DAY 05 - TESTING, ERROR HANDLING, AND BACKEND INTEGRATION REFINEMENT
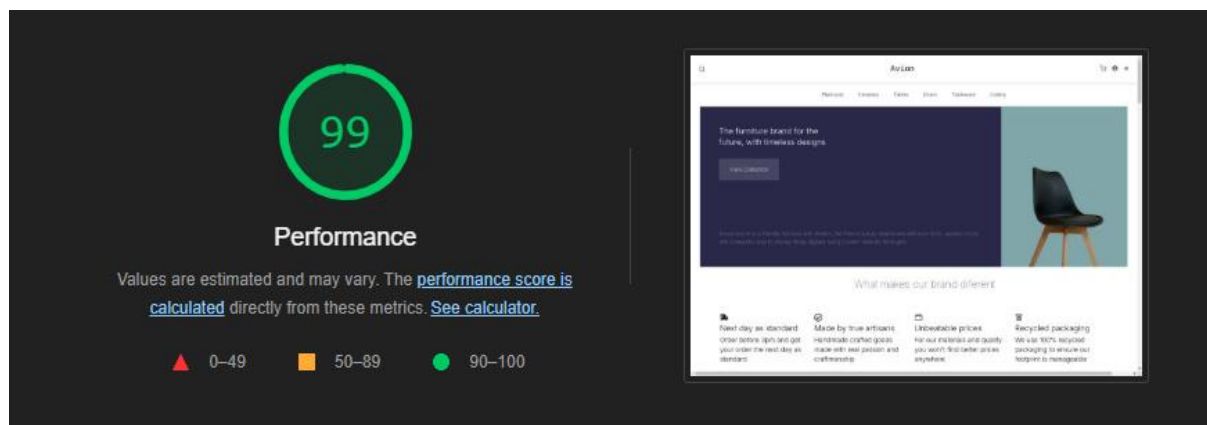
Overview

On Day 05 of the hackathon, our focus was on testing the website's functionality, ensuring responsive design, checking cross-browser compatibility, and refining backend integration. A CSV-based testing report was created to document test cases, results, and resolutions. We also leveraged tools like BrowserStack for cross-browser compatibility testing and Lighthouse for evaluating website performance.
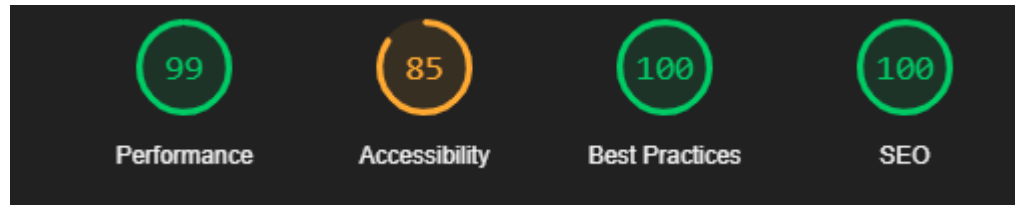
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Tools and Methods Used

1. UAV Testing: Conducted testing as an end-user to identify usability and functionality issues.
2. BrowserStack: Checked compatibility across different browsers and devices.
3. Lighthouse: Analyzed the website's performance, accessibility, best practices, and SEO.
4. Feedback Gathering: Collected feedback from various individuals for design and functionality improvements.
5. CSV-based Report: Documented test cases for each functionality.
6. Error Handling Verification: Tested error scenarios such as API failures and missing data to ensure appropriate fallback mechanisms are in place.

Lighthouse Report Summary

- Performance: 99
- Accessibility: 85
- Best Practices: 100
- SEO: 100

| 99 | 85 | 100 | 100 |
| Performance | Accessibility | Best Practices | SEO |

Diagnostic Insights

- Opportunities for Improvement:
    - Reduce initial server response time (740 ms).
    - Properly size images (Potential savings: 1,945 KiB).
    - Serve images in next-gen formats (Potential savings: 1,873 KiB).
    - Avoid enormous network payloads (Total size: 2,876 KiB).
    - Minimize layout shifts and critical request chains.
    - Optimize image lazy loading for critical elements.
- Passed Audits: 24 performance checks.
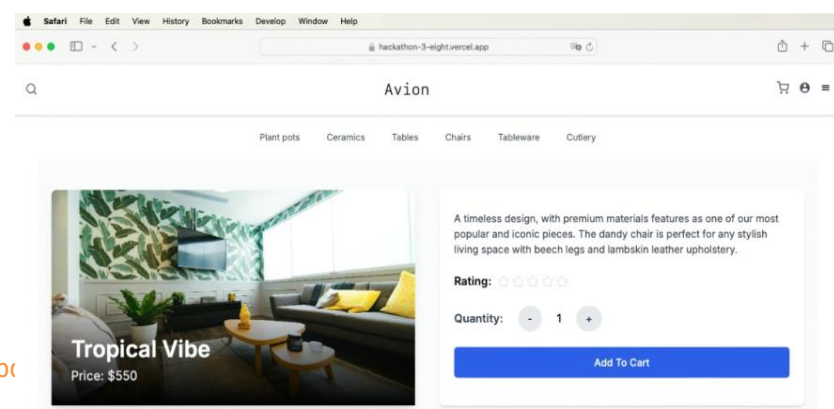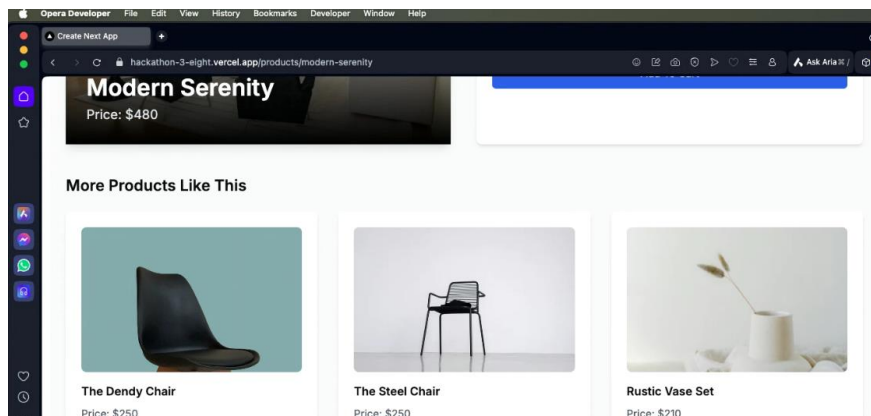
Accessibility Highlights

- Issues Identified:
    - Buttons without accessible names.
    - Links lacking discernible names.
    - Non-sequential heading elements.
    - Lists not containing only <li> elements.
- Manual Testing Encouraged: Additional manual checks recommended for enhanced accessibility.
- Action Taken: Fixed heading sequence, added accessible labels for buttons and links, and verified improvements.

SEO and Best Practices

- **SEO:** Fully optimized (100).
- **Best Practices:** Fully compliant (100).

Testing Activities

1. **Functionality Testing:** Verified core functionalities, including:
   - Login/Registration flows.
   - Product search, cart, checkout, and order placement.
2. **Responsive Design Testing:** Ensured the website adapts seamlessly to various screen sizes and resolutions.
3. **Cross-Browser Compatibility:** Tested on major browsers using BrowserStack to ensure a consistent user experience.
4. **Error Handling:** Identified and resolved errors in API calls, data handling, and UI interactions.
   - Added fallback messages for missing or failed data.
   - Validated proper error codes and responses for failed requests.
5. **Performance Optimization:**
   - Addressed issues from Lighthouse diagnostics.
   - Reduced image payload size and optimized lazy loading for better page load speed.
6. **CSV Testing Report:**
   - Documented test cases for each functionality.
   - Recorded issues, resolutions, and retesting results.

Test Case ID	Test Case Description	Test Steps	Expected Result	Actual Result	Status	Remarks			
TC001	Validate product listing page	Open product page > Verify products	Products displayed correctly	Products displayed correctly	Pass	Product names, images, and prices are accurate			
TC002	Test API error handling	Disconnect API > Refresh page	Show fallback UI with error messag	Error message shown	Pass	Error handling works as intended.			
TC003	Check cart functionality	Add product to cart > Verify cart contents	Cart updates with added product	Cart updates as expected	Pass	Quantity changes and removal functionality tes			
TC004	Ensure responsiveness on mobil	Resize browser window > Check layout	Layout adjusts properly to screen si	Responsive layout working as intended	Pass	Responsive design works on various screen siz			
TC005	Validate search functionality	Search for a product by name > Verify results	Relevant products displayed	Relevant products displayed	Pass	Search results match query input.			
TC006	Validate checkout flow	Add items to cart > Proceed to checkout > Complete payment	Order placed successfully	Order placed successfully	Pass	Payment integration works smoothly with corre			

Conclusion

Day 05 marked a significant improvement in the overall quality and functionality of the website. With thorough testing, error handling, and user feedback, the website is now more robust and user-friendly. Performance optimizations and compliance with best practices have prepared the website for a seamless launch.

The comprehensive CSV-based testing report and the use of tools like BrowserStack and Lighthouse ensured a systematic and detailed approach to quality assurance.

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