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April 21, 2025

Server-Side Development

Module 7

Modify the E-shop application, implementing the MVC architecture

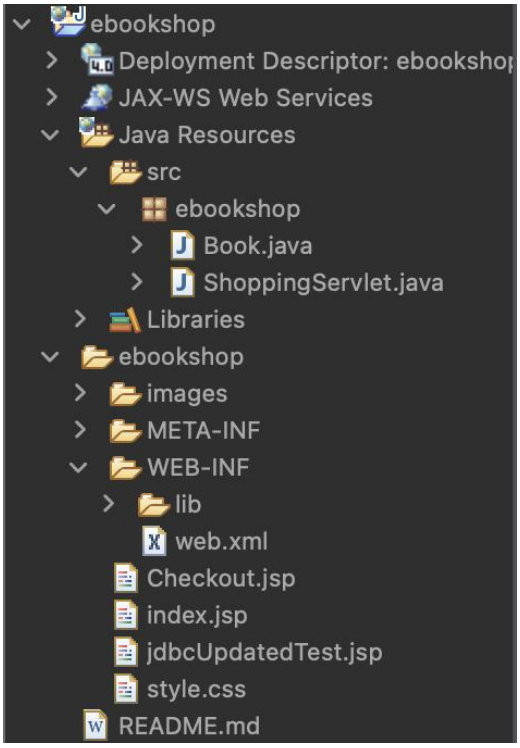
Introduction

After reviewing the assignment instructions, I was initially unsure whether we were expected to restructure our existing ebookshop application or create a new one based on the textbook example. To ensure I addressed both possibilities, I decided to do both.

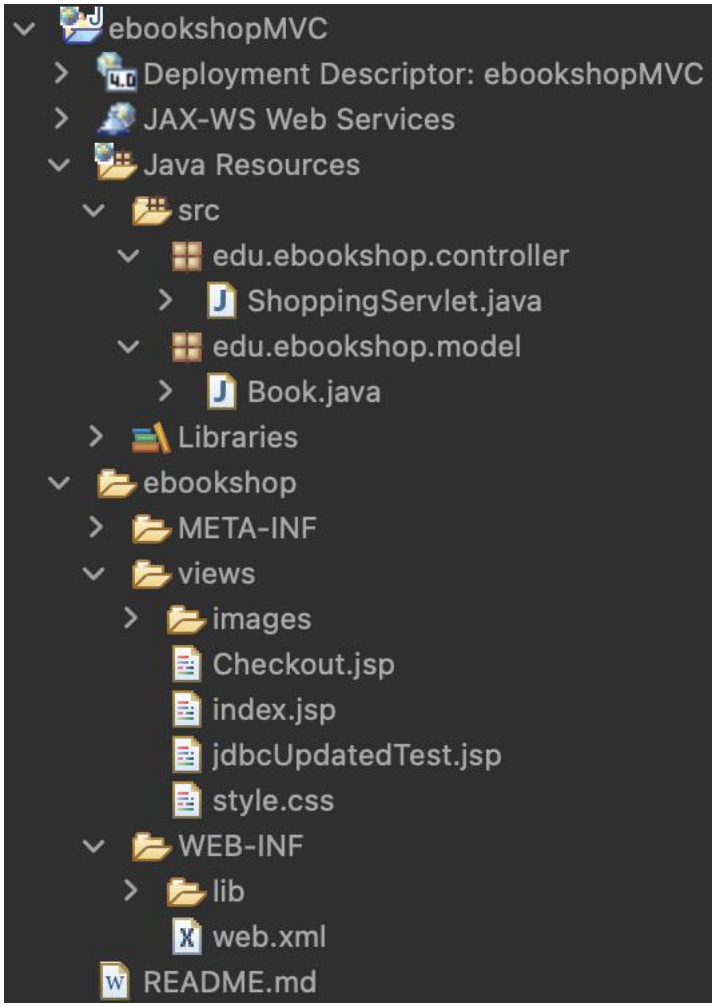
Rearchitecting the Existing ebookshop Application

To begin, I duplicated my existing ebookshop project, which I have been developing over the past few modules, and renamed it to ebookshopMVC. I then refactored the project to follow the Model-View-Controller (MVC) architecture. This involved organizing the source files into distinct packages representing models, views, and controllers. I also reconfigured the deployment assembly and updated the server context path due to match the new project name.

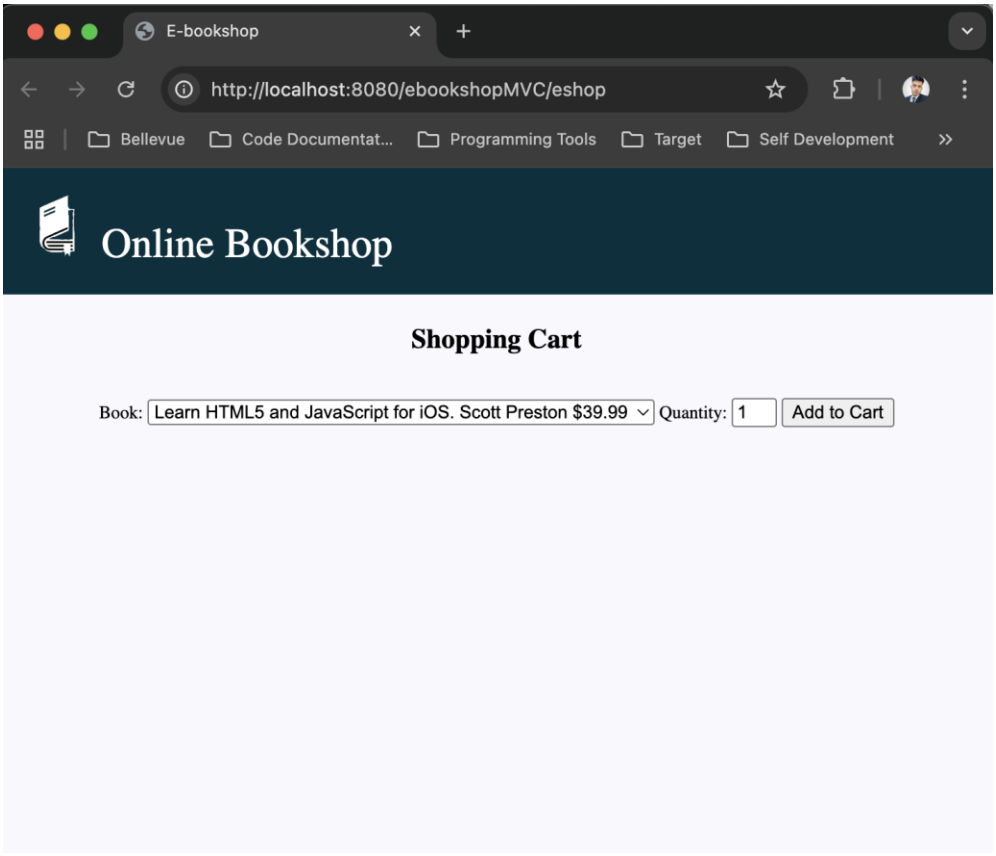
Found below is my previous ebookshop structure:



And below this is the updated ebookshopMVC structure after implementing the MVC design pattern:



The screenshots below demonstrate that the application continues to function correctly after the MVC changes were applied:


E-bookshop
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Online Bookshop
Shopping Cart
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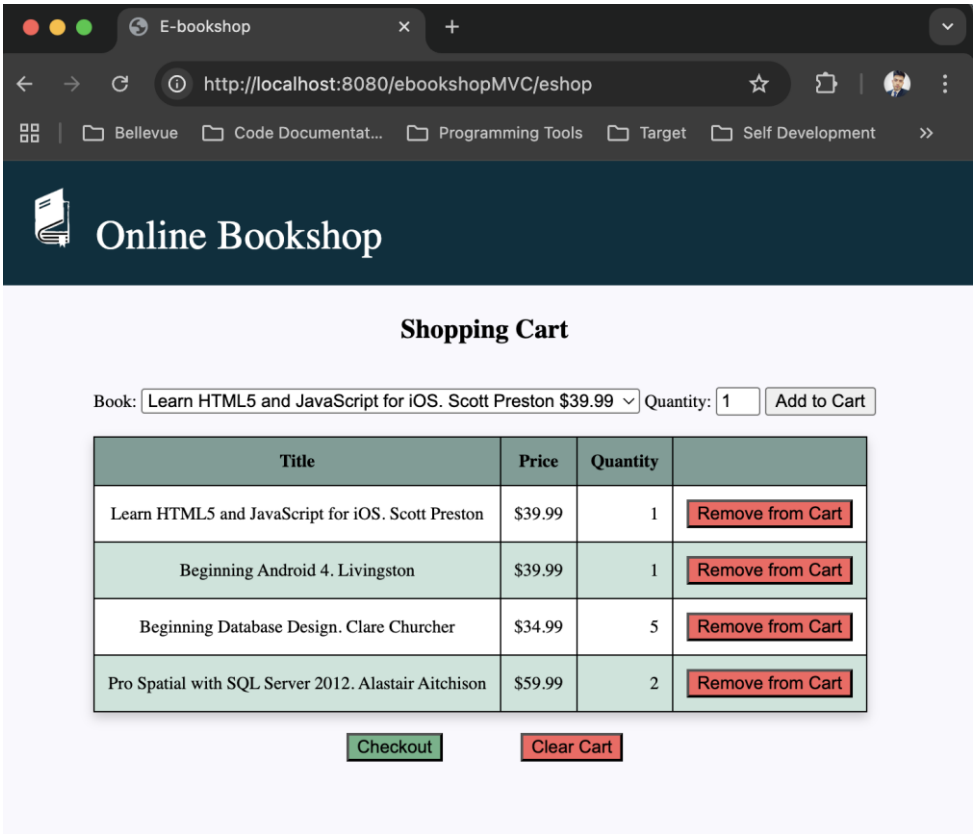
Quantity: 1
Add to Cart


E-bookshop
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Online Bookshop
Shopping Cart
Book: Learn HTML5 and JavaScript for iOS. Scott Preston $39.99
Quantity: 1
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Learn HTML5 and JavaScript for iOS. Scott Preston
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Remove from Cart
Beginning Android 4. Livingston
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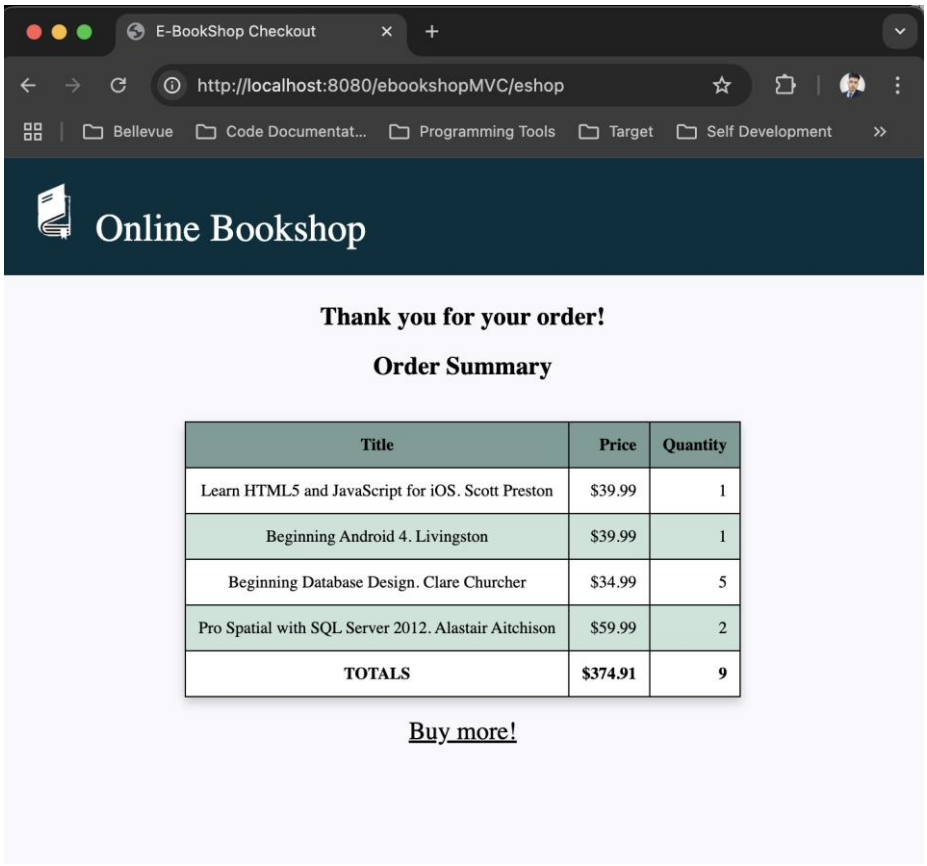
$59.99
2
Remove from Cart
Checkout
Clear Cart


E-BookShop Checkout
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Thank you for your order!
Order Summary
Title
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Learn HTML5 and JavaScript for iOS. Scott Preston
$39.99
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Beginning Android 4. Livingston
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Beginning Database Design. Clare Churcher
$34.99
5
Pro Spatial with SQL Server 2012. Alastair Aitchison
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TOTALS
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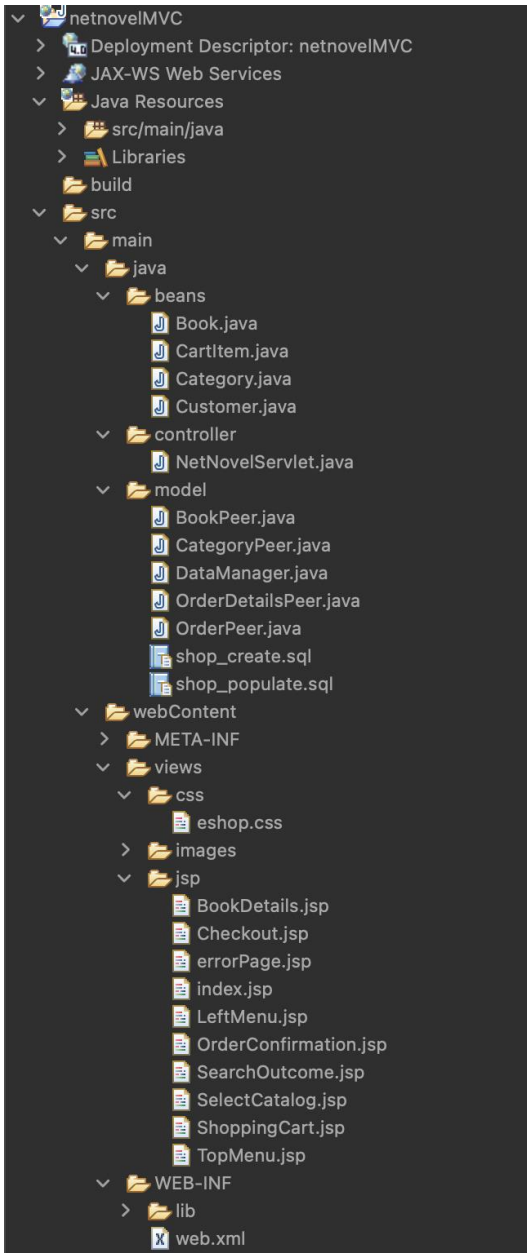
9
Buy more!

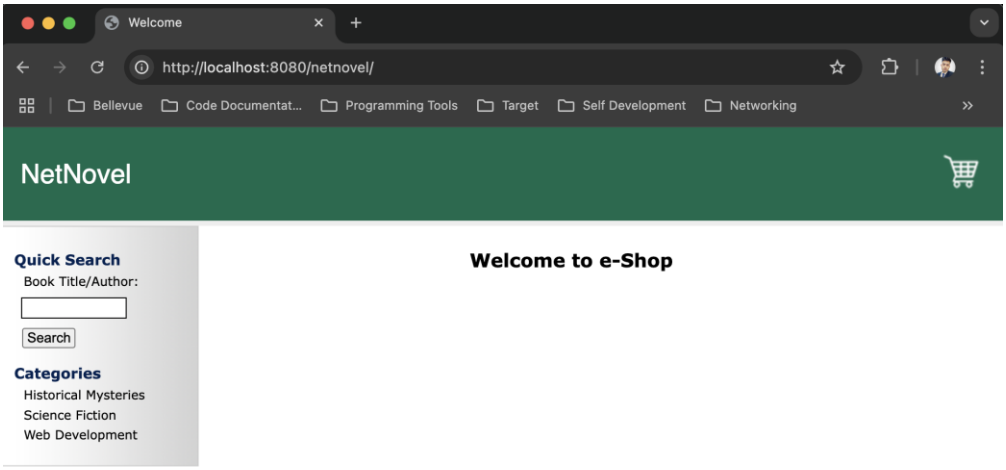
Following the MVC Textbook Example: Optimized and Customized

To further reinforce my understanding, I created a second project named netnovelMVC, inspired by the textbook's MVC example but customized for better organization and functionality. I used "/netnovel" as the application's context root for clarity and branding. In this version, I included a dedicated controller package to clearly separate request-handling logic. I also removed the redundant eshop folder under src/main/java to streamline the structure. I implemented all necesary components, including JSPs, JavaBeans, DAOs, and CSS files. While setting up each part, I focused on understanding the flow of user requests through the controller to the model and view. I thoroughly commented throughout the code to document my understanding and decision-making. I also replaced a couple of scriptlets with jsp action tags and Expression Language (EL) for cleaner, mode modern JSP syntax. As an added touch, I implemented a custom 404.jsp page to enhance user experience by handling invalid requests.

Netnovel's MVC Project Structure



Pictures of netnovel being Executed during Testing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Quick Search
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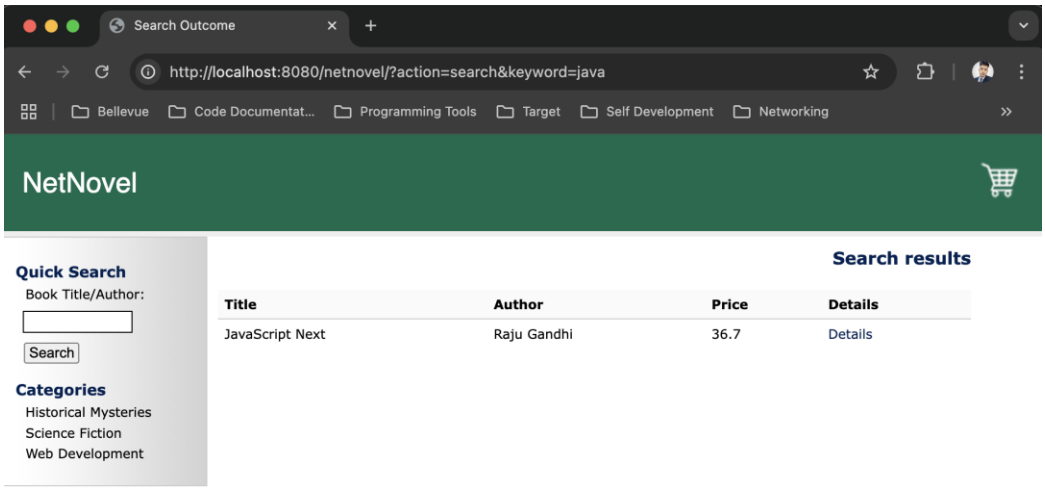
Categories
Historical Mysteries
Science Fiction
Web Development
Welcome to e-Shop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JavaScript Next
Raju Gandhi
36.7
Details

Book details
http://localhost:8080/netnovel/buybooks?action=bookDetails&bookId=2
Bellevue
Code Documentat...
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Target
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Quick Search
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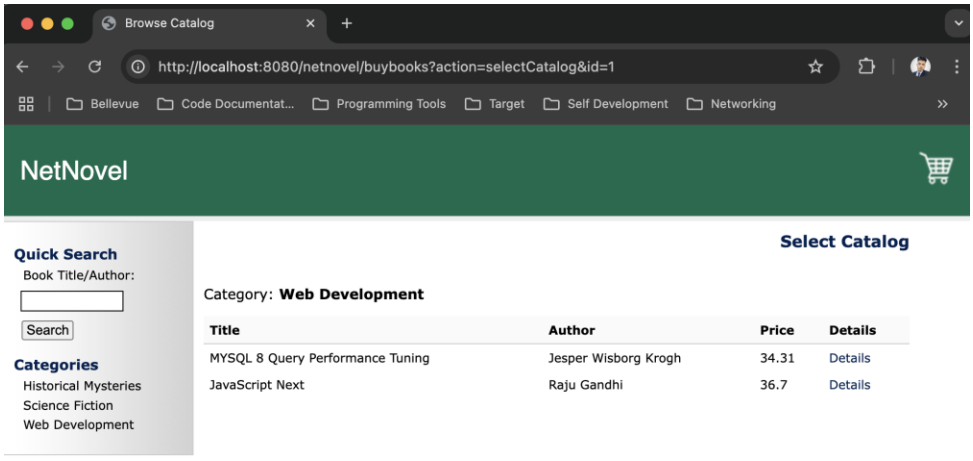
Historical Mysteries
Science Fiction
Web Development
Book details
JavaScript Next
Your Complete Guide to the New Features Introduced in JavaScript, Starting from ES6 to ES9
Raju Gandhi
Apress
JavaScript Next
Raju Gandhi
Price: $36.7
Add To Cart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Quick Search
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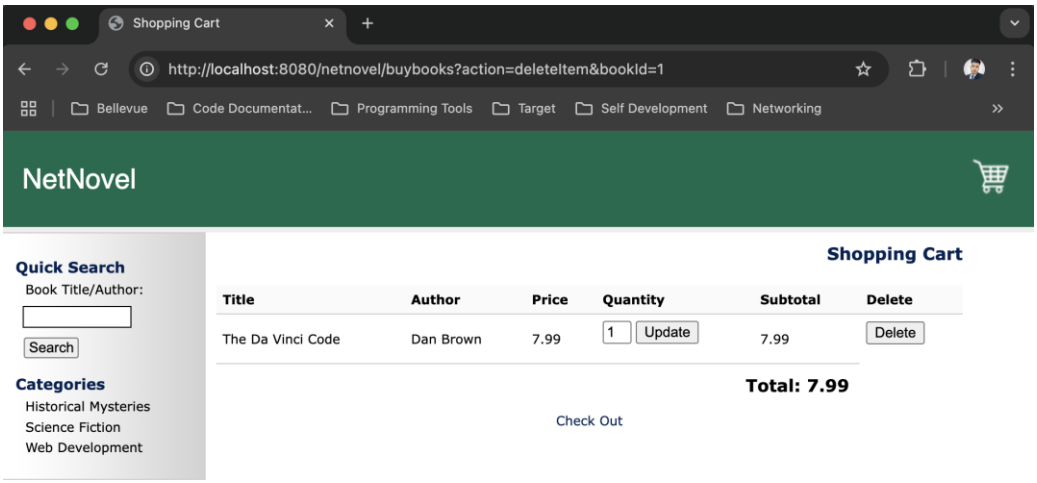
Shopping Cart
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Bellevue
Code Documentat...
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Self Development
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Quick Search
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Historical Mysteries
Science Fiction
Web Development
Shopping Cart
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Price
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7.99
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Update
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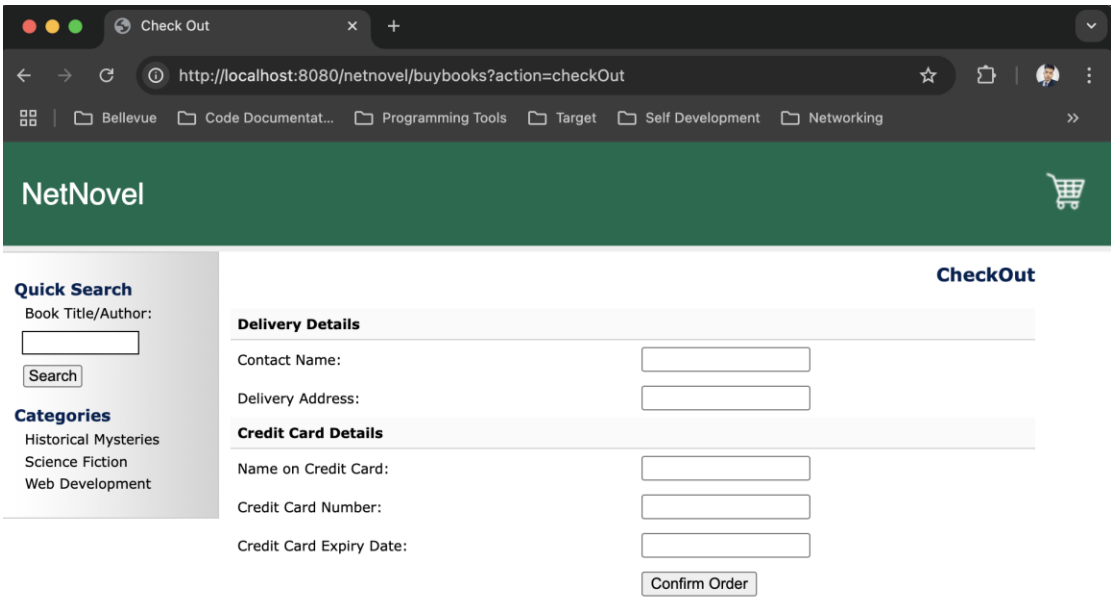
Total: 7.99
Check Out


Check Out
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Categories
Historical Mysteries
Science Fiction
Web Development
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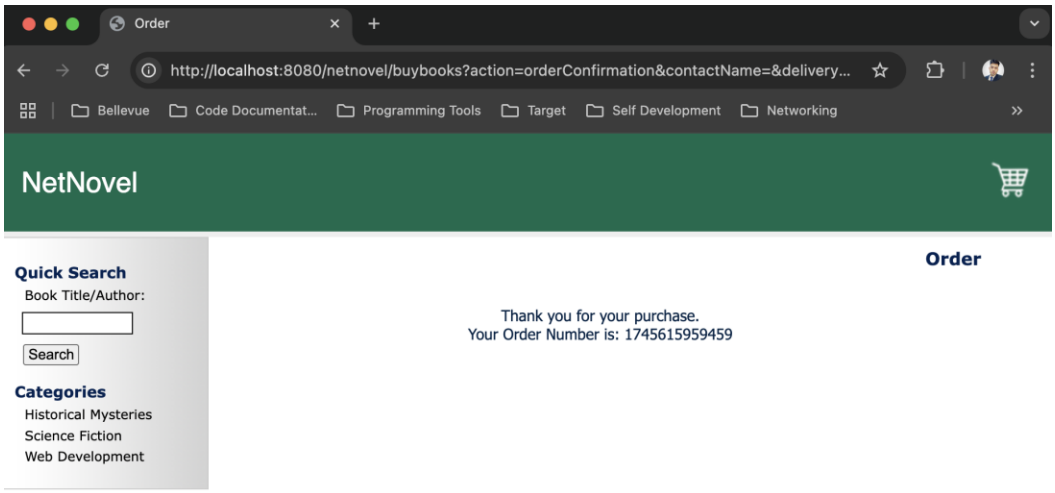
Credit Card Details
Name on Credit Card:
Credit Card Number:
Credit Card Expiry Date:
Confirm Order


Order
http://localhost:8080/netnovel/buybooks?action=orderConfirmation&contactName=&delivery...
Bellevue
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Quick Search
Book Title/Author:
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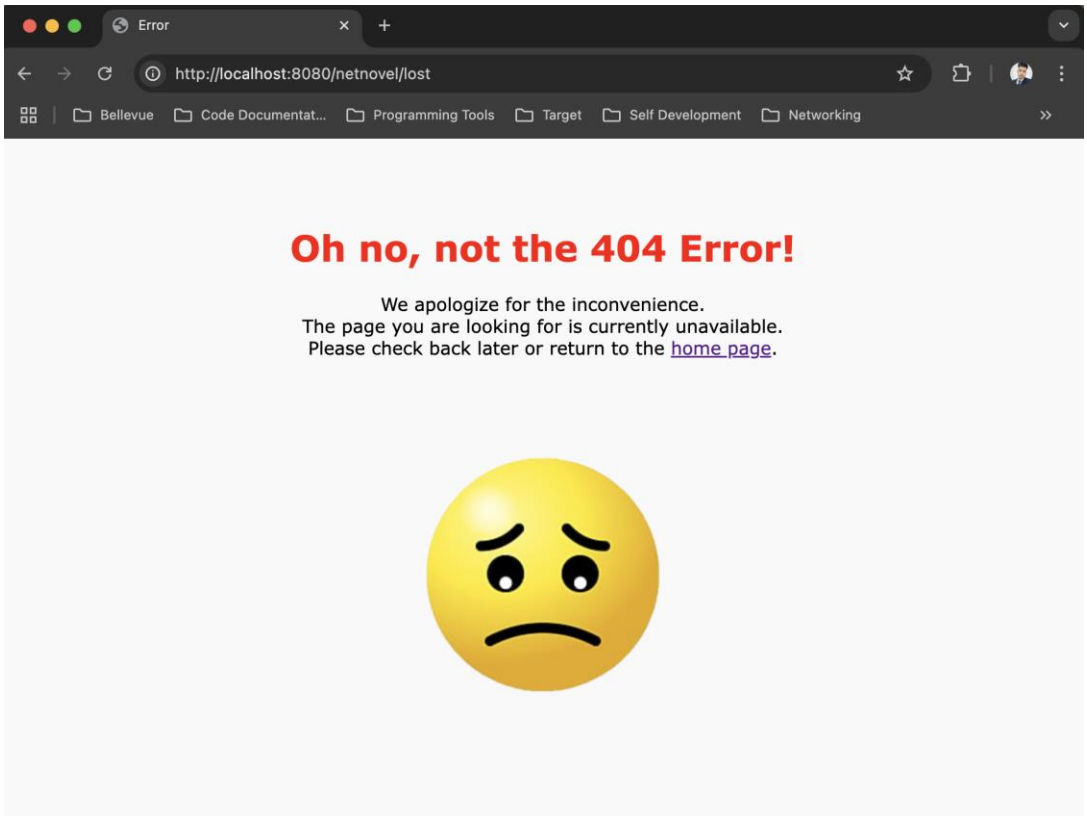
Categories
Historical Mysteries
Science Fiction
Web Development
Order
Thank you for your purchase.
Your Order Number is: 1745615959459


Error
http://localhost:8080/netnovel/lost
Bellevue
Code Documentat...
Programming Tools
Target
Self Development
Networking
Oh no, not the 404 Error!
We apologize for the inconvenience.
The page you are looking for is currently unavailable.
Please check back later or return to the home page.

Final Thoughts

By reworking both the existing ebookshop and creating a new netnovel application, I gained hands-on experience applying the MVC architecture. This process helped reinforce my understanding of seperating concerns and maintaining a clean, scalable application structure.

While I optimized the application's structure and improved some of the design choices, I recognize there is still more work to be done. For example, I plan to eventually convert the DAO queries from simple Statement objects to PreparedStatement objects to prevent SQL injection and improve overall security. I also want to continue reducing the use of scriptlets by implementing JSTL across all JSP files. Additionally, I intend to replace older collections like Hashtable and Enumeration with more modern alternatives such as Map and enhanced for-each loops, or Iterator. Another improvement I had in mind was moving the core logic out of ShoppingCart.jsp and into a dedicated servlet or a separate Java class to better align with the MVC pattern.

Although I was excited to make all of these improvements now, I decided to hold off so I can stay on track with my other assignments. However, I plan to return to this project as a side project for personal learning and to eventually feature it in my resume.

References

Manelli, L., & Giulio Zambon. (2020). *Beginning Jakarta EE web development : using JSP, JSF, MySQL, and Apache Tomcat for building Java web applications*. Apress.