Day 5 Report - Testing, Error Handling, and Backend Integration Refinement

1. Introduction

Day 5 focused on ensuring that the marketplace is fully functional, optimized, and secure for real-world deployment. The primary objectives were:

- Testing functionality
- Implementing error handling
- Optimizing performance
- Refining backend integrations

2. Key Areas of Focus

2.1 Functional Testing

Objective: Ensure all core features of the marketplace are working as expected.

- **Components Tested:**
  - Product Listing: Ensured products are displayed correctly.
  - Filters and Search: Validated accurate search results.
  - Cart Operations: Tested adding/removing items and updating quantities.
  - User Profiles: Verified login and profile update functionality.
- **Tools Used:**
  - Postman: For API testing.
  - React Testing Library: For unit testing.
 - Cypress: For end-to-end testing.

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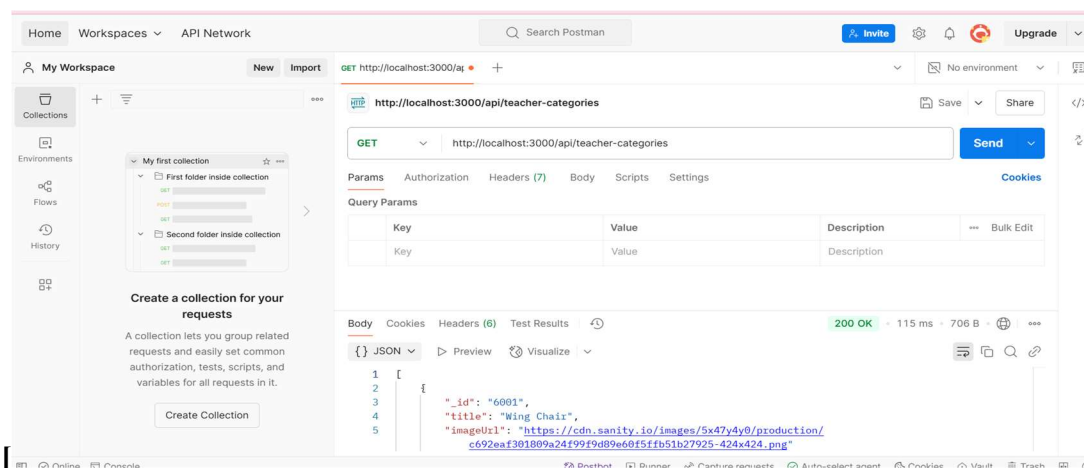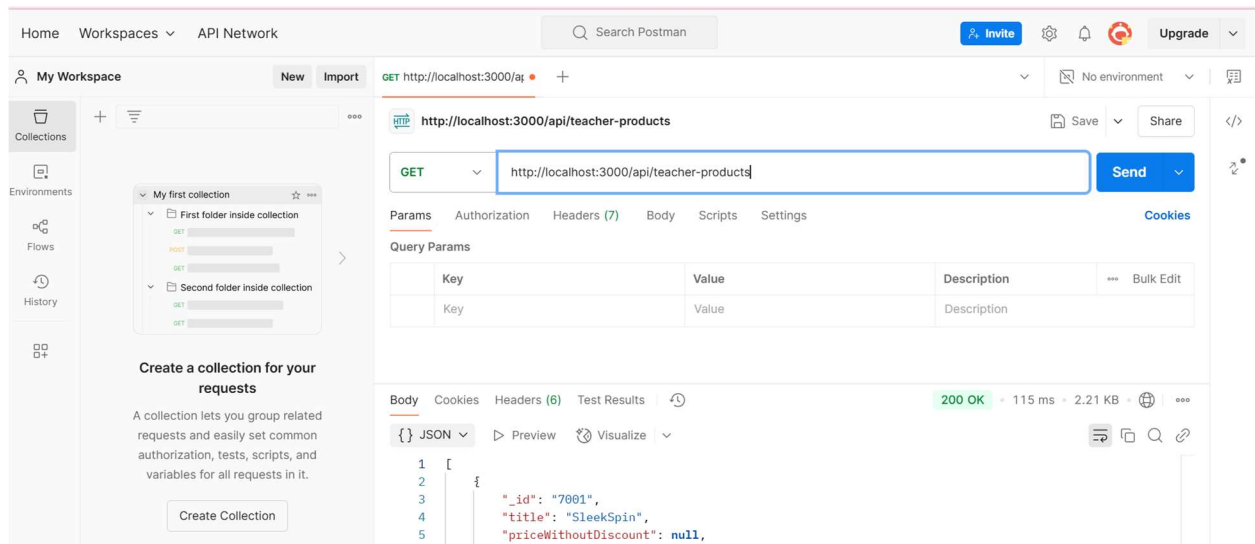
2.2 Error Handling

Objective: Implement robust error handling for a smooth user experience.

- **Error Types Handled:**
  - Network Failures: Display user-friendly error messages when API calls fail.
  - Missing or Invalid Data: Show fallback UI when no data is available (e.g., "No products found").
  - Server Errors: Display appropriate messages for server-related issues.

- **Example Code:**

```
try {
  const data = await fetchProducts();
  setProducts(data);
} catch (error) {
  console.error("Failed to fetch products:", error);
  setError("Unable to load products. Please try again later.");
}
```

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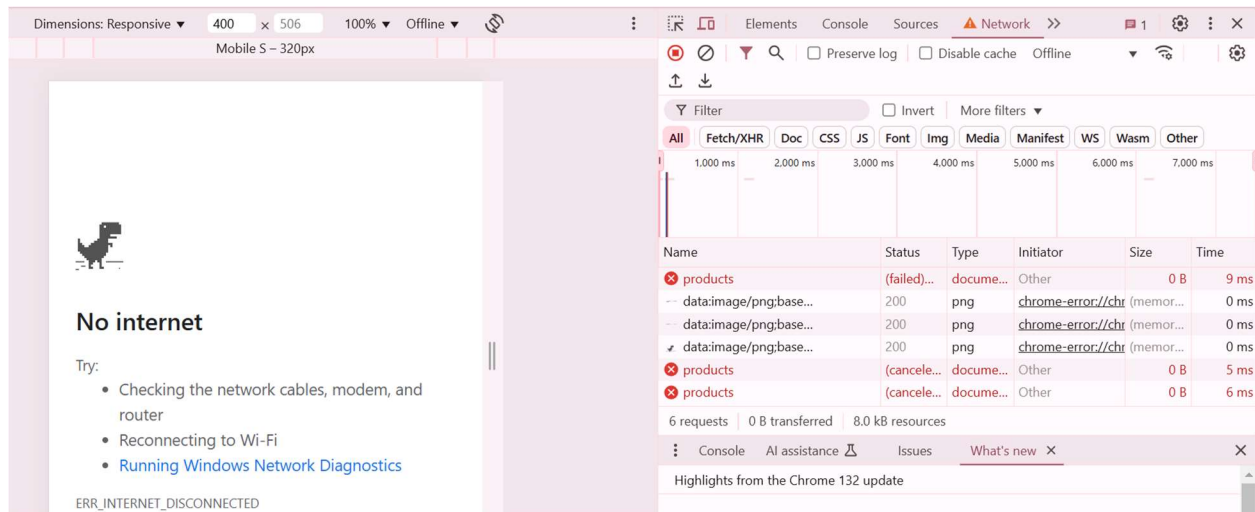
2.3 Performance Optimization

Objective: Improve the marketplace's speed and user experience.

- **Optimizations Applied:**
  - Image Compression: Reduced image sizes using TinyPNG and ImageOptim.
  - Lazy Loading: Implemented lazy loading for large images.
  - Code Splitting: Minimized JavaScript and CSS files.
  - Caching: Applied browser caching for faster repeated visits.
- **Performance Tools Used:**
  - Lighthouse: For performance audits.
  - GTmetrix: For page load analysis.
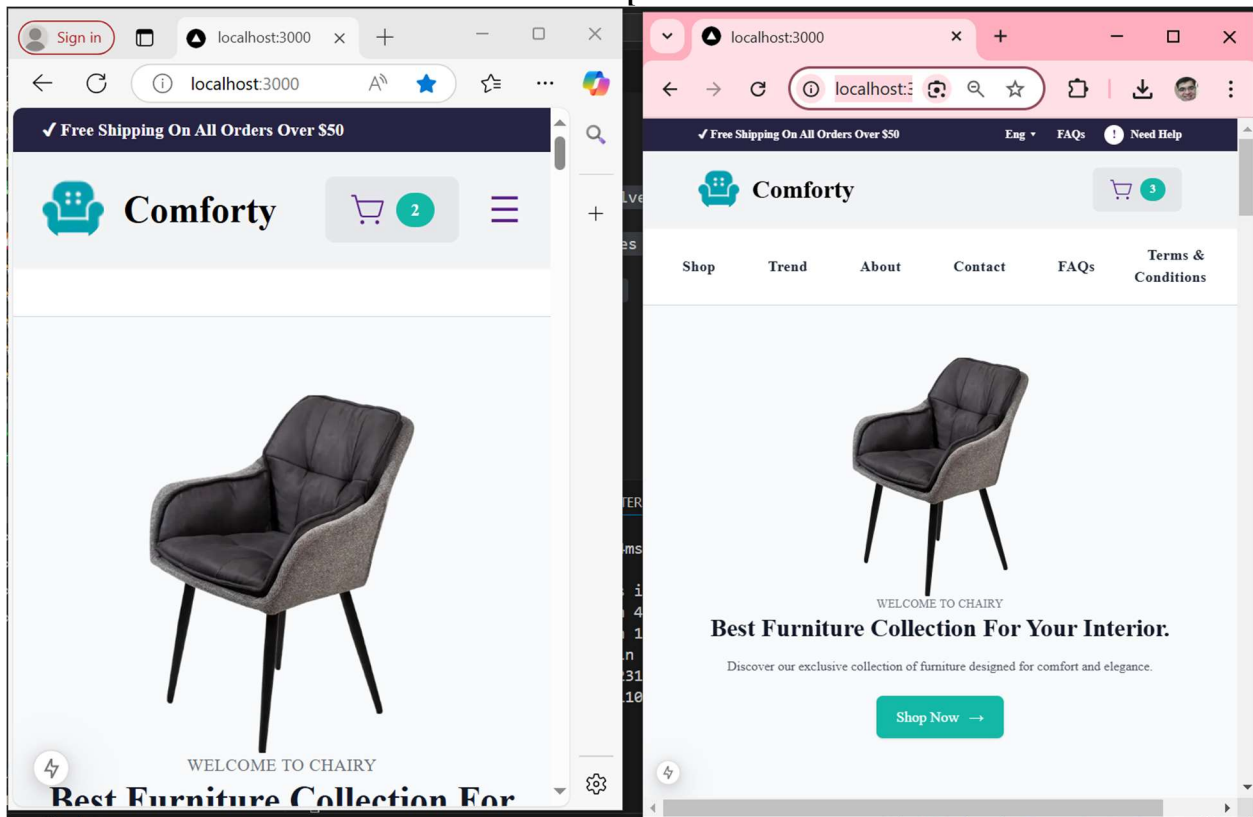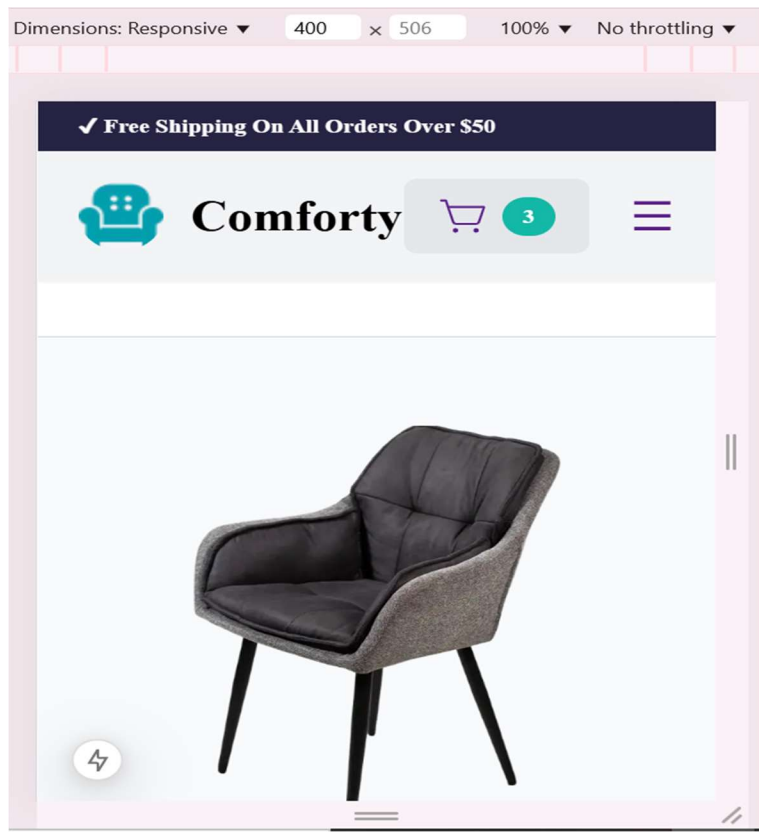 - WebPageTest: For detailed performance metrics.

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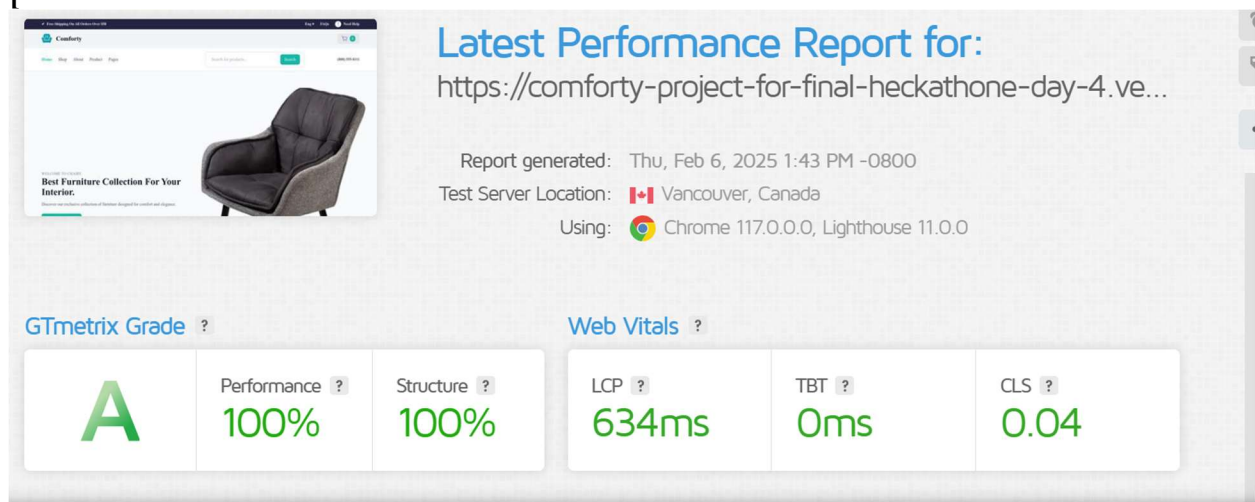
2.4 Cross-Browser and Device Testing

Objective: Ensure the marketplace functions across all popular browsers and devices.

- **Browsers Tested:** Chrome, Firefox, Safari, Edge.
- **Devices Tested:** Desktop, Tablet, Mobile.
- **Tools Used:** BrowserStack, LambdaTest, physical device testing.

MOBILE

2.5 Security Testing

Objective: Ensure the marketplace is secure from potential vulnerabilities.

- **Security Measures Implemented:**
  - Input Validation: Prevent SQL injection and XSS attacks.
  - HTTPS: Ensured all API calls use HTTPS for secure communication.
  - API Key Management: Sensitive keys stored securely in environment variables.
- **Security Tools Used:**
  - OWASP ZAP: For vulnerability scanning.
  - Burp Suite: For penetration testing.

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2.1 Targets Summary

The number of potential vulnerabilities found for each target by severity.

Target	● Critical	● High	● Medium	● Low	● Accepted
● https://comforty-project-for-final-heckathone-day-4.vercel.app/	0	0	0	1	0

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2.6 User Acceptance Testing (UAT)

Objective: Simulate real-world usage and ensure usability.

- **Tasks Tested:**
  - Browsing: Ensured product browsing is intuitive.
  - Search: Verified search results.
  - Checkout: Tested the checkout process.
- **Feedback:** Collected feedback from peers and mentors to make usability improvements.

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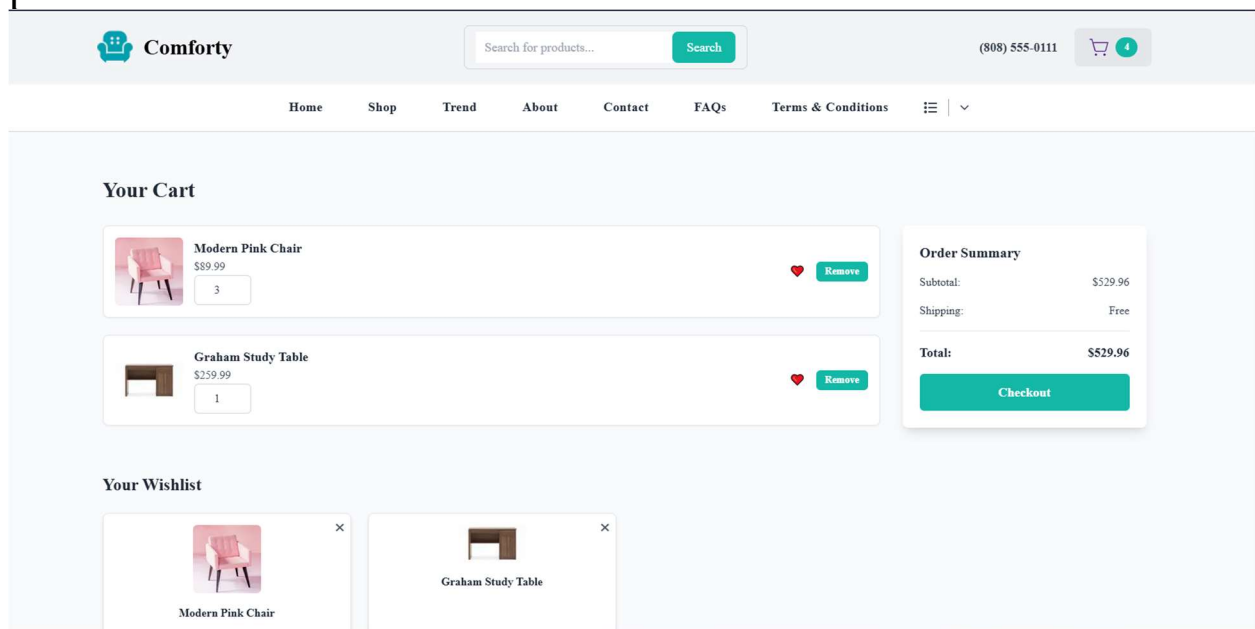
Checkout

Order Summary

Modern Pink Chair (x3)	$269.97
Graham Study Table (x1)	$259.99
Total:	**$529.96**

Shipping Details

Full Name

Email Address

Address

City

Zip Code

Place Order

Comforty

Search for products...   **Search**

(808) 555-0111   🛒 ④

Home   Shop   Trend   About   Contact   FAQs   Terms & Conditions   ☰ ｜ ⌄

Order Confirmed!

Thank you for your purchase. Your order has been placed successfully.

You will receive an email confirmation shortly with your order details.

Back to Home   **View More Products**

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3. Test Report

Test Case Report

Test Case ID	Description	Test Steps	Expected Result	Actual Result	Status	Severity	Assigned To	Remarks
TC-001	Product Listing Display	Check if products are displayed	Products should appear correctly	Products loaded successfully	Passed	High	Ameen Alam	N/A
TC-002	Product Search Functionality	Search for a product by name	Correct products should appear	Products matched correctly	Passed	High	Ameen Alam	N/A
TC-003	Cart Functionality	Add product to cart	Product should be added to cart	Product added to cart successfully	Passed	High	Ameen Alam	N/A
TC-004	API Error Handling	Simulate network failure	Display error message	Error message displayed correctly	Passed	High	Ameen Alam	N/A
TC-005	Performance Optimization	Run Lighthouse audit	Performance score above 90	Performance score: 92	Passed	Medium	Ameen Alam	Optimization complete

4. Performance and Optimization Details

- **Initial Load Time:** 3.5 seconds
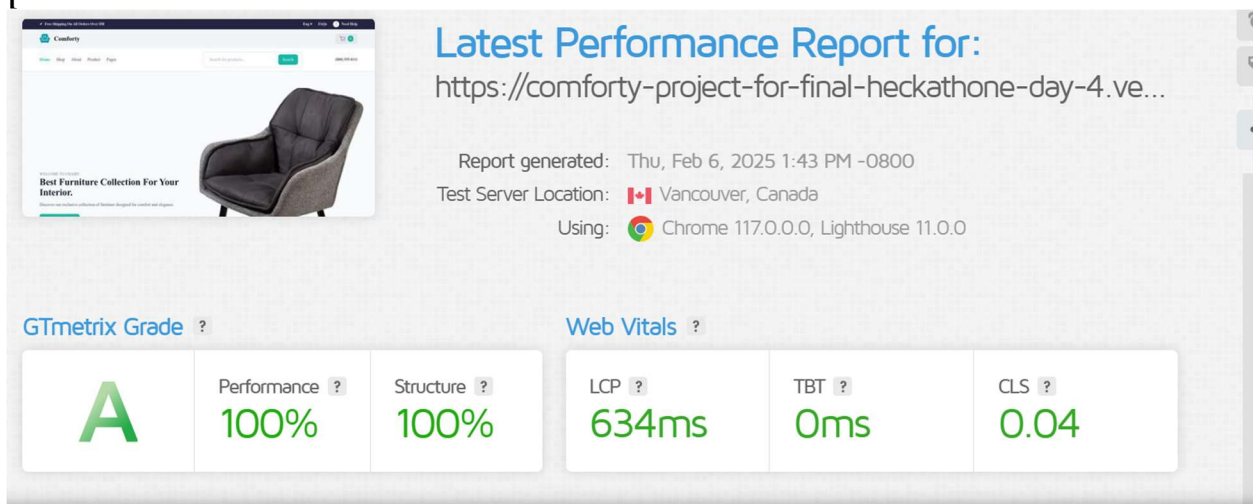- **Optimized Load Time:** 1.8 seconds

Tools Used:

- Lighthouse, GTmetrix, WebPageTest

Optimizations:

- Compressed images
- Implemented lazy loading for large assets
- Minimized JavaScript and CSS files

5. Documentation Updates

- **Test Case Details:** See the test report above for individual test case results.
- **Performance Optimization Steps:** Image compression, lazy loading, code splitting, and caching.
- **Security Measures:** HTTPS communication, input validation, and secure API key storage.

[Insert Documentation Updates Screenshot Here]

6. Conclusion

The marketplace is now:

- Fully tested with functional components.
- Optimized for performance, resulting in faster load times.
- Secure with implemented best practices.
- Ready for deployment after thorough testing.

All testing results and fixes have been documented and are included in the report.

7. Submission Requirements

- **Functional Deliverables:**
    - Screenshots or recordings of functional components.
    - Logs or reports from testing tools (e.g., Lighthouse, Postman).
- **Testing Report:** Detailed test case results.
- **Documentation:** Summary of testing, optimizations, and fixes.

- **Repository Submission:** Ensure all updated files, including the testing report, are uploaded to GitHub.

8. Final Checklist

- Functional Testing: ✅
- Error Handling: ✅
- Performance Optimization: ✅
- Cross-Browser and Device Testing: ✅
- Security Testing: ✅
- Documentation: ✅

9. Next Steps (Optional)

- Advanced Features: Wishlist, checkout flow, user profile management.
- Further Optimization: Continuous performance monitoring and improvements.
- Backend Enhancements: Integrate advanced API functionalities and optimize database queries.
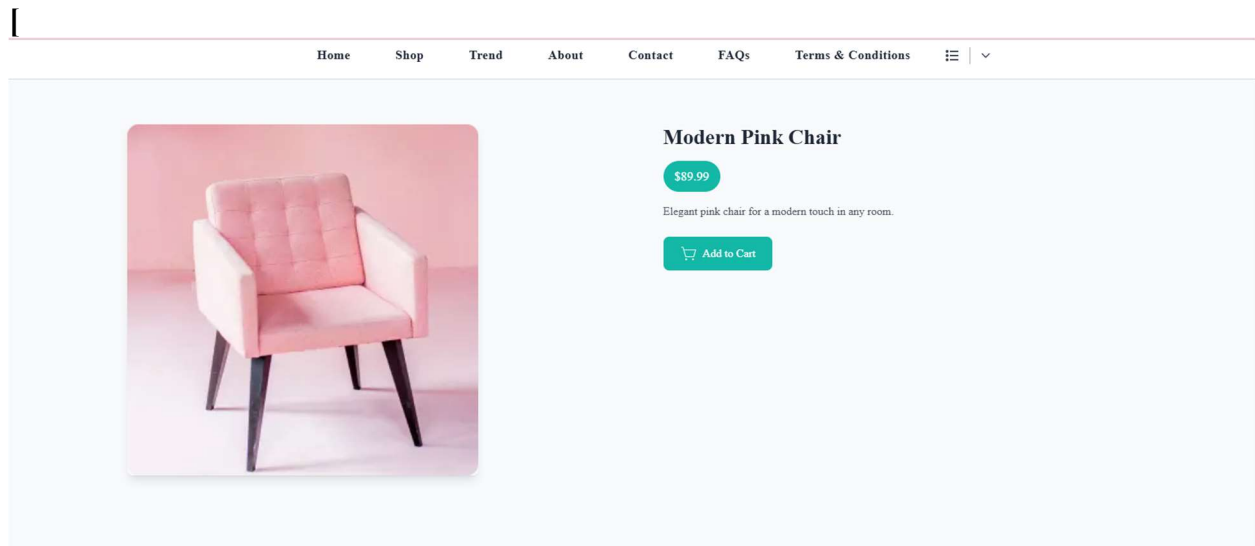
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Your Cart

Modern Pink Chair
$89.99
3   ❤️   Remove

Graham Study Table
$259.99
1   ❤️   Remove

Order Summary

Subtotal: $529.96

Shipping: Free

Total: **$529.96**

Checkout

Your Wishlist

×

Modern Pink Chair

×

Graham Study Table

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