React

VS Code Plugins

- Simple React Snippets
- Prettier - Code Formatter

What is React?

- React is a JavaScript library for building user interfaces.
- React is maintained by Facebook and a community of individual developers.
- React is primarily use for developing single page or mobile applications. (SPA)
- React is also referred to as ReactJS and React Native.
  - ReactJS is the one we will be learning in class.
  - React Native is used for mobile development and exposes native IOS and Android feature. Like GPS, Camera, etc.
- Although it is not required React uses JSX syntax to render HTML to the DOM.

What is JSX?

- JSX stands for JavaScript XML.
- JSX is a syntax extension to JavaScript.
- JSX looks similar to HTML.
- React recommends using JSX when programming with React.
- JSX tags look like HTML tags that transpile to JavaScript code that adds HTML to the DOM.

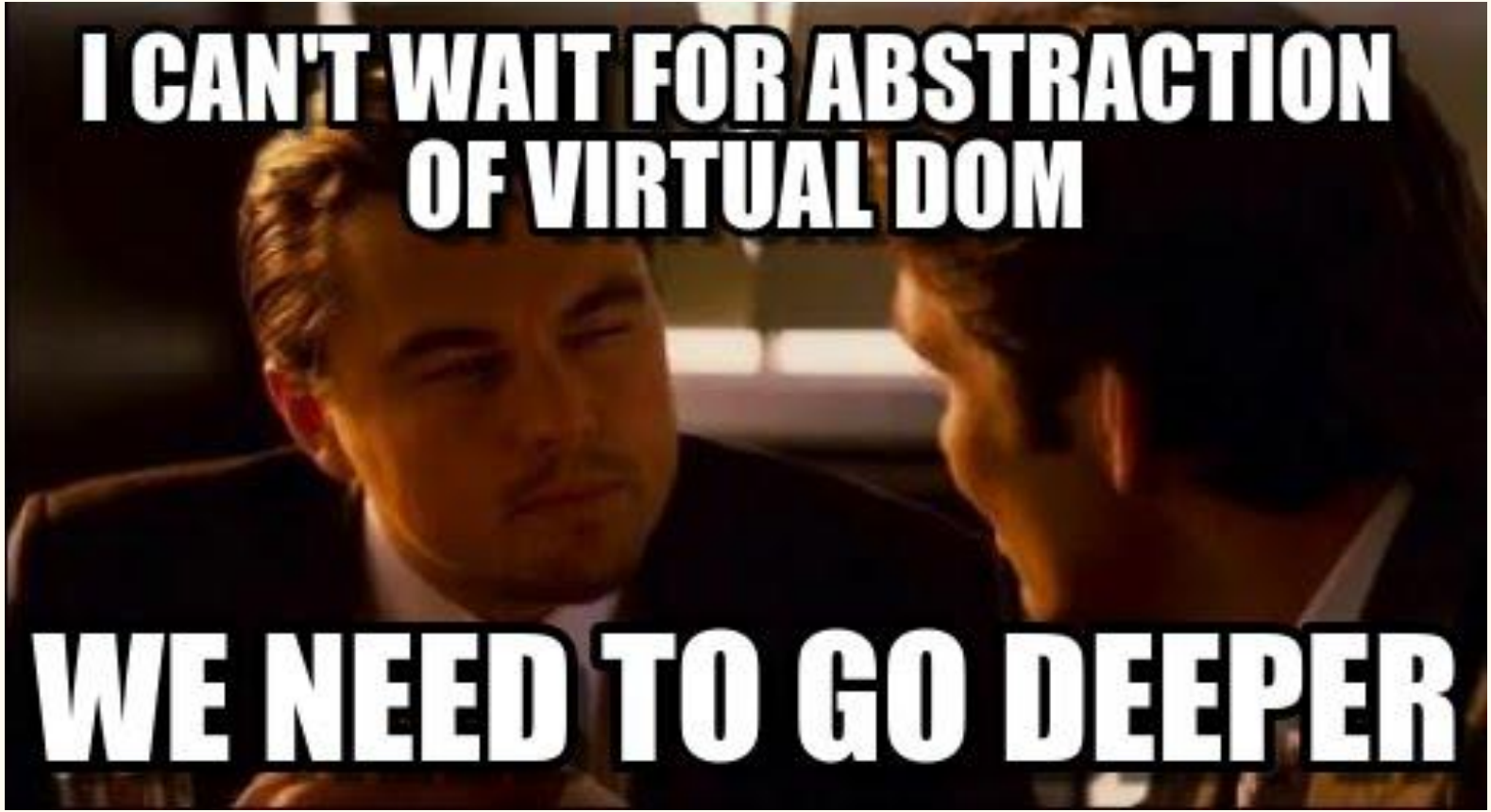
```
var element = <h1>Hello World!</h1>;
```

Why use React?

- Reusable Components
- Faster Rendering to the DOM using a virtual DOM
- Clean Abstraction
- Mobile Support with React Native

React Virtual DOM

- A browser DOM is in most cases a representation of your HTML elements in memory.
- The DOM gives a layer of abstraction to your browser.
- The problem with the DOM is it is very inefficient when modifying HTML elements frequently.
- React adds another layer of abstraction using a Virtual DOM and only pushes things that have changes from the Virtual DOM to the browsers DOM.
- This makes changes very fast and efficient.


I CAN'T WAIT FOR ABSTRACTION
OF VIRTUAL DOM
WE NEED TO GO DEEPER

Let's set up our first React app!

- First we'll need a couple things
  - We'll need npm installed on our computer.
    - To Test run: `npm -v` (you should see a version number appear like 6.1.0)
  - We'll also need to install a package called: `create-react-app`
    - To test whether you have it installed run: `create-react-app --help` this should not error if you have it installed.
    - If you do not have it installed run the command: `npm i -g create-react-app`
- At this point we should have enough to make our first app. To do so run the command:

  `create-react-app <project name>`
  - Example: `create-react-app hello-world`
- This will install a boiler plate project for running a react project!

Running our React app

- Once npm is finished downloading required files you can now navigate into the project directory and run: `npm start` to start your React app.
- This should open a browser connecting to http://localhost:3000/ and show a template React page.
- Port 3000 is the default port React runs on.

React's Entry Point

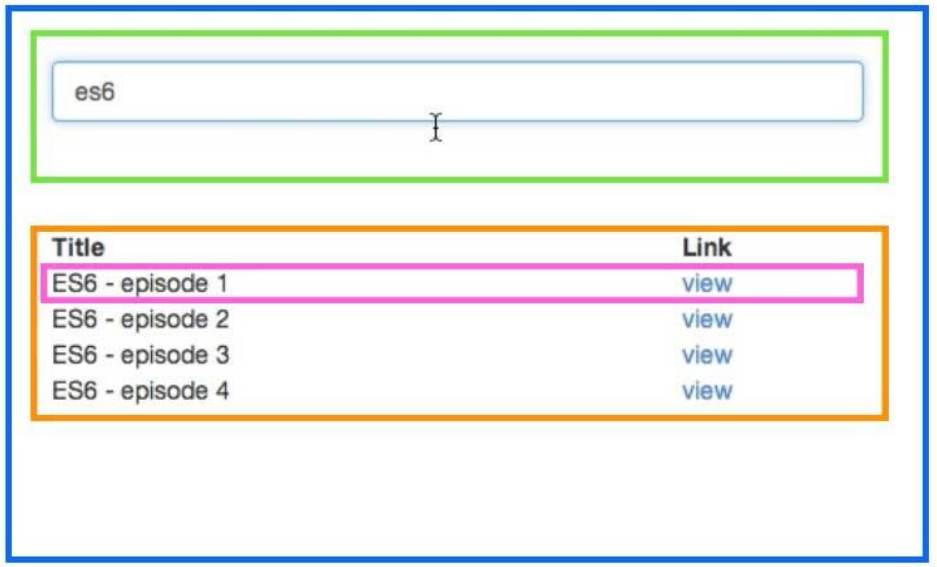
- In a simple description, React loads a single html page and then modifies that page using JavaScript.
- It does this by interacting with the Virtual DOM.
- This is imported from the react-dom library.
- ReactDOM is the magic happening behind the scenes.

```
import React from 'react';
import ReactDOM from 'react-dom';

ReactDOM.render(
  <App />,
  document.getElementById('root')
);
```

Components

- Everything in react is build with components.
- There are two types of components, functional and class components.
- Components are like the building blocks of react.
- Think of components as any piece of reusable code that makes sense grouped together.



State

- State is the place in your component to put your variables or anything that your component relies on to function.
- State should always be immutable data.
- The are used similar to how HTML attributes are associated to HTML elements and is used by calling: `this.state.<stateVariable>`

Props

- Props are how components communicate with each other.
- The are used similar to how HTML attributes are associated to HTML elements.
- They get passed into the component and are used by calling: `this.props.<propertyName>`

Exercise

Create a Component that holds information about a User.

The component should contains a header tag with the name of the user, a section for their bio, a user profile image, and their email.

The component should accept all of the user's information as properties.

Duplicate the component a couple times with different users.

Exercise

Create single react page that has a textbox and a header tag.

As you type in the textbox have the header tag update with same text as you are typing.

Hint: You will need to use state and event handling for this.

Axios

What is Axios?

- Axios is a lightweight HTTP client.
- Axios allows us to make HTTP request to API's or other websites.
- Axios is promise based, so it can be ran async.
- Axios has built in client side protection from cross site request forgery.

How do we use Axios?

- We can start by adding axios to our project by running this command inside the project directory.

  `npm install axios --save`
- Inside the component we'll need to import axios so we can use it.
  - Add an import statement to the top of your file.

    `import axios from 'axios'`
- Inside our React lifecycle we can add our calls to our api. If we do not do this in the lifecycle function there is a chance we'll try to make the call before axios is even loaded.

```
import React from 'react';
import axios from 'axios';
export default class PersonList extends React.Component {
  state = {
        persons: []
  }
  componentDidMount() {
        axios.get(`https://jsonplaceholder.typicode.com/users`)
        .then(res => {
          const persons = res.data;
          this.setState({ persons });
        })
  }
  render() {
        return (
        <ul>
        { this.state.persons.map(person => <li>{person.name}</li>)}
        </ul>
        )
  }
}
```

Exercise

Using theMovieDB API and Axios, make a request to grab a list of the most popular movies.

Display the Movie titles in a user friendly way.

When a user clicks on a movie title pull more detailed information about the movie that was clicked.

Like, Release date, the genres, the overview, the image, etc