

# day1

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## Introduction

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React Js Is a Javascript Library for building frontend application or UI The main reason to use it is it's reusable ui components

### Advantages of ReactJS

- Reusable Components
- Open source
- Efficient and Fast
- Works in Browser
- Vast Community

## How ReactJs works

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- Creates a Virtual Dom
- This Guy checks all the time what has changed with it's past self with the present code and change only them
- So the other things don't change
- So the application acts as a single page application(working without reloading)
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# day2

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## React Requirements:-

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- NPM:- It is a js packagemanager. It is used to take advantages of third party packages and easily install or update them.
- Webpack:- It is a static module bundler for modern js application. When webpack processes the application , it internally builds a dependency graph which maps every module the project needs and generates one or more bundles
- Babel - It's a toolchain that is mainly used to convert es6+ code into backward compatible versions of js in current and older browsers.

## How to create react application without using babel webpack,cdn links and jsx

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- `React.createElement(type,props,children)`

- type-> type of html element or component
- props -> properties of the object
- children -> anything need to be put between the dom elements
- render() -> It is the only required method in a class component . It examines this.props and this.state . it returns one of the following types:
  - React elements -> these are created via jsx
  - array and fragments -> React can't return multiple elements together so they use arrays.
- ReactDOM.render(element,DOMnode)->
  - element:- which element u want to render
  - DOMnode:- where u want to render

Ex:-

```
ReactDOM.render(<App />, document.getElementById("root"));
```

## React directory structure

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# Directory Structure

**my-app** – This is your Project Name  
**node\_modules** – It contains all packages and dependencies installed.  
**public** –  
 favicon.ico – It's a favicon for website  
**index.html** – This file holds the HTML template of our app.  
**manifest.json** – manifest.json provides metadata used when your web app is installed on a user's mobile device or desktop.  
**src** –  
 App.css – It's a css file related to App.js but its global.  
 App.js – It's Parent component of your react app  
 App.test.js – Its Test environment  
 index.css - It's a css file related to index.js but its global  
**index.js** – It's the JavaScript entry Point.  
 logo.svg – React logo file  
 serviceWorker.js – It can help to access website offline.  
**.gitignore** – It is used when you want to ignore git push.  
**package-lock.json** – Its version control package json file  
**package.json** – All dependencies mentioned in this file.  
**README.md** – It readme file

For the project to build, these files must exist with exact filenames

Public folder's content doesn't get bundled , They are just copied while making stuff

## day3

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## Create First app

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- **npx create-next-app@latest** >I have no clue
- **npm create vite@latest**

# render method, createElement method and ReactDOM render method

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## render() Method

The render() method is the only required method in a class component. It examines this.props and this.state . It returns one of the following types:

React elements – These are created via JSX(Not required).

For example, <div /> and <App /> are React elements that instruct React to render a DOM node, or another user-defined component, respectively.

Arrays and fragments - It is used to return multiple elements from render.

Portals – It is used to render children into a different DOM subtree.

String and numbers - These are rendered as text nodes in the DOM.

Booleans or null - It renders nothing. (Mostly exists to support return test && <Child /> pattern, where test is boolean.)

Note - The render() function should be pure, meaning that it does not modify component state, it returns the same result each time it's invoked, and it does not directly interact with the browser.

## React Element

You can create a react element using React.createElement() method but there is a easy way to create element via JSX.

### Using createElement() Method

```
React.createElement("h1", null, "Hello GeekyShows");
```

### Using JSX

```
<h1>Hello GeekyShows</h1>
```

## ReactDOM.render(element, DOMnode)

ReactDOM.render(element, DOMnode) - It takes a React Element and render it to a DOM node.

Syntax:- ReactDOM.render(element, DOMnode)

- The first argument is which component or element needs to render in the dom.
- The second argument is where to render in the dom.

Ex:-

```
ReactDOM.render(<App />, document.getElementById("root"));
```

## Fragments

it is used to group a list of children without adding extra nodes to the dom

- <></>
- <React.Fragment></React.Fragment>

## Components

# Components

- Components are the building blocks of any React app.
- Components let you split the UI into independent, reusable pieces, and think about each piece in isolation.
- Components are like JavaScript functions. They accept arbitrary inputs (called “props”) and return React elements describing what should appear on the screen.
- Always start component names with a capital letter.
- React treats components starting with lowercase letters as DOM tags. For example, <div /> represents an HTML div tag, but <App /> represents a component requires App to be in scope.

## day4

# Compose Components in ReactJS

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- Did last day

## difference between functional and class Component

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- Use functional components if we are writing a presentational component which doesn't have its own state or needs to access a lifecycle hook. You cannot use `setState()` in your component because Functional Components are pure Javascript function.

**Note:-** After 16.8 update it has `useState` and `useEffect` and other hooks to manage state and lifecycle logic

- Class Components Definition: ES6 classes that extend `React.Component` and must have a `render()` method returning JSX.

State: Can use `this.state` and `this.setState()` to manage state.

Lifecycle Methods: Support built-in lifecycle methods like `componentDidMount()`, `componentDidUpdate()`, etc.

## JSX

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JSX stands for JavaScript XML. It is a extension to JavaScript. Jsx is a preprocessor step that XML syntax

It produces React Element It is easier to understand in {} we have to use them for writing js directly! [alt text](#)

## Specifying Attributes with JSX

You may use quotes to specify string literals as attributes.

Syntax:-

```
const el = <h1 attribute="value"></h1>
```

Ex:-

```
const el = <h1 className="bg">Hello</h1>
```

```
const el = <label htmlFor="name">Name</label>
```

You may also use curly braces to embed a JavaScript expression in an attribute.

```
const el = <h1 className={ac.tab}>Hello</h1>
```

```
ReactDOM.render(<App name="Rahul" />, document.getElementById("root"));
```

Note –

- Since JSX is closer to JavaScript than to HTML, React DOM uses camelCase property naming convention instead of HTML attribute names.
- Don't put quotes around curly braces when embedding a JavaScript expression in an attribute. You should either use quotes (for string values) or curly braces (for expressions), but not both in the same attribute.

# Props

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- It is the jsx attributes
- **Note** -> Each element name should be in capital Letter
- In class based components we have to use this.props. to access them

## PropType

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- It is used to make sure the type of the properties
  - At first Installation

```
npm install --save prop-types
```

- then

```
import PropTypes from 'prop-types';
Student.propTypes ={
    name: PropTypes.string
}

Student.propTypes ={
    name: PropTypes.string.isRequired // It is for is required
logic means u can't pass null
}
Student.defaultProps ={
    name: "<default value>"
}
```

# day5

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## ✓ Children in JSX

- In **JSX**, any content placed between an opening and closing tag is passed to the component as a special prop called `props.children`.
  - Example:

```
<Student>Hello, I'm a child!</Student>
```

## ✓ Functional Component Example

---

```
import React from "react";

const Student = (props) => {
  return <div>{props.children}</div>;
};

export default Student;
```

## ✓ Class Component Example

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

class Student extends Component {
  render() {
    return <div>{this.props.children}</div>;
  }
}

export default Student;
```

## ✓ State in React

**State** is used to manage dynamic data in a component. It is **private** to the component and determines how the component renders and behaves.

### ✗ Outdated Statement:

~~We can create state only in class components.~~ ✓ **Correct:** With the introduction of **Hooks**, we can now create state in **functional components** as well.

## ✓ 3 Ways to Declare State

### 1 Functional Component with **useState** (Modern – Recommended)

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

const Student = (props) => {
  const [name, setName] = useState("Rahul");
  const [roll, setRoll] = useState(props.roll);

  return (
    <div>
```

```
{name} - {roll}
</div>
);
};

export default Student;
```

---

## 2 Class Component – Directly Inside Class (Old but Valid)

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

class Student extends Component {
  state = {
    name: "Rahul",
    roll: this.props.roll,
  };

  render() {
    return (
      <div>
        {this.state.name} - {this.state.roll}
      </div>
    );
  }
}

export default Student;
```

---

## 3 Class Component – Inside Constructor (Older Style)

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

class Student extends Component {
  constructor(props) {
    super(props);
    this.state = {
      name: "Rahul",
      roll: this.props.roll,
    };
  }

  render() {
    return (
      <div>
        {this.state.name} - {this.state.roll}
      </div>
    );
  }
}
```

```
    }  
}  
  
export default Student;
```

- When the component class is created, the constructor is the first method called, so it's the right place to add state.
- The class instance has already been created in memory, so you can use *this* to set properties on it.
- When we write a constructor, make sure to call the parent class' constructor by super(props)
- When you call super with props, React will make props available across the component through this.props

## Event Handling

The actions to which JavaScript can respond are called Events.

# Event Handling

Handling events with React elements is very similar to handling events on DOM elements. There are some syntactic differences:

- React events are named using camelCase, rather than lowercase.
- With JSX you pass a function as the event handler, rather than a string.

### In HTML

```
<button onclick="handleClick()">Click Me</button>
```

### In React

```
<button onClick={handleClick}>Click Me</button> // Function Component
```

now this works kinda different in js . it behaves differently depending on the situations. If in interview they ask to implement this without implementing it using arrow function

```

import React, { Component } from "react";
class Student extends Component {
  constructor(props) {
    super(props);
    this.handleClick = this.handleClick.bind(this);
  }
  handleClick() {
    console.log("Button Clicked", this);
  }
  render() {
    return (
      <div>
        <h1>Hello Event</h1>
        <button onClick={this.handleClick}>Click Me</button>
      </div>
    );
  }
}

```

[www.geekushow.com](http://www.geekushow.com)

- Mouse Events

Event	Description
onClick	User clicks on an element
onDoubleClick	User double-clicks on an element
onMouseDown	Mouse button is pressed
onMouseUp	Mouse button is released
onMouseEnter	Cursor enters an element (no bubbling)
onMouseLeave	Cursor leaves an element (no bubbling)
onMouseMove	Mouse is moved over an element
onMouseOver	Mouse is over an element or its children
onMouseOut	Mouse leaves an element or its children

- Keyboard Events

Event	Description
onKeyDown	Key is pressed down
onKeyPress	Key is pressed (deprecated, use <code>onKeyDown</code> )

Event	Description
onKeyUp	Key is released

- Form Events

Event	Description
onChange	Value of input/textarea/select changes
onInput	User input in text field
onSubmit	Form submission
onReset	Form reset
onInvalid	Form field validation fails
onSelect	Text is selected in input/textarea

- Focus Events

Event	Description
onFocus	Element receives focus
onBlur	Element loses focus

- Clipboard Events

Event	Description
onCopy	Copy operation triggered
onCut	Cut operation triggered
onPaste	Paste operation triggered

- Composition Events

Event	Description
onCompositionStart	Composition starts (IME)
onCompositionUpdate	During composition
onCompositionEnd	Composition ends

- Touch Events (Mobile)

Event	Description
onTouchStart	Finger touches the screen
onTouchMove	Finger moves on screen

Event	Description
onTouchEnd	Finger lifted from screen
onTouchCancel	Touch event interrupted

- ✓ Pointer Events

Event	Description
onPointerDown	Pointer is pressed down
onPointerMove	Pointer is moved
onPointerUp	Pointer is released
onPointerCancel	Pointer is canceled
onPointerEnter	Pointer enters element
onPointerLeave	Pointer leaves element
onPointerOver	Pointer is over element or child
onPointerOut	Pointer leaves element or child

- ✓ UI Events

Event	Description
onScroll	Element is scrolled
<b>Wheel Events</b>	
onWheel	Mouse wheel or trackpad used

- ✓ Media Events

Event	Description
onAbort	Media load aborted
onCanPlay	Media can start playing
onCanPlayThrough	Media can play through
onDurationChange	Duration metadata loaded
onEmptied	Media becomes empty
onEncrypted	Encrypted media encountered
onEnded	Playback reaches end
onLoadedData	Media data loaded

<b>Event</b>	<b>Description</b>
<code>onLoadedMetadata</code>	Metadata (duration, etc.) loaded
<code>onLoadStart</code>	Media loading started
<code>onPause</code>	Media is paused
<code>onPlay</code>	Media is starting to play
<code>onPlaying</code>	Media is playing
<code>onProgress</code>	Media is downloading
<code>onRateChange</code>	Playback rate changed
<code>onSeeked</code>	Seek operation completed
<code>onSeeking</code>	Seeking in progress
<code>onStalled</code>	Fetching media is stalled
<code>onSuspend</code>	Media fetch suspended
<code>onTimeUpdate</code>	Time indicated by the <code>currentTime</code>
<code>onVolumeChange</code>	Volume changed
<code>onWaiting</code>	Playback is waiting for more data

- Image Events

<b>Event</b>	<b>Description</b>
<code>onLoad</code>	Image or iframe is loaded
<code>onError</code>	Error occurred while loading

- Animation Events

<b>Event</b>	<b>Description</b>
<code>onAnimationStart</code>	CSS animation starts
<code>onAnimationEnd</code>	CSS animation ends
<code>onAnimationIteration</code>	CSS animation repeats

- Transition Events

<b>Event</b>	<b>Description</b>
<code>onTransitionEnd</code>	CSS transition completes

- Drag Events

<b>Event</b>	<b>Description</b>

Event	Description
onDrag	Element is being dragged
onDragStart	Dragging starts
onDragEnd	Dragging ends
onDragEnter	Draggable enters a target
onDragLeave	Draggable leaves a target
onDragOver	Draggable is over a target
onDrop	Dropped on a target

## setState

In React, `setState` is a method used to update the state of a component. It triggers a re-render with the new state.

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

  increment = () => {
    this.setState({ count: this.state.count + 1 });
  };

  render() {
    return <button onClick={this.increment}>Count: {this.state.count}</button>;
  }
}
```

- Asynchronous: `setState` doesn't update the state immediately.
- Batched Updates: React may combine multiple `setState` calls for performance.
- Function Form (when new state depends on previous state):

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

## Passing Arguments to Event handlers in ReactJS

# Passing Arguments to Event Handlers

- **Arrow Function**

```
<button onClick={(e) => this.handleClick(id, e)}>Delete</button>
```

- **Bind Method**

```
<button onClick={this.handleClick.bind(this, id)}>Delete</button>
```

**Note:-**

- In both cases, the *e* argument representing the React event will be passed as a second argument after the ID.
- With an arrow function, we have to pass it explicitly, but with bind any further arguments are automatically forwarded.

inplace of the extra function we can pass it as arrow function inside the jsx/tsx itself

there's also another way

```
<button onClick={this.handleClick.bind(this, id)}>Delete</button>
```

## day6

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## Life Cycle of Components in React

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In React, components go through a lifecycle of events from creation to destruction. Understanding these lifecycle methods is crucial for managing side effects, optimizing performance, and ensuring that your components behave as expected. They are divided into three main phases:

1. **Mounting:** When an instance of a component is being created and inserted into the DOM.
2. **Updating:** When a component is being re-rendered as a result of changes to either its props or state.
3. **Unmounting:** When a component is being removed from the DOM.
4. **Error Handling:** When an error occurs during rendering, in a lifecycle method, or in the constructor of any child component.

## mounting:-

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- Mounting is the process of creating an element and inserting it in a DOM tree

Following methods are called in the following order when an instance of a component is being created and inserted into the DOM

- **constructor**

- static getDerivedStateFromProps
- render
- componentDidMount

## Constructor

The constructor is called before a React component is mounted. When implementing the constructor for a React.Component subclass , you should call super(props) before any other statement. Otherwise, this.props will be undefined in the constructor, which can lead to bugs.

React Constructors are used only for 2 purpose

- Initializing local state by assignig an object to this.state
- binding event handler methods to an instance.

```
constructor(props) {  
  super(props);  
  this.state = {  
    name: "Rahul",  
    roll: this.props.roll  
  };  
  this.handleClick = this.handleClick.bind(this);  
}
```

## getDerivedStateFromProps

getDerivedStateFromProps is invoked right before calling the render method, both on the initial mount and on subsequent updates. It should return an object to update state, or null to update nothing. Yhis method exists for rare use cases where the state depends on changes in props over time. It is a static method, so it does not have access to this.

```
static getDerivedStateFromProps(props, state) {  
  // Return an object to update state, or null to update nothing.  
  return null;  
}
```

## Render

The render() method is the only required method in a class component. It examines this.props and this.state. It returns one of the following types:

- React elements - These are created via JSX(Not required). For example, and are React elements that instruct React to render a DOM node, or another user-defined component, respectively.
- Arrays and fragments It is used to return multiple elements from render.
- Portals It is used to render children into a different DOM subtree.
- String and numbers - These are rendered as text nodes in the DOM.
- Booleans or null It renders nothing. (Mostly exists to support return test && <Child pattern, where test is boolean.)

**Note** The render() function should be pure, meaning that it does not modify component state, it returns the same result each time it's invoked, and it does not directly interact with the browser.

## componentDidMount

componentDidMount is invoked immediately after a component is mounted. This method is executed once, only on the client side, and is a good place to initiate network requests, set up subscriptions, or perform any setup that requires DOM nodes.

```
componentDidMount() {  
  // Perform setup that requires DOM nodes or network requests.  
}
```

## Updating:-

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Updating is the process of changing state or props of an element in a DOM tree.

An update can be caused by changes to either the component's props or state. The following methods are called in the following order when a component is being re-rendered as a result of changes to either its props or state:

- static getDerivedStateFromProps
- shouldComponentUpdate
- **render**
- getSnapshotBeforeUpdate
- **componentDidUpdate**

### getDerivedStateFromProps

This method is invoked right before calling the render method, both on the initial mount and on subsequent updates. It should return an object to update state, or null to update nothing. This method exists for rare use cases where the state depends on changes in props over time. It is a static method, so it does not have access to `this`.

```
static getDerivedStateFromProps(props, state) {  
  // Return an object to update state, or null to update nothing.
```

```
    return null;
}
```

Let's say we have 2 components, `Parent` and `Child`, where `Child` receives props from `Parent`. If `Parent` updates its state, `Child` will re-render. If you want to update the state of `Child` based on the new props it receives, you can use `getDerivedStateFromProps`.

```
class Parent extends React.Component {
  constructor(props) {
    super(props);
    this.state = { value: 0 };
  }
  increment = () => {
    this.setState({ value: this.state.value + 1 });
  };
  render() {
    return (
      <div>
        <Child value={this.state.value} />
        <button onClick={this.increment}>Increment</button>
      </div>
    );
  }
}
```

```
class Child extends React.Component {
  constructor(props) {
    super(props);
    this.state = { derivedValue: 0 };
  }
  static getDerivedStateFromProps(Props, State) {
    // Update derivedValue based on the new props
    if (Props.value !== State.derivedValue) {
      return { derivedValue: Props.value };
    }
    return null; // No state update needed
  }
  render() {
    return <div>Derived Value: {this.state.derivedValue}</div>;
  }
}
```

## shouldComponentUpdate

`shouldComponentUpdate` is invoked before rendering when new props or state are received. It allows you to control whether a component should re-render or not. If it returns false, the component will not re-render. This method is useful for optimizing performance by preventing unnecessary renders.

```
shouldComponentUpdate(nextProps, nextState) {
  // Return true to allow re-render, false to prevent it.
  return true; // or false based on your logic
}
```

For example, if you have a component that receives props frequently but doesn't need to update its UI, you can use `shouldComponentUpdate` to prevent unnecessary re-renders.

```
class MyComponent extends React.Component {
  shouldComponentUpdate(nextProps, nextState) {
    // Prevent re-render if props haven't changed
    return nextProps.value !== this.props.value;
  }
  render() {
    return <div>{this.props.value}</div>;
  }
}
```

## getSnapshotBeforeUpdate

This method is invoked right before the most recently rendered output is committed to the DOM. It allows you to capture some information (snapshot) from the DOM before it changes. The value returned by this method is passed as a third parameter to `componentDidUpdate`.

```
getSnapshotBeforeUpdate(prevProps, prevState) {
  // Capture some information from the DOM before it changes.
  return null; // or some value to be used in componentDidUpdate
}
```

For example, if you want to capture the scroll position of a list before it updates, you can use `getSnapshotBeforeUpdate`:

```
classListComponent extends React.Component {
  getSnapshotBeforeUpdate(prevProps, prevState) {
    // Capture the scroll position before the update
    const list = this.listRef.current;
    return list.scrollTop; // Return the scroll position
  }
  componentDidUpdate(prevProps, prevState, snapshot) {
    // Use the snapshot to restore the scroll position after the update
    const list = this.listRef.current;
    if (snapshot !== null) {
      list.scrollTop = snapshot; // Restore the scroll position
    }
  }
  render() {
```

```
        return (
          <div ref={this.listRef}>
            {/* Render list items here */}
          </div>
        );
    }
}
```

## componentDidUpdate

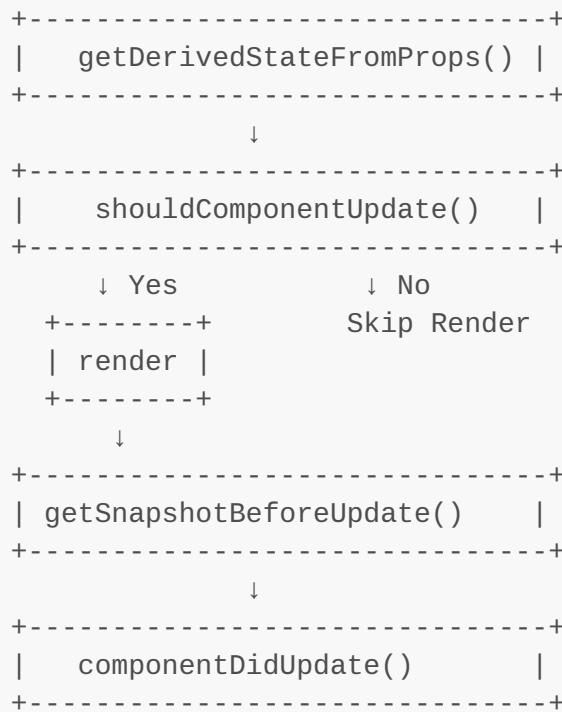
componentDidUpdate is invoked immediately after updating occurs. This method is not called for the initial render. It is a good place to perform side effects, such as network requests or DOM manipulations, based on the updated props or state. It receives three parameters: prevProps, prevState, and snapshot (if getSnapshotBeforeUpdate is used). It will not get called if shouldComponentUpdate returns false.

```
componentDidUpdate(prevProps, prevState, snapshot) {
  // Perform side effects based on the updated props or state.
  // prevProps and prevState are the previous values before the update.
  // snapshot is the value returned by getSnapshotBeforeUpdate, if used.
}
```

For example, if you want to fetch new data based on updated props, you can use componentDidUpdate:

```
class DataFetcher extends React.Component {
  componentDidUpdate(prevProps) {
    // Fetch new data if the props have changed
    if (prevProps.id !== this.props.id) {
      this.fetchData(this.props.id);
    }
  }
  fetchData(id) {
    // Fetch data based on the provided id
    fetch(`/api/data/${id}`)
      .then(response => response.json())
      .then(data => {
        this.setState({ data });
      });
  }
  render() {
    return (
      <div>
        {/* Render fetched data here */}
      </div>
    );
  }
}
```

# Life Cycle Diagram



## Unmounting:-

Unmounting is the process of removing a component from the DOM. The following method is called when a component is being removed from the DOM:

- **componentWillUnmount**

`componentWillUnmount`

`componentWillUnmount` is invoked immediately before a component is unmounted and destroyed. This method is used to perform any necessary cleanup, such as cancelling network requests, removing event listeners, or cleaning up timers.

```
componentWillUnmount() {
  // Perform cleanup before the component is removed from the DOM.
}
```

For example, if you have a component that sets up a timer, you can use `componentWillUnmount` to clear the timer when the component is about to be removed:

```
class TimerComponent extends React.Component {
  componentDidMount() {
    this.timer = setInterval(() => {
```

```
        this.setState({ time: new Date() });
    }, 1000);
}
componentWillUnmount() {
    clearInterval(this.timer); // Clear the timer when the component is
unmounted
}
render() {
    return <div>Current Time: {this.state.time.toLocaleTimeString()}</div>;
}
}
```

## Hooks

---

Hooks are functions that let you use state and other React features without writing a class. They allow you to manage component lifecycle, state, and side effects in functional components.

when to use hooks:

- When you want to use state in a functional component.

Rules of Hooks:

- Only call hooks at the top level of your React function. Don't call hooks inside loops, conditions, or nested functions.
- Only call hooks from React function components or custom hooks. Don't call hooks from regular JavaScript functions.
- React relies on the order of hooks calls to maintain state consistency. If you change the order of hooks, it can lead to bugs.
- Hooks don't work inside class components. They are designed for functional components only.

## useState

useState is a Hook that lets you add state to your functional components. we call it inside a functional component to declare a state variable and a function to update it. Usestate returns an array with two elements: the current state value and a function to update that state value.

```
import React, { useState } from 'react';
function Counter() {
    // Declare a state variable called count, initialized to 0
    const [count, setCount] = useState(0);
    muhehehe = () => {
        // Update the count state when the button is clicked
        setCount(count + 1);
    };
    return (
        <div>
            <p>You clicked {count} times</p>
    )
}
```

```
/* Update the count state when the button is clicked */
<button onClick={muhehehe}>
  Click me
</button>
</div>
);
}
```

## UseEffect

useEffect is a Hook that lets you perform side effects in your functional components. It is called after the component renders and can be used for tasks like data fetching, subscriptions, or manually changing the DOM. useEffect takes two arguments: a function that contains the side effect logic and an optional dependency array that determines when the effect should run. If the dependency array is empty, the effect runs only once after the initial render. If it contains variables, the effect runs whenever those variables change. Basically it is used to replace the componentDidMount, componentDidUpdate, and componentWillUnmount lifecycle methods in class components.

```
import React, { useState, useEffect } from 'react';
function ExampleComponent() {
  const [count, setCount] = useState(0);
  useEffect(() => {
    // This effect runs after every render
    document.title = `You clicked ${count} times`;

    // Cleanup function (optional)
    return () => {
      console.log('Cleanup before the next effect or unmount');
    };
  }, [count]); // The effect depends on the count variable
  return (
    <div>
      <p>You clicked {count} times</p>
      <button onClick={() => setCount(count + 1)}>
        Click me
      </button>
    </div>
  );
}
```

# What does useEffect do ?

By using this Hook, you tell React that your component needs to do something after render. React will remember the function you passed and call it later after performing the DOM updates. In this effect, we set the document title, we could also perform data fetching or call some other imperative API.

## Does useEffect run after every Render

Yes! By default, it runs both after the first render and after every update.

It also takes an array of dependencies as the second argument. If any of the dependencies change, the effect will run again. If you pass an empty array, the effect will only run once after the initial render, similar to componentDidMount.

```
useEffect(() => {
  // This effect runs only once after the initial render
  console.log('Component mounted');
}, []); // Empty dependency array
```

## Custom Hooks

A custom Hook is a JavaScript function, when we want to share logic between components, we can create a custom Hook. Custom Hooks allow you to extract component logic into reusable functions.

Example of a custom Hook that manages a counter:

```
import { useState } from "react";
function useCustomCounter() {
  const [count, setCount] = useState(0);
  const handleIncrement = () => {
    setCount(count + 1);
  };
  return {
    count,
    handleIncrement
  };
}
export default useCustomCounter;
```

## day7

---

### Conditional Rendering in React

---

## Conditional Rendering

Conditional rendering in React works the same way conditions work in JavaScript.

Use JavaScript operators like if or the conditional (ternary) operator to create elements representing the current state, and let React update the UI to match them.

if and if-else statements don't work inside JSX. This is because JSX is just syntactic sugar for function calls and object construction.

## Inline if with Logical && Operator

You may embed any expressions in JSX by wrapping them in curly braces. This includes the JavaScript logical `&&` operator.

Operand 1	<code>&amp;&amp;</code>	Operand 2	Result
True		True	True
True		False	False
False		True	False
False		False	False
True		Expression	Expression
False		Expression	False

Ex:- `purchase && <Payment />`  
If `purchase` evaluates to `true`, the `<Payment />` component will be returned

Ex:- `purchase && <Payment />`  
If `purchase` evaluates to `false`, the `<Payment />` component will be ignored

`true && expression1 && expression2 = expression2`

## Inline if-else with Conditional Operator

Syntax: -

`Condition ? Expression_1 : Expression_2`

If the condition is true it will return `expression_1` else it will return `expression_2`.



```

src
  App.css M
  App.js M
  Guest.js U
  index.js M
  Marks.js U
  serviceWorker.js
  Student.js U
  User.js U
  .gitignore
  package-lock.json
  package.json
  README.md

18  render() {
19    const isLoggedIn = this.state.isLoggedIn;
20    return (
21      <div>
22        {isLoggedIn ? <User clickData={this.clickLogout}> :
23          <Guest />}
24      </div>
25    )
}

```

# IIFE

```
return (
  <div>
    {
      () => {
        // Your Code
      }()
    }
  </div>
);
```

In React, we use curly braces to wrap an IIFE, put all the logic you want inside it (if/else, switch, ternary operators, etc), and return whatever you want to render.

## IIFE (Immediately Invoked Function Expression)

```
const MyComponent = ({ user }) => {
  return (
    <div>
      {
        () => {
          if (user.isAdmin) {
            return <p>Welcome, Admin!</p>;
          } else {
            return <p>Welcome, User!</p>;
          }
        }()
      }
    </div>
  );
};
export default MyComponent;
```

## Lists in React

# Lists

You can build collections of elements and include them in JSX using curly braces {}.

```
const arr = [10, 20, 30, 40];
```

# Iteration using map ( ) Method

The map( ) method creates a new array with the results of calling a provided function on every element in the calling array.

map calls a provided callback function once for each element in an array, in order, and returns a new array from the results.

Syntax:- map(callback(currentValue, index, array), thisArg);

Ex:- map((num, index) => {return num})

```
// Declaration and Initialization of Array
```

```
const arr = [10, 20, 30, 40];
```

```
// Using Array Map Method
```

```
const newArr = arr.map(num => {
  return <li>{num * 2}</li>;
});
```

```
const MyList = ({ items }) => {
  return (
    <ul>
      {items.map((item, index) => (
        <li key={index}>{item}</li>
      ))}
    </ul>
  );
};
export default MyList;
```

## keys in Lists

---

# Keys

- A “key” is a special string attribute you need to include when creating lists of elements.
- Keys help React identify which items have changed, are added, or are removed.
- Keys should be given to the elements inside the array to give the elements a stable identity.
- The best way to pick a key is to use a string that uniquely identifies a list item among its siblings.
- Most often you would use IDs from your data as keys.
- Keys used within arrays should be unique among their siblings. However they don’t need to be globally unique. We can use the same keys when we produce two different arrays.
- Keys serve as a hint to React but they don’t get passed to your components.
- If you need the same value in your component, pass it explicitly as a prop with a different name.

## Inline Styles in React

---

### Inline Stylesheet

*style* is most often used in React applications to add dynamically-computed styles at render time. The *style* attribute accepts a JavaScript object with camelCased properties rather than a CSS string. This is consistent with the DOM style JavaScript property, is more efficient, and prevents XSS security holes.

CSS classes are generally better for performance than inline styles.

styles are not autoprefixed. Vendor prefixes other than ms should begin with a capital letter e.g. WebkitTransition has an uppercase “W”

Ex:-

```
const btnStyle = {
  color: 'blue',
  backgroundColor: 'orange',
};
<button style={btnStyle}>Button</button>
```

```
const MyComponent = () => {
  const divStyle = {
    color: 'blue',
    backgroundColor: 'lightgray',
    padding: '10px',
    borderRadius: '5px',
  };

  return <div style={divStyle}>Hello, Inline Styles!</div>;
}
```

```
};

export default MyComponent;
```

To apply both class

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

export default class App extends Component {
  render() {
    const txtc = {
      color: "blue"
    };
    const txts = {
      fontSize: "80px"
    };
    return <h1 style={{ ...txtc, ...txts }}>Hello App</h1>;
  }
}
```

## External CSS in React

### External Stylesheet

App.css

```
.txt {
  color: blue;
}
```

App.js

```
import './App.css'; // This tells Webpack that App.js uses these styles.
<h1 className="txt">Hello App</h1>
```

Note:-

- Use `className` not `class` e.g. `className="txt"`
- Pass a string as the `className` prop.
- It is common for CSS classes to depend on the component props or state.

```
import './styles.css';
const MyComponent = () => {
  return <div className="my-class">Hello, External CSS!</div>;
};
export default MyComponent;
```

```
.my-class {  
  color: green;  
  background-color: lightyellow;  
  padding: 10px;  
  border-radius: 5px;  
}
```

External CSS is global and can affect all components that use the same class names. To avoid conflicts, consider using CSS Modules or styled-components for scoped styles.

## day8

---

### CSS Module

---

This is a simple CSS module that can be used to style your web applications. It includes basic styles for layout, typography, and buttons. It lets us define styles in a modular way, avoiding conflicts with other styles in the application.

## CSS Module

CSS Modules let you use the same CSS class name in different files without worrying about naming clashes.

CSS files in which all class names and animation names are scoped locally by default.

CSS Modules allows the scoping of CSS by automatically creating a unique classname of the format [filename]\\_[classname]\\_\\_[hash]

Syntax:-

[name].module.css

Ex:-

FileName:

App.module.css

↳

```
import styles from "./App.module.css"  
<h1 className={styles.txt}>Hello</h1>;
```

```
/* app.module.css */  
.container {  
  display: flex;  
  flex-direction: column;  
  align-items: center;  
  padding: 20px;  
}  
.title {  
  font-size: 2rem;  
}
```

```
    color: #333;
}

.button {
  padding: 10px 20px;
  background-color: #007bff;
  color: white;
  border: none;
  border-radius: 5px;
  cursor: pointer;
}
```

```
import React from 'react';
import styles from './app.module.css';

const App = () => {
  return (
    <div className={styles.container}>
      <h1 className={styles.title}>Welcome to My App</h1>
      <button className={styles.button}>Click Me</button>
    </div>
  );
};

export default App;
```

## CSS in JS

---

This is a simple CSS-in-JS example using styled-components. It allows you to write CSS directly within your JavaScript files, making it easier to manage styles that are scoped to components.

## CSS in JS

“CSS-in-JS” refers to a pattern where CSS is composed using JavaScript instead of defined in external files. This functionality is not a part of React, but provided by third-party libraries.

- Glamorous
- Styled Component
- Radium
- Emotion

## Images and assets in React

---

# Inside public Folder

If you put a file into the public folder, it will not be processed by Webpack. Instead it will be copied into the build folder untouched.

To reference assets in the public folder, you need to use a special variable called PUBLIC\_URL. Only files inside the public folder will be accessible by %PUBLIC\_URL% prefix.

Normally we recommend importing stylesheets, images, and fonts from JavaScript.

```
<link rel="shortcut icon" href="%PUBLIC_URL%/favicon.ico">
```

- None of the files in public folder get post-processed or minified.
- Missing files will not be called at compilation time, and will cause 404 errors for your users.
- Result filenames won't include content hashes so you'll need to add query arguments or rename them every time they change.

# Inside public Folder

## When use Public Folder

- You need a file with a specific name in the build output, such as manifest.webmanifest.
- You have thousands of images and need to dynamically reference their paths.
- You want to include a small script like pace.js outside of the bundled code.
- Some library may be incompatible with Webpack and you have no other option but to include it as a <script> tags

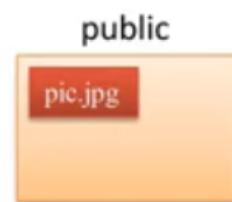
# Inside public Folder

## How to use

Public Folder -> index.html

```


```



## App.js

```
<img src={process.env.PUBLIC_URL + "/pic.jpg"} />
<img src={process.env.PUBLIC_URL + "/image/pic.jpg"} />
```

## Public Folder

For running in HTML:-

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>CSS Module Example</title>
  <link rel="stylesheet" href="app.module.css">
</head>
<body>
  <div id="root"></div>
  
  <script src="app.js"></script>
</body>
</html>
```

For running in React:-

```
import React from 'react';
export default function App() {
  return (
    <div>
      <h1>CSS Module Example</h1>
      <img src={process.env.PUBLIC_URL + '/image.png'} alt="Image
description" />
    </div>
  );
}
```

src Folder

# Inside src Folder

With Webpack, using static assets like images and fonts works similarly to CSS. You can import a file right in a JavaScript module. This tells Webpack to include that file in the bundle. Unlike CSS imports, importing a file gives you a string value. This value is the final path you can reference in your code, e.g. as the src attribute of an image or the href of a link to a PDF.

- Scripts and stylesheets get minified and bundled together to avoid extra network requests.

# Inside src Folder

## How to Use

### App.js

```
import pic from './pic.jpg';
<img src={pic} alt="mypic" />
```



This ensures that when the project is built, Webpack will correctly move the images into the build folder, and provide us with correct paths.

# Form

# Forms

HTML form elements work a little bit differently from other DOM elements in React, because form elements naturally keep some internal state.

In HTML, form elements such as <input>, <textarea>, and <select> typically maintain their own state and update it based on user input. In React, mutable (changeable) state is typically kept in the state property of components, and only updated with `setState()`.

- Controlled Component
- Uncontrolled Component

# Controlled Component

Form has the default HTML form behavior of browsing to a new page when the user submits the form. If you want this behavior in React, it just works. But in most cases, it's convenient to have a JavaScript function that handles the submission of the form and has access to the data that the user entered into the form. The standard way to achieve this is with a technique called "controlled components".

In a controlled component, form data is handled by a React component.

## When Use Controlled Component-

You need to write an event handler for every way your data can change and pipe all of the input state through a React component.

# Uncontrolled Component

In a controlled component, form data is handled by a React component. The alternative is uncontrolled components, where form data is handled by the DOM itself.

To write an uncontrolled component, instead of writing an event handler for every state update, you can use a *ref* to get form values from the DOM.

## When Use Uncontrolled Component-

You do not need to write an event handler for every way your data can change and pipe all of the input state through a React component.

Converting a preexisting codebase to React, or integrating a React application with a non-React library.