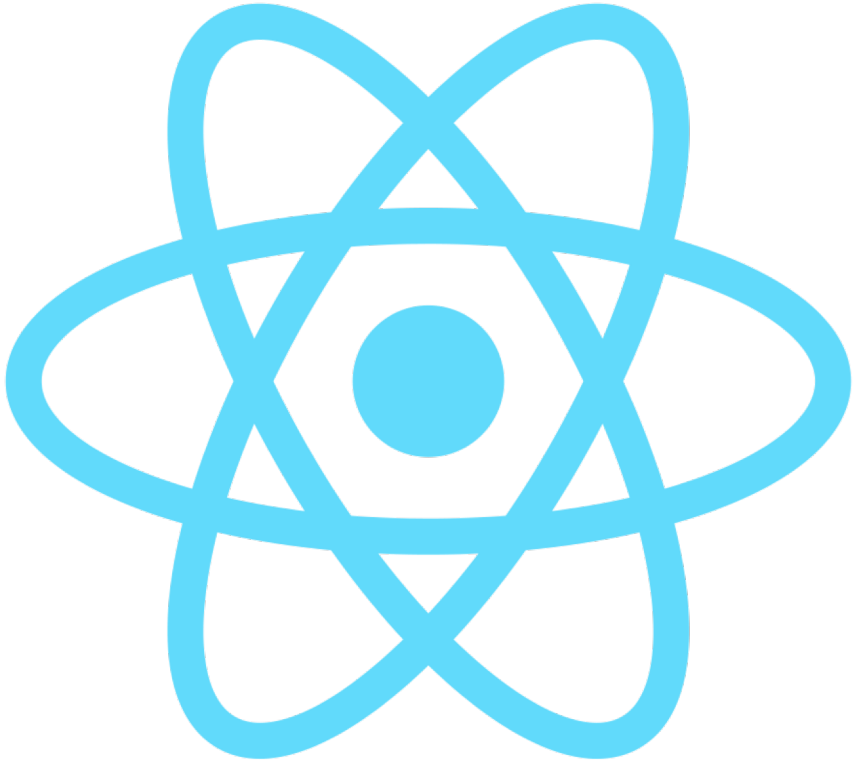
ITMD 465/565
Rich Internet Applications

Lecture 12

Fall 2019 – November 6, 2019

Tonight's Agenda

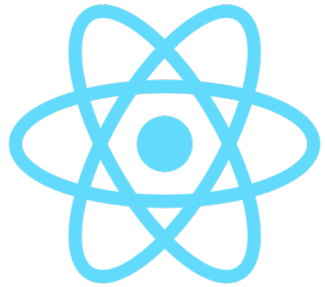
- Didn't give lab or quiz yet like I mentioned last week.
- Finish Class 11 Slides and Demo
- React State Management review
- React Lifecycle events
- Basic webpack and babel project setup and using modules
- Create React App tool
- React Todo App Demo



ReactJS

JavaScript library for building user interfaces

React JS – State



- State is place we can store data in a component and change the data to see a reflection in the UI.
- It is available in the this.state object
- Must add a constructor to your class and initialize the state there.

```
class App extends React.Component {
   constructor(props) {
      super(props);
      this.state = { header: "Header from state...", content: "Content from state..." }
   }
   render() {
      return ( <div> <h1>{this.state.header}</h1> <h2>{this.state.content}</h2> </div> );
   }
}
```

- Try to make the state as simple as possible and keep as many components stateless as possible. If you have many components that need state you should make a parent component that has the state in it and pass it down through props.

React JS – State

- Do not try to modify the state object directly

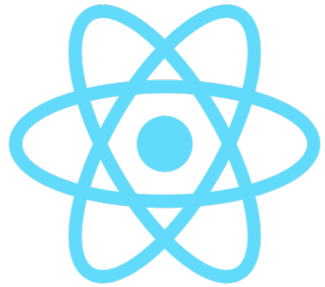
```
// Wrong
this.state.comment = 'Hello';

// Correct
this.setState( { comment: 'Hello' } );
```

Or this.setState((currentState) => { return new state});

- If you need to set state in one component from another you need to pass handlers down to the child component that then calls setState() in the parent that has the state object.
- The React library watches this state and when it detects changes it compares it to the browser DOM and updates only what is necessary
- https://reactjs.org/docs/state-and-lifecycle.html

React JS – Lifecycle



- React class components have lifecycle events you can use.
- We will look at a few of the most important ones.
- Some older ones are marked as not safe and will be removed soon.
- https://reactjs.org/docs/react-component.html#componentdidupdate
- componentDidMount()
  - Called immediately after the component is rendered to the DOM
  - This is good for initialization that requires the DOM nodes or network request.
- componentWillUnmount()
  - Called before the component is removed from the DOM
  - Used to clean up timers, subscriptions, and other items to keep them from running
- conponentDidUpdate()
  - Called immediately after updating occurs. Opportunity for updated network requests but make sure they are necessary by comparing prevProps and prevState to current.

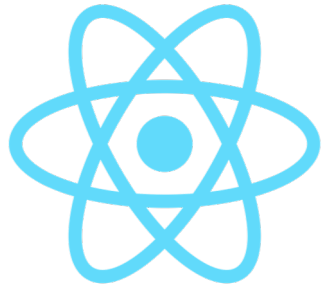
Demo

- Lifestyle & leak example

Helpful Array Functions

- Here are a few array functions you should know. The important part here is they work in a functional way. They do not modify the input but instead return a new array. Map is especially helpful when outputting JSX from arrays.
- map()
  https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/Array/map
- filter()
  https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/Array/filter
- reduce()
  https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/Array/Reduce
- concat()
  https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/Array/concat

React JS and Babel



- Babel is used to convert JSX to plain JavaScript React calls.
- Babel can also compile our ES6 to ES5
- Babel can be directly used in the browser for development purporses

```
<script src="https://unpkg.com/babel-standalone@6/babel.min.js"></script>
<!-- Your custom script here -->
<script type="text/babel">
    const getMessage = () => "Hello World";
    document.getElementById('output').innerHTML = getMessage();
</script>
```

- Need to configure the babel presets or it won't do anything. Typically in a .babelrc file.
- Need to load modules for the presets you want to use and then add them to the .babelrc
- https://babeljs.io/docs/setup/#installation

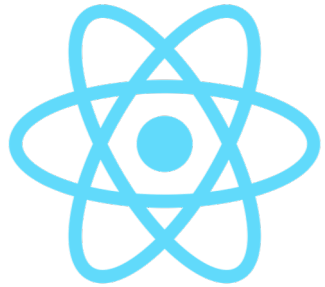
React JS and bundleing

- In an application that is all written in React it is common to use a bundler tool like webpack or browserify
- Browserify - http://browserify.org/
- Webpack - https://webpack.js.org/
- These tools take all the JavaScript files and combine them into a single file to load on your app.
- Browsers can not require or import other JavaScript files so this traces down all the imports/requires and in-lines them into the final script.
- Each has a plugin ecosystem to do many other things too, like minified output
- We will look at webpack

Webpack, Babel, React Setup

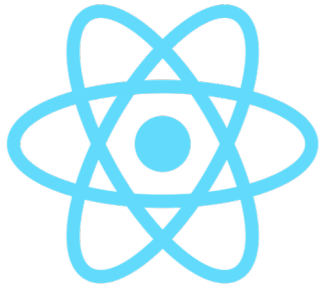
- We will look at setting up webpack, babel, and react ourselves before looking at the scaffolding tool.
- Here is a web tutorial we will work through.
- https://www.valentinog.com/blog/react-webpack-babel/
- Here is an additional Webpack 4 tutorial
- https://www.valentinog.com/blog/webpack-tutorial/

Create React App



- Handy CLI that will completely scaffold a React app with webpack, babel, Jest testing and scripts to build and run a dev server.
- Created by the Facebook team
- https://github.com/facebook/create-react-app
- Recommend usage is now with npx so you don't have to install it globally.
- npx create-react-app my-app
- Can use npm or yarn to run the scripts defined in the package.json, defaults to yarn

React JS, Webpack, and Babel



- https://babeljs.io/docs/setup/#installation
- https://webpack.js.org/concepts/
- https://webpack.js.org/configuration/dev-server/#devserver
- https://www.valentinog.com/blog/webpack-tutorial/
- https://www.valentinog.com/blog/react-webpack-babel/

Demo

- React Todo List Demo

Assignments

Reading/Assignments

- I will assign a blackboard quiz sometime before the weekend
- I will post a new Lab by tomorrow evening
- Details will go out via email