book

ISBN *: 0-345-24223-8
Title *: Database Management Systems
Publication Year: 2022
Selling Price *: 60
Category *: Science
Stock Quantity *: 50
Minimum Quantity *: 10
Publisher ID *: 1

Harry Potter and the Sorcere
ISBN: 978-0439708180
Category: Fantasy
Year: 1997
$20.00

350884
nology
Stock: 30

Figure 13: Interface for Adding New Books



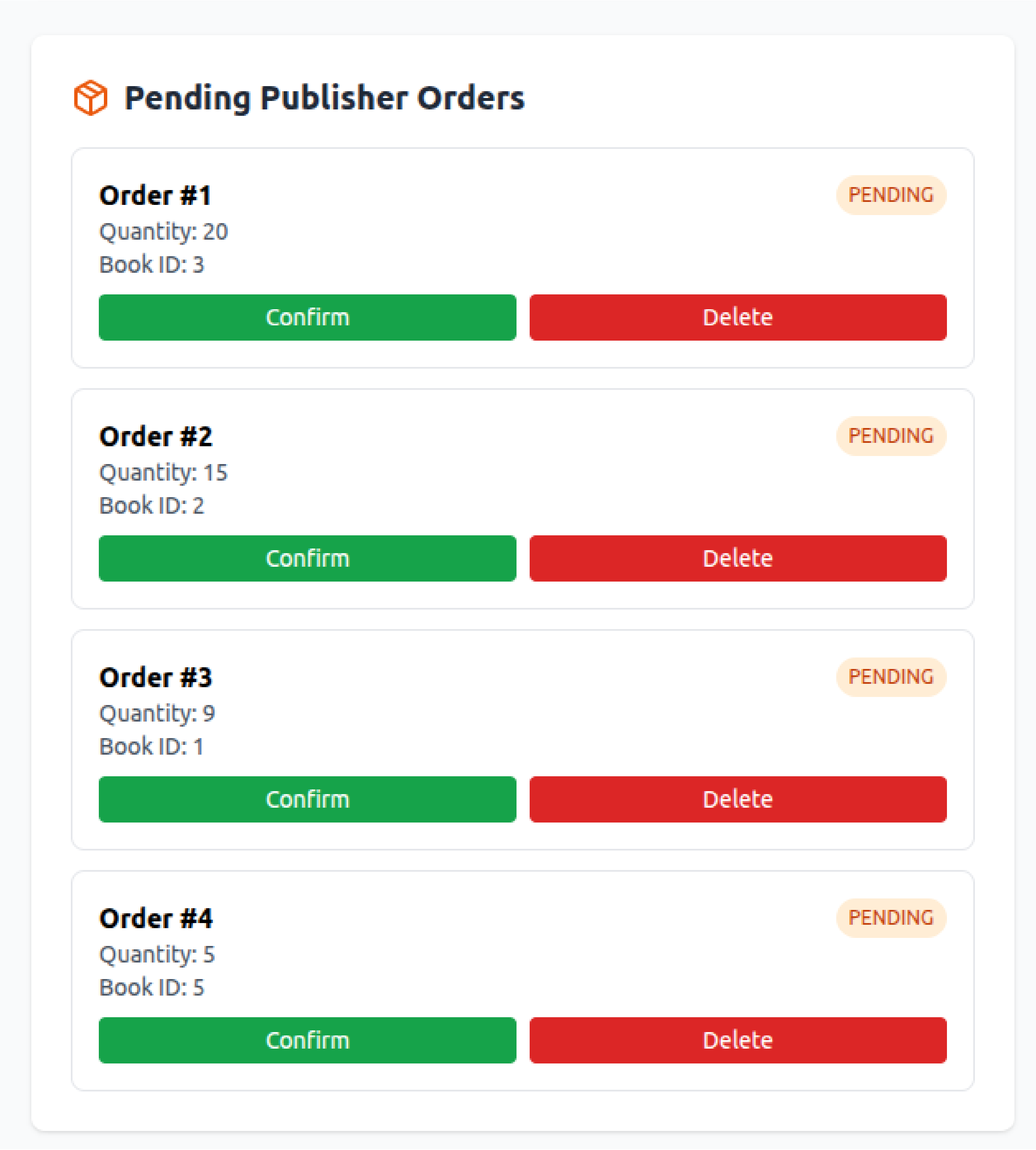
	BookID	isbn	Title	PublicationYear	sellingPrice	category	NumberOfBooks
1	1	978-0439708180	Harry Potter and the Sorce…	1997	20.00	Fantasy	100
2	2	978-0451524935	1984	1949	15.50	Dystopian	50
3	3	978-0132350884	Clean Code	2008	45.00	Technology	30
4	4	978-0743273565	The Great Gatsby	1925	12.99	Classic	75
5	5	978-0201633610	Design Patterns	1994	54.99	Technology	40
6	6	978-0441013593	Dune	1965	18.00	Science Fiction	150
7	7	978-0262033848	Introduction to Algorithms	2009	95.00	Education	20
8	9	0-345-24223-8	Database Management Systems	2022	60.00	Science	50

Figure 14: Database Verification: Books Table Population

2.7 7. Automated Re-ordering (Trigger Implementation)

Developer: Abdelrahman Reda (8716)

This feature demonstrates the advanced use of Database Triggers to automate inventory maintenance.



Pending Publisher Orders

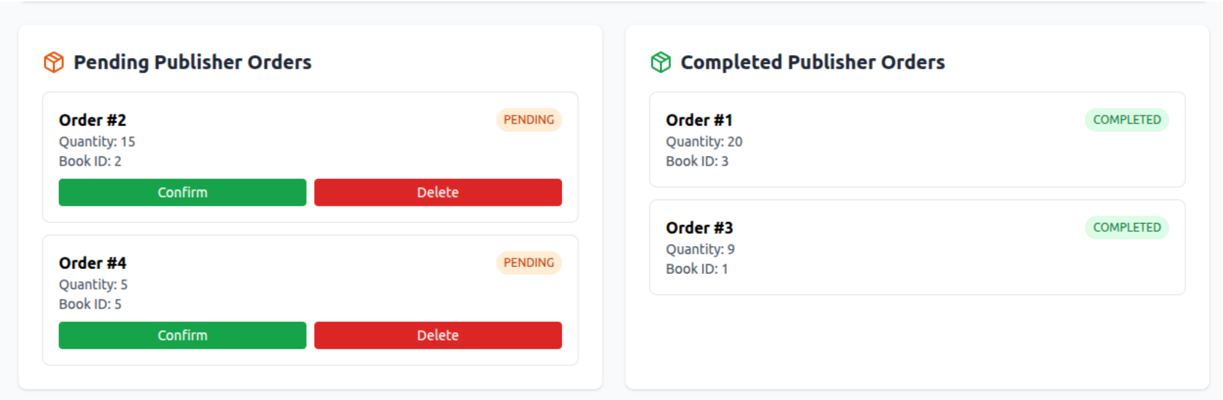
Order #1
Quantity: 20
Book ID: 3

Order #2
Quantity: 15
Book ID: 2

Order #3
Quantity: 9
Book ID: 1

Order #4
Quantity: 5
Book ID: 5

Figure 15: Pending Publisher Orders (Automatically Generated by Trigger)



Pending Publisher Orders

Order #2 PENDING
Quantity: 15
Book ID: 2

Order #4 PENDING
Quantity: 5
Book ID: 5

Completed Publisher Orders

Order #1 COMPLETED
Quantity: 20
Book ID: 3

Order #3 COMPLETED
Quantity: 9
Book ID: 1

Figure 16: Completed Publisher Orders

Detailed Logic Description:

- **The Trigger Mechanism:** An `AFTER UPDATE` trigger is defined on the `Books` table.
- **Condition:** `IF NEW.Stock_Quantity < NEW.Threshold`
- **Action:** The trigger automatically inserts a row into the `Publisher_Orders` table. This ensures that no book ever runs out of stock without an order being placed, eliminating human error.
- **Confirmation:** When the Admin clicks ”Confirm”, a backend service updates the status to ’Confirmed’ and adds the ordered quantity back to the book’s stock, completing the cycle.