Experiment 11

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

Theory:

Google Lighthouse is an open-source, automated tool for improving the quality of webpages. It is used to audit web pages, measure their performance, accessibility, progressive web app (PWA) capabilities, SEO (Search Engine Optimization), and more. Lighthouse is commonly used by developers, webmasters, and SEO professionals to identify areas where a website can be optimized for better user experience, performance, and search engine rankings.

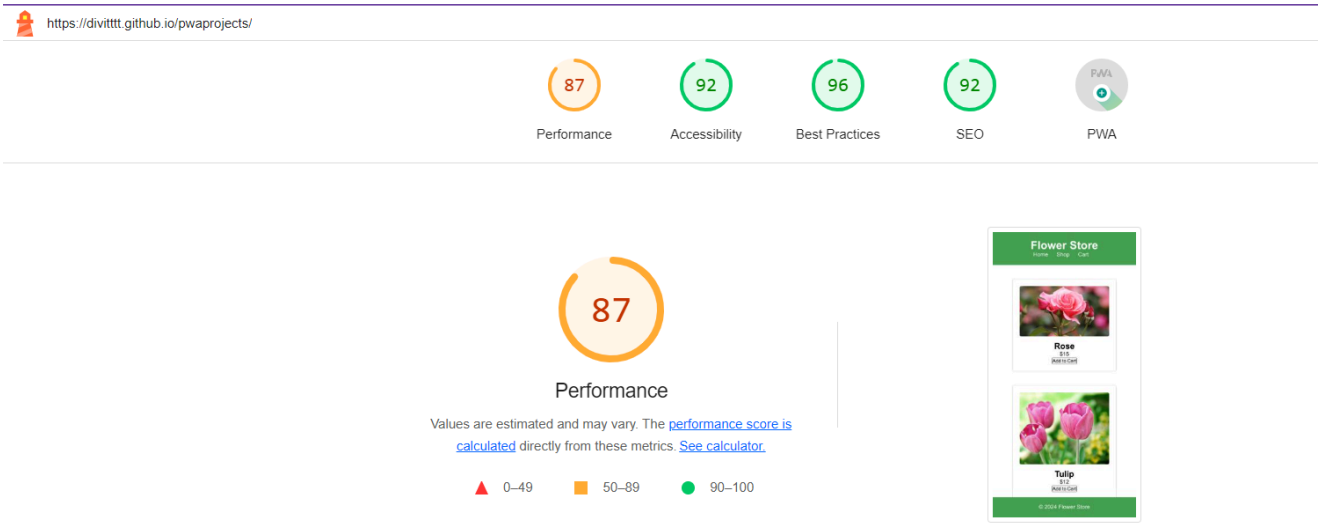
Features of Google Lighthouse:

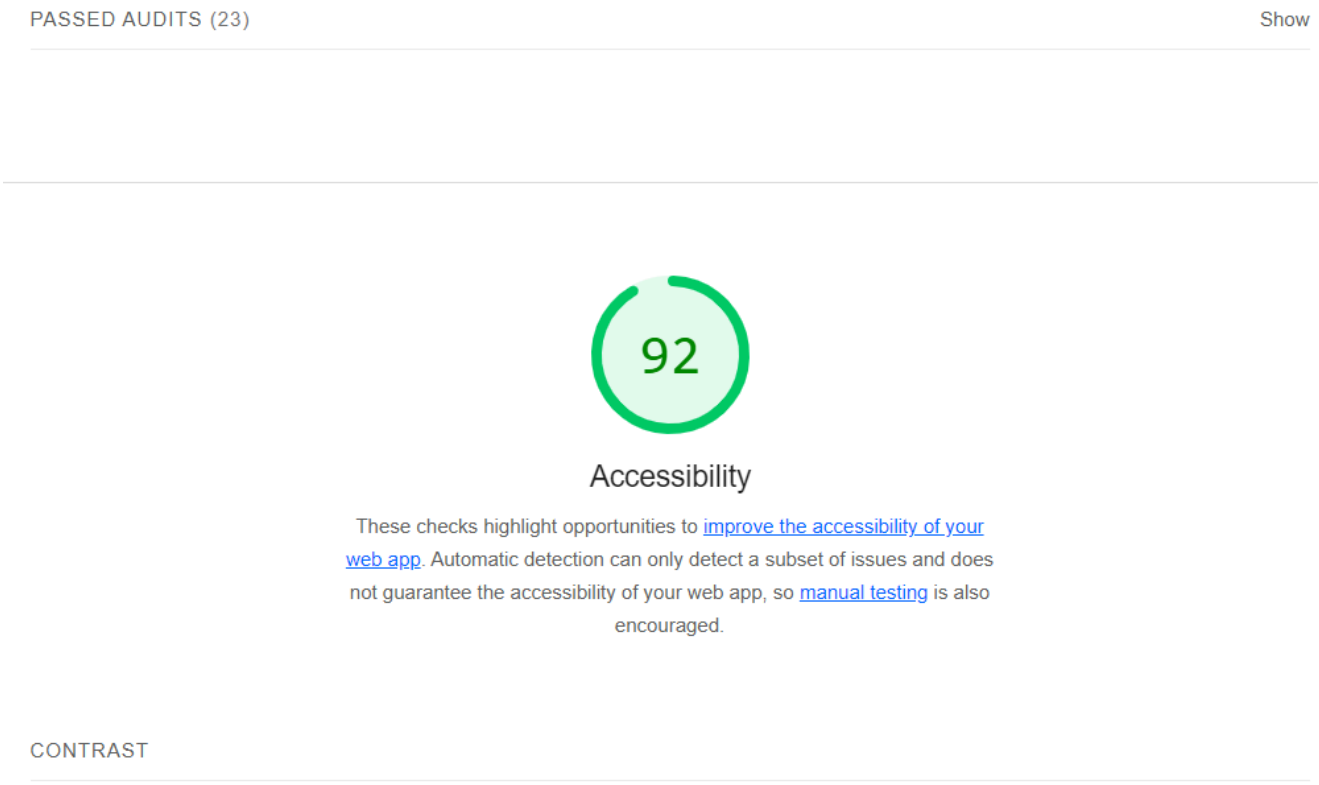
1. **Performance:**
    a. Lighthouse assesses a webpage's loading speed and responsiveness.
    b. It provides metrics such as First Contentful Paint (FCP), Largest Contentful Paint (LCP), Time to Interactive (TTI), and more.
    c. Suggestions are given to improve these metrics, like optimizing images, deferring offscreen images, minifying CSS and JavaScript, etc.
2. **Accessibility:**
    a. Lighthouse evaluates a webpage's accessibility for users with disabilities.
    b. It checks for proper HTML markup, ARIA attributes, color contrast, andother factors that impact accessibility.
    c. Suggestions are provided to improve accessibility, such as adding alt textto images, ensuring keyboard navigation, and using proper heading structure.
3. **Best Practices:**
    a. Lighthouse checks a webpage against web development best practices.
    b. It looks for deprecated JavaScript features, security vulnerabilities, outdated libraries, and more.
    c. Recommendations are given to follow modern web development practicesand ensure a secure website.
4. **SEO (Search Engine Optimization):**
    a. Lighthouse provides insights into a webpage's SEO performance.
    b. It checks for meta tags, heading structure, sitemap usage, and otherSEO- related elements.

c. Recommendations are offered to improve the webpage's visibility in search engine results.

5. **Progressive Web App (PWA):**
   a. For websites aiming to be Progressive Web Apps, Lighthouse evaluatestheir PWA capabilities.
   b. It checks for features such as offline functionality, fast loading times onrepeat visits, and app-like behavior.
   c. Suggestions are given to enhance the website's PWA features, improvinguser engagement and experience.
6. **Metrics and Scoring:**
   a. Lighthouse provides a comprehensive report with scores for each category (Performance, Accessibility, Best Practices, SEO, PWA).
   b. These scores give a quick overview of how well a webpage is performingin each area.
   c. Developers can use these scores to prioritize improvements and track progress over time.
7. **Command Line Interface (CLI):**
   a. Lighthouse can be used both through its web interface and as a command-line tool.
   b. The CLI allows for integration into automated build processes and continuous integration (CI) workflows.
   c. This makes it easy to run audits regularly, ensuring ongoing improvementsto web performance and quality.
8. **Chrome DevTools Integration:**
   a. Lighthouse is integrated into Google Chrome's DevTools.
   b. Developers can run audits directly from the browser, making it convenientto analyze and improve web pages during development.
   c. The DevTools integration offers real-time feedback and suggestions as developers make changes to their code.

OUTPUT:


https://divitttt.github.io/pwaprojects/
87
Performance
92
Accessibility
96
Best Practices
92
SEO
PWA
87
Performance
Values are estimated and may vary. The performance score is calculated directly from these metrics. See calculator.
0–49
50–89
90–100
Flower Store
Rose
Tulip
METRICS
Expand view
First Contentful Paint
1.0 s
Largest Contentful Paint
2.7 s
Total Blocking Time
0 ms
Cumulative Layout Shift
0.198
Speed Index
2.1 s



CONCLUSION: Hence, we have understood the working of Google Lighthouse PWAanalysis tool and used Google Lighthouse tool to test and analyze the performancestatistics of our E-commerce Progressive web application.