Experiment No: 11

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

Theory:

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Google Lighthouse is an open-source tool developed by Google that is used to audit and improve the quality of web pages. It provides a comprehensive set of tests and metrics to evaluate various aspects of a web application, including performance, accessibility, best practices, and search engine optimization (SEO). One of the key features of Lighthouse is its support for testing Progressive Web Apps (PWAs), which are web applications that leverage modern web technologies to provide a native app-like experience to users.
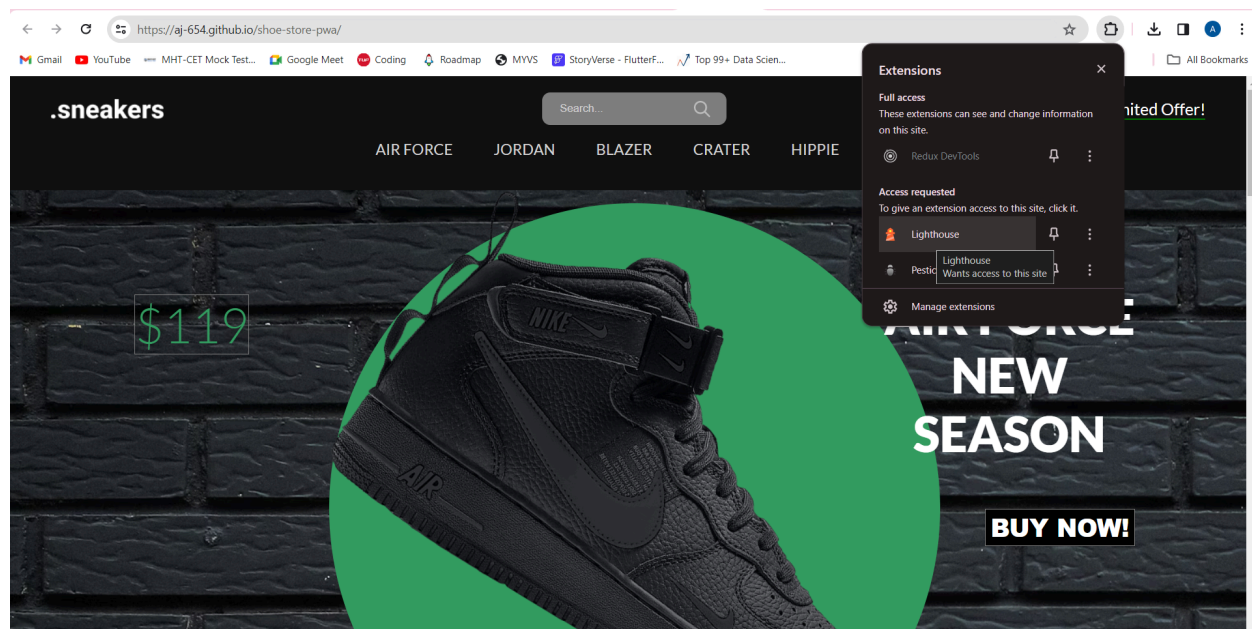
When testing a PWA using Google Lighthouse, several key areas are evaluated to ensure that the application meets the standards of a Progressive Web App:
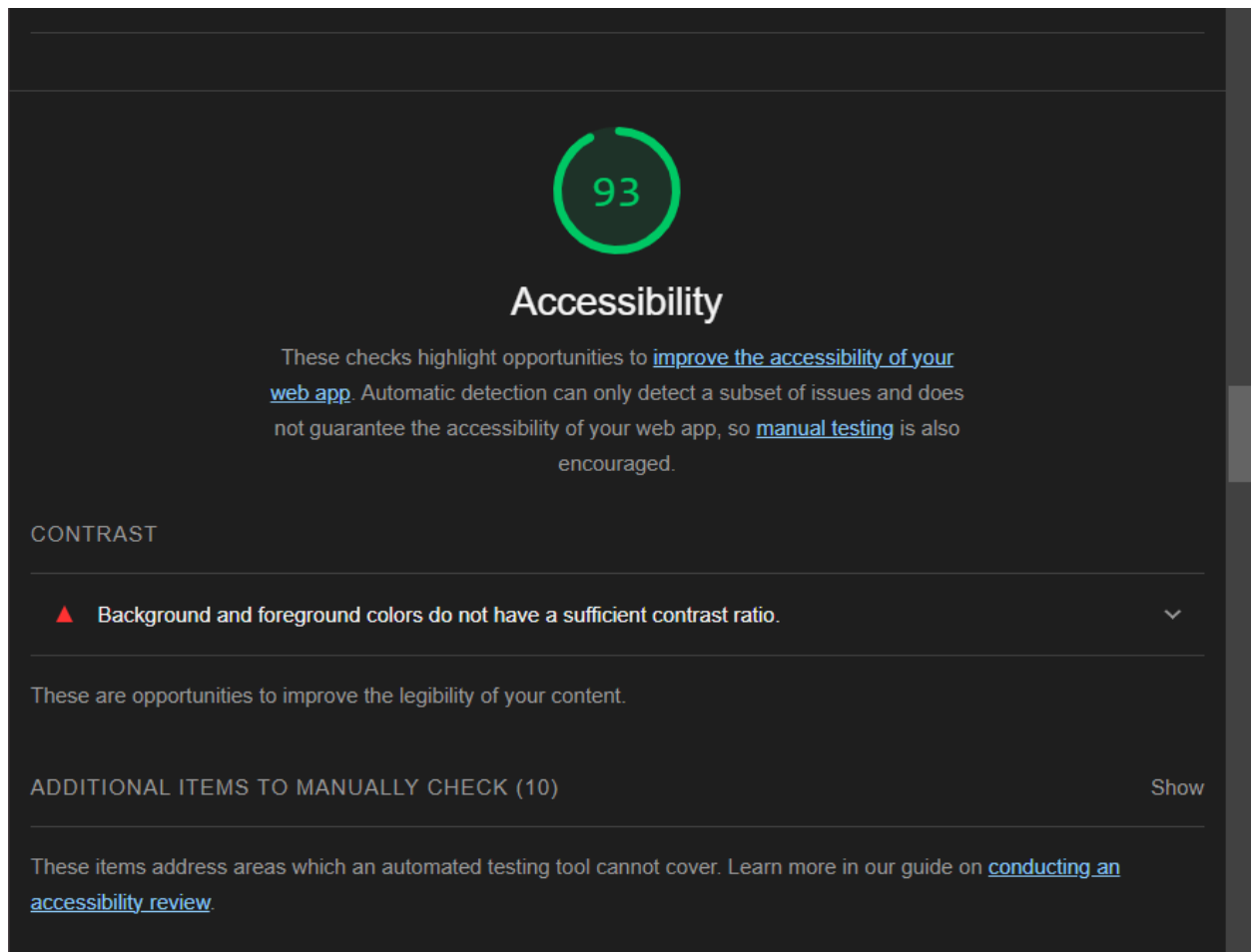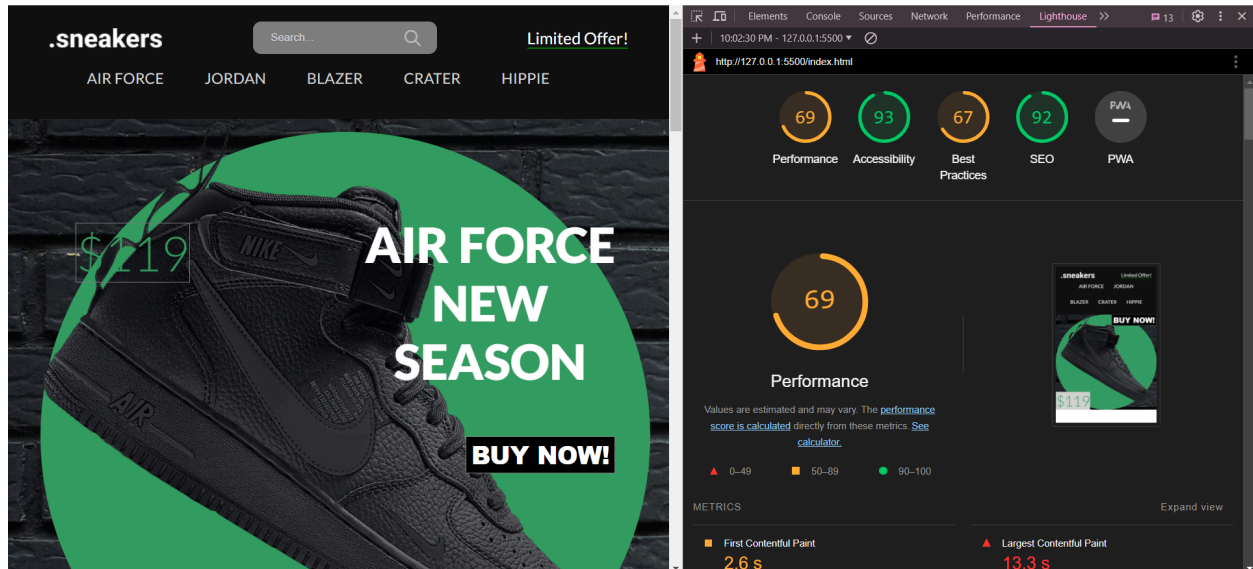
1. Performance: Lighthouse measures various performance metrics such as First Contentful Paint (FCP), Speed Index, Time to Interactive (TTI), and more. These metrics assess how quickly the application loads and becomes interactive, providing insights into its responsiveness and user experience.

2. Accessibility: Lighthouse checks for accessibility issues within the PWA, ensuring that it is usable by people with disabilities. It evaluates factors such as proper semantic HTML, keyboard navigation, and the use of accessible color contrast.

3. Progressive Enhancement: Lighthouse verifies that the PWA is built using progressive enhancement principles, meaning that it functions across a wide range of devices and browsers, regardless of their capabilities. This includes ensuring that the application works on both desktop and mobile devices, with or without JavaScript enabled.

4. Best Practices: Lighthouse examines the PWA for adherence to best practices and web standards. It checks for common issues such as deprecated APIs, security vulnerabilities, and outdated technologies, providing recommendations for improvement.
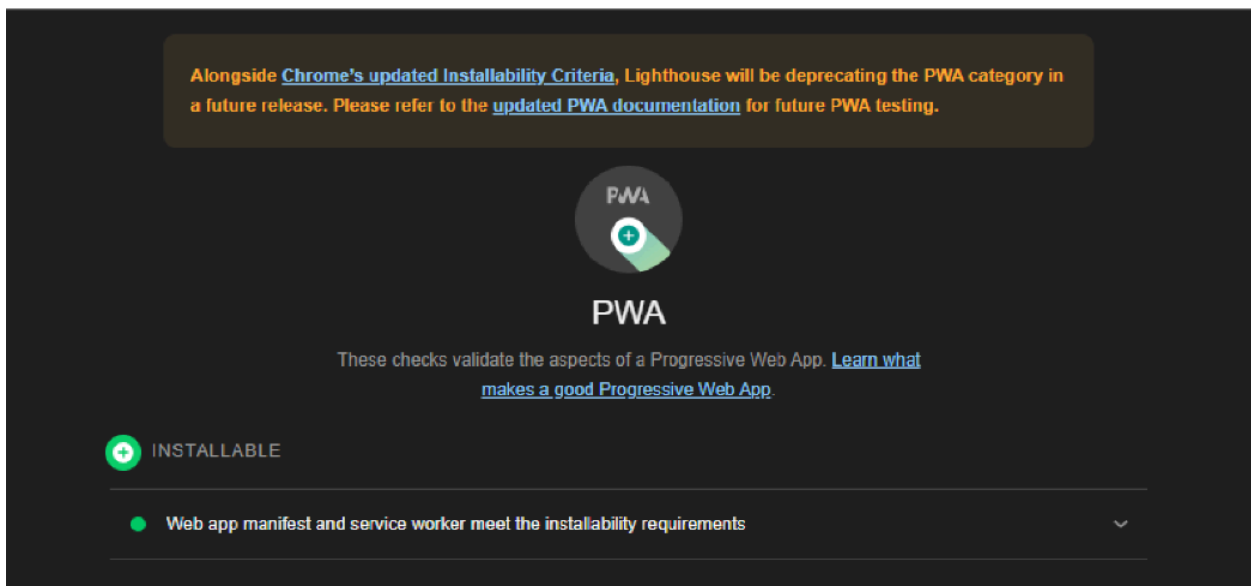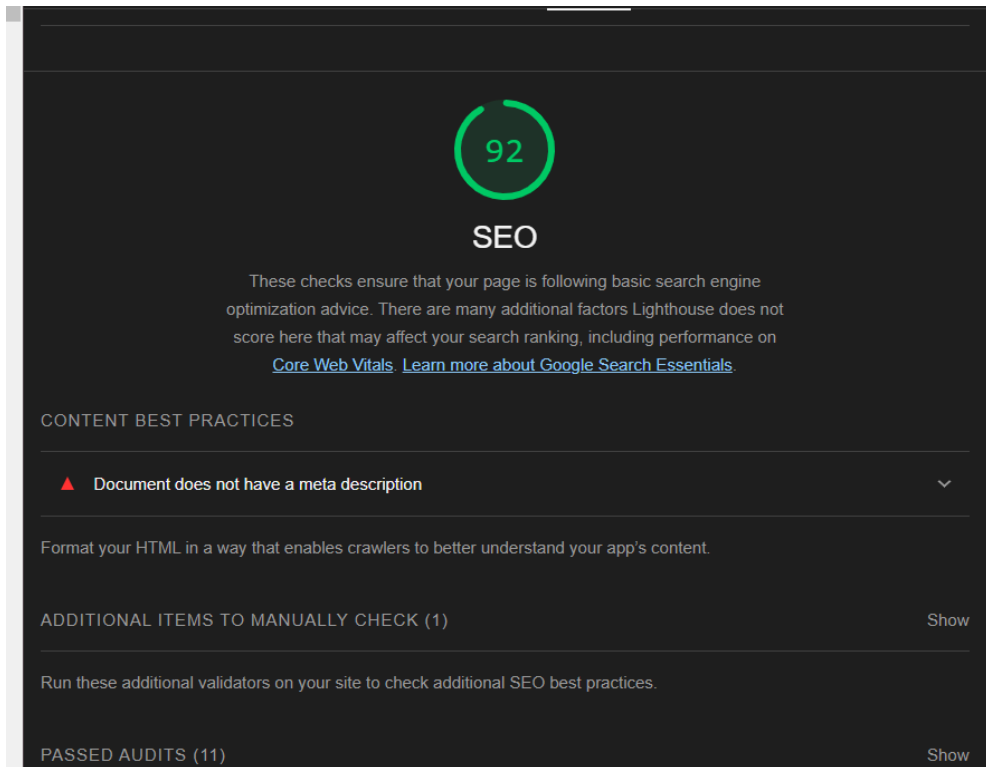
5. PWA-specific Criteria: Lighthouse evaluates additional criteria specific to Progressive Web Apps, such as the presence of a web app manifest file (`manifest.json`), service worker registration, and responsiveness to different screen sizes (responsive design).

By conducting a Google Lighthouse analysis of a PWA, developers gain valuable insights into its overall performance, accessibility, and adherence to best practices. The results of the audit can be used to identify areas for improvement and optimize the PWA for a better user experience. Additionally, Lighthouse reports can serve as documentation and validation of the PWA's compliance with PWA standards and guidelines. Overall, leveraging Google Lighthouse as a PWA analysis tool helps ensure that the web application meets the criteria for a modern, reliable, and user-friendly Progressive Web App.

Implementation:

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

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 (11)   Show

Alongside Chrome's updated Installability Criteria, Lighthouse will be deprecating the PWA category in a future release. Please refer to the updated PWA documentation for future PWA testing.

PWA

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

INSTALLABLE

● Web app manifest and service worker meet the installability requirements

Conclusion:

In conclusion, utilizing Google Lighthouse as a PWA analysis tool offers developers valuable insights into their web applications' performance, accessibility, and adherence to best practices. By leveraging Lighthouse's comprehensive audits, developers can optimize their PWAs for enhanced user experiences, ensuring they meet modern web standards and provide inclusive access to all users.