Experiment No.11
MAD & PWA LAB

- **Aim:** To use google Lighthouse PWA Analysis Tool to test the PWA functioning.

- **Theory:**

  ✓ **Google Lighthouse: Enhancing Web Page Quality:**
  Google Lighthouse is a powerful, open-source, and automated tool designed to improve the quality of web pages. It can be used to audit any web page, whether public or requiring authentication, and provides audits for performance, accessibility, progressive web apps (PWAs), SEO, and more. The tool can be accessed through Chrome DevTools, the command line, or as a Node module. After running an audit, Lighthouse generates a detailed report highlighting areas for improvement.

  ✓ **Performance Audit:**
  The Performance audit in Google Lighthouse is highly valuable, offering metrics that can help improve a website's performance and climb Google's rankings. It provides insights such as opportunities for optimization, field data, lab data, and diagnostics metrics. For example, it flags render-blocking resources like stylesheets, scripts, and HTML imports, providing a precise analysis of a site's performance and suggestions for improvement.

  ✓ **Accessibility Audit:**
  The Accessibility audit is a new feature in Google Lighthouse that highlights potential improvements to make a website more accessible and user-friendly. Following the recommendations from this audit can ensure that users can easily navigate and use the site, potentially improving its search engine ranking.

  ✓ **Best Practices Audit:**
  Another new feature in Google Lighthouse is the Best Practices audit, which provides recommendations to improve a site's performance and user experience, especially for mobile sites. While it doesn't directly provide performance-related data, it offers valuable suggestions for enhancing the overall site experience.
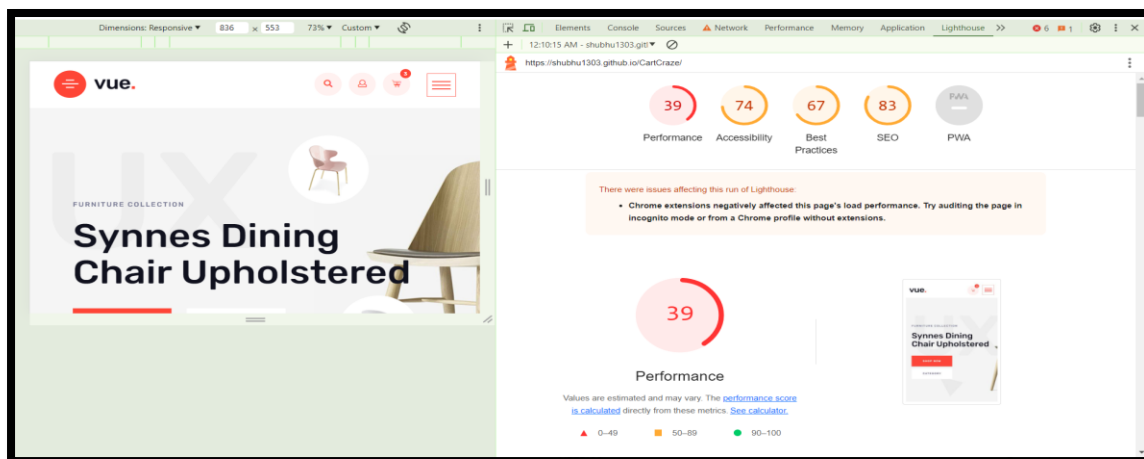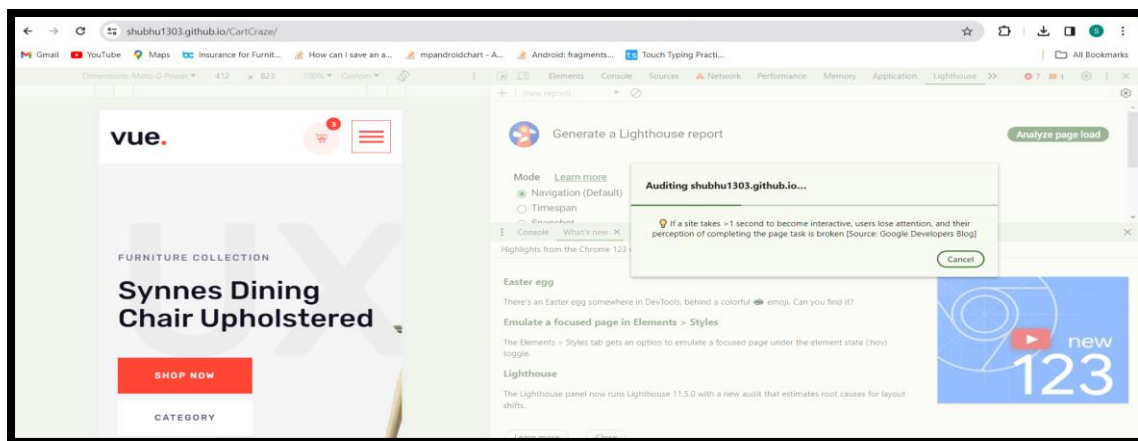
  ✓ **SEO Audit:**
  The SEO audit in Google Lighthouse is a dynamic and advanced feature not found in PageSpeed Insights. It provides essential tools to analyze a page's optimization for search engine result rankings, making it a preferred choice for web designers and SEO specialists. While it may not cover all factors, it focuses on the most crucial aspects of SEO optimization.

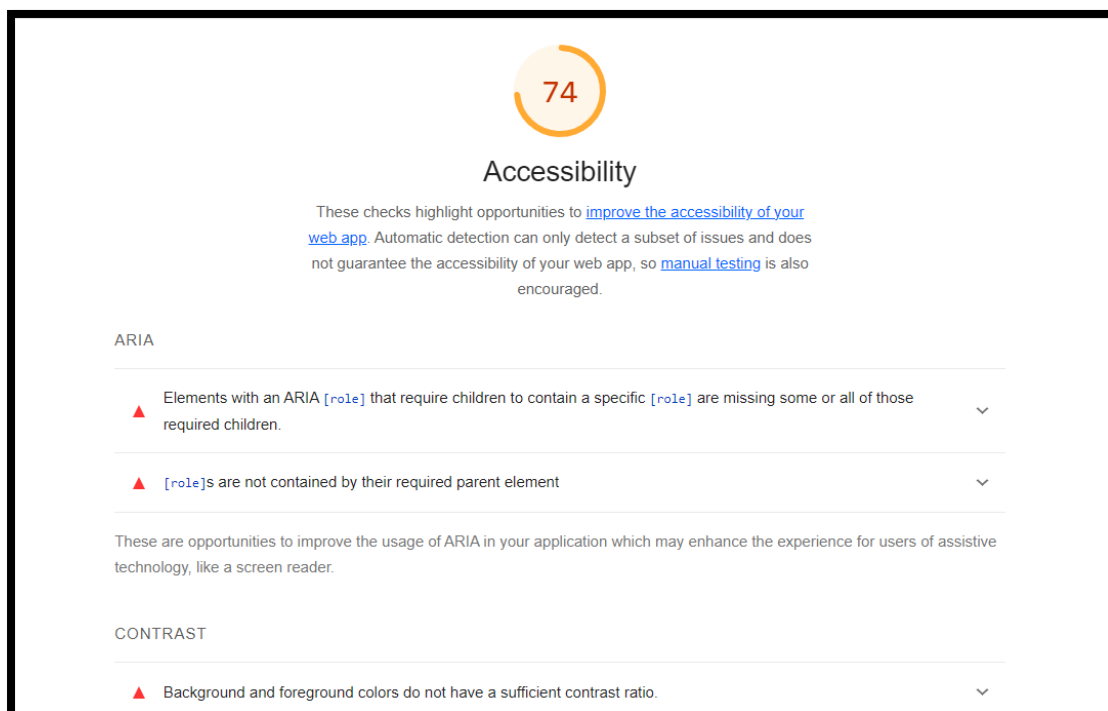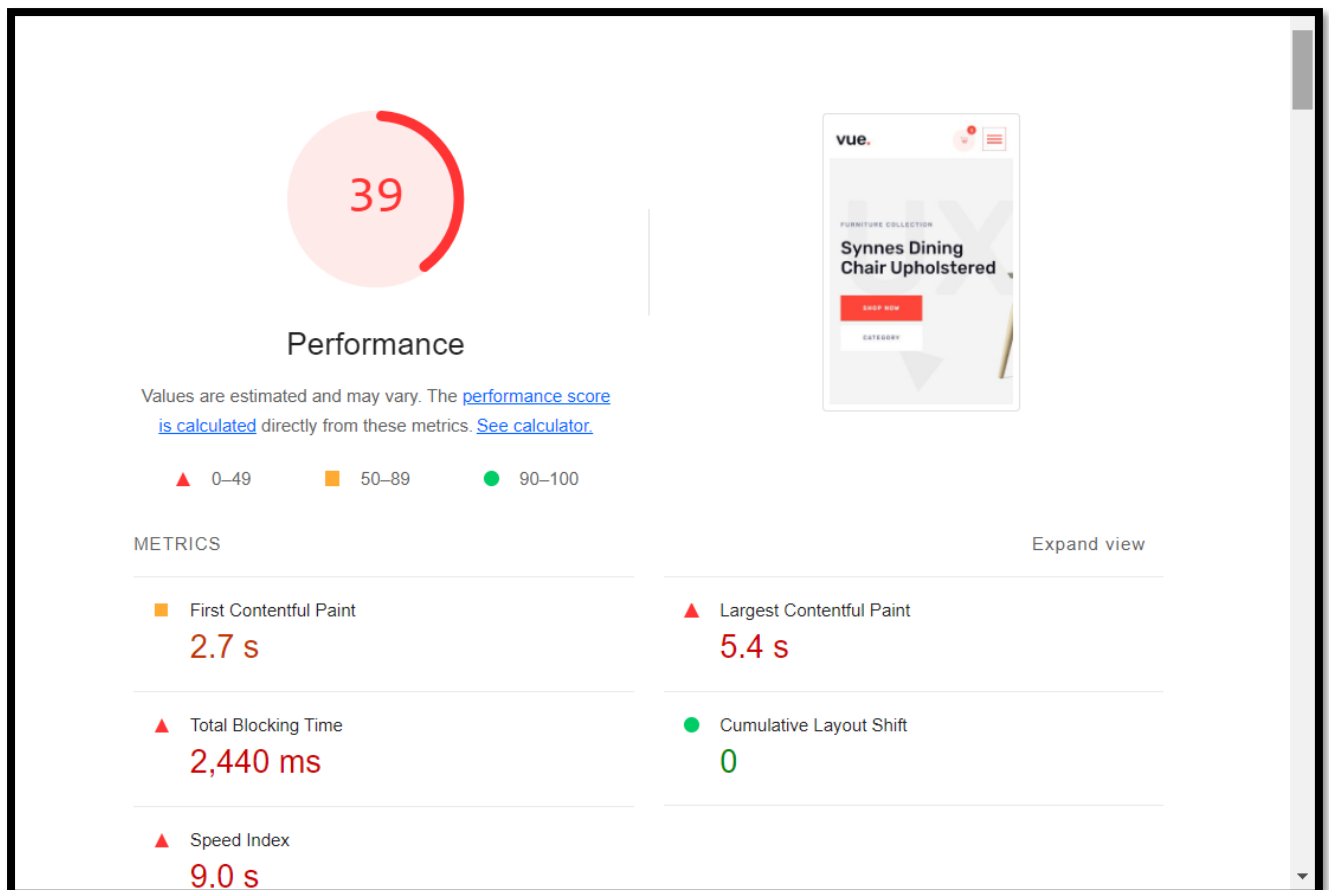✓ **Progressive Web Applications (PWAs) Audit:**
The Progressive Web Applications audit is another recent addition to Google Lighthouse, focusing on the key factors that make a site a PWA. One of the notable features of this audit is the ability to register service workers, enabling push notifications on web apps and enhancing the user experience.

- **Implementation:**

→ **Light House Report [Mobile] –**

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Performance

Values are estimated and may vary. The performance score is calculated directly from these metrics. See calculator.

▲ 0–49   ■ 50–89   ● 90–100

METRICS   Expand view

■ First Contentful Paint
2.7 s

▲ Largest Contentful Paint
5.4 s

▲ Total Blocking Time
2,440 ms

● Cumulative Layout Shift
0

▲ Speed Index
9.0 s

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Accessibility

These checks highlight opportunities to improve the accessibility of your web app. Automatic detection can only detect a subset of issues and does not guarantee the accessibility of your web app, so manual testing is also encouraged.

ARIA

▲ Elements with an ARIA `[role]` that require children to contain a specific `[role]` are missing some or all of those required children.   ⌄

▲ `[role]`s are not contained by their required parent element   ⌄

These are opportunities to improve the usage of ARIA in your application which may enhance the experience for users of assistive technology, like a screen reader.

CONTRAST

▲ Background and foreground colors do not have a sufficient contrast ratio.   ⌄

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Best Practices

GENERAL

▲ Uses deprecated APIs — 1 warning found   ˅

▲ Registers an `unload` listener   ˅

▲ Browser errors were logged to the console   ˅

○ Detected JavaScript libraries   ˅

TRUST AND SAFETY

▲ Requests the notification permission on page load   ˅

○ Ensure CSP is effective against XSS attacks   ˅

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SEO

These checks ensure that your page is following basic search engine optimization advice. There are many additional factors Lighthouse does not score here that may affect your search ranking, including performance on Core Web Vitals. Learn more about Google Search Essentials.

CONTENT BEST PRACTICES
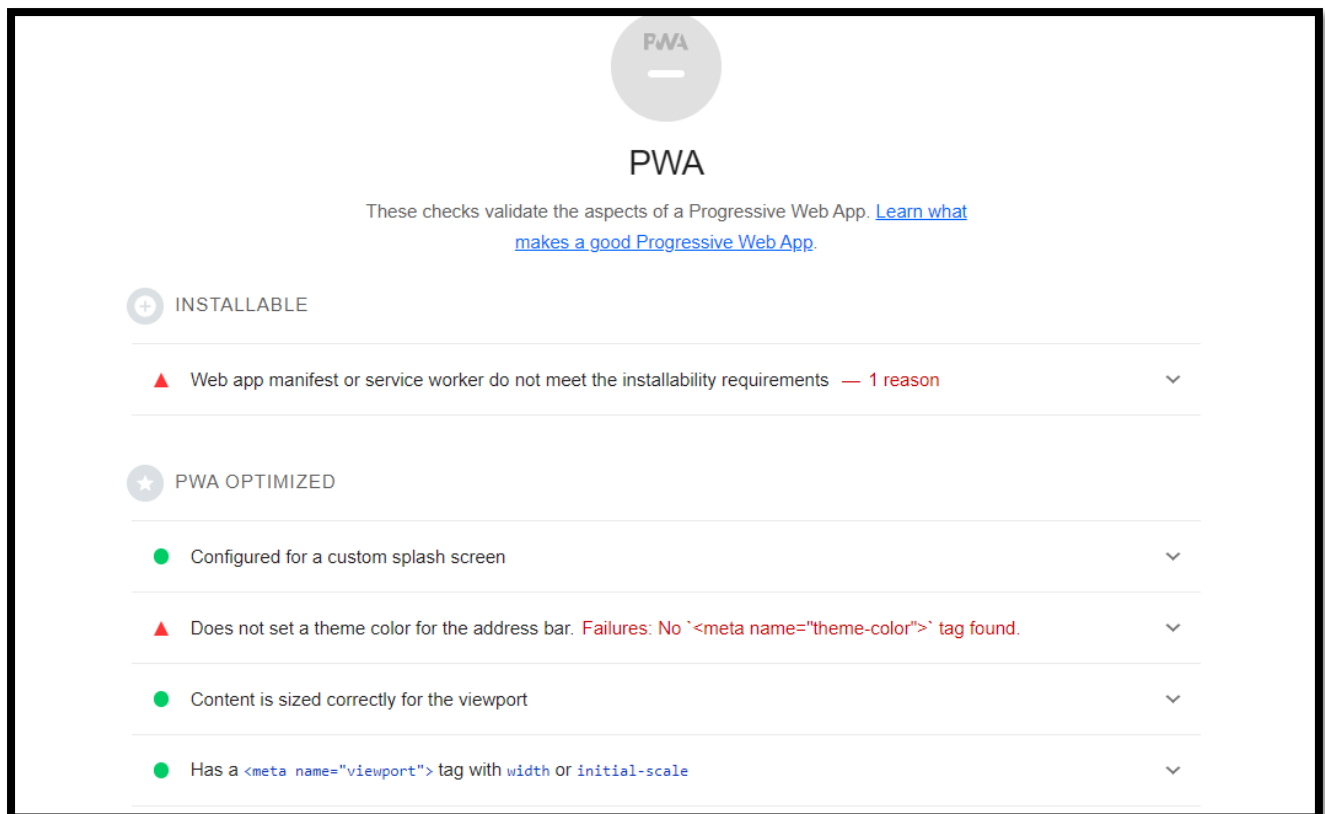
▲ Document does not have a meta description Description text is empty.   ˅

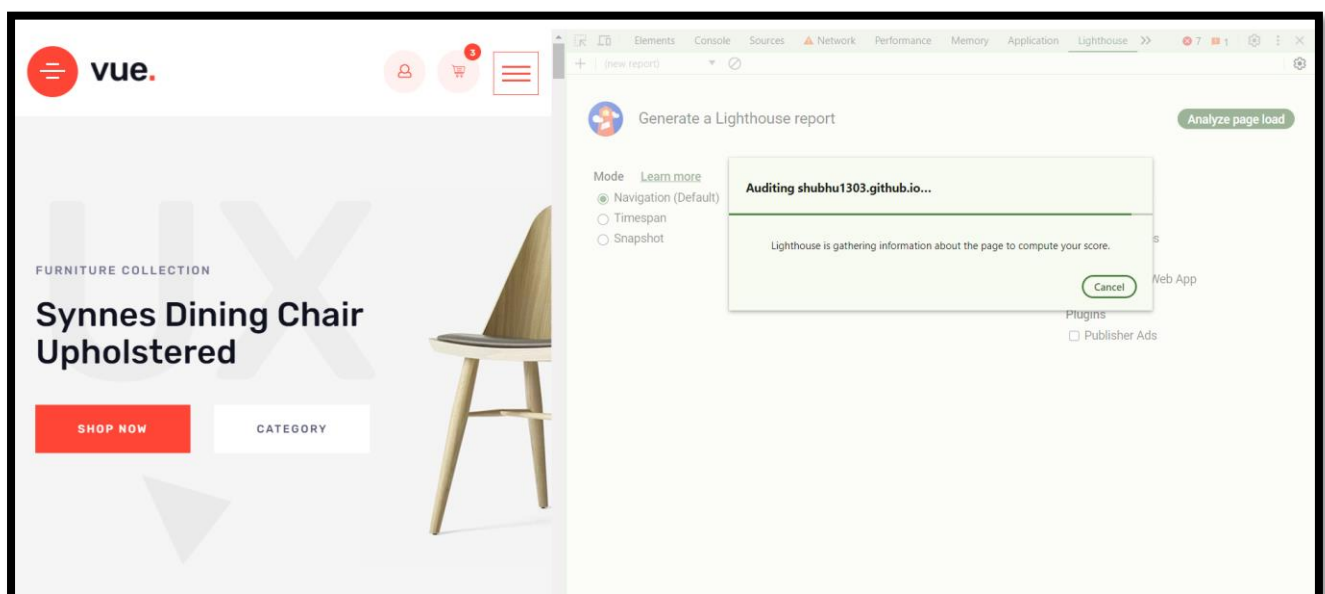Format your HTML in a way that enables crawlers to better understand your app's content.
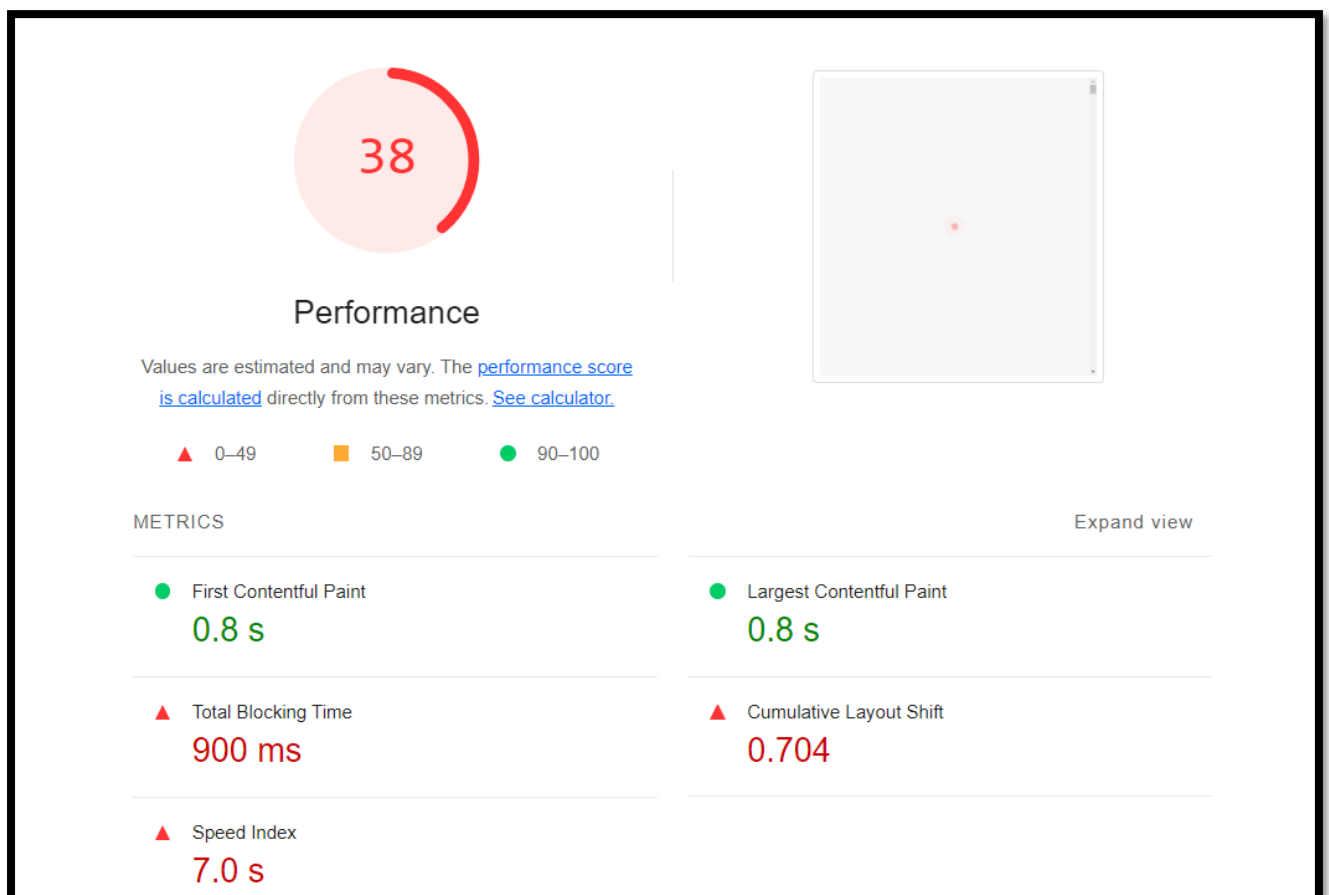
CRAWLING AND INDEXING
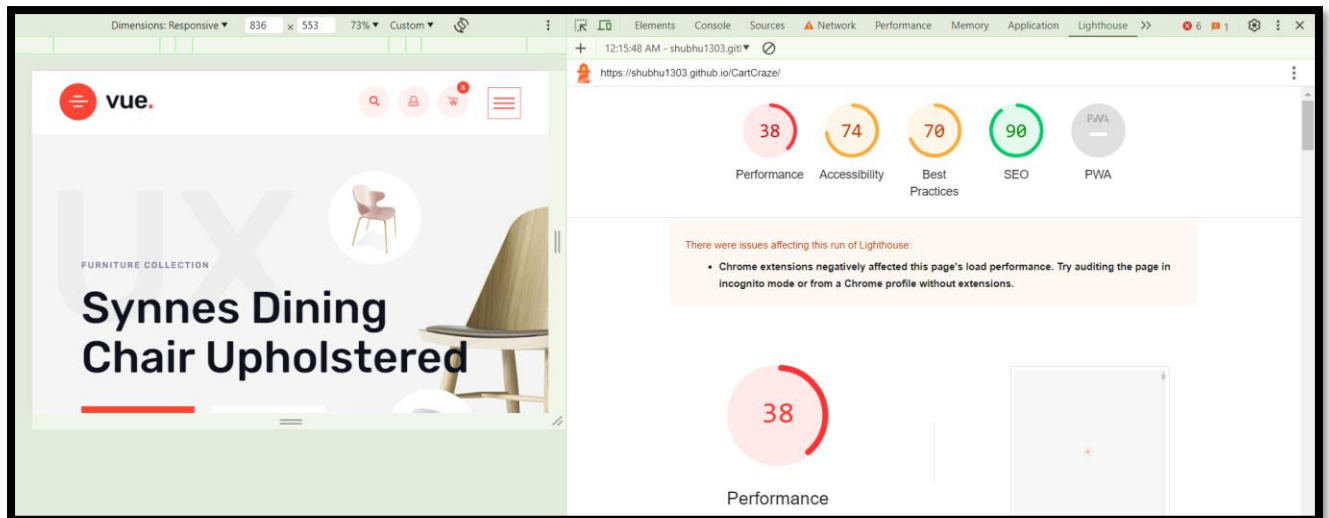
▲ robots.txt is not valid Lighthouse was unable to download a robots.txt file   ˅

To appear in search results, crawlers need access to your app.

→ **Light House Report [Desktop] –**

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Accessibility

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ARIA

⚠ Elements with an ARIA [role] that require children to contain a specific [role] are missing some or all of those required children.   ⌄

⚠ [role]s are not contained by their required parent element   ⌄

These are opportunities to improve the usage of ARIA in your application which may enhance the experience for users of assistive technology, like a screen reader.

CONTRAST

⚠ Background and foreground colors do not have a sufficient contrast ratio.   ⌄

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Best Practices

GENERAL

⚠ Uses deprecated APIs — 1 warning found   ⌄

⚠ Registers an unload listener   ⌄

⚠ Browser errors were logged to the console   ⌄

○ Detected JavaScript libraries   ⌄

TRUST AND SAFETY

⚠ Requests the notification permission on page load   ⌄

○ Ensure CSP is effective against XSS attacks   ⌄

90

SEO

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CONTENT BEST PRACTICES

⚠ Document does not have a meta description Description text is empty.

Format your HTML in a way that enables crawlers to better understand your app's content.

ADDITIONAL ITEMS TO MANUALLY CHECK (1)   Show

Run these additional validators on your site to check additional SEO best practices.

PASSED AUDITS (9)   Show

NOT APPLICABLE (4)   Show

PWA

PWA

These checks validate the aspects of a Progressive Web App. Learn what makes a good Progressive Web App.

⊕ INSTALLABLE

⚠ Web app manifest or service worker do not meet the installability requirements — 1 reason

★ PWA OPTIMIZED

● Configured for a custom splash screen

⚠ Does not set a theme color for the address bar. Failures: No `<meta name="theme-color">` tag found.

○ Content is sized correctly for the viewport

● Has a `<meta name="viewport">` tag with `width` or `initial-scale`

- **Conclusion:**

  Hence, Google Lighthouse emerges as an indispensable tool for web developers and designers aiming to enhance their websites' performance, accessibility, SEO, and overall user experience. Its versatility and ease of use empower users to make informed decisions and implement optimizations effectively, ensuring their websites are optimized to meet modern standards and deliver exceptional user experiences.