Experiment 11

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

Theory : Reference : https://www.semrush.com/blog/google-lighthouse/

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.

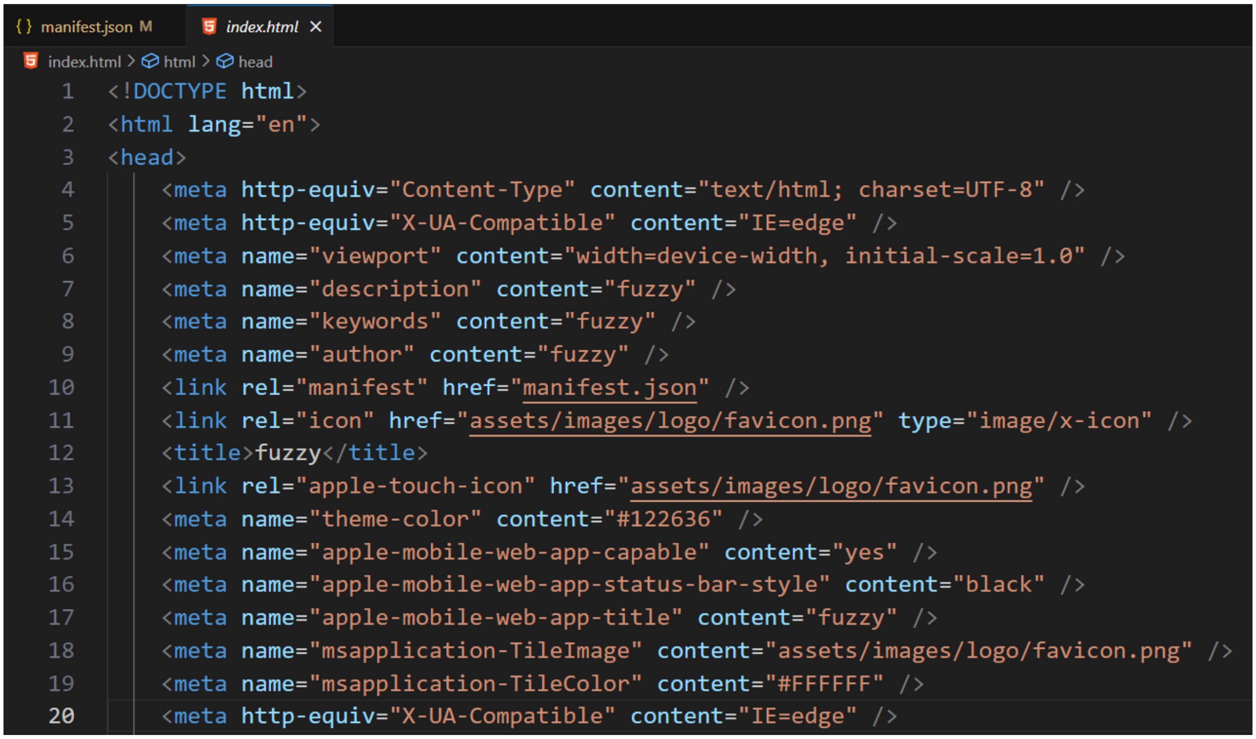
3. **Accessibility:** As you might have guessed, this metric is a measure of how accessible your website is, across a plethora of accessibility features that can be implemented in your page (such as the 'aria-' attributes like aria-required, audio captions, button names, etc.). Unlike the other metrics 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.

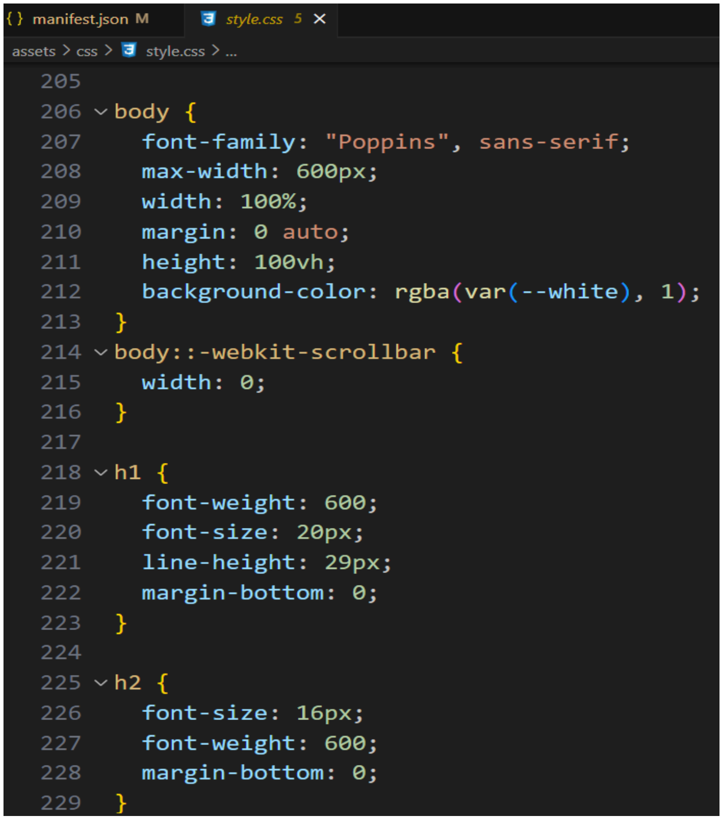
Code&Implementation:

Index.html



```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />
    <meta http-equiv="X-UA-Compatible" content="IE=edge" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <meta name="description" content="fuzzy" />
    <meta name="keywords" content="fuzzy" />
    <meta name="author" content="fuzzy" />
    <link rel="manifest" href="manifest.json" />
    <link rel="icon" href="assets/images/logo/favicon.png" type="image/x-icon" />
    <title>fuzzy</title>
    <link rel="apple-touch-icon" href="assets/images/logo/favicon.png" />
    <meta name="theme-color" content="#122636" />
    <meta name="apple-mobile-web-app-capable" content="yes" />
    <meta name="apple-mobile-web-app-status-bar-style" content="black" />
    <meta name="apple-mobile-web-app-title" content="fuzzy" />
    <meta name="msapplication-TileImage" content="assets/images/logo/favicon.png" />
    <meta name="msapplication-TileColor" content="#FFFFFF" />
    <meta http-equiv="X-UA-Compatible" content="IE=edge" />
```

Style.css



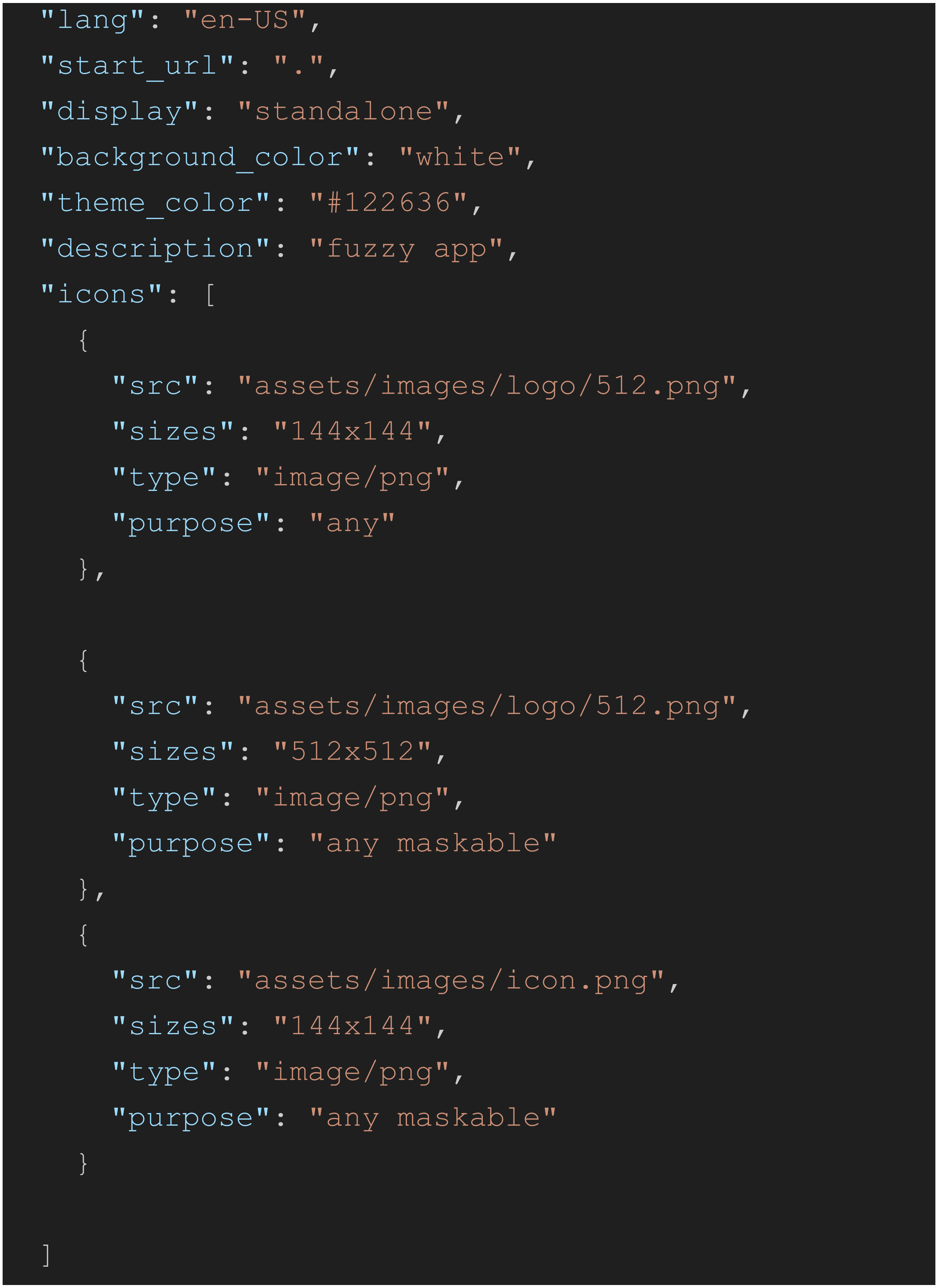
```css

body {
  font-family: "Poppins", sans-serif;
  max-width: 600px;
  width: 100%;
  margin: 0 auto;
  height: 100vh;
  background-color: rgba(var(--white), 1);
}
body::-webkit-scrollbar {
  width: 0;
}

h1 {
  font-weight: 600;
  font-size: 20px;
  line-height: 29px;
  margin-bottom: 0;
}

h2 {
  font-size: 16px;
  font-weight: 600;
  margin-bottom: 0;
}
```

Script.js

```
document.getElementById("loginForm").addEventListen
er("submit",(event)=>{
    event.preventDefault()
})

firebase.auth().onAuthStateChanged((user)=>{
    if(user){
        location.replace("/landing.html")
    }
})

function login(){
    const email =
document.getElementById("email").value
    const password =
document.getElementById("password").value

firebase.auth().signInWithEmailAndPassword(email,
password)
    .catch((error)=>{
        document.getElementById("error").innerHTML
= error.message
    })
}

function signUp(){
    const email_login =
document.getElementById("email_login").value
                     const     password_login     =
document.getElementById("password_login").value

firebase.auth().createUserWithEmailAndPassword(emai
l, password)
    .catch((error) => {
          document.getElementById("error").innerHTML
= error.message
    });
}

function forgotPass(){
                           const      email      =
document.getElementById("email").value
    firebase.auth().sendPasswordResetEmail(email)
    .then(() => {
        alert("Reset link sent to your email id")
    })
    .catch((error) => {
          document.getElementById("error").innerHTML
= error.message
    });
}
```

Manifest.json

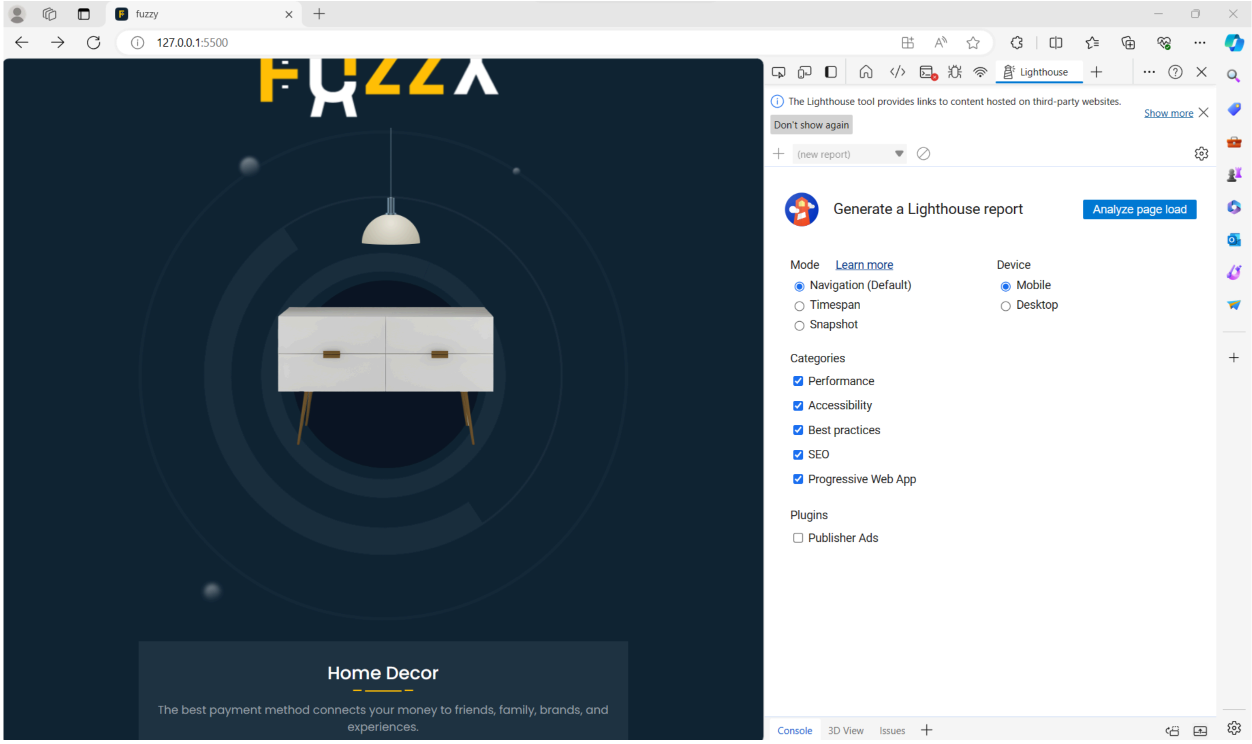
```
{
  "name": "Fuzzy app",
  "short_name": "Fuzzy app",
```



```
  "lang": "en-US",
  "start_url": ".",
  "display": "standalone",
  "background_color": "white",
  "theme_color": "#122636",
  "description": "fuzzy app",
  "icons": [
    {
      "src": "assets/images/logo/512.png",
      "sizes": "144x144",
      "type": "image/png",
      "purpose": "any"
    },

    {
      "src": "assets/images/logo/512.png",
      "sizes": "512x512",
      "type": "image/png",
      "purpose": "any maskable"
    },
    {
      "src": "assets/images/icon.png",
      "sizes": "144x144",
      "type": "image/png",
      "purpose": "any maskable"
    }

  ]
```

Output:

For Desktop Devices



Home Decor

The best payment method connects your money to friends, family, brands, and experiences.

The Lighthouse tool provides links to content hosted on third-party websites. Show more

Don't show again

(new report)

Generate a Lighthouse report

Analyze page load

Mode Learn more

● Navigation (Default)
○ Timespan
○ Snapshot

Device

● Mobile
○ Desktop

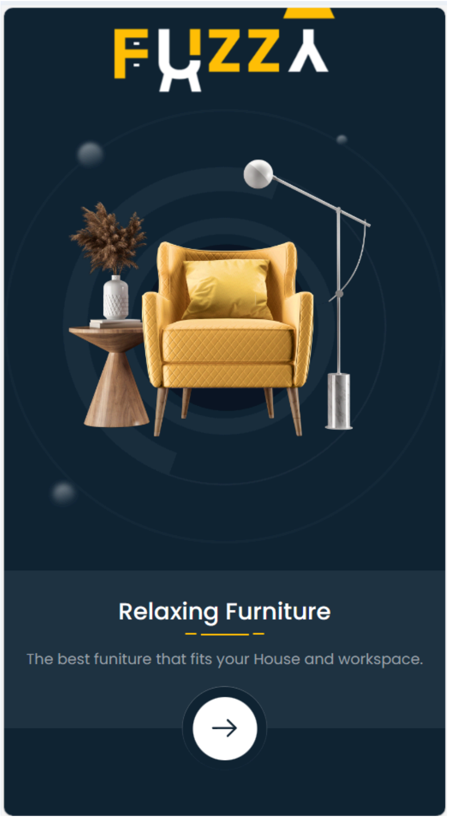
Categories

☑ Performance
☑ Accessibility
☑ Best practices
☑ SEO
☑ Progressive Web App

Plugins

□ Publisher Ads

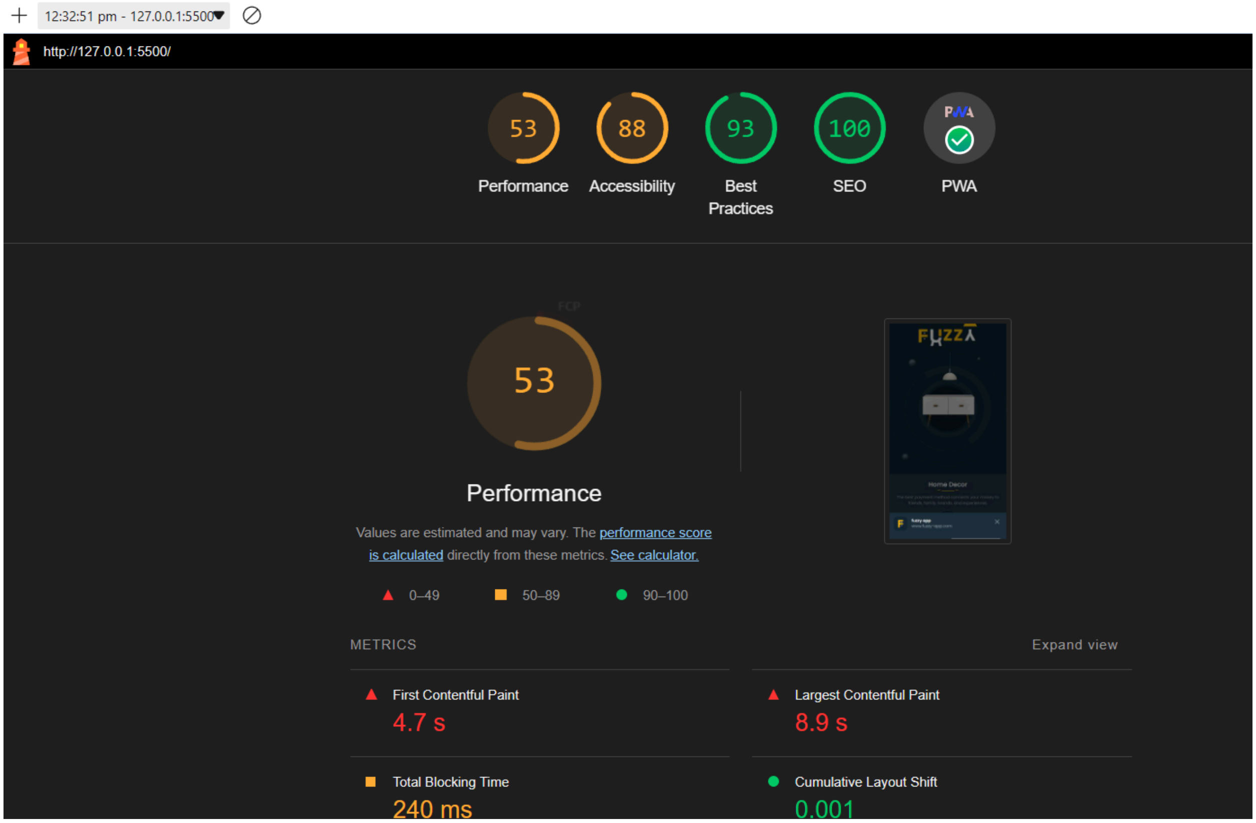
For Mobile Devices



Relaxing Furniture

The best funiture that fits your House and workspace.

Report Generated

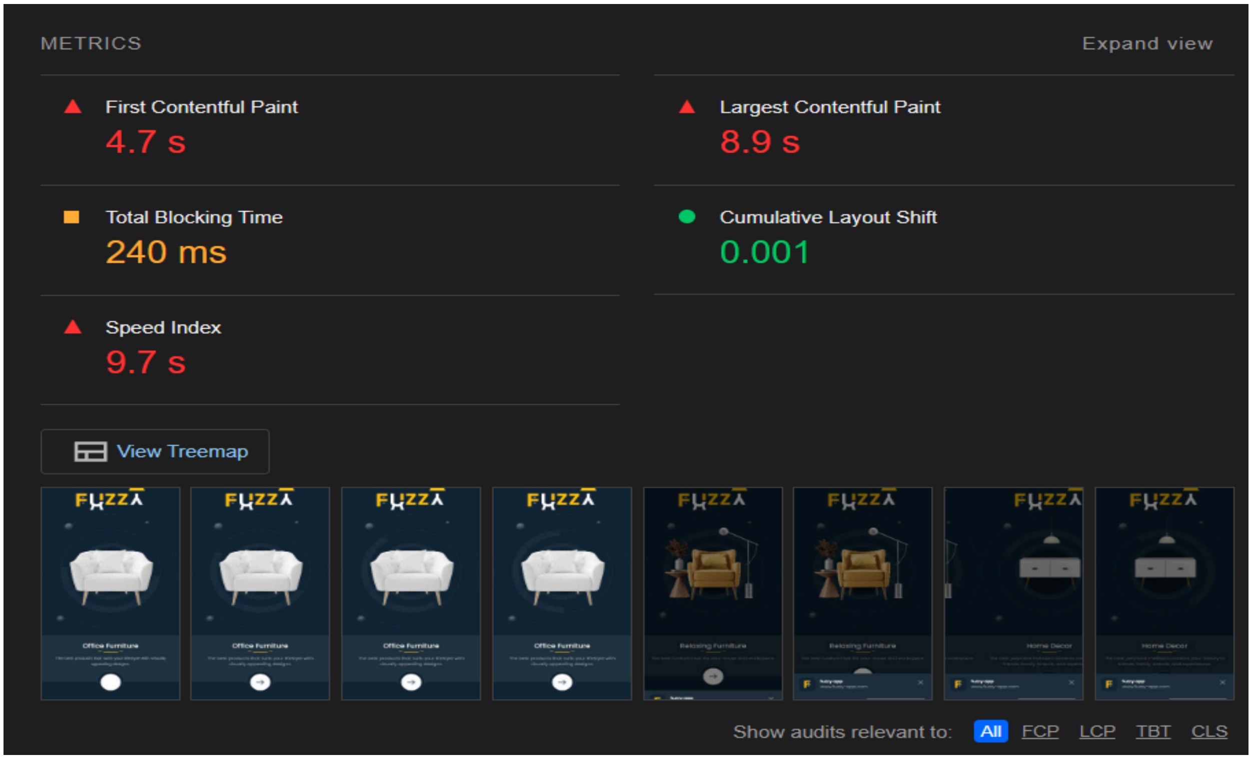


Values are estimated and may vary. The performance score is calculated directly from these metrics. See calculator.

▲ 0–49 ■ 50–89 ● 90–100

METRICS Expand view

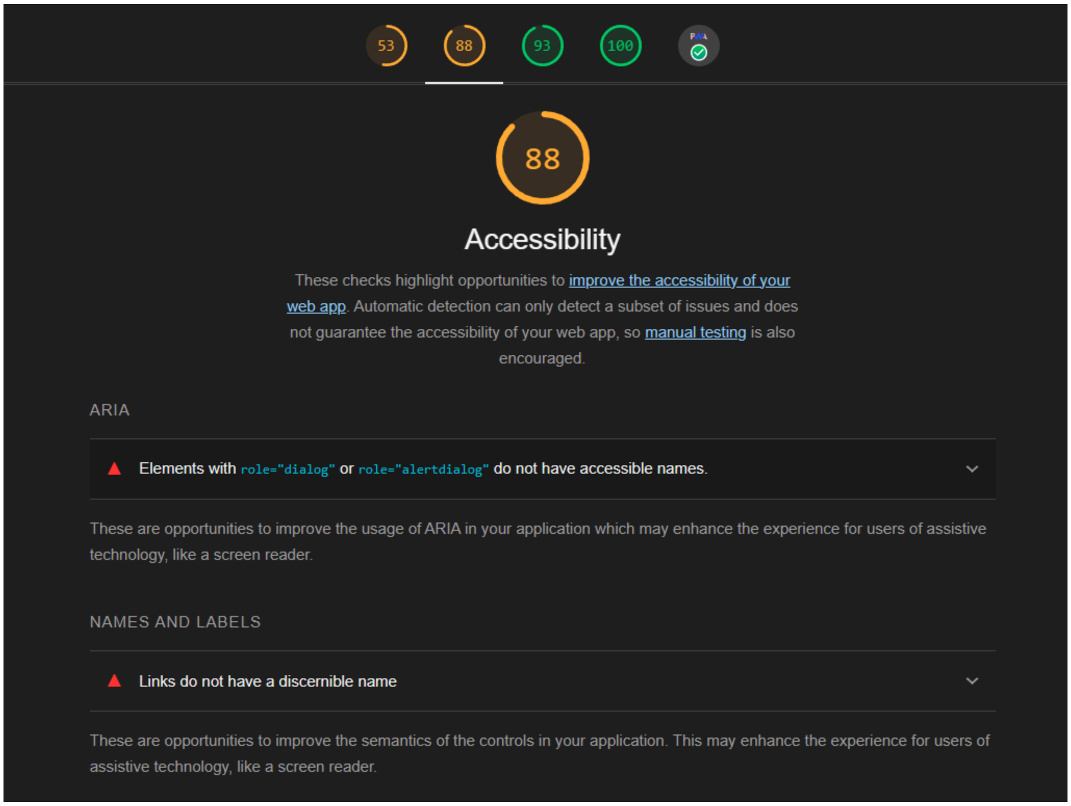
▲ First Contentful Paint 4.7 s	▲ Largest Contentful Paint 8.9 s
■ Total Blocking Time 240 ms	● Cumulative Layout Shift 0.001



METRICS Expand view

▲ First Contentful Paint 4.7 s	▲ Largest Contentful Paint 8.9 s
■ Total Blocking Time 240 ms	● Cumulative Layout Shift 0.001
▲ Speed Index 9.7 s	

Show audits relevant to: All FCP LCP TBT CLS



Accessibility

These checks highlight opportunities to improve the accessibility of your web app. Automatic detection can only detect a subset of issues and does not guarantee the accessibility of your web app, so manual testing is also encouraged.

ARIA

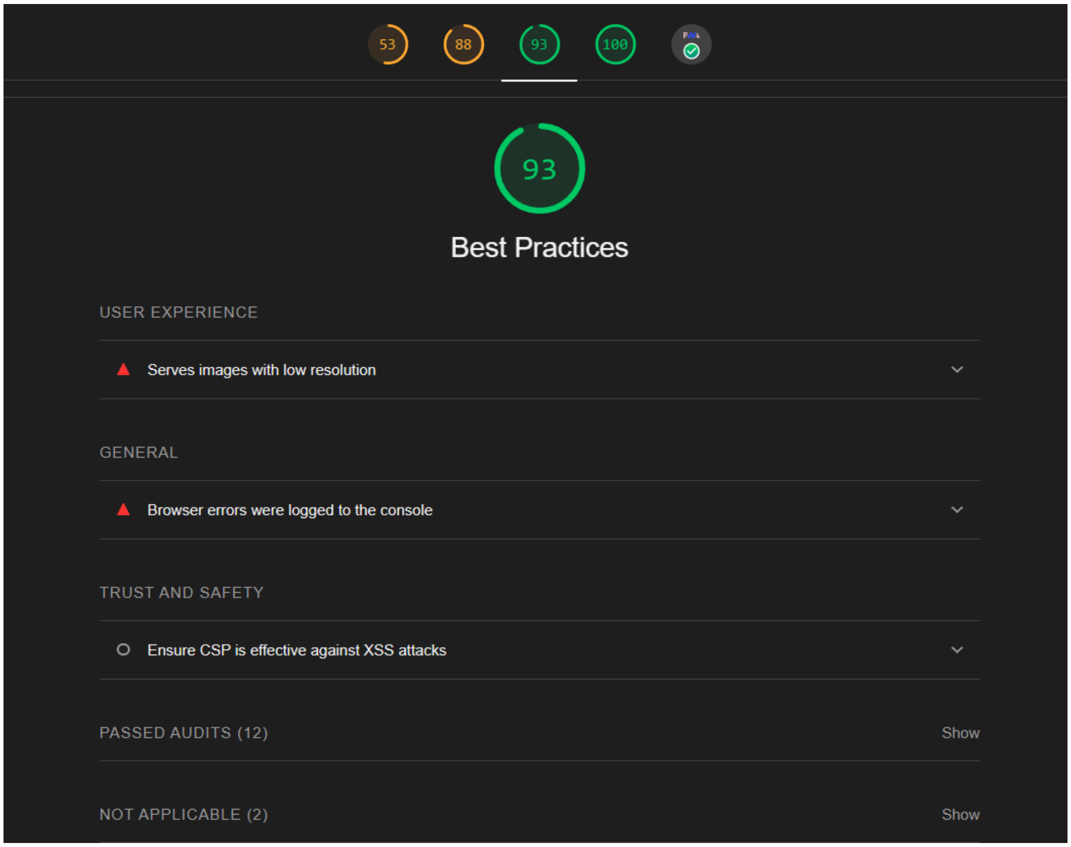
▲ Elements with `role="dialog"` or `role="alertdialog"` do not have accessible names.

These are opportunities to improve the usage of ARIA in your application which may enhance the experience for users of assistive technology, like a screen reader.

NAMES AND LABELS

▲ Links do not have a discernible name

These are opportunities to improve the semantics of the controls in your application. This may enhance the experience for users of assistive technology, like a screen reader.



Best Practices

USER EXPERIENCE

▲ Serves images with low resolution

GENERAL

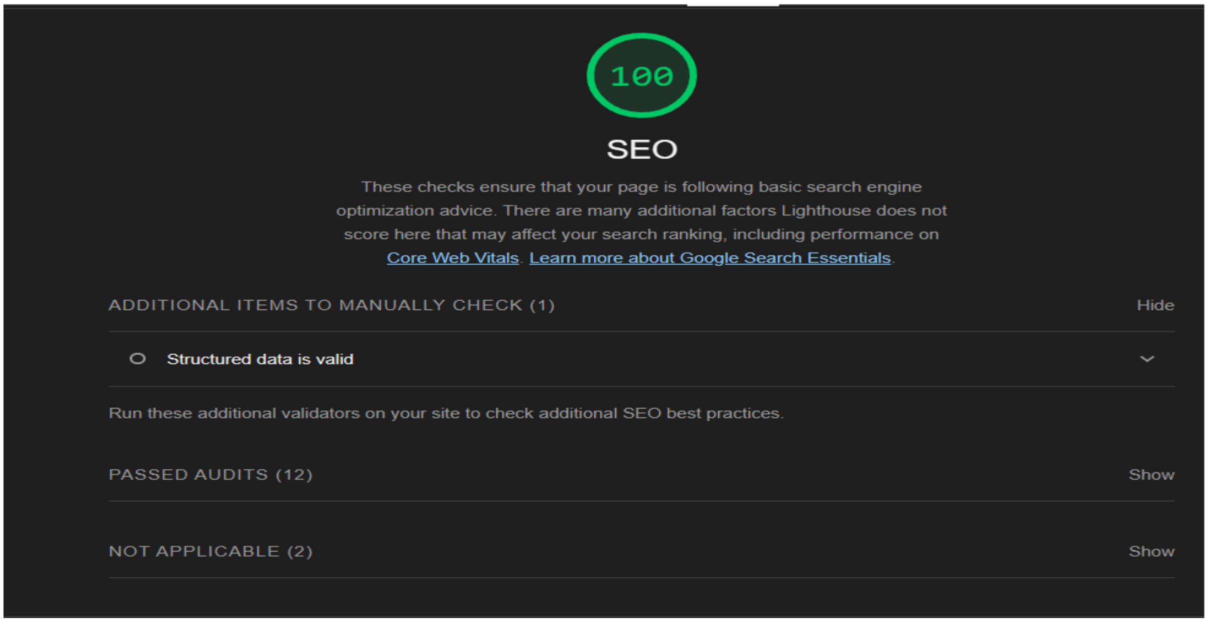
▲ Browser errors were logged to the console

TRUST AND SAFETY

○ Ensure CSP is effective against XSS attacks

PASSED AUDITS (12) Show

NOT APPLICABLE (2) Show



100

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.

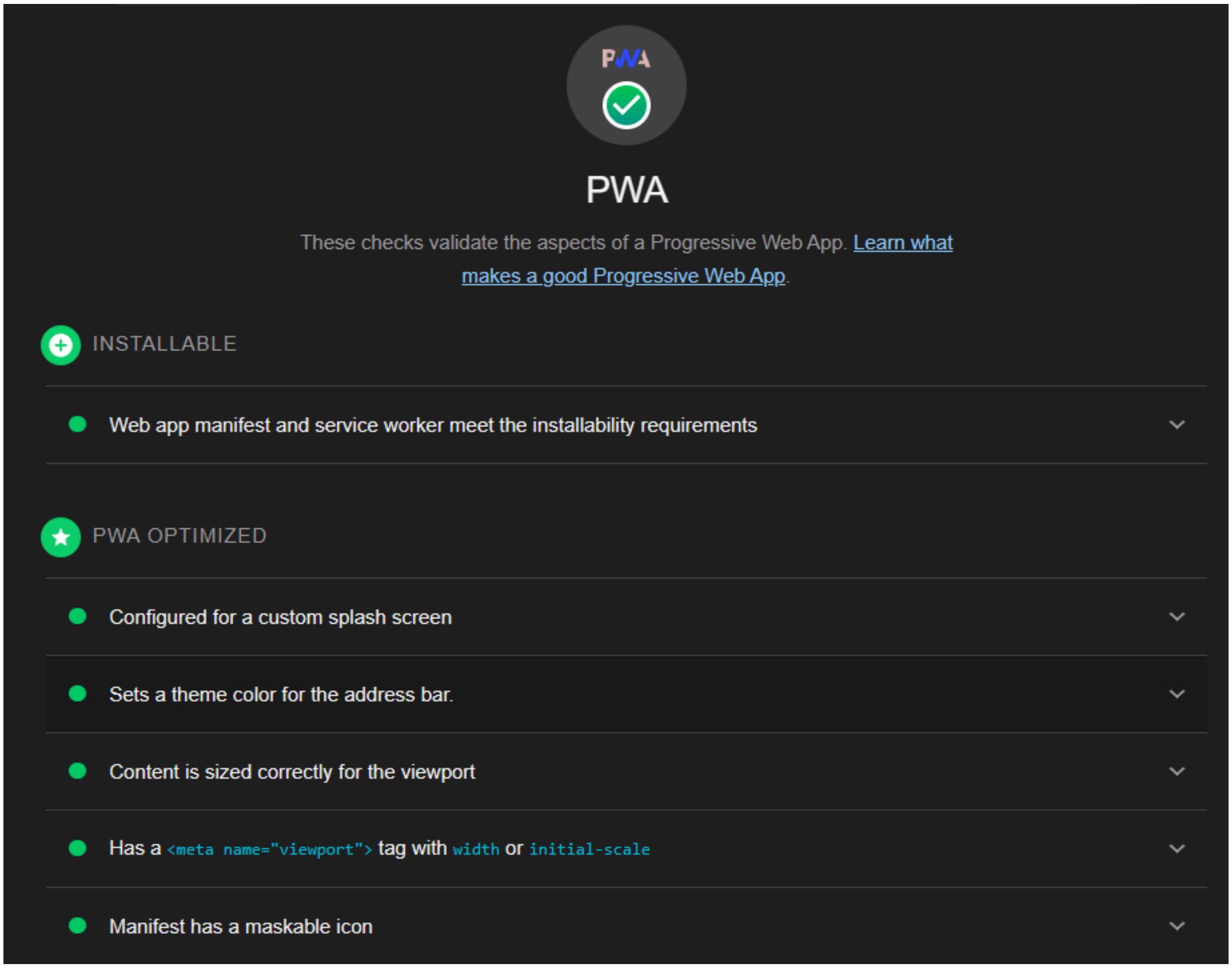
ADDITIONAL ITEMS TO MANUALLY CHECK (1) Hide

○ Structured data is valid

Run these additional validators on your site to check additional SEO best practices.

PASSED AUDITS (12) Show

NOT APPLICABLE (2) Show



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

PWA OPTIMIZED

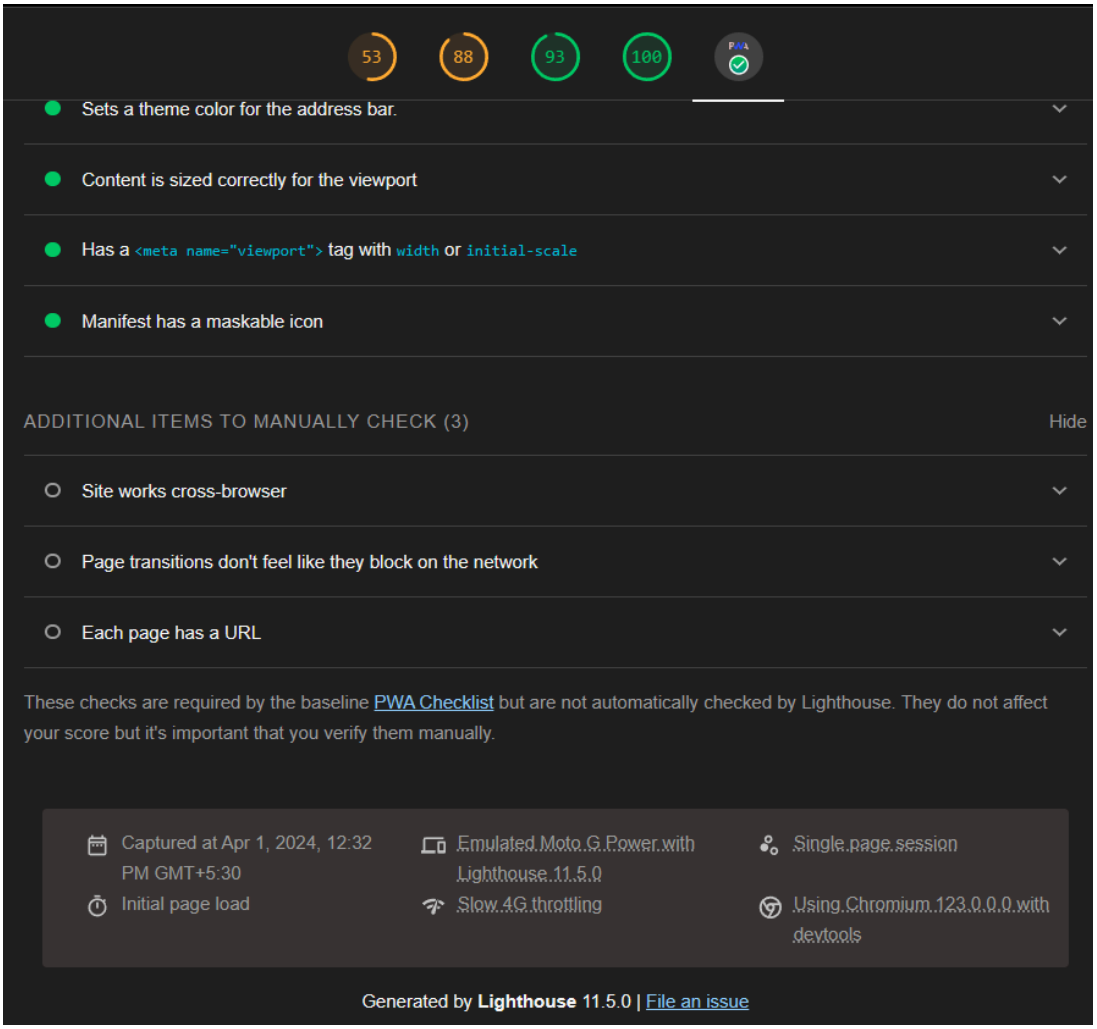
● Configured for a custom splash screen

● Sets a theme color for the address bar.

● Content is sized correctly for the viewport

● Has a `<meta name="viewport">` tag with `width` or `initial-scale`

● Manifest has a maskable icon



● Sets a theme color for the address bar.

● Content is sized correctly for the viewport

● Has a `<meta name="viewport">` tag with `width` or `initial-scale`

● Manifest has a maskable icon

ADDITIONAL ITEMS TO MANUALLY CHECK (3) Hide

○ Site works cross-browser

○ Page transitions don't feel like they block on the network

○ Each page has a URL

These checks are required by the baseline PWA Checklist but are not automatically checked by Lighthouse. They do not affect your score but it's important that you verify them manually.

Captured at Apr 1, 2024, 12:32 PM GMT+5:30
Initial page load
Emulated Moto G Power with Lighthouse 11.5.0
Slow 4G throttling
Single page session
Using Chromium 123.0.0.0 with devtools

Generated by **Lighthouse** 11.5.0 | File an issue

Conclusion: Thus we successfully used google Lighthouse PWA Analysis Tool for testing the PWA functioning.