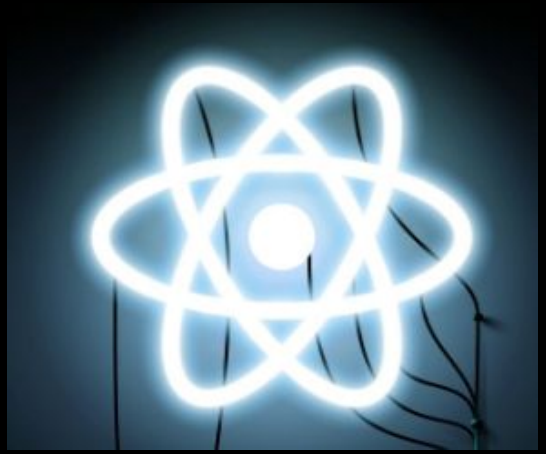
FS IV- Lecture

Intro to React Hooks



Topics

- Component Review
- Disadvantages of Components
- React Hooks!

Components Review

Functional vs Class Component Recap

Functional Component

```
import React from 'react';

const Greeter = React.createClass({
  render: function() {
    return <div>Hello {this.props.firstName}</div>;
  }
});

export default Greeter;
```

Class Component

```
import React, { Component } from 'react';

class Greeter extends Component {
  render() {
    return <div>Hello {this.props.firstName}</div>;
  }
}

export default Greeter;
```

Class Component - State and Life Cycle

```
import React, { Component } from 'react';

class Greeter extends Component {
  state = {
    loaded: false
  };

  componentDidMount() {
    this.setState({ loaded: true });
  }

  render() {
    return <div>Hello {this.props.firstName}</div>;
  }
}

export default Greeter;
```

Class Components - Disadvantages

Class Component Disadvantage #1 - No Autobinding

```
1  class Counter extends Component {
2    state = { count: 0 };
3
4    onClick() {
5      this.setState({ count: this.state.count + 1 });
```

```
▸Uncaught TypeError: Cannot read property 'setState' of undefined
    at onClick (Counter.js:79)
    at HTMLUnknownElement.callCallback (react-dom.development.js:147)
    at Object.invokeGuardedCallbackDev (react-dom.development.js:196)
    at invokeGuardedCallback (react-dom.development.js:250)
    at invokeGuardedCallbackAndCatchFirstError (react-dom.development.js:26
    at executeDispatch (react-dom.development.js:622)
    at executeDispatchesInOrder (react-dom.development.js:647)
```

```
12         </button>
13       );
14     }
15   }
```

- React components using ES6 classes no longer autobind this to non React methods.
- In your constructor, you need to add:

  this.onChange = this.onChange.bind(this)

Class Component Disadvantage #2 - Single Responsibility

```
class Clock extends Component {
  state = { now: new Date().toLocaleTimeString() };

  componentDidMount() {
    this.handle = setInterval(
      () ⇒
        this.setState({
          now: new Date().toLocaleTimeString()
        }),
      1000
    );
  }
  componentWillUnmount() {
    clearInterval(this.handle);
  }
  render() {
    return <div>{this.state.now}</div>;
  }
}
```

- Single responsibility in multiple functions
- Unrelated mixed in logic in lifecycle methods can get repetitive, and cause unnecessary side effects

Class Component Disadvantage #3 - Deeply Nested Components

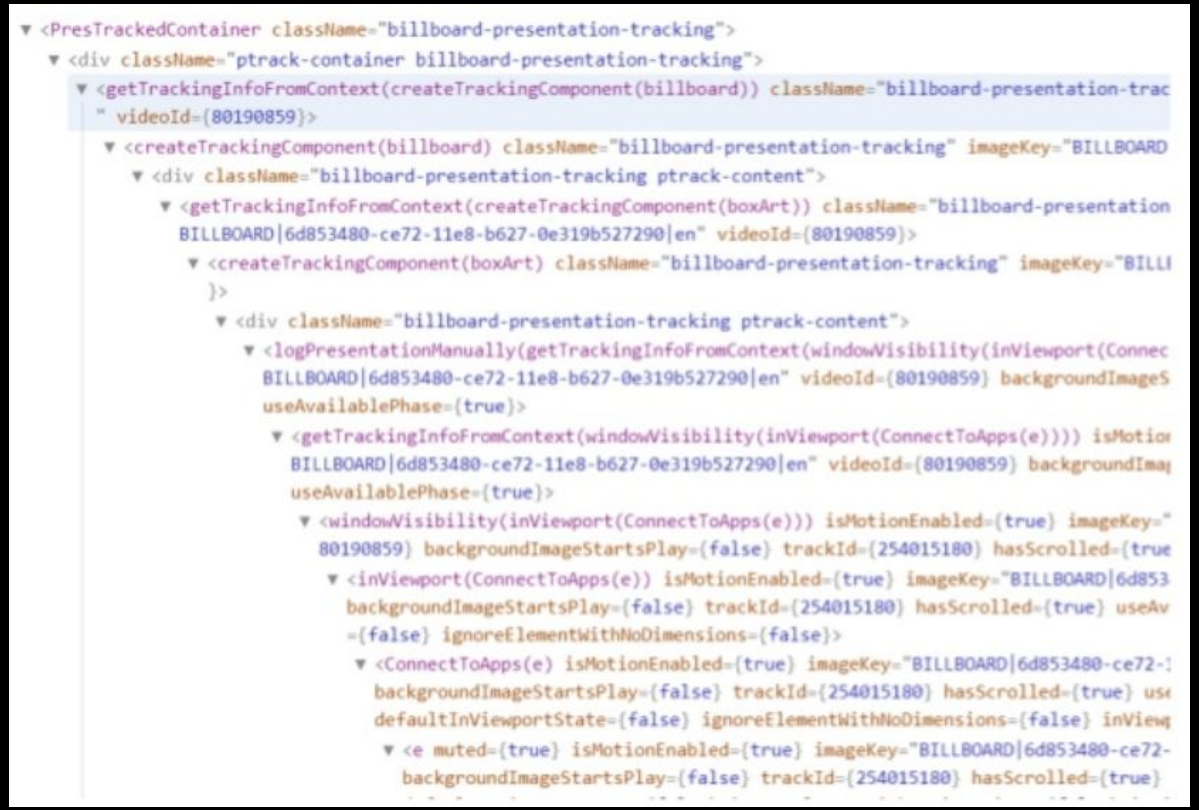
- Managing State: Reusing logic between multiple components can lead to wrapper hell or deeply nested components.

Functional Components - Disadvantages

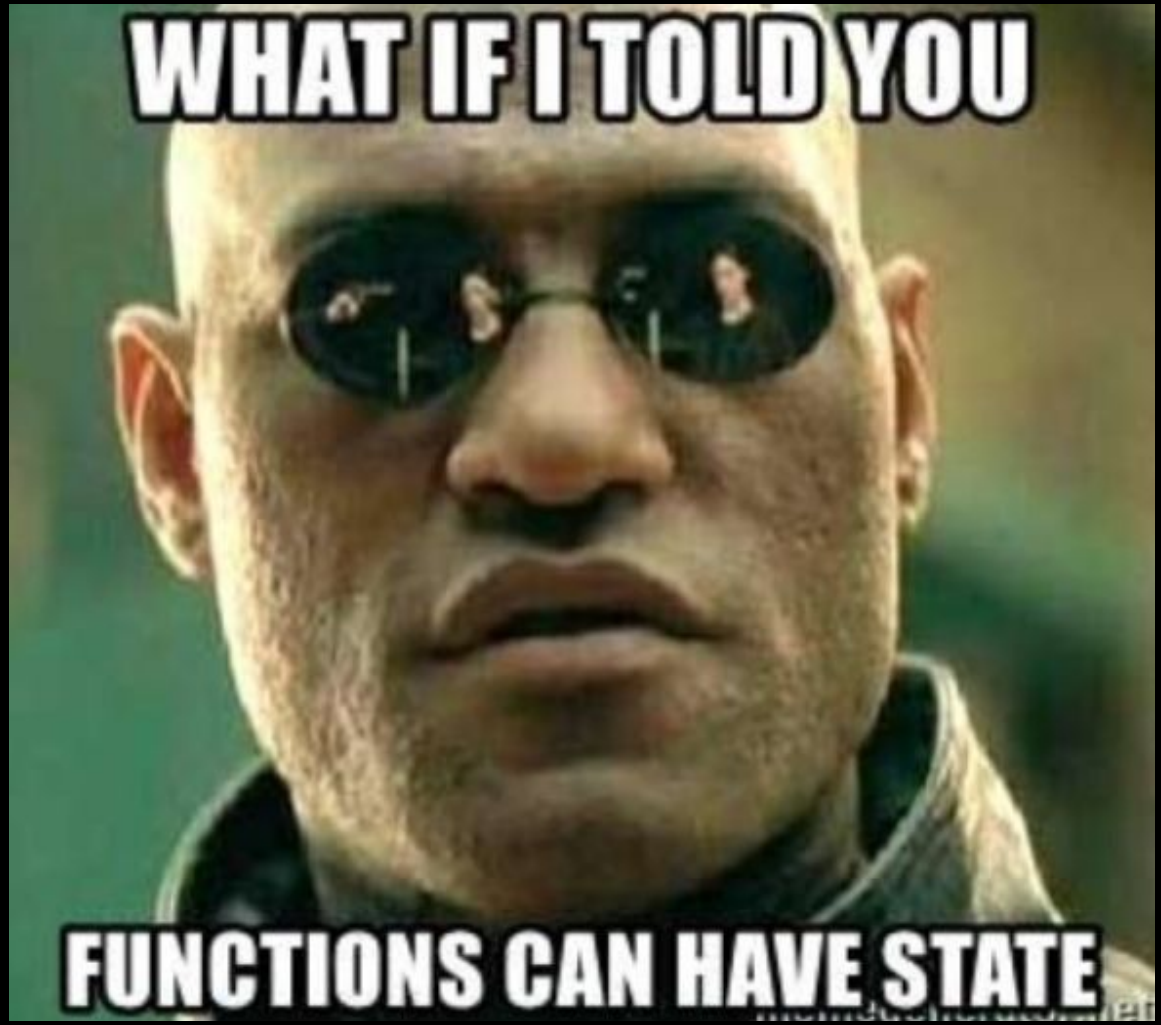
Functional Component Disadvantage #1 - No State & Life Cycle!

```
import React from 'react';

const Greeter = props ⇒ {
  return <div>Hello {props.firstName}</div>;
};

export default Greeter;
```

Functional Component Disadvantage #2 - Deep Nesting



- Deeply Nested Components
- Many are wrappers to add props


WHAT IF I TOLD YOU
FUNCTIONS CAN HAVE STATE

React Hooks!

React Hooks!

- Basic hooks
  - useState()
  - useEffect()
  - useContext()
- Additional Hooks
  - useReducer()
  - useMutationEffect()
  - useLayoutEffect ()
  - useCallback ()
  - useMemo()
  - useRef()
  - useImperativeMethods()
- Custom hooks

- Hooks are a new addition in React 16.8.
- They let you use state and other React features without writing a class.

useState() Hook

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

const Counter = () => {
  const [count, setCount] = useState(1);

  return (
    <div>
      <p>The counter is: {count}</p>
      <button onClick={
          () => setCount(count + 1)}>
        Increment
      </button>
    </div>
  );
};

export default Counter;
```

- The *State Hook* lets you have state in functional components without using class

Class Component Example

```
class Example extends React.Component {
  constructor(props) {
    super(props);
    this.state = {
      count: 0
    };
  }

  render() {
    return (
      <div>
        <p>You clicked {this.state.count} times</p>
        <button onClick={() => this.setState({ count: this.state.count + 1 })}>
          Click me
        </button>
      </div>
    );
  }
}
```

Equivalent Function Component - useState Example

```jsx
import React, { useState } from 'react';

function Example() {
  // Declare a new state variable, which we'll call "count"
  const [count, setCount] = useState(0);

  return (
    <div>
      <p>You clicked {count} times</p>
      <button onClick={() => setCount(count + 1)}>
        Click me
      </button>
    </div>
  );
}
```

useEffect() Hook

```
import React, { useEffect, useState } from 'react';
import AnalogClock from './AnalogClock';

const Clock = ({ interval }) => {
  const [time, setTime] = useState(new Date());

  useEffect(
    () => {
      const handle = setInterval(
        () => setTime(new Date()), interval);

      return () => clearInterval(handle);
    },
    [interval]
  );

  return <AnalogClock time={time} />;
};

export default Clock;
```

- he *Effect Hook* lets you perform side effects in function components

```jsx
class Example extends React.Component {
  constructor(props) {
    super(props);
    this.state = {
      count: 0
    };
  }

  componentDidMount() {
    document.title = `You clicked ${this.state.count} times`;
  }
  componentDidUpdate() {
    document.title = `You clicked ${this.state.count} times`;
  }

  render() {
    return (
      <div>
        <p>You clicked {this.state.count} times</p>
        <button onClick={() => this.setState({ count: this.state.count + 1 })}>
          Click me
        </button>
      </div>
    );
  }
}
```

Equivalent Function Component - useEffect Example

```jsx
import React, { useState, useEffect } from 'react';

function Example() {
  const [count, setCount] = useState(0);

  // Similar to componentDidMount and componentDidUpdate:
  useEffect(() => {
    // Update the document title using the browser API
    document.title = `You clicked ${count} times`;
  });

  return (
    <div>
      <p>You clicked {count} times</p>
      <button onClick={() => setCount(count + 1)}>
        Click me
      </button>
    </div>
  );
}
```

Context API and Hooks

Context API

- Context is designed to share data that can be considered “global” for a tree of React components, such as the current authenticated user, theme, or preferred language

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

const TimeContext = createContext(new Date());

export default TimeContext;
```

Context API

```
import React, { Component } from 'react';
import TimeContext from './TimeContext';
import ThemeContext from './ThemeContext';
import AnalogClock from './AnalogClock';

class Clock extends Component {
  render() {
    return (
      <TimeContext.Consumer>
        {({ time }) => (
          <ThemeContext.Consumer>
            {({ theme }) => (
                <AnalogClock time={time} theme={theme} />
            )}
          </ThemeContext.Consumer>
        )}
      </TimeContext.Consumer>
    );
  }
}

export default Clock;
```

- Context provides a way to pass data through the component tree without having to pass props down manually at every level.

useContext() Hook

```
import React, { useContext } from 'react';
import TimeContext from './TimeContext';
import ThemeContext from './ThemeContext';
import AnalogClock from './AnalogClock';

const Clock = () => {
  const time = useContext(TimeContext);
  const theme = useContext(ThemeContext);

  return <AnalogClock time={time} theme={theme}
};

export default Clock;
```

- *Context Hook*, gives functional components easy access to your context

Rules with Hooks

- Hooks can only be used in functional components
  - Or in other hooks
  - Not in class based components
- Hooks must be created in the same order
  - Must be used outside loops, conditions or nest functions
- Hooks names must be prefixed with 'use'