WEB TECHNOLOGIES

React JS – Component States and LifeCycle Methods

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Acknowledgement
The slides are created from various internet resources with valuable contributions from multiple professors and teaching assistants in the university.

Component States and LifeCycle Methods

Agenda

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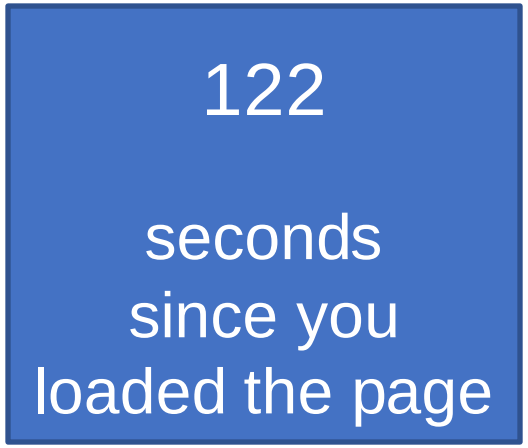
- Introduction to Life cycle
- Pictorial Representation of methods
- Life cycle methods in brief
- Key Methods in the React Component Lifecycle: From Mounting to Unmounting
- Demo

React.JS – Stateful Components

Counter Component

- Let’s consider this Component that shows the number of seconds the user has been on the page



React.JS – Stateful Components

Counter Component…(cntd.)

- We consider two Components, CounterDisplay and Counter

```
ReactDOM.render(
        <CounterDisplay/>,
        document.querySelector("#container")
);
```

```
class CounterDisplay extends React.Component {
        render() {
                return (
                        <div>
                                <Counter/>
                                <h2>seconds </h2>
                                <h2>since you loaded the page</h2>
                        </div>
                );
        }
}
```

```
class Counter extends React.Component {
        render() {
                return (
                        …
                );
        }
}
```

React.JS – Stateful Components

Counter Component…(cntd.)

- We use the ***constructor*** method to initialize the counter
- The Component also has the method ***componentDidMount*** that can be used to start the counter
- It also exposes the ***setState*** method to update the state (the counter)

React.JS – Stateful Components

Counter Component…(cntd.)

- We use these methods as follows

```
class Counter extends React.Component {
        constructor(props, context) {
                super(props, context);

                this.state = {
                        seconds: 0
                };
        }

        render() {
                return (
                        <h1>{this.state.seconds}</h1>
                );
        }
}
```

Add this code after the constructor:

```
componentDidMount() {
        setInterval(this.timerTick, 1000);
}
timerTick() {
        this.setState({
                seconds: this.state.seconds + 1
        });
}
```

React.JS – Stateful Components

Counter Component…(cntd.)

- To bring in the stateful Component behaviour, that also ensures that state variable seconds is never out of sync

```
this.setState((prevState) => {
    return {
        seconds: prevState.seconds
        + 1
    };
});
```

```
timerTick() {
    this.setState({
        seconds: this.state.seconds + 1
    });
}
```

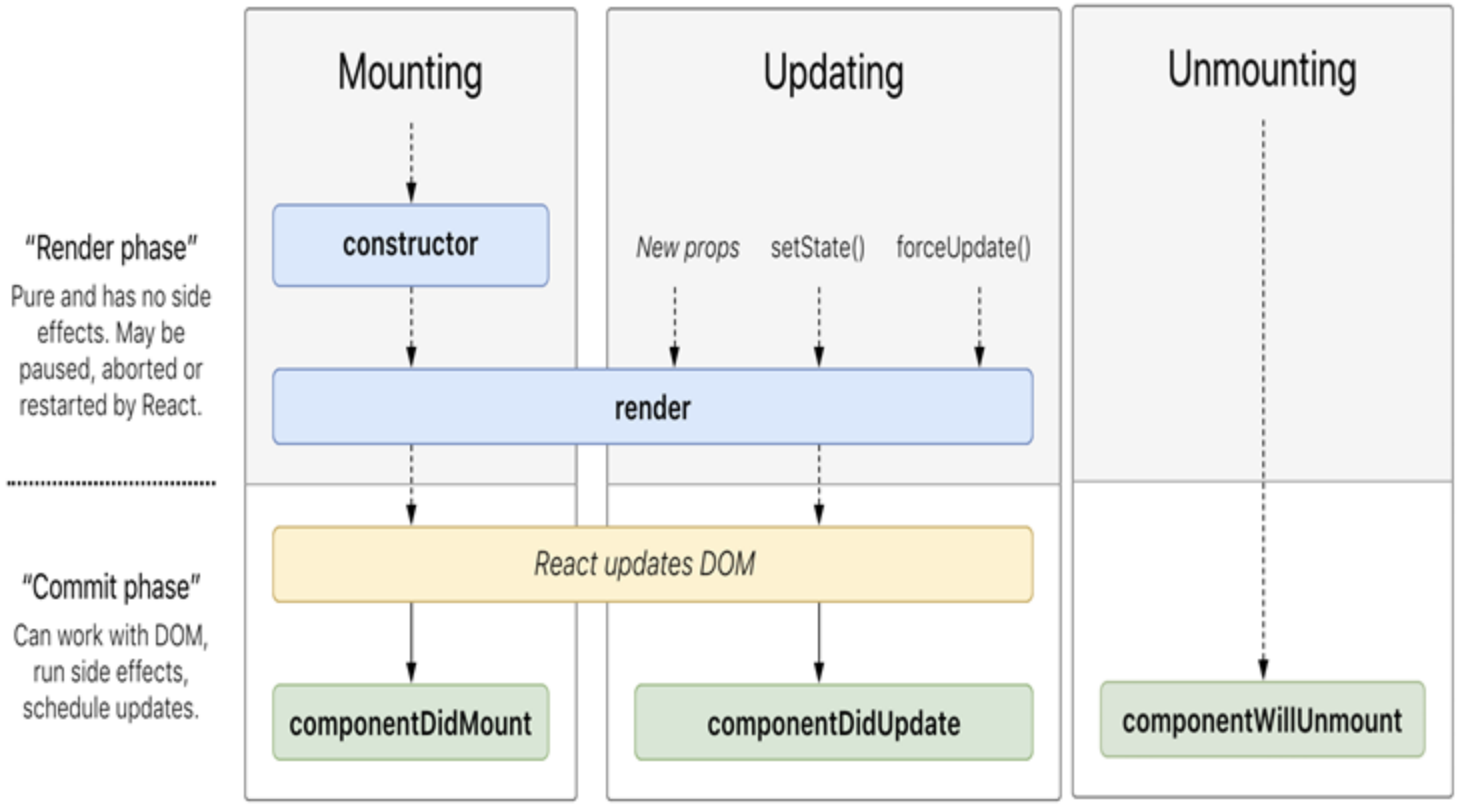
- To ensure that the this.state works well in the timerTick method, add the following line to call that function with the context of the Component

```
constructor(props, context) {
    …
    this.timerTick = this.timerTick.bind(this);
}
```

Component States and LifeCycle methods

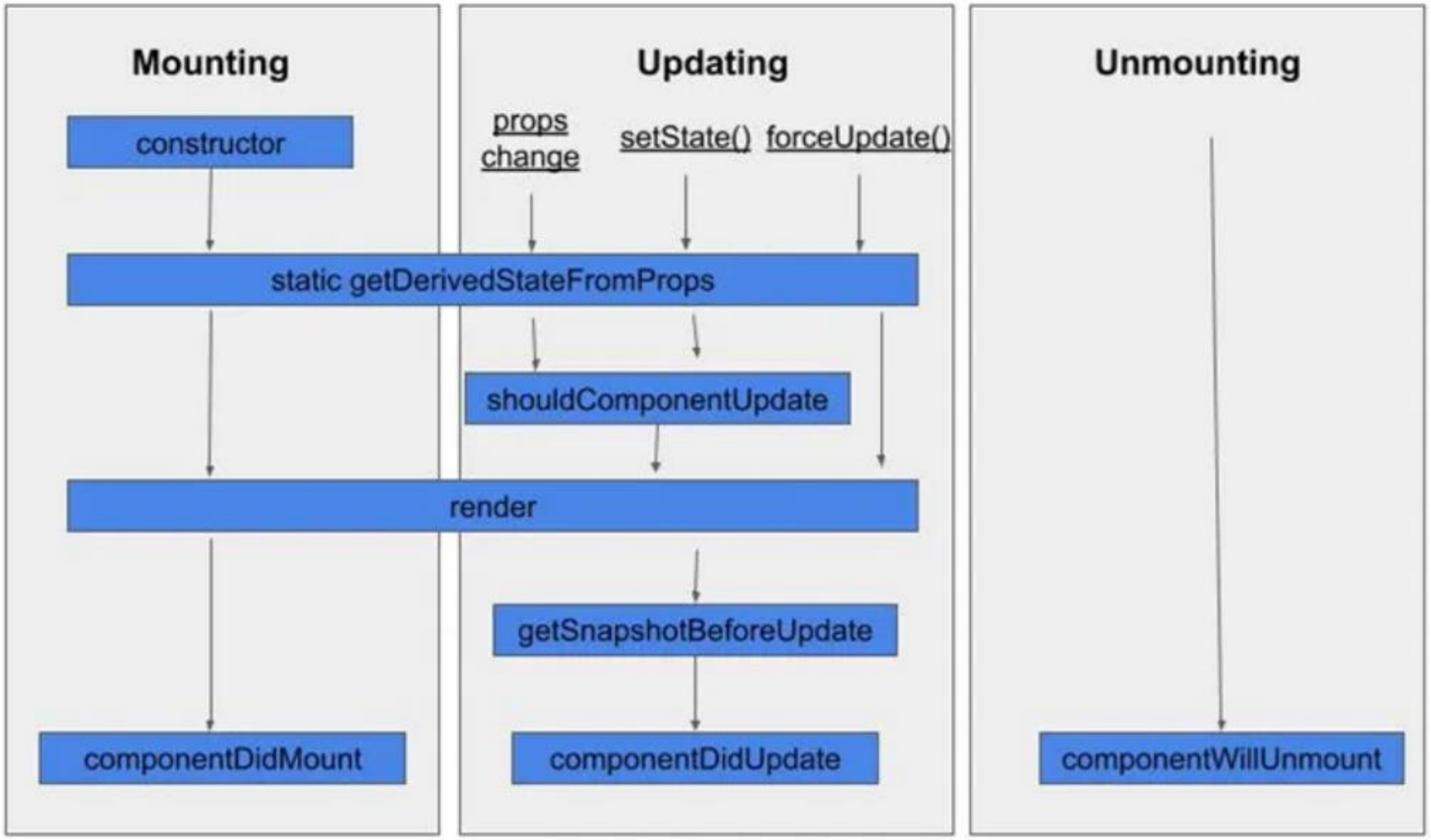
Introduction to Life Cycle

- The series of events that happen from the starting of a React component to its ending.
- Every component in React should go through the following lifecycle of events.
  - **Mounting** - Birth of the Component
  - **Updating**- Growing of component
  - **Unmounting**- End of the component



Component States and LifeCycle methods

Pictorial Representation of methods



Component States and LifeCycle methods

Methods

- **constructor()**
  - Called before the component is mounted.
  - Implementation requires calling of super(props) before further moving. Otherwise, this.props will be undefined in the constructor, which can lead to a major error in the application.
  - Supports Initializing the state and Binding our component
- **render()**
  - Most useful life cycle method as it is the only method that is required
  - Handles the rendering of component while accessing ***this.state*** and **this.props**

Component States and LifeCycle methods

Methods continued..

- **componentDidMount()**
  - The best place to initiate API calls in order to fetch data from remote servers
  - Use setState which will cause another rendering but It will happen before the browser updates the UI. This is to ensure that the user won't see the intermediate state
  - AJAX requests and DOM or state updates should occur here
  - Also used for integration with other JavaScript frameworks like Node.js and any functions with late execution such as **setTimeout** or **setInterva**l

Component States and LifeCycle methods

Methods continued..

getDerivedStateFromProps()

- This method is invoked right before rendering, both during the initial mount and when the component is re-rendered due to changes in props.
- It was used to compare the incoming props (nextProps) with the current props (this.props) and make state updates or logic adjustments accordingly before the next render.

- **shouldComponentUpdate()**
  - allows you to control whether a component should re-render when there are changes to its props or state.
  - Allows a component to exit the Update life cycle if there's no reason to use a replacement render.
  - It returns either true (the component will re-render) or false (the component will not re-render).

Component States and LifeCycle methods

Methods continued..

- **getSnapshotBeforeUpdate()-** for capturing information from the DOM before re-rendering. To capture some properties (a "snapshot") from the DOM before updates occur, which you can then pass into componentDidUpdate() to make adjustments after the update

- **componentDidUpdate()**
  - Is invoked immediately after updating occurs. Not called for the initial render.
  - Will not be invoked if **shouldcomponentUpdate() returns false**.
- **componentWillUnmount()**
  - Called when a component is being removed from the DOM

Component States and LifeCycle methods

Key Methods in the React Component Lifecycle: From Mounting to Unmounting

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Mounting (Birth of the Component): This phase occurs when a component is created and inserted into the DOM for the first time. The key lifecycle methods or hooks that run during this phase include:

- **constructor():** Initializes the component's state.
- **render():** Returns the JSX to display.
- **componentDidMount()** (class components) / **useEffect(() => {}, [])** (functional components): Executed after the component is mounted, typically used for API calls or subscriptions.

Component States and LifeCycle methods

Key Methods in the React Component Lifecycle: From Mounting to Unmounting

Updating (Growth of the Component): This happens when the component's state or props change, causing it to re-render. The key methods/hooks during this phase include:

- **shouldComponentUpdate()** (class components): Determines whether the component should re-render.
- **render():** Re-renders the JSX when state or props change.
- **componentDidUpdate()** (class components) / **useEffect()** (functional components): Runs after the component has updated.

Component States and LifeCycle methods

Key Methods in the React Component Lifecycle: From Mounting to Unmounting

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Unmounting (End of the Component): This phase happens when the component is removed from the DOM. The key lifecycle method is:

- **componentWillUnmount()** (class components) / Cleanup function in **useEffect()** (functional components): Used for cleanup tasks like cancelling API calls or removing event listeners.

Component States and LifeCycle methods

Demo of diff lifecycle methods

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THANK YOU

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