Department of Information Technology

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Experiment No.10

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

Prerequisites: HTML, JavaScript, JSON.

Software: VS code, Browser, Lighthouse tool.

Problem Statement: Make use of google Lighthouse PWA Analysis Tool to test the PWA functioning of web application created in experiment:8

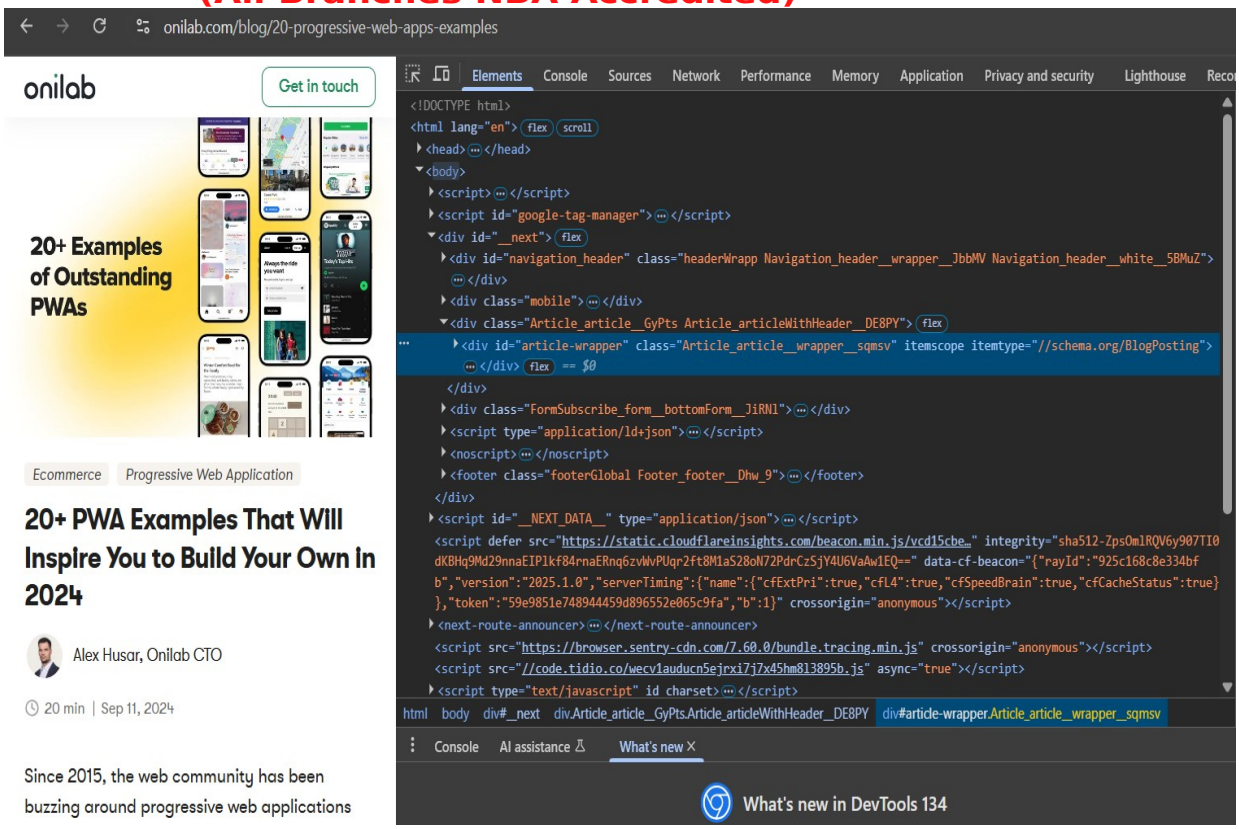
Lighthouse is a performance auditing tool built into **Chrome DevTools**, which is available only in the **Google Chrome browser**. Since Lighthouse is an integrated feature, using Chrome is the easiest way to access and run the Lighthouse audit.

Open Your PWA in Chrome

Once Google Chrome is installed, the next step is to open your Progressive Web App (PWA) in the browser to test its functionality using Lighthouse.

Open Your PWA by Entering the URL

- In the **Chrome address bar**, type the URL of your PWA and press **Enter**.
- The PWA should load in your browser like any other website.



Open Chrome DevTools and Lighthouse

Once your PWA is loaded in Google Chrome, you need to access **Chrome DevTools** and the **Lighthouse** tool to analyze the PWA's performance.

Open Chrome DevTools
Chrome DevTools is a built-in developer tool in Chrome that helps inspect and debug web applications.

Right-Click and Inspect

- Right-click anywhere on your PWA webpage.
- Click **Inspect** from the menu.

Access the Lighthouse Tab

Lighthouse is one of the tools inside DevTools that allows you to audit your PWA.

Steps to Find the Lighthouse Tab:

1. In the **DevTools panel**, look at the top menu where different tabs like **Elements**, **Console**, and **Network** are displayed.
2. Click on the **Lighthouse** tab.

- If you don't see the Lighthouse tab, click on the >> **(overflow menu)** to reveal hidden tabs.

3. Now, you're ready to analyze your PWA using Lighthouse.

Select the Lighthouse Audit Categories
Once the **Lighthouse panel** is open in Chrome DevTools, you need to configure the audit settings to test your Progressive Web App (PWA).

Choose the Mode (Device Type)
Lighthouse allows testing in two different modes:

Mobile Mode

- Simulates a **mid-range mobile device** with slower network speed and CPU.
- Helps test how well your PWA performs on mobile phones.
- Recommended for real-world PWA performance analysis.

Desktop Mode

- Uses a **faster CPU and network speed**, simulating a desktop experience.
- Useful for testing PWAs optimized for larger screens.

How to Select Mode:

- In the Lighthouse panel, find the **Device Mode** section.
- Choose either **Mobile** or **Desktop** based on your testing needs.

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2 Select Audit Categories
Lighthouse provides multiple categories to evaluate different aspects of your PWA. You can choose one or more of the following:

Performance

- Measures loading speed, responsiveness, and efficiency.
- Identifies bottlenecks like render-blocking resources and unoptimized images.
- Provides recommendations for faster load times.

Progressive Web App (PWA) – Essential for PWA Testing

- Ensures your app meets all **PWA requirements**, such as:
  - **Service Worker** for offline functionality.
  - **Web App Manifest** for installation support.
  - **HTTPS** for security.
  - **Fast and reliable performance.**

For PWA testing, make sure this category is selected!

Best Practices

- Checks for security issues and outdated web practices.
- Ensures modern JavaScript and CSS techniques are used.

- Flags vulnerabilities like **non-secure connections** or **deprecated APIs**.

Accessibility

- Evaluates how well the PWA works for users with disabilities.
- Checks for **color contrast issues, missing alt text, keyboard navigation,** etc.
- Helps make the PWA **usable by everyone**.

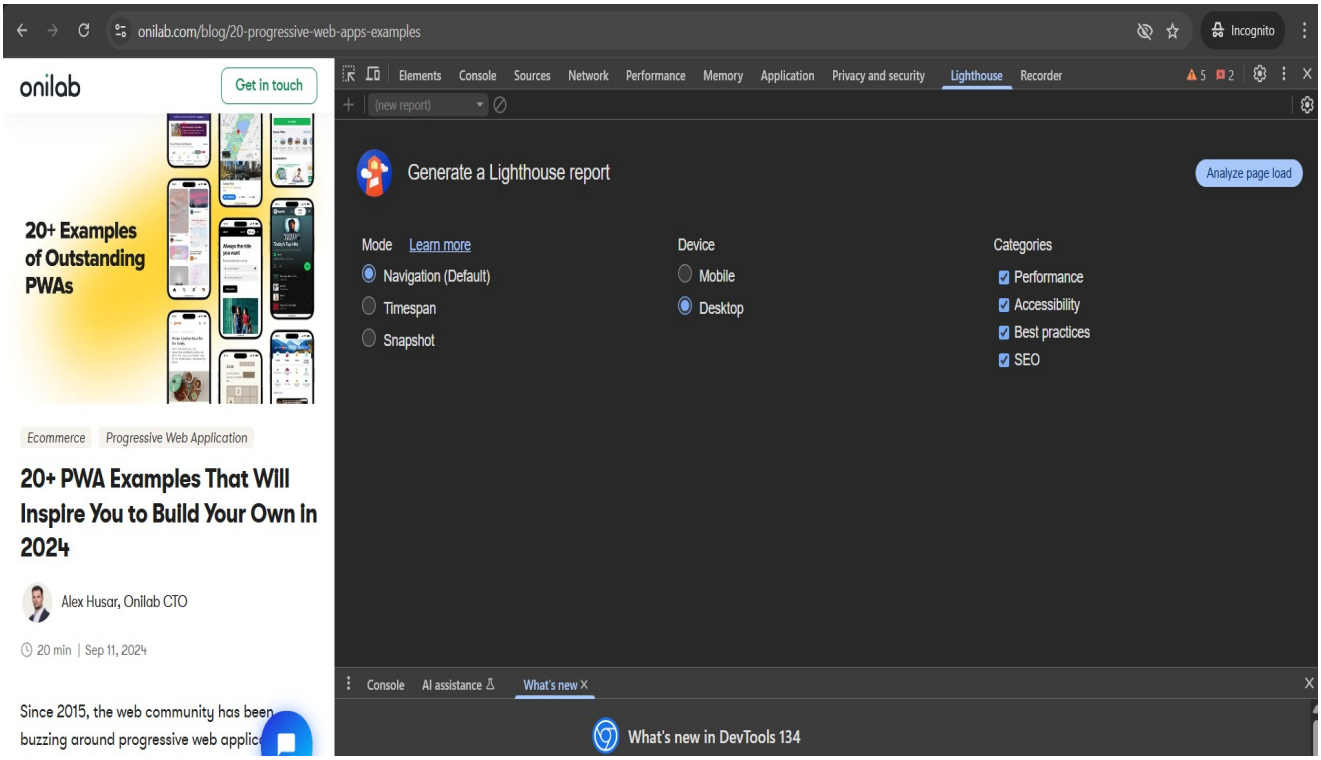
SEO (Search Engine Optimization)

- Ensures that the PWA follows **best practices for search engines**.
- Checks for **meta tags, mobile-friendliness, proper heading structures,** etc.
- Helps the PWA rank higher on Google searches.

Start the Audit

- Once you have selected the mode (**Mobile/Desktop**) and categories, click the **Analyze page load** or **Generate report** button.

Lighthouse will begin testing your PWA and provide a detailed

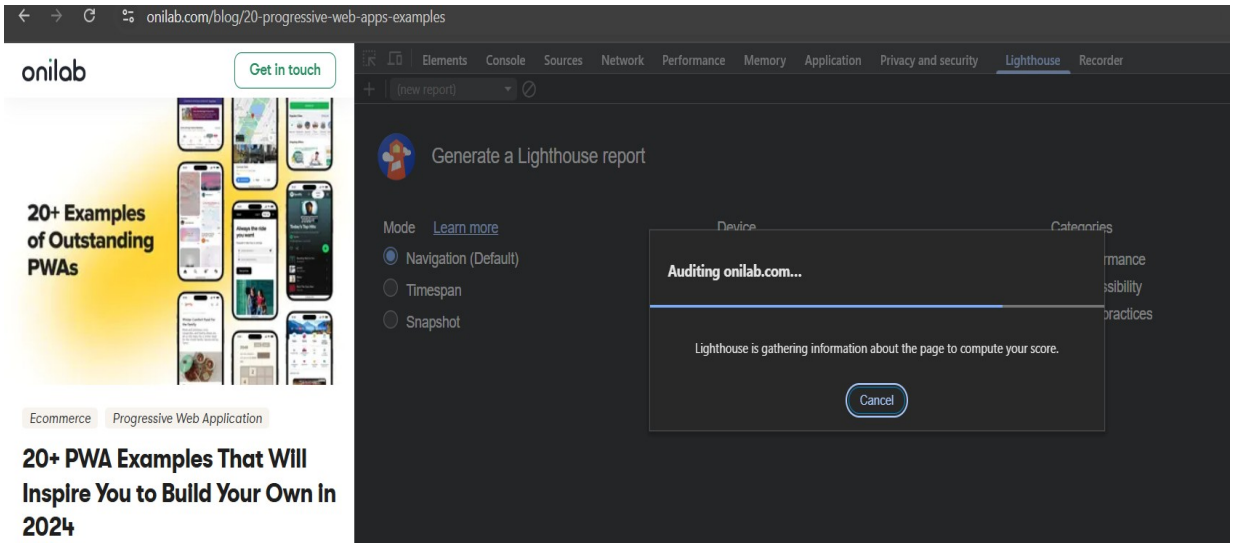


Start the Audit

- Once you have selected the mode (**Mobile/Desktop**) and categories, click the **Analyze page load** or **Generate report** button.
- Lighthouse will begin testing your PWA and provide a detailed report after a few seconds.

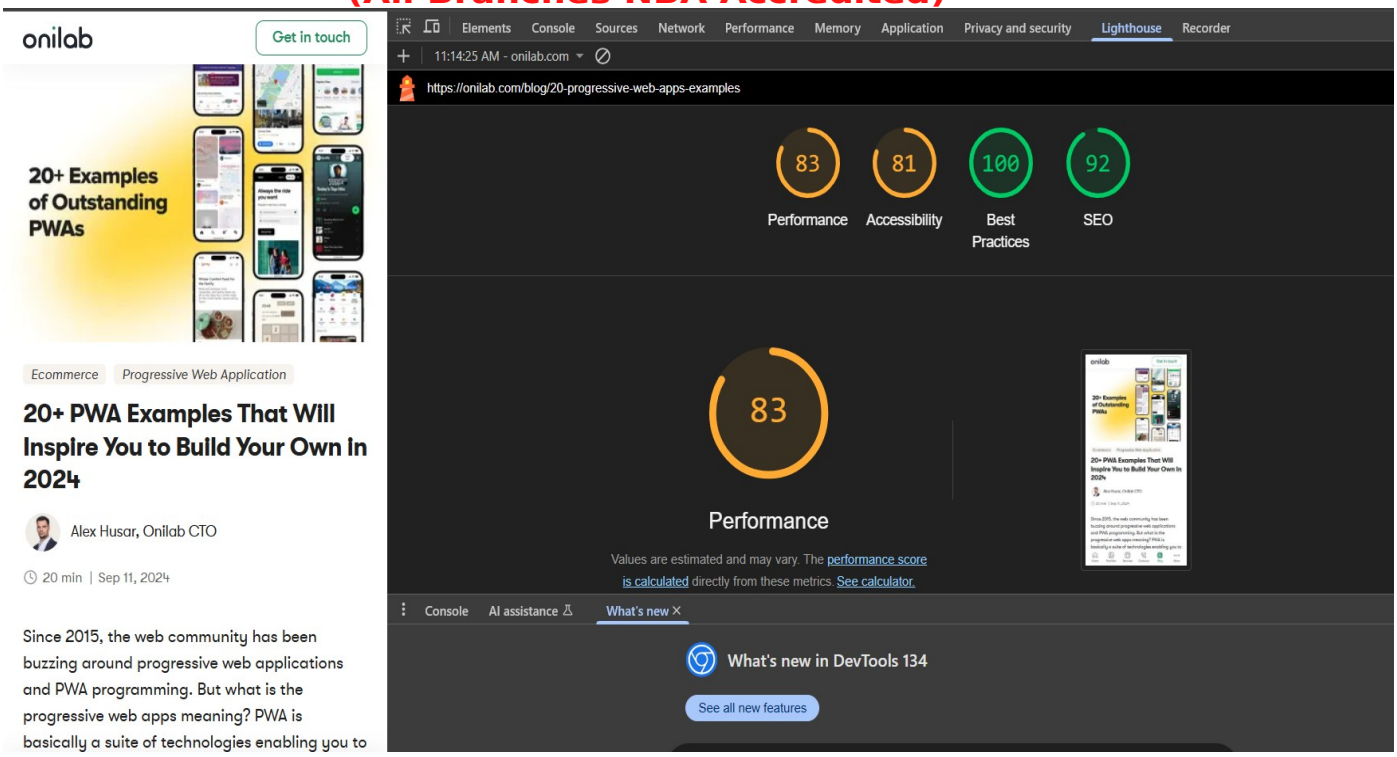
Run the Lighthouse Audit

1. Click the **Analyze page load** or **Generate report** button.
2. Wait for Lighthouse to analyze your PWA (this takes a few seconds).

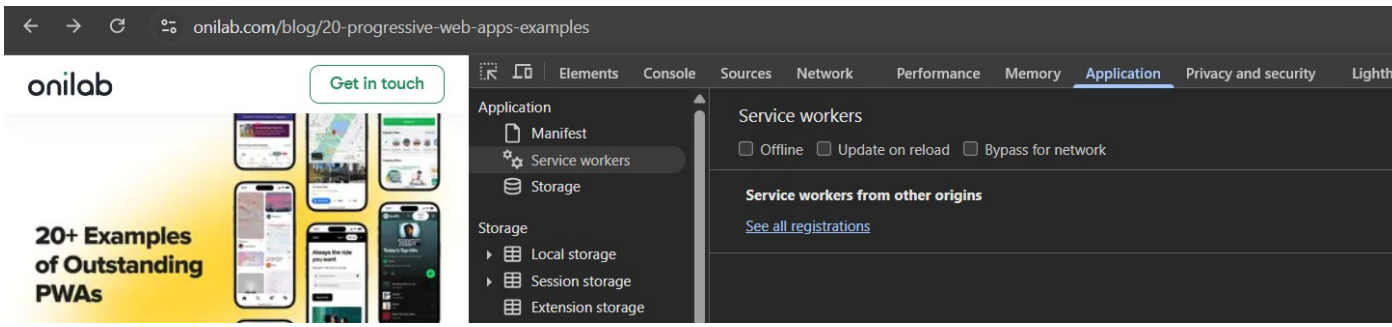


Review Lighthouse Audit Results

Once the analysis is complete, Lighthouse provides a detailed report with scores (0–100) for different categories. Key sections of the report include:



1. **PWA Compliance:**
   - Checks if your app works offline.
   - Ensures the PWA is installable.
   - Tests for Service Worker functionality.



Conclusion: In this experiment we have use of google Lighthouse PWA Analysis Tool to test the PWA functioning and report analysis