React Advanced (pt. 2)

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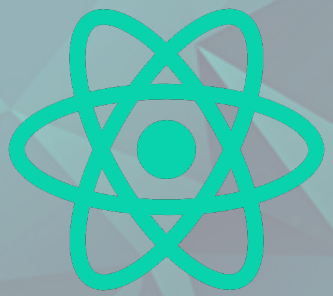

React Lifecycle

Each React Compoment has a lifecycle split in three phases

- Mounting
- Updating
- Unmounting

Mounting

React has four built-in methods that gets called in order during mounting:

1. constructor()
2. getDerivedStateFromProps()
3. render()
4. componentDidMount()

The render() is mandatory, while the others are optional

CONSTRUCTOR

- Invoked when a new component of the class defining it is instantiated

GETDERIVEDSTATEFROMPROPS

- Invoked right before the render() method
- Static method
- Takes **props** and **state** as parameters
- Natural place to set the state object based on props

RENDER

- Required method
- The method that actually outputs HTML to the DOM

componentDidMount

- Executed after the component is rendered
- For statements that require that the component is already placed in the DOM

Updating

A component is update whenever there is a change in the component **state**. React has 5 built-in methods that gets called, in orderd, when a component is updated

1. getDerivedStateFromProps()
2. shouldComponentUpdate()
3. render()
4. getSnapshotBeforeUpdate()
5. componentDidUpdate()

The render() is again the only mandatory method

GETDERIVEDSTATEFROMPROPS

Discussed previously. It is also executed when a component gets updated

shouldComponentUpdate

- Boolean method
- Tells React whether it should continue with the rendering or not
- Default returned value is true

RENDER

Discussed previously. It also gets executed on component update.

- Only if shouldComponentUpdate returned true

getSnapshotBeforeUpdate

- Provides access to **props** and **state** of the component before the update
- Takes previous props and state as arguments
- If getSnapshotBeforeUpdate is implemented, then also componentDidUpdate has to be implemented

componentDidUpdate

- Last method executed in the updating phase

UNMOUNTING

The unmounting phase happens when a component is removed from the DOM. React has a single built-in method related to the unmounting phase:

1. componentWillUnmount()

React Events

React allows to handle user events (e.g. click, mouseover, change)

- Events use camel-case syntax (e.g. onClick instead of onclick)
- Event handlers are written in curly brackets (e.g. onClick={handleOnClick})
- Good practice is that event-handlers are methods in the component class
- Arrow functions are the best suited option fro implementing events
- Events methods can take argument and an event object (that stores event info) can be passed over

React Forms

React has several integration points with HTML forms

- Forms data is usually handled by the components
- Changes in forms data can be handled by adding an onChange event handler
- Forms data is typically intended to be stored in the component state

Forms Submit

- Place a submit button in the form
- Implement an onSubmit event handler
- Invoke event.preventDefault() to prevent default form submit behaviour

Multiple input fields

Implementing more onChangeEvents at once can be made compact:

- Add a **name** attribute to inputs
- Implement a single change event handler with square bracket notation around the property name

Inputs validation

Inputs are typically validated on input change or on submit

Some react form inputs

- Input:
  - Used for short text, numbers, e-mails, checkboxes, and many more
- Textarea:
  - Used for long text
  - In React, the value of a textarea is placed inside a **value** attribute
- Select:
  - Used for selections
  - In react, the selected value is defined with a **value** attribute in the **select** tag

Inline Styling

Styling can be done inline:

```
render() {
    return (
        <div>
            <h1 style={{color: "red"}}> Ciccio pasticcio </h1>
        </div>
    )
}
```

JavaScript Object Styling

Styling can be placed in a JavaScript object:

```
const mystyle = {
    color: "red"
};

class Person extends React.Component {

    render() {
        return (
            <div>
                <h1 style={mystyle}> Ciccio pasticcio </h1>
            </div>
        )
    }
```

Stylesheet File Styling

Styling can be declared in a css file:

- Place css in a separate .css file
- Import the css file

Best practice: use css modules

- Use extension .module.css
- css rules will be applied only to components importing the module
- No worries about name clashes

Note: remember that class names are defined with the className attribute

HANDLE AJAX REQUESTS IN REACT

By default, React does not include dedicated classes for performing server requests. Some options are:

- Use plain JavaScript
- Use a library

In the tutorial we will consider the Axios React library.

Note: componentDidMount() is a good place for doing sever calls

Axios

- Promise-based API (for asynchronous calls)
- Supports all HTTP verbs (get, post, delete, ..)
- Is simple and compact

Get started: install axios dependency in your project

```
$ npm install axios -save
```

AXIOS GET EXAMPLE

An example of GET request with axios on a sample API

```
import React from 'react';
import axios from 'axios';
export default class PersonList extends React.Component {
  state = {
    persons: []
  }
  componentDidMount() {
    axios.get(`https://jsonplaceholder.typicode.com/users`)
      .then(res => {
        const persons = res.data;
        this.setState({ persons: persons });
      })
  }
  render() {
    return (
      <ul>
        { this.state.persons.map(person => <li>{person.name}</li>)}
      </ul>
    )
  }
}
```

Errors can be caught by using **.catch()** (can be placed after .then())

AXIOS POST EXAMPLE

An example of POST request with axios on a sample API

```
import React from 'react';
import axios from 'axios';
export default class PersonList extends React.Component {
  state = {
    name: '',
  }
  handleChange = event => {
    this.setState({ name: event.target.value });
  }
  handleSubmit = event => {
    event.preventDefault();
    const user = {
      name: this.state.name
    };
    axios.post(`https://jsonplaceholder.typicode.com/users`, { user: user })
      .then(res => {
        console.log(res);
        console.log(res.data);
      })
  }

  render() {
    /* */
```

AXIOS BASE INSTANCE

Axios allow for the creation of a base instance where we put configuration elements:

```
import axios from 'axios';

export default axios.create({
  baseURL: `http://jsonplaceholder.typicode.com/`
});
```

It can then be used wherever needed:

```
import React from 'react';
import API from './API.js';
export default class PersonList extends React.Component {
  state = {
    persons: []
  }
  componentDidMount() {
    API.get(`/users`)
      .then(res => {
        const persons = res.data;
        this.setState({ persons: persons });
      })
  }
  /*...*/
```

Make your application look good

Use a UI library

- for example Material-UI: `https://material-ui.com`

UI libraries contains reusable good-looking standard components (buttons, inputs, menus, etc.)

React + Spring Boot

- Develop business logic in Spring Services (@Service annotated classes)
- Expose API through Rest Controllers (@RestController annotated classes)
- Add @CrossOrigin annotation on controllers methods (see Cross-origin Resource Sharing policies)
- Invoke API from React app (e.g. with axios)
- Render stuff in React app

QUESTIONS??