**React -Advance React- Styling , Routing**

**Hooks (useState, useEffect, useReducer, useMemo, useRef, useCallback)**

**Question : What are React hooks? How do useState()and useEffect()hooks work in functional components?**

**React Hooks** are special functions introduced in React 16.8 that allow functional components to use features previously only available in class components—like state and lifecycle methods.

**🔹 Commonly Used Hooks:**

* useState() – for state management.
* useEffect() – for side effects (similar to lifecycle methods like componentDidMount, componentDidUpdate, and componentWillUnmount).

### ✅ useMemo – ****Memoize Expensive Calculations****

Avoids recalculating **heavy functions** unless dependencies change.

### ✅ useRef – ****Reference to DOM or Value****

Used to store a value that doesn’t cause re-renders (like a timer ID or input ref).

### ✅ useCallback – ****Memoize Functions****

Prevents a function from being re-created unless dependencies change. Good for performance in child components.

**• Question : What’s the Difference between the useCallback & useMemo Hooks?**

### ✅ useCallback – When you want to ****memoize a function****

Use it to prevent **re-creating a function** on every render—especially useful when passing that function to child components.

### ✅ useMemo – When you want to ****memoize a value****

Use it to cache the **result of an expensive calculation** so it’s not recalculated every time.

**• Routing in React (React Router)**

**• Question : What is React Router? How does it handle routing in single-page applications?**

**React Router** is a **standard routing library** for React. It enables navigation between different "pages" or components **without reloading the page**, making it ideal for **single-page applications (SPAs)**.

📦 Common package: react-router-dom (used in web apps)

In a **single-page application**, the entire app runs on **a single HTML page**. Instead of reloading the page on each navigation, React Router:

1. **Listens to URL changes** (like /home, /about)
2. **Matches the URL** to a route
3. **Loads the matching component** dynamically
4. **Does NOT reload the browser** — it updates the content via JavaScript

Question : Explain the difference between BrowserRouter, Route, Link, and Switch components in React Router.

components of **React Router**—BrowserRouter, Route, Link, and Switch—with clear, simple explanations:

**✅ 1. BrowserRouter**

📦 **Purpose:**  
Wraps your entire app and enables React Router to manage routing using the **HTML5 history API**.

<BrowserRouter>

{/\* Your Routes and Links go here \*/}

</BrowserRouter>

### ✅ 2. Route

📦 **Purpose:**  
Defines the mapping between a **URL path** and the **component** to display.

<Route path="/about" element={<About />} />

### ✅ 3. Link

📦 **Purpose:**  
Used for **navigation** between pages **without refreshing** the browser.

<Link to="/about">Go to About</Link>

**Think of it as:** A **React version of <a href>** but without full page reload.