Adding React via a CDN

```
<!DOCTYPE html>
<html>

<head>
    <title>Test</title>
    <script src="https://unpkg.com/react@16/umd/react.development.js" crossorigin>
</script>
    <script src="https://unpkg.com/react-dom@16/umd/react-dom.development.js"
crossorigin>
    </script>
    <script src="https://unpkg.com/babel-standalone@6/babel.min.js"></script>
</head>

<body>

    <div id="container"></div>

    <script type="text/babel">
        ReactDOM.render(
            <h1>Hello, React!</h1>,
            document.getElementById('container')
        )
    </script>
</body>

</html>
```

Adding React via 'Create React App' tool

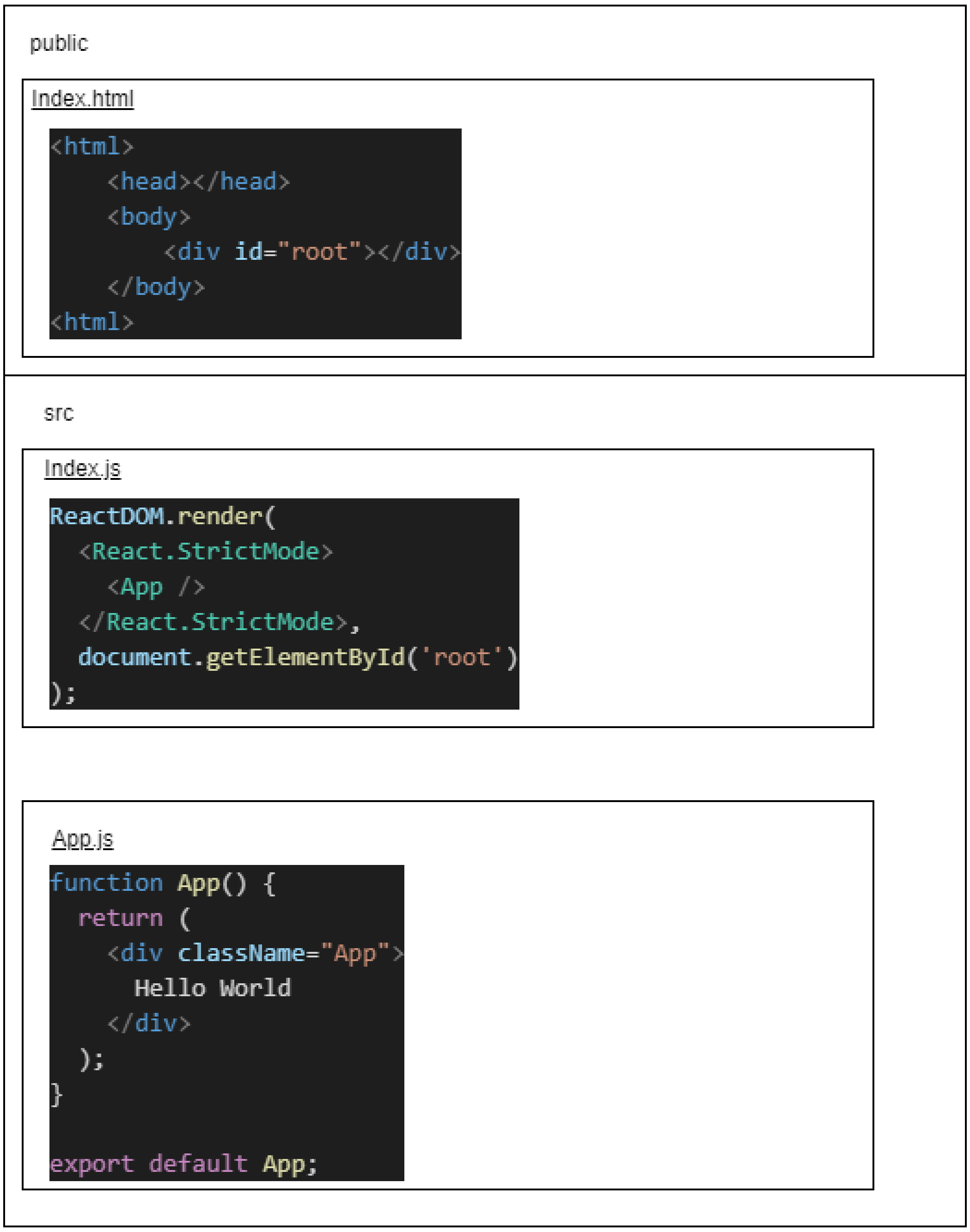
```
# create App
npx create-react-app myAppName
cd myAppName

# run app on http://localhost:3000
npm start
```

App Folder Structure

Folder/File	Description
public	folder contains files related to how the application will display on the client
Public/index.html	HTML template of the page

Folder/File	Description
src	folder contains all of the JavaScript, CSS, and image files that will be compiled into a bundle file and injected into index.html
src/index.js	This file is the entry point into our application. In our code, a method called **ReactDOM.render()** is used to find an element with **id="root"** in the HTML and add our React application inside of that element
src/App.js	This file is the main component that will be rendered to the DOM


public

Index.html

```
<html>
    <head></head>
    <body>
        <div id="root"></div>
    </body>
<html>
```

src

Index.js

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

App.js

```
function App() {
  return (
    <div className="App">
      Hello World
    </div>
  );
}

export default App;
```

> How is React compiled into a bundle file? It uses what is called a "file loader". In the case of Create React App, **Webpack** is used. Webpack creates a "bundle" file containing the content of multiple files that need to be "bundled" together and it is all added together into a single file. Instead of making the HTML file go and find multiple files, which can slow down load times tremendously, it only has to find one file. create-react-app also install **Babel**, a JavaScript compliller that converts jsx to JavaScript (see Babeljs.io)

JSX

- ReactDOM.render(jsx, container)
- Javascript expressions are used to ease building HTML elements in Javascript
- Javascript variables can be passed in a JSX using curly braces

```
cosnt name = 'David';
cosnt el = <p>Hello {name}</p>;
ReactDOM.render(el, document.getElementById('root'));
```

- Use curly braces when using jsx as attribute values

```
// html
<div id="name"></div>
// jsx
<div id={user.id}></div>
```

> React DOM uses **camelCase** property Naming convention eg **class** becomes **className**

Components

Lets you split a page into independent and reusable parts, In react you can create **Functional** or **Class** components

Functional Components

This is a simple JavaScript function save that it starts with an ***upper case*** letter. To display the component, we need to create the corresponding jsx element

```
function Hello(){
    return <h1>Hello World</h1>;
}

const el = <Hello />;
ReactDOM.render(el, document.getElementById('root'));
```

Class Components

Typically used when there are more advanced user interactions like forms and animation.

```
class Hello extends React.Component{
    render(){
        return <h1>Hello World</h1>;
    }
}
```

Props

Functional components can accept arguments, similar to JavaScript functions. These arguments are called **props**, and represent an object

```
fucntion Hello(props){
    return <p>Hello {props.name}</p>;
}

const el = <Hello name="Sesugh" />;
```

Components can also return other components

```
function App(){
    return <div>
    <Hello name="Sesugh" />
    <Hello name="Paul" />
    </div>;
}
```

Props can be accessed in class components using **this.props**

```
class Hello extends React.Component{
    render(){
        return <p> hello {this.props.name}</p>;
    }
}
```

State

state is an object that is added as a property in a class component, this helps components change their data. Because state should not be modified directly, react provides a **setState()** method

```
//class counting appp using setState
class Counter extends React.Component{
    state = {
        counter : 0
        }

     increment = () => this.setState({counter: this.state.counter + 1});

    render(){
        return (
            <div>
```

```
                <p>{this.state.counter}<p>
                <button onClick ={increment}>Increment</button>
            </div>
        );
    }
}
```

Hooks

Hooks was introduced to allow the use of state inside functional components, we need to import the **useState** named module from react. useState returns a pair, the current state value and a function that lets you change the state useState takes one argument which is the intial value of the state

```
//function counting app using hooks
import React, {useState} from 'react';

function Counter(){
    const [counter, setCounter] = useState(0);

    increment = () => setCounter(counter + 1);

    return (
        <div>
            <p>{counter}<p>
            <button onClick ={increment}>Increment</button>
        </div>
    );
}
```

Lifecycle Methods

for class components

Class Method	Function Hook	Description
ComponentDidMount	`useEffect(()=>{//code})`	called when a component is rendered on a page
ComponentDidUpdate	`useEffect(()=>{//code}, [count])`	called when a component is updated in the DOM
ComponentWillUnMount	`useEffect(()=>{//code return ()=>{// cleanup};})`	called just before the component is removed from the DOM

React provides the **useEffect** Hook to make the Lifecycle methods available in functional components

Handling Events

React uses camelCase for event names

```
function Converter() {
  const [km, setKm] = useState(0);

  function handleChange(e) {
    setKm(e.target.value);
  }
  function convert(km) {
    return (km/1.609).toFixed(2);
  }

  return <div>
        <input type="text" value={km} onChange={handleChange} />
        <p> {km} km is {convert(km)} miles </p>
  </div>;
}
```

```
  // hanldling form input
    function AddForm() {
        const [sum, setSum] = useState(0);
        const [num, setNum] = useState(0);

        function handleChange(e) {
            setNum(e.target.value);
        }

        function handleSubmit(e) {
            setSum(sum + Number(num));
            e.preventDefault();
        }

        return <form onSubmit={handleSubmit}>
        <input type="number" value={num} onChange={handleChange} />
        <input type="submit" value="Add" />
        <p> Sum is {sum} </p>
        </form>;
    }
```

The Contact App

```
  //structure
  |- index.js
  |- App.js
  |- components
  |-- contactMgr
  |--- contactManager.jsx
  |--- addPerson.jsx
  |--- peopleList.jsx.jsx
```

Intro to Redux

Saves us the stress of having to pass down data through components, provides a single state container and strict rules on how a state can be changed you cannot change the state directly but dispatch an **action** to do so

Core Concepts

Store Application state is stored in a single object called store

```
{
    contacts:[{name:"Paul Bija"}, {name: "Sesugh Hulugh"}],
    toggle:true
}
```

Action

Adding Redux

```
yarn add redux / npm install redux
yarn add react-redux / npm install react-redux
```

- under src folder create **actions** and reducers **folders**
- under src folder add a **store.js** file
- in the index.js file add the store and wrap the jsx render method input with the provider component

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

  ReactDOM.render(
      <Provider store={store}>
          <React.StrictMode>
              <App />
          </React.StrictMode>
      </Provider>
      , document.getElementById('root'));
  ```