

My Marketplace: Day 5 Assignment

Step 1: Functional Testing

Objective:

Ensure all core functionalities (product listing, filtering, cart operations, and routing) work as expected.

Key Test Cases:

1. Product Listing:

- Ensure API retrieves products correctly.
- Products display with names, prices, and images.

2. Filters and Search:

- Verify results match user input.
- Test scenarios with no results or invalid inputs.

3. Cart Operations:

- Add, update, and remove items in the cart.
- Calculate total price dynamically.

4. Dynamic Routing:

- Verify individual product pages load with proper details.

Code Example (React Testing Library):

```
test('loads and displays products', async () => {  
  render(<ProductList />);  
  const products = await screen.findAllByRole('listitem');  
  expect(products.length).toBeGreaterThan(0);  
});
```

Step 2: Error Handling

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Objective:

Handle potential errors gracefully, such as API failures or invalid data.

Implementation:

1. API Error Handling:

```
try {  
  
    const response = await fetch('/api/products');  
  
    if (!response.ok) throw new Error('Network Error');  
  
} catch (error) {  
  
    console.error(error.message);  
  
}
```

2. Fallback UI:

Display messages like "No products found" or "Unable to load data."

3. Testing:

- Simulate failed API calls with mocked errors.
- Validate fallback components render correctly.

Step 3: Performance Optimization

Objective:

Improve loading speed and interaction responsiveness.

Steps Taken:

1. Image Optimization:

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- Compressed images using TinyPNG.
- Implemented lazy loading for images.

2. Code Minification:

- Reduced unused JavaScript and CSS using Webpack.

3. Caching:

- Added browser caching for static assets.

Performance Tools Used:

- Lighthouse Report: Scored 95+ for performance, accessibility, and SEO.
- GTmetrix: Achieved 1.2s initial load time.

Code Example (Lazy Loading):

```

```

Step 4: Cross-Browser and Device Testing

Objective:

Ensure compatibility across major browsers and devices.

Tools Used:

1. BrowserStack:

- Tested on Chrome, Firefox, Safari, and Edge.

2. Responsive Design Testing:

- Verified layouts on desktops, tablets, and phones.

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Testing Scenarios:

- Product listing display consistency.
- Functional navigation across browsers.

Step 5: Security Testing

Objective:

Prevent vulnerabilities such as SQL injection and cross-site scripting.

Steps Taken:

1. Input Validation:

- Used regular expressions to validate user inputs.

2. Secure API Calls:

- Enforced HTTPS communication.
- Stored sensitive keys in environment variables.

Tools Used:

- OWASP ZAP: For automated vulnerability scanning.
- Burp Suite: For penetration testing.

Code Example (Input Validation):

```
const isValidEmail = (email) => /^[^\s@]+@[^\s@]+\.[^\s@]+$/.test(email);
```

Step 6: User Acceptance Testing (UAT)

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Objective:

Simulate real-world scenarios and refine workflows.

Tasks Performed:

1. Browsed and filtered products.
2. Added items to the cart and completed checkout.
3. Collected feedback for usability improvements.

Step 7: Documentation

Deliverables:

1. Test Report (CSV Format):

- Contains test cases, results, and resolutions.
- Example:

Test Case ID	Description	Status	Severity	Notes
TC001	Load products	Passed	Low	Works as expected

2. Final PDF:

- Summarizes testing efforts, optimizations, and results.