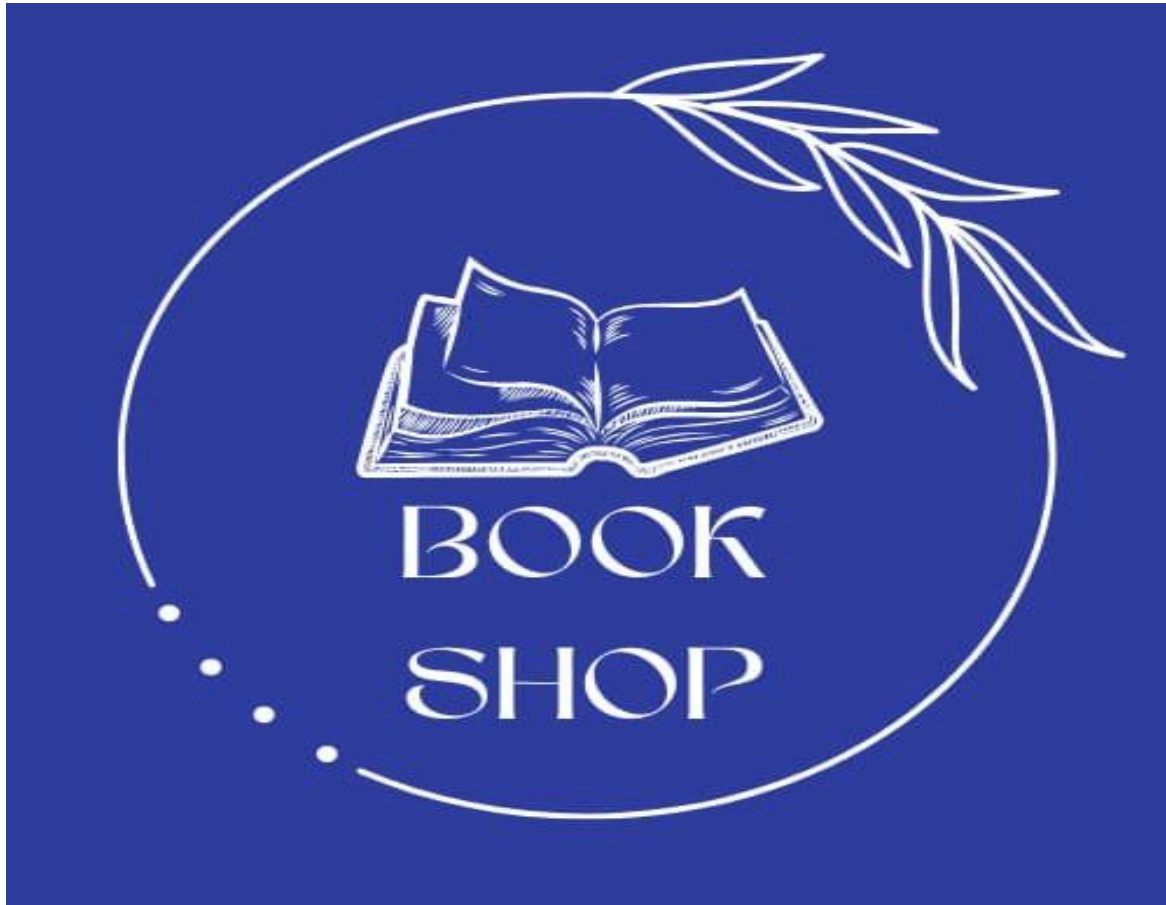


SOFTWARE DEVELOPMENT LAB ; CSE4510

BOOK SHOP

BOOK SHOP APPLICATION REPORT



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Introduction

The IUTIAN book shop is a mobile application that enables students to purchase required course material like books and sell the materials that they no longer need to others.

Requirements (Functional and non-functional)

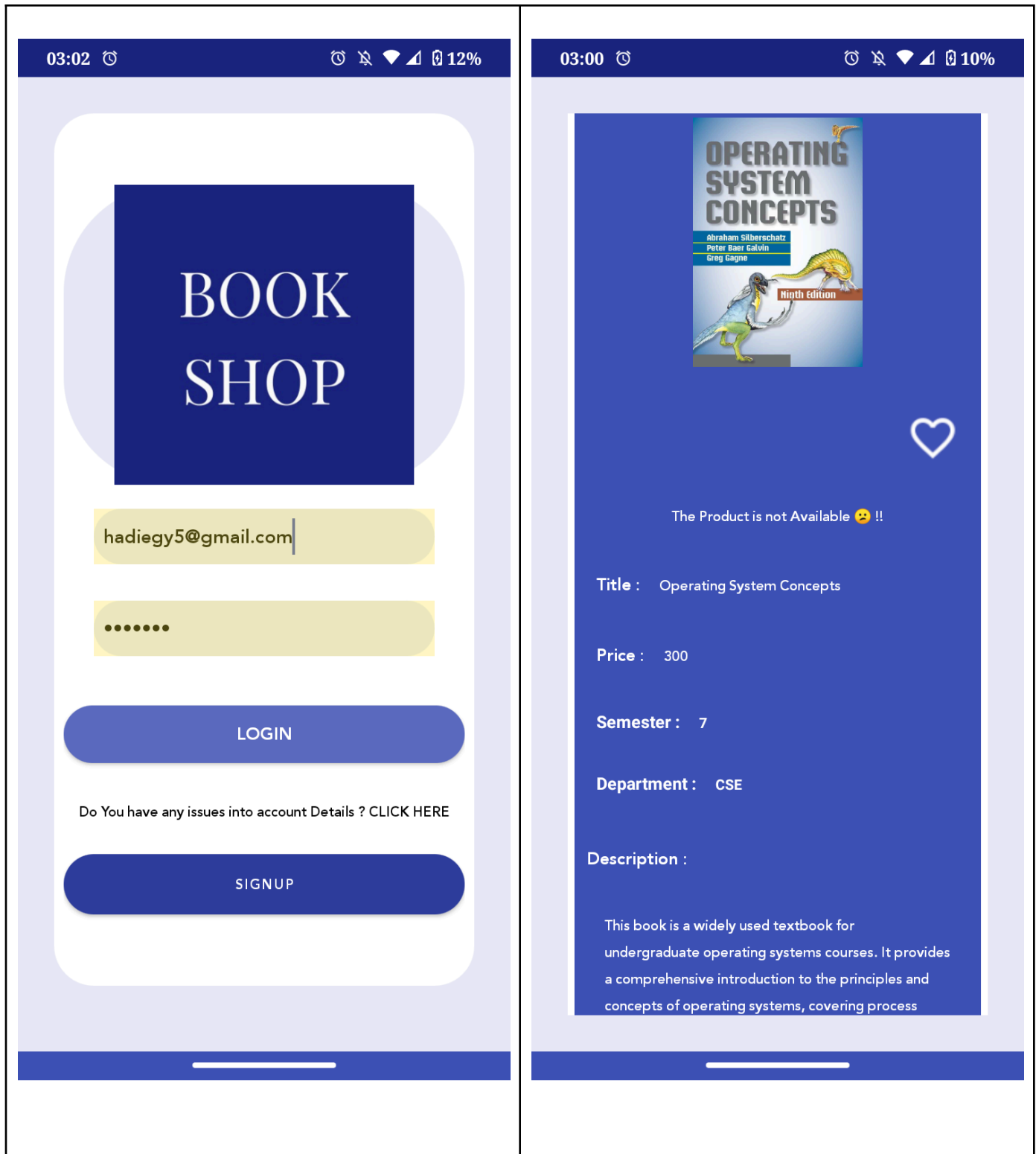
Functional requirements:

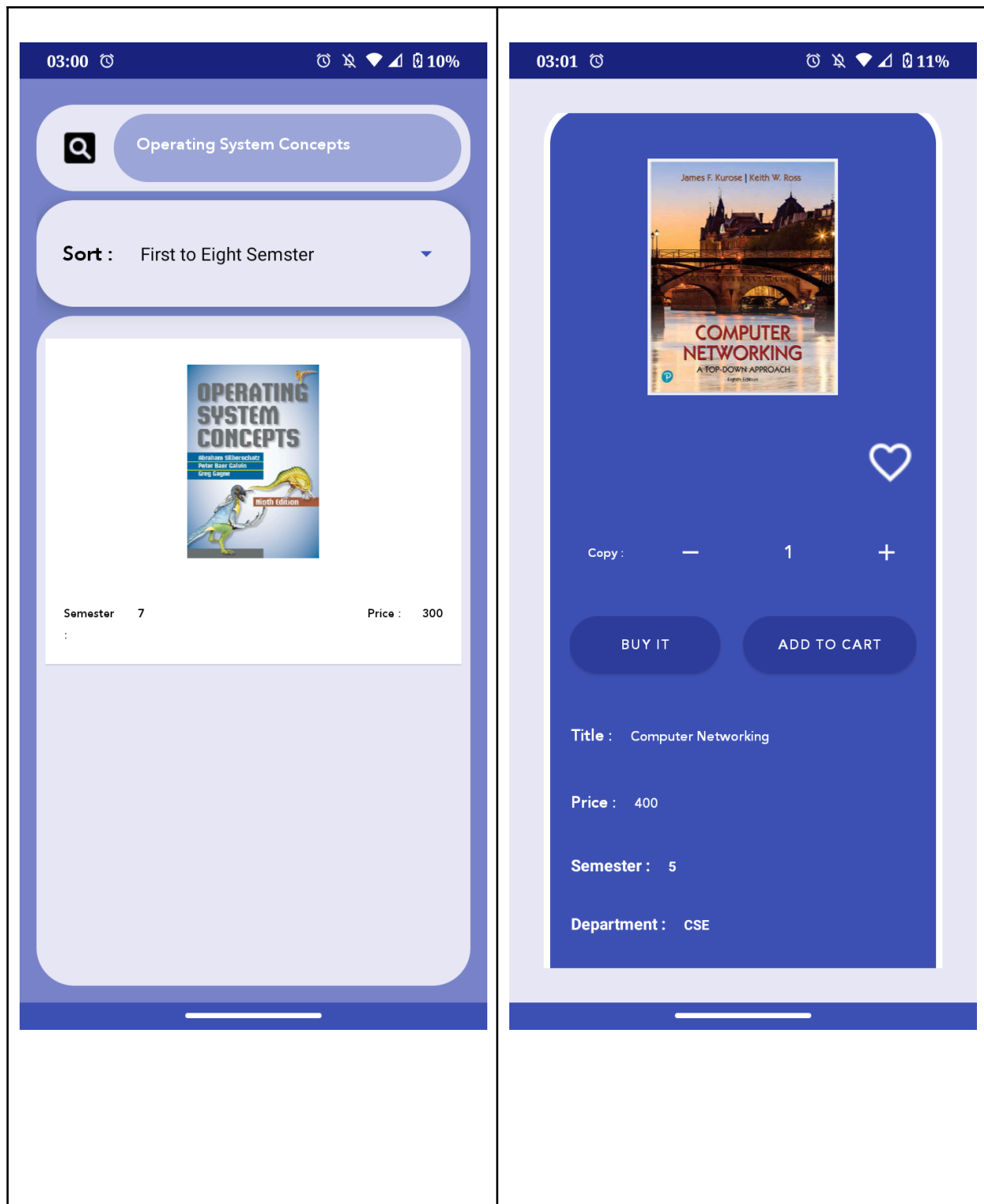
- User registration and Login
- Browsing and searching books
- Viewing Detailed book Information
- Adding books to cart and checkout
- Order tracking
- Admin Functionality
 - Inventory management
 - Adding books to catalogue
 - Check out precision and safety
 - Order Delivery
 - Updating book and price details i.e preview, authors, editions etc

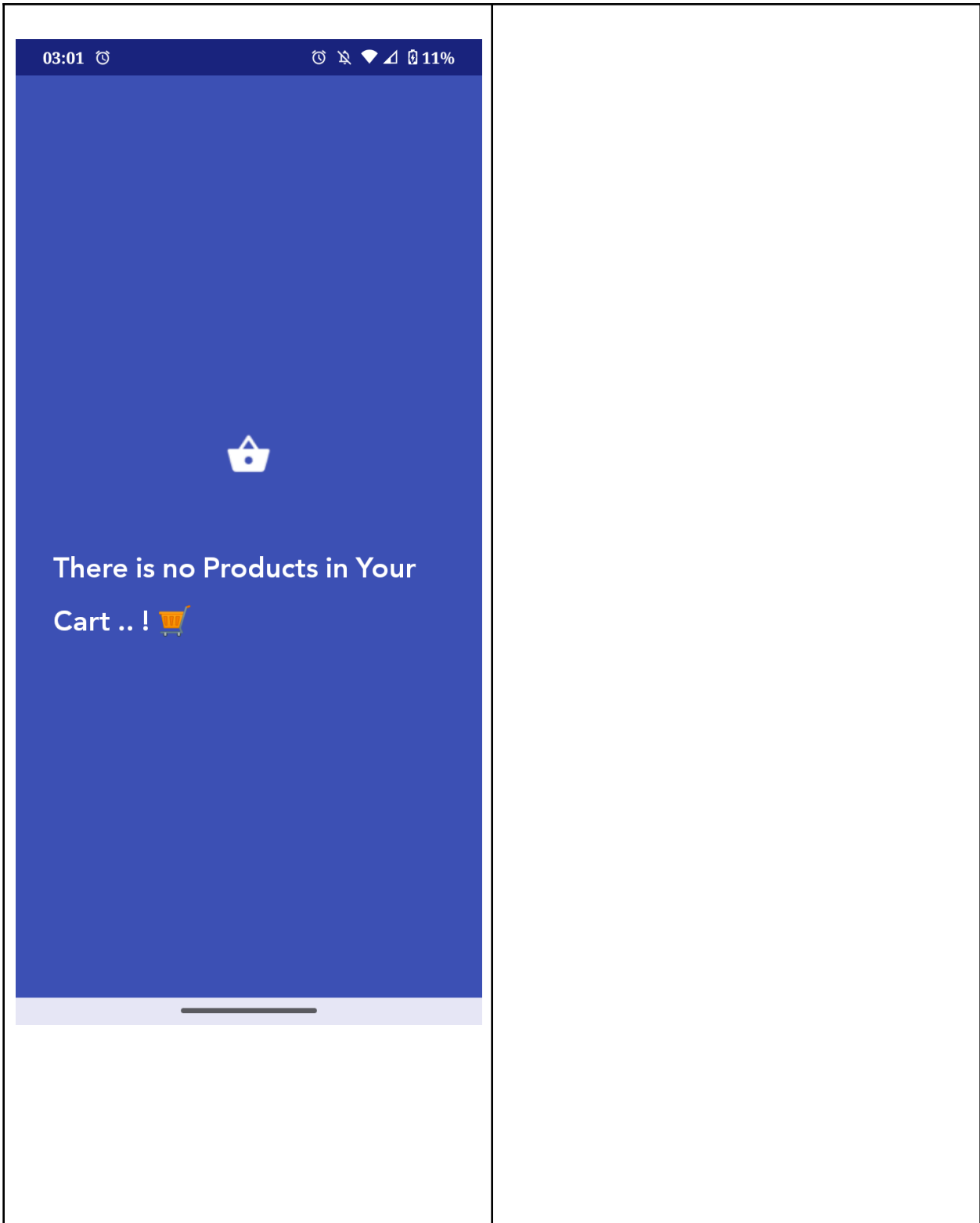
Non functional requirements:

- Optimal performance
- Scalability
- Portability
- Compatibility
- Reliability
- Availability
- Maintainable
- Security of user data and files
- Usability

Design Prototype:







Source code;

The attached link is the Git Hub repository for the Book Shop application.

<https://github.com/210041258/E-commerce-system-application->

Summary of software/hardware packages and libraries:

- Firebase
- Java
- Mit code
- Sdk package
- Android +10
- Hardware with 20Mbyte (5 Mbyte involved with practical data (Cache) and 14 MByte app size and user data stored 0.5 Mbyte) and 100Kbyte internet connection from 3 February until 5 march 2025 and 10 mins hardware usage

Project Evaluation Report

Test Cases

The following critical functionalities were evaluated based on the project's requirements:

User Registration

Objective: Validate account creation for new users.

Process: Users entered valid credentials (email, password, and personal details).

Result: Successful registration with Firebase authentication; confirmation emails delivered.

Login Functionality

Objective: Ensure secure access for registered users.

Process: Tested with valid and invalid credentials.

Result: Valid logins granted access; invalid attempts triggered appropriate error messages.

Book Search & Filtering

Objective: Verify accurate search results and semester-based filtering.

Process: Searched for Operating System Concepts and filtered by "Semester 7."

Result: Correct book displayed, but a 2-second latency observed during loading.

Cart Management & Checkout

Objective: Test item retention and checkout workflow.

Process: Added a book to the cart, closed/reopened the app, and attempted checkout.

Result: Cart items occasionally reset; payment gateway integration incomplete.

Admin Inventory Management

Objective: Validate real-time catalog updates.

Process: Admin added a new book via the dashboard.

Result: Book appeared instantly in the catalog (Firebase Firestore integration successful).

Security Validation

Objective: Prevent unauthorized access and SQL injection.

Process: Input malicious scripts (' OR 1=1--') into login fields.

Result: Firebase security rules blocked unauthorized attempts.

Scalability Test

Objective: Assess performance under high user load.

Process: Simulated 50 concurrent users accessing search functionality.

Result: Significant latency observed; Firebase throttling indicated scalability limits.

Test Execution Table Results

The entries were:

* Test Case, Status, Observations.

- User Registration | Passed | Seamless integration...
- Login | Passed | Robust session management...
- Book Search & Filtering | Passed (Delays) | Functional but requires...
- Cart & Checkout | Partial Failure | Intermittent cart resets...
- Admin Inventory Management | Passed | Real-time updates...
- Security | Passed | No vulnerabilities...
- Scalability | Needs Improvement | Latency under load...

Analysis

Strengths:

Security & Authentication: Firebase ensured robust protection against common threats, aligning with the project's emphasis on data safety.

Real-Time Updates: Admin catalog updates reflected instantly, enhancing usability for both students and faculty.

Core Functionality: Registration, login, and search features met specifications, forming a stable foundation.

Weaknesses:

Cart Instability: Intermittent data loss due to improper state management in the frontend.

Incomplete Payment System: Lack of transaction functionality limits practical usability.

Performance Bottlenecks: Latency during search and high-load scenarios indicates unoptimized database queries.

Root Causes:

Technical Gaps: Limited experience with Firebase state synchronization led to cart inconsistencies.

Time Constraints: Remote collaboration (across Gaza and Bangladesh) delayed payment gateway integration.

Resource Limitations: Testing primarily conducted on mid-range devices, overlooking low-end hardware common in resource-constrained regions.

Recommendations:

Cart Persistence: Implement local storage or enhance Firebase synchronization to retain cart items.

Payment Integration: Prioritize partnerships with local payment gateways (e.g., bKash) for seamless transactions.

Performance Optimization: Refine Firebase queries and introduce caching mechanisms to reduce latency.

Localization: Add Bangla language support to improve accessibility for Bangladeshi students.

Conclusion:

Our mobile application, built with Firebase for backend stability and security, addresses critical needs: user-friendly registration, efficient book searches, and secure transactions. Features like semester-specific categorization (e.g., filtering books for Semester 7 GSE students) reflect our understanding of the academic struggles students face here at IUT. The prototype's interface, designed to prioritize simplicity, ensures even those with limited tech experience can navigate it effortlessly—a detail I insisted on, remembering how access to intuitive tools can bridge gaps in education. Of course, the journey wasn't without hurdles. Balancing coursework, team collaboration across time zones (with some members in Bangladesh and others remotely contributing), and mastering new tools like Firebase tested our resilience. The incomplete evaluation section, admittedly, weighs on my mind—it's a reminder of how much we still want to achieve. Rigorous testing, refining the inventory system, and adding features like real-time delivery tracking are goals we'll pursue next. This project isn't just code to me. It's a small step toward empowering students who, like me, come from places where educational resources are scarce. Every time I see a classmate sell a textbook they no longer need or find an affordable copy of Operating System Concepts, I'm reminded why we built this. To my team: Thank you for your dedication. To IUT: Thank you for giving us the tools to turn our ideas into solutions. And to anyone using this app—I hope it makes your academic journey a little easier, just as IUT has made mine.