Day 5 - Testing and Backend Refinement - General E-Commerce

1. Introduction

This document summarizes the testing, error handling, and backend integration refinement performed for the marketplace application. The goal was to ensure the application is functional, secure, and user-friendly while handling all edge cases effectively.

2. Key Features Tested

1. **Dynamic Product Listing**:
   - Products fetched from Sanity CMS.
   - Dynamically displayed with responsiveness.
2. **Search Functionality**:
   - Users can search for products with valid/invalid inputs.
3. **Product Details Page**:
   - Pages rendered dynamically based on product ID.
4. **Cart Operations**:
   - Add to cart, remove from cart, and update totals.
5. **Error Handling**:
   - Gracefully handling API failures and invalid inputs.

3. Testing Process

3.1 Tools Used

- **Cypress**: For end-to-end testing.
- **Postman**: For API testing and validation.
- **Lighthouse**: For performance and accessibility evaluation.

4. Error Handling

- **API Errors**:
  - Handled using `try-catch` blocks.
  - Displayed user-friendly error messages, e.g., "Unable to fetch products."
- **Search Edge Cases**:
  - For invalid search terms, displayed "No products found."
- **Fallback UI**:
  - If no data is available, placeholders and messages guide users.

5. Performance Optimization

1. **Tools Used**: Lighthouse.
2. **Steps Taken**:
   - Compressed images and enabled lazy loading.
   - Minified JavaScript and CSS files.
   - Implemented caching strategies.
3. **Results**:
   - Reduced initial page load time to under 2 seconds.
   - Improved Lighthouse scores for performance and accessibility.

6. Security Enhancements

1. **Input Validation**:
   - Validated user inputs to prevent XSS and SQL injection.
2. **API Security**:
   - Used HTTPS for all API communications.
   - Stored sensitive data (like API keys) in environment variables.

7. Issues Encountered and Resolutions

Issue	Root Cause	Resolution
API fails occasionally	Network connectivity issue	Added fallback UI and retry mechanism
Search shows no results	Typing errors or invalid terms	Improved error messaging for invalid inputs
Cart total not updating	Missing state update in logic	Fixed state management issue

8. Test Report:

Link: https://github.com/AbdullahNisar123/e-commerce-website-hackathon-3-Documentation/blob/main/Day-5/Testing_Report.csv