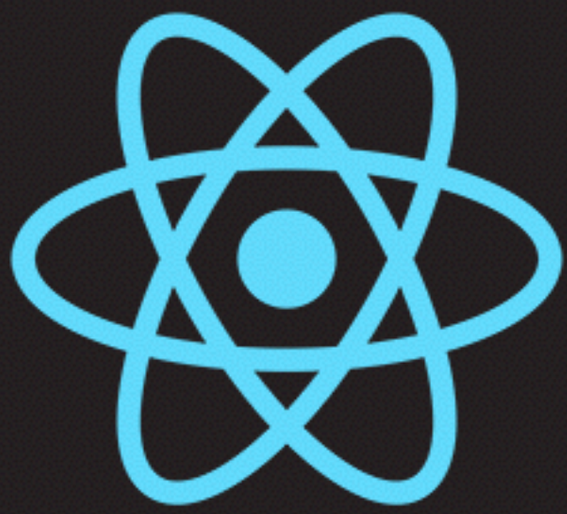
COLLEGIO TECHNOLOGIES INC.

REACT, REDUX AND AJAX



REACT AND REDUX: THE PERFECT MATCH!

- Now that we have some experience with setting up a Redux store, as well as dispatching actions and creating reducers to handle dispatched actions, we need to see how we can connect it with our React apps.

- Also, now that our data layer is essentially separate from our application logic, we can concentrate any AJAX calls to outside servers into here, instead of all over your app!

SETTING UP REDUX WITH REACT

- As is the case with just about everything we've added to our React project, you're going to want to organize your Redux functions so that you can have easier access and separation of functionality.

- It is recommended that you have separate folders in which to store your Redux reducers, actions, and selectors, and stores.

- Once you have everything broken out, you will need to install a library called **react-redux**
  - **npm install react-redux**

- The react-redux library makes extensive use of what are known as **Higher Order Components**.

HIGHER ORDER COMPONENTS

- A ***Higher Order Component*** is a component that renders another component.
- The primary advantages for using a Higher Order Components are:
  - Code Reuse
  - Render Hijacking
  - Prop Manipulation
  - Abstraction of the State

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

const NameInfo = (props) => (
    <div>
        <h1>Hey There!</h1>
        <p>Your name is: {props.yourName}</p>
    </div>
);

const withShareWarning = (WrappedComponent) => {
    return (props) => (
        <div>
            <p>Sharing your name on the internet may lead to undesirable results!</p>
            <WrappedComponent {...props} />
        </div>
    );
}

const AdminNameInfo = withShareWarning(NameInfo);

ReactDOM.render(<AdminNameInfo yourName="Rob" />,  document.getElementById('app'));
```

SETTING UP REACT AND REDUX

- Inside of the react-redux library, we will essentially only be using two functions:
  - The **Provider** component
  - The connect function

- The provider component will be declared once when we are setting up our store in Redux, and the connect functions will be used for each component that needs to connect to the store.

THE PROVIDER COMPONENT

- As mentioned, the Provider component will be declared inside of your app's entry point. If you are following along with the course code, this will be the **/src/app.js** file.

- The Provider component is a Higher Order Component that will provide your Redux store to the entire app.

- Once it is imported into your project, you simply create the Provider Component, add your Redux store as a prop, and include your Wrapper Component, and you will have access to your Redux store throughout your app!

```
import { Provider } from 'react-redux';
import configStore from './store/configStore';

// create the Redux Store (using our imported store)
const store = configStore();

const appTemplate = (
    <Provider store={store}>
        <MainRouter />
    </Provider>
);

ReactDOM.render(appTemplate, document.getElementById('app'));
```

THE CONNECT FUNCTION

- The second part to using the React-Redux library is the **connect()** function.
  - This is the function that we use to specify which specific data we should have access to inside of our component.

- After importing the connect function from the react-redux library, we will be using the connect() function to pass in our mapped state variables, and from the resulting function, we will pass in our component.
  - This sounds a little convoluted, but after several examples, it should become clear.

```
import React from 'react';
import { connect } from 'react-redux';

const PlayersListPage = (props) => (
    <div className="container">
        <h1>Players List</h1>
        {props.players.length}
    </div>
);

// we use the connect function to map our state, then call our component!
const ConnectedPlayersListPage = connect((state) => {
    return {
        players: state.players
    }
})(PlayersListPage);

export default ConnectedPlayersListPage;
```

THE CONNECT FUNCTION (CONTINUED)

- Furthermore, we can simplify our connect code so that it is even more concise:
  - We don't need to declare **ConnectedPlayersListPage**, as we can just export this as the default.
  - Typically, the state that is passed into the component as a props is abstracted out as well (typically called **mapStateToProps**).

```
import React from 'react';
import { connect } from 'react-redux';

const PlayersListPage = (props) => (
    <div className="container">
        <h1>Players List</h1>
        {props.players.length}
    </div>
);

const mapStateToProps = (state) => {
    return {
        players: state.players
    }
}
export default connect(mapStateToProps)(PlayersListPage);
```

INTERLUDE: INSTALLING REACT DEVELOPER TOOLS

- Before we move on, we should download a third party extension for our browser called **React Developer Tools**.
  - Chrome: https://chrome.google.com/webstore/detail/react-developer-tools/fmkadmapgofadopljbjfkapdkoienihi?hl=en
  - Firefox: https://addons.mozilla.org/en-US/firefox/addon/react-devtools/
  - Any other browser: You're on your own! ;)
  - **Note:** You may need to restart your browser once it is installed.
- React Dev Tools are a useful extension to your developer tools that will allow you to see what your code looks like from a component perspective, and let's you see data about each specific component, such as props and state values.
- Now, back to our regularly scheduled programming! (get it? get it? ;))

THE CONNECT FUNCTION AND DISPATCHING ACTIONS

- In addition to any state values passed down via **mapStateToProps()**, if you use React Dev Tools you will notice that you also have access to the **dispatch()** function for dispatching actions.
  - This is a feature of **connect()**, and allows you to be able to make updates to any necessary state values.

- Please note, if you are using a text field to input any prop values, you will also need to declare an **onChange()** event to update the values. If you do not include an **onChange()** event, the field will be read-only.

EXAMPLE: UPDATING STATE USING INPUTS AND ONCHANGE()

```
import React from 'react';
import { connect } from 'react-redux';
import { setFilterText } from '../actions/filters';

const PlayersListFilters = (props) => (
    <div>
        <input type="text" value={props.filters.text} onChange={(e) => {
            props.dispatch(setFilterText(e.target.value));
        }} />
    </div>
);

const mapStateToProps = (state) => {
    return {
        filters: state.filters
    };
};

export default connect(mapStateToProps)(PlayersListFilters);
```

USING CONNECT() WITHOUT PASSING STATE

- Sometimes, you may only need to use the **dispatch()** function within a component, and have no need to declare state.
  - This is perfectly fine, and is common practice in React. When you export your component, simply export it and leave the first set of arguments blank.

```
import React from 'react';
import { connect } from 'react-redux';
import { removePlayer } from '../actions/players';

const PlayersListItem = ({ dispatch, id, name, sport_type, skill_level, gender, message }) => (
    <div>
        <h3>{name} ({gender})</h3>
        <h4>{skill_level}</h4>
        <p>{message}</p>
        <button onClick={() => {
            dispatch(removePlayer({ id }));
        }}>Remove</button>
    </div>
);

export default connect()(PlayersListItem);
```

EXERCISE: SETTING UP FILTERING AND ADDING NEW PLAYERS

- Now that we know how we can connect up some info, let's try to set up our app to display, filter and add new players using Redux.

- Use **props.history.push('/')** to redirect your page to the homepage using react-router. You can change the value to redirect to other internal locations too!

- ***Side Note:*** We don't cover any date-related functionality in this app, but it is fairly common that you'll want to set up a date-picker to use inside of your app. AirBnB has developed an open-source React date picker that is great for serving this purpose:
  - ***https://github.com/airbnb/react-dates***
  - In addition, you may want to use moment.js to configure your date info if you don't already: ***http://momentjs.com/***

RESTFUL HTTP CALLS WITH AXIOS

- Finally, we'll take a look at how we can work with external data via RESTful HTTP calls using a third party library known as ***axios***.
  - **yarn add axios**
  - **import axios from 'axios';**

- Once you have the axios library imported, you can make GET, POST, and DELETE calls using **axios.get()**, **axios.push()** and **axios.delete()**
  - These functions return promises, which are handled by using the **.then()** function, which contains the returned response information from the API call. We'll be interested in **response.data** to see any returned values.

```
axios.get('http://your-data-url/')
    .then((res) => {
        res.data.players.forEach((player) => {
            store.dispatch(addPlayer(player));
        });
    });
```

CONCLUSION: REACT

- That's it! We've covered the entirety of the React Lesson Materials! Unfortunately, we can only cover so much over the time allotted, and there are some things that need to be left out.

- If you are interested in working with React, it is recommended that you look into unit testing and test driven development using a library such as Jest or React TDD.

- Next up, we'll be moving onto using React to develop mobile apps using the React Native library!

RESOURCES

- **React Developer Tools:**
  - **Chrome -** https://chrome.google.com/webstore/detail/react-developer-tools/fmkadmapgofadopljbjfkapdkoienihi?hl=en
  - **Firefox -** https://addons.mozilla.org/en-US/firefox/addon/react-devtools/

- **Axios:**
  - **Official Site -** https://github.com/axios/axios
  - **alligator.io Tutorial on Axios -** https://alligator.io/react/axios-react/

- **Date Picker and Time Display:**
  - **AirBnB Date Picker -** https://github.com/airbnb/react-dates
  - **Moment.js -** http://momentjs.com/

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