

React

React is a JavaScript Library which is used to Create Single Page Application User interface.

React is actually a JS library but it is commonly Known as a FrameWork because it is comparable to Angular, vue js .

React is a JavaScript library for building user interfaces.

React is used to build single-page applications.

React allows us to create reusable UI components.

SPA means whenever we move from one page to another our page will not Reload.

We use JSX (JavaScript Syntax Extension) in react which is basically HTML with some changes.

We can divide our website into Components

The main benefit of dividing in the components is we can create our website in small parts such that management of the whole website will improve.

Why REACT ? We cannot do the stuffs with simple HTML JS CSS as it will take a lot of efforts time to do so.

Starter template

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Spread Operator

The JavaScript spread operator (...) allows us to quickly copy all or part of an existing array or object into another array or object.

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React Render HTML

React renders HTML to the web page by using a function called ReactDOM.render().

The ReactDOM.render() function takes two arguments, HTML code and an HTML element.

The purpose of the function is to display the specified HTML code inside the specified HTML element.

But render where?

There is another folder in the root directory of your React project, named "public". In this folder, there is an index.html file.

You'll notice a single `<div>` in the body of this file. This is where our React application will be rendered.

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

```
const myelement = (
  <table>
    <tr>
      <th>Name</th>
    </tr>
    <tr>
      <td>John</td>
    </tr>
    <tr>
      <td>Elsa</td>
    </tr>
  </table>
);
```

```
ReactDOM.render(myelement, document.getElementById('root'));
```

What is JSX?

JSX stands for JavaScript XML.

JSX allows us to write HTML in React.

JSX makes it easier to write and add HTML in React.

```
const myelement = <h1>React is {5 + 5} times better with JSX</h1>;
```

Elements Must be Closed

JSX follows XML rules, and therefore HTML elements must be properly closed.

Use attribute className instead of Class

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React Components

Components are like functions that return HTML elements

Components are independent and reusable bits of code. They serve the same purpose as JavaScript functions, but work in isolation and return HTML

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Components inside Components

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Components in Files

React is all about re-using code, and it is recommended to split your components into separate files.

To do that, create a new file with a .js file extension and put the code inside it:

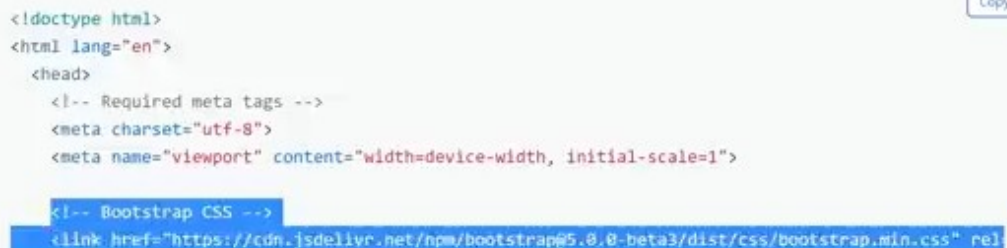
Note that the filename must start with an uppercase character.

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React Props

props stands for properties.

Props are like function arguments, and you send them into the component as attributes.

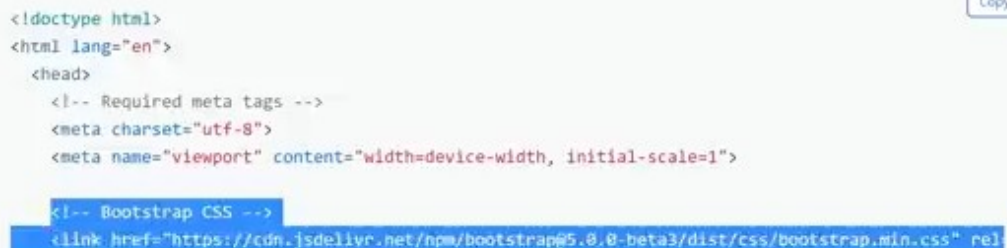
Components can be passed as props, which stands for properties.

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Pass Data

Props are also how you pass data from one component to another, as parameters.

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React Events

React events are written in camelCase syntax:

onClick instead of onclick.

React event handlers are written inside curly braces:

onClick={shoot} instead of onClick="shoot()"

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Passing Arguments

To pass an argument to an event handler, use an arrow function.

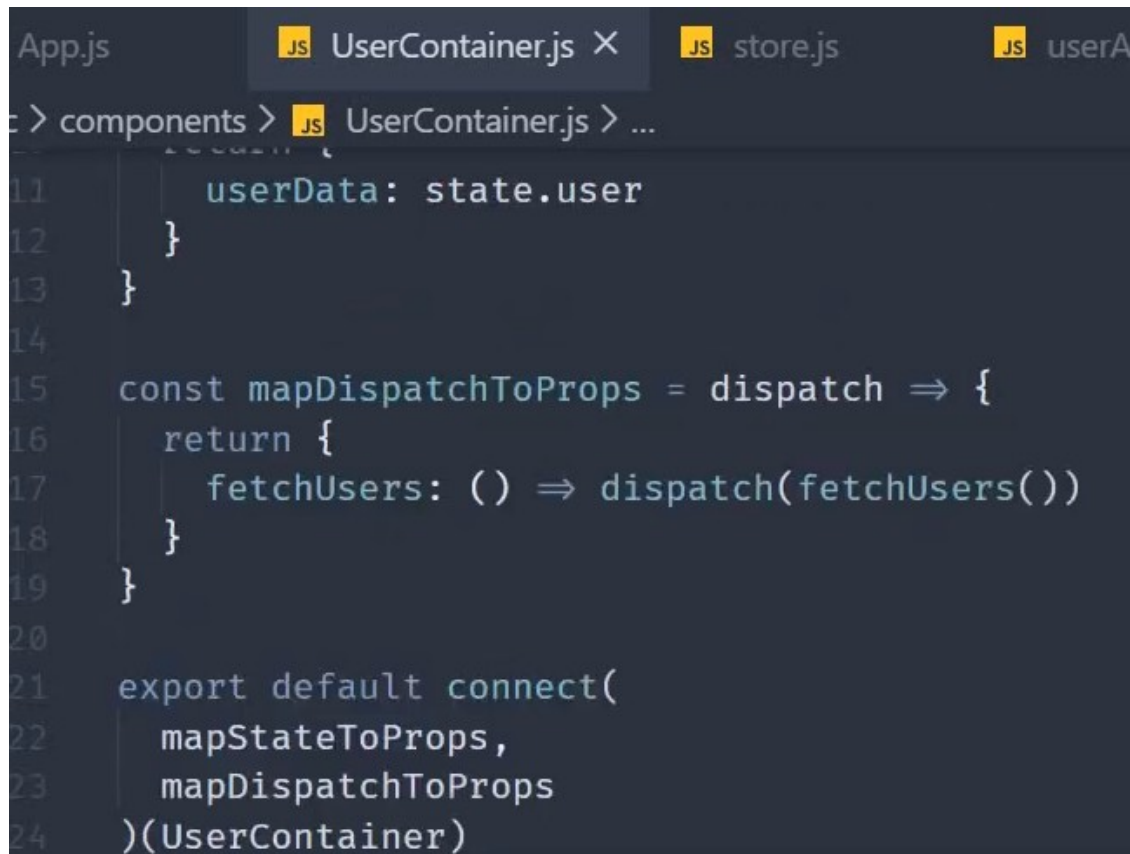
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```

React Conditionals



```
App.js  JS UserContainer.js X  JS store.js  JS userA
> components > JS UserContainer.js > ...
11   |   userData: state.user
12   |   }
13   | }
14
15   | const mapDispatchToProps = dispatch => {
16   |   return {
17   |     fetchUsers: () => dispatch(fetchUsers())
18   |   }
19   | }
20
21   | export default connect(
22   |   mapStateToProps,
23   |   mapDispatchToProps
24   | )(UserContainer)
```

React Lists

In React, you will render lists with some type of loop.

The JavaScript `map()` array method is generally the preferred method.

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Handling Forms

Handling forms is about how you handle the data when it changes value or gets submitted.

In HTML, form data is usually handled by the DOM.

In React, form data is usually handled by the components.

When the data is handled by the components, all the data is stored in the component state.

You can control changes by adding event handlers in the `onChange` attribute.

We can use the `useState` Hook to keep track of each inputs value and provide a "single source of truth" for the entire application.

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Hooks

Hooks were added to React in version 16.8.

Hooks allow function components to have access to state and other React features. Because of this, class components are generally no longer needed.

Hooks allow us to "hook" into React features such as state and lifecycle methods.

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useState Hook

Steps:

create a function component by rfce.

We need a state property initialized to "0". We need a method capable of setting that state property value Hooks are just functions so we simply call them `useState()`.

`useState` accepts the initial value of the state which is "0" **`useState(0)`** and returns a pair of values [**value**, **setValue**]

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-
- `setCount` in the array is a **method** which is used to **UPDATE** the current values

- At last we used arrow function as it was a method and would become function CALL without Arrow function.
-

Always use functions for setValue method

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useState - default state will be an Object.

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Only One state changes as we write our Name the other state disappears.

Why is this happening ?

This is happening because the NEW State does not automatically merge and update the Object.

useState will not merge the STATE.

Solution We can use SPREAD operator for that

We say copy all the fields in the given state and OVERWRITE with a different value

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useEffect()

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WE can only return ONE element from any functional component

React Router DOM

Create React App doesn't include page routing.

React Router is the most popular solution.

To create an application with multiple page routes, let's first start with the file structure.

Create a file MainRouter.js

```
import BrowserRouter from "react-router-dom"
```

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Changes in the Latest Version

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?

Signup Form with hooks

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[Copy](#)

Using fetch to POST data from the form to the backend

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Showing Error messages on the Frontend getting from backend

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Whenever uses starts typing the ERROR message will disappear ***

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Redux

Starter template

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The above blocks are the states(`useState(...)`) of the component.

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Copy

Suppose we want to send componenet name from A to B

How do we send the object (here name) from component A to B ?

We need to pass it as a prop to component C.

Suppose we need to display the name in component G

The state is maintained in the app component and has to be passed as props to the level component

Note: Some component may not require this state but has to be passed in the heirarchy.

Starter template

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With Redux our State is contained outside the Components.

Then the components which require these states can take from the container.

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```
npm install redux
npm install redux react-redux
```

Example

Starter template

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STORE | Action | Reducer

Starter template

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Redux mainly revolves around the above three core concepts

Starter template

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15 const mapDispatchToProps = dispatch => {
16   return {
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18   }
19 }
20
21 export default connect(
22   mapStateToProps,
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24 )(UserContainer)
```

Suppose we have an application

The STATE of the application is maintained Separately in the REDUX STORE

The APP cannot directly update the STATE.

If the application wants to update the state it has to **EMIT** or **DISPATCH** an **ACTION**

Once the ACTION has been dispatched the **REDUCCERS** then **handles that ACTION** and **updates the current STATE**.

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Example...

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The

ABOVE are ACTION Creators.

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BUT you should SEPARATE it for better understanding

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Combining multiple REDUCERS

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```

REACT + Redux

```
npm install redux react-redux
```

Create a folder Components

within component create Container.js

Folder structure would be

```
src/redux(folder) and components(folder)
```

```
/redux/cakes(folder)/cakeActions.js
```



```
/redux/cakes(folder)/cakeTypes.js  
/redux/cakes(folder)/cakeReducers.js  
/redux/store.js
```

Component is CakeContainer.js ***

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- Number of Cake is the component where we want to display number of cake which is part of the Redux state
- And also we want to Dispatch an Action Buy_cake using button

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Reducer

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To Provide this redux-store to our React Application we use React-Redux library which exports a component called Provider

Starter template

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How to Dispatch Action in React-Redux ?

- First Define a function **mapStateToProps**
 - this function gets the **state as a parameter** and returns an Object.
-

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Copy

- Make another function **mapDispatchToProps**
 - this function gets the **redux dispatch as a parameter** and returns an Object.
-

HERE buyCake is an ACTION CREATOR

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Connect the above two functions with the REACT COMPONENT **

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

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We always exports Action/Action Creators

See above we are passing mapState and dispatch as a PROP in the CakeContainer itself from the same FILE.

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The above code is similar to `mapStateToProps`

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Make similar redux-store for IceCream as well

Now combining multiple **REDUCER**

Make a folder rootReducer.js

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Remember to Make changes in the state also

In mapStateToProps or useSelector

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Adding Logger Middleware

```
npm i redux-logger
```

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```

Adding Payload to our Action creator

We are using Hooks `useState` for specifying the number of cakes/products to BUY.

```
const [number, setNumber] = useState();
```

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Fetching Users

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Make a Get request to an API end point

axios is used to make an get request from an API endpoint

redux-thunk allows us to define async action creators in our application

```
npm install axios redux-thunk
```

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Last Step is to SUBSCRIBE our useContainer to the redux store and display list of user

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```

```
App.js  JS UserContainer.js X  JS store.js  JS userA
> components > JS UserContainer.js > ...
11     userData: state.user
12   }
13 }
14
15 const mapDispatchToProps = dispatch => {
16   return {
17     fetchUsers: () => dispatch(fetchUsers())
18   }
19 }
20
21 export default connect(
22   mapStateToProps,
23   mapDispatchToProps
24 )(UserContainer)
```

Final

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Copy

Goto the Folder where you want your react app

shift + right click -> to open powershell

(npm was used to install packages of other people and those packages will be stored forever)

while npx is used when we want to run only one time -- files wont be downloaded in your pc.

type

```
npx create-react-app my-app
```

To start react-app

```
npm start
```

How does React Work?

React creates a VIRTUAL DOM in memory.

Instead of manipulating the browser's DOM directly, React creates a virtual DOM in memory, where it does all the necessary manipulating, before making the changes in the browser DOM.

React only changes what needs to be changed!

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JSX = JS + HTML

Add this to index.html for using Bootstrap

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In index.html

After body

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