

5.1 | React Deep dive

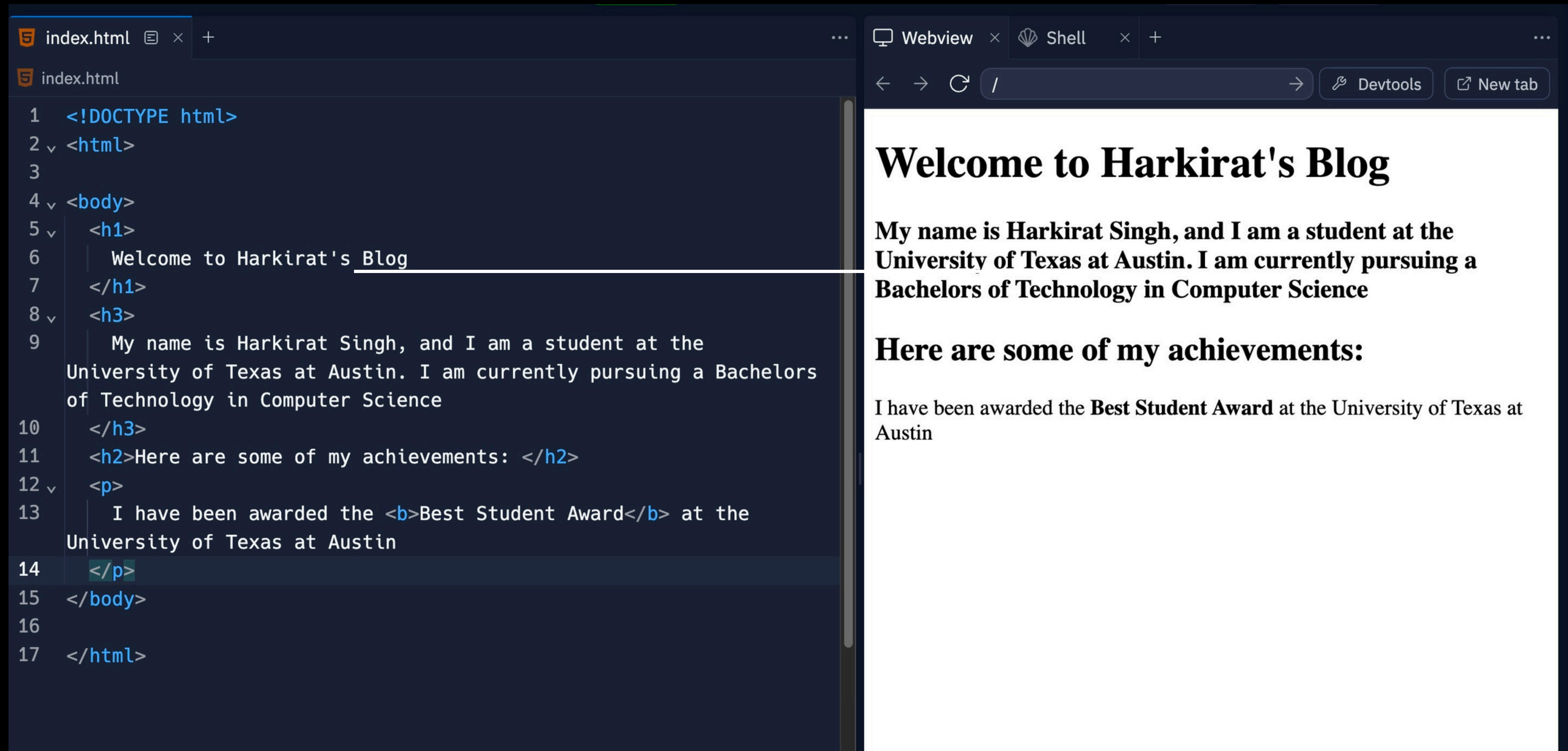
Understanding React from examples

Jargon we'll learn today

Jsx, class vs className, static vs dynamic websites,
State, components, re-rendering

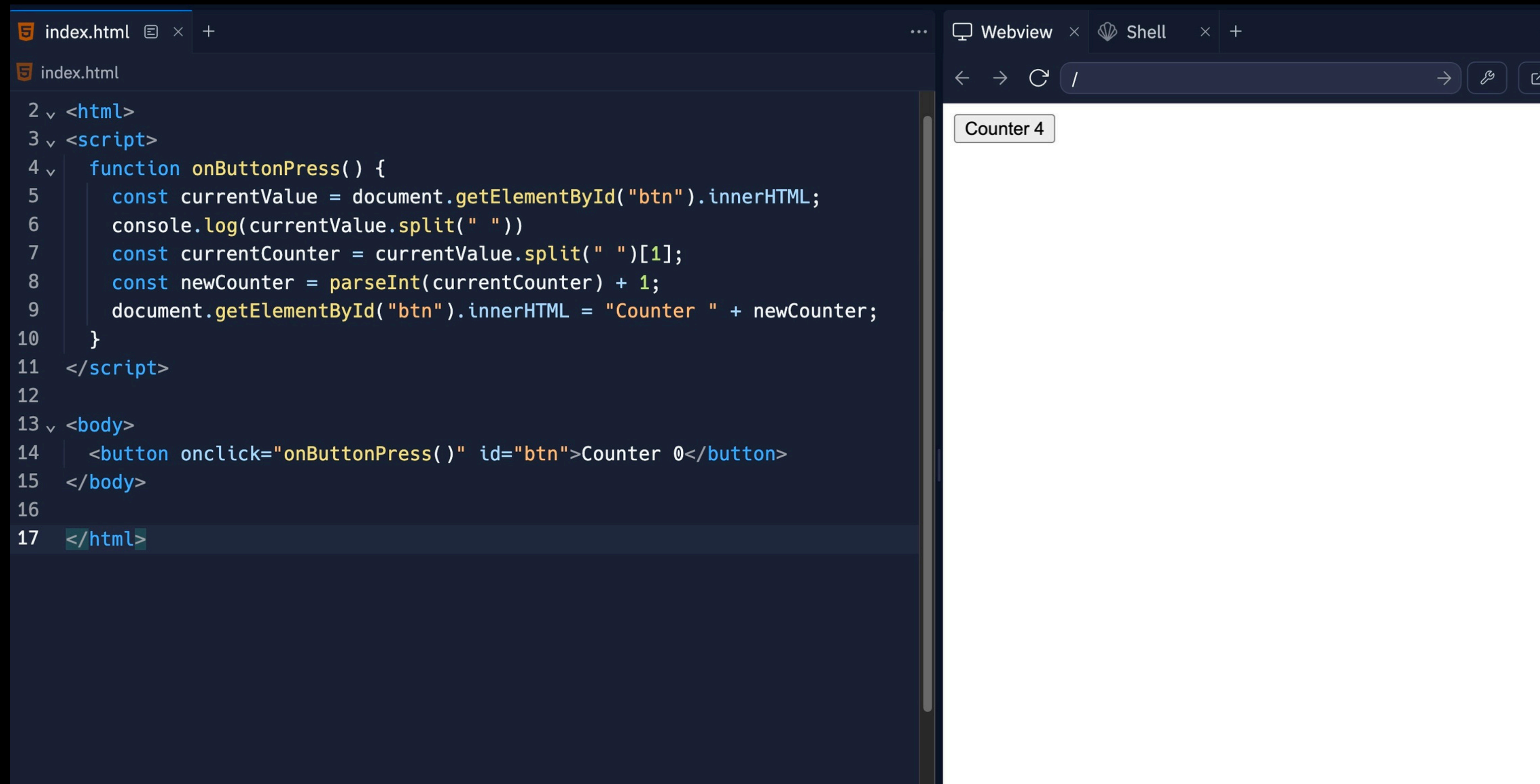
Why do you need React?

For static websites, you don't!



Why do you need React?

For dynamic websites, these libraries make it easier to do DOM manipulation



The image shows a code editor with two panes. The left pane displays the source code for a web page, and the right pane shows the rendered output in a webview.

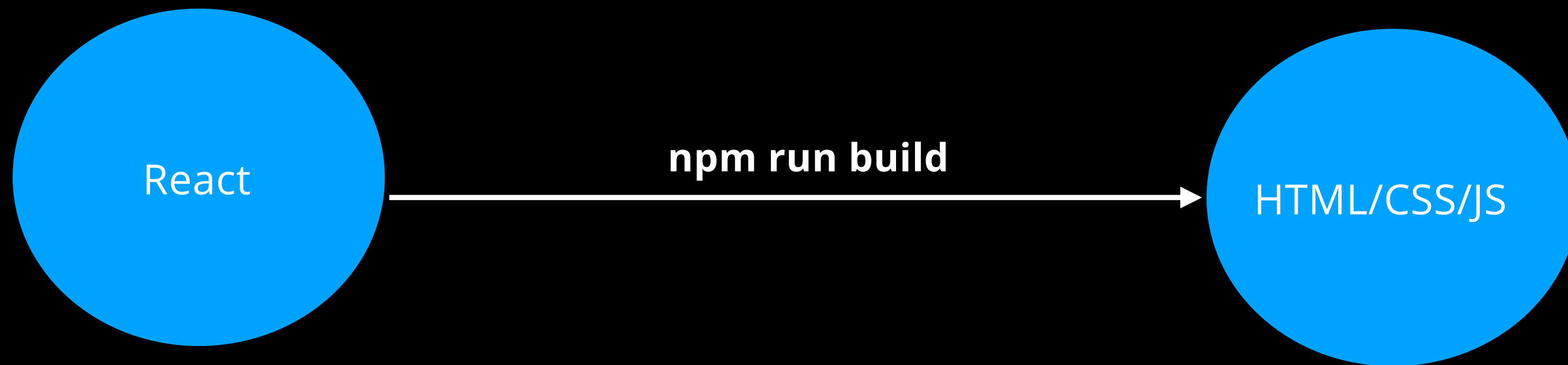
Source Code (index.html):

```
2 <html>
3 <script>
4   function onPress() {
5     const currentValue = document.getElementById("btn").innerHTML;
6     console.log(currentValue.split(" "))
7     const currentCounter = currentValue.split(" ")[1];
8     const newCounter = parseInt(currentCounter) + 1;
9     document.getElementById("btn").innerHTML = "Counter " + newCounter;
10  }
11 </script>
12
13 <body>
14   <button onclick="onPress()" id="btn">Counter 0</button>
15 </body>
16
17 </html>
```

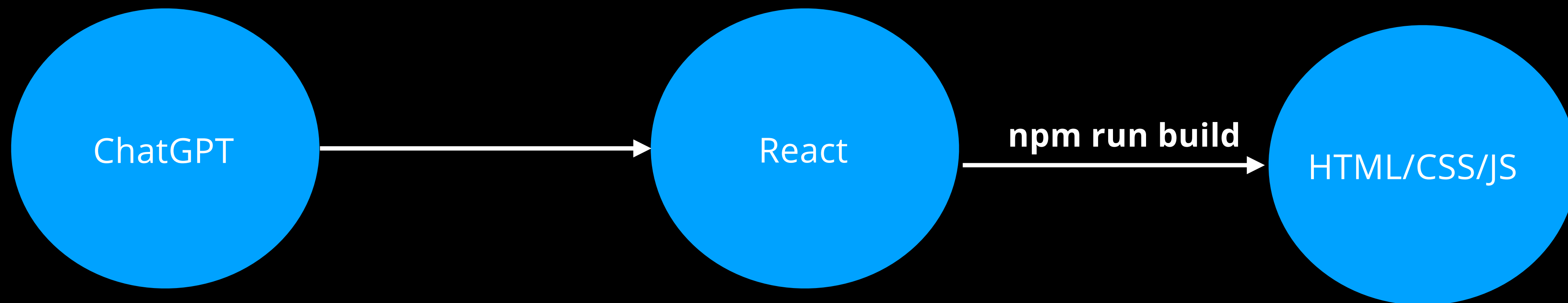
Webview Output:

The webview displays a single button with the text "Counter 4".

React is just an easier way to write normal HTML/CSS/JS
It's a new syntax, that under the hood gets converted to
HTML/CSS/JS



Just how ChatGPT is an easier way to write code,
React is an easier way to write HTML/CSS



Why React?

People realised it's harder to do DOM manipulation the conventional way

There were libraries that came into the picture that made it slightly easy, but still for a very big app it's very hard (jQuery)

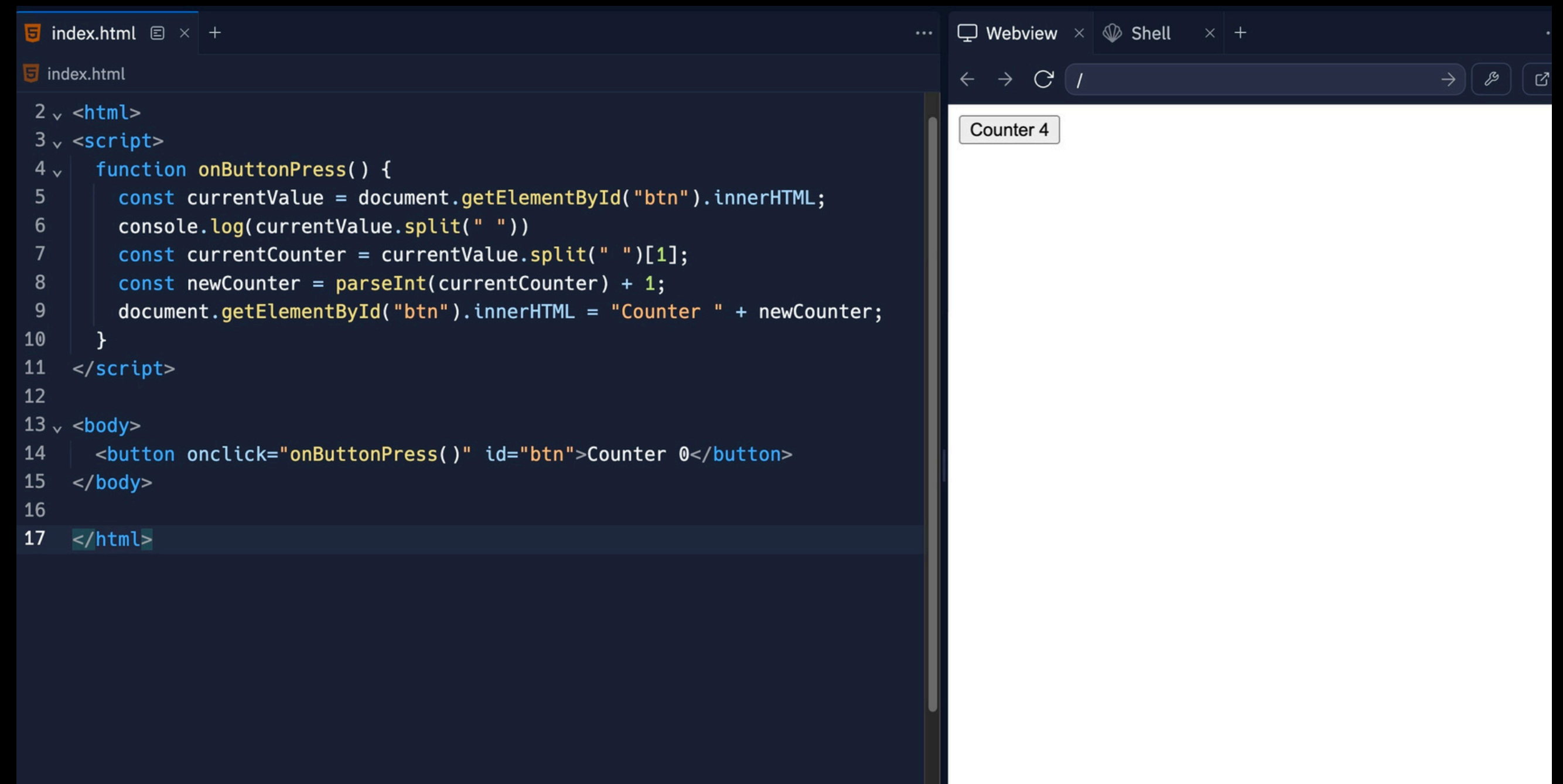
Eventually, VueJS/React created a new syntax to do frontends

Under the hood, the react compiler convert your code to HTML/CSS/JS

Let's look at a simple example

Problem with this approach

1. Too much code you have to write as the developer
2. As your app scales (todo app for eg), this gets harder and harder.



The screenshot shows a code editor on the left and a web browser on the right. The code editor displays the following HTML and JavaScript code for a counter application:

```
2 <html>
3 <script>
4   function onButtonPress() {
5     const currentValue = document.getElementById("btn").innerHTML;
6     console.log(currentValue.split(" "))
7     const currentCounter = currentValue.split(" ")[1];
8     const newCounter = parseInt(currentCounter) + 1;
9     document.getElementById("btn").innerHTML = "Counter " + newCounter;
10  }
11 </script>
12
13 <body>
14   <button onclick="onButtonPress()" id="btn">Counter 0</button>
15 </body>
16
17 </html>
```

The web browser on the right shows the rendered application with a single button labeled "Counter 4".

<https://gist.github.com/hkirat/0c22122a9485d4d592b92677570e6be8>

Some react jargon

Some react jargon

To create a react app, you usually need to worry about two things

Some react jargon

To create a react app, you usually need to worry about two things



State

Components

Some react jargon

To create a react app, you usually need to worry about two things

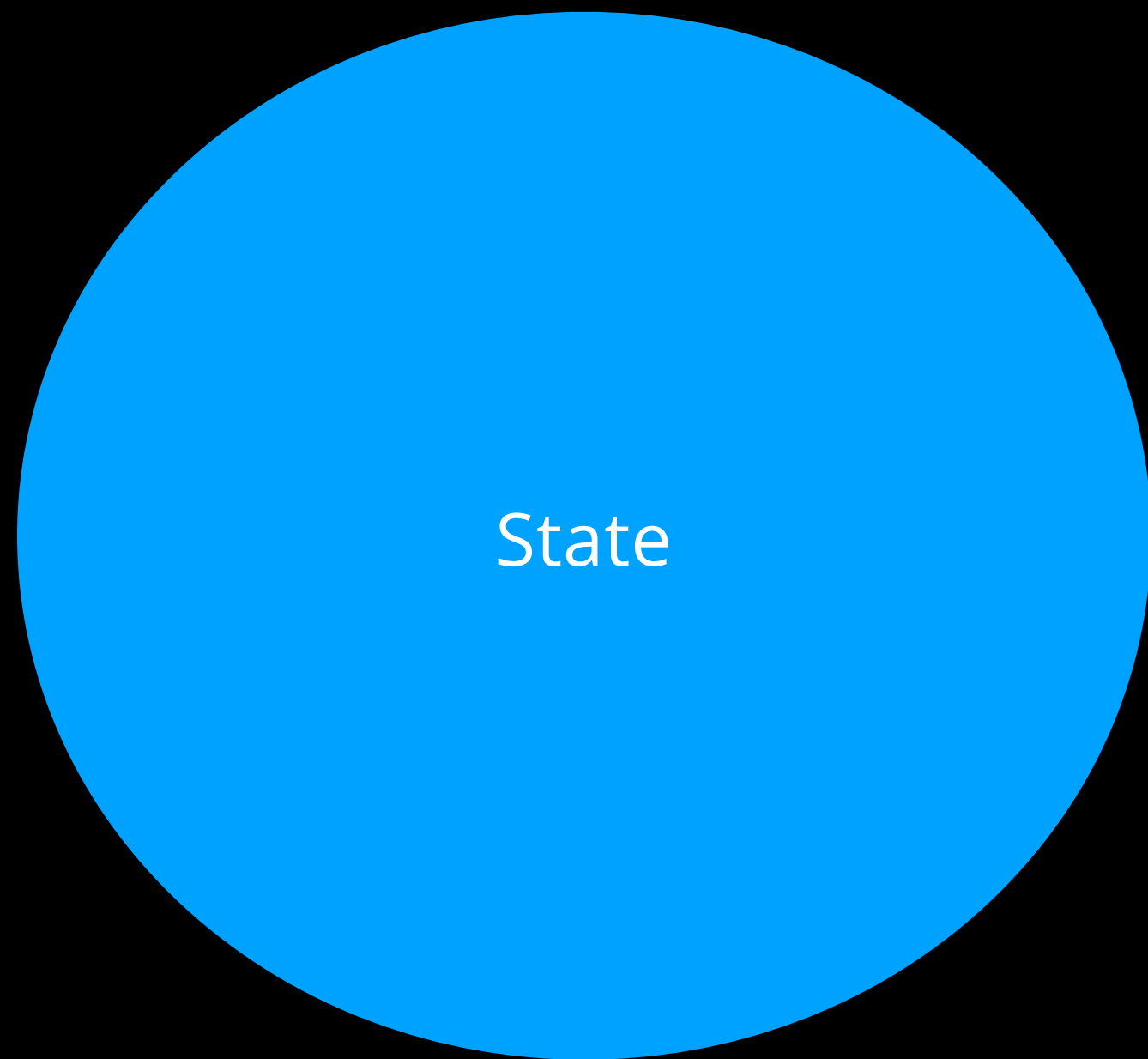
Creators of frontend frameworks realised that all websites can effectively be divided into two parts



State

Components

State/Components/Re-rendering

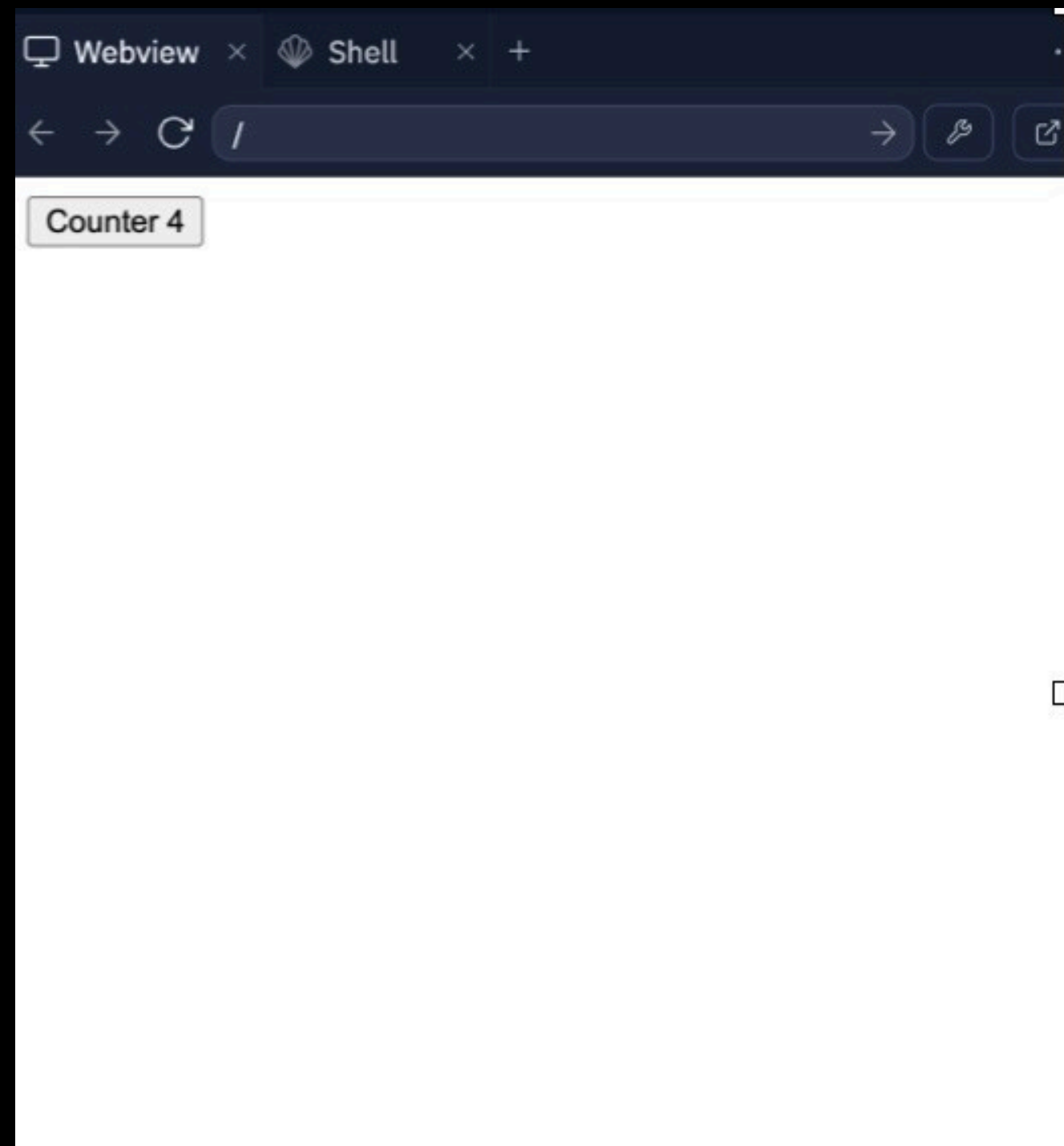


An object that represents the current **state of the app**

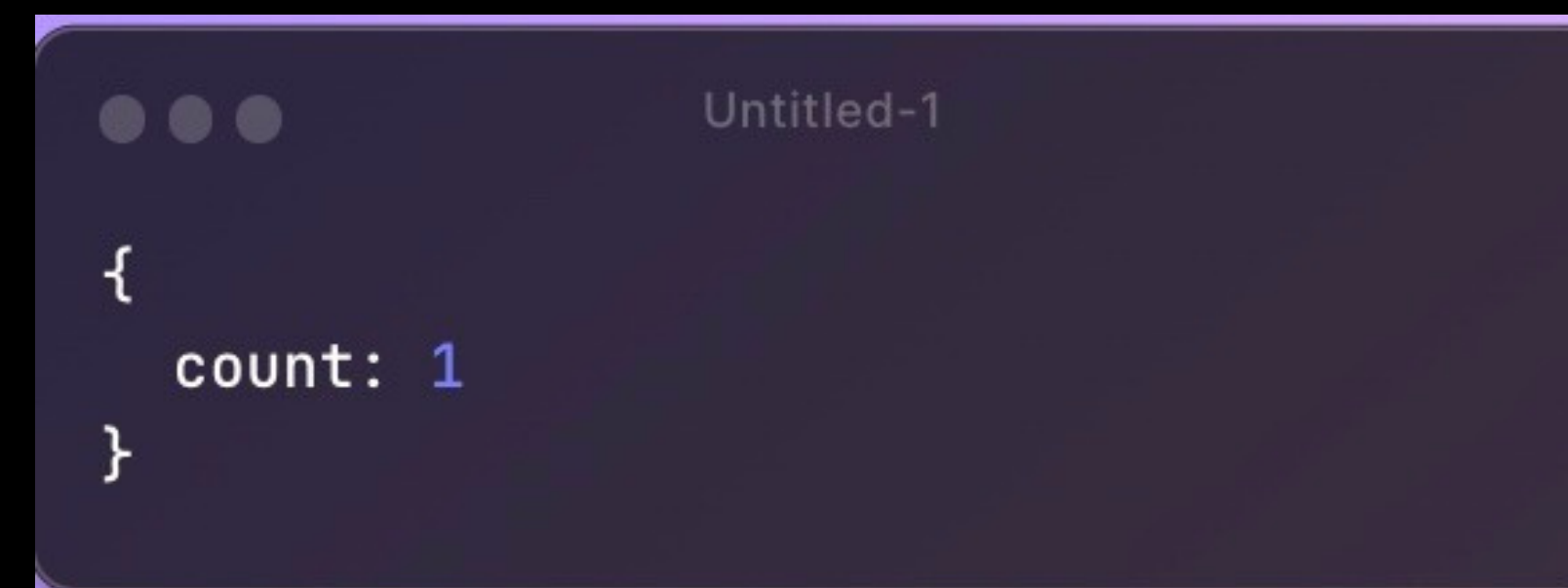
It represents the dynamic things in your app (things that change)

For example, the value of the counter

State/Components/Re-rendering

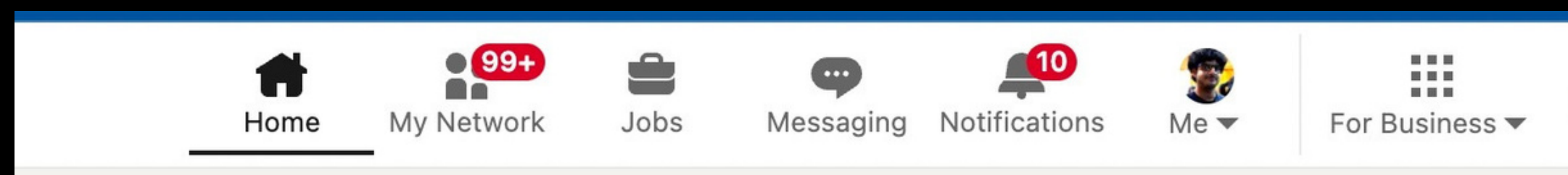


For the counter app, it could look something like this -



State/Components/Re-rendering

For the LinkedIn Topbar, it could be something like this -



```
Untitled-1
{
  topbar: {
    home: 0,
    myNetwork: "99+",
    jobs: 0,
    messaging: 0,
    notificaitons: 10
  }
}
```

State/Components/Re-rendering

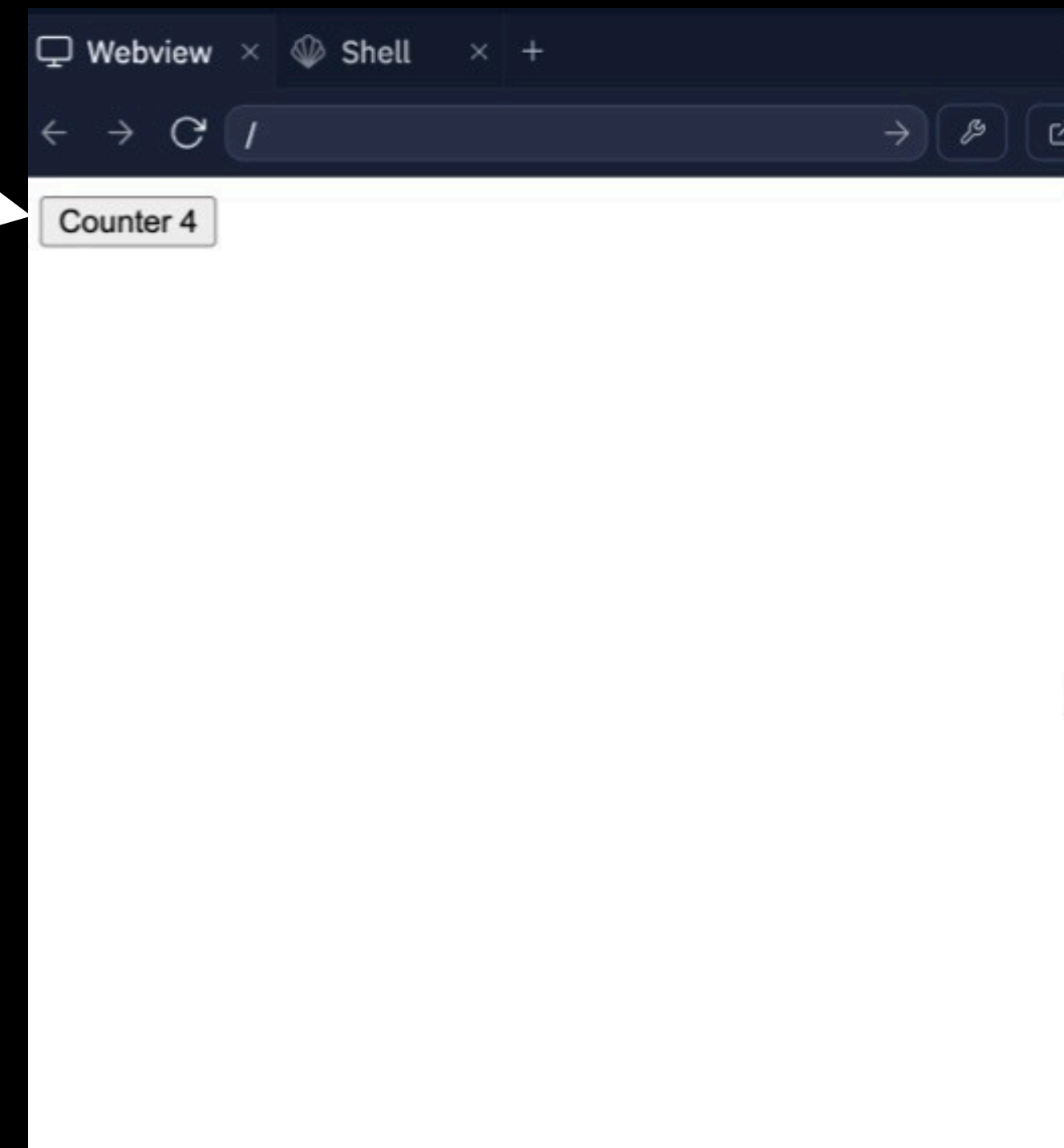


Components

How a DOM element should render, given a state
It is a re-usable, dynamic, HTML snippet that changes given the state

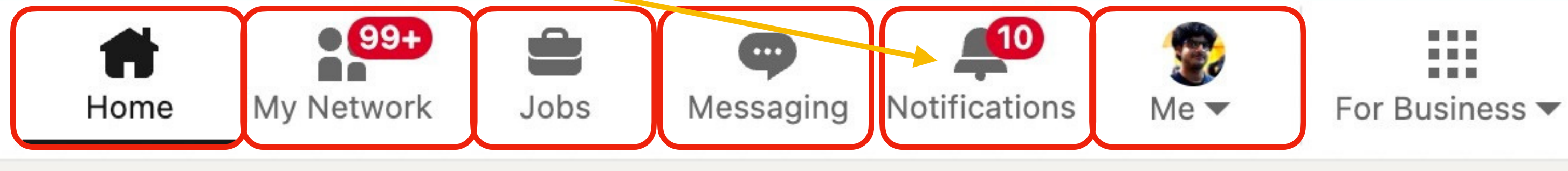
State/Components/Re-rendering

**This button is a component
It takes the state (currentCount) as an input
And is supposed to render accordingly**



State/Components/Re-rendering

```
Untitled-1  
  
{  
  topbar: {  
    home: 0,  
    myNetwork: "99+",  
    jobs: 0,  
    messaging: 0,  
    notificaitons: 10  
  }  
}
```

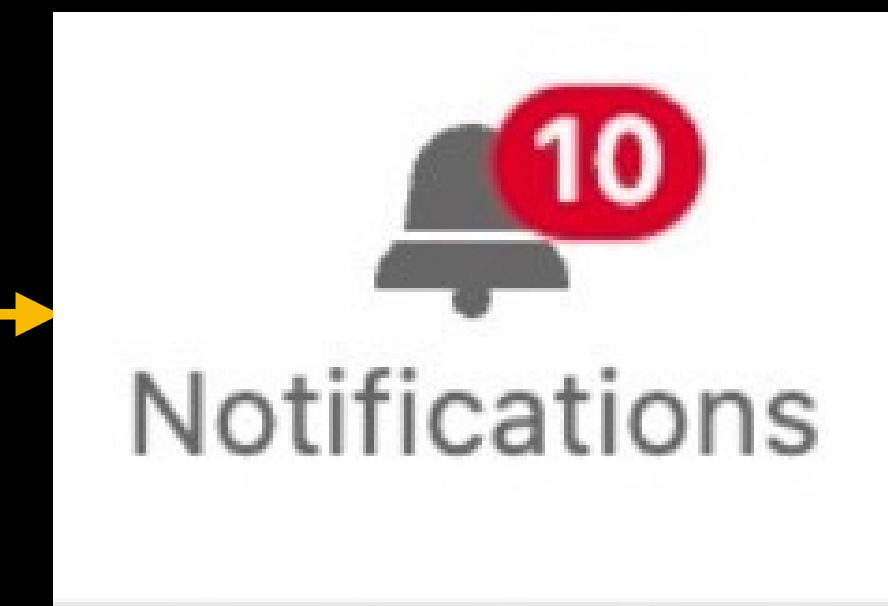


State/Components/Re-rendering

State

```
Untitled-1
{
  topbar: {
    home: 0,
    myNetwork: "99+",
    jobs: 0,
    messaging: 0,
    notificaitons: 10
  }
}
```

Component



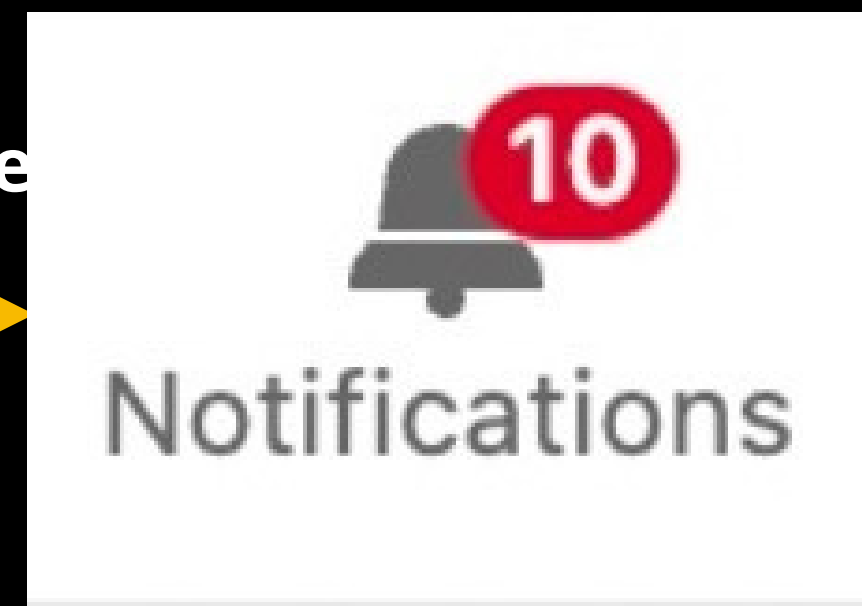
State/Components/Re-rendering

State

```
Untitled-1  
  
{  
  topbar: {  
    home: 0,  
    myNetwork: "99+",  
    jobs: 0,  
    messaging: 0,  
    notificaitons: 10  
  }  
}
```

A state change triggers a **re-render**
A **re-render** represents the actual DOM being manipulated
when the state changes

Component



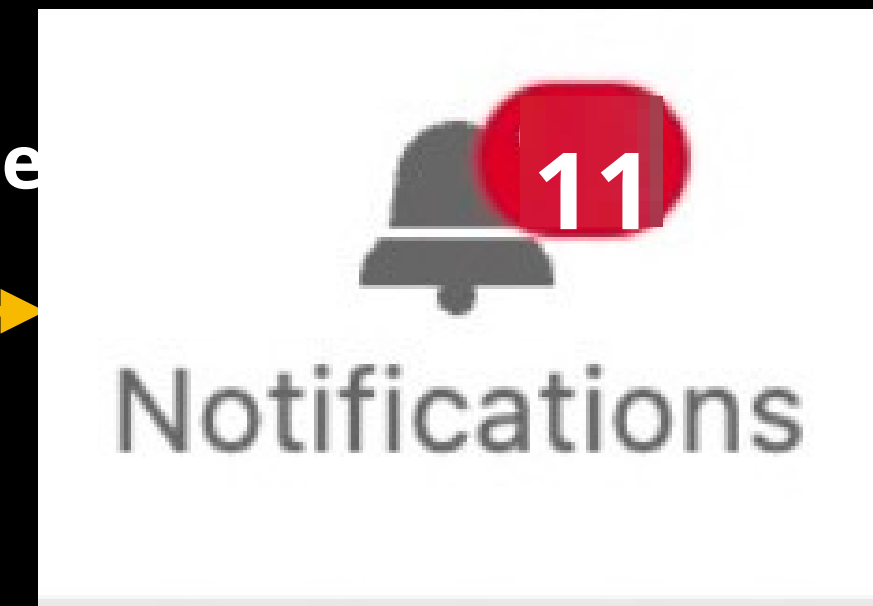
State/Components/Re-rendering

State

```
Untitled-1
{
  topbar: {
    home: 0,
    myNetwork: "99+",
    jobs: 0,
    messaging: 0,
    notificaitons: 11
  }
}
```

A state change triggers a **re-render**
A **re-render** represents the actual DOM being manipulated
when the state changes

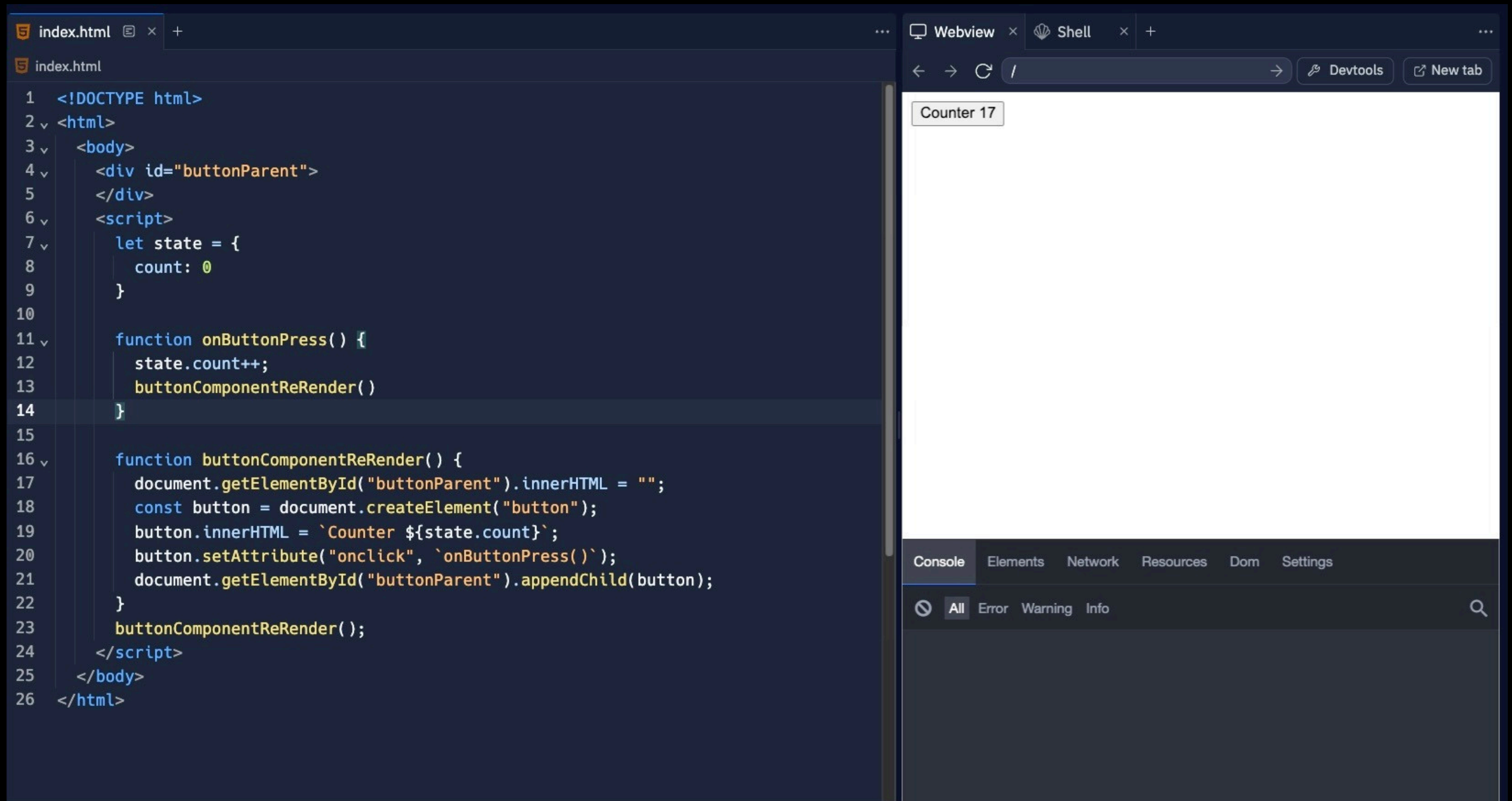
Component



State/Components/Re-rendering

**You usually have to define all your components once
And then all you have to do is update the state of your app, React takes care of re-rendering your app**

Let's create a counter app using state/components



The image shows a web browser window with a single tab titled 'Webview'. The address bar shows a forward slash '/'. Below the address bar, there's a search bar with the text 'Counter 17'. The browser's developer tools are open at the bottom, with the 'Console' tab selected. The console shows no messages. The code editor on the left shows the following HTML and JavaScript code:

```
1 <!DOCTYPE html>
2 <html>
3 <body>
4 <div id="buttonParent">
5 </div>
6 <script>
7   let state = {
8     count: 0
9   }
10
11   function onPressed() {
12     state.count++;
13     buttonComponentReRender()
14   }
15
16   function buttonComponentReRender() {
17     document.getElementById("buttonParent").innerHTML = "";
18     const button = document.createElement("button");
19     button.innerHTML = `Counter ${state.count}`;
20     button.setAttribute("onclick", `onPressed()`);
21     document.getElementById("buttonParent").appendChild(button);
22   }
23   buttonComponentReRender();
24 </script>
25 </body>
26 </html>
```

<https://gist.github.com/hkirat/c3d98735cec445e718b08f972dda7>

Let's create a counter app using state/components

1. State initialisation

```
Untitled-1

<!DOCTYPE html>
<html>

<body>
  <div id="buttonParent">
  </div>
  <script>
    let state = {
      count: 0
    }

    function onPress() {
      state.count++;
      buttonComponentReRender()
    }

    function buttonComponentReRender() {
      document.getElementById("buttonParent").innerHTML = "";
      const component = buttonComponent(state.count);
      document.getElementById("buttonParent").appendChild(component);
    }

    function buttonComponent(count) {
      const button = document.createElement("button");
      button.innerHTML = `Counter ${count}`;
      button.setAttribute("onclick", `onPress()`);
      return button;
    }

    buttonComponentReRender();

  </script>
</body>

</html>
```

Let's create a counter app using state/components

2. Defining the button component

```
Untitled-1

<!DOCTYPE html>
<html>

<body>
  <div id="buttonParent">
  </div>
  <script>
    let state = {
      count: 0
    }

    function onPress() {
      state.count++;
      buttonComponentReRender()
    }

    function buttonComponentReRender() {
      document.getElementById("buttonParent").innerHTML = "";
      const component = buttonComponent(state.count);
      document.getElementById("buttonParent").appendChild(component);
    }

    function buttonComponent(count) {
      const button = document.createElement("button");
      button.innerHTML = `Counter ${count}`;
      button.setAttribute("onclick", `onPress()`);
      return button;
    }

    buttonComponentReRender();

  </script>
</body>

</html>
```

Let's create a counter app using state/components

The react library



```
<!DOCTYPE html>
<html>

<body>
  <div id="buttonParent">
  </div>
  <script>
    let state = {
      count: 0
    }

    function onPress() {
      state.count++;
      buttonComponentReRender()
    }

    function buttonComponentReRender() {
      document.getElementById("buttonParent").innerHTML = "";
      const component = buttonComponent(state.count);
      document.getElementById("buttonParent").appendChild(component);
    }

    function buttonComponent(count) {
      const button = document.createElement("button");
      button.innerHTML = `Counter ${count}`;
      button.setAttribute("onclick", `onPress()`);
      return button;
    }

    buttonComponentReRender();

  </script>
</body>

</html>
```


The equivalent code in React looks like this

```
Untitled-1

<!DOCTYPE html>
<html>

<body>
  <div id="buttonParent">
  </div>
  <script>
    let state = {
      count: 0
    }

    function onButtonPress() {
      state.count++;
      buttonComponentReRender()
    }

    function buttonComponentReRender() {
      document.getElementById("buttonParent").innerHTML = "";
      const component = buttonComponent(state.count);
      document.getElementById("buttonParent").appendChild(component);
    }

    function buttonComponent(count) {
      const button = document.createElement("button");
      button.innerHTML = `Counter ${count}`;
      button.setAttribute("onclick", `onButtonPress()`);
      return button;
    }

    buttonComponentReRender();

  </script>
</body>

</html>
```

```
App.jsx > ...
1  import React from 'react'
2
3  function App() {
4    const [count, setCount] = React.useState(0)
5
6    return (
7      <div>
8        <Button count={count} setCount={setCount}></Button>
9      </div>
10    )
11  }
12
13  function Button(props) {
14    function onButtonClick() {
15      props.setCount(props.count + 1);
16    }
17    return <button onClick={onButtonClick}>Counter {props.count}</button>
18  }
19
20  export default App
21
```

The equivalent code in React looks like this

Lets start small, and then build up to this app

```
App.jsx > ...
1  import React from 'react'
2
3  function App() {
4    const [count, setCount] = React.useState(0)
5
6    return (
7      <div>
8        <Button count={count} setCount={setCount}></Button>
9      </div>
10   )
11 }
12
13 function Button(props) {
14   function onClick() {
15     props.setCount(props.count + 1);
16   }
17   return <button onClick={onClick}>Counter {props.count}</button>
18 }
19
20 export default App
21
```

The equivalent code in React looks like this

Lets start with a simple button component

```
App.jsx > Button
import React from 'react'

function App() {
  const [count, setCount] = React.useState(0)

  return (
    <div>
      <Button count={count} setCount={setCount}></Button>
    </div>
  )
}

function Button(props) {

  function onClick() {
    props.setCount(count + 1);
  }

  return React.createElement(
    'button',
    { onClick: onClick },
    `Counter ${props.count}`
  );
}

export default App
```


The equivalent code in React looks like this

Defining Button component

```
App.jsx > Button
import React from 'react'

function App() {
  const [count, setCount] = React.useState(0)

  return (
    <div>
      <Button count={count} setCount={setCount}></Button>
    </div>
  )
}

function Button(props) {

  function onClick() {
    props.setCount(count + 1);
  }

  return React.createElement(
    'button',
    { onClick: onClick },
    `Counter ${props.count}`
  );
}

export default App
```

The equivalent code in React looks like this

Defining Button component

```
Untitled-1

<!DOCTYPE html>
<html>

<body>
  <div id="buttonParent">
  </div>
  <script>
    let state = {
      count: 0
    }

    function onPressed() {
      state.count++;
      buttonComponentReRender()
    }

    function buttonComponentReRender() {
      document.getElementById("buttonParent").innerHTML = "";
      const component = buttonComponent(state.count);
      document.getElementById("buttonParent").appendChild(component);
    }

    function buttonComponent(count) {
      const button = document.createElement("button");
      button.innerHTML = `Counter ${count}`;
      button.setAttribute("onclick", `onPressed()`);
      return button;
    }

    buttonComponentReRender();

  </script>
</body>

</html>
```

```
App.jsx > Button
import React from 'react'

function App() {
  const [count, setCount] = React.useState(0)

  return (
    <div>
      <Button count={count} setCount={setCount}></Button>
    </div>
  )
}

function Button(props) {

  function onClick() {
    props.setCount(count + 1);
  }

  return React.createElement(
    'button',
    { onClick: onClick },
    `Counter ${props.count}`
  );
}

export default App
```


The equivalent code in React looks like this

Triggering re-render

```
Untitled-1

<!DOCTYPE html>
<html>

<body>
  <div id="buttonParent">
  </div>
  <script>
    let state = {
      count: 0
    }

    function onPressed() {
      state.count++;
      buttonComponentReRender()
    }

    function buttonComponentReRender() {
      document.getElementById("buttonParent").innerHTML = "";
      const component = buttonComponent(state.count);
      document.getElementById("buttonParent").appendChild(component);
    }

    function buttonComponent(count) {
      const button = document.createElement("button");
      button.innerHTML = `Counter ${count}`;
      button.setAttribute("onclick", `onPressed()`);
      return button;
    }

    buttonComponentReRender();

  </script>
</body>

</html>
```

```
App.jsx > Button
import React from 'react'

function App() {
  const [count, setCount] = React.useState(0)

  return (
    <div>
      <Button count={count} setCount={setCount}></Button>
    </div>
  )
}

function Button(props) {

  function onClick() {
    props.setCount(count + 1);
  }

  return React.createElement(
    'button',
    { onClick: onClick },
    `Counter ${props.count}`
  );
}

export default App
```


The equivalent code in React looks like this

Jsx syntax is a cleaner way to wrote components

```
App.jsx > Button
import React from 'react'

function App() {
  const [count, setCount] = React.useState(0)

  return (
    <div>
      <Button count={count} setCount={setCount}></Button>
    </div>
  )
}

function Button(props) {

  function onClick() {
    props.setCount(count + 1);
  }

  return React.createElement(
    'button',
    { onClick: onClick },
    `Counter ${props.count}`
  );
}

export default App
```

```
src > App.jsx > ...
1  import React from 'react'
2
3  function App() {
4    const [count, setCount] = React.useState(0)
5
6    return (
7      <div>
8        <Button count={count} setCount={setCount}></Button>
9      </div>
10   )
11 }
12
13 function Button(props) {
14   function onClick() {
15     props.setCount(props.count + 1);
16   }
17   return <button onClick={onClick}>Counter {props.count}</button>
18 }
19
20 export default App
21
```

The equivalent code in React looks like this

What Is jsx

JSX stands for JavaScript XML. It is a syntax extension for JavaScript, most commonly used with React, a popular JavaScript library for building user interfaces. JSX allows you to write HTML-like code directly within JavaScript. This makes it easier to create and manage the user interface in React applications.

<https://gist.github.com/hkirat/dcc85803a20639826bf8f64c6be24a31>