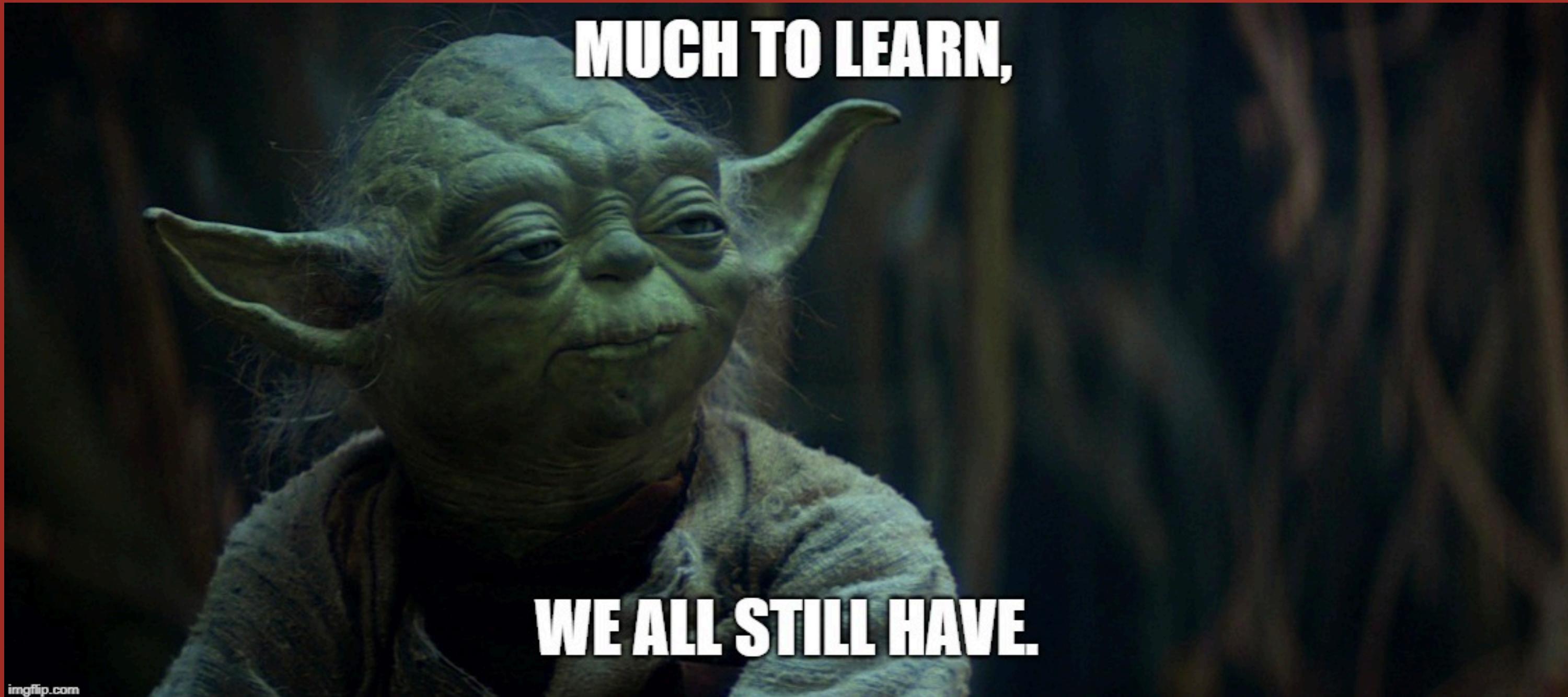


Class 18

Component Based UI

seattle-javascript-401n14

Welcome Back!



imgflip.com

Our Progress

- We have learned:
 - Classes in JavaScript
 - Schema validation
 - How to read from and write to files
 - NoSQL Databases using MongoDB
 - How to make an HTTP request using superagent or fetch
 - How to create a server using Express
- Creating POST, GET, UPDATE, DELETE endpoints
- Creating Middleware
- Authenticating using Basic and Bearer Auth
- OAuth for 3rd party authentication
- Role-Based Access Control
- Events emission using the net package
- What TCP is and how to use Sockets

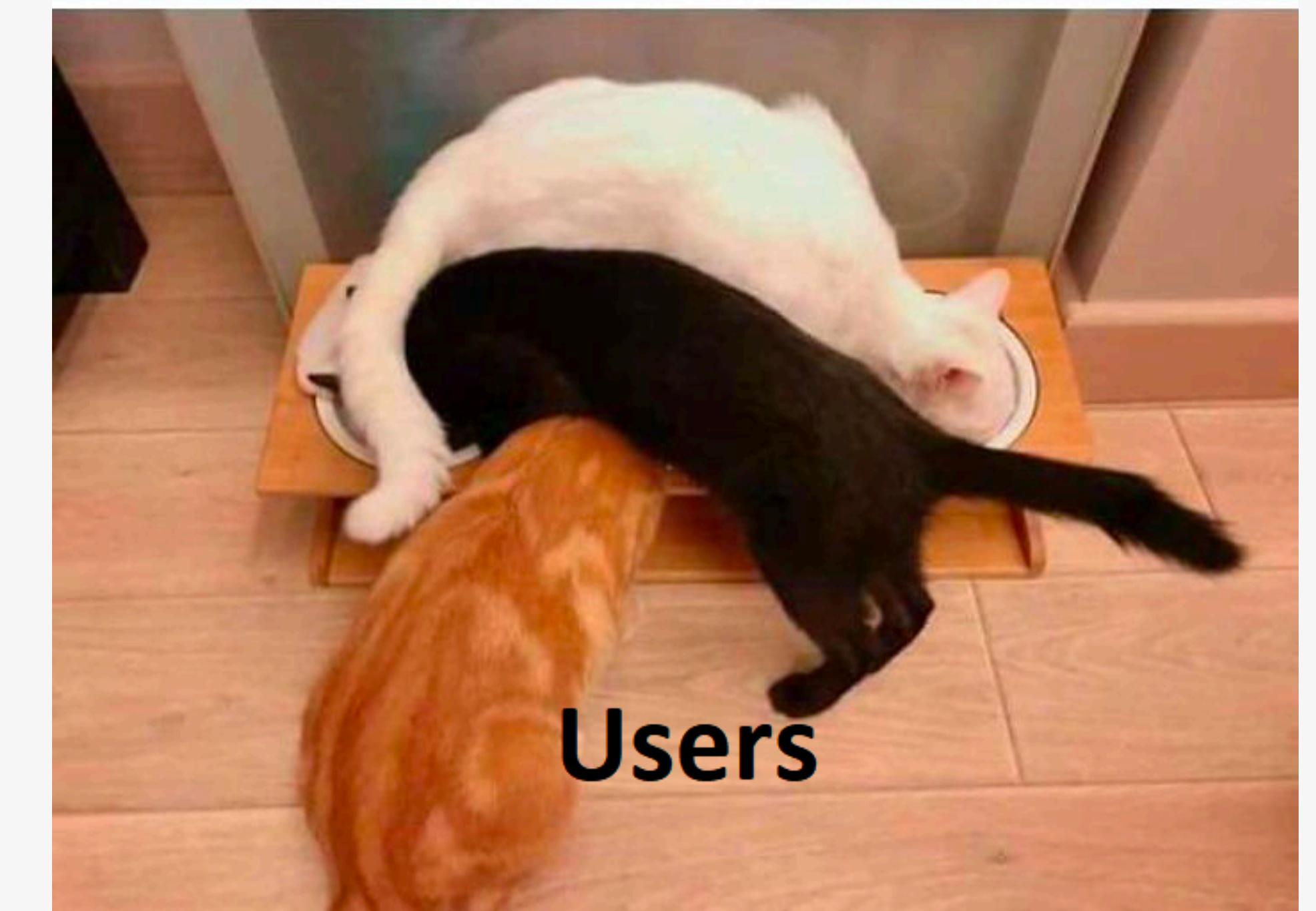


That's a lot!



Going Forward...

- All about User Interfaces (UIs)
- How do we think about our HTML like we think about JavaScript?
 - Modular
 - Interactive / dynamic
 - Extendable
 - DRY code

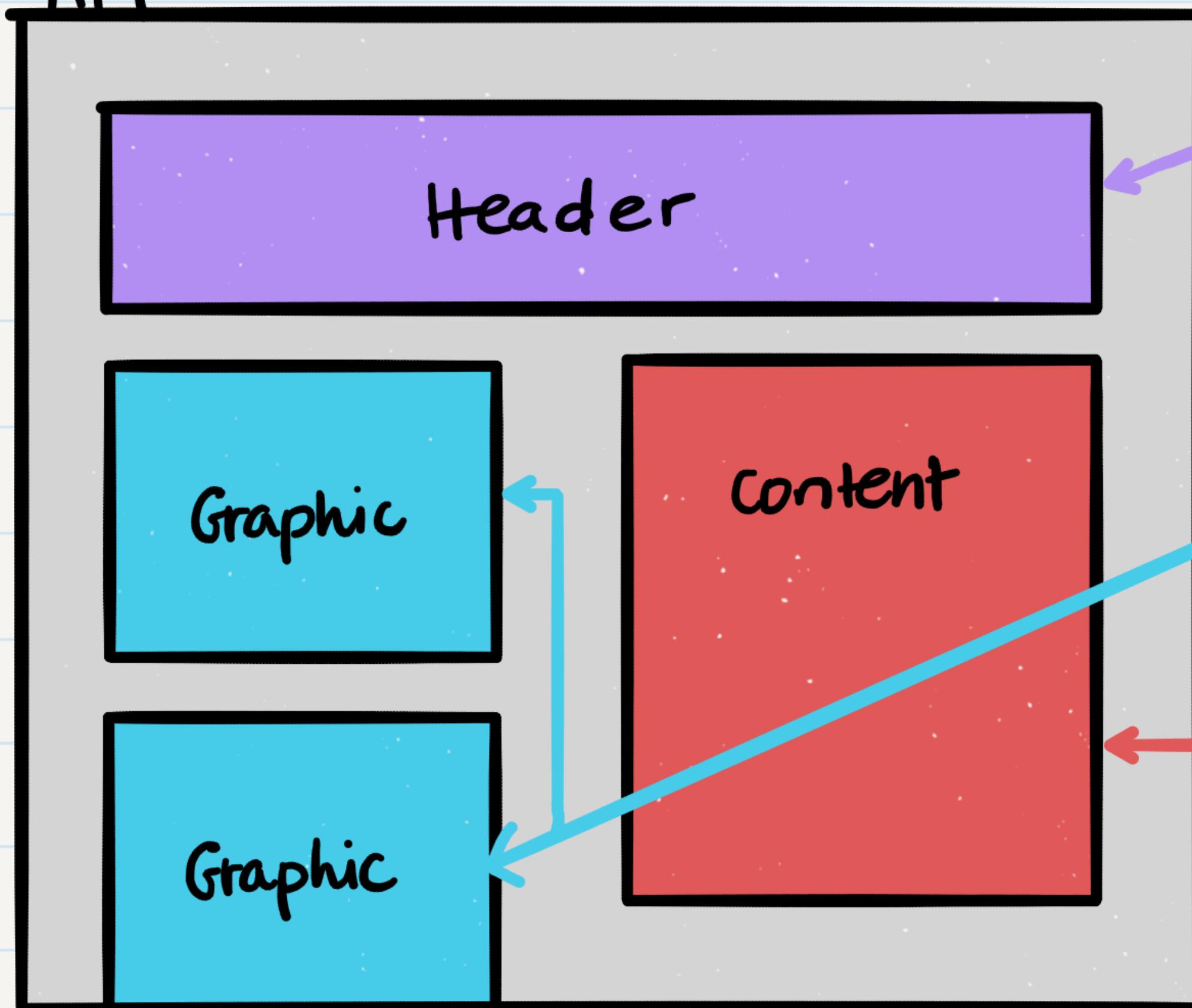


React

- A JavaScript **library / framework**
- Combines JavaScript and HTML into one file using JavaScript XML (or **JSX**)
- We should now start thinking of our HTML pages as a collection of modular **components**
- Every component has some HTML it **renders**, and some JavaScript logic it follows



APP



header.js

graphic.js

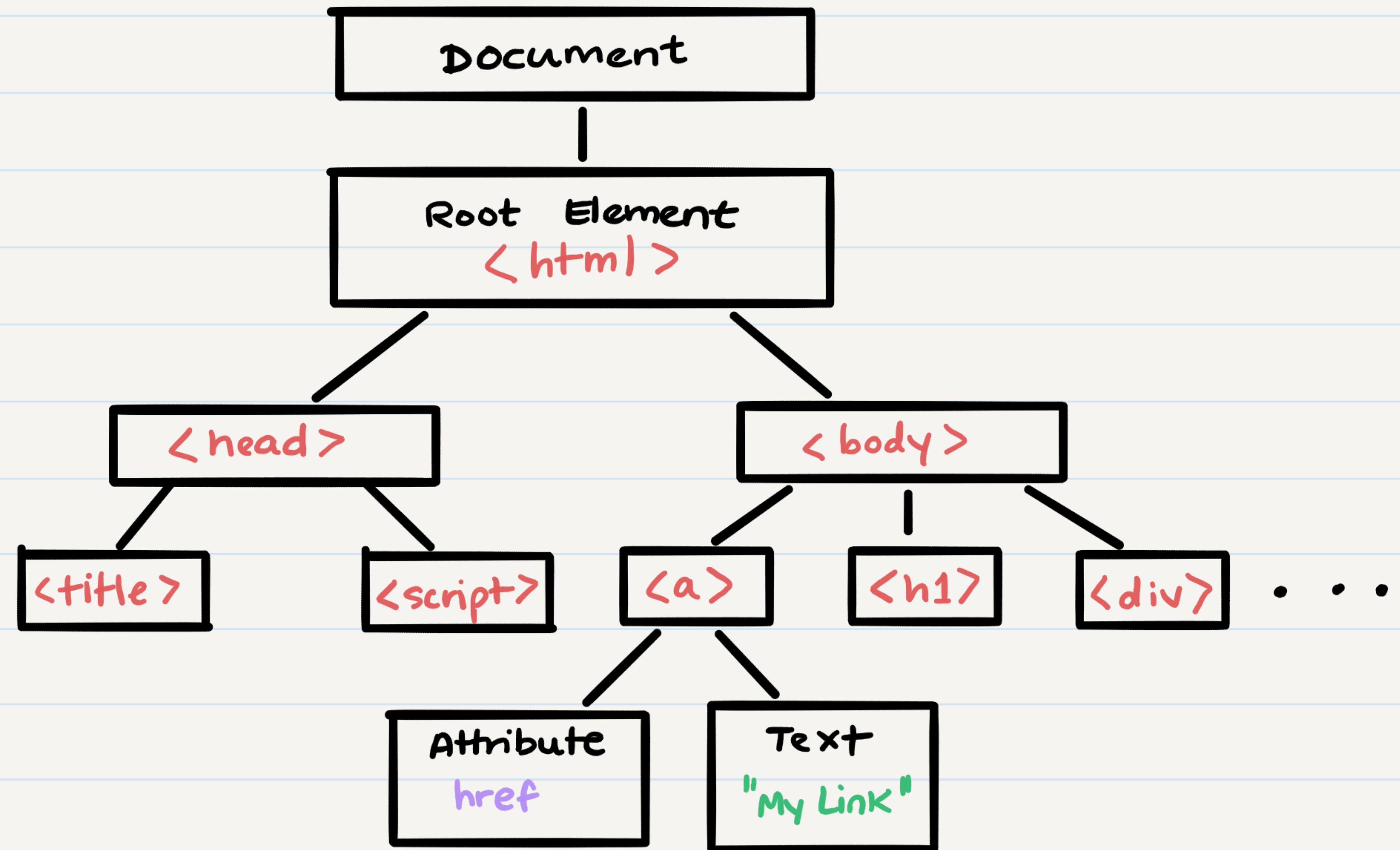
content.js

app.js

Document Object Model

- Your HTML pages are the documents
- When the document is interpreted by a web browser, it is turned into a tree structure, where HTML elements are the leaves / nodes
- Updating this tree (the Document Object Model) is time consuming
- React stores a virtual copy of the **DOM** in memory, and only updates the pieces that need to be updated
- This makes our apps much faster!





```
<!DOCTYPE html>
<html lang="en">
  <head>
    <title>Demo</title>
  </head>

  <body>
    <header>
      <h1>The current count is: <span id="count">0</span></h1>
    </header>
    <div>
      <button id="add">Add to Count</button>
    </div>
    <footer>
      <script
        src="https://code.jquery.com/jquery-3.3.1.min.js"
        integrity="sha256-FgpCb/KJQlLNf0u91ta32o/NMZxltwRo8QtmkMRdAu8="
        crossorigin="anonymous"
      ></script>
      <script src=".//app.js"></script>
    </footer>
  </body>
</html>
```

Demo

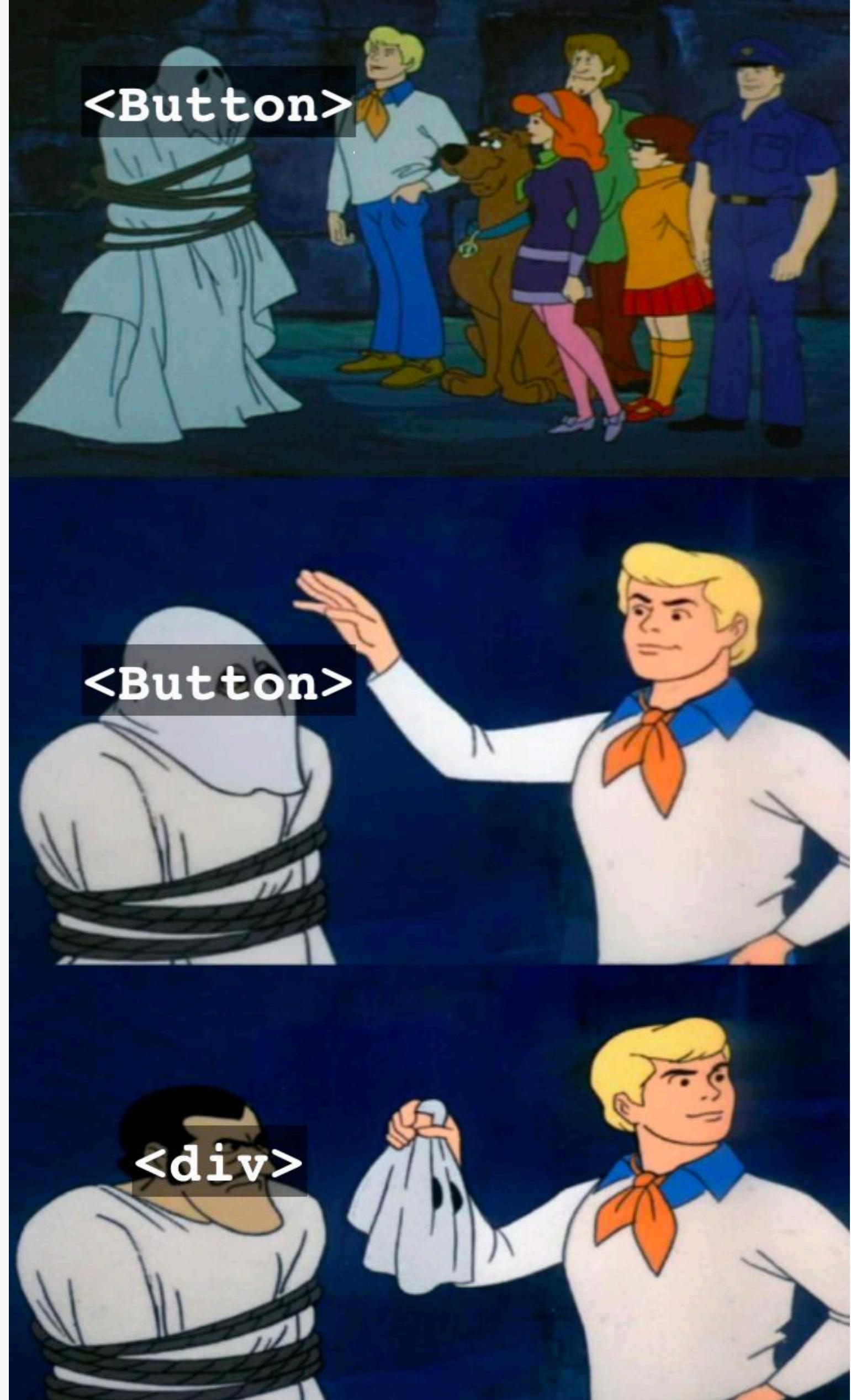
demo/counter

Let's compare making a counter button using JQuery and then using React.



Components

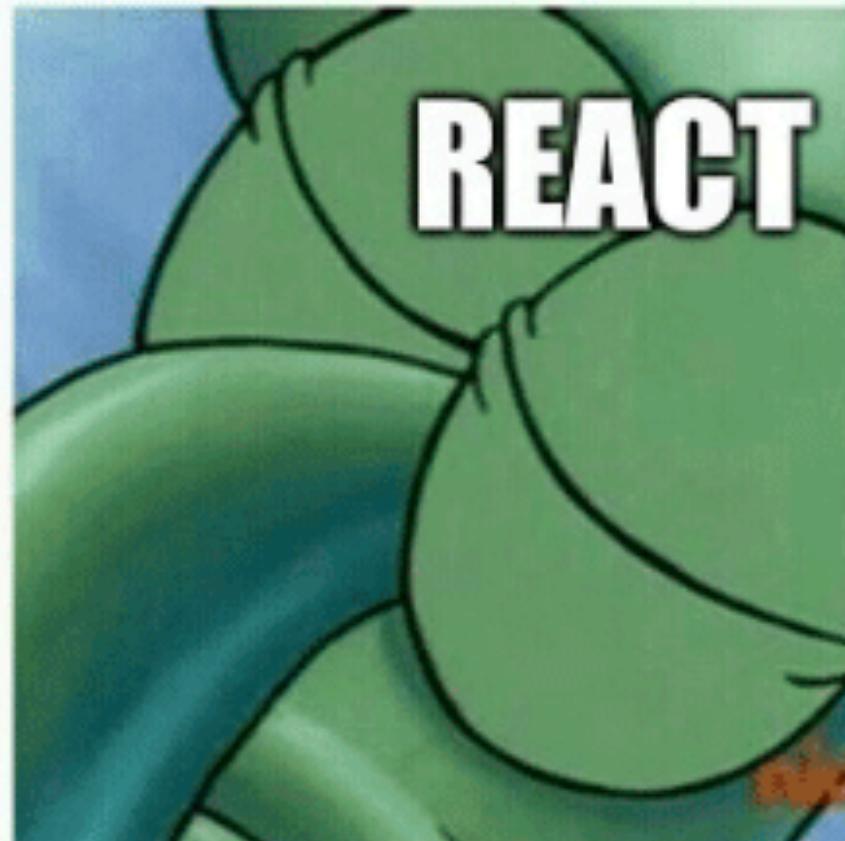
- These can be **classes** or **functions**
 - Classes expose a `render()` function
 - Functions return some HTML to render
 - Functions DO NOT support state
- State variables are initialized in a class constructor
- State variables are only **mutated** (changed) by using the `setState()` function
- Remember to use `.bind(this)` for callbacks!



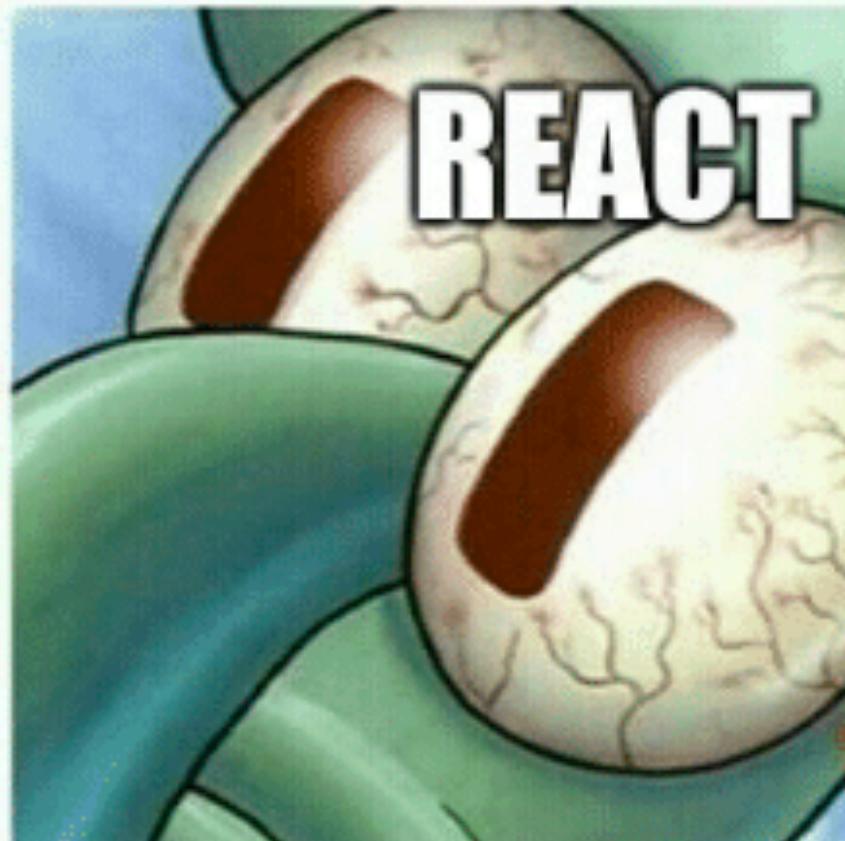
State and Props

- **State** variables are essentially local variables for a current component
- When state variables change, parts of the DOM that depend on that variable update
- State is tied to the current component, and is referenced using `this.state`
- **Props** are parameters given to the component, either through the constructor or through function params
 - They aren't dynamic, they're passed along

WHEN
PROPS CHANGE



WHEN
STATE CHANGES



Handlers and Elements

- HTML content can be intermixed with JavaScript content
 - () defines HTML
 - { } defines JavaScript
- All HTML elements still have events you can attach handlers on. Just remember that React uses **camelCasing**
 - `onclick` becomes `onClick`
- All HTML elements can still have all the same inline attributes like `id`, `style`, etc. Just remember that React uses `className` instead of `class`



Let's Talk about React Labs!



React Lab 18

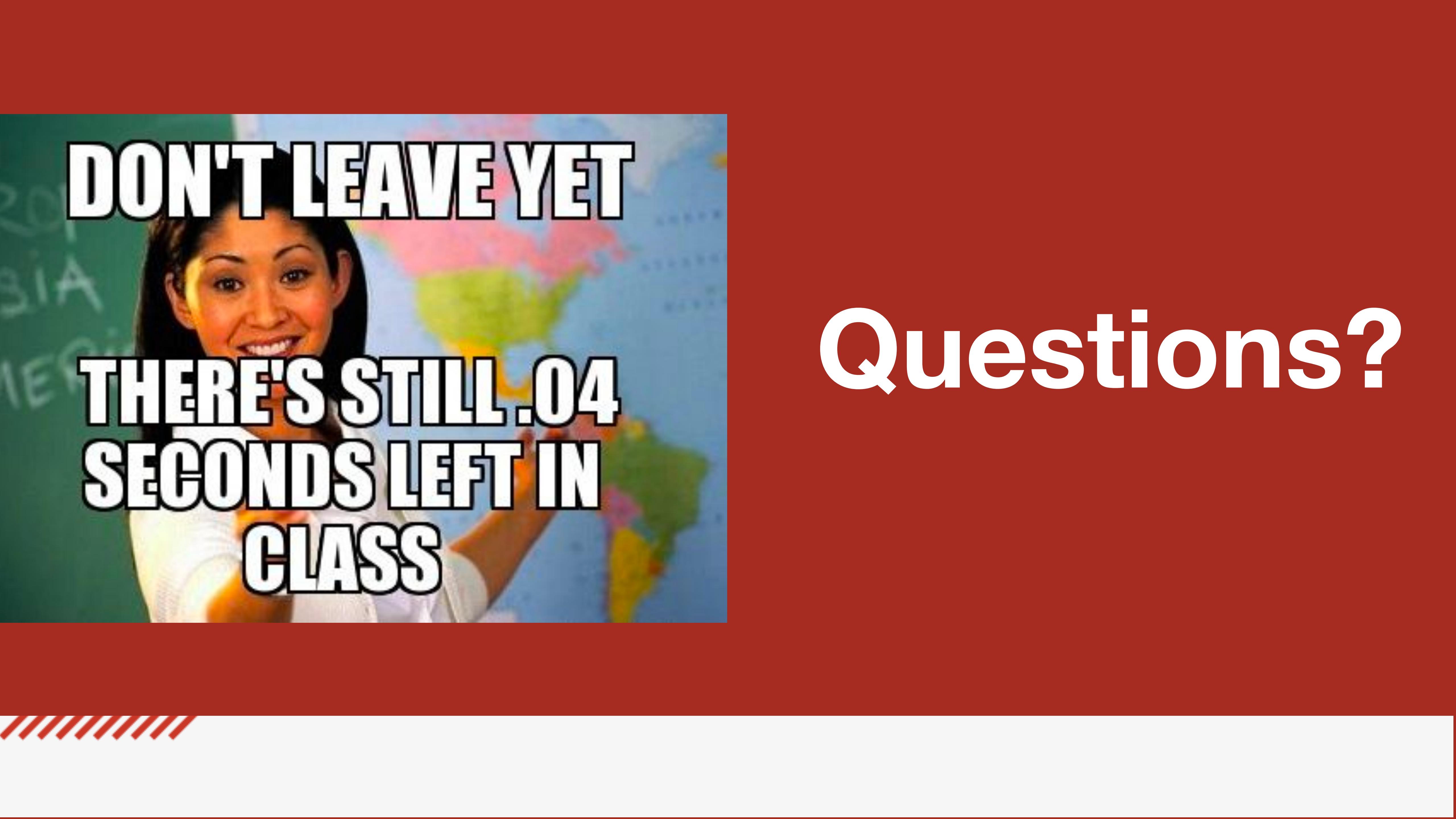
- A lot of room to take your own approach! Use the example solution as a guide
- Mostly use **CodeSandbox** to write you React projects
 - Easier for us to test and run your code!
- Still need a README and UML
 - No testing or deployment for this lab
- Get back in the swing of styling!
 - Use custom CSS and/or a CSS Framework



What's Next:

- Due by Midnight Wednesday:
 - **Learning Journal 18**
- Due by Midnight Thursday:
 - **Code Challenge 18**
- Due by Saturday 9am
 - **Lab 18**
 - **Reading Class 19**
 - **Reading DSA 04**
- Next Class on Saturday: **Class 19 - React Testing and Deployment + DSA 04**



A photograph of a young woman with dark hair, smiling broadly. She is positioned in front of a world map that shows various continents in different colors. The map is mounted on a green chalkboard, which has some faint, illegible text written on it.

DON'T LEAVE YET

THERE'S STILL .04

SECONDS LEFT IN

CLASS

Questions?