

# Designing Progressive Web Apps

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CREATING THE PROGRESSIVE WEB APP



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# Overview

## **Creating the Progressive Web App**

- Introduction to the Project
- The Web App Manifest
- Meta Data for the HTML
- Theming the App for iOS and iPadOS



# Introduction to the Project

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# Objectives

# Objectives



Web

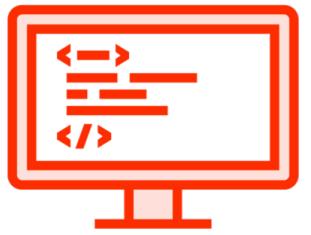


Progressive Web App

PWA

Progressive Web App

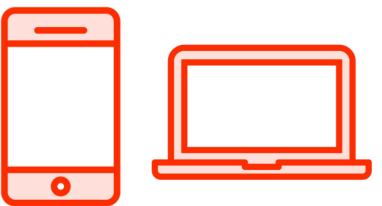
# Progressive Web App



App built with web technologies

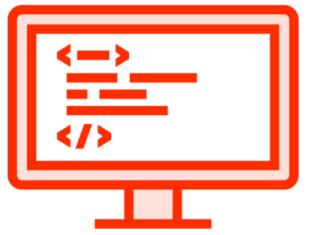


It works fast while online or offline



It can be installed on different platforms

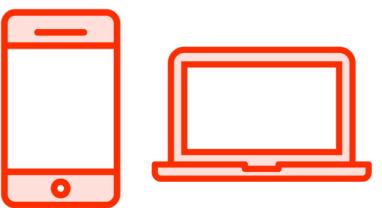
# Progressive Web App



**App built with web technologies**

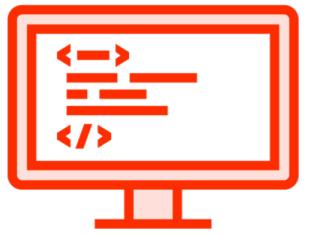


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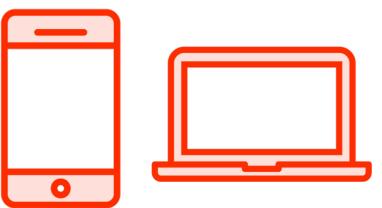
# Progressive Web App



**App built with web technologies**

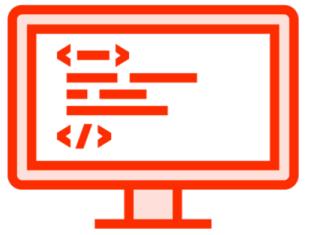


**It works fast while online or offline**



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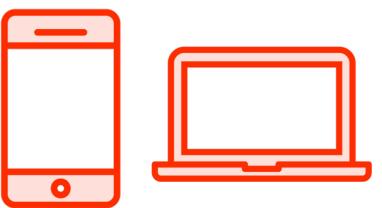
# Progressive Web App



**App built with web technologies**



**It works fast while online or offline**



**It can be installed on different platforms**

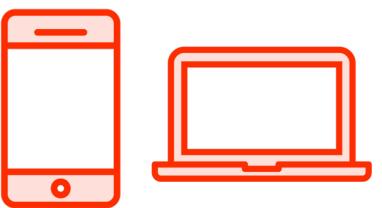
# Progressive Web App



App built with web technologies



It works fast while online or offline



It can be installed on different platforms



# Why design for PWAs?

We are used to design websites, content for the browser. But now, we are designing standalone experiences that are part of an operating system.

# Design Tasks of PWAs

- Integrate as an Android or iOS app
- Integrate as a Desktop or iPad app
- Design for the lack of a browser
- Create an app-friendly stylesheet
- Design for different distribution channels
- Create Iconography and splash screens

# Our Project

- Calculator App
- Built using HTML, CSS and JavaScript
- Dependency: Bootstrap 4
- It's currently working in the browser
- It already has a basic offline support
- We'll convert it into a fully designed PWA

# Demo

## Analyze the Project

- Set up the editor
- Check the initial code
- Test it on different browsers
- Verify PWA status



# Web App Manifest Basics

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# Three Main Components of a PWA

# Three Main Components of a PWA

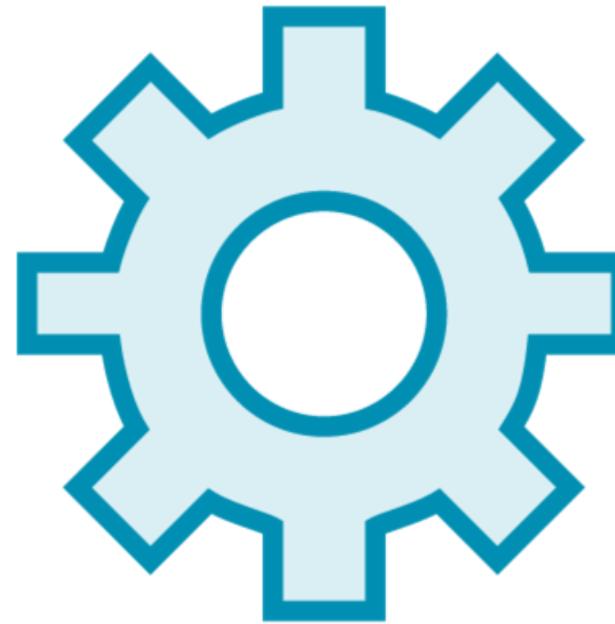


**Web app**

# Three Main Components of a PWA

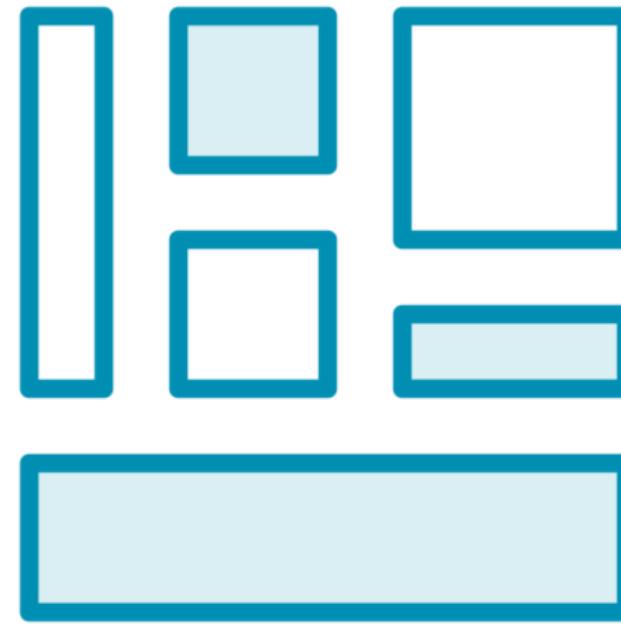


**Web app**

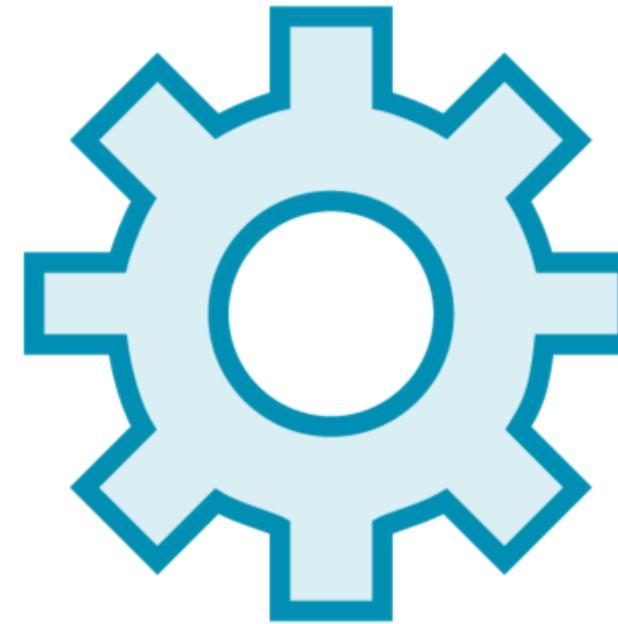


**Service worker**

# Three Main Components of a PWA



**Web app**



**Service worker**

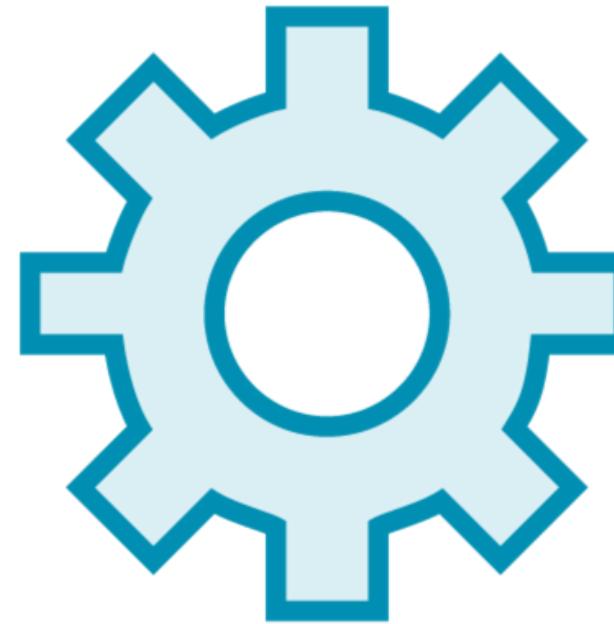


**App distribution**

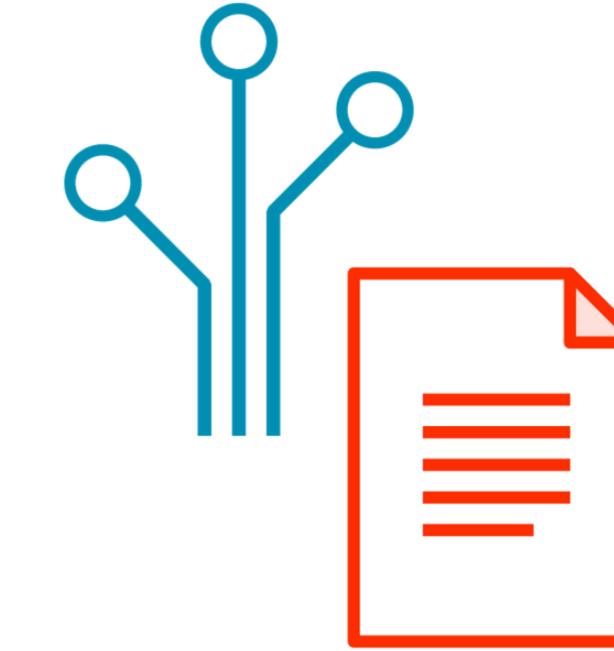
# Three Main Components of a PWA



**Web app**



**Service worker**



**Web app manifest**

```
{  
  "name": "PWA Name",  
  "short_name": "PWA",  
  "theme_color": "#385770",  
  "background_color":  
    "#18481d",  
  "display": "standalone",  
  "orientation": "portrait",  
  "scope": "/",  
  "start_url": "/",  
  "icons": [ ]  
}
```

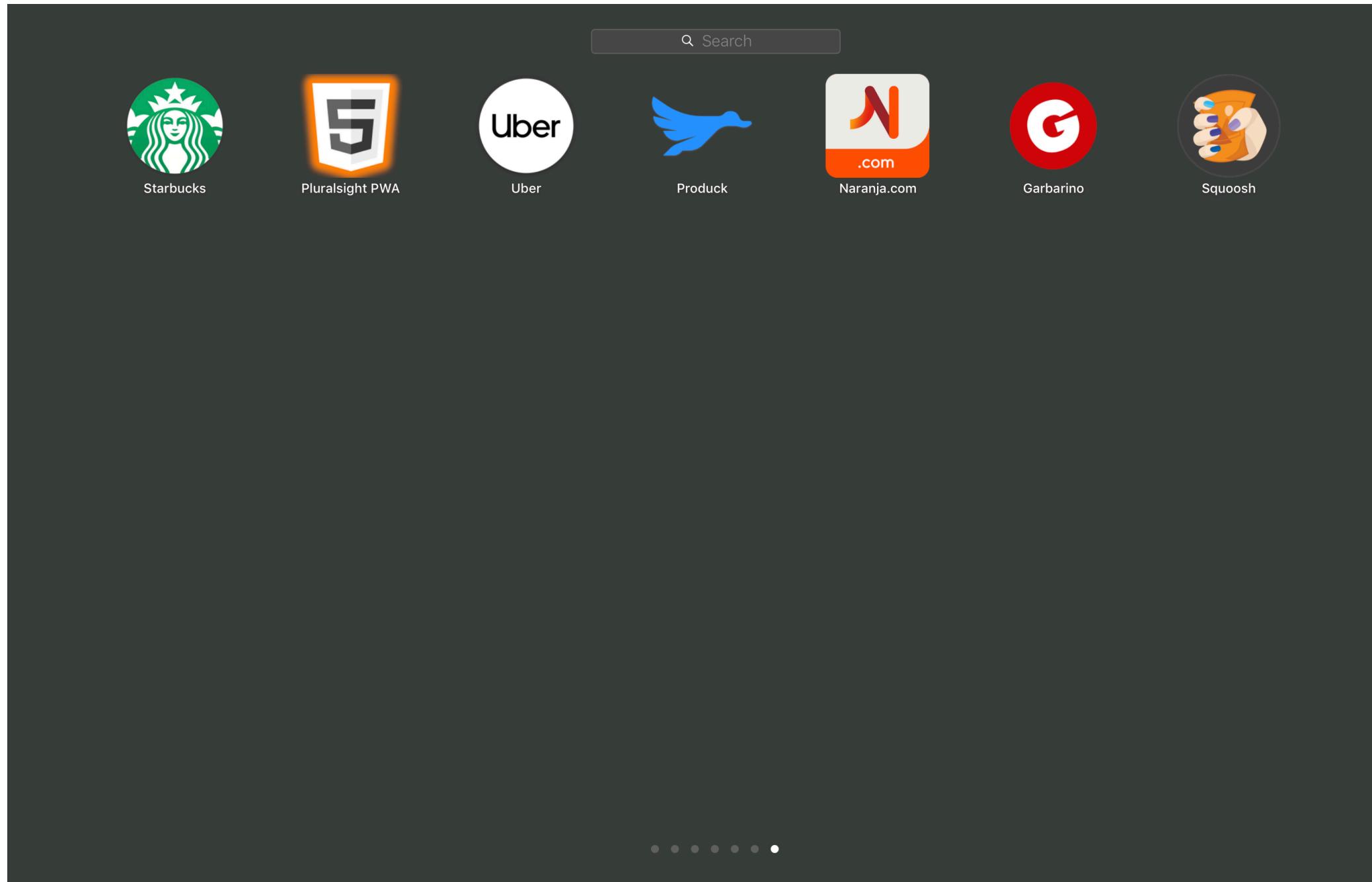


**Web app manifest**

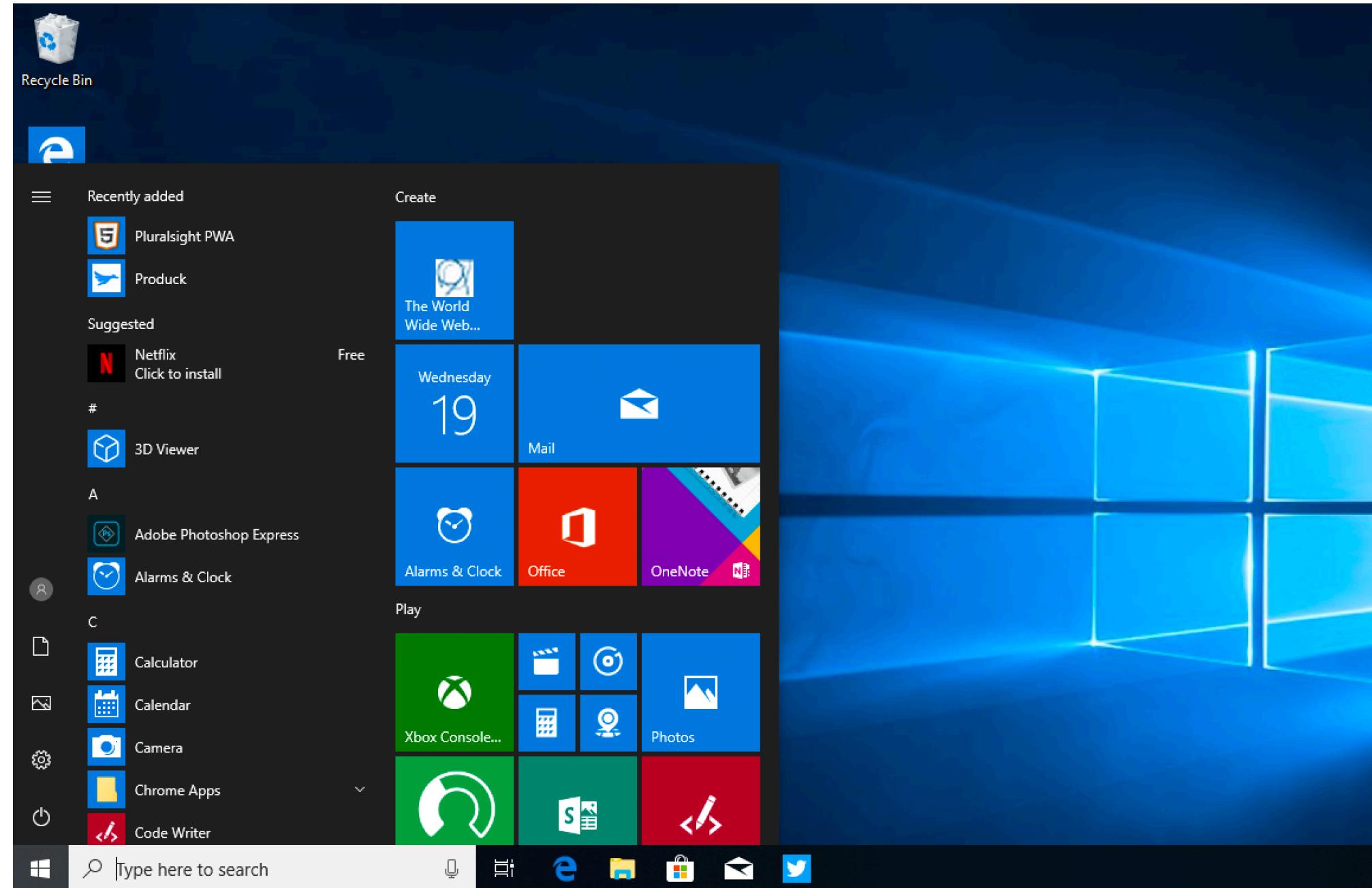
- **JSON file**

- Icon and name when installed
- Theme
- Orientation

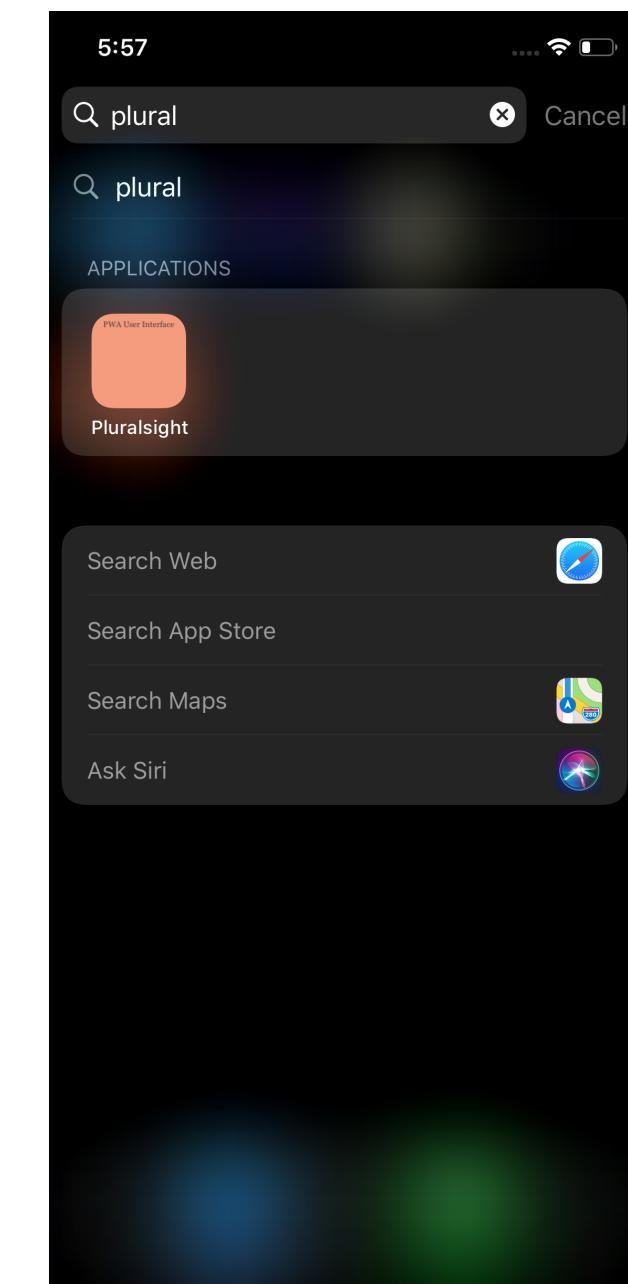
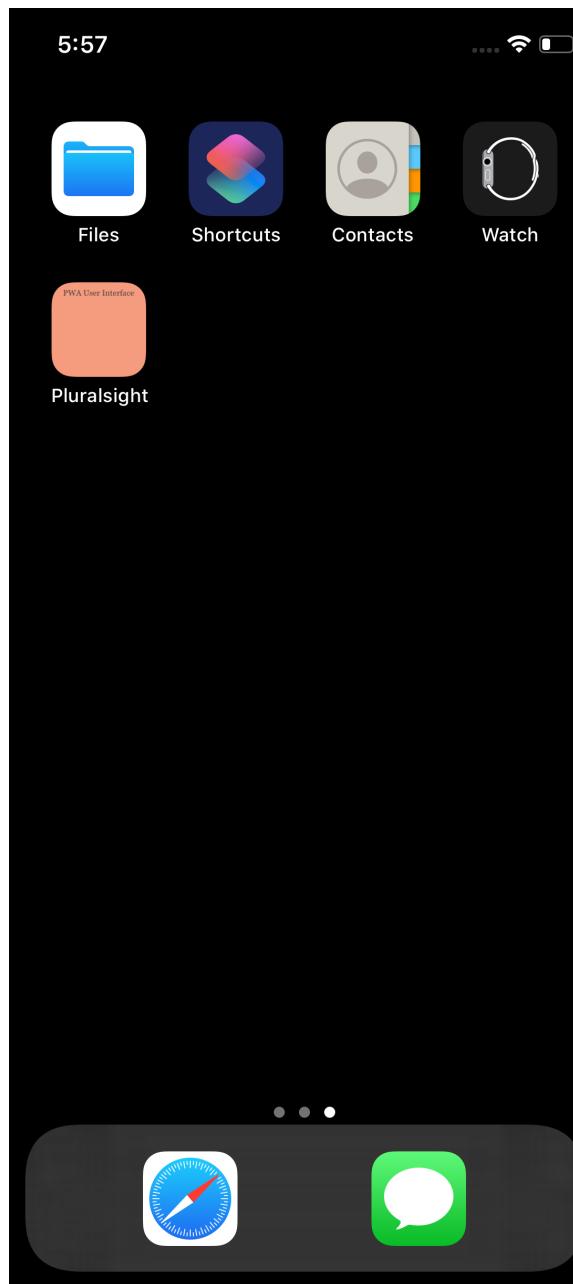
# Icons on Desktop



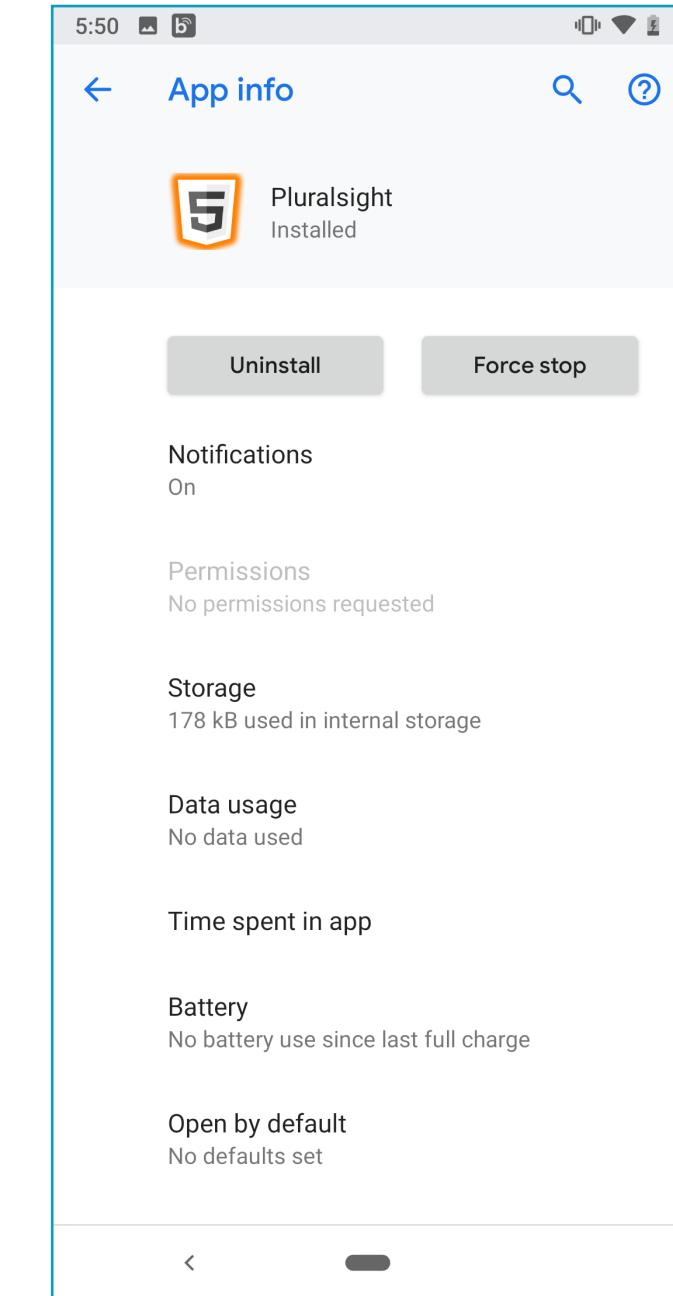
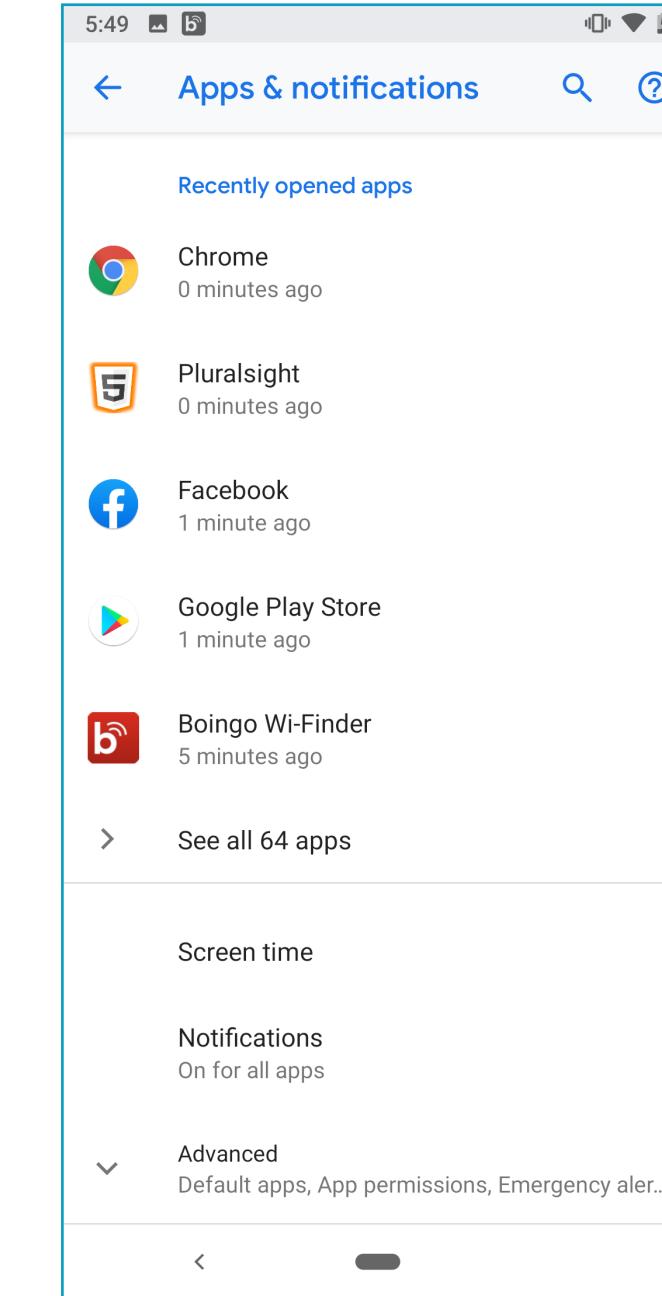
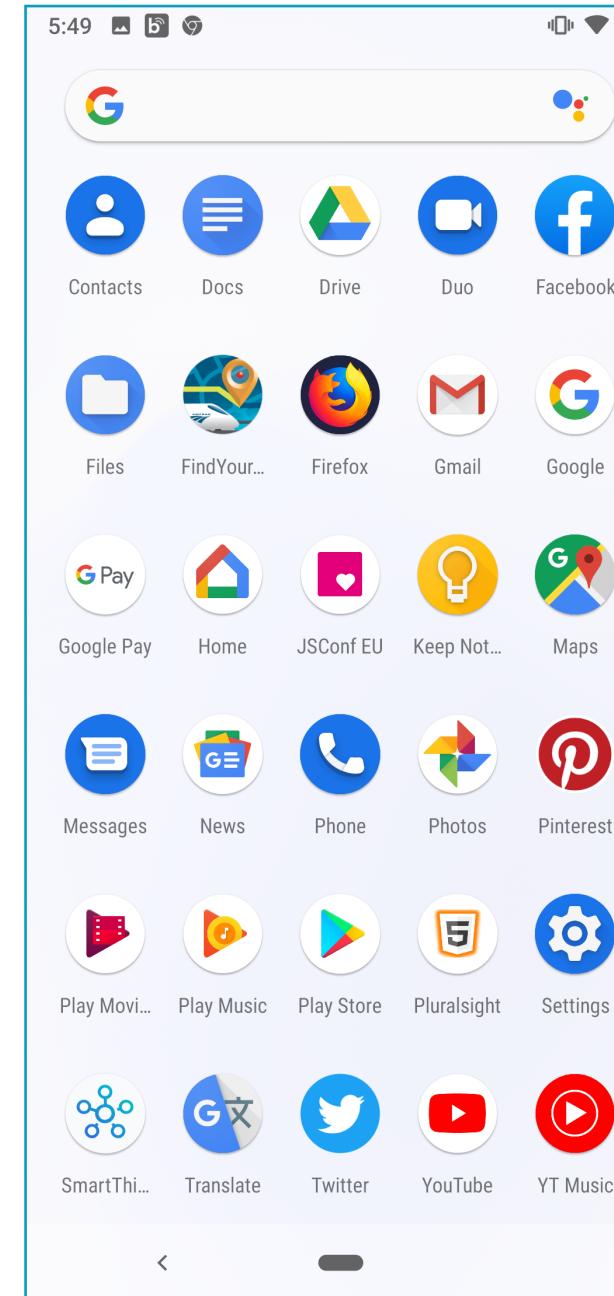
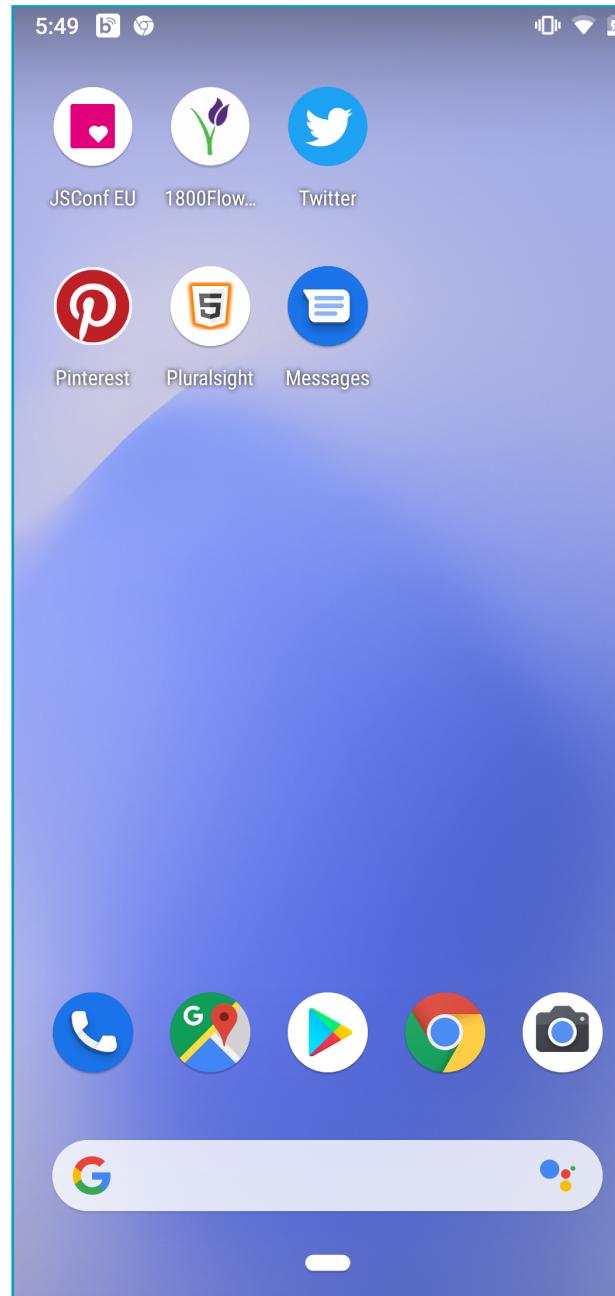
# Icons on Desktop



# Icons on iOS and iPadOS



# Icons on Android



```
{  
  "name": "PWA Name",  
  "short_name": "PWA",  
  "theme_color": "#385770",  
  "background_color":  
    "#18481d",  
  "display": "standalone",  
  "orientation": "portrait",  
  "scope": "/",  
  "start_url": "/",  
  "icons": [ ]  
}
```



**Web app manifest**

- App's Icon
- Long Name

```
{  
  "name": "PWA Name",  
  "short_name  "theme_color": "#385770",  
  "background_color":  
    "#18481d",  
  "display": "standalone",  
  "orientation": "portrait",  
  "scope": "/",  
  "start_url": "/",  
  "icons": [ ]  
}
```



**Web app manifest**

- **App's Icon**
  - Long Name
  - Short Name (optional)

```
{  
  "name": "PWA Name",  
  "short_name": "PWA",  
  "theme_color": "#385770",  
  "background_color":  
    "#18481d",  
  "display": "standalone",  
  "orientation": "portrait",  
  "scope": "/",  
  "start_url": "/",  
  "icons": [ ]  
}
```



Web app manifest

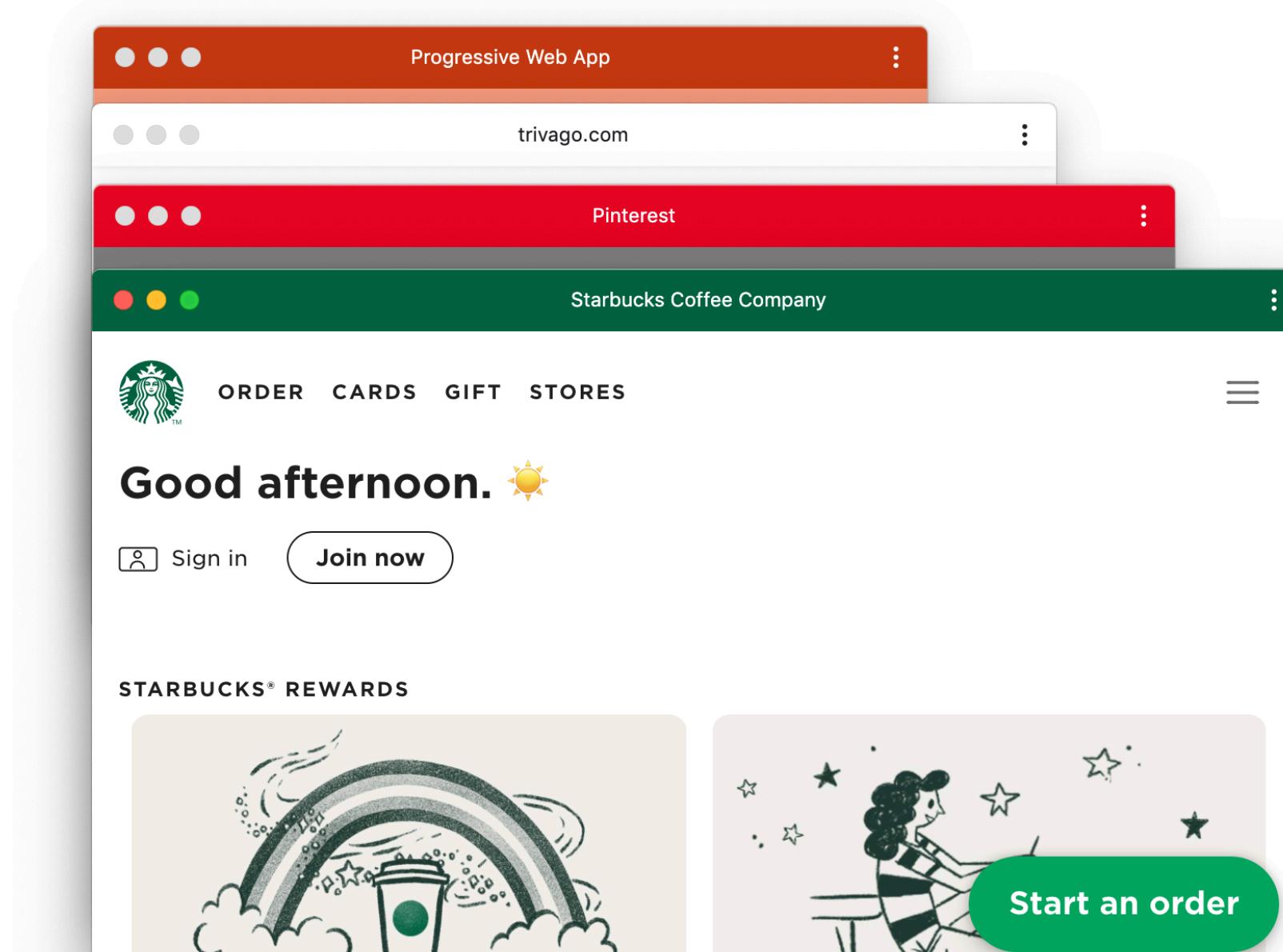
- **App's Icon**

- Long Name
- Short Name (optional)
- Icon's collection

The app experience differs  
per platform and browser

# Theme Color

# Theme Color



# Theme Color



On iOS and iPadOS theme color is not supported. Only black/white/translucent via non-standard settings

```
{  
  "name": "PWA Name",  
  "short_name": "PWA",  
  "theme_color  "background_color":  
    "#18481d",  
  "display": "standalone",  
  "orientation": "portrait",  
  "scope": "/",  
  "start_url": "/",  
  "icons": [ ]  
}
```



**Web app manifest**

- **Theme Color**
  - HTML version

# Display Options

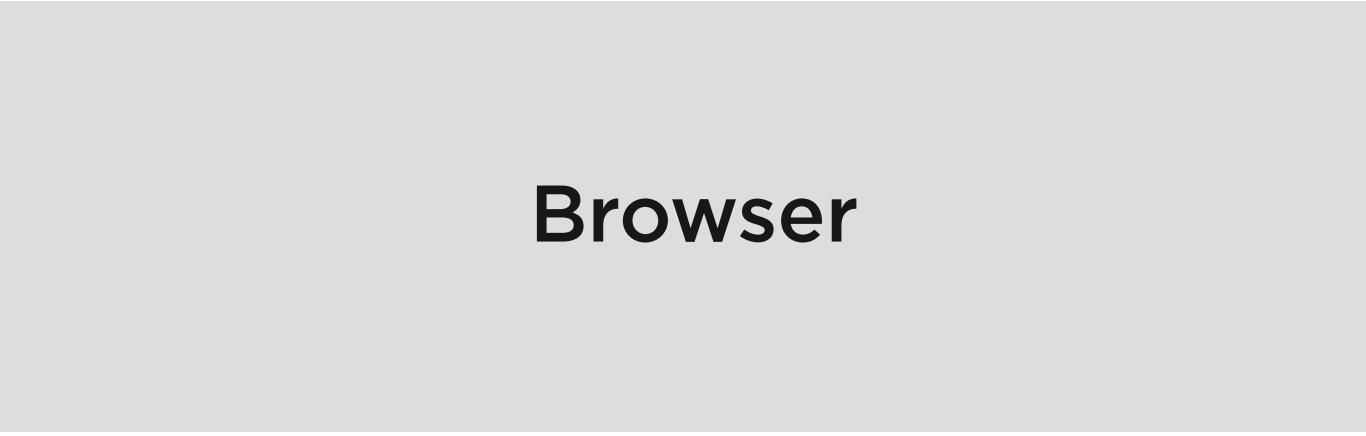
**Browser**

**Standalone**

**Fullscreen**

**Minimal-UI**

# Display Options



**Browser**



**Standalone**

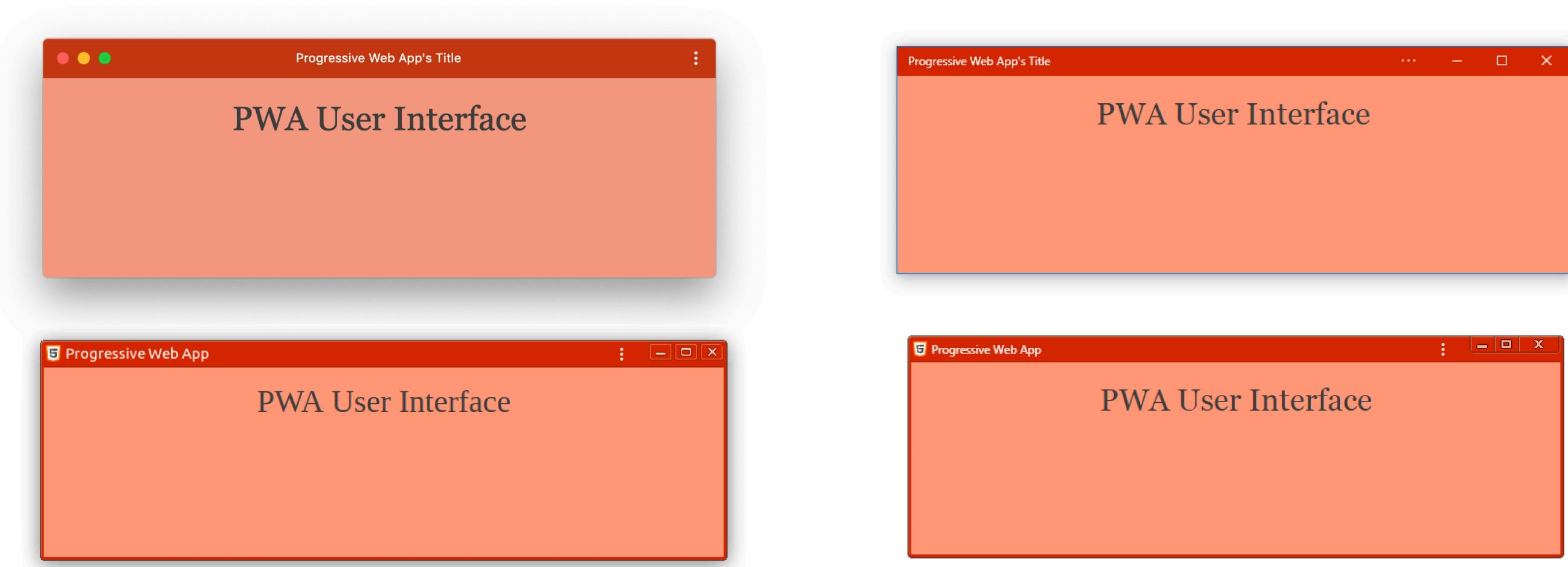


**Fullscreen**

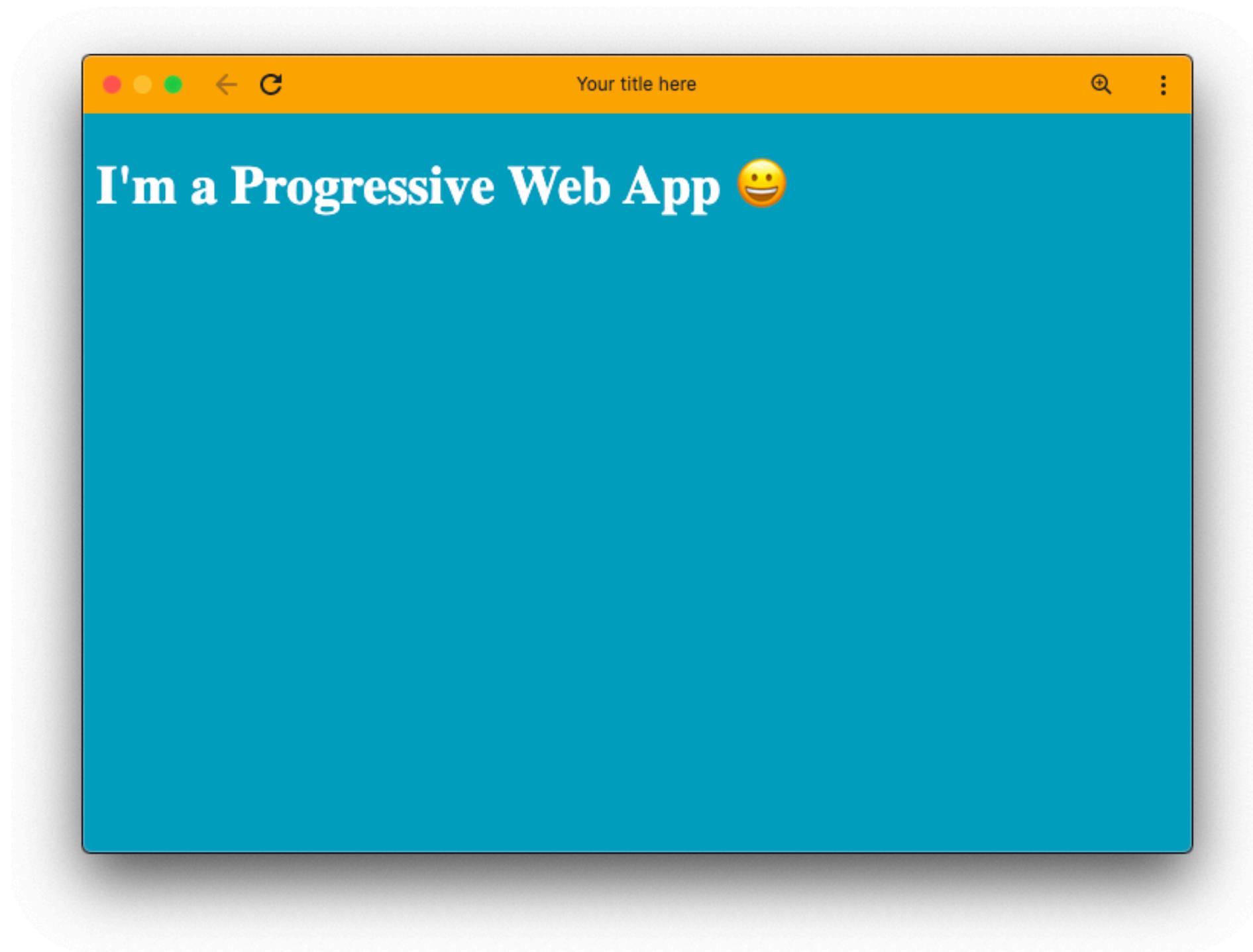


**Minimal-UI**

# Desktop Standalone Experience

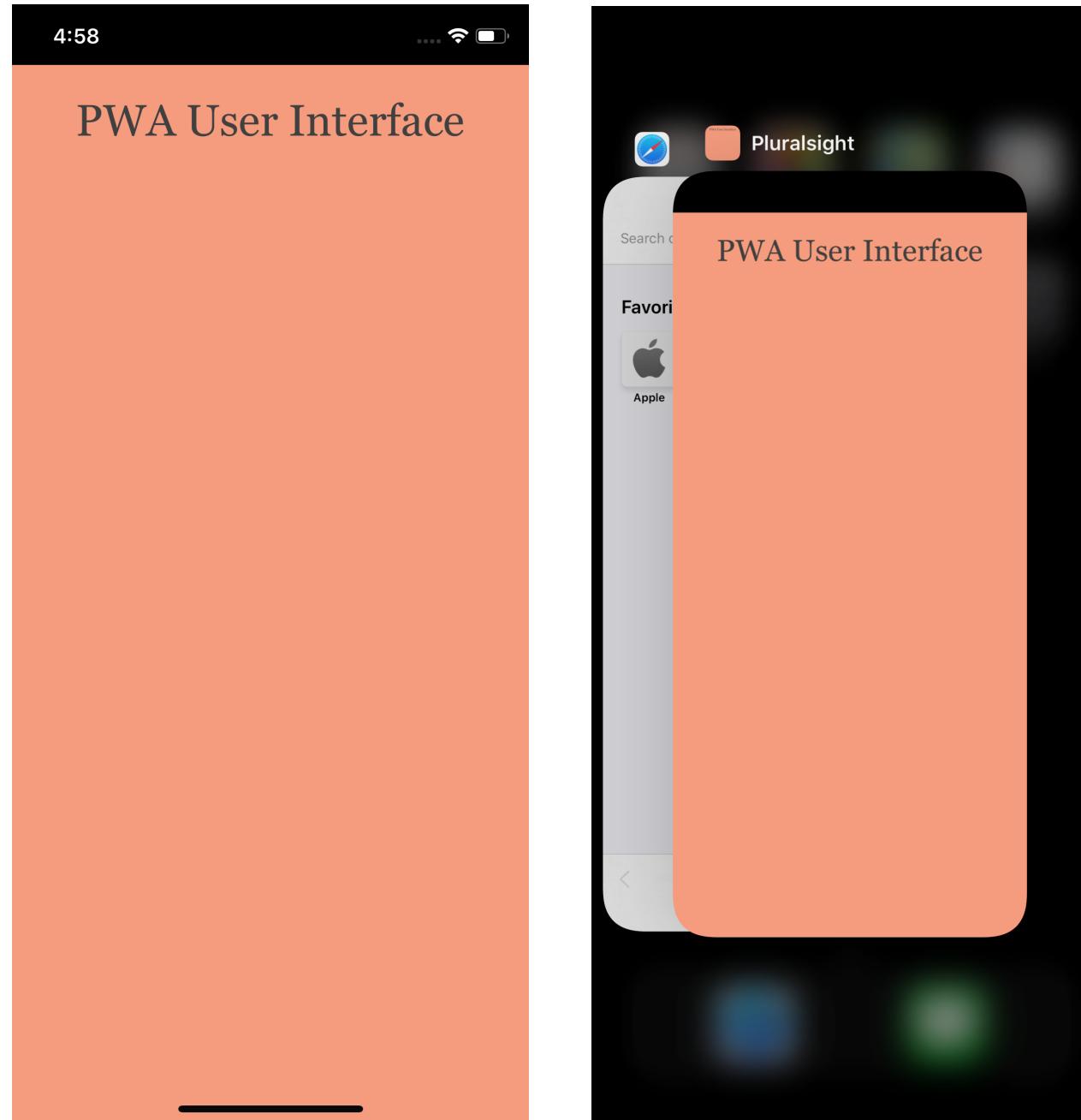


# Desktop Minimal-UI Experience



No fullscreen support on  
desktop

# iOS and iPadOS Standalone Experience

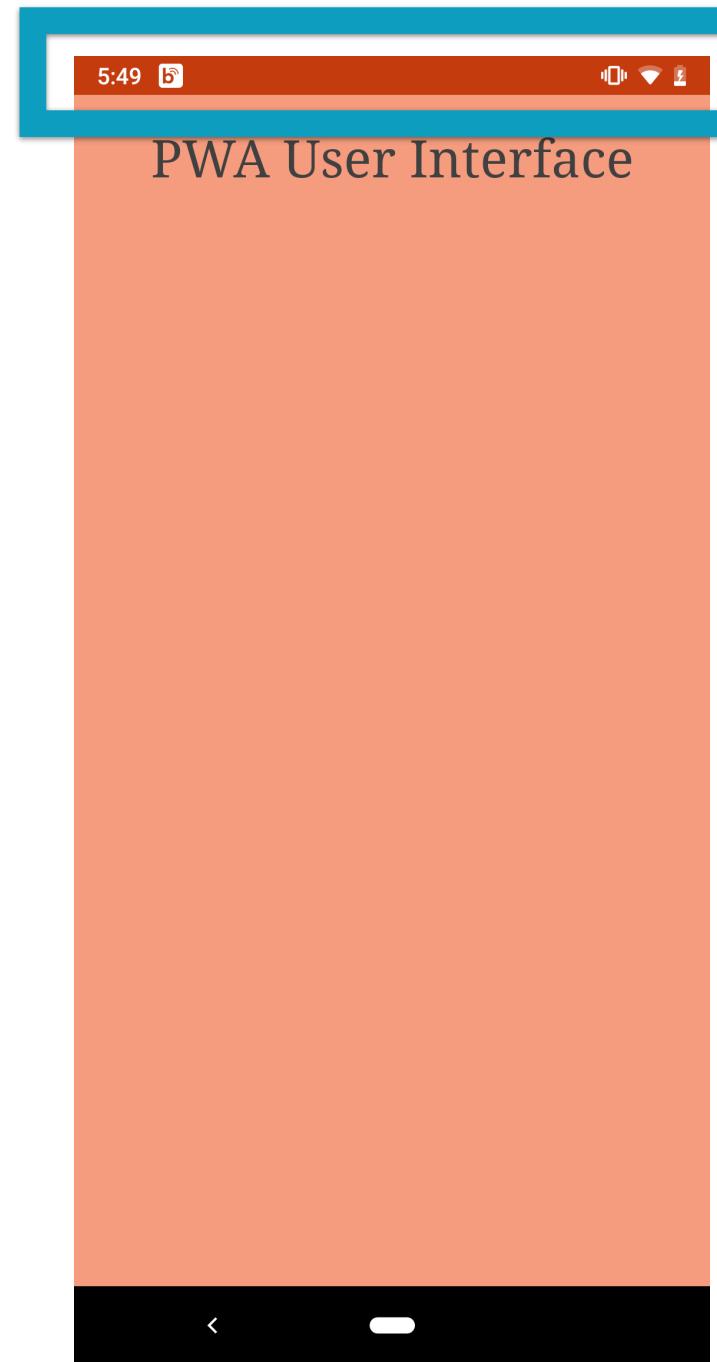


No fullscreen or minimal-ui  
support on iOS and iPadOS

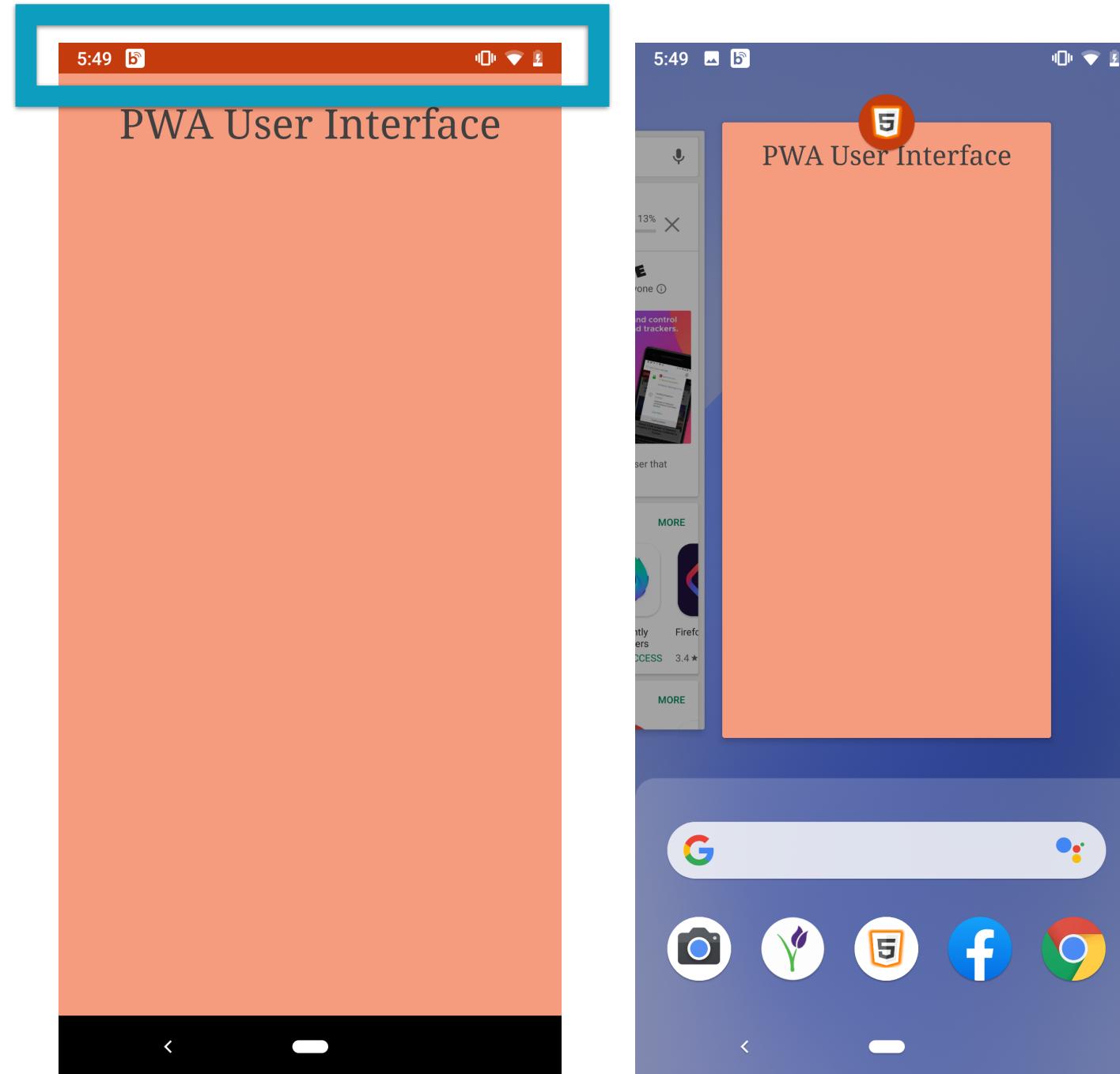
# Android Standalone Experience



# Android Standalone Experience



# Android Standalone Experience



# Android Minimal UI Experience



# Android Minimal UI Experience



# Android Fullscreen Experience



PWA User Interface

# App Experience Display Modes on Android



Only use fullscreen for  
games and immersive  
experiences

```
{  
  "name": "PWA Name",  
  "short_name": "PWA",  
  "theme_color": "#385770",  
  "background_color":  
    "#18481d",  
  "display": "standalone",  
  "orientation": "portrait",  
  "scope": "/",  
  "start_url": "/",  
  "icons": [ ]  
}
```



Web app manifest

- **Display Property**

- Browser (no PWA)
- Standalone
- Fullscreen (Android)
- Minimal UI (Android and desktop)

```
{  
  "name": "PWA Name",  
  "short_name": "PWA",  
  "theme_color": "#385770",  
  "background_color":  
    "#18481d",  
  "display": "standalone",  
  "orientation": "portrait",  
  "scope": "/",  
  "start_url": "/",  
  "icons": [ ]  
}
```

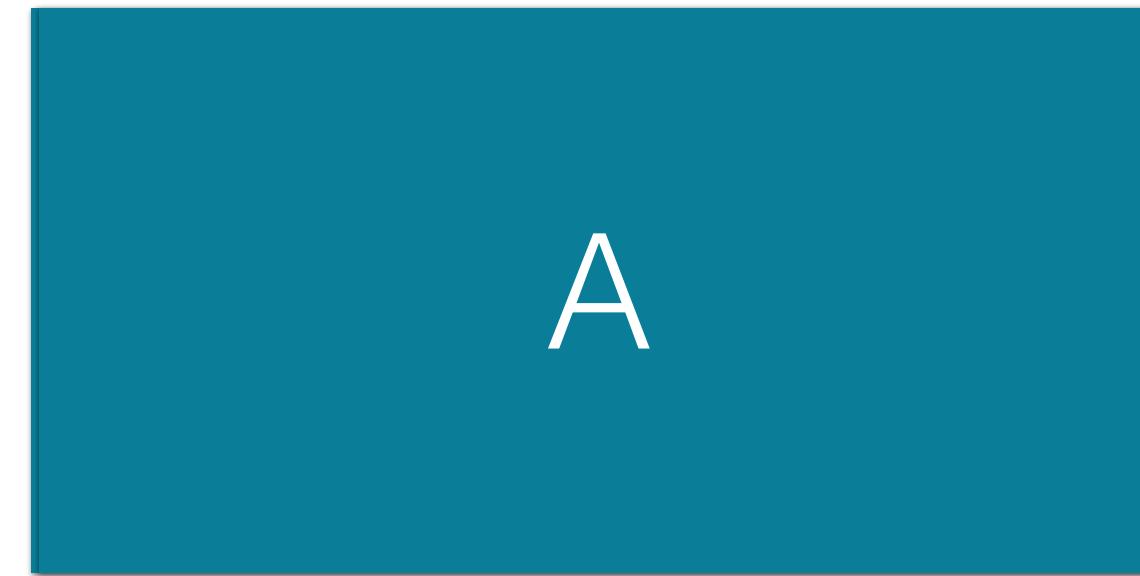
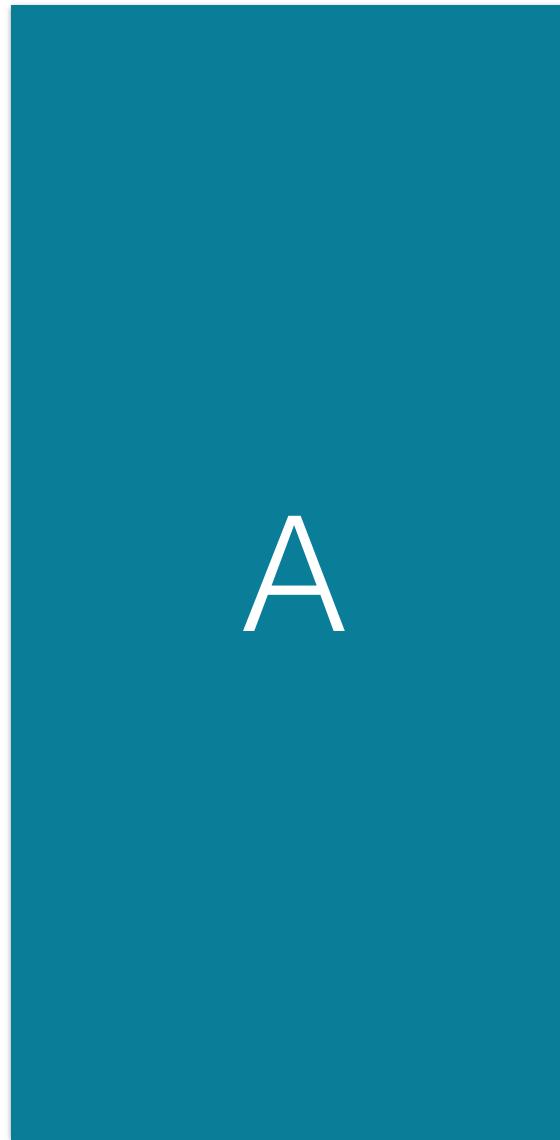


Web app manifest

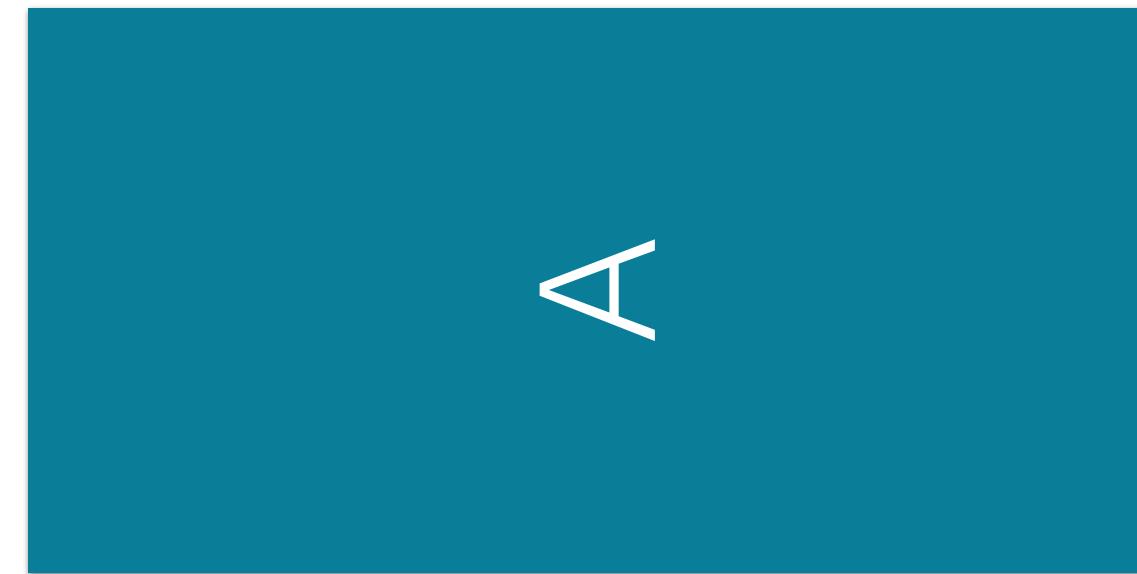
- **Display Property**

- Browser (no PWA)
- **Standalone**
- Fullscreen (Android)
- Minimal UI (Android and desktop)

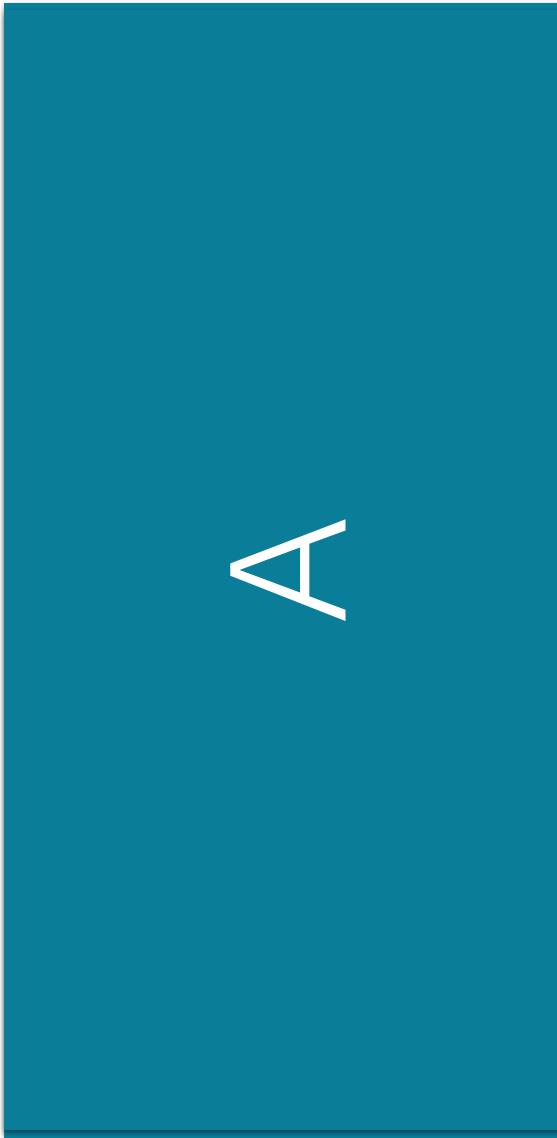
Orientation: any



# Orientation: portrait



# Orientation: landscape



```
{  
  "name": "PWA Name",  
  "short_name": "PWA",  
  "theme_color": "#385770",  
  "background_color":  
    "#18481d",  
  "display": "standalone",  
  "orientation  "scope": "/",  
  "start_url": "/",  
  "icons": [ ]  
}
```



Web app manifest

- **Orientation Property**
  - portrait
  - landscape
  - any
  - natural

Orientation property works  
only on Android

Other platforms?



# Preparing our Web App Manifest

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# Demo

## **Prepare Web App Manifest**

- Set up basic properties
- Check installation and experience



# Advanced App Manifest Topics

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## Multi-language App Manifest

What if you want to define alternative app's names or icons for different languages?

# Multi language Manifest support

**There is a lang attribute**

**There is no built-in support**

**Solutions:**

- You can generate the file on the server
- You can have more than one manifest and define the right one in the HTML
- App Store distribution has other solutions



## App Manifest Not Loading

Sometimes the user installs the PWA but the App Manifest couldn't be loaded

# App Manifest Not Loading

**Most browsers download and parse the App Manifest when the app loads**

**But some others, such as Safari on iOS and iPadOS loads it when the user installs the App**

If there is a network issue or if the manifest takes more than a couple of seconds to load, Safari will fallback to a browser shortcut

# Preload assets for Safari to reduce installation issues

You can add this only for Safari dynamically

**index.html**

```
<link rel="manifest" href="app.webmanifest">  
<link rel="preload" href="app.webmanifest">
```

(Also useful for preloading icons)



## Updates to the App Manifest

What if you want to change app's name or icon after the user has installed it?

Updates to the  
manifest meta  
data

**It depends on the platform and browser**

**Android:**

- Chrome and WebAPK
  - Check on every access
  - If there is an update, the APK will be regenerated at some point in the future
  - User will see the update
- Other browsers: re-install needed

Updates to the  
manifest meta  
data

**It depends on the platform and browser**  
**Desktop, iOS and iPadOS:** re-install needed  
**App Stores:** update the package



# Decorating the HTML for a PWA

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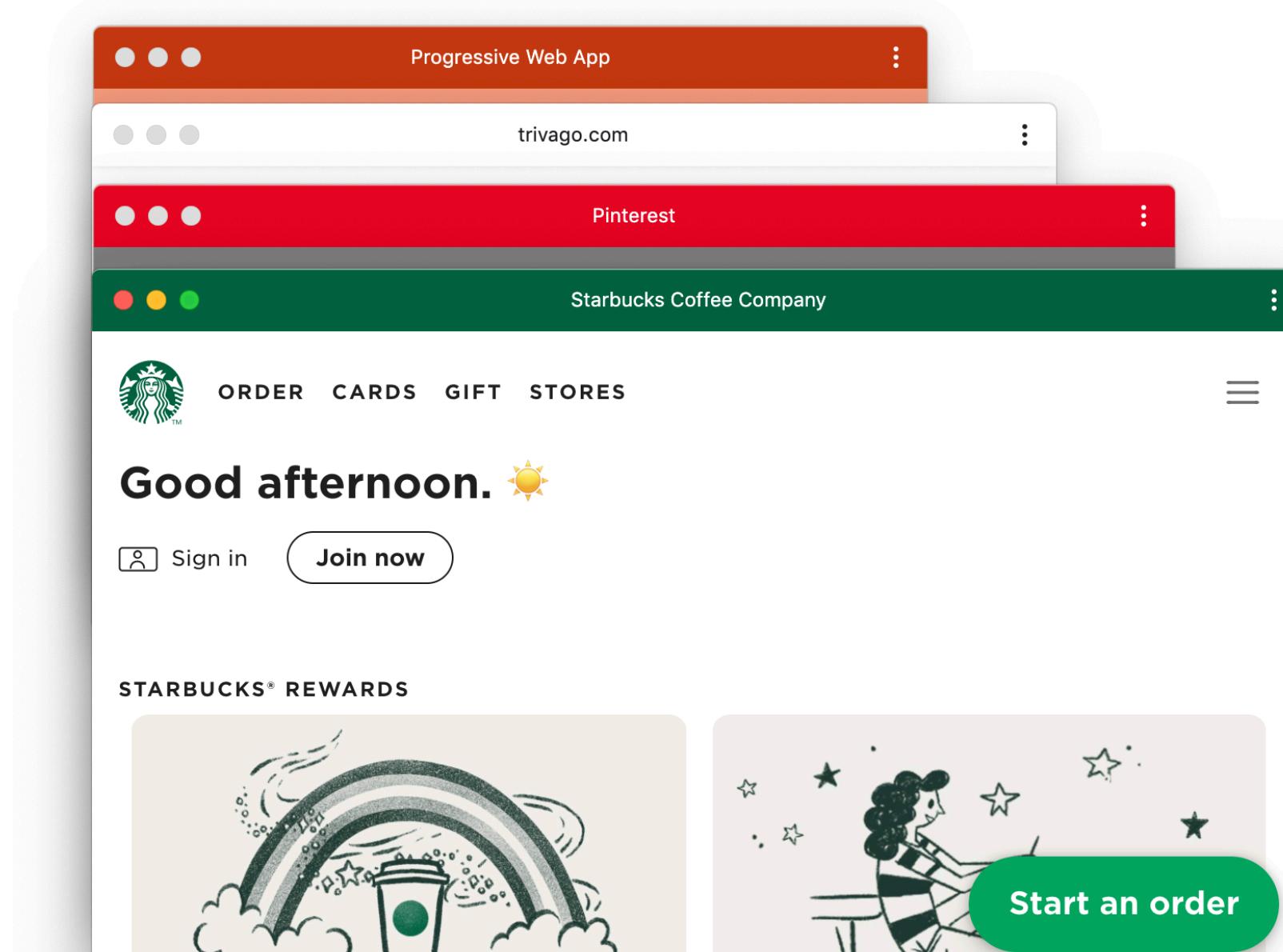
# Meta Tags for our HTML

**Theme Colors**

**Meta Data for iOS &  
iPadOS**

**Standard Title &  
Open Graph**

# Theme Color



```
{  
  "name": "PWA Name",  
  "short_name": "PWA",  
  "theme_color  "background_color":  
    "#18481d",  
  "display": "standalone",  
  "orientation": "portrait",  
  "scope": "/",  
  "start_url": "/",  
  "icons": [ ]  
}
```



Web app manifest

```
<meta name="theme-color"  
      content="#385770">
```

Theme Color in HTML as a Meta Tag

**It's mandatory. We typically start with the same color as in the Web App Manifest**

**We can change it dynamically with JavaScript**

Be careful: in the manifest  
we use **theme\_color**; in the  
HTML meta element:  
**theme-color**



## iOS and iPadOS Meta Data

Apple supported standalone mode several years before the Web App Manifest was created.

```
<meta name="apple-mobile-web-app-capable"  
      content="yes">
```

PWAs before PWAs

**It's still supported, but it has different behavior and engine**

```
<meta name="mobile-web-app-capable"  
      content="yes">
```

PWAs before PWAs

**It's still supported, but it has different behavior and engine**

```
<meta name="apple-mobile-web-app-capable"  
      content="yes">
```

```
<meta name="mobile-web-app-capable"  
      content="yes">
```

Do not use them on modern PWAs



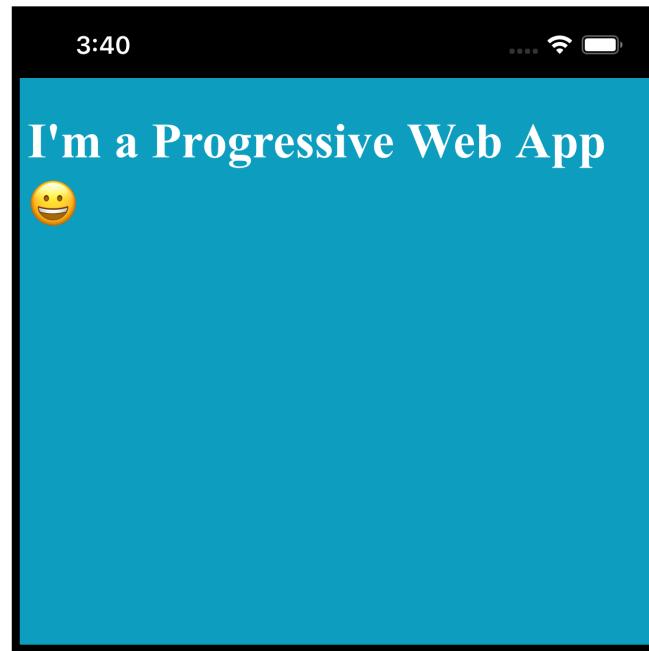
Do not add any meta tag  
that you don't know what it's  
actually doing

```
<meta name="apple-mobile-web-app-status-bar-style"  
      content="white|black|black-translucent">
```

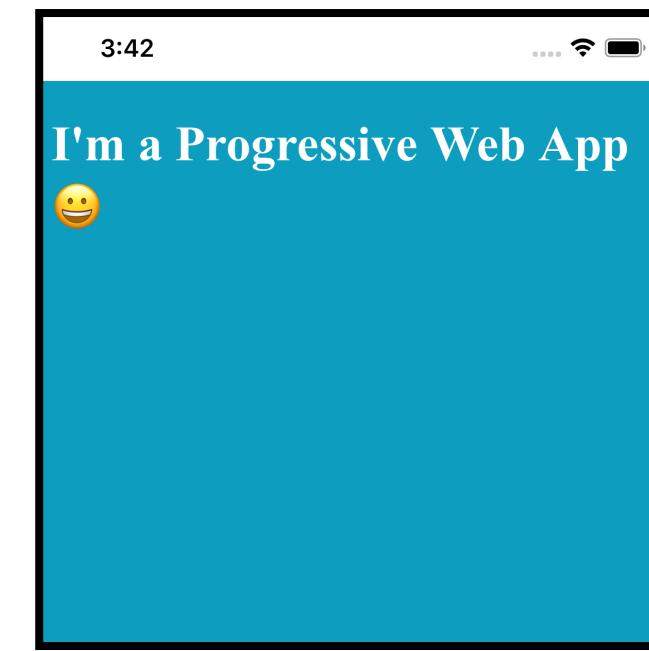
## Theming on iOS and iPad OS

**It will define how the standalone experience will be themed within the OS and the status bar.**

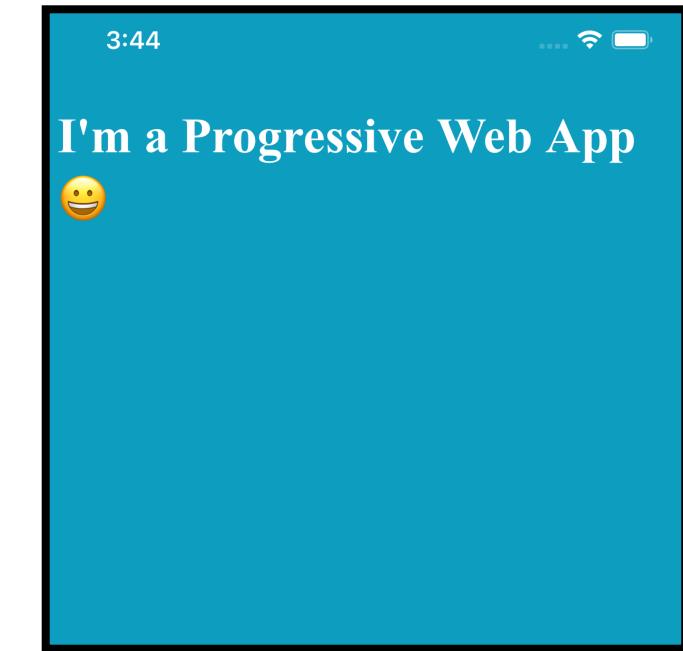
# apple-mobile-web-app-status-bar-style



**black (default)**



**white**



**black-translucent**

Black-translucent creates a taller viewport and the status bar is transparent on top of our content

black-translucent

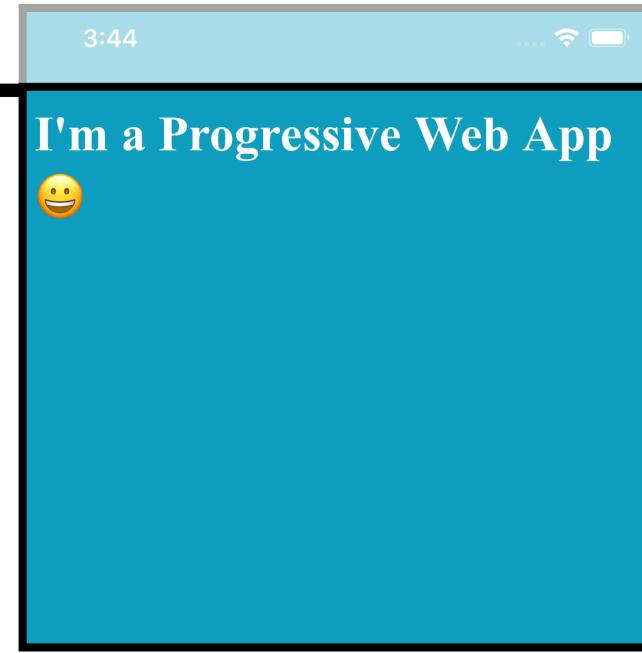
I'm<sup>3.45</sup> a Progressive Web App



Do not use white  
backgrounds with this  
style

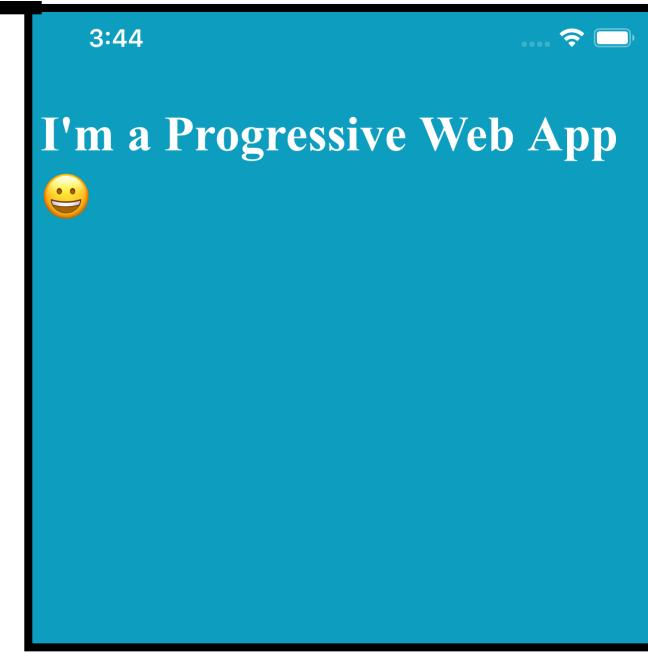
# Black-translucent over versions

top: 0px



Newer versions

top: 0px



Older versions

Status bar is not visible while  
on landscape on iPhones



## Title and Open Graph

The <title> tag is important for desktop mainly, and Open Graph will be useful when sharing the PWA with other apps

# Demo

## **Decorating the HTML**

- Theme-color
- Change title with results
- Change theme-color for errors
- iOS White Theme



# Summary

## **Creating the Progressive Web App**

- The Calculator Project
- The Web App Manifest
- Advanced Ideas
- Decorations for the HTML

Up Next:  
Defining Icons and Splash Screens

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