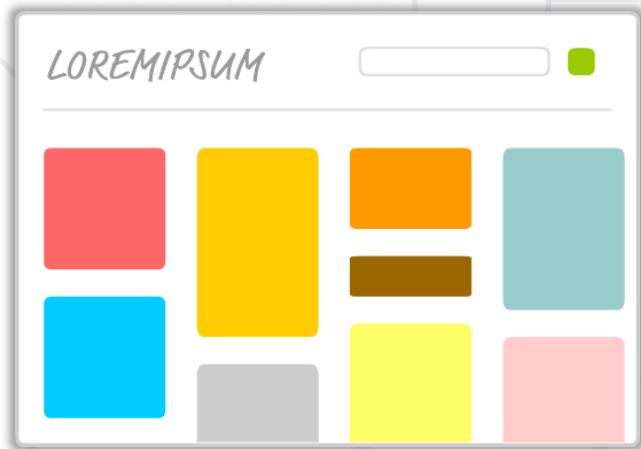


React Components – Basic Idea

How to Compose in React ?



SoftUni Team
Technical Trainers



SoftUni



Software University

<https://softuni.bg>

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sli.do

#react



Components Overview

Syntax, Functional and Class Components

Components Overview

- Components let you
 - Split the UI into **independent** and **reusable pieces**
 - Think about **isolation**
- React let you define components as
 - **Functions**
 - **Classes**



- **Functional component** is a JS function which
 - Accepts single argument called **props** (object with data)
 - Returns a **React Element**

```
function Person(props){  
  return <div>My name is {props.name}</div>  
}
```

- To define a **React component class**, you need to extend **React.Component**

```
class Person extends React.Component {  
  render() {  
    return <h1>My name is {this.props.name}</h1>  
  }  
}
```

- The only method you must define is called **render()**

- Names always start with **UpperCase**
- Tags always must be **closed**
- **Information** is passed via **props**

```
function SimpleComponent(props) {  
  return (  
    <div>  
      <h1>{props.title}</h1>  
      <p>{props.description}</p>  
    </div>  
  );  
}
```




Component Props and State

Overview

Props and State Overview

- In React **props** and **state** represent the rendered values
- Both are plain JavaScript **objects**
- Both hold information that influences the output of render



Props and State Overview

- They are different in one important way
 - **Props** get passed to the component (like function params)
 - **State** is managed within the component (like local variables)





Component Props

Passing Data, Access and Usage

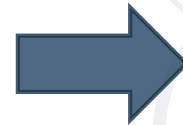
- **Props** is short for **properties**
 - Are received from above (parent)
 - **Immutable** as far as the component receiving them is concerned
- A component **cannot change** its own props, but it is responsible for putting together the props of its child components

Passing Props to Nested Components

- We use props to **pass data** from parent to child

```
const BookList = () => {  
  return (  
    <ul>  
      <Book  
        title="IT"  
        author="Stephen King"  
        price="20"  
      />  
      <Book  
        title="The Hunger Games"  
        author="Suzanne Collins"  
        price="10"  
      />  
    </ul>  
  );  
};
```

Prop name should start
with lowercase letter

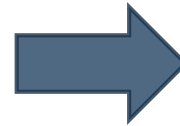


Use className to set css classes

```
const Book = (props) => {  
  return (  
    <li className="book">  
      <div>{props.title}</div>  
      <div>{props.author}</div>  
      <div>{props.price}</div>  
    </li>  
  );  
};
```

- Use **children** property to access information between **opening** and **closing** tags

```
const BookList = () => {  
  return (  
    <ul>  
      <Book  
        title="IT"  
        author="Stephen King"  
        price="20">  
        <span>  
          Some value here  
        </span>  
      </Book>  
    </ul>  
  );  
};
```

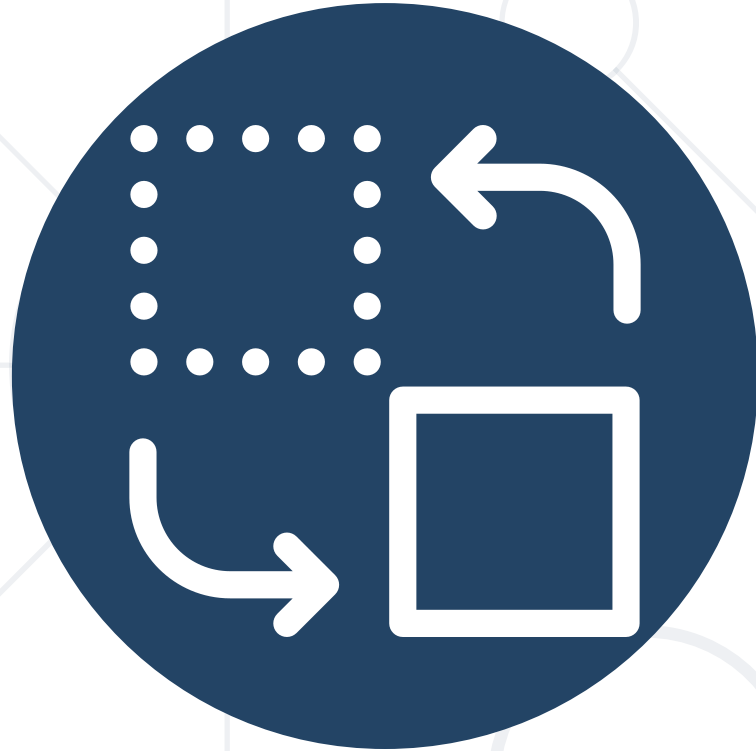


```
const Book = (props) => {  
  return (  
    <li className="book">  
      ...  
      <div>{props.children}</div>  
    </li>  
  );  
};
```

Could be plain text or nested HTML



Props Demo



Storing and Modifying Data

Component State

Component State Overview

- The heart of every React component is its "state"
 - It determines how the component renders and behaves
 - State allows you to create components that are dynamic and interactive



State

- **State** starts with default value when a component mounts
 - After mounts, suffers from **mutations** in time
 - Its **serializable**
- Component manages its own state internally





State Hook

State Hook



- Hook is a special function that lets you "hook into" React features
 - **useState** is a Hook that lets you add **React state** to function components
 - You don't have to convert functional component into class to use state

- Calling **useState** inside functional component to add some local state to it

```
import { useState } from 'react';
```

- React will preserve this state between re-renders

- **useState** returns a pair `const [count, setCount] = useState(0);`

- Current state **value**
- **Function** that lets you update it

- You can call the update function from anywhere
- It's similar to **this.setState** in class, except it **doesn't merge** the **old** and **new** state together
- The only argument to **useState** hooks is the **initial state**
 - Unlike **this.state**, here doesn't have to be an object
 - Although it can be if you want

- You can use the **State Hook** more than once in a single component

```
const registerComponent = () {  
  const [email, setEmail] = useState("");  
  const [age, setAge] = useState("0");  
  const [password, setPassword] = useState("");  
  // ...  
}
```

- The initial state argument is only used during the **first render**



State Demo



Handling Events

Handling Events

- Handling events with React elements is very similar to handling event on **DOM elements**
- The syntactic differences are:
 - React events are named using **camelCase**
 - With JSX you pass a function as the **event handler**



- When using React you should generally
 - **Not** need to call **addEventListener** to add listeners to a DOM element after it is created
 - Just provide a listener when the element is initially rendered

```
<button onClick={clickHandler}  
  Click me! I'm a counter  
</button>
```

```
import { useState } from 'react';

const counter = () {
  const [count, setCount] = useState(0);
  return (
    <div>
      <p>Counter: {count}</p>
      <button onClick={() => setCount(count + 1)}>
        Click me
      </button>
    </div>
  );
}
```

- There are two ways to pass an event handler
 - Using **function reference**

```
<button onClick={deleteRow}>  
  Delete Row  
</button>
```

- Using **inline arrow functions**

```
<button onClick={(e) => deleteRow(id, e)}>  
  Delete Row  
</button>
```

Handling Events

```
const [clicks, setClicks] = useState(0);  
const clickHandler = (e) => {  
  setClicks(c => c + 1)  
}
```

```
<Button  
  clickHandler={clickHandler}  
  clicks={clicks}  
>
```

```
const Button = (props) => (  
  <button className="counter" onClick={props.clickHandler}>  
    Click me! I'm a counter [{props.clicks}]  
  </button>  
);
```

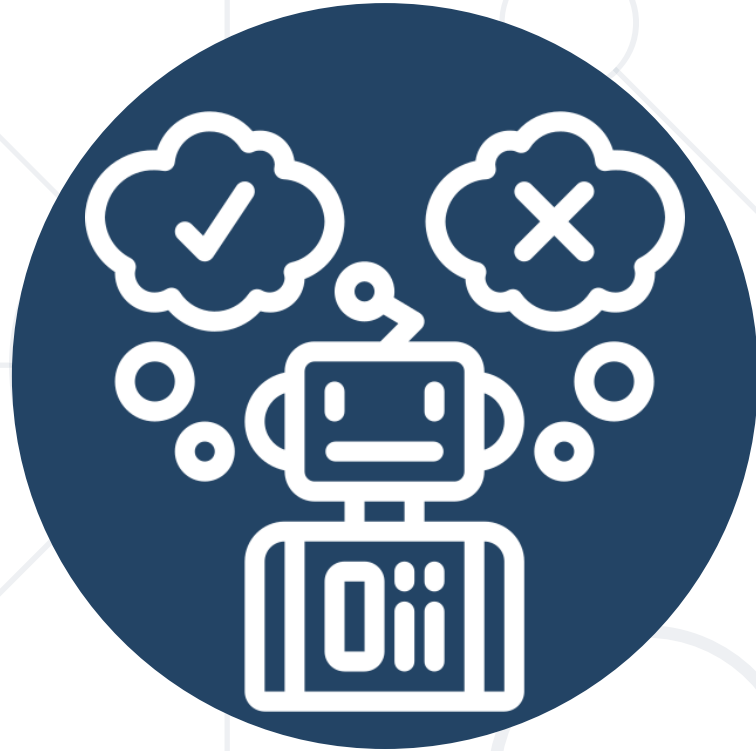
Click me! I'm a counter [0]

- Event handlers will be passed instances of **SyntheticEvent**
 - It has the same interface as the browser's native event
 - Including **stopPropagation()** and **preventDefault()**
 - Except the events work identically across all browsers

```
function onClick(event) {  
  console.log(event);  
  console.log(event.type);  
  const eventType = event.type;  
}
```




Handling Events Demo



Conditional Rendering

Conditional Rendering

- Conditional rendering in React works the same way conditions work in JavaScript using:
 - Operators like **if**
 - Conditional (**ternary**) operators



- Using **if** operator

```
function UserGreeting(props) {  
  return <h1>Welcome back!</h1>;  
}  
  
function GuestGreeting(props) {  
  return <h1>Please sign up.</h1>;  
}
```

```
function Greeting(props) {  
  const isLoggedIn = props.isLoggedIn;  
  if (isLoggedIn) {  
    return <UserGreeting />;  
  }  
  return <GuestGreeting />  
}
```

- Using **ternary** operator

```
function UserGreeting(props) {  
  return <h1>Welcome back!</h1>;  
}  
  
function GuestGreeting(props) {  
  return <h1>Please sign up.</h1>;  
}  
  
function Greeting(props) {  
  return (  
    <div>  
      { props.isLoggedIn ? < UserGreeting /> : <GuestGreeting /> }  
    </div>  
  )}  
}
```



Conditional Rendering Demo



Debugging React Components with the Components Tab

Debugging React Components

- Debugging is a **critical** skill in development. It helps identify and fix issues within your code
- React applications can have **complex** component hierarchies. Debugging ensures components work as expected



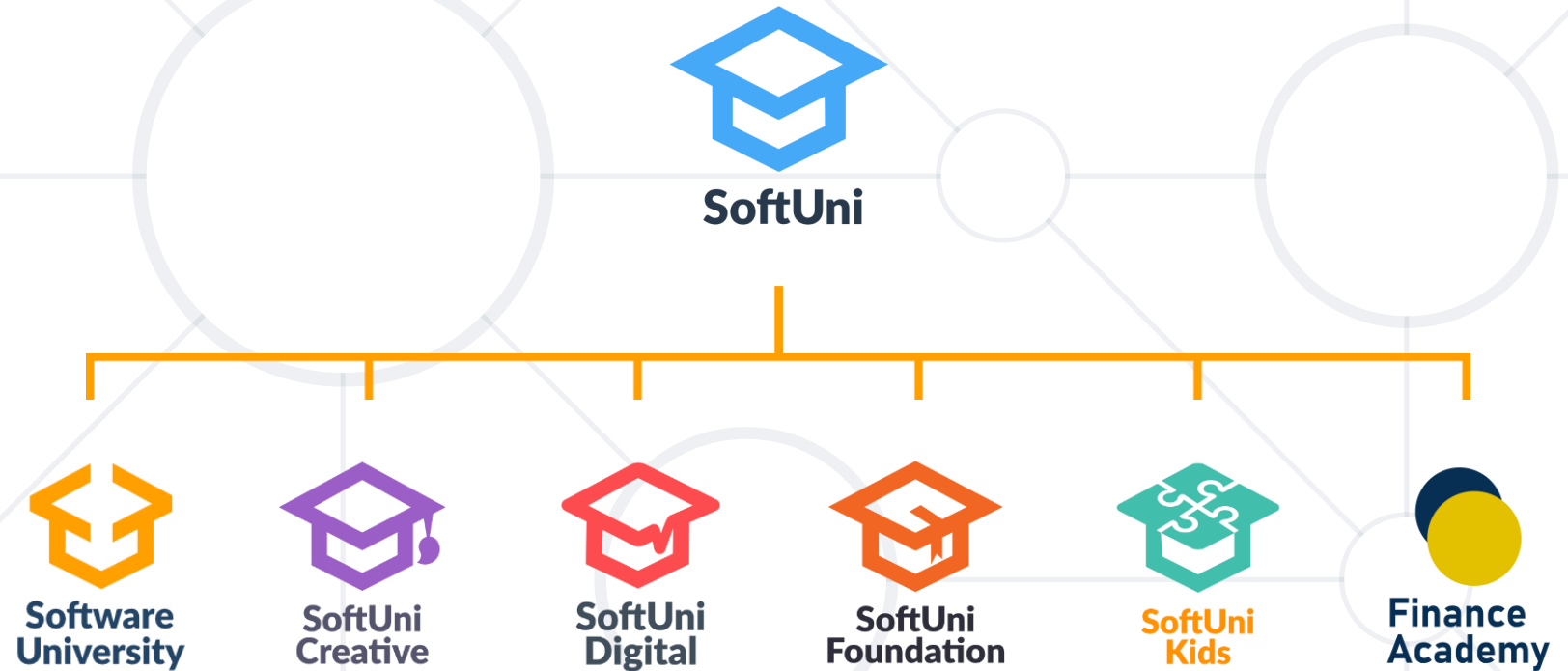
- Open your React app project folder in VS Code
- Click on the "**Run and Debug**"
- Select "**Web App (Chrome)**" for debugger
- Modify the generated "**launch.json**" by changing **URL** to match your app address
- Press **F5** button

```
"version": "0.2.0",  
"configurations": [  
  {  
    "type": "chrome",  
    "request": "launch",  
    "name": "Launch Chrome against localhost",  
    "url": "http://localhost:5173",  
    "webRoot": "${workspaceFolder}"  
  }  
]
```

- **Components** reusable elements
 - **Functional** and **Class**
- **Props** are used to pass down data
- **State** is used to hold component data
- Handling Events in React
- Conditional Rendering
 - **If** and **ternary** operators



Questions?



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