

React Architecture Explained



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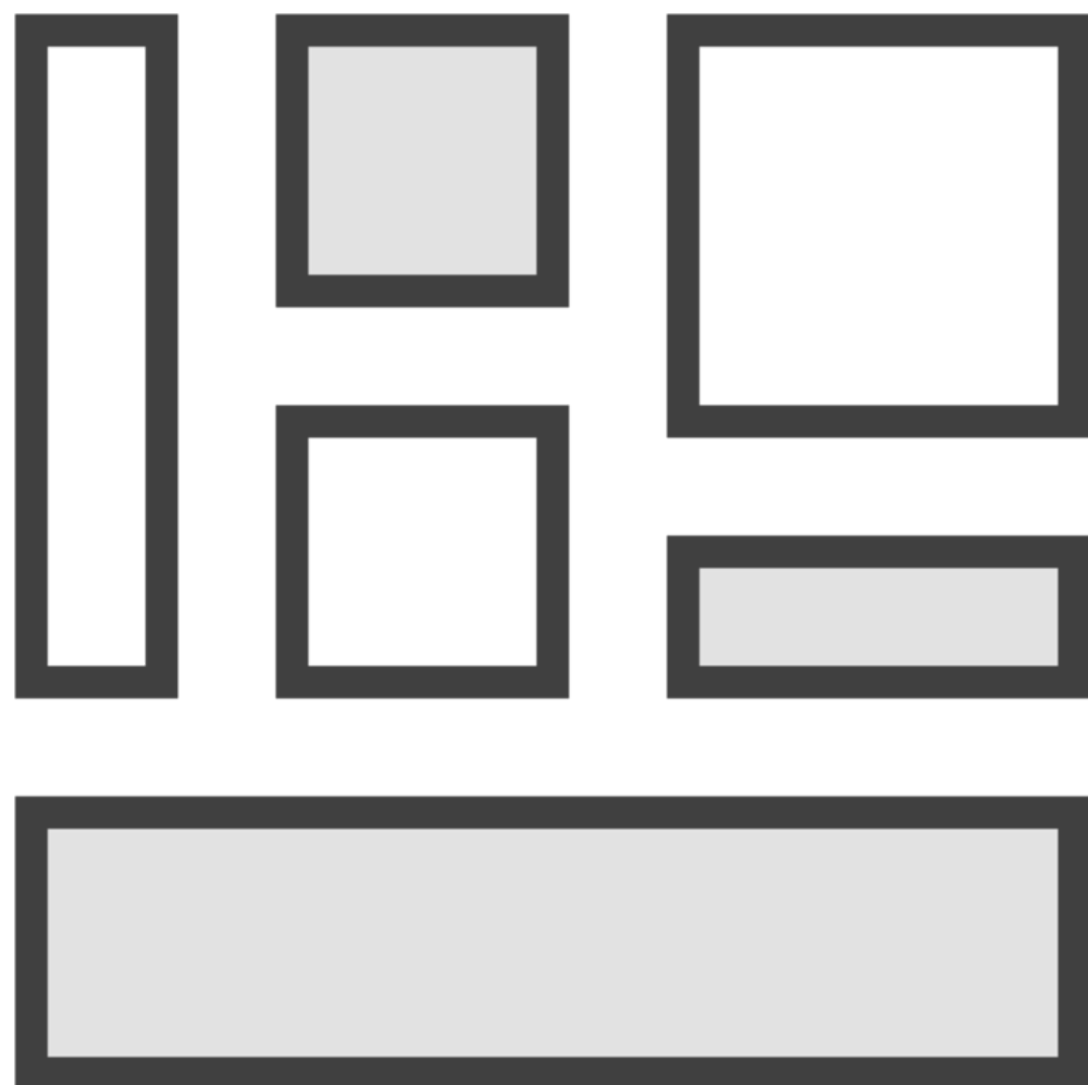


**React is 100%
component based**

**All React apps start
by rendering a
single component**

**Understand how
that single
component
renders to a
browser**





React is 100% component based



All React apps start by rendering a single component



Understand how that single component renders to a browser



Coming Up



React is a Library



What it means to be a Single Page App (SPA)



Create web app with only native DOM calls



Convert DOM calls to React without JSX



Convert React JavaScript to use JSX



Explain the meaning of $F(G(x))$ in a component tree



Everything in this module uses
very simple JavaScript and
coding along is optional



Demo

Course demonstrations
in NextJS

App start

At app start component
in `/pages/index.js` is
launched

Root element

That `index.js` contains
the root element of our
React app

Is possible

It's possible to write
React apps with little
understanding

But recommended

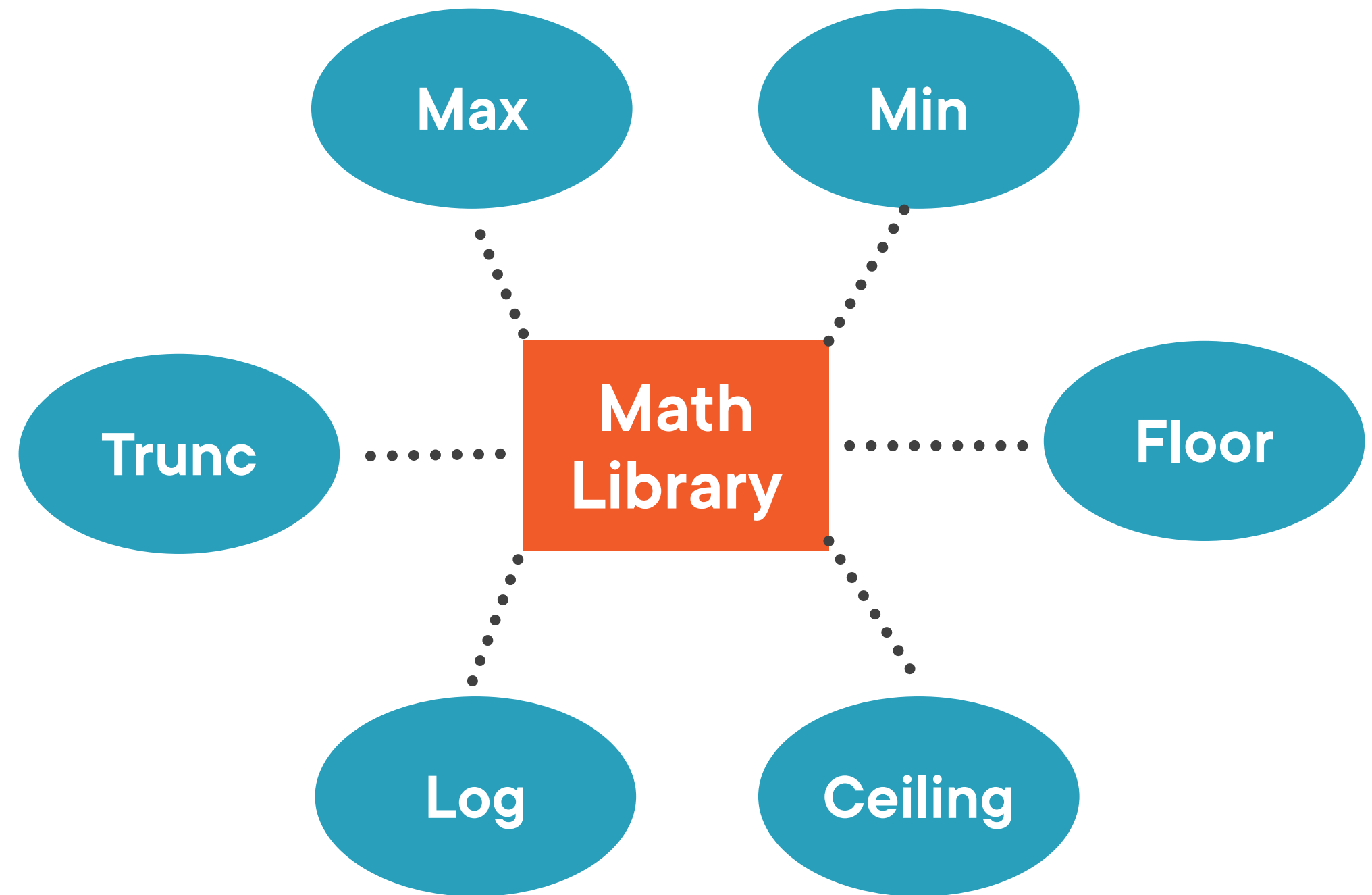
Going forward you'll
learn details of the
inner workings of React



A Library is defined as a group of related functions or classes that perform unique operations.



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index.js

React is two
libraries

```
import react from "react";  
import ReactDOM from "react-dom";
```

CDN Links

Both React and ReactDOM are available over a CDN.

```
<script crossorigin src="https://unpkg.com/react@18/umd/react.development.js">
</script>
<script crossorigin src="https://unpkg.com/react-dom@18/umd/react-dom.development.js">
</script>
```

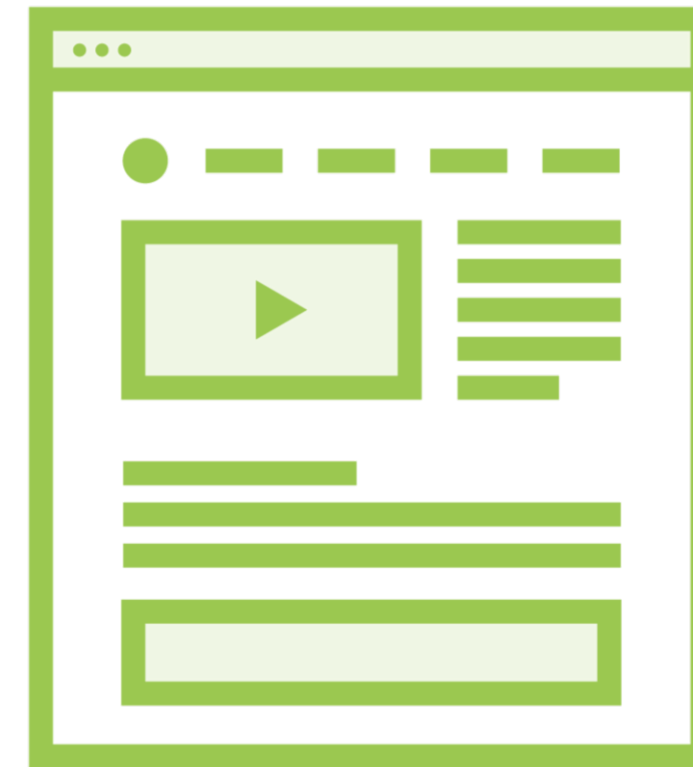
The versions above are only meant for development, and are not suitable for production.

Minified and optimized production versions of React are available at:

A framework is a collection of programming tools with a specific goal in mind.



A Library is defined as a group of related functions or classes that perform unique operations.



Goals

Building a website

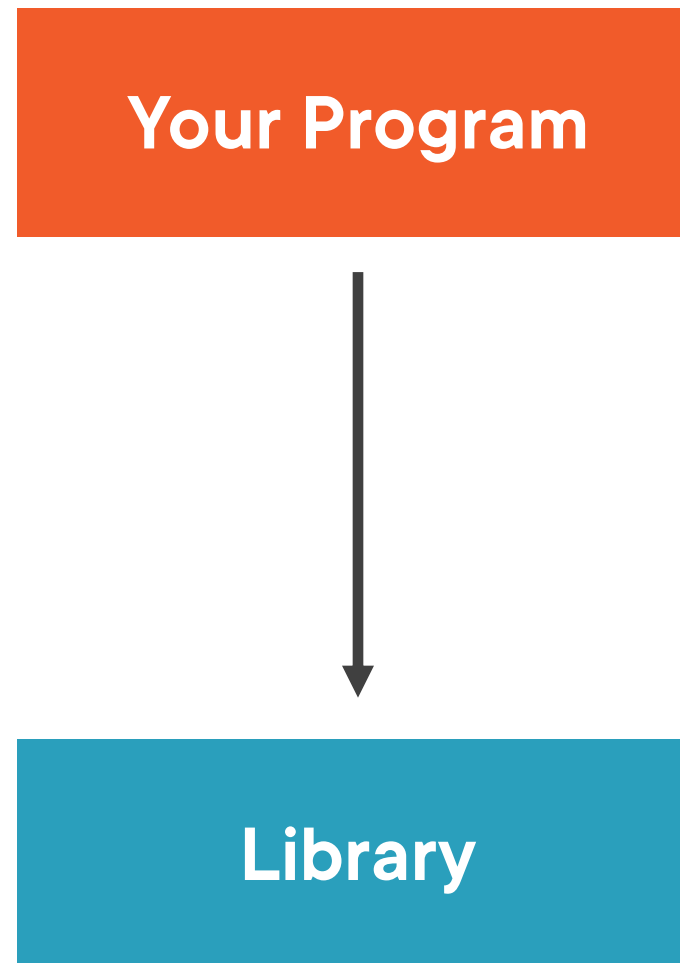
Deploying a website

Framework
It is in control

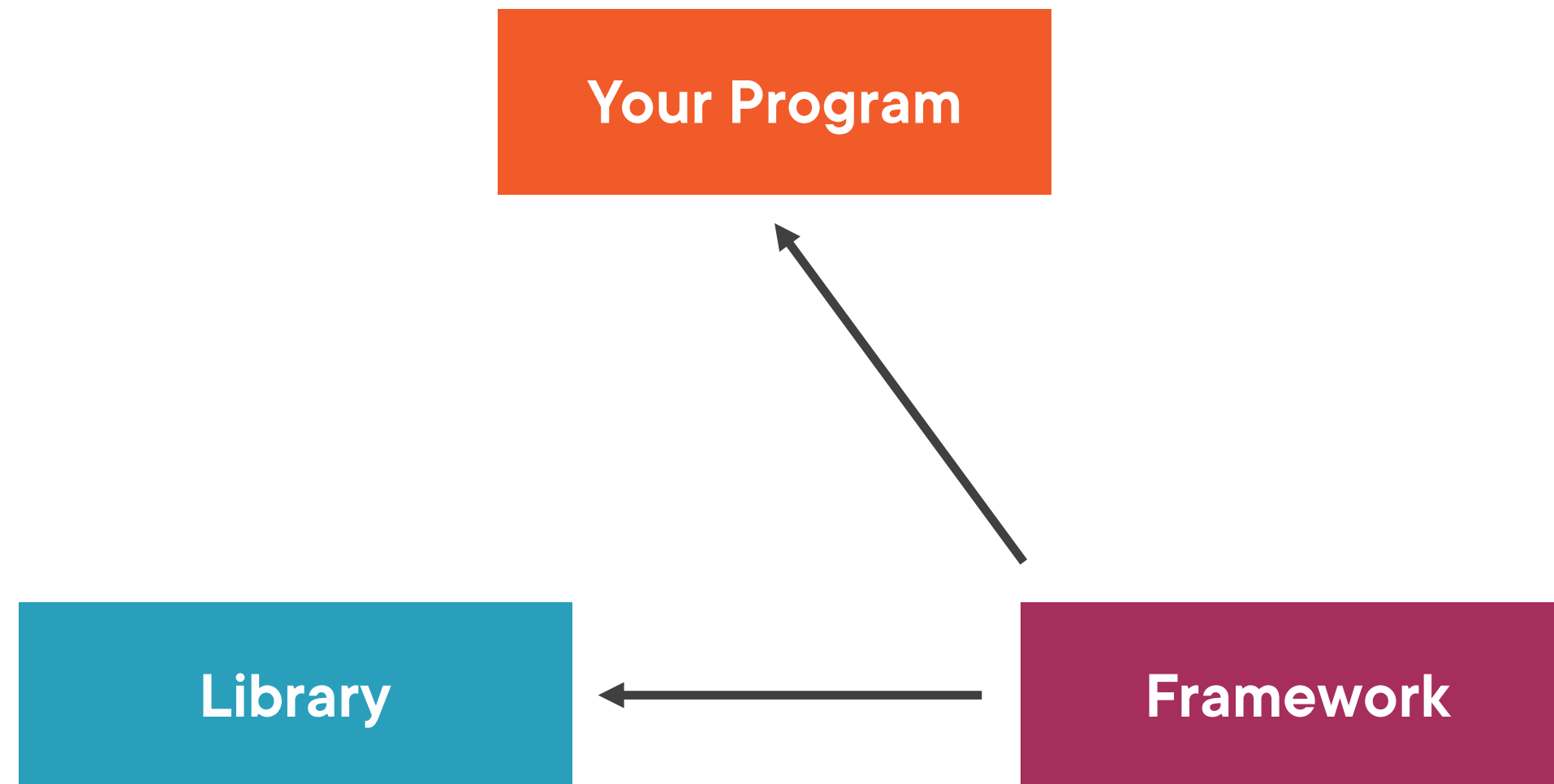
Library
You are in control



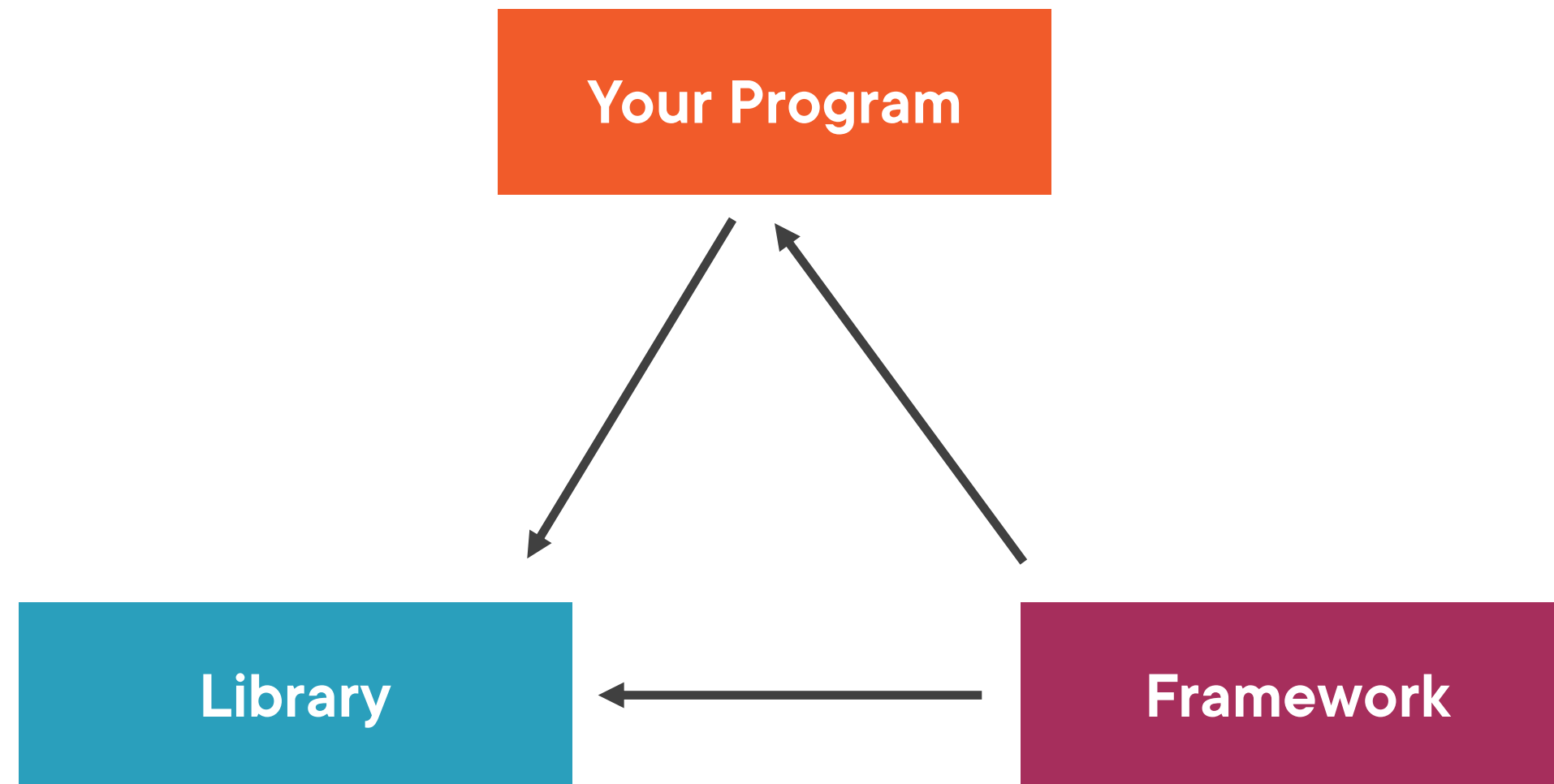
Library vs Framework



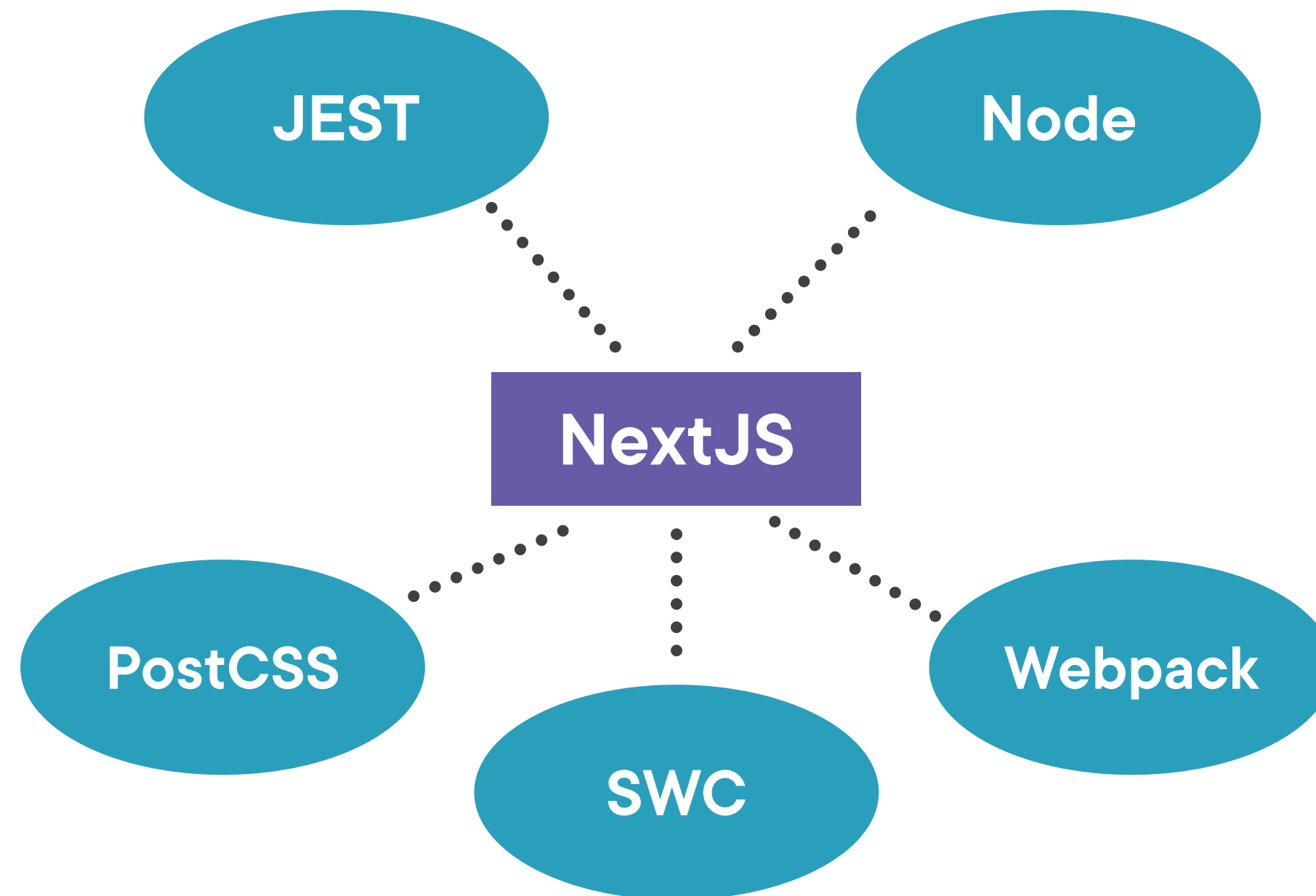
Library vs Framework



Library vs Framework



NextJS Framework



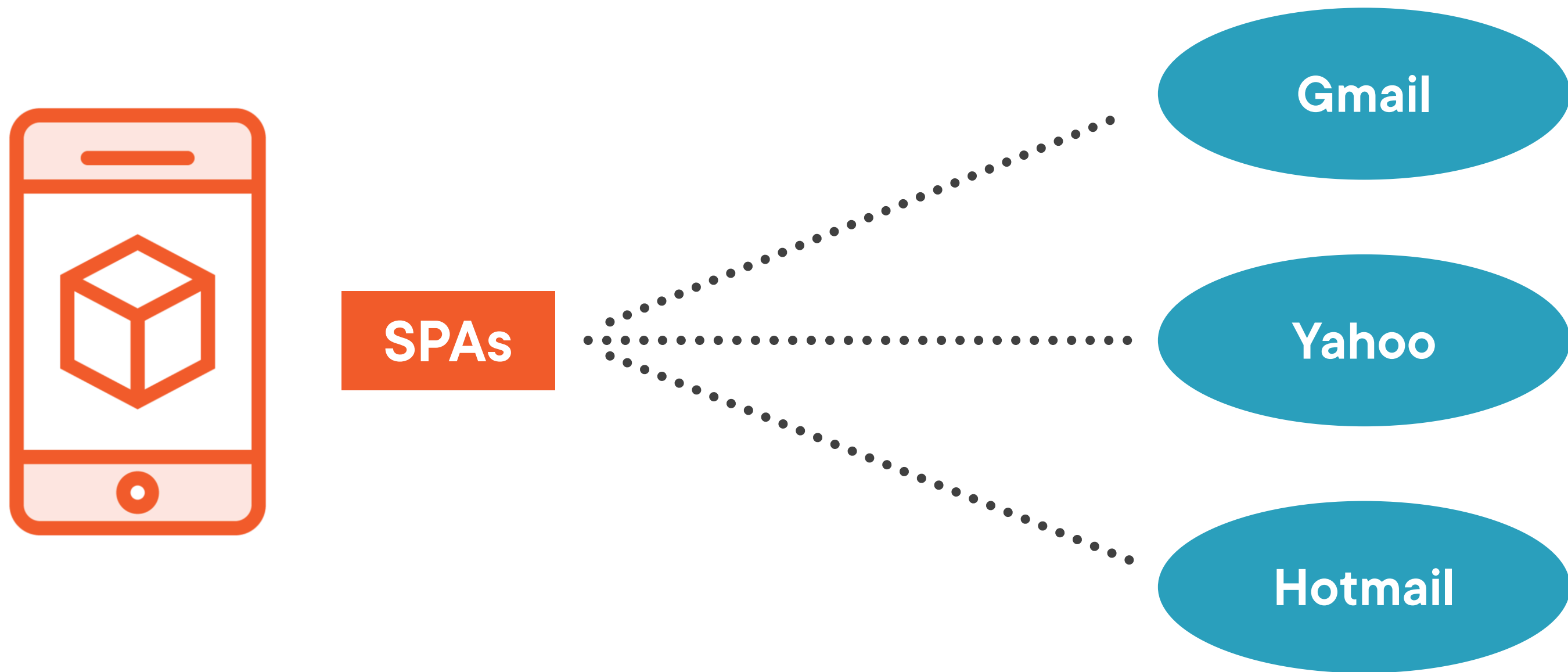
SPA's (Single Page Apps) Are Not New



SPAs



SPA's (Single Page Apps) Are Not New



What It Means to Be a SPA

When a web page is requested by a browser, the page downloaded includes minimal HTML and JavaScript, and that from then on, there are no more full-page requests made from the browser.

Gmail

Yahoo

Hotmail





Does being a SPA
mean there are no
server interactions
once the browser
page downloads?





No

There is almost always server interaction once the full page is downloaded

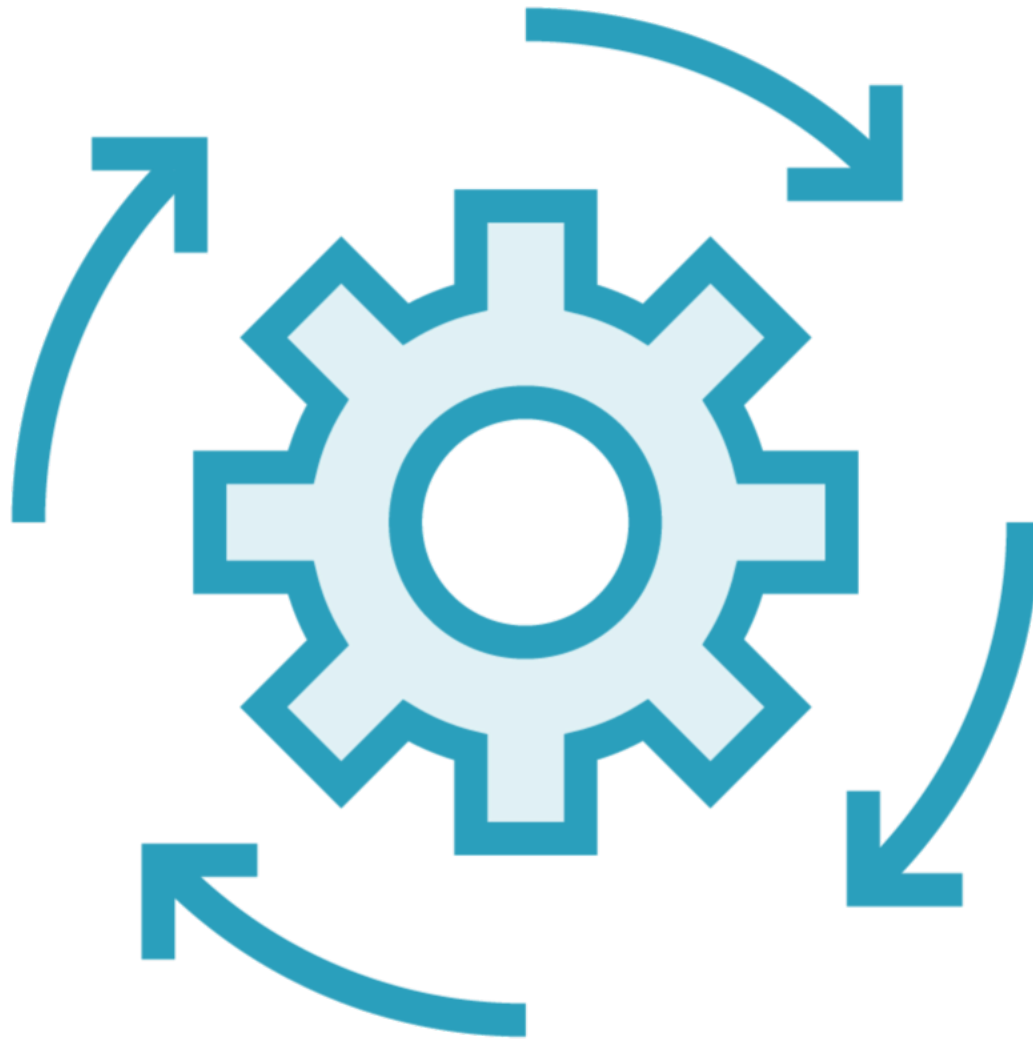
To be a SPA, just no full-page downloads after first page load.



Coming up:
Create a trivial example
building a SPA

**The example we build will follow the
same principles that React uses**





The plan now is to build the identical app we already built with just the React API, but instead with a Toolchain and JSX



React, With No Toolchain Creates a Virtual DOM and Then Renders It

```
window.onload = () => {  
  const rootElement = document.getElementById("root");  
  const root = ReactDOM.createRoot(rootElement);  
  
  const ints = [1, 2, 3];  
  
  const childrenElements = [];  
  
  childrenElements.push(  
    React.createElement("li", { key: ints[0] }, ints[0])  
  );  
  childrenElements.push(  
    React.createElement("li", { key: ints[1] }, ints[1])  
  );  
  childrenElements.push(  
    React.createElement("li", { key: ints[2] }, ints[2])  
  );  
  
  root.render(childrenElements);  
};
```





You can build a complete React app
without using a toolchain, but ...

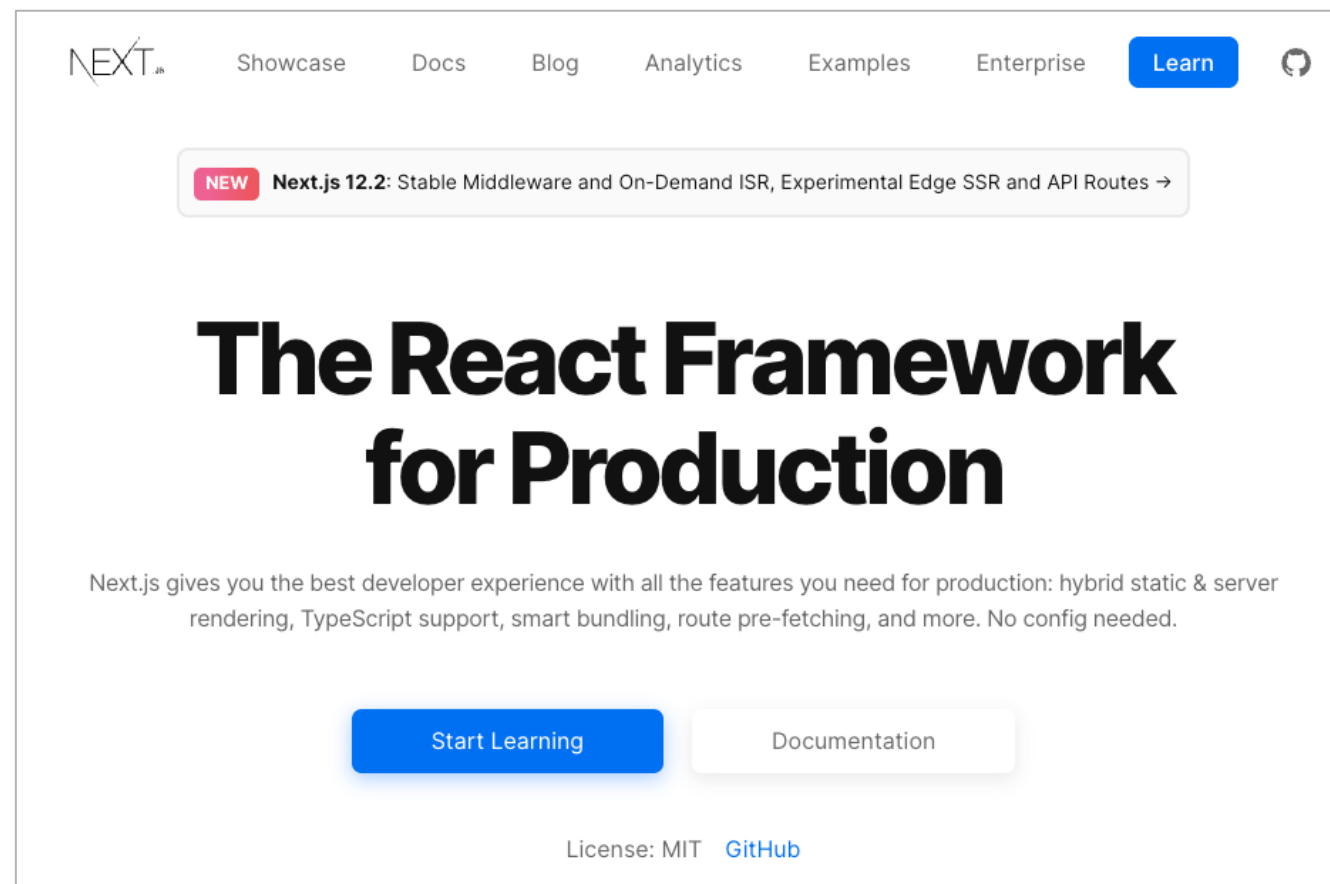




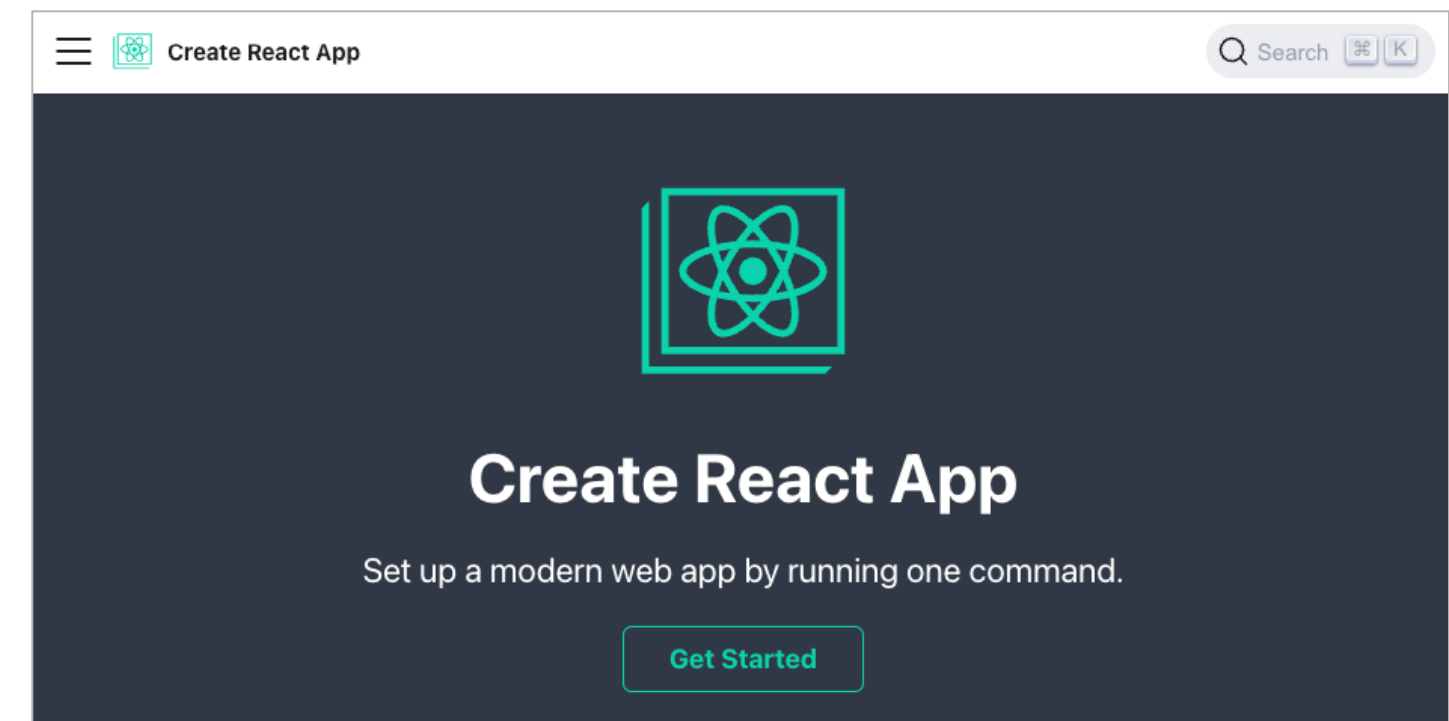
... I can assure you,
almost nobody does that!



Two Most Popular Toolchains for React



NextJS



Create React App
(CRA)



F (G (X))

Functional programming is the language
of $F(G(X))$

Functional programming is about
functional composition

Build Complex apps by combining
simpler apps together

