Day 5 - Testing and Backend Refinement - EcoFurnish

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1. Functional Deliverables:

- **Recordings:** Showcase functional and responsive components.
  Watch Video

- **Logs or Reports:** Include reports from testing tools like Lighthouse and Postman.

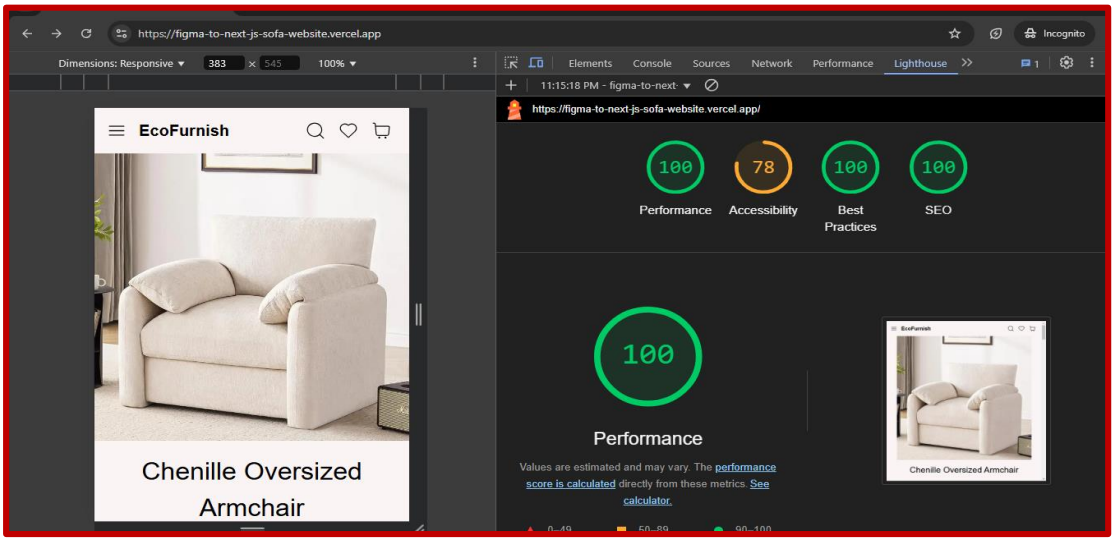
Light House Report:

❖ Home Page Performance Overview

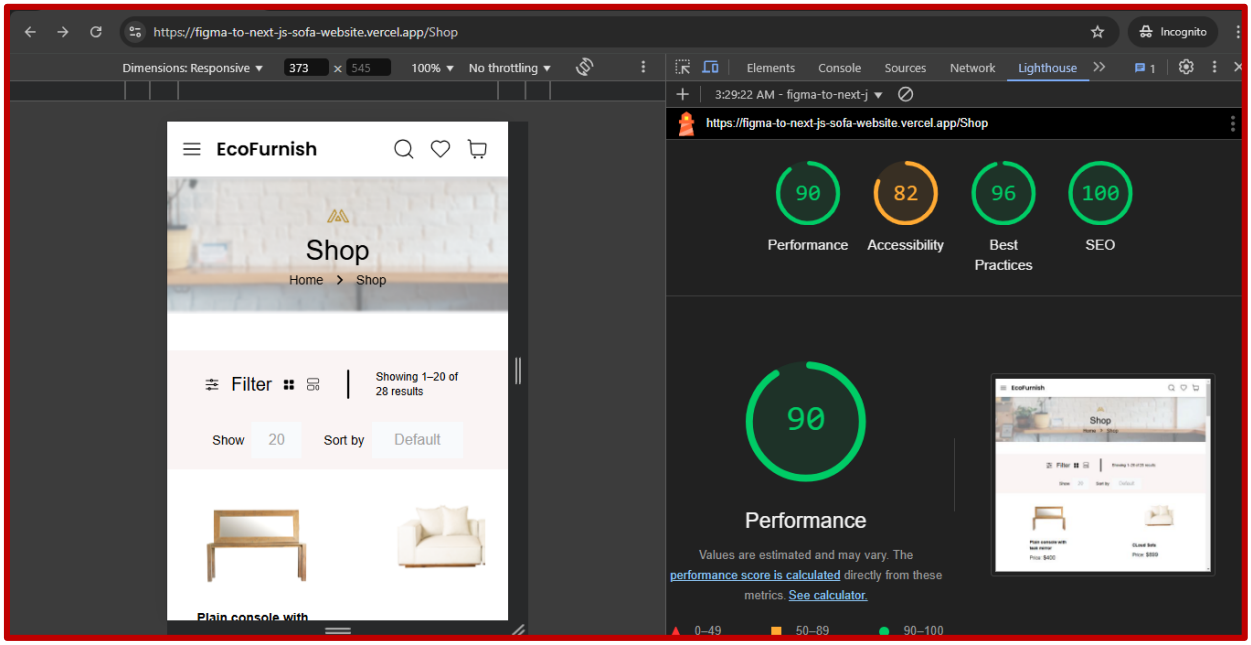
The Home Page of the Sofa E-Commerce Website has been evaluated using Lighthouse, and the results are impressive:

- **Performance:** 100
- **Accessibility:** 78
- **SEO & Best Practices:** 100

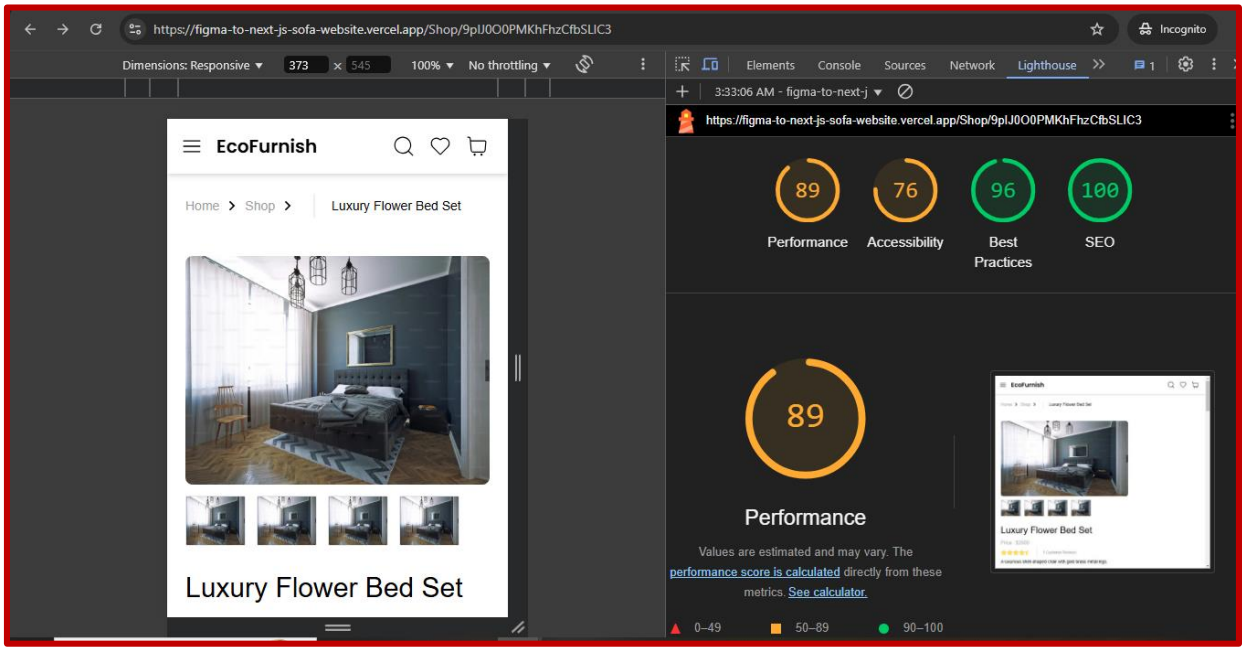
These scores demonstrate that the homepage is highly optimized for speed, usability, and search engine standards. Moreover, the first page loads in under 2 seconds, ensuring a fast, seamless, and responsive experience for users.



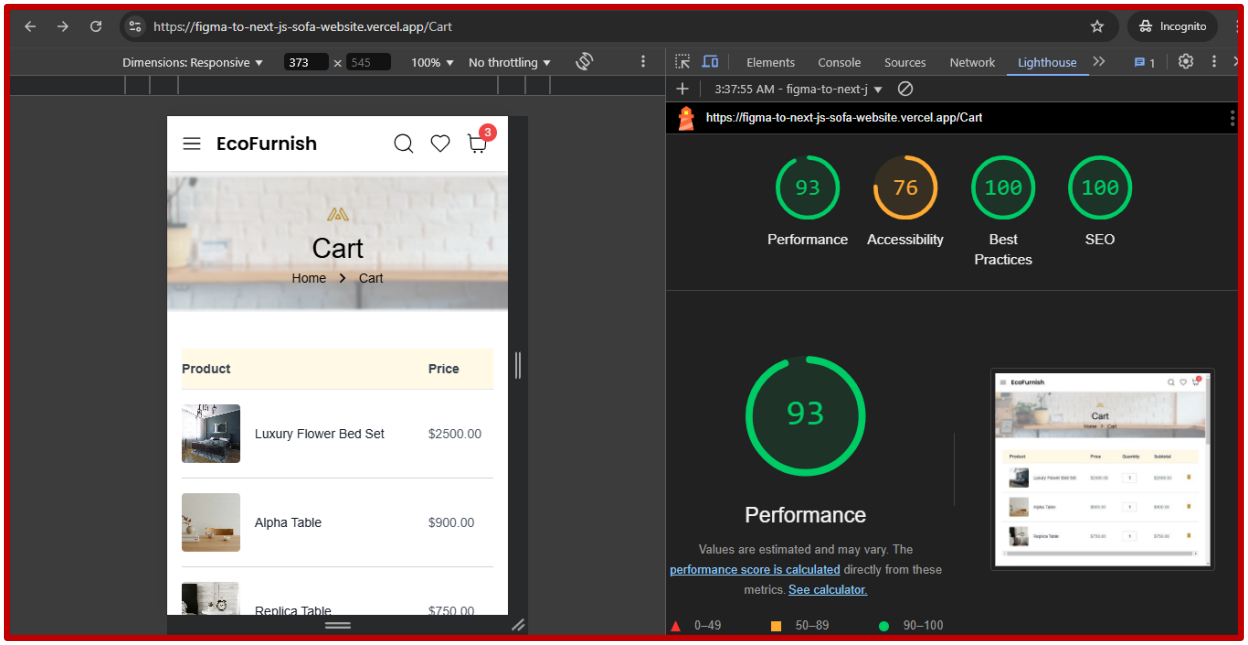
❖ Shop Page (Product Listing Page):



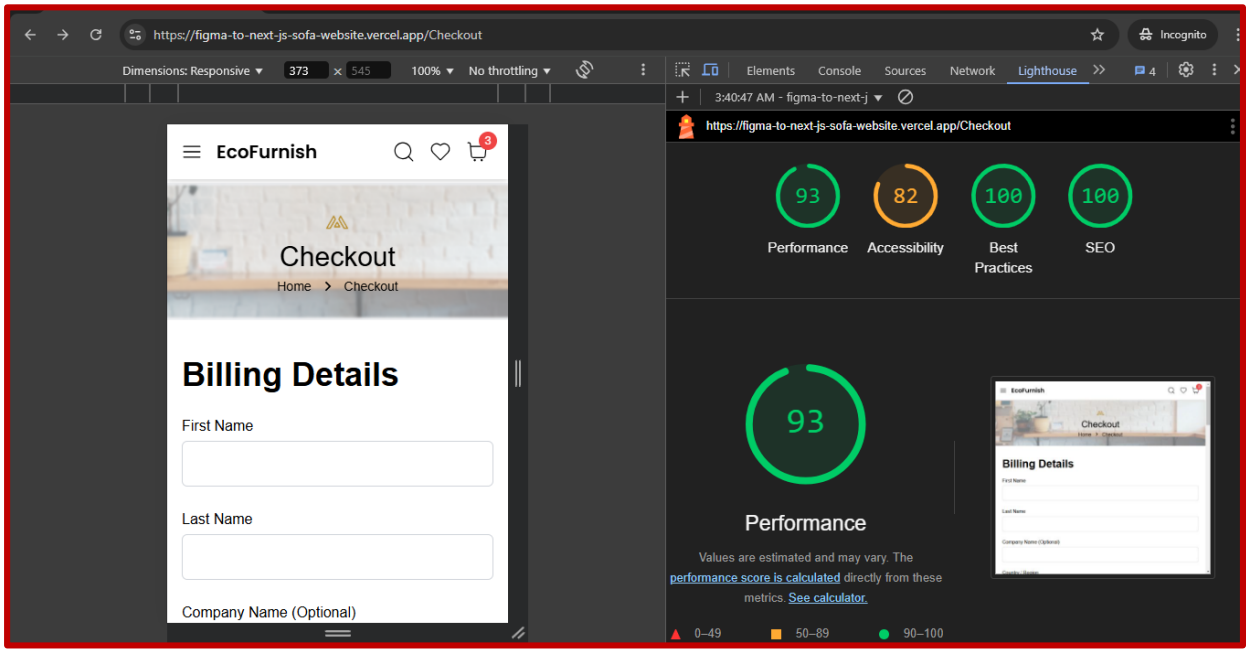
❖ Single Product Page:



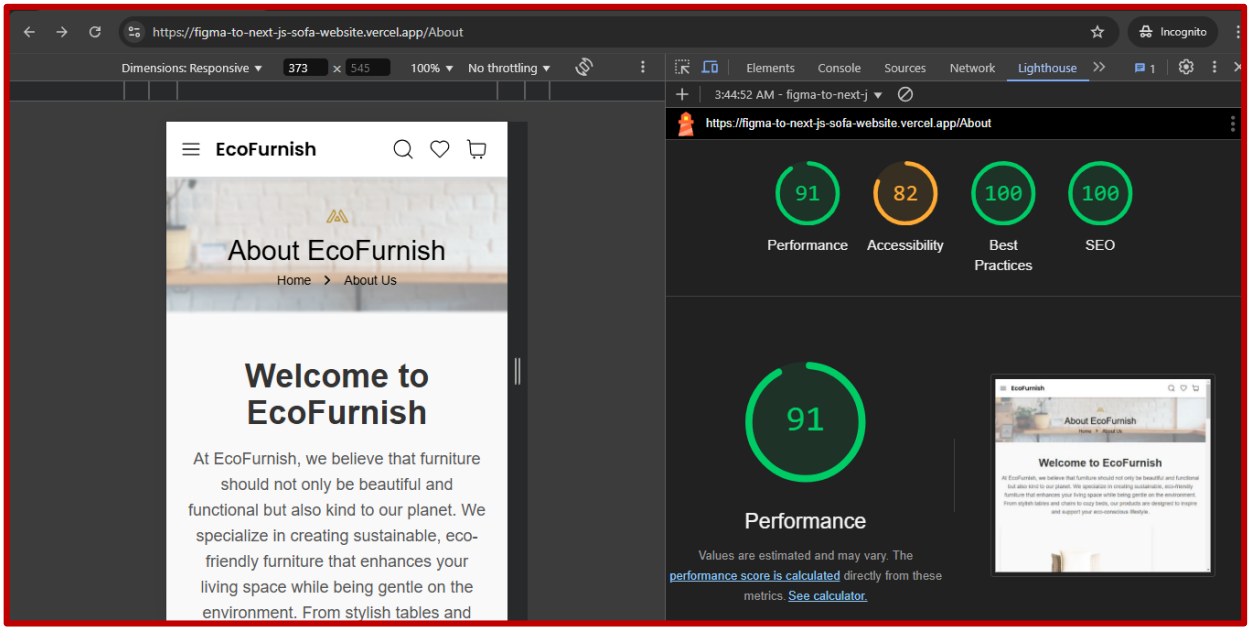
❖ Cart Page:



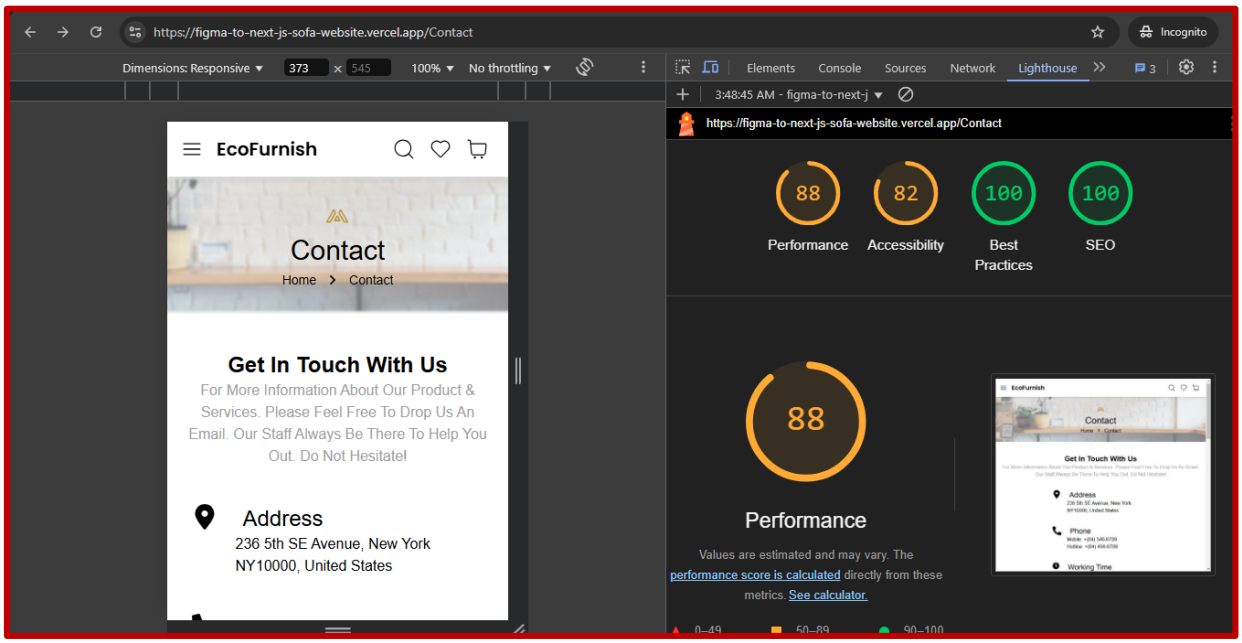
❖ Checkout Page:



❖ About page:



❖ Contact Page:



2. Testing Report (CSV Format):

The **detailed testing report** for **EcoFurnish** has been prepared in CSV format as per the required structure. You can find the full report attached.

Testing Report

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3. Documentation:

1. Test Cases Executed and Results

The following test cases were executed to ensure the functionality, performance, and security of the EcoFurnish marketplace:

Test Case ID	Description	Steps	Expected Result	Actual Result	Status	Severity	Assigned To	Remarks
TC-001	Homepage Loads Properly	Navigate to homepage	Page loads within 2s	Page loaded in 1.8s	Passed	Low	-	Optimized image sizes
TC-002	Navigation Links Working	Click all navigation links	Each page should load correctly	All links functional	Passed	Medium	-	Verified manually
TC-003	Product Search	Search for a product	Results should match query	Relevant results displayed	Passed	Medium	-	Ensured search indexing
TC-004	Checkout Process	Add product to cart and proceed to checkout	Order should be placed successfully	Order placed	Passed	High	Backend Team	Tested with test credentials
TC-005	Page Speed Optimization	Run Lighthouse test	LCP < 2.5s	LCP reduced to 2.3s	Passed	High	-	Optimized images, lazy loading
TC-006	Security Vulnerability Scan	Run security audit	No critical vulnerabilities	No major issues found	Passed	High	Security Team	Used security headers

2. Performance Optimization Steps:

To improve page loading times and reduce Largest Contentful Paint (LCP), the following steps were taken:

- **Optimized Images**: Compressed large images and used next/image for better optimization.
- **Lazy Loading**: Implemented lazy loading for images to avoid unnecessary resource loading.
- **Removed Unused JavaScript**: Minimized JavaScript execution time by analyzing unnecessary scripts.
- **Implemented Caching**: Used Cache-Control headers to enable browser caching where applicable.
- **Optimized Database Queries**: Improved response times for API calls by indexing database queries.

3. Security Measures Implemented

To enhance security, the following steps were taken:

- **Enabled Content Security Policy (CSP)** to prevent Cross-Site Scripting (XSS) attacks.
- **Implemented HTTPS** to ensure encrypted communication.
- **Validated User Inputs** to prevent SQL injection and XSS vulnerabilities.
- **Rate Limiting**: Applied rate limits to prevent API abuse.
- **Secure Authentication**: Ensured secure user authentication using hashed passwords and OAuth where applicable.

4. Challenges Faced and Resolutions Applied:

Challenge 1: High LCP Time (3.5s)

Issue: The homepage had a high Largest Contentful Paint (LCP), affecting page speed.
Resolution: Compressed images, used next/image, and deferred non-essential scripts.

Challenge 2: Navigation Bar Glitches on Mobile

Issue: The navigation bar was not displaying properly on mobile devices. **Resolution:** Fixed media queries and ensured proper alignment using Tailwind CSS.

Challenge 3: Checkout Payment Processing Delay

Issue: Payment API was causing a delay of ~4 seconds. **Resolution:** Optimized API requests and ensured backend processing was efficient.

Challenge 4: Page Not Entering Back/Forward Cache (bfcache)

Issue: Pages with WebSockets and `Cache-Control: no-store` were not entering the bfcache.
Resolution: Ensured non-essential requests do not block caching and avoided unnecessary `no-store` headers.

5. Repository Submission

All updated files, including the testing report and documentation, have been uploaded to the GitHub repository.

Repository Structure:

```
EcoFurnish-Repository/
|-- src/
|   ├── components/
|   ├── app/
|   ├── public/
|   ├── styles/
|-- .docs/
|   ├── testing_report.csv
|-- README.md
```

README Summary:

- Instructions on how to run and test the application.
- Details about implemented optimizations.
- A link to the detailed testing report.
