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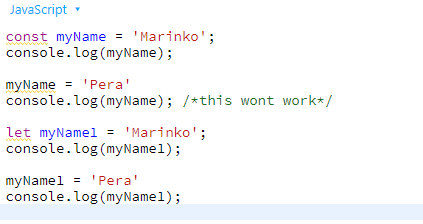
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# React Tutorial

# Basic Introduction

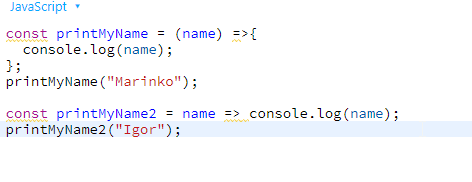
## Let and Const keywords

Instead of var we should always use let or const keywords. Let is used for variable that could be changed further in a code but const cannot, it is constant.



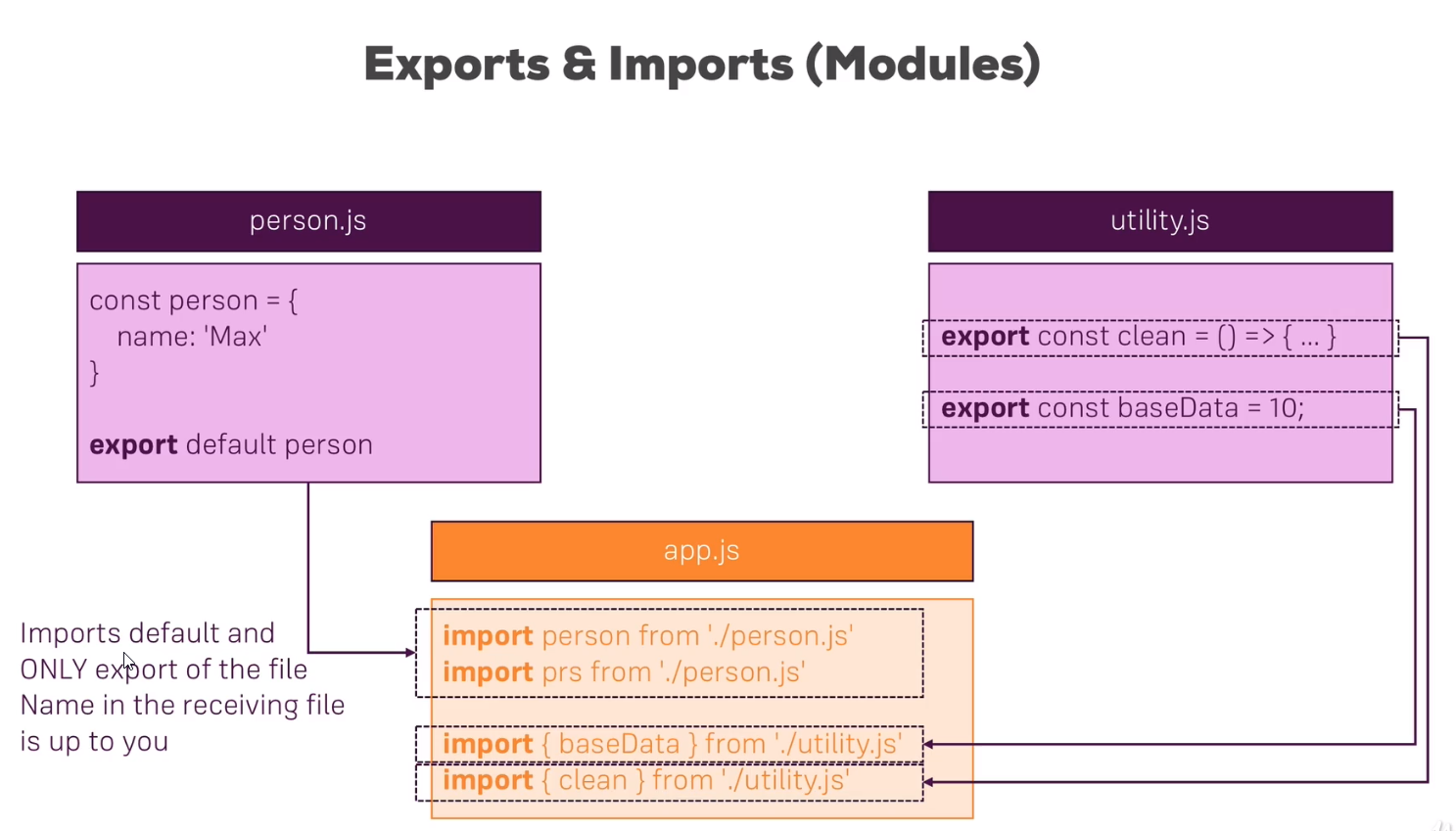
## Arrow functions

We can use normal functions as we used to in java script, but now it is popular to use arrow functions.

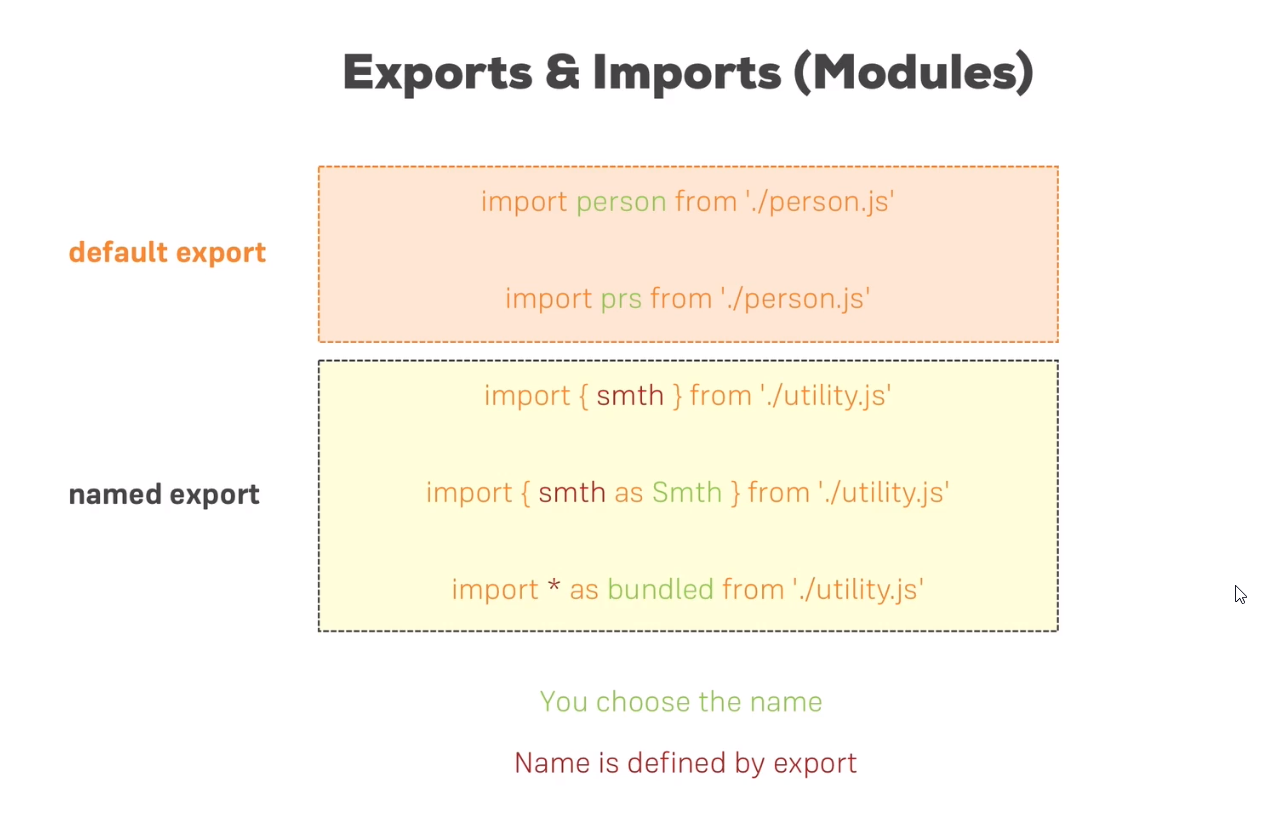


## Imports and Exports

We can export some variables from one file and import it into another file. Two keywords: default and named. With default keyword you can import that variable with any name you want. With named export you can import this variable but only with the same name (between curly brackets) as the name of variable in export file.

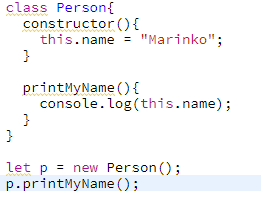


When importing as named, you can add alias to the imported variable with keyword “as”. Or if you importing multiple values, you can wrap them into one object with the \*. And then call them as properties: bundled.something …

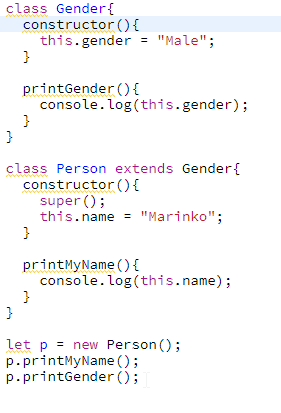


## Classes

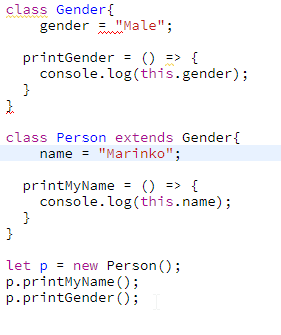
Classes are the same as everywhere.



Classes can inherit from other class with keyword extends. You must use super keyword to call constructor of a base class.



With next generation of java script we can write the same code without this keyword and constructor at all and with arrow functions:

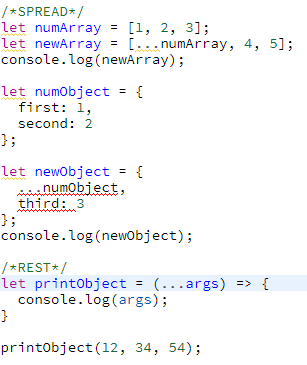


## Spread and Rest

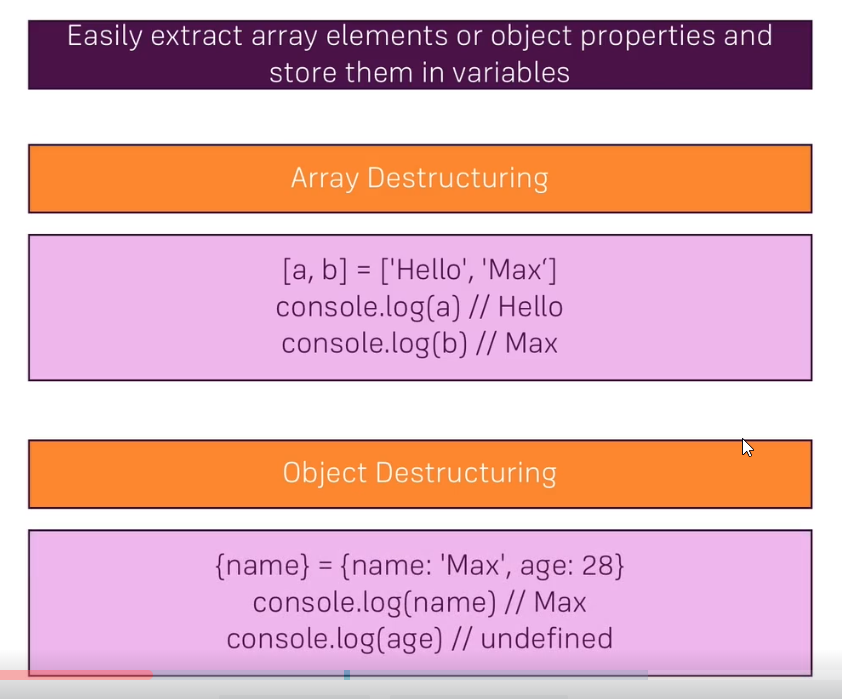
The spread and rest operator is “…”.

As a spread you can extract all the values from some array or object and store it into another array or object with all other values inside this new array or object.

As a rest you can use it in a function as a parameter which receives the list of arguments (like params [] inside .NET)



## Destructuring



When destructuring arrays you need to keep mind on order of the elements. With objects you need to pay attention on keys (must match).

## Reference and primitive types

This is the same as in .NET. Reference types are classes, objects, arrays and they are stored into memory with pointers to that location. Value types are creating are not using pointers but they keep the value inside. If you want a copy of reference type, use spread operator.

# Project Set up

## Using React Create-app

We will use tool to set up complete project for us, with all dependences and bundling tools. Instructions on this link <https://github.com/facebook/create-react-app> .

Node.js latest version must be installed prior to any action with the React Create-app.

## First look at created project

It is similar to Angular project. It has only the Index page, and inside that index page you are adding references towards the css and the js files. Index.html has its own Index.js file, which renders App.js component and html code inside. The rendering is executed with this peace of code:

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

App.js file looks like this:

import React, { Component } from 'react';

import './App.css';

class App extends Component {

render() {

return (

<div className="App">

<h1>Hi, I am React App</h1>

</div>

);

}

}

export default App;

It is component which inherits from the Component class. It has a render method that returns content for the index.js to render inside Index.html file. This part of code, inside render method is called jsx.

This is another way of writing component in React:

import React from 'react';

const person = () => {

return (

<p>I am a Person!</p>

);

}

export default person;

## Dynamic content output

In angular for something like this we would use interpolation {{}} but in react we use just one pair of brackets like this

<p>I am a Person and I am {Math.floor(Math.random() \* 30)} years old.</p>

## Dynamic properties

App.js

import React, { Component } from 'react';

import './App.css';

import Person from './Person/Person';

class App extends Component {

render() {

return (

<div className="App">

<h1>Hi, I am React App</h1>

<Person name="Marinko" age="35" />

<Person name="Marina" age="32">My hobby is to love my husband.</Person>

<Person name="Goran" age="28"/>

</div>

);

}

}

export default App;

Person.js

import React from 'react';

const person = (props) => {

return (

<div>

<p>I am a {props.name} and I am {props.age} years old.</p>

<p>{props.children}</p>

</div>

);

}

export default person;

With props.children we are collecting content between open and close Person tags.

## Using state inside component

State is special property that works only inside component that extends Component class. If state changes, complete DOM is rendered again. This is how to use state:

class App extends Component {

state = {

persons: [

{name: "Marinko", age: 35},

{name: "Marina", age: 32},

{name: "Goran", age: 28}

]

}

render() {

return (

<div className="App">

<h1>Hi, I am React App</h1>

<button>Switch button</button>

<Person name={this.state.persons[0].name} age={this.state.persons[0].age} />

<Person name={this.state.persons[1].name} age={this.state.persons[1].age}>My hobby is to love my husband.</Person>

<Person name={this.state.persons[2].name} age={this.state.persons[2].age}/>

</div>

);

}

}

export default App;

## Activating the handler and setting state

switchState = () => {

console.log("clicked");

}

<button onClick={this.switchState}>Switch button</button>

You need to include complete object you want to change with the changed values inside setState function. If you have any other properties inside state object, they won’t be changed at all.

switchState = () => {

this.setState({

persons: [

{ name: "Marinko", age: 35 },

{ name: "Marina", age: 32 },

{ name: "Jovan", age: 29 }

]

});

}

## Transferring handler between components

We can reference handler from one component into another component in the same way as we reference properties. It is sent as an attribute like name and age.

App.js

<Person name={this.state.persons[0].name} age={this.state.persons[0].age} click={this.switchState} />

Person.js

<p onClick={props.click}>I am a {props.name} and I am {props.age} years old.</p>

## Passing params to the handler

switchState = (newName, newAge) => {

this.setState({

persons: [

{ name: "Marinko", age: 35 },

{ name: "Marina", age: 32 },

{ name: newName, age: newAge }

]

});

}

<button onClick={this.switchState.bind(this, "Jovan", 29)}>Switch button</button>

## Two way binding

We can create two way binding by sending an handler to Pearson.js component to call it whenever you want to change something, and also writing it down into text box.

App.js

changeName = (event) => {

this.setState({

persons: [

{ name: "Marinko", age: 35 },

{ name: "Marina", age: 32 },

{ name: event.target.value, age: 29 }

]

});

}

<Person name={this.state.persons[2].name} age={this.state.persons[2].age} change={this.changeName} />

Pearson.js

<input type="text" onChange={props.change} value={props.name} />

## Styling

When using styling it is enough to just create css file, to IMPORT it inside component you want to use it in and to call the class in appropriate element. If using inline style then make an object with css properties and call in in element with attribute style={someStyleObject}.

# List and conditionals

## Conditioning

To do condition rendering you need to wrap all of your code inside curly brackets. That way it can accept java script code. Then you can just use ternary operator.

state = {

persons: [

{ name: "Marinko", age: 35 },

{ name: "Marina", age: 32 },

{ name: "Goran", age: 28 }

],

other: "something other here.",

showPersons: false

}

togglePerson = () => {

this.setState({

showPersons: !this.state.showPersons

})

}

render() {

return (

<div className="App">

<h1>Hi, I am React App</h1>

{/\* <button onClick={this.switchState.bind(this, "Jovan", 29)}>Switch button</button> \*/}

<button onClick={this.togglePerson}>Switch button</button>

{

this.state.showPersons ?

<div>

<Person name={this.state.persons[0].name} age={this.state.persons[0].age} click={this.switchState.bind(this, "Jovan", 29)} />

<Person name={this.state.persons[1].name}

age={this.state.persons[1].age} other={this.state.other}>My hobby is to love my husband.</Person>

<Person name={this.state.persons[2].name} age={this.state.persons[2].age} change={this.changeName} />

</div> : null

}

</div>

);

}

**There is another, better, way of doing this** =>

I can extract all this html inside condition into variable only if condition is true something. Then just invoke this variable inside jsx return between curly brackets like this:

render() {

let persons = null;

if(this.state.showPersons){

persons = (

<div>

<Person name={this.state.persons[0].name} age={this.state.persons[0].age} click={this.switchState.bind(this, "Jovan", 29)} />

<Person name={this.state.persons[1].name}

age={this.state.persons[1].age} other={this.state.other}>My hobby is to love my husband.</Person>

<Person name={this.state.persons[2].name} age={this.state.persons[2].age} change={this.changeName} />

</div>

);

}

return (

<div className="App">

<h1>Hi, I am React App</h1>

{/\* <button onClick={this.switchState.bind(this, "Jovan", 29)}>Switch button</button> \*/}

<button onClick={this.togglePerson}>Toggle persons</button>

{persons}

</div>

);

}

## Lists

To show the list of elements, and not repeating it in jsx part, we can use map method on the persons array inside state object.

render() {

let persons = null;

if (this.state.showPersons) {

persons = (

<div>

{

this.state.persons.map( (person, index) => {

return <Person name={person.name} age={person.age}></Person>

})

}

</div>

);

}

Then we just use this “persons” reference inside jsx code.

When coping array form the reference object you are just making a copy that point to the same location, therefore making mutable change. If you want to make it immutable then you can use spread operator on that array.

this.state.persons.map((person, index) => {

return <Person name={person.name} age={person.age}

click={this.deletePerson.bind(this, index)}></Person>

deletePerson = (personIndex) => {

const persons = [...this.state.persons];

persons.splice(personIndex, 1);

this.setState({ persons: persons })

}

## Keys in the list rendering

It is very important to have a key while rendering html from the list. It helps react a lot to know which element to render. For the key always send unique element inside your object like id.

state = {

persons: [

{ id: 1, name: "Marinko", age: 35 },

{ id: 2, name: "Marina", age: 32 },

{ id: 3, name: "Goran", age: 28 }

],

other: "something other here.",

showPersons: false

}

this.state.persons.map((person, index) => {

return <Person name={person.name} age={person.age}

click={this.deletePerson.bind(this, index)} key={person.id}></Person>

})

## Flexible lists

render() {

let persons = null;

if (this.state.showPersons) {

persons = (

<div>

{

this.state.persons.map((person, index) => {

return <Person name={person.name} age={person.age}

click={this.deletePerson.bind(this, index)} key={person.id}

change={this.changeName.bind(this, person.id)}></Person>

})

}

</div>

);

}

changeName = (id, event) => {

let personIndex = this.state.persons.findIndex(p => p.id === id);

let person = {...this.state.persons[personIndex]};

person.name = event.target.value;

let persons = [... this.state.persons];

persons[personIndex] = person;

this.setState({persons: persons});

}

It is important to know if you send not just event to the function, this event parameter must be on the last place if you send params with bind() method.

# Styling components

## Dynamically styling components

We can define style elements as a json object inside render method, and call it like style attribute inside button or any element.

render() {

const style = {

backgroundColor: 'green',

color: 'white',

font: 'inherit',

border: '1px solid blue',

padding: '8px',

cursor: 'pointer'

};

<button style={style} onClick={this.togglePerson}>Toggle persons</button>

Now we can dynamically change the style in our “if” statement:

if (this.state.showPersons) {

persons = (

<div>

{

this.state.persons.map((person, index) => {

return <Person name={person.name} age={person.age}

click={this.deletePerson.bind(this, index)} key={person.id}

change={this.changeName.bind(this, person.id)}></Person>

})

}

</div>

);

style.backgroundColor = 'red';

}

## Dynamically set classes to style components

ClassName property accepts one string with name of the class or on string with name of the classes blank space separated.

selectClasses = (person) => {

let classArray = [];

if(person.age > 33){

classArray.push('red');

}

else if(person.age < 33 && person.age > 28){

classArray.push('green');

}

else{

classArray.push('bold', 'italic'); }

return classArray.join(' ');

}

this.state.persons.map((person, index) => {

let classes = this.selectClasses(person);

return <Person name={person.name} age={person.age}

click={this.deletePerson.bind(this, index)} key={person.id}

change={this.changeName.bind(this, person.id)}

classNames={classes}></Person>

})

Person.js

<p onClick={ props.click } className={props.classNames}>I am { props.name } and I am { props.age } years old.</p>

App.css

.red{ color: red; }

.green{ color: green; }

.bold{ font-weight: bold; }

.italic{ font-style: italic; }

## Using Radium library to create :hover effect on style

Radium is library that allows us to create ‘:hover’ property inside json object, and to be accepted as a style element. We need it if we use inline style object. For me better way is to use classes. Also you can use Radium for media queries.

## CSS Modules

In react, as in contrary to angular, css files could be shared if you use classes with the same name. We need to change configuration of eject: “react-scripts eject”. **BOOTSTRAP won’t work if this is executed.**

Run the command: npm run eject

After operation finishes there will be additional folders in solution. Open webpack.config.dev file and finde css-loader part and change options part:

options: {

importLoaders: 1,

modules: true,

localIdentName: '[name]\_\_[local]\_\_[hash:base64:5]'

},

Then copy the importLoaders, modules and localIdentName to the options part in webpack.config.prod file.

Now every import css needs to have name like **import classes from “./App.css”.** And now all the classes inside the component needs to be called as classes.name\_of\_class

classArray.push(classes.bold);

<div className={classes.App}>

At the end, restart npm in command window, for the changes to take effect.

By the way, if you somehow also want to define a global (i.e. un-transformed) CSS class in such a .css file, you can prefix the selector with :global .

**Example:**

:global .Post { ... }

Now you can use className="Post" anywhere in your app and receive that styling.

# Debugging react apps

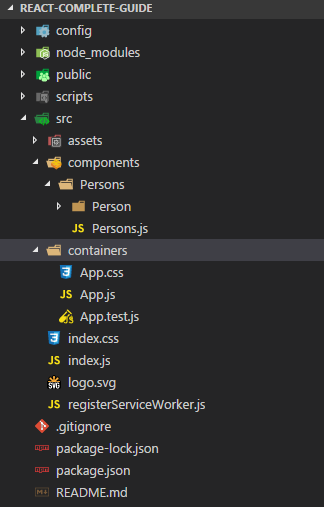
## Debugging part and insights

It is all pretty same as everywhere. Chrome debug window etc. But there is a free tool we can install, react developer tools which could help us a little. Also for production if you think the component could fall apart you could wrap it inside <ErrorBoundary></ErrorBoundary> peace of code. For how to create that look at Section 6 part 75 of the tutorial.

# Components deep dive

## Structuring components in better order

It is always much better to have structure that is easier to maintain and to search through. Creating components, containers, assets folders will help to that.



## Splitting into smaller components

In persons component we will extract generation of Pearson list. Also extract selectClasses function and some css classes like this:

import React from 'react';

import Person from './Person/Person';

import classes from './Persons.css';

const selectClasses = (person) => {

let classArray = [];

if (person.age > 33) {

classArray.push(classes.red);

}

else if (person.age < 33 && person.age > 28) {

classArray.push(classes.green);

}

else {

classArray.push(classes.bold);

classArray.push(classes.italic);

}

return classArray.join(' ');

}

const persons = (props) => {

return (

props.persons.map((person, index) => {

return <Person name={person.name} age={person.age}

click={props.deletePerson.bind(this, index)} key={person.id}

change={props.changeName.bind(this, person.id)}

classNames={selectClasses(person)} />

})

);

}

export default persons;

App.js

let persons = null;

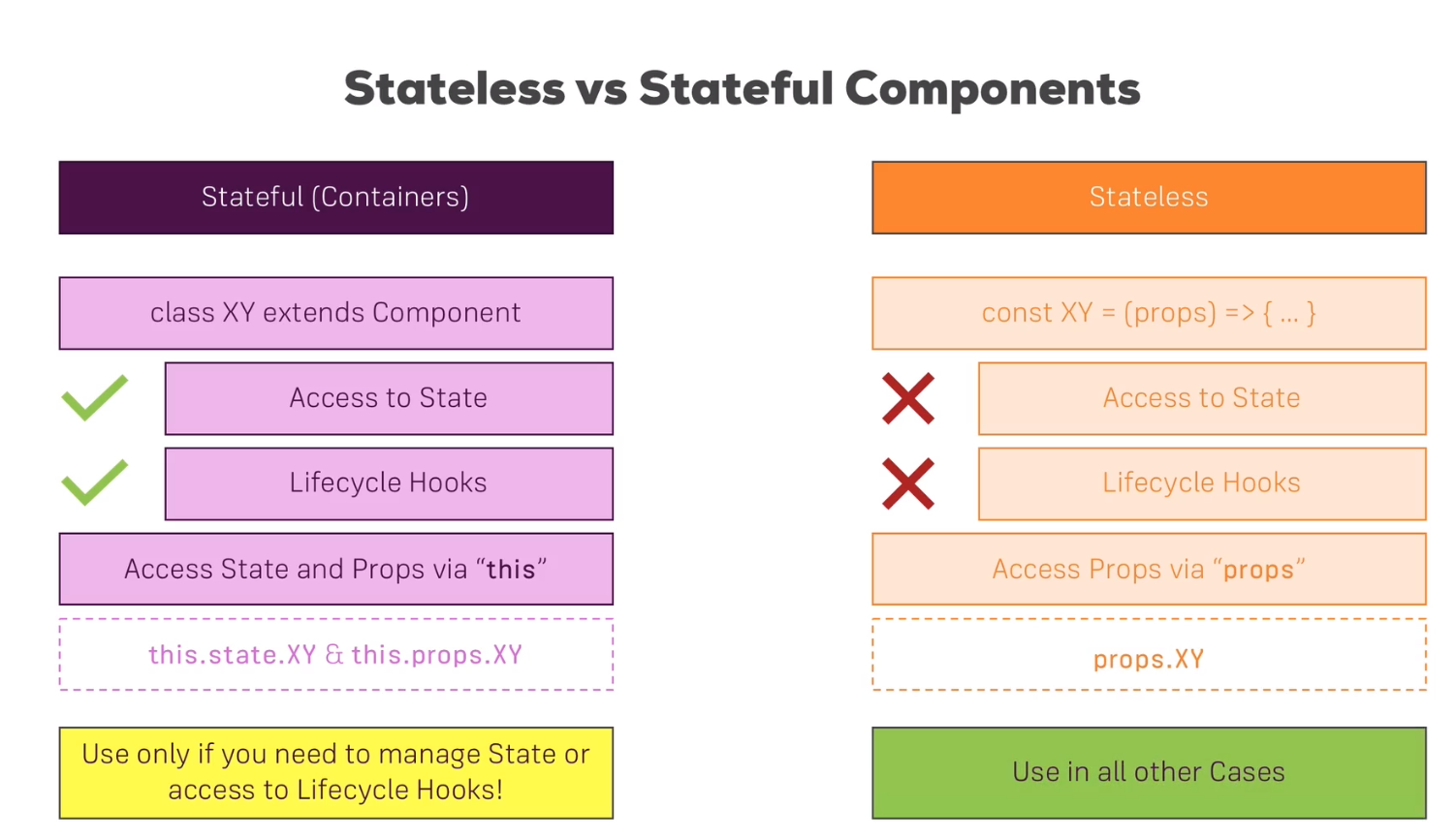
if (this.state.showPersons) {

persons = <Persons persons={this.state.persons} deletePerson={this.deletePerson}

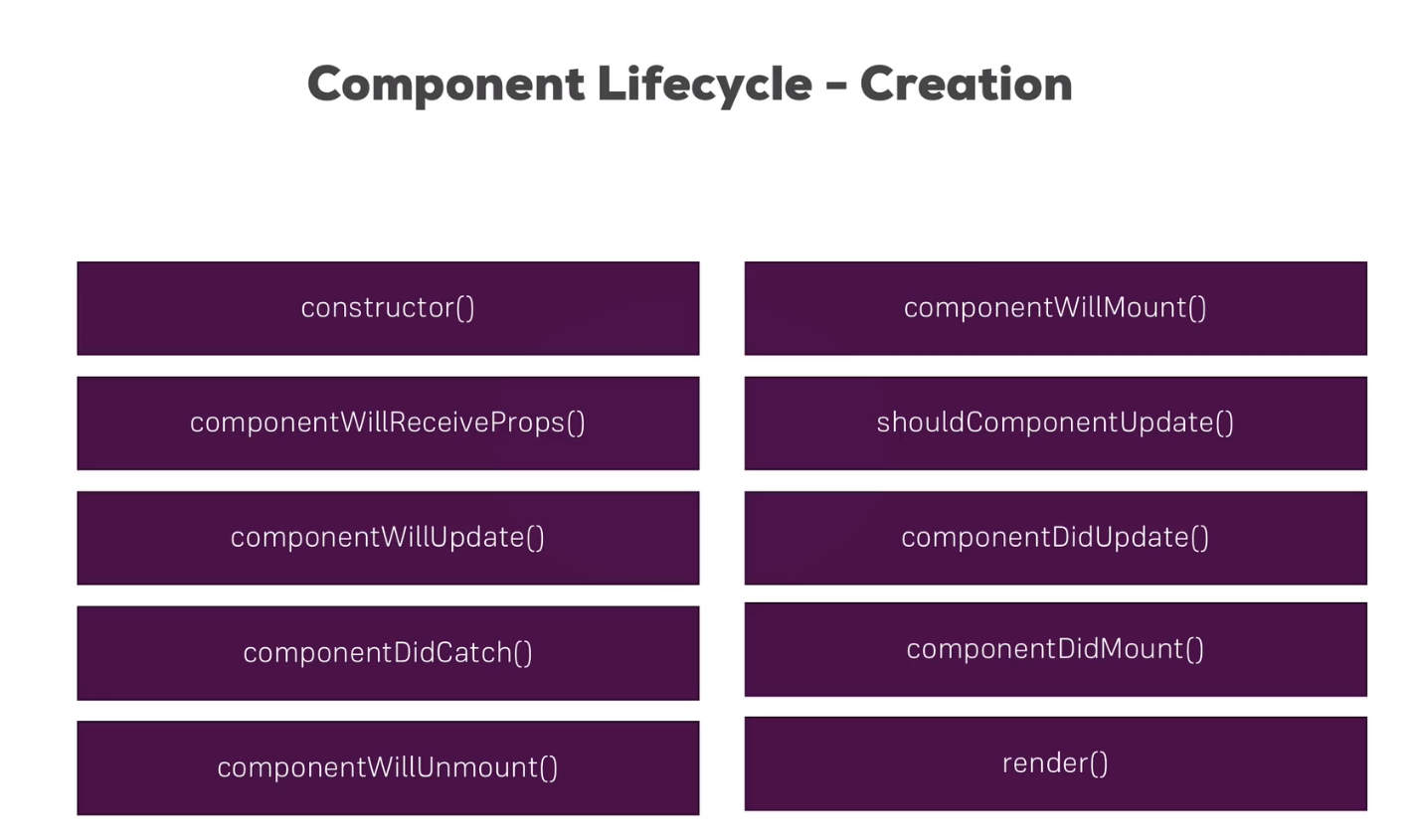
changeName={this.changeName} />

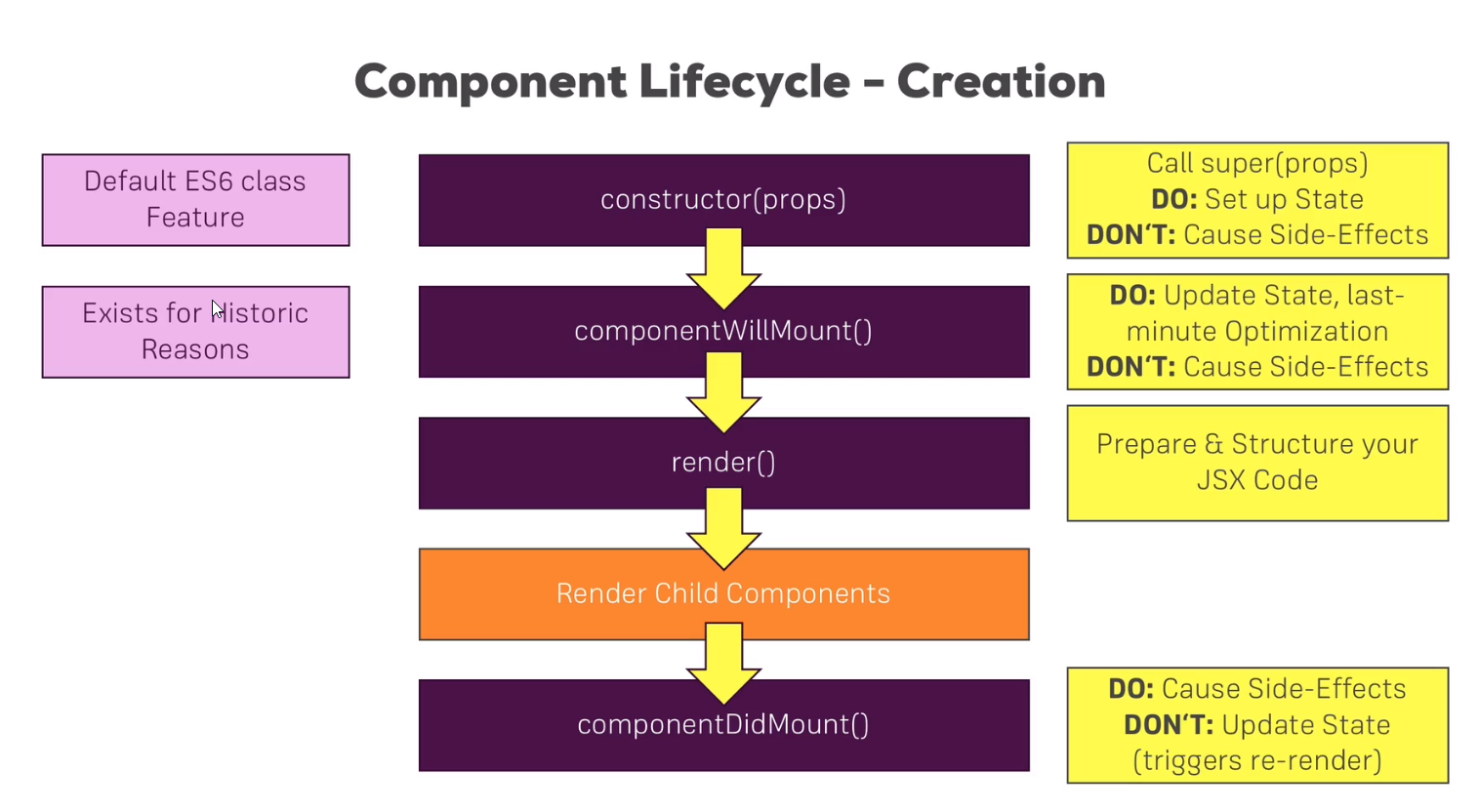
The important thing to know is that functions that changes the state needs to stay inside container, in this case in App.js. All the functions that doesn’t change the state, and are related to the imported component, should be removed from container and placed inside imported component as we did width selectClasses.

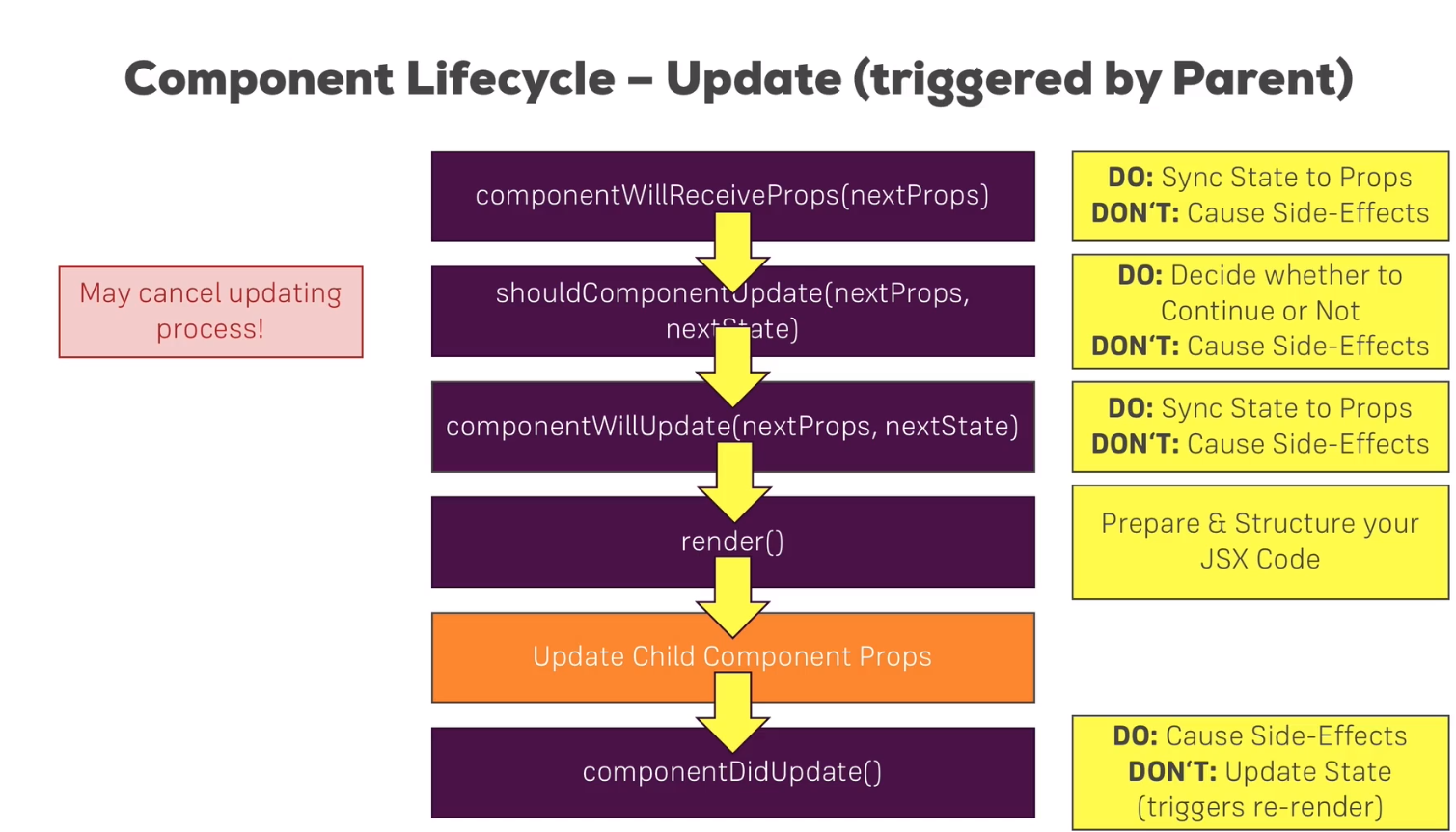
## Stateful vs Stateless components



## Lifecycle in react







## Aux implementation (Higher order component – hoc)

In the cases as in our Cockpit component, when you have only elements wrapped inside div tag, just because jsx doesn’t accept elements without root element, you can remove that div wrapper and replace it with Aux implementation. **Don’t name the file Aux.js it could lead to problem.**

Old Cockpit component:

const cockpit = (props) => {

return (

<div>

<h1>{props.title}</h1>

{/\* <button onClick={this.switchState.bind(this, "Jovan", 29)}>Switch button</button> \*/}

<button className={props.buttonClass} onClick={props.togglePerson}>Toggle persons</button>

</div>

);

}

Auxiliary.js

const auxiliary = (props) => props.children;

export default auxiliary;

New Cockpit component

import Aux from '../../hoc/Auxiliary';

const cockpit = (props) => {

return (

<Aux>

<h1>{props.title}</h1>

{/\* <button onClick={this.switchState.bind(this, "Jovan", 29)}>Switch button</button> \*/}

<button className={props.buttonClass} onClick={props.togglePerson}>Toggle persons</button>

</Aux>

);

}

This way in the DOM you won’t find another div element that can screw up your css in the app.

## SetState method properly

SetState method is always executed asynchrony therefore never use states properties inside setstate method. If you need to have some calculations you can always extract states properties with spread if they are referenced types or without if they are value types and then update them and after that update state, as we did in above examples with delete person or change name of person.

state = {

persons: [

{ id: 1, name: "Marinko", age: 35 },

{ id: 2, name: "Marina", age: 32 },

{ id: 3, name: "Goran", age: 28 }

],

other: "something other here.",

showPersons: false,

countToggle: 0

}

togglePerson = () => {

let count = this.state.countToggle;

this.setState({

showPersons: !this.state.showPersons,

countToggle: count + 1

})

}

Or you can write this kind of method if you need something like this we have done right above

togglePerson = () => {

this.setState((prevState, props) => {

return {

showPersons: !this.state.showPersons,

countToggle: prevState.countToggle + 1

}

})

}

In the prevState parameter we are saving the new state which is not pointing to old one, thus it I safe to use it in asynch method.

## Wrapping component with hoc

We can even wrap our entire component with hoc component something like this.

WithClass.js => pay attention on {…props} part. Without that we wouldn’t see our title.

import React from 'react';

const withClass = (WrappedComponent, className) => {

return(props) => (

<div className={className}>

<WrappedComponent {...props} />

</div>

)

}

export default withClass;

Then we need to import it and aux into the component we want to wrap:

import Aux from '../hoc/Auxiliary';

import WithClass from '../hoc/WithClass';

return (

<Aux>

<Cockpit buttonClass={buttonClass} togglePerson={this.togglePerson} title={this.props.title} />

{persons}

</Aux>

);

export default WithClass(App, classes.App);

# Project

## Basic setup

We have created aux component, then Layout to handle navigation menu and body for every menu, and all that imported into app.js file.

Aux.js

const aux = (props) => props.children;

export default aux;

Layout.js

import React from 'react';

import Aux from '../../hoc/Auxiliaru';

const layout = (props) => {

return (

<Aux>

<div>Toolbar, SideBar, Backdrop</div>

<main>

{props.children}

</main>

</Aux>

)

};

export default layout;

App.js

import React, { Component } from 'react';

import Layout from '../components/Layout/Layout';

class App extends Component {

render() {

return (

<div>

<Layout>

<p>Test</p>

</Layout>

</div>

);

}

}

export default App;

## BurgerBuilder container

We are adding a new container folder and inside it BurgerBuilder folder. Then we create this Stateful component

import React, { Component } from 'react';

import Aux from '../../hoc/Auxiliaru';

class BurgerBuilder extends Component {

render() {

return(

<Aux>

<div>Burger</div>

<div>Build Controls</div>

</Aux>

);

}

}

export default BurgerBuilder;

And then change app.js

<div>

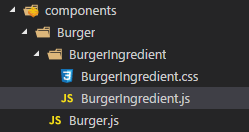
<Layout>

<BurgerBuilder />

</Layout>

</div>

Then we are continuing with the following structure:



The BurgerIngredient.js looks like this:

import React from 'react';

import classes from './BurgerIngredient.css';

const burgerIngredient = (props) => {

let ingredient = null;

switch (props.type) {

case ('bread-bottom'):

ingredient = <div className={classes.BreadBottom}></div>;

break;

case ('bread-top'):

ingredient = (

<div className={classes.BreadTop}>

<div className={classes.Seeds1}></div>

<div className={classes.Seeds2}></div>

</div>

);

break;

case ('meat'):

ingredient = <div className={classes.Meat}></div>;

break;

case ('cheese'):

ingredient = <div className={classes.Cheese}></div>;

break;

case ('bacon'):

ingredient = <div className={classes.Bacon}></div>;

break;

case ('salad'):

ingredient = <div className={classes.Salad}></div>;

break;

default: null;

return ingredient;

}

}

export default burgerIngredient;

We also have a BurgerIngredient.css file which contains all those classes.

## Prop type validation

To install: npm install –save prop-types.

For prop-types to work with our function we need to convert it to class.

import React, { Component } from 'react';

import PropTypes from 'prop-types';

import classes from './BurgerIngredient.css';

class BurgerIngredient extends Component {

render() {

let ingredient = null;

switch (props.type) {

case ('bread-bottom'):

ingredient = <div className={classes.BreadBottom}></div>;

break;

case ('bread-top'):

ingredient = (

<div className={classes.BreadTop}>

<div className={classes.Seeds1}></div>

<div className={classes.Seeds2}></div>

</div>

);

break;

case ('meat'):

ingredient = <div className={classes.Meat}></div>;

break;

case ('cheese'):

ingredient = <div className={classes.Cheese}></div>;

break;

case ('bacon'):

ingredient = <div className={classes.Bacon}></div>;

break;

case ('salad'):

ingredient = <div className={classes.Salad}></div>;

break;

default: null;

return ingredient;

}

}

}

BurgerIngredient.propTypes = {

type: PropTypess.string.isRequired

};

export default BurgerIngredient;

## Burger component

Burger.js file

import React from 'react';

import classes from './Burger.css';

import BurgerIngredient from './BurgerIngredient/BurgerIngredient';

const burger = (props) => {

return (

<div className={classes.Burger}>

<BurgerIngredient type="bread-top" />

<BurgerIngredient type="cheese" />

<BurgerIngredient type="meat" />

<BurgerIngredient type="bread-bottom" />

</div>

);

}

export default burger;

Burger.css

.Burger{

width: 100%;

margin: auto;

height: 250px;

overflow: auto;

text-align:center;

font-weight: bold;

font-size: 1.2rem;

}

@media(min-width: 1000px) and (min-height: 700px){

.Burger{

width: 700px;

height: 600px;

}

}

@media(min-width: 500px) and (min-height: 401px){

.Burger{

width: 450px;

height: 400px;

}

}

@media(min-width: 500px) and (min-height: 400px){

.Burger{

width: 350px;

height: 300px;

}

}

## Introducing state with array transformation

The state will use as for ingredients

class BurgerBuilder extends Component {

state = {

ingredients: {

salad: 1,

bacon: 1,

cheese: 2,

meat: 2

}

}

render() {

return(

<Aux>

<Burger ingredients={this.state.ingredients} />

<div>Build Controls</div>

</Aux>

);

}

}

export default BurgerBuilder;

burger.js file

const burger = (props) => {

let transformedIngredients = Object.keys(props.ingredients) //this Object.keys just extract the keys from the object to the array

.map((ingKey, index) => {

return [...Array(props.ingredients[ingKey])]

.map((\_, ind) => {

return <BurgerIngredient type={ingKey} key={ingKey + ind} />

});

});

return (

<div className={classes.Burger}>

<BurgerIngredient type="bread-top" />

{transformedIngredients}

<BurgerIngredient type="bread-bottom" />

</div>

);

}

export default burger;

## Using reduce method on array

We have changed the burger.js component like this to check if arrays has any elements at all

const burger = (props) => {

let transformedIngredients = Object.keys(props.ingredients) //this Object.keys just extract the keys from the object to the array

.map((ingKey, index) => {

return [...Array(props.ingredients[ingKey])]

.map((\_, ind) => {

return <BurgerIngredient type={ingKey} key={ingKey + ind} />

});

}).reduce((arr, el) => { //fancy way of placing values from all the arrays to one array

return arr.concat(el);

}, []);

if(!transformedIngredients.length){

transformedIngredients = <p>Please start adding ingredients</p>

}

return (

<div className={classes.Burger}>

<BurgerIngredient type="bread-top" />

{transformedIngredients}

<BurgerIngredient type="bread-bottom" />

</div>

);

}

We have changed all the values in state.ingredients object to 0.

## Creating build controls

import React from 'react';

import classes from './BuildControl.css';

const buildControl = (props) => {

return (

<div className={classes.BuildControl}>

<div className={classes.Label}>{props.label}</div>

<button className={classes.Less}>Less</button>

<button className={classes.More}>More</button>

</div>

);

}

export default buildControl;

import React from 'react';

import classes from './BuildControls.css';

import BuildControl from '../BuildControls/BuildControl/BuildControl';

const controls = [

{ label: 'Salad', type: 'salad' },

{ label: 'Bacon', type: 'bacon' },

{ label: 'Cheese', type: 'cheese' },

{ label: 'Meat', type: 'meat' }

];

const buildControls = (props) => {

return (

<div className={classes.BuildControls}>

{

controls.map( control => {

return <BuildControl key={control.label} label={control.label} />

})

}

</div>

);

}

export default buildControls;

import React, { Component } from 'react';

import Aux from '../../hoc/Auxiliaru';

import Burger from '../../components/Burger/Burger';

import BuildControls from '../../components/Burger/BuildControls/BuildControls';

class BurgerBuilder extends Component {

state = {

ingredients: {

salad: 0,

bacon: 0,

cheese: 0,

meat: 0

}

}

render() {

return(

<Aux>

<Burger ingredients={this.state.ingredients} />

<BuildControls />

</Aux>

);

}

}

export default BurgerBuilder;

## Add and remove ingredients

In BurgerBuilder.js we create one object and three methods to manipulate adding and removing of the ingredients:

ingredientPrice = {

salad: 0.4,

bacon: 0.8,

cheese: 0.6,

meat: 1.3

}

addIngredient = (type) => {

let newIngredients = { ...this.state.ingredients };

let newTotal = this.state.totalPrice;

newIngredients[type] = newIngredients[type] + 1;

newTotal = newTotal + this.ingredientPrice[type];

this.setState({ ingredients: newIngredients, totalPrice: newTotal });

}

removeIngredient = (type) => {

if (this.state.ingredients[type] > 0) {

let newIngredients = { ...this.state.ingredients };

let newTotal = this.state.totalPrice;

newIngredients[type] = newIngredients[type] - 1;

newTotal = newTotal - this.ingredientPrice[type];

this.setState({ ingredients: newIngredients, totalPrice: newTotal });

}

}

shoudDisableButton = () => {

let ingredients = {...this.state.ingredients};

for(let key in ingredients){

ingredients[key] = ingredients[key] <= 0;

}

return ingredients;

}

render() {

return (

<Aux>

<Burger ingredients={this.state.ingredients} />

<BuildControls addIngredient={this.addIngredient} removeIngredient={this.removeIngredient}

disable={this.shoudDisableButton()} />

</Aux>

);

}

Then in all other components we just subscribe to attributes inside BuildControls tag(component)

const controls = [

{ label: 'Salad', type: 'salad' },

{ label: 'Bacon', type: 'bacon' },

{ label: 'Cheese', type: 'cheese' },

{ label: 'Meat', type: 'meat' }

];

const buildControls = (props) => {

return (

<div className={classes.BuildControls}>

{

controls.map( control => {

return <BuildControl key={control.label} label={control.label}

add={props.addIngredient.bind(this, control.type)}

remove={props.removeIngredient.bind(this, control.type)}

disable={props.disable[control.type]}/>

})

}

</div>

);

}

const buildControl = (props) => {

return (

<div className={classes.BuildControl}>

<div className={classes.Label}>{props.label}</div>

<button className={classes.Less} onClick={props.remove} disabled={props.disable}>Less</button>

<button className={classes.More} onClick={props.add}>More</button>

</div>

);

}

## Showing the total price

In BurgerBuilder.js we add just additional property price

render() {

return (

<Aux>

<Burger ingredients={this.state.ingredients} />

<BuildControls addIngredient={this.addIngredient} removeIngredient={this.removeIngredient}

disable={this.shoudDisableButton()} price={this.state.totalPrice} />

</Aux>

);

And in BuildControls.js we subscribe to that attribute:

const buildControls = (props) => {

return (

<div className={classes.BuildControls}>

<p>Current price: <strong>{props.price.toFixed(2)}</strong></p>

{

controls.map( control => {

return <BuildControl key={control.label} label={control.label}

add={props.addIngredient.bind(this, control.type)}

remove={props.removeIngredient.bind(this, control.type)}

disable={props.disable[control.type]}/>

})

}

</div>

);

}

## Purchasable button and logic for disabling it

BurgerBuilder.js

updatePurchaseState = (ingredients) => {

let sum = 0;

Object.keys(ingredients).map((ingKey) => {

return sum = sum + ingredients[ingKey];

})

this.setState({purchasable: sum > 0})

}

This method decides should the purchase button be enabled or disabled. We are calling this method after each call of add or remove ingredient method. Also we have added a new property to state, purchasable.

<Aux>

<Burger ingredients={this.state.ingredients} />

<BuildControls addIngredient={this.addIngredient} removeIngredient={this.removeIngredient}

disable={this.shoudDisableButton()} price={this.state.totalPrice}

purchasable={this.state.purchasable} />

</Aux>

BuilderControls.js

const buildControls = (props) => {

return (

<div className={classes.BuildControls}>

<p>Current price: <strong>{props.price.toFixed(2)}</strong></p>

{

controls.map( control => {

return <BuildControl key={control.label} label={control.label}

add={props.addIngredient.bind(this, control.type)}

remove={props.removeIngredient.bind(this, control.type)}

disable={props.disable[control.type]}/>

})

}

<button disabled={!props.purchasable} className={classes.OrderButton}>ORDER NOW</button>

</div>

);

## Adding modal window

Modal.js file

import React from 'react';

import classes from './Modal.css';

const modal = (props) => {

return (

<div className={classes.Modal}>

{props.children}

</div>

);

}

export default modal;

OrderSummary.js

import React from 'react';

import classes from './OrderSummary.css';

import Aux from '../../../hoc/Auxiliaru';

const orderSummary = (props) => {

let ingSummary = Object.keys(props.ingredients)

.map(igKey => {

return <li key={igKey}>

<span className={classes.AllCaps}>{igKey}</span>: {props.ingredients[igKey]}

</li>

})

return (

<Aux>

<h3>Your order:</h3>

<p>A delicious burger with following ingredients:</p>

<ul>

{ingSummary}

</ul>

<p>Continue to checkout?</p>

</Aux>

);

}

export default orderSummary;

BurgerBuilder.js

render() {

return (

<Aux>

<Modal><OrderSummary ingredients={this.state.ingredients} /></Modal>

<Burger ingredients={this.state.ingredients} />

<BuildControls addIngredient={this.addIngredient}

removeIngredient={this.removeIngredient}

disable={this.shoudDisableButton()} price={this.state.totalPrice}

purchasable={this.state.purchasable} />

</Aux>

);

}

## Showing Modal window

class BurgerBuilder extends Component {

state = {

ingredients: {

salad: 0,

bacon: 0,

cheese: 0,

meat: 0

},

totalPrice: 4,

purchasable: false,

purchasing: false

}

…

purchaseHandler = () => {

this.setState({ purchasing: true });

}

render() {

return (

<Aux>

<Modal show={this.state.purchasing}>

<OrderSummary ingredients={this.state.ingredients} />

</Modal>

<Burger ingredients={this.state.ingredients} />

<BuildControls

addIngredient={this.addIngredient}

removeIngredient={this.removeIngredient}

disable={this.shoudDisableButton()} price={this.state.totalPrice}

purchasable={this.state.purchasable} ordered={this.purchaseHandler} />

</Aux>

);

}

BuildControls.js

<button disabled={!props.purchasable} className={classes.OrderButton}

onClick={props.ordered}>ORDER NOW</button>

Modal.js

import React from 'react';

import classes from './Modal.css';

const renderClasses = (show) => {

let classesArray = [];

if(show){

classesArray.push(classes.Modal, classes.ShowModal);

}

else{

classesArray.push(classes.Modal, classes.HideModal);

}

return classesArray.join(' ');

}

const modal = (props) => {

let modalClasses = renderClasses(props.show);

return (

<div className={modalClasses}>

{props.children}

</div>

);

}

export default modal;

## Backdrop component

With backdrop component we will create the cover screen all over the screen and behind the modal. And also we will enable click on that backdrop to close the modal.

Backdrop.js

import React from 'react';

import classes from './Backdrop.css';

const backdrop = (props) => {

return (

props.show ? <div className={classes.Backdrop} onClick={props.closeOrder}></div> : null

);

}

export default backdrop;

Modal.js

const modal = (props) => {

let modalClasses = renderClasses(props.show);

return (

<Aux>

<BackDrop show={props.show} closeOrder={props.closeOrder}/>

<div className={modalClasses}>

{props.children}

</div>

</Aux>

);

}

BurgerBuilder.js

purchaseCancel = () => {

this.setState({ purchasing: false });

}

render() {

return (

<Aux>

<Modal show={this.state.purchasing} closeOrder={this.purchaseCancel} >

<OrderSummary ingredients={this.state.ingredients} />

</Modal>

<Burger ingredients={this.state.ingredients} />

<BuildControls

addIngredient={this.addIngredient}

removeIngredient={this.removeIngredient}

disable={this.shoudDisableButton()} price={this.state.totalPrice}

purchasable={this.state.purchasable} ordered={this.purchaseHandler} />

</Aux>

);

}

## Creating buttons for the modal (Order summary)

Created new Button component to wrap around regular button

import React from 'react';

import classes from './Button.css';

const button = (props) => {

return (

<button className={[classes.Button, classes[props.buttonType]].join(' ')}

onClick={props.clicked}>{props.children}</button>

);

}

export default button;

In Aux tag of order summary we add two buttons and total price

<p><strong>Total price: {props.totalPrice.toFixed(2)}</strong></p>

<p>Continue to checkout?</p>

<Button buttonType={'Danger'} clicked={props.closeOrder}>CANCEL</Button>

<Button buttonType={'Success'} clicked={props.continueOrder}>SUCCESS</Button>

In BurgerBuilder.js we just add another function and pass those handlers

purchaseContinue = () => {

alert('You have continued!!!');

}

render() {

return (

<Aux>

<Modal show={this.state.purchasing} closeOrder={this.purchaseCancel} >

<OrderSummary ingredients={this.state.ingredients}

closeOrder={this.purchaseCancel} continueOrder={this.purchaseContinue}

totalPrice={this.state.totalPrice}/>

</Modal>

## Toolbar

In the components folder we create Navigation and inside that Toolbar folder

import React from 'react';

import classes from './Toolbar.css';

const toolbar = (props) => {

return(

<header className={classes.Toolbar}>

<div>MENU</div>

<div>LOGO</div>

<nav>

...

</nav>

</header>

);

}

export default toolbar;

In the Layout file we make this change

const layout = (props) => {

return (

<Aux>

<Toolbar />

<main className={classes.content}>

{props.children}

</main>

</Aux>

)

};

Layout.css

.content{

margin-top: 72px;

}

## Adding the LOGO

In the components folder we create the Logo folder

import React from 'react';

import classes from './Logo.css';

import burgerLogo from '../../assets/images/burger-logo.png';

const logo = (props) => {

return(

<div className={classes.Logo}>

<img src={burgerLogo} alt='burger logo'/>

</div>

);

}

export default logo;

This is the way to use img src tag. We need to import it dynamically.

Toolbar.js

const toolbar = (props) => {

return(

<header className={classes.Toolbar}>

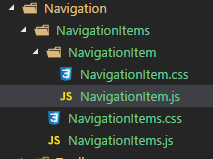
<div>MENU</div>

<Logo/>

<nav>

## Navigation menu

Structure is as follows:



The code in the navigation item is as follows:

import React from 'react';

import classes from './NavigationItem.css';

const navigationItem = (props) => (

<li className={classes.NavigationItem}>

<a href={props.link}

className={props.active ? classes.active : null}>

{props.children}</a>

</li>

);

export default navigationItem;

Code in the NavigationItems.js is:

import React from 'react';

import NavigationItem from './NavigationItem/NavigationItem';

import classes from './NavigationItems.css';

const navigationItems = () => (

<ul className={classes.NavigationItems}>

<NavigationItem active link="/">Burger Builder</NavigationItem>

<NavigationItem link="/">Checkout</NavigationItem>

</ul>

);

export default navigationItems;

## Creating SideDrawer

import React from 'react';

import Logo from '../../Logo/Logo';

import NavigationItems from '../NavigationItems/NavigationItems';

import classes from './SideDrawer.css';

const sideDrawer = (props) => {

return(

<div className={classes.SideDrawer}>

<div style={{height: 11 + '%'}}>

<Logo />

</div>

<nav>

<NavigationItems />

</nav>

</div>

);

}

export default sideDrawer;

Layout.js

const layout = (props) => {

return (

<Aux>

<Toolbar />

<SideDrawer />

<main className={classes.content}>

{props.children}

</main>

</Aux>

)

};

export default layout;

Toolbar.js

const toolbar = (props) => {

return(

<header className={classes.Toolbar}>

<div>MENU</div>

<div style={{height: 80 + '%'}}>

<Logo />

</div>

<nav>

<NavigationItems />

</nav>

</header>

);

}

export default toolbar;

The rest is the styling and adding and removing sidebar… Also inside the Model component, we make change where we turn it into class component and use shouldUpdate function to check should order summary be updated every time.

## Controlling should component update

class Modal extends Component {

renderClasses = (show) => {

let classesArray = [];

if (show) {

classesArray.push(classes.Modal, classes.ShowModal);

}

else {

classesArray.push(classes.Modal, classes.HideModal);

}

return classesArray.join(' ');

}

shouldComponentUpdate(nextProps, nextState) {

return nextProps.show !== this.props.show;

}

componentWillUpdate(){

console.log('Modal will update');

}

render() {

let modalClasses = this.renderClasses(this.props.show);

return (

<Aux>

<BackDrop show={this.props.show} closeOrder={this.props.closeOrder} />

<div className={modalClasses}>

{this.props.children}

</div>

</Aux>

);

}

}

export default Modal;

We are not using PureComponent because it would make much more checks.

# HTTP

## Axios Installation

Axios needs to be installed to send ajax requests. This is java script third party library.

We can use it like this:

componentDidMount() {

axios.get('https://jsonplaceholder.typicode.com/posts')

.then(response => {

console.log(response);

});

}

## Using get request to fill the posts on the page for the first time

class Blog extends Component {

state = {

posts: []

}

componentDidMount() {

axios.get('https://jsonplaceholder.typicode.com/posts')

.then(response => {

let posts = response.data.slice(0, 4);

let updatePosts = posts.map(post => {

return {

...post,

author: 'Max'

}

});

this.setState({posts: updatePosts});

});

}

render () {

const posts = this.state.posts.map(post => {

return <Post title={post.title} key={post.id} author={post.author} />

});

return (

<div>

<section className="Posts">

{posts}

</section>

<section>

<FullPost />

</section>

<section>

<NewPost />

</section>

</div>

);

}

}

export default Blog;

Post.js

const post = (props) => (

<article className="Post">

<h1>{props.title}</h1>

<div className="Info">

<div className="Author">{props.author} </div>

</div>

</article>

);

## Get request during update of component

import React, { Component } from 'react';

import axios from 'axios';

import './FullPost.css';

class FullPost extends Component {

componentDidUpdate(){

if(this.props.id){

axios.get('https://jsonplaceholder.typicode.com/posts/' + this.props.id)

.then(response => {

console.log(response);

})

} … … … …

We need to be careful for the infinite loop. Because we update the Id and componentDidUpdate executes. But inside we update the state, and that will start this function again, and so on in the circle.

This is the right way:

class FullPost extends Component {

state = {

loadedPost: {}

}

componentDidUpdate() {

if (this.props.id) {

if (!this.state.loadedPost || (this.state.loadedPost && this.state.loadedPost.id !== this.props.id)) {

axios.get('https://jsonplaceholder.typicode.com/posts/' + this.props.id)

.then(response => {

this.setState({ loadedPost: response.data });

})

}

}

}

render() {

let post = <p style={{ textAlign: 'center' }}>Please select a Post!</p>;

if (this.props.id) {

post = (

<div className="FullPost">

<h1>{this.state.loadedPost.title}</h1>

<p>{this.state.loadedPost.body}</p>

<div className="Edit">

<button className="Delete">Delete</button>

</div>

</div>

);

}

return post;

}

}

export default FullPost;

## Post request

NewPost.js

createNewPost = () => {

let objToSend = {

title: this.state.title,

body: this.state.content,

author: this.state.author

};

axios.post('https://jsonplaceholder.typicode.com/posts', objToSend)

.then(response => {

console.log(response);

});

}

<button onClick={this.createNewPost}>Add Post</button>

## Delete request

deleteHandler = () => {

axios.delete('https://jsonplaceholder.typicode.com/posts/' + this.props.id)

.then(response => {

console.log(response);

})

}

## Handling errors

On every then we can chain this

.catch(error => {

console.log(error);

});;

To catch the error which could happened inside our request.

## Interceptors

In Index.js file we can globally set the interceptors for http requests. We can do that for requests and responses:

axios.interceptors.request.use(request => {

console.log(request);

return request;

}, error => {

console.log(error);

return Promise.reject(error);

});

axios.interceptors.response.use(response => {

console.log(response);

return response;

}, error => {

console.log(error);

return Promise.reject(error);

})

You learned how to add an interceptor, getting rid of one is also easy. Simply store the reference to the interceptor in a variable and call eject  with that reference as an argument, to remove it (more info: <https://github.com/axios/axios#interceptors>):

1. var myInterceptor = axios.interceptors.request.use(function () {/\*...\*/});
2. axios.interceptors.request.eject(myInterceptor);

## Global configuration and headers

Inside index.js we can set globally configuration:

axios.defaults.baseURL = 'https://jsonplaceholder.typicode.com';

axios.defaults.headers.common['Authorization'] = 'AUTH TOKEN';

axios.defaults.headers.post['Content-Type'] = 'application/json';

Now we have a headers set or we have base url and then just we can add /post or something like that.

This is the way to create instance of axios to use it:

import axios from 'axios';

const instance = axios.create({

baseURL: 'https://react-burger-4e498.firebaseio.com/',

headers: {

auth: 'authorization token'

}

});

export default instance;

# Routing

## Setting up the links

This is the code from the Blog.js file

return (

<div className="Blog">

<header>

<nav>

<ul>

<li><a href="/">Home</a></li>

<li><a href="/new-post">New Post</a></li>

</ul>

</nav>

</header>

<section className="Posts">

{posts}

</section>

<section>

<FullPost id={this.state.selectedPostId} />

</section>

<section>

<NewPost />

</section>

</div>

);

We just set up the links with the base classes inside Blog.css file.

## Introducing router in react

**npm install --save react-router-dom** is command to install both packages

Then we need to wrap the app.js return method inside BrowserRouter tag

import React, { Component } from 'react';

import Blog from './containers/Blog/Blog';

import { BrowserRouter } from 'react-router-dom';

class App extends Component {

render() {

return (

<BrowserRouter>

<div className="App">

<Blog />

</div>

</BrowserRouter>

);

}

}

export default App;

Then in the Blog.js where we want our paths to be generated with content we will use this code:

import React, { Component } from 'react';

import Posts from '../Blog/Posts/Posts';

import './Blog.css';

import { Route } from 'react-router-dom';

class Blog extends Component {

render() {

return (

<div className="Blog">

<header>

<nav>

<ul>

<li><a href="/">Home</a></li>

<li><a href="/new-post">New Post</a></li>

</ul>

</nav>

</header>

<Route path="/" exact render={() => <Posts/>}/>

</div>

);

}

}

export default Blog;

When we use exact in <Route /> it means that path must have exact match to render the page. Without the exact attribute it would render any page that starts with “/”.

This is another way of loading component in Route.

<Route path="/" exact component={Posts}/>

<Route path="/new-post" exact component={NewPost}/>

## Rerendering the page not loading it again

By using Link instead of a tag we are rerendering parts of the page.

import React, { Component } from 'react';

import Posts from '../Blog/Posts/Posts';

import NewPost from './NewPost/NewPost';

import './Blog.css';

import { Route, Link } from 'react-router-dom';

class Blog extends Component {

render() {

return (

<div className="Blog">

<header>

<nav>

<ul>

<li><Link to="/">Home</Link></li>

<li><Link to="/new-post">New Post</Link></li>

</ul>

</nav>

</header>

<Route path="/" exact component={Posts}/>

<Route path="/new-post" exact component={NewPost}/>

</div>

);

}

}

export default Blog;

## Props in component generated by the Route

In all components that are generated through the Route, we can use props which has some additional content because of the Route component. Those additional content are history, location, match, which will allow us to use advanced possibilities of routing.

But in component that are nested inside the container served by the Route, we cant find those additional content. If we want to have those in there too we need to use **hoc** component “withRouter” and to wrap the nested component with it.

import React from 'react';

import './Post.css';

import { withRouter } from 'react-router-dom';

const post = (props) => {

console.log(props);

return (

< article className = "Post" onClick = { props.clicked } >

<h1>{props.title}</h1>

<div className="Info">

<div className="Author">{props.author}</div>

</div>

</article >

)

};

export default withRouter(post);

## Styling the active link

We are not using the Link anymore but NavLink, it will automatically add the .active class to active element link. Of course we need to create that class. Also we need to use exact on NavLink.

import React from 'react'

import { NavLink } from 'react-router-dom';

const navigation = (props) => {

return (

<nav>

<ul>

<li><NavLink exact to="/">Home</NavLink></li>

<li><NavLink exact to="/new-post">New Post</NavLink></li>

</ul>

</nav>

)

}

export default navigation;

## Routing parameters

class Blog extends Component {

render() {

return (

<div className="Blog">

<header>

<Navigation />

</header>

<Route path="/" exact component={Posts}/>

<Route path="/new-post" exact component={NewPost}/>

<Route path="/:id" exact component={FullPosts} />

</div>

);

}

}

Posts.js. And this is not programmatically navigation.

posts = this.state.posts.map(post => {

return (

<NavLink to={'/' + post.id} key={post.id}>

<Post title={post.title} author={post.author} clicked={this.postSelected.bind(this, post.id)} />

</NavLink>

)

});

And then in the FullPost.js file, where we want to get the post with id from the rout we need to write this peace of code:

this.props.match.params.id

with this line, we can access our id from the route, so the complete code needs to be changed.

For programmatically navigation we should do this thing:

postSelected = (id) => {

this.props.history.push('/full-post/' + id)

}

**Route could be used anywhere in the application. But in nested Route we need to create path attribute <Route path={this.props.match.url + ‘/:id’} exact component=”FullPost” />**

## Redirect user

If we want to redirect user from one url to another we can use something like this

render() {

return (

<div className="Blog">

<header>

<Navigation />

</header>

<Switch>

<Route path="/" exact component={Posts} />

<Route path="/new-post" exact component={NewPost} />

<Route path="/full-post/:id" exact component={FullPosts} />

<Redirect from="/" to="/home"/>

</Switch>

</div>

);

}

}

We need to use from only when inside the Switch statement. Outside of it is used without from.

With import of Redirect:

import { Route, Switch, Redirect } from 'react-router-dom';

## Guards

There are different then in angular. In here it is just conditional rendering. So , we can create object in state like auth: false. And then we can render the page conditionaly, “if this.state.auth”. If this is true we would render the page, otherwise we would return a null.

## 404

<Route path="\*" render={() => <h1>Not Found</h1>} />

We can do something like this, but Redirect part must be removed, it cannot be both of them inside switch component. We could also use component instead of render.

## Lazy content loading

First we need to create the async hoc component

import React, {Component} from 'react';

const asyncComponent = (importComponent) => {

return class extends Component{

state = {

component: null

}

componentDidMount(){

importComponent()

.then(cmp => {

this.setState({component: cmp.default});

});

}

render(){

const C = this.state.component;

return C ? <C {...this.props} /> : null;

}

}

}

export default asyncComponent;

And then in the component where we create routes, the component(NewPost) we want to load in async manner will be imported in a different way:

import React, { Component } from 'react';

import Posts from '../Blog/Posts/Posts';

//import NewPost from './NewPost/NewPost';

import './Blog.css';

import { Route, Switch} from 'react-router-dom';

import Navigation from '../../components/Navigation/Navigation';

import FullPosts from '../Blog/FullPost/FullPost';

import asyncComponent from '../../hoc/asyncComponent';

const AsyncNewPost = asyncComponent(() => {

return import('./NewPost/NewPost');

});

class Blog extends Component {

render() {

return (

<div className="Blog">

<header>

<Navigation />

</header>

<Switch>

<Route path="/" exact component={Posts} />

<Route path="/new-post" exact component={AsyncNewPost} />

<Route path="/full-post/:id" exact component={FullPosts} />

{/\* <Redirect to="/404"/> \*/}

<Route path="\*" render={() => <h1>Not Found</h1>} />

</Switch>

</div>

);

}

}

export default Blog;

## Sending query parameters to the certain route

First we need to send the object not just the address:

const queryParams = [];

for(let i in this.state.ingredients){

queryParams.push(encodeURIComponent(i) + '=' + encodeURIComponent(this.state.ingredients[i]));

}

const queryString = queryParams.join('&');

this.props.history.push({

pathname: '/checkout',

search: '?' + queryString

});

Now when we have a path to go to and the object as query string, we need to extract it in other page:

componentDidMount(){

const query = new URLSearchParams(this.props.location.search);

const ingredients = {};

for(let param of query.entries()){

ingredients[param[0]] = +param[1];

}

this.setState({ingredients: ingredients}); }

Never use exact in Route if you plan to nest the route in component which is always rendered by routing

If you want with Rout to send the properties to another component you are routing to, don’t use component property but render:

<Route path={this.props.match.path + '/contact-data'}

render={() => (<ContactData ingredients={this.setState.ingredients}/>)} />

Now because we used this render for redirecting we are not going to have props.history or any related props inside ContactData. To enable that, we need to do other thing:

<Route path={this.props.match.path + '/contact-data'}

render={(props) => (<ContactData ingredients={this.state.ingredients} totalPrice={this.state.totalPrice} {...props}/>)} />

# Form validation

We are going to create for every input inside contact-data component as a self-component like this:

import react from 'React';

const input = (props) => {

let inputElement = null;

switch (prop.inputtype) {

case ('input'):

inputElement = <input {...props} />;

break;

case ('textarea'):

inputElement = <textarea {...props}/>;

break;

default:

inputElement = <input {...props}/>

}

return (

<div>

<label>{props.label}</label>

{inputElement}

</div>

)

}

export default input;

With the …props I am distributing the properties inside the input or textarea. It is expected to be valid properties.

In ContactData the change is as follows:

import React, { Component } from 'react';

import Button from '../../../components/UI/Button/Button';

import axios from '../../../Axios/axios';

import classes from './ContactData.css';

import Input from '../../../components/UI/Input/Input';

class ContactData extends Component {

state = {

orderForm: {

name: {

elementType: 'input', elementConfig: { type: 'text', placeholder: 'Your Name' }, value: '', validation: { required: true },

valid: false, touched: false

},

email: {

elementType: 'input', elementConfig: { type: 'email', placeholder: 'Your Email' }, value: '', validation: { required: true },

valid: false, touched: false

},

street: {

elementType: 'input', elementConfig: { type: 'text', placeholder: 'Your Street' }, value: '', validation: { required: true },

valid: false, touched: false

},

country: {

elementType: 'input', elementConfig: { type: 'text', placeholder: 'Your Country' }, value: '', valid: true

},

postalCode: {

elementType: 'input', elementConfig: { type: 'text', placeholder: 'Zip Code' }, value: '',

validation: { required: true, minLength: 5, maxLength: 5 }, valid: false, touched: false

},

deliveryMethod: {

elementType: 'select', elementConfig: {

options: [{ value: 'fastest', displayValue: 'Fastest' }, { value: 'cheapest', displayValue: 'Cheapest' }]

},

value: '', validation: { required: true }, valid: false, touched: false

}

},

isFormValid: false

}

checkValidity = (value, validation) => {

let isValid = false;

if (validation){

if (validation.required) {

isValid = value.trim() !== '';

}

if (validation.minLength) {

isValid = value.length >= validation.minLength;

}

if (isValid && validation.maxLength) {

isValid = value.length <= validation.maxLength;

}

return isValid;

}

return true;

}

orderHandler = (event) => {

event.preventDefault();

const formData = {}

Object.keys(this.state.orderForm).map(element => {

return formData[element] = this.state.orderForm[element].value;

});

let order = {

orderData: formData,

ingredients: this.props.ingredients,

totalPrice: this.props.totalPrice.toFixed(2)

}

axios.post('/orders.json', order)

.then(response => {

console.log(response);

this.props.history.push('/');

})

}

convertStateToArrayOfFormObjects = () => {

const formElementsArray = [];

for (let key in this.state.orderForm) {

formElementsArray.push({

id: key,

config: this.state.orderForm[key]

});

}

return formElementsArray;

}

inputChangedHandler = (event, identifyer) => {

const updatedOrderForm = { ...this.state.orderForm };

const updatedFormElement = { ...updatedOrderForm[identifyer] };

updatedFormElement.value = event.target.value;

updatedFormElement.valid = this.checkValidity(updatedFormElement.value, updatedFormElement.validation)

updatedFormElement.touched = true;

updatedOrderForm[identifyer] = updatedFormElement;

let countInvalidElements = 0;

for(let element in updatedOrderForm){

if(!updatedOrderForm[element].valid){

countInvalidElements = countInvalidElements + 1;

break;

}

}

this.setState({ orderForm: updatedOrderForm, isFormValid: countInvalidElements === 0 });

}

render() {

const formElementsArray = this.convertStateToArrayOfFormObjects();

return (

<div className={classes.ContactData}>

<h4>Enter your Contact Data</h4>

<form onSubmit={this.orderHandler}>

{

formElementsArray.map(element => {

return <Input key={element.id}

elementType={element.config.elementType}

elementConfig={element.config.elementConfig}

value={element.config.value}

changed={(event) => this.inputChangedHandler(event, element.id)}

invalid={!element.config.valid}

shouldValidate={element.config.validation}

touched={element.config.touched}

valueType={element.id} />

})

}

<Button buttonType="Success" disabled={!this.state.isFormValid}>ORDER</Button>

</form>

</div>

);

}

}

export default ContactData;

And Input.js:

import React from 'react';

import classes from './Input.css';

const input = (props) => {

let inputElement = null;

const inputClasses = [classes.InputElement];

let errorMessage = null;

if(props.invalid && props.shouldValidate && props.touched){

inputClasses.push(classes.Invalid);

errorMessage = (<em>Please enter a valid {props.valueType} value!!!</em>);

}

switch (props.elementType) {

case ('input'):

inputElement = <input className={inputClasses.join(' ')} {...props.elementConfig} value={props.value} onChange={props.changed}/>;

break;

case ('textarea'):

inputElement = <textarea className={inputClasses.join(' ')} {...props.elementConfig} value={props.value} onChange={props.changed}/>;

break;

case ('select'):

inputElement = (

<select className={inputClasses.join(' ')} {...props.elementConfig} value={props.value} onChange={props.changed}>

<option value="">Choose an export type</option>

{

props.elementConfig.options.map(opt => {

return <option key={opt.value} value={opt.value}>{opt.displayValue}</option>

})

}

</select>

);

break;

default:

inputElement = <input className={inputClasses.join(' ')} value={props.value}/>

}

return (

<div className={classes.Input}>

<label className={classes.Label}>{props.label}</label>

{inputElement}

{errorMessage}

</div>

)

}

export default input;

# Redux

## Installation

For installation use this command: **npm install --save redux**

Basic example of redux:

const redux = require('redux');

const createStore = redux.createStore;

const initialState = {

counter: 0

}

//Reducer

const rootReducer = (state = initialState, action) => {

if(action.type === 'INC\_COUNTER'){

return {

...state,

counter: state.counter + 1

}

}

if(action.type === 'ADD\_COUNTER'){

return {

...state,

counter: state.counter + action.value

}

}

return state;

};

//Store

const store = createStore(rootReducer);

console.log(store.getState());

//Subscription

store.subscribe(() => {

console.log('[Subscription]', store.getState());

});

//Dispatching Action

store.dispatch({type: 'INC\_COUNTER'});

store.dispatch({type: 'ADD\_COUNTER', value: 10});

console.log(store.getState());

## Using Redux in application

import {createStore} from 'redux';

const store = createStore();

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

registerServiceWorker();

Reducers always has to be inside it’s own files, so in folder store create reducer.js

const initialState = {

counter: 0

}

const reducer = (state = initialState, action) => {

return state;

}

export default reducer;

And then just import that reducer in app.js

import reducer from './store/reducer';

const store = createStore(reducer);

## Connection redux to react

**npm install --save react-redux**

This package is mandatory to connect redux to react, because react is standalone.

Now we need to import the Provider and to wrap our App in it:

import { Provider } from 'react-redux';

const store = createStore(reducer);

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

This Provider has its prop “store” to which we assign the created store from redux.

Now we have to connect our components to the reducer function.

In Counter.js we first import **connect**:

import { connect } from 'react-redux';

Then we are mapping the state from the reducer to the props of the Counter.js file beneath the class:

const mapStateToProps = (state) => {

return {

ctr: state.counter

};

}

This **state** parameter is not the state from the Counter.js file but the state from the reducer.js file. And now the counter prop from the state inside reducer.js is mapped to the **ctr** property.

For this to take effect we need to call the **connect** function that accepts this mapStateToProps function as parameter:

export default connect(mapStateToProps)(Counter);

And now finally we can call that **ctr** property with this.props.ctr:

<CounterOutput value={this.props.ctr} />

## Connecting an actions

Right now we have only state connected, and in the app we can see only the value of 0. But if we want to dispatch the actions also, we need to do something like this:

Add new settings for dispatch:

const mapDispatchToProps = (dispatch) => {

return {

onIncrementCounter: () => dispatch({type: 'INCREMENT'})

};

};

Then connect it:

export default connect(mapStateToProps, mapDispatchToProps)(Counter);

then call it :

<CounterControl label="Increment" clicked={ this.props.onIncrementCounter } />

And in the reducer.js modify it:

const initialState = {

counter: 0

}

const reducer = (state = initialState, action) => {

if(action.type === 'INCREMENT'){

return {

counter: state.counter + 1

}

}

return state;

}

export default reducer;

When all is finished Counter.js looks like this:

import React, { Component } from 'react';

import { connect } from 'react-redux';

import CounterControl from '../../components/CounterControl/CounterControl';

import CounterOutput from '../../components/CounterOutput/CounterOutput';

class Counter extends Component {

render() {

return (

<div>

<CounterOutput value={this.props.ctr} />

<CounterControl label="Increment" clicked={ this.props.onIncrementCounter } />

<CounterControl label="Decrement" clicked={ this.props.onDecrementCounter } />

<CounterControl label="Add 5" clicked={ this.props.onAdditionCounter } />

<CounterControl label="Subtract 5" clicked={ this.props.onSubtractCounter } />

</div>

);

}

}

const mapStateToProps = (state) => {

return {

ctr: state.counter

};

};

const mapDispatchToProps = (dispatch) => {

return {

onIncrementCounter: () => dispatch({ type: 'INCREMENT' }),

onDecrementCounter: () => dispatch({ type: 'DECREMENT' }),

onAdditionCounter: () => dispatch({ type: 'ADD', value: 5}),

onSubtractCounter: () => dispatch({ type: 'SUBTRACT', value: 5 })

};

};

export default connect(mapStateToProps, mapDispatchToProps)(Counter);

and reducers.js like this:

const initialState = {

counter: 0

}

const reducer = (state = initialState, action) => {

switch (action.type) {

case 'INCREMENT':

return {

counter: state.counter + 1

}

case 'DECREMENT':

return {

counter: state.counter - 1

}

case 'ADD':

return {

counter: state.counter + action.value

}

case 'SUBTRACT':

return {

counter: state.counter - action.value

}

default:

return state;

}

}

export default reducer;

## Updating reducer’s state immutable

Look at this example to see how to update state immutable:

const initialState = {

counter: 0,

results: []

}

const reducer = (state = initialState, action) => {

switch (action.type) {

case 'INCREMENT':

return {

...state,

counter: state.counter + 1,

}

case 'DECREMENT':

return {

...state,

counter: state.counter - 1

}

case 'ADD':

return {

...state,

counter: state.counter + action.value

}

case 'SUBTRACT':

return {

...state,

counter: state.counter - action.value

}

case 'STORE\_RESULT':

return {

...state,

results: state.results.concat({value: state.counter, id: new Date()})

}

default:

return state;

}

}

export default reducer;

Because we have our array results, we need to immutable change the state. If we don’t do that, our array will be deleted (if we have left the old way, without spread operator). Also updating that array needs to be done without push function but with concat.

To delete element from array we clicked on, we are going to use this logic:

<ul>

{this.props.storedResults.map(strResult => {

return <li key={strResult.id} onClick={() => this.props.onDeleteResult(strResult.id)}>{strResult.value}</li>

})}

</ul>

onDeleteResult: (id) => dispatch({ type: 'DELETE\_RESULT', elementId: id})

and in the reducer.js

case 'DELETE\_RESULT':

const newArray = state.results.filter(x => x.id !== action.elementId)

return {

...state,

results: newArray

}

## Split reducers

To split reducers, to have more than one we should make some changes:

First we need to create those reducers files(counter and result reducers) and to import them in the app.js file. Import combine reducers as well:

import {createStore, combineReducers} from 'redux';

import counterReducer from './store/reducers/counter';

import resultReducer from './store/reducers/result';

import { Provider } from 'react-redux';

const rootReducer = combineReducers({

ctr: counterReducer,

res: resultReducer

});

const store = createStore(rootReducer);

Then we delete old reducer file and modify those two new files:

Result.js:

import \* as actions from '../actions';

const initialState = {

results: []

}

const reducer = (state = initialState, action) => {

switch (action.type) {

case actions.STORE\_RESULT:

return {

...state,

results: state.results.concat({value: action.result, id: new Date() })

}

case actions.DELETE\_RESULT:

const newArray = state.results.filter(x => x.id !== action.elementId)

return {

...state,

results: newArray

}

default:

return state;

}

}

export default reducer;

counter.js

import \* as actions from '../actions';

const initialState = {

counter: 0,

}

const reducer = (state = initialState, action) => {

switch (action.type) {

case actions.INCREMENT:

return {

...state,

counter: state.counter + 1,

}

case actions.DECREMENT:

return {

...state,

counter: state.counter - 1

}

case actions.ADD:

return {

...state,

counter: state.counter + action.value

}

case actions.SUBTRACT:

return {

...state,

counter: state.counter - action.value

}

default:

return state;

}

}

export default reducer;

As you can see, we have just split one big reducer into two files. Then in Counter.js we make this change:

const mapStateToProps = (state) => {

return {

ctr: state.ctr.counter,

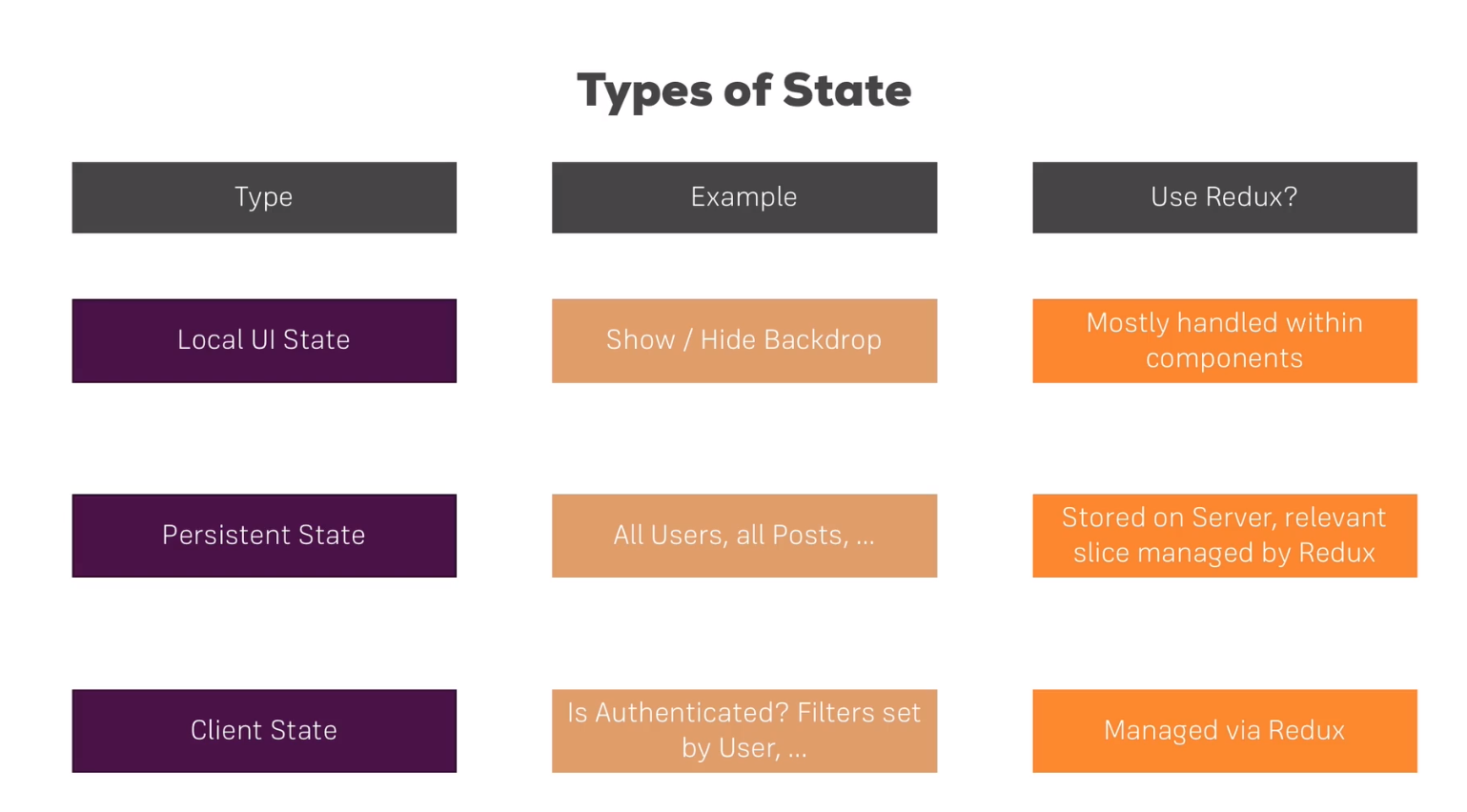
storedResults: state.res.results

};

};

This state.ctr and state.res are names of properties from index.js file in root reducers.

## Should types be handled by redux or component



## Handling much of project logic in redux

Checkout BurgerBuilder.js file and Checkout.js and ContactData.js as well. We will see how we changed our code to use redux, to share the properties (ingredients and totalprice). It is much better approach to use.

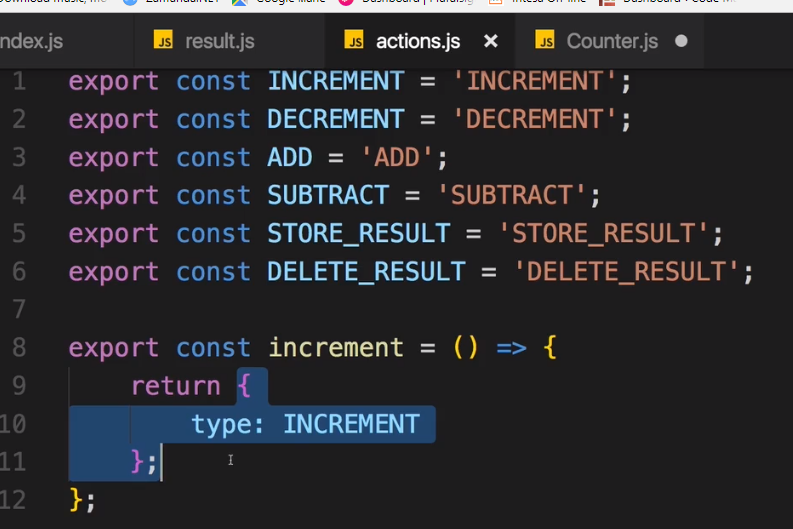
# Async redux – (for http requests – axios)

## React DevTools

For help working with redux we can install Redux devtools, as we did with the react developer tools.

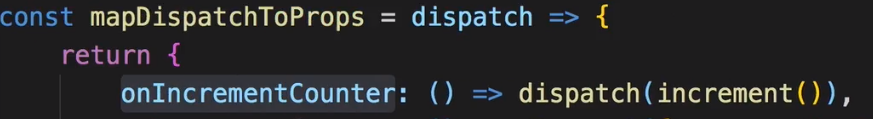
## Action creator

For async code to work we can use action creators in the same file where we have our actions (actions.js). Those actions are functions which can be called instead of passing the object inside the dispatch function.



These functions should be created for all the exported constants.

Counter.js file now change the dispatch call:



## Redux thunk

Npm install –save redux-thunk

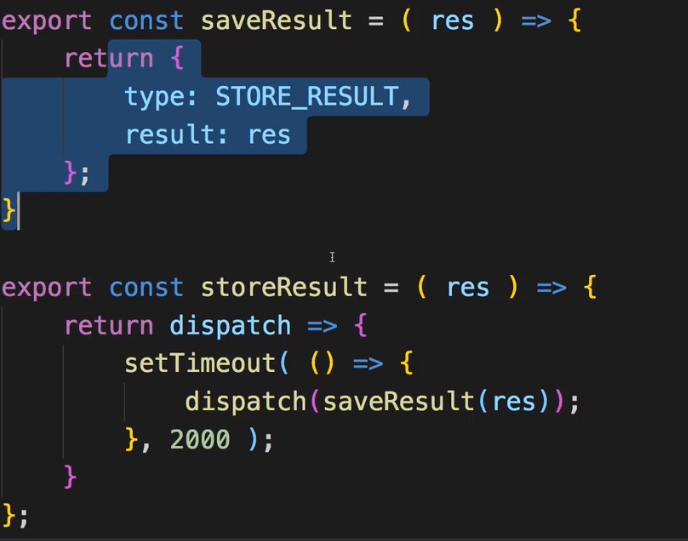
After installation we must import it in index.js:



And then we register it in createStore function:



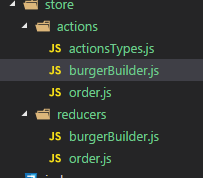
Now when Thunk middleware is installed and registered it will work with dispatch. Now we can change the actions.js actions:



In here storeResult is async function that works with dispatch, due to the Thunk library. And it executes saveResult, which just returns our object.

## Burger project changes

First we are going to change folder structure for the store folder part:



Let’s start by changing the burgerBuilder.js action creator:

import \* as actionTypes from './actionsTypes';

export const addIngredient = (ingName) => {

return {

type: actionTypes.ADD\_INGREDIENT,

ingredientName: ingName

}

}

export const removeIngredient = (ingName) => {

return {

type: actionTypes.REMOVE\_INGREDIENT,

ingredientName: ingName

}

}

Modify the index.js:

import burgerBuilderReducer from './store/reducers/burgerBuilder';

const store = createStore(burgerBuilderReducer);

And modify the BurgerBuilder.js container:

import \* as burgerBuilderActions from '../../store/actions/burgerBuilder';

const mapDispatchToProps = (dispatch) => {

return {

onIngredientAdded: (ingName) => dispatch(burgerBuilderActions.addIngredient(ingName)),

onIngredientRemoved: (ingName) => dispatch(burgerBuilderActions.removeIngredient(ingName))

}

}

## Handling orders in redux

Lets install redux-thunk and change the index.js

import thunk from 'redux-thunk';

const store = createStore(burgerBuilderReducer, applyMiddleware(thunk));

then in actionTypes.js:

export const SET\_INGREDIENTS = 'SET\_INGREDIENTS';

export const FETCH\_INGREDIENTS\_FAILED = 'FETCH\_INGREDIENTS\_FAILED';

burgerBuilder.js actions:

export const setIngredients = (ingredients) => {

return {

type: actionTypes.SET\_INGREDIENTS,

ingredients: ingredients

}

}

export const fetchIngredientsFailed = (error) =>{

return {

type: actionTypes.FETCH\_INGREDIENTS\_FAILED,

error: error

}

}

export const initIngredients = () => {

return (dispatch) => {

axios.get('/ingredients.json')

.then(response => {

dispatch(setIngredients(response.data));

}).catch(error => {

dispatch(fetchIngredientsFailed(error));

});

}

}

In here we created initIngredients which we are going to call from the BurgerBuilder container. And inside this action we are sending the get request and dispatching two actions for success and for error.

Now we are going to connect this with the reducer file and with the container.

burgerBuilder.js reducer:

case actionTypes.SET\_INGREDIENTS:

return {

...state,

ingredients: action.ingredients

};

case actionTypes.FETCH\_INGREDIENTS\_FAILED:

console.log(action.error);

break;

BurgerBuilder.js container:

const mapDispatchToProps = (dispatch) => {

return {

onIngredientAdded: (ingName) => dispatch(burgerBuilderActions.addIngredient(ingName)),

onIngredientRemoved: (ingName) => dispatch(burgerBuilderActions.removeIngredient(ingName)),

onInitIngredients: () => dispatch(burgerBuilderActions.initIngredients())

}

}

componentDidMount() {

this.props.onInitIngredients();

}

## Create order async

In actionTypes.js:

export const PURCHASE\_BURGER\_SUCCESS = 'PURCHASE\_BURGER\_SUCCESS';

export const PURCHASE\_BURGER\_FAIL = 'PURCHASE\_BURGER\_FAIL';

In order.js actionStore:

import \* as actionTypes from './actionsTypes';

import axios from '../../Axios/axios';

const purchaseBurgerSuccess = (id, orderData) => {

return {

type: actionTypes.PURCHASE\_BURGER\_SUCCESS,

orderId: id,

order: orderData

}

}

const purchaseBurgerFail = (error) => {

return {

type: actionTypes.PURCHASE\_BURGER\_FAIL,

error: error

}

}

export const purcahseBurgerStart = (orderData) => {

return (dispatch) => {

axios.post('/orders.json', orderData)

.then(response => {

dispatch(purchaseBurgerSuccess(response.data, orderData));

})

.catch( error => {

dispatch(purchaseBurgerFail(error));

});

}

}

In ContactData.js:

import \* as orderActions from '../../../store/actions/order';

const mapDispatchToProps = (dispatch) => {

return {

onOrderBurger: (orderData) => dispatch(orderActions.purcahseBurgerStart(orderData))

}

}

export default connect(mapStateToProps, mapDispatchToProps)(ContactData);

orderHandler = (event) => {

event.preventDefault();

const formData = {}

Object.keys(this.state.orderForm).map(element => {

return formData[element] = this.state.orderForm[element].value;

});

let order = {

orderData: formData,

ingredients: this.props.ings,

totalPrice: this.props.totalPrice.toFixed(2)

}

this.props.onOrderBurger(order);

}

Now we need to handle our order.js reducer file:

import \* as actionTypes from '../actions/actionsTypes';

const initialState = {

orders: []

}

const reducer = (state = initialState, action) => {

switch (action.type) {

case actionTypes.PURCHASE\_BURGER\_SUCCESS:

const newOrder = {

...action.orderData,

id: action.orderId

}

return {

...initialState,

orders: state.orders.concat(newOrder)

};

case actionTypes.PURCHASE\_BURGER\_FAIL:

console.log(action.error);

default:

return state;

}

}

export default reducer;

In index we need to combine our reducers:

const rootReducers = combineReducers({

burgerBuilder: burgerBuilderReducer,

order: orderReducer

})

const store = createStore(rootReducers, applyMiddleware(thunk));