Day 5 - Testing, Error Handling, and Backend Refinement -FoodTuck Q-Commerce Website

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Objective

The task for Day 5 focused on improving backend functionality and error handling to ensure the application runs smoothly. Functional testing was implemented, and issue resolution was carried out for the marketplace application.

Testing & Refinement Steps:

1. Functional Testing:

What I did: I thoroughly tested the application by focusing on key features such as user registration, login, product addition, and order placement.
Tools used: Postman was used to test the APIs, and Lighthouse was used to evaluate the performance of the application.
Outcome: The application's main functionalities were successfully tested, ensuring that all features work as expected.
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2. Error Handling:

What I did: I implemented proper error handling across the website to ensure users encounter user-friendly error messages in case of unexpected issues or system errors.
Outcome: The user experience was enhanced with proper error messaging, and the backend was refined to optimize response times by removing unnecessary server requests.
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3. Backend Integration Refinement:

Fetching Data from Sanity CMS:

- First, I fetched data from Sanity CMS, where I had stored the food items data.
- I used the Sanity API endpoint and wrote a GROQ query to retrieve the required data

Checking Data with Postman:

- I used Postman to send a GET request and fetch data from the Sanity API.
- After sending the request, I checked the response and successfully received the food items data in JSON format**.**
- The data was being fetched correctly, and everything was functioning as expected.

Testing Tool

API Testing with Postman (Sanity Integration)
To ensure proper backend integration with Sanity, I tested the API endpoint using Postman to fetch the data for food items from the database. This step was crucial to confirm that the frontend could retrieve and display data correctly.
Test Steps:

1. Constructed the URL for the API query:
2. https://<PROJECT_ID>.api.sanity.io/v1/data/query/production?query=*[_type == 'food']
3. Added the Authorization header with a valid token for secure access.
4. Triggered the request to fetch food items data from Sanity.
5. Checked the response status and the structure of the returned data.

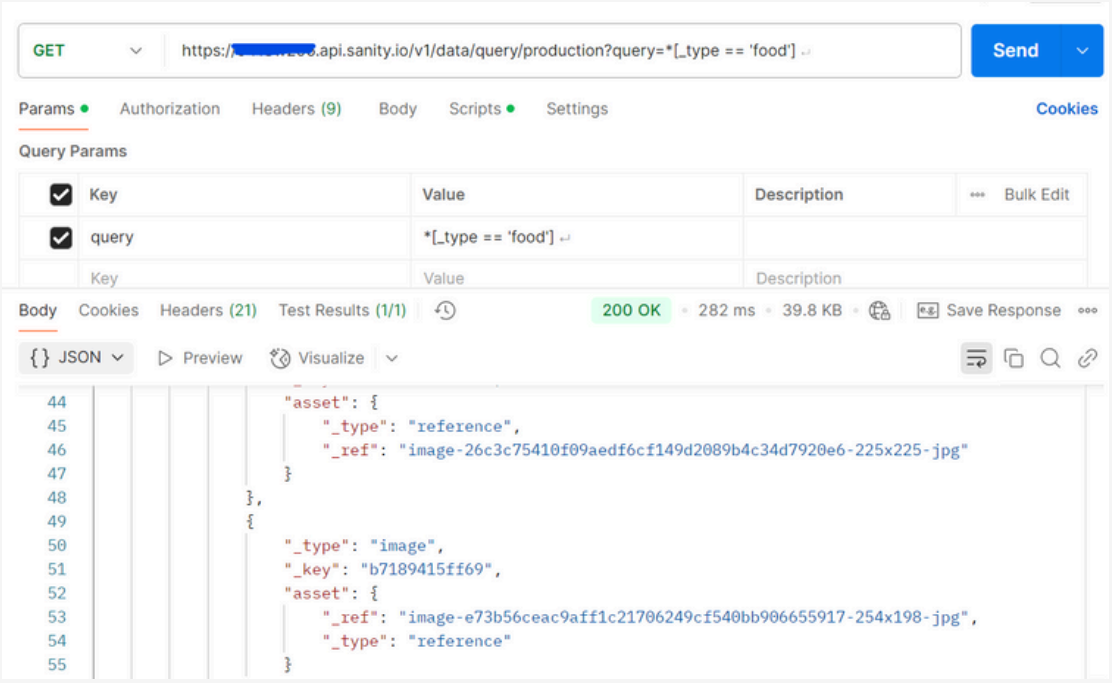
Expected Result:

- The API should return a list of food items, formatted correctly, with all relevant details such as name, description, and price.

Actual Result:

- The API successfully returned the expected data, confirming that the integration is working as expected.

Status: Passed



React Testing Library: Component Testing

To ensure the correct functionality of my components, I tested them using React Testing Library. This step was crucial for verifying that the components render as expected and respond correctly to user interactions.

Test Steps:

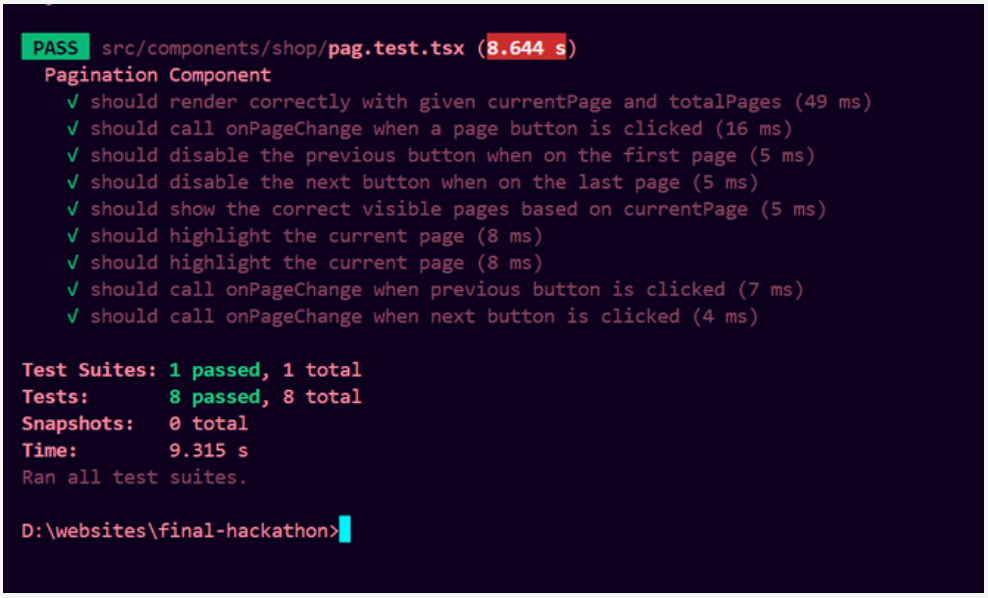
1. Imported the necessary testing utilities from React Testing Library.
2. Created test cases for rendering components, simulating user actions (e.g., clicking buttons), and checking if the components update accordingly.
3. Ensured that components displayed the expected content based on the state and props.
4. Validated the interaction behavior, such as handling button clicks and form submissions.
5. Verified that the components handle edge cases and error states properly.

Expected Result: Components should render correctly, respond to user input, and handle interactions as expected**.**

Actual Result: Out of the total tests, some tests passed successfully, but a few failed due to issues such as:

- Incorrect rendering of dynamic data.
- Misbehavior in user interactions (like button clicks not triggering the expected results).
- Some components not handling edge cases properly.

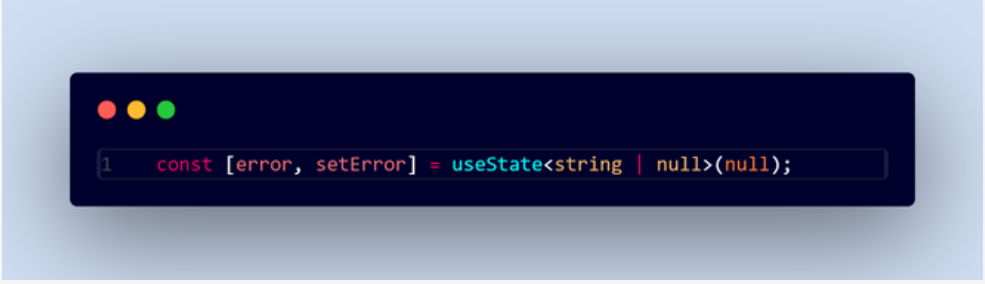
Status: Partial Pass (Some Tests Failed)



Error Handling

Steps for Error Handling:

State Management for Error: The state error is defined using the useState hook to hold the error message whenever an error occurs. If an error happens during the API call, the error message will be saved to this state.



Fetching Data with Error Handling:

The fetchFoods function is responsible for fetching the food data from the Sanity API. If any error occurs during the fetch (such as no data returned or an issue with the query), it will throw an error and the catch block will capture this error.

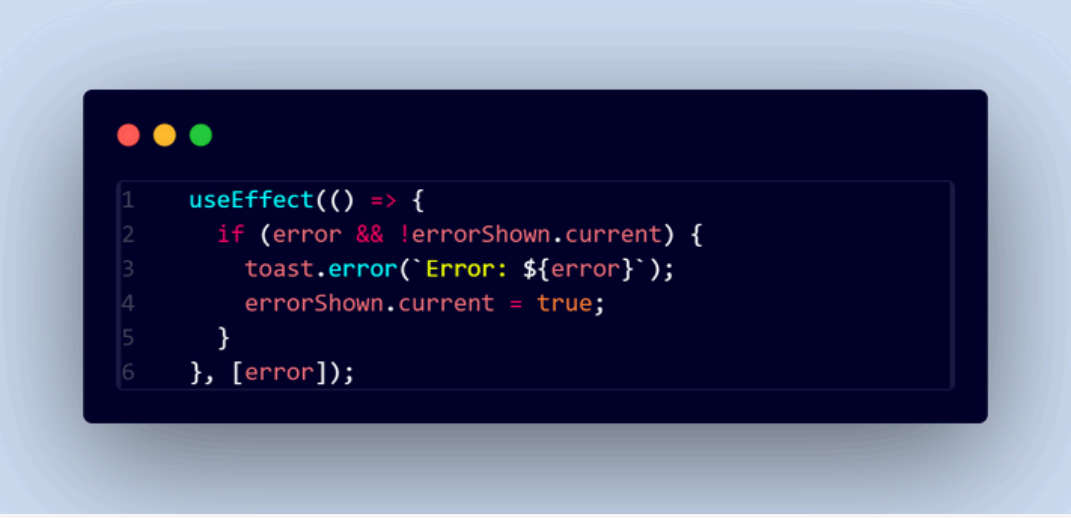
```
const fetchFoods = async () => {
    try {
      const query = `
*[_type == "food"]{_id, name, category, price, originalPrice, image, slug}`;
      const foods = await client.fetch(query);

      if (!foods.length) {
        throw new Error("No data found or query is incorrect");
      }

      setAllFoods(foods);
    } catch (error: any) {
      console.error("Error caught:", error);
      setError(error.message || "Something went wrong");
    }
  };
```

Displaying Error Message Using Toast:

If an error occurs, the state error is updated, and a toast notification is triggered using react-toastify to show the error message to the user. This is done inside a useEffect hook to monitor the error state.



```
  useEffect(() => {
    if (error && !errorShown.current) {
      toast.error(`Error: ${error}`);
      errorShown.current = true;
    }
  }, [error]);
```

Performance Optimization with Lighthouse

To ensure that the web page performs at its best, I used Lighthouse, an automated tool by Google, to analyze the page's speed, accessibility, SEO, and best practices. The Lighthouse tool provides a comprehensive report on how the page is performing and highlights areas that need improvement.

Performance Optimization with Lighthouse

I used Google Chrome Developer Tools to run a Lighthouse audit on the page, which provided a detailed report on the following key metrics:

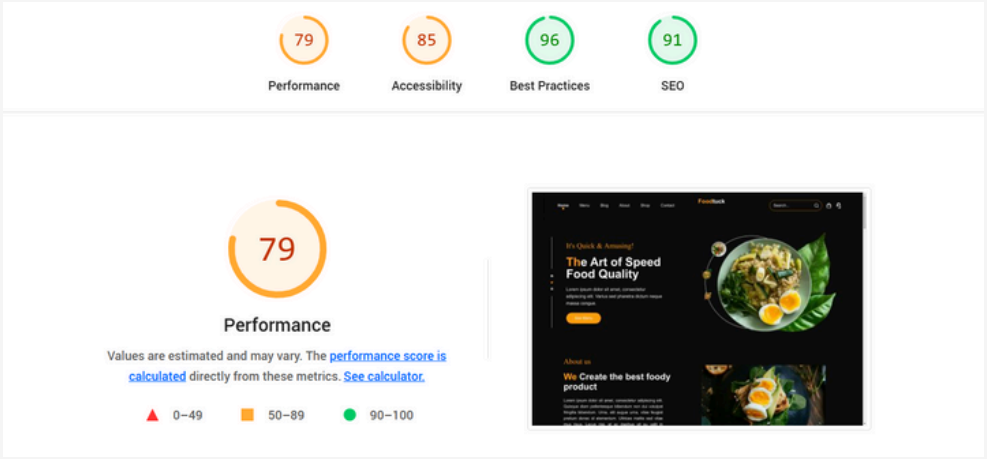
- Performance: Analyzed page speed and load time.
- Accessibility: Checked usability for users with disabilities.
- SEO: Evaluated search engine optimization.
- Best Practices: Assessed adherence to coding standards.

Based on Lighthouse recommendations, I implemented the following optimizations:

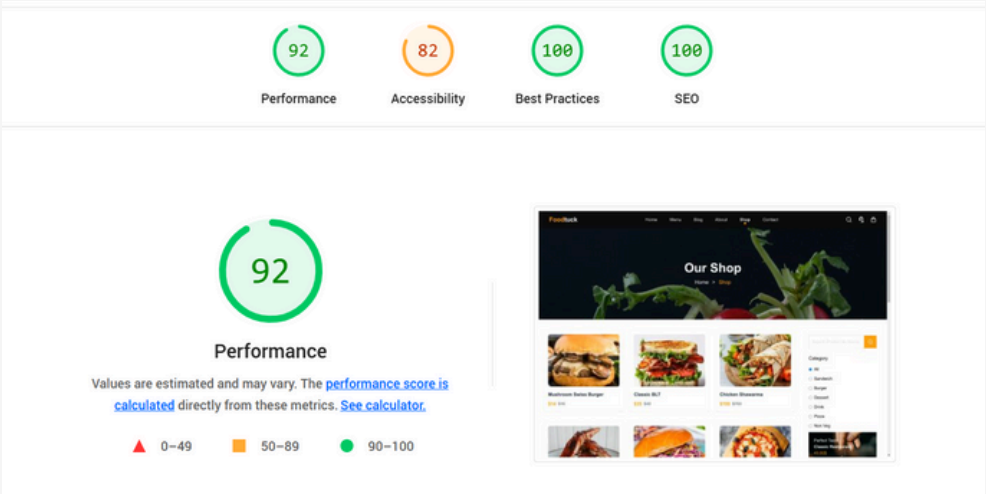
- Reduced Unused CSS: Removed unnecessary CSS to improve load times.
- Enabled Browser Caching: Cached static assets to avoid reloading on each visit.
- Optimized JavaScript Bundles: Minimized JavaScript file sizes for faster page load and interactivity.

These changes significantly improved the page's loading speed and overall performance.

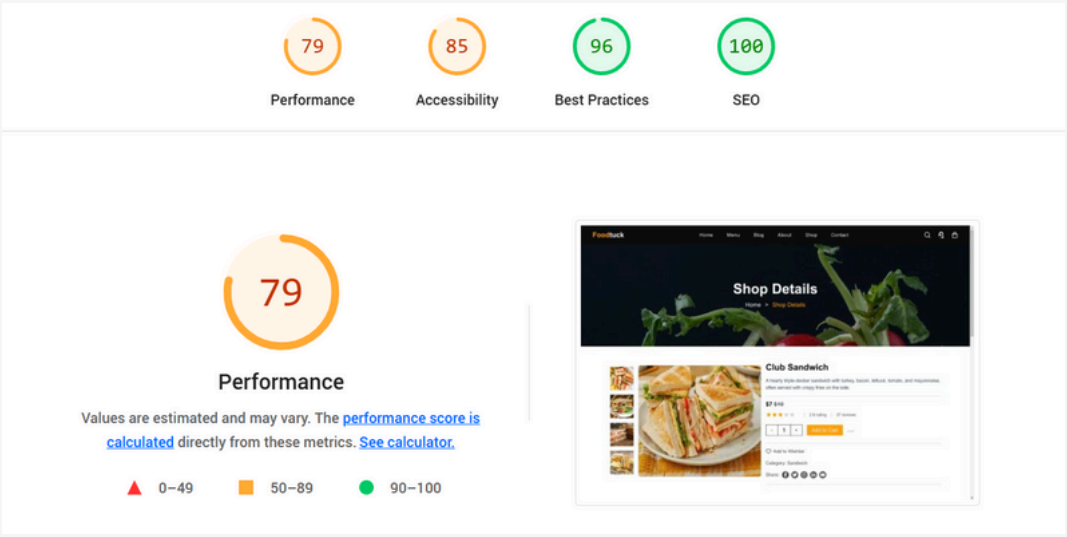
Homepage Performance



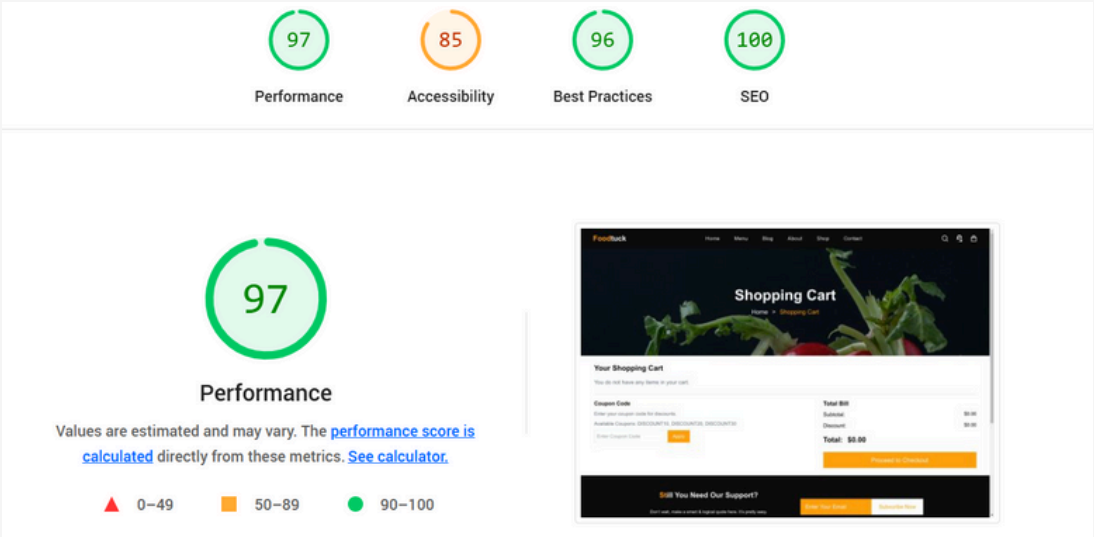
Food Listing Page Performance



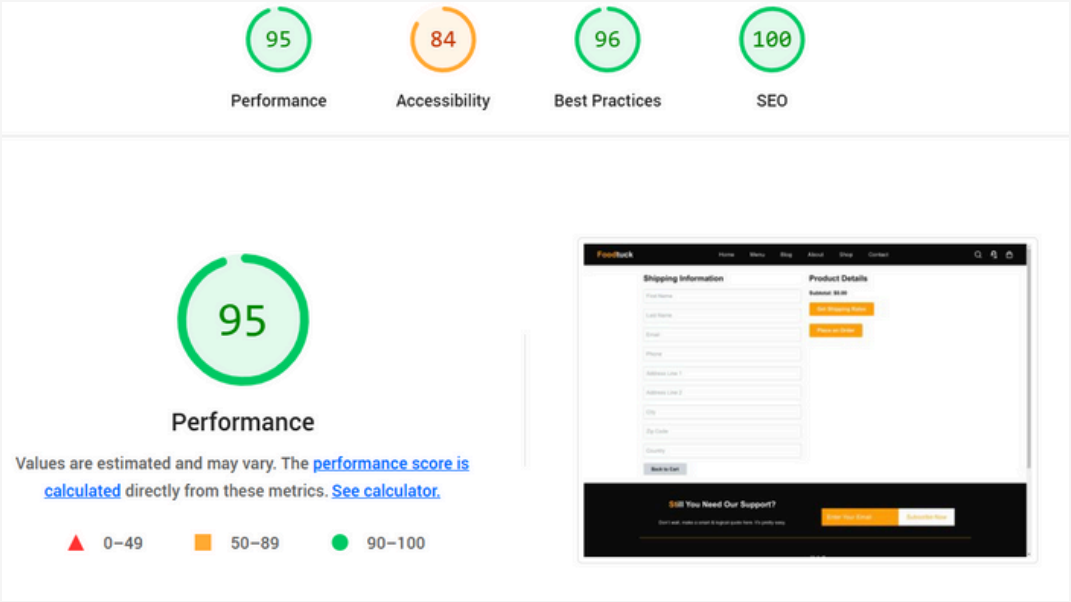
Food Detail Page Performance



Cart Detail Page Performance



Checkout Page Performance



Cross-Browser and Device Testing

I used BrowserStack to test the page's compatibility across different browsers and devices. It allowed me to ensure that the page works seamlessly for users, no matter what browser or device they are using.
Steps Taken:

1. Opened BrowserStack and selected the desired browser and device.
2. Conducted tests on multiple browsers (e.g., Chrome, Firefox, Safari) to ensure consistent behavior.
3. Verified page responsiveness, layout consistency, and functionality on various devices.

Outcome: By utilizing BrowserStack, I was able to identify and fix any cross-browser or device-related issues to enhance the user experience.

. Testing Report (CSV Format)

Test Case ID	Test Case Description	Test Steps	Expected Result	Actual Result	Status	Severity Level	Assigned To	Remarks
TC01	**Verify food product display**	1. Open website and navigate to Shop page. 2. Check food items are displayed with name, image, original price with line-through, and discounted price.	Food items displayed with name, image, original price with line-through, and discounted price.	All products are shown correctly with name, image, and prices as expected. Original price has line-through.	Passed	Medium	-	Test passed. No issues with product display or pricing.
TC02	**Verify Dynamic Routing for Food Details Page**	1. Navigate to the food product page from shop.	The correct product page loads for the selected item.	The correct product page with all details (name, description, price, benefits, category) loads correctly.	Passed	Medium	-	Test passed. All details are displayed.
		2. Verify that product details like name, description, price, benefits, and category are displayed correctly.	All product details should be visible on the page.	All product details (name, description, price, benefits, category) are displayed correctly.	Passed	Medium	-	All data fetched correctly from Sanity.
TC03	**Verify that the category filter functionality correctly displays food items according to selected categories using radio buttons.**	Navigate to the Shop page where all food items are displayed.	When a category is selected, only food items from that category should be visible. All relevant details (name, price, description, etc.) of the filtered items should be displayed correctly.	(Write your result, e.g., "Category filter works as expected for all categories".)	Passed/Failed	Medium	Optional	(Mention any notes, e.g., "Filtering works for all categories except 'Non Veg'".)
		Identify the radio button group for food categories (e.g., Sandwich, Burger, Dessert, etc.).						
		Select a category, for example, **"Burger"** by clicking its radio button.						
		Check if only items belonging to the **"Burger"** category are displayed.						
		Repeat the steps for other categories like **"Drink"** or **"Pizza"**.						
TC04	Verify that the search bar allows users to search for food items by name and displays matching results.	1. Navigate to the Shop page where the search bar is located.	When a user types a food name (e.g., "Pizza"), only food items containing "Pizza" should be displayed, showing correct name, price, description, and other details.	(Write your result, e.g., "Search functionality correctly displays matching food items.")	Passed/Failed	Medium	Optional	The search bar correctly handles inputs regardless of letter case (case-insensitive).
		2. Click on the search bar and type the name of a food item, such as "Pizza".						
		3. Press Enter or click the search button.						
		4. Observe if only food items matching the search term are displayed.						
TC05	Verify that users can filter food items based on price range using a slider from $0 to $800.	1. Navigate to the Shop page.	Only food items with prices within the selected range should be displayed (between $100 and $500).	(Write your result, e.g., "Food items are correctly filtered according to the selected price range."	Passed/Failed	Medium	Optional	The slider filters items dynamically as the price range changes.
		2. Use the price range slider to select a range between $100 and $500.						
		3. Observe the displayed food items.						

TC06	Verify that pagination allows users to navigate through multiple pages of food items, displaying 12 items per page.	1. Navigate to the Shop page.	The correct number of food items (12) should be displayed per page, and navigation buttons should load the corresponding items correctly.	(Write your result, e.g., "Pagination works as expected, showing 12 items per page and allowing navigation between pages.")	Passed/Failed	Medium	(Optional)	Pagination dynamically displays items as the user navigates between pages.
		2. Observe that only the first 12 food items are displayed initially.						
		3. Click the "Next" button or a page number to navigate to the next set of items.						
		4. Use the "Previous" button to go back to the first page						
TC07	Verify that the "Add to Cart" button allows adding food items to the cart, and quantity can be adjusted using increment and decrement buttons.	1. Navigate to the Shop page.	Clicking "Add to Cart" should add the item to the cart.	Write your result, e.g., "Add to Cart, increment, and decrement functionality work as expected. Quantity updates and total price are correct.")	Passed/Failed	High	Optional	Quantity changes dynamically with the use-shopping-cart library. Buttons correctly update item count.
		2. Select a food item and click the "Add to Cart" button.	The increment button should increase the item quantity.					
		3. Use the increment (+) button to increase the quantity.	The decrement button should decrease the item quantity (without going below zero).					
		4. Use the decrement (-) button to decrease the quantity.	The cart should display the correct updated total.					
		5. Check the cart for updated quantity and item details.						
TC08	Verify that applying a voucher code applies a discount to the cart total, stores the discount in local storage, and displays it on the checkout page.	1. Add items to the cart.	The discount amount should be subtracted from the total price when a valid voucher is entered.	(Write your result after testing, e.g., "Discount applied successfully, total updated, and discount value shown on checkout page.")	Passed/Failed	High	Optional	Ensure invalid voucher codes show an error message. Discount value persists correctly between pages.
		2. Enter a valid voucher code in the discount input field.	The discount should be saved in local storage.					
		3. Click the "Apply Discount" button.	The checkout page should display the discounted total and the applied discount amount.					
		4. Verify that the cart total is reduced by the discount amount.						
		5. Click the "Proceed to Checkout" button.						
		6. Check if the discount value is displayed on the checkout page.						

TC09	Verify that the total price, including quantity-based calculations and discounts, is correctly displayed on the cart and checkout pages.	1. Add multiple food items to the cart.	The total price should reflect the correct sum of (price × quantity) for each item. Discount should be subtracted correctly. The checkout page should display the final total, item details, and discount information	(Write your result after testing, e.g., "Total price and discount correctly applied and displayed on checkout page."	Passed/Failed	High	(Optional)	Ensure calculations are accurate for all quantity changes and discounts persist across navigation.
		2. Increase or decrease the quantity of food items using the increment and decrement buttons.						
		3. Apply a valid discount voucher.						
		4. Verify that the total price is updated correctly, subtracting the discount.						
		5. Click the "Proceed to Checkout" button.						
		6. Confirm that the checkout page displays the final total with quantity adjustments and applied discounts.						
TC10	Verify that when API data fetch fails, the fallback UI is displayed to inform users about the error.	1. Simulate an API failure by disabling the network or introducing an error in the API endpoint.	The fallback UI or a user-friendly error message should be displayed, guiding users without breaking the page layout.	(Write the result, e.g., "Fallback UI was shown correctly with an error message: 'Data failed to load. Please try again later.)"	Passed/Failed	High	Optional	Ensure fallback UI design is responsive and descriptive. Check console logs to avoid uncaught exceptions.
		2. Load the page where API data is fetched (e.g., product listing or category view).						
		3. Observe whether fallback UI or an error message is displayed instead of product data.						

Checklist for Day 5:

Task/Component	Status
Functional Testing	✓
Performance Optimization	✓
Error Handling	✓
Cross-Browser and Device Testing	✓
Documentation	✓
Final Review	✓