**1. Explain the Need and Benefits of Component Life Cycle**

**✅ Need for Component Lifecycle:**

The **Component Lifecycle** in React helps developers understand and control what happens at different stages of a component’s existence — from creation to update to removal.

**✅ Benefits:**

* 🔄 **Control over Component Behavior:** Enables you to perform specific actions at certain points (e.g., fetching data when component mounts).
* ⚙️ **Resource Management:** Helps in setting up and tearing down resources (e.g., event listeners, timers) properly.
* 🚀 **Performance Optimization:** Enables you to control rendering and update logic efficiently.
* 📦 **Code Organization:** Cleanly separates setup, logic, and cleanup in different lifecycle methods.

**2. Identify Various Lifecycle Hook Methods**

There are **three main phases** in a component's lifecycle:

**A. Mounting Phase (Component is being added to the DOM)**

| **Lifecycle Method** | **Purpose** |
| --- | --- |
| constructor() | Initialize state and bind methods |
| static getDerivedStateFromProps() | Sync state from props (rarely used) |
| render() | Returns JSX to render the UI |
| componentDidMount() | Called after component is rendered to the DOM |

B. **Updating Phase** (Component is re-rendered due to changes in props or state)

| **Lifecycle Method** | **Purpose** |
| --- | --- |
| static getDerivedStateFromProps() | Invoked before every render (also during update) |
| shouldComponentUpdate() | Allows preventing unnecessary re-render |
| render() | Returns updated JSX |
| getSnapshotBeforeUpdate() | Captures data (like scroll position) before DOM changes |
| componentDidUpdate() | Runs after DOM is updated |

**C. Unmounting Phase (Component is removed from the DOM)**

| **Lifecycle Method** | **Purpose** |
| --- | --- |
| componentWillUnmount() | Used for cleanup (e.g., removing event listeners, canceling timers) |

**3. List the Sequence of Steps in Rendering a Component**

Here is the **sequence of lifecycle methods during initial rendering (Mounting)**:

1. constructor()
2. static getDerivedStateFromProps()
3. render()
4. componentDidMount()