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## **Experiment No: 11**

**AIM:** To use Google Lighthouse PWA Analysis Tool to test the PWA functioning

### **THEORY:**

#### Lighthouse

Lighthouse is an open-source, automated tool for improving the quality of web pages. You can run it against any web page, public or requiring authentication. It has audits for performance, accessibility, progressive web apps, SEO and more.

You can run Lighthouse in Chrome DevTools, from the command line, or as a Node module. You give Lighthouse a URL to audit, it runs a series of audits against the page, and then it generates a report on how well the page did. From there, use the failing audits as indicators on how to improve the page. Each audit has a reference doc explaining why the audit is important, as well as how to fix it. You can also use Lighthouse CI to prevent regressions on your sites.

#### Lighthouse workflow:

- In Chrome DevTools: Easily audit pages that require authentication, and read your reports in a user-friendly format.
- From the command line: Automate your Lighthouse runs via shell scripts.
- As a Node module: Integrate Lighthouse into your continuous integration systems.
- From a web UI: Run Lighthouse and link to reports without installing a thing.

Note: The CLI and Node workflows require you to have an instance of Google Chrome installed on your machine.

#### Run Lighthouse in Chrome DevTools

Lighthouse powers the Audits panel of Chrome DevTools. To run a report:

1. Download **Google Chrome for Desktop**.
2. In Google Chrome, go to the URL you want to audit. You can audit any URL on the web.
3. **Open Chrome DevTools**.
4. Click the **Lighthouse** tab.
5. Click on **Generate Report** : Lighthouse runs its audits against the currently-focused page, then opens up a new tab with a report of the results.

The screenshot shows the Lighthouse audit interface in the Chrome DevTools. The left pane displays a mobile version of the Chanel website with a white quilted handbag. The right pane shows the configuration for the audit:

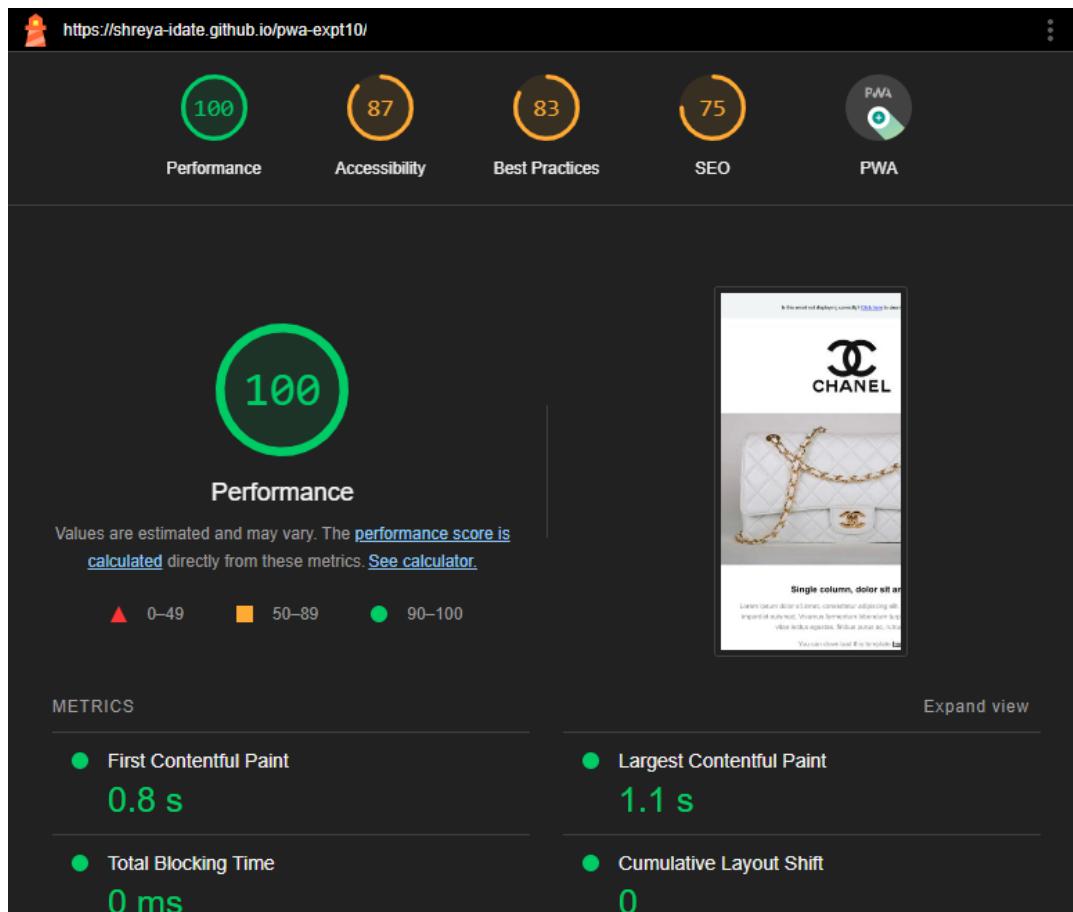
- Mode:** Navigation (Default)
- Device:** Mobile
- Categories:** Performance, Accessibility, Best practices, SEO, Progressive Web App (all checked)
- Plugins:** Publisher Ads (unchecked)

The audit status is "Lighthouse is warming up...".

A modal dialog box titled "Generate a Lighthouse report" is displayed, showing the progress of auditing the URL "shreya-icode.github.io...". The progress bar is at 0% completion. The dialog includes the same configuration options as the main interface:

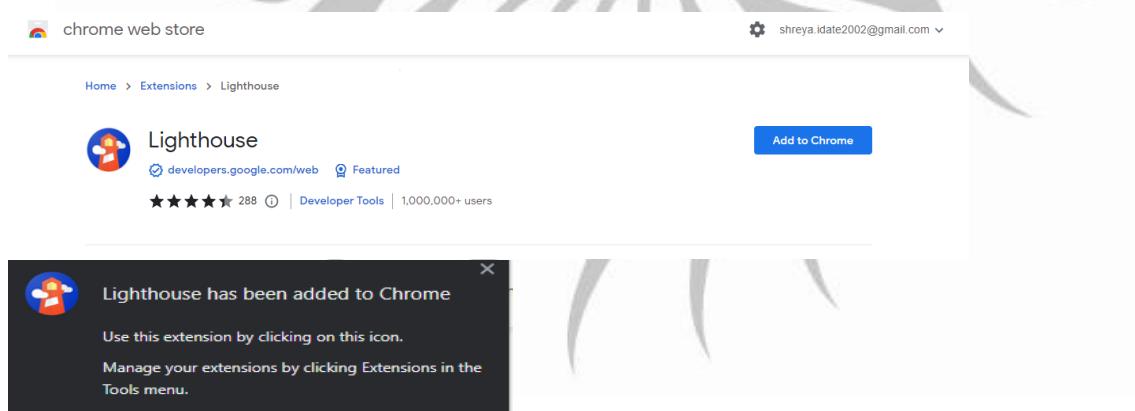
- Mode:** Navigation (selected)
- Categories:** Performance, Accessibility, Best practices, SEO, Progressive Web App (all checked)
- Plugins:** Publisher Ads (unchecked)

A "Cancel" button is visible in the bottom right corner of the dialog.



To install the extension:

1. Download Google Chrome for Desktop.
2. Install the [Lighthouse Chrome Extension](#) from the Chrome Webstore.



To run an audit:

1. In Chrome, go to the page you want to audit.
2. Click Lighthouse. It should be next to the Chrome address bar. If not, open Chrome's main menu and access it at the top of the menu. After clicking, the Lighthouse menu expands.

The screenshot shows a web browser window with the Chanel logo at the top. A message at the top left says, "Is this email not displaying correctly? [Click here](#) to view in browser". On the right side of the screen, a dark overlay titled "Extensions" is displayed, showing "Full access" with three extensions listed: Google Translate, Grammarly: Grammar Check..., and Lighthouse, which is highlighted with a red border.

<https://shreya-ideate.github.io/pwa-exp10/>

Performance: 100 | Accessibility: 87 | Best Practices: 83 | SEO: 75 | PWA

**Performance** (Score: 100)

Values are estimated and may vary. The [performance score](#) is calculated directly from these metrics. [See calculator](#).

▲ 0–49   ■ 50–89   ● 90–100

METRICS

- First Contentful Paint: 0.8 s
- Total Blocking Time: 0 ms
- Largest Contentful Paint: 1.1 s
- Cumulative Layout Shift: 0

Expand view

**Performance** (Score: 100)

Values are estimated and may vary. The [performance score](#) is calculated directly from these metrics. [See calculator](#).

▲ 0–49   ■ 50–89   ● 90–100

**Performance** (Score: 100)

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▲ 0–49   ■ 50–89   ● 90–100

## Run PageSpeed Insights

To run Lighthouse on PageSpeed Insights:

1. Navigate to [PageSpeed Insights](#).
2. Enter a web page URL.  
Click **Analyze**.

The screenshot shows the PageSpeed Insights interface with the URL <https://shreya-ideate.github.io/pwa-exp10/> entered in the search bar. The "Desktop" tab is selected. The main summary shows a Performance score of 100, Accessibility of 87, Best Practices of 92, and SEO of 78.

**Performance** (Score: 100)

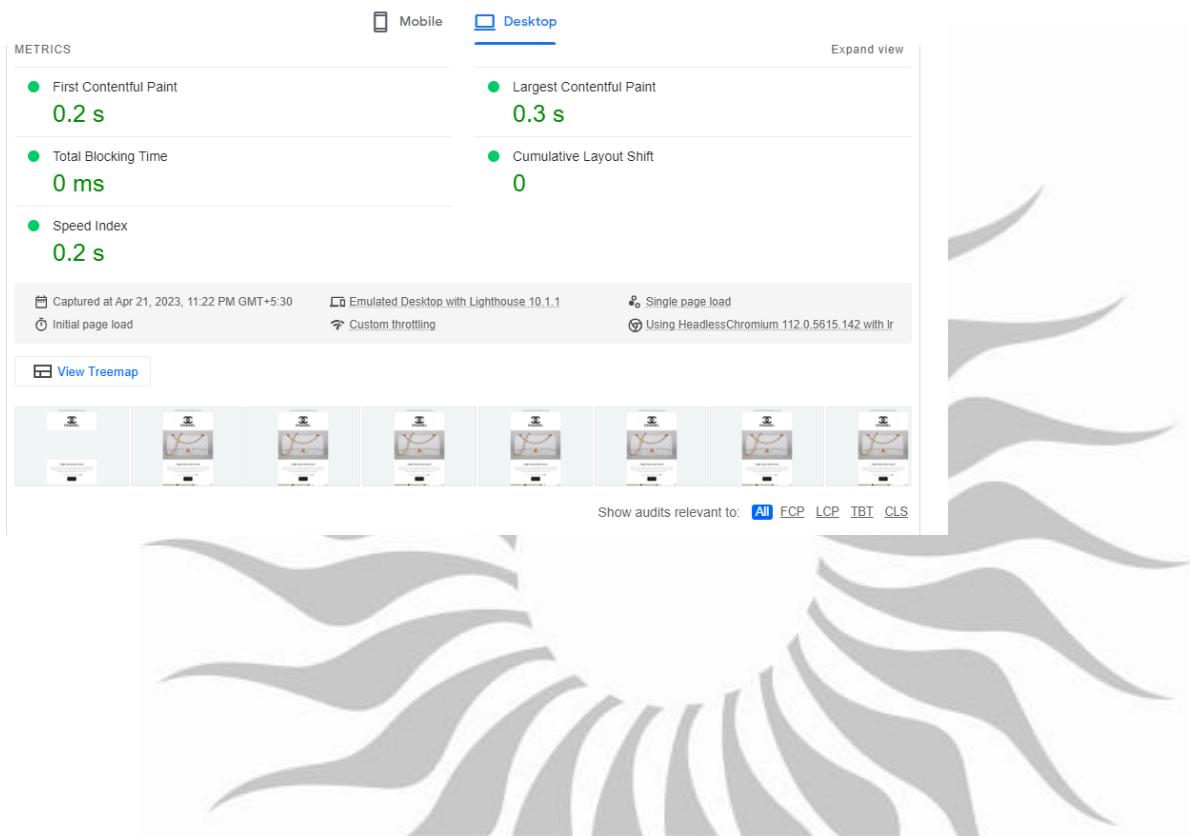
Values are estimated and may vary. The [performance score](#) is calculated directly from these metrics. [See calculator](#).

▲ 0–49   ■ 50–89   ● 90–100

**Performance** (Score: 100)

Values are estimated and may vary. The [performance score](#) is calculated directly from these metrics. [See calculator](#).

▲ 0–49   ■ 50–89   ● 90–100



### Share reports as JSON

The Lighthouse Viewer needs the JSON output of a Lighthouse report. The list below explains how to get the JSON output, depending on what Lighthouse workflow you're using:

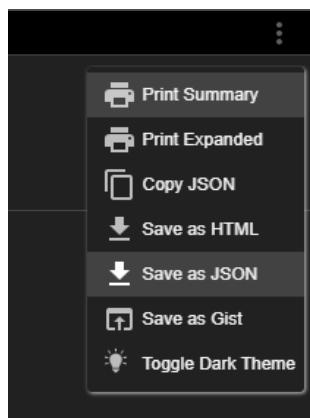
1. **Chrome DevTools.** Click [Download Report](#)
2. **Command line.** Run:

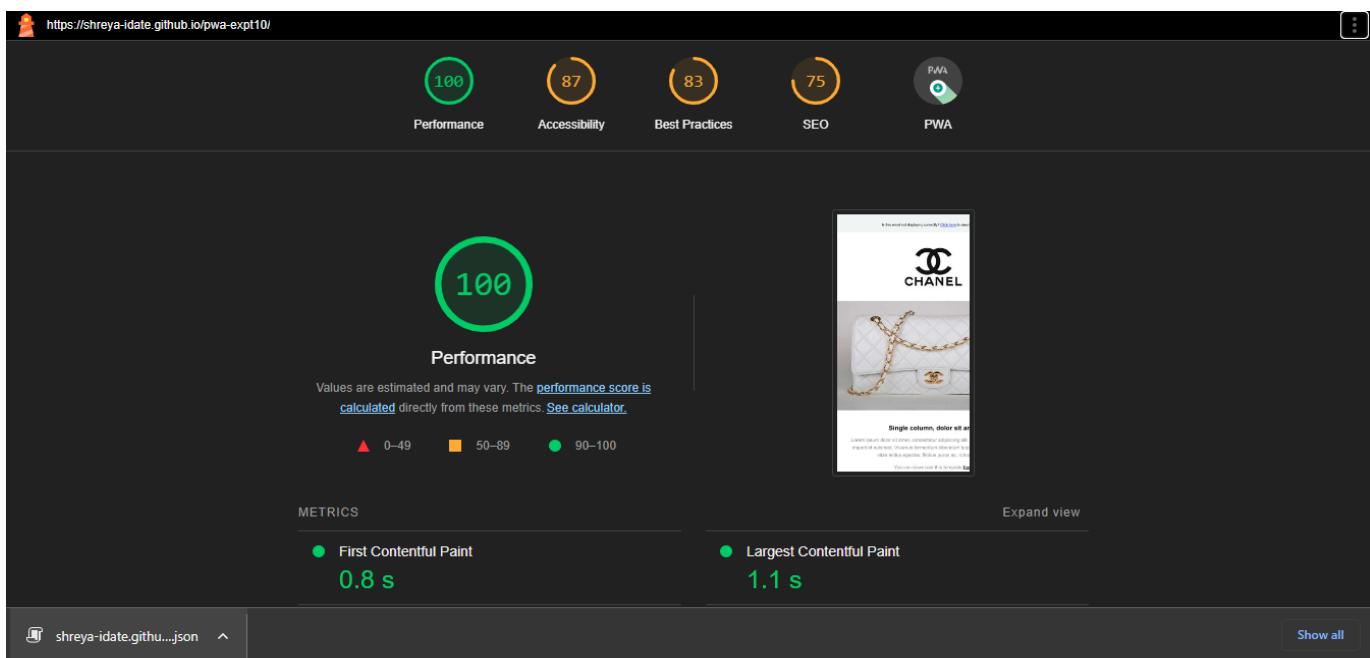
```
lighthouse --output json --output-path <path/for/output.json>
```

3. **Lighthouse Viewer.** Click **Export > Save as JSON**.
4. **Click on and save as Json**

To view the report data:

1. Open the [Lighthouse Viewer](#) in Google Chrome.
2. Drag the JSON file onto the viewer, or click anywhere on the Viewer to open your file navigator and select the file.





## Share reports as GitHubGists

If you don't want to manually pass around JSON files, you can also share your reports as secret GitHubGists. One benefit of Gists is free version control.

To export a report as a Gist from the report:

1. (If already on the viewer, skip this step) Click Export > Open In Viewer. The report opens in the Viewer, located at <https://googlechrome.github.io/lighthouse/viewer/>.
2. In the Viewer, click Share . The first time you do this, a popup asks permission to access your basic GitHub data, and to read and write to your Gists.
3. To export a report as a Gist from the CLI version of Lighthouse, just manually create a Gist and copy-paste the report's JSON output into the Gist. The Gist filename containing the JSON output must end in .lighthouse.report.json. See Share reports as JSON for an example of how to generate JSON output from the command line tool.

To view a report that's been saved as a Gist:

1. Add ?gist=<ID> to the Viewer's URL, where <ID> is the ID of the Gist.
2. <https://googlechrome.github.io/lighthouse/viewer/?gist=<ID>>
3. Open the Viewer, and paste the URL of a Gist into it.
4. Click on and save as Gists
5. Open your GitHub account and go to Your Gists to find the gistsurl

The screenshot shows a web browser window titled "Authorize application - Google Chrome" with the URL [github.com/login/oauth/authorize?response\\_type=code&client\\_id=...](https://github.com/login/oauth/authorize?response_type=code&client_id=...). The page displays the GitHub logo and a yellow Lighthouse logo. It asks for permission to "Authorize Lighthouse Viewer". The "Lighthouse Viewer by GoogleChrome" wants access to the user's "Gists" (Read and write access) and "Personal user data" (Email addresses (read-only)). At the bottom, there are "Cancel" and "Authorize GoogleChrome" buttons. A note says "Authorizing will redirect to <https://lighthouse-chrom-1560304954232.firebaseioapp.com>". Below this, there are two status indicators: "Not owned or operated by GitHub" and "Created 2 years ago".

The screenshot shows the GitHub profile sidebar for a user named "Shreya-Idate". The sidebar includes sections for "Welcome to Campus!", "Latest changes", and "Go to Global". The "Your gists" section is highlighted with a blue background, indicating it is the active tab. Other options in the sidebar include "Your profile", "Your repositories", "Your organizations", "Your projects", "Your stars", "Your sponsors", "Upgrade", "Try Enterprise", "Feature preview", "Help", "Settings", and "Sign out".

All gists 1

Type: All ▾ Sort: Recently created ▾

Shreya-Idate / shreya-ide.github.io\_2023-04-21\_23-17-39.lighthouse.report.json Secret

Created 1 minute ago Lighthouse json report

```
1 {"requestedUrl": "https://shreya-ide.github.io/pwa-expt10/", "finalUrl": "https://shreya-ide.github.io/pwa-expt10/", "mainDocume
```

**Conclusion:** - We have successfully learnt how to use Google Lighthouse PWA Analysis Tool to test the PWA functioning.

