

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

Theory :

Google Lighthouse :

Google Lighthouse is a tool that lets you audit your web application based on a number of parameters including (but not limited to) performance, based on a number of metrics, mobile compatibility, Progressive Web App (PWA) implementations, etc. All you have to do is run it on a page or pass it a URL, sit back for a couple of minutes and get a very elaborate report, not much short of one that a professional auditor would have compiled in about a week.

The best part is that you have to set up almost nothing to get started. Let's begin by looking at some of the top features and audit criteria used by Lighthouse.

Key Features and Audit Metrics

Google Lighthouse has the option of running the Audit for Desktop as well as mobile version of your page(s). The top metrics that will be measured in the Audit are:

1. **Performance:** This score is an aggregation of how the page fared in aspects such as (but not limited to) loading speed, time taken for loading for basic frame(s), displaying meaningful content to the user, etc. To a layman, this score is indicative of how decently the site performs, with a score of 100 meaning that you figure in the 98th percentile, 50 meaning that you figure in the 75th percentile and so on.
2. **PWA Score (Mobile):** Thanks to the rise of Service Workers, app manifests, etc., a lot of modern web applications are moving towards the PWA paradigm, where the objective is to make the application behave as close as possible to native mobile applications. Scoring points are based on the Baseline PWA checklist laid down by Google which includes Service Worker implementation(s), viewport handling, offline functionality, performance in script-disabled environments, etc.
3. **Accessibility:** As you might have guessed, this metric is a measure of how accessible your website is, across a plethora of accessibility features that can be implemented in your page (such as the 'aria-' attributes like aria-required, audio captions, button names, etc.). Unlike the other metrics though, Accessibility metrics score on a pass/fail basis i.e. if all possible elements of the page are not screen-reader friendly (HTML5 introduced features that would make pages easy to interpret for screen readers used by visually challenged people like tag names, tags such as <section>, <article>, etc.), you get a 0 on that score. The aggregate of these scores is your Accessibility metric score.

4. Best Practices: As any developer would know, there are a number of practices that have been deemed 'best' based on empirical data. This metric is an aggregation of many such points, including but not limited to: Use of HTTPS
Avoiding the use of deprecated code elements like tags, directives, libraries, etc.
Password input with paste-into disabled
Geo-Location and cookie usage alerts on load, etc.

Changes made to the code :

For a maskable icon add "purpose": "any maskable" to the icons in manifest.json file For apple touch icon add the following meta tag in index.html-
<link rel="apple-touch-icon" href="">

Changes in manifest.json

```
{
  "name": "PWA Tutorial",
  "short_name": "PWA",
  "start_url": "index.html",
  "display": "standalone",
  "background_color": "#5900b3",
  "theme_color": "black",
  "scope": ".",
  "description": "This is a PWA tutorial.",
  "icons": [
    {
      "src": "images/192.png",
      "sizes": "192x192",
      "type": "image/png",
      "purpose": "maskable"
    },
    {
      "src": "images/unnamed.png",
      "sizes": "512x512",
      "type": "image/png"
    }
  ]
}
```

Output:

Desktop

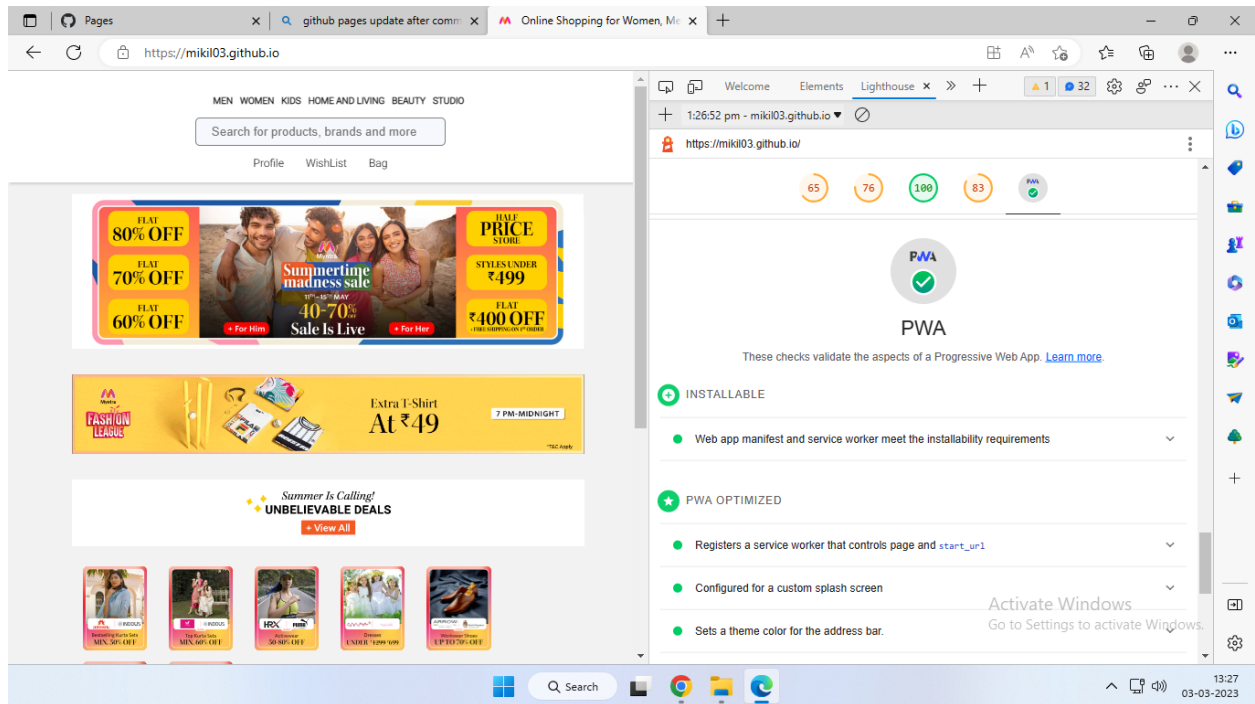
The screenshot shows a desktop browser window with the URL <https://miki03.github.io>. The website displays a shopping interface with a navigation bar (MEN, WOMEN, KIDS, HOME AND LIVING, BEAUTY, STUDIO), a search bar, and a sidebar (Profile, WishList, Bag). The main content area features a large promotional banner for a "Summertime madness sale" with discounts of 80%, 70%, and 60% off, and a "PRICE STORE" section with styles under ₹499. Below the banner is a section titled "Extra T-Shirt At ₹49" and a "Summer Is Calling! UNBELIEVABLE DEALS" section with a "View All" button. At the bottom, there are five product cards with various discounts.

Overlaid on the right side of the browser window is the Lighthouse performance audit for the same URL. The audit shows scores for Performance (65), Accessibility (76), Best Practices (100), SEO (83), and PWA (PWA icon). The Performance section is expanded, showing a score of 65 and a message: "Values are estimated and may vary. The performance score is calculated directly from these metrics. See calculator." Below this, there are two metrics: "First Contentful Paint" and "Time to Interactive".

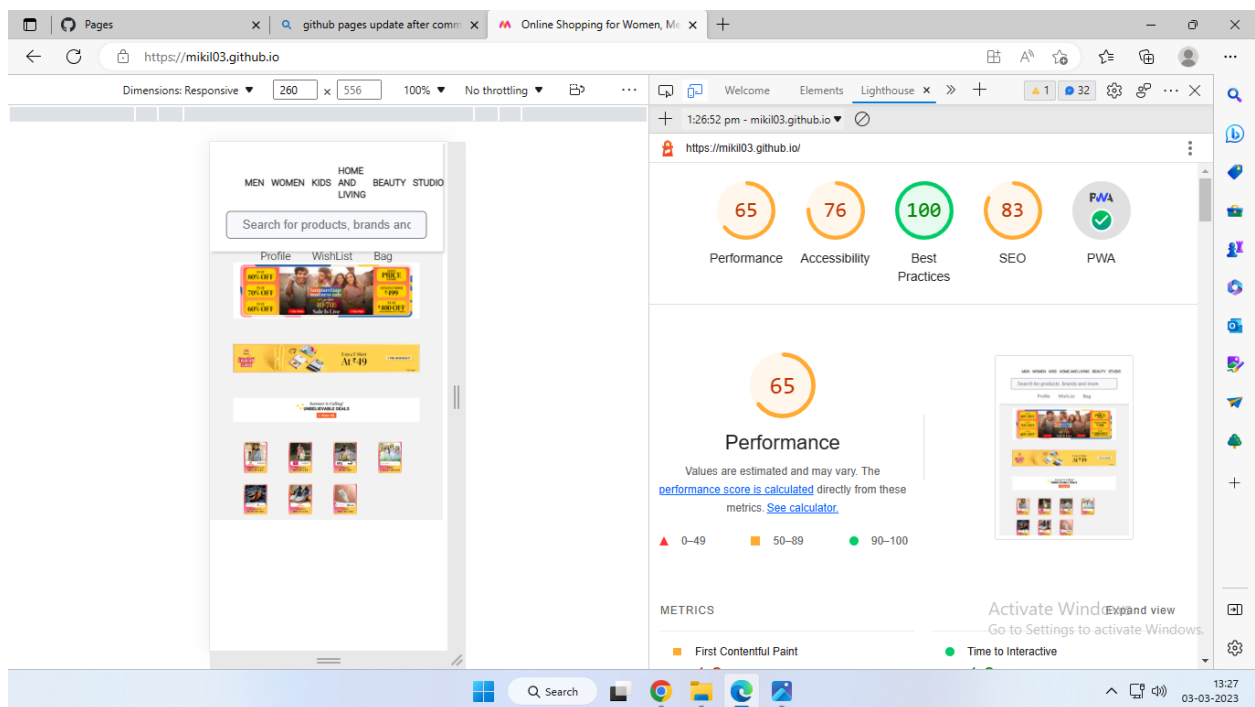
This screenshot is similar to the one above, showing the same website and Lighthouse audit. However, the Lighthouse audit's "PWA" section is now expanded, showing a "PWA OPTIMIZED" status with a green star icon. The expanded section lists several PWA-related checks, all of which are marked as "Optimized" (green dots):

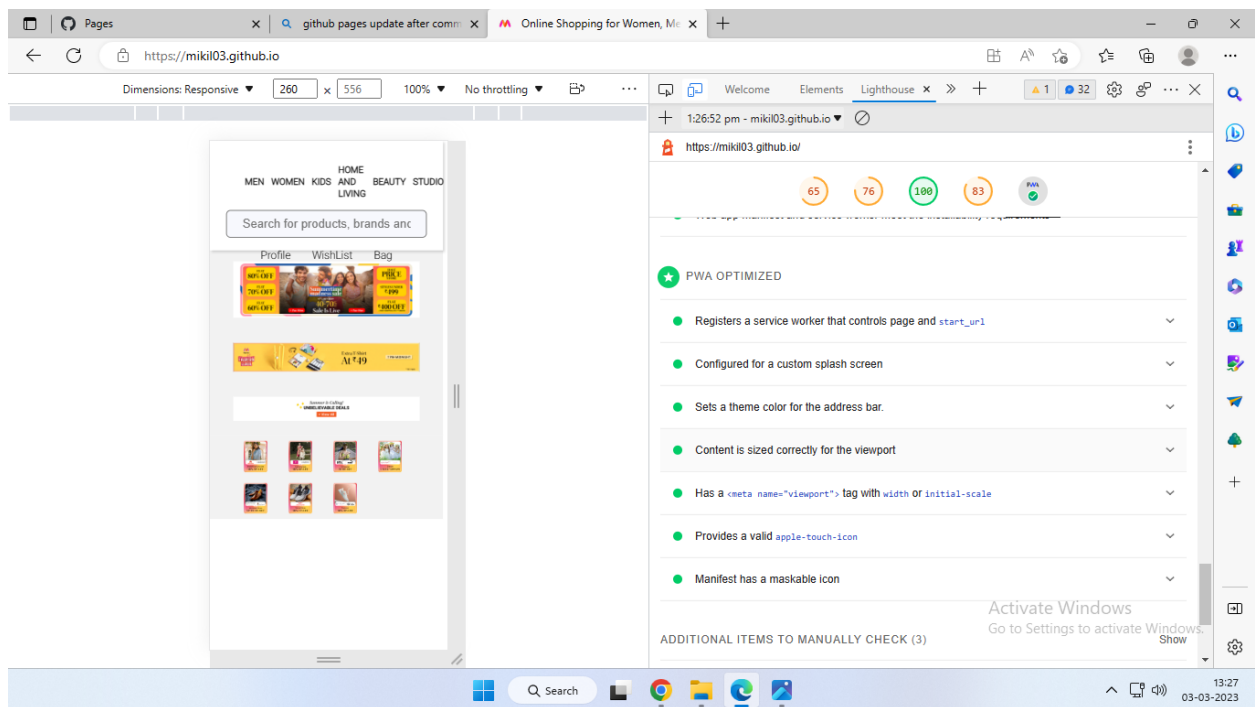
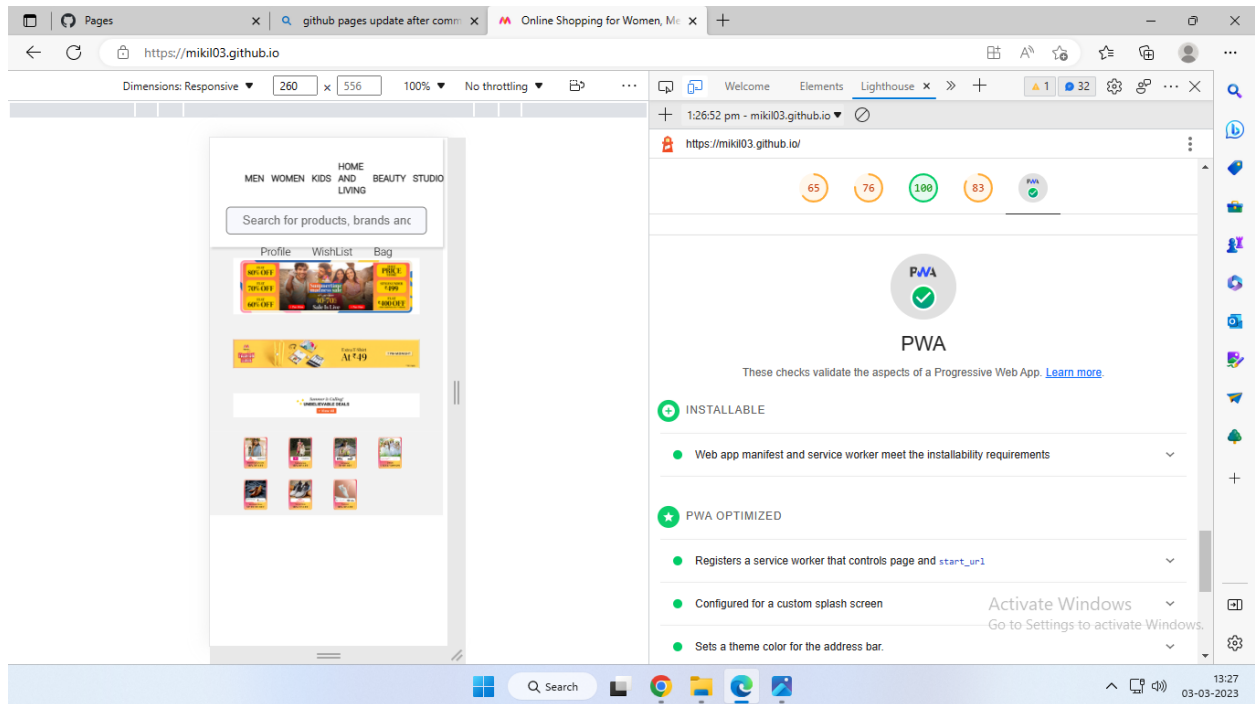
- Registers a service worker that controls page and `start_url`
- Configured for a custom splash screen
- Sets a theme color for the address bar
- Content is sized correctly for the viewport
- Has a `<meta name="viewport">` tag with width of `initial-scale`
- Provides a valid `apple-touch-icon`
- Manifest has a maskable icon

At the bottom of the PWA section, it says "ADDITIONAL ITEMS TO MANUALLY CHECK (3)".



Mobile





Conclusion:

Hence we successfully used google Lighthouse PWA Analysis Tool for testing the PWA functioning.