Name: Muhammad Awais (Senior Student) **Roll no. 00329887**

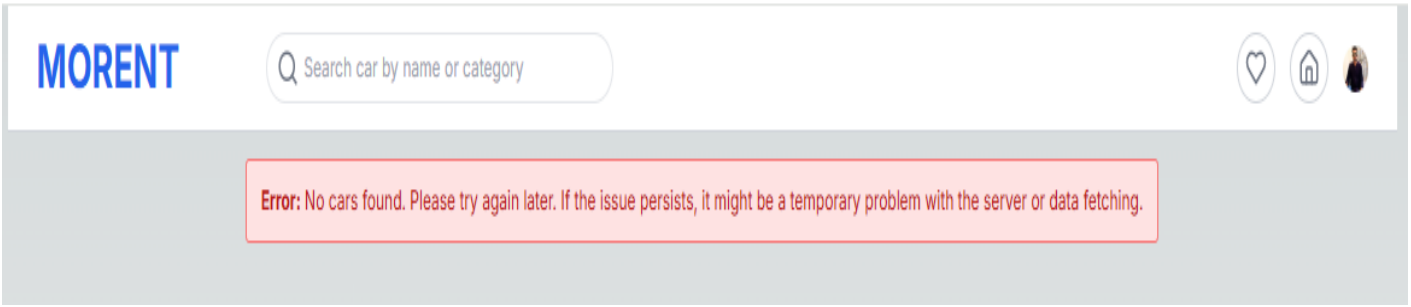
Hackathon Day 05: TESTING, ERROR HANDLING, AND BACKEND INTEGRATION REFINEMENT

Step 01: Functional Testing.

- **Car listing:** I have ensured that all cars are fetched correctly from the API and displayed on the homepage, with essential details like car name, price, and image. The display is clear and well-organized, allowing users to browse through various options easily. Responsiveness has been verified on both desktop and mobile.
- **Car Detail Pages:** I have verified that each car opens a dynamic detail page when the "Details" button is clicked. The correct car information appears with no errors, ensuring a smooth and informative user experience.
- **Filters and search:** I have validated that filters, such as car category type, price range, and the search functionality, provide accurate results based on the user's input. The results match the criteria set by the user, ensuring a smooth browsing experience.
- **Wish List:** I have ensured that clicking the heart icon adds a car to the wish list, and cars can be removed from the wish list without any issues. The "Rent Now" button starts the rental process seamlessly.
- **Dynamic routing:** I have verified that individual car detail pages load correctly when a user clicks on a specific car listing. Each car's unique information, such as specifications, price, and images, is displayed without any issues.

Step 02: Error Handling.

Clear error messages are displayed: if data fails to load (e.g. “No cars found. Please try again later. If the issue persists, there may be a temporary problem with the server or data fetching process.”).



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Step 03: Performance Optimization.

Performance Audit Summary:

Overall Scores:

- Performance: 89
- Accessibility: 86
- Best Practices: 78
- SEO: 100

Performance Metrics:

- **First Contentful Paint (FCP):** 0.3 seconds
- **Largest Contentful Paint (LCP):** 0.8 seconds
- **Total Blocking Time (TBT):** 50 ms
- **Cumulative Layout Shift (CLS):** 0.209
- **Speed Index:** 0.9 seconds

Performance Improvement Suggestions:

- Avoid large layout shifts (3 found).
- Lazily loaded Largest Contentful Paint (LCP) image.
- Eliminate render-blocking resources (Potential savings: 30 ms).
- Reduce unused JavaScript (Potential savings: 139 KiB).
- Minimize main-thread work (1.2 seconds).
- Address long main-thread tasks (6 tasks found).
- Optimize server response time (Root document: 30 ms).
- Minimize DOM size (365 elements).
- Avoid chaining critical requests (1 chain found).

Accessibility Suggestions:

- Ensure buttons have accessible names.
- Add discernible names to links.
- Improve background and foreground contrast for better legibility.
- Conduct manual accessibility reviews for undetected issues.

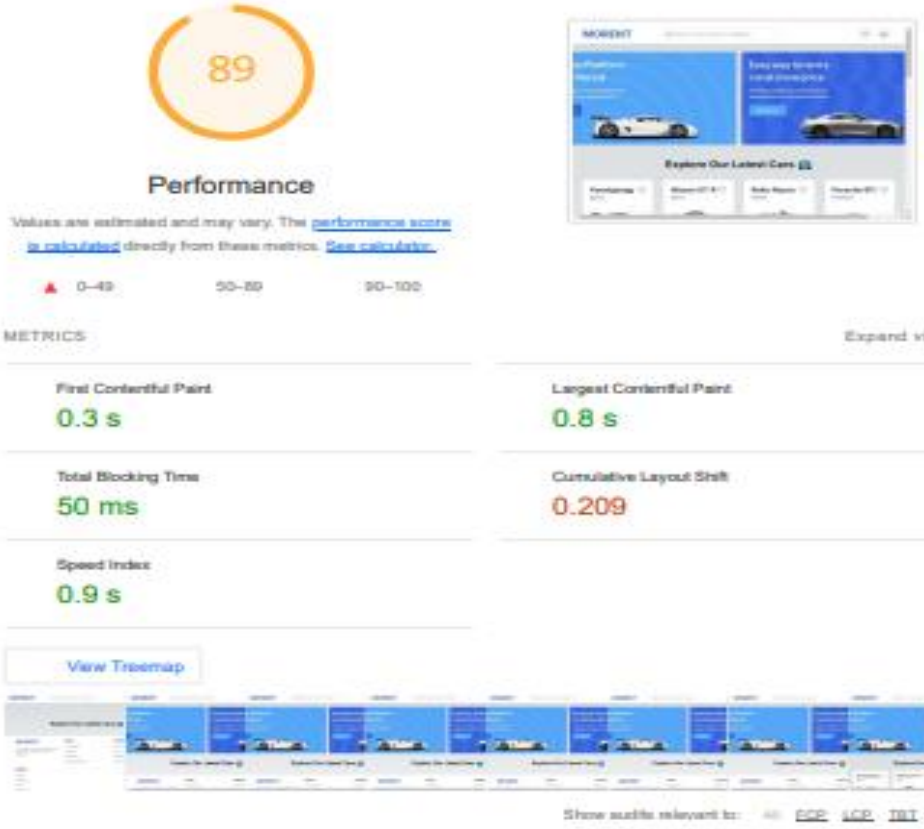
Best Practices Suggestions:

- Review third-party cookie usage (9 cookies found).
- Address logged issues in Chrome DevTools.
- Ensure Content Security Policy (CSP) is effective against XSS attacks.

SEO Insights:

SEO score is excellent at 100.

- No critical issues identified; manual checks recommended for best practices validation.
- This summary provides actionable steps to improve performance, accessibility, and best practices for a web app while maintaining excellent SEO results.



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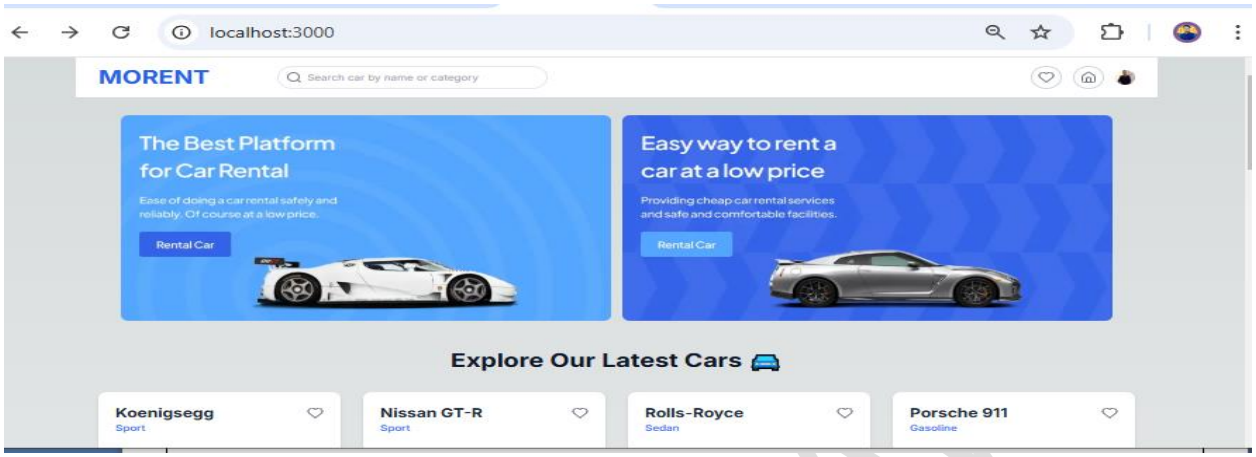
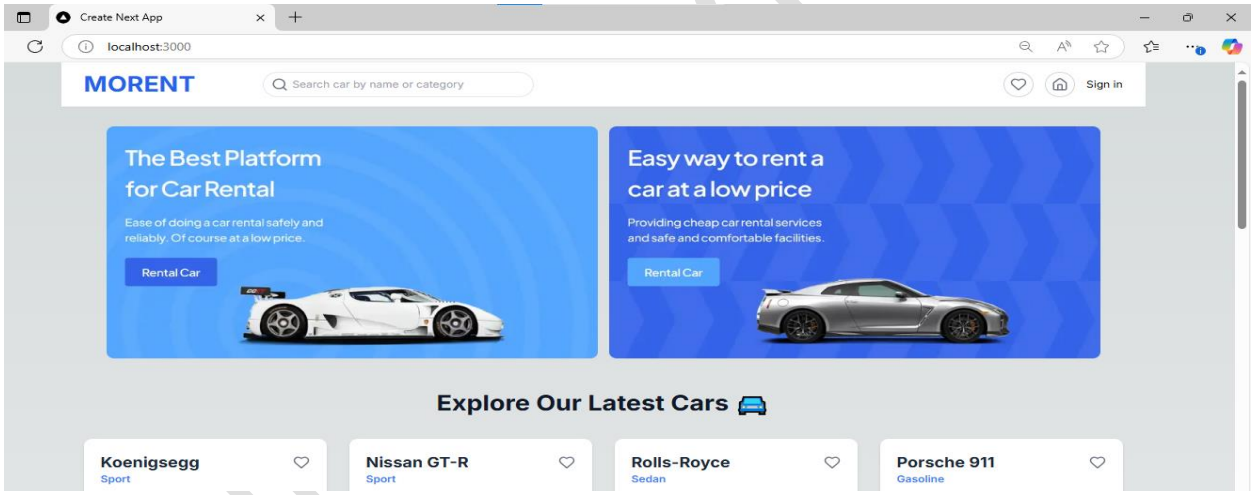
Step 04: Cross-Browser and Device Testing.

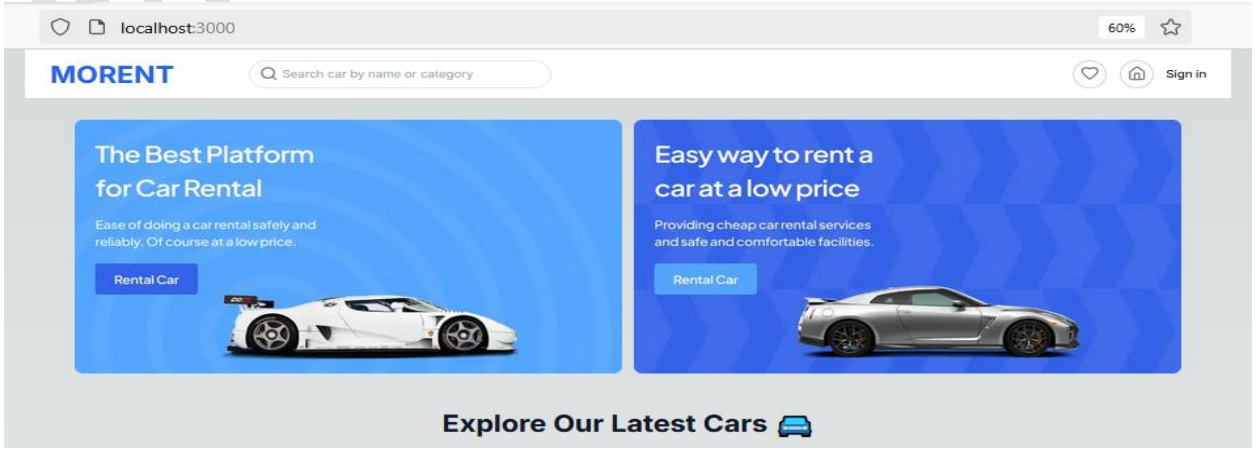
Google Chrome:



Microsoft Edge:



Firefox:



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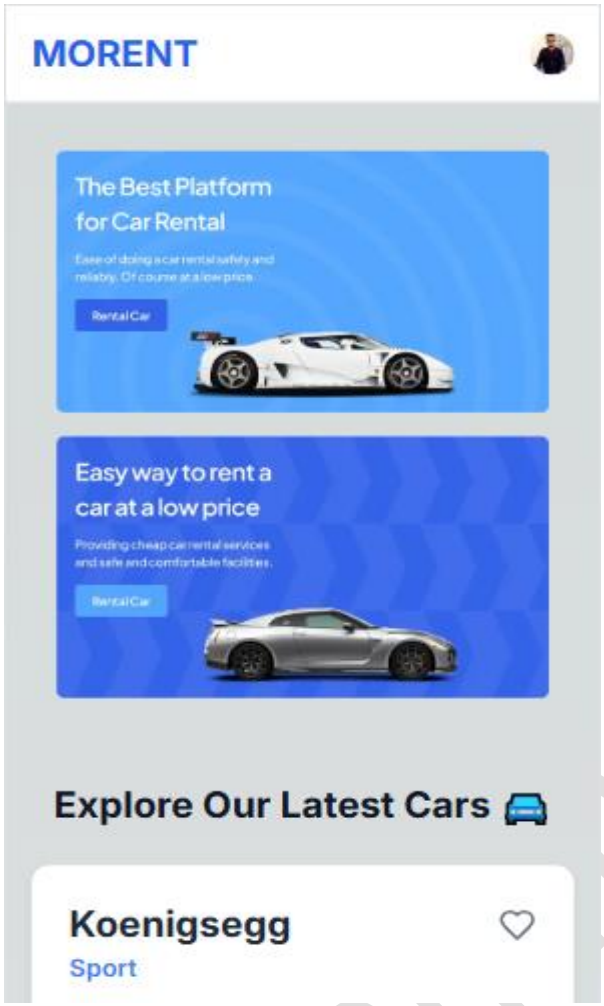
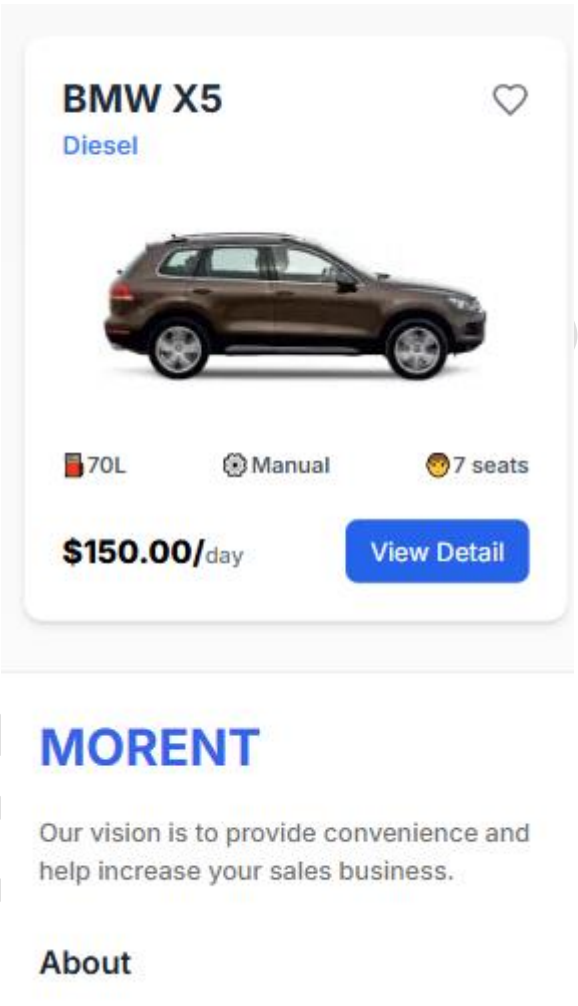
Responsive Layout:





Step 05: Testing Report.

	A	B	C	D	E	F	G	H	I
1	Test Case ID	Test Case Description	Test Steps	Expected Result	Actual Result	Status	Severity Level	Assigned To	Remarks
2	TC001	Car Listing	Home Page > Verify Car Listing	Cars should be displayed correctly	All cars are displayed	Passed	Low	-	No issues found
3	TC002	Dynamic Page	Click on a car for details	Dynamic route should work properly	Dynamic route works properly	Passed	Low	-	No issues found
4	TC003	Add to Whishlist	Click on the heart icon of a car	Car should be successfully added to the wishlist	Car successfully added to the wishlist	Passed	Low	-	No issues found
5	TC004	Search Bar	Click on the search bar in the header	Search cars by their name or type	Cars are successfully displayed	Passed	Low	-	No issues found
6	TC005	Filter Bar	Select "SUV" type in the filter bar	"SUV" cars should be displayed successfully	"SUV" cars are displayed successfully	Passed	Low	-	No issues found
7	TC006	Responsive Design	Test on desktop, tablet, and mobile	Design should be responsive on all devices	Works on desktop and mobile, not on tablet	Failed	Medium	-	Fix tablet layout
8	TC007	Cross-browser compatibility test	Test the website on Chrome, Firefox, and Edge	Website should render correctly on all browsers	Website displayed correctly on all browsers	Passed	Medium	-	Verified on multiple browsers
9	TC008	Test data submission to Sanity	Enter car details in the form > Click submit	Data should be successfully entered into Sanity and shown in the browser console	Data successfully entered into Sanity and logged in the console	Passed	low	-	No issues found
10	TC009	Test "Rent Now" flow and login	Click "Rent Now" > Redirect to sign-in page > Login > Redirect to billing page	User should be redirected to the sign-in page, logged in, and then redirected to the billing page	User was redirected to sign-in, logged in, and redirected to billing page	Passed	Low	-	No issues found
11	TC010	Error handling	Disconnect API > Load cars page	Show fallback UI with error message	Error message shown successfully	Passed	low	-	No issues found

Conclusion:

The testing process for the car rental website was carried out successfully, covering key functionalities such as car listing, dynamic routing, wishlist feature, search, filtering, responsive design, cross-browser compatibility, and data submission to Sanity. Most test cases passed without issues, demonstrating that the core features of the website are functioning as expected.

However, the responsive design failed on tablet devices, indicating the need for further optimization. Additionally, cross-browser compatibility was thoroughly verified, ensuring the website works seamlessly across popular browsers.

Overall, the website is in a good state, with minor adjustments needed for tablet responsiveness. The testing process was efficient, and no major issues were encountered. Further testing should be conducted after the tablet layout fix to ensure consistent performance across all devices.

THANK YOU