**Question 1: What is React Router? How does it handle routing in single-page applications (SPAs)?**

**✅ What is React Router?**

**React Router** is a **standard library** for routing in React applications. It enables **navigation between different components or views** in a **single-page application (SPA)** without reloading the entire page.

**✅ How React Router handles routing in SPAs:**

* In SPAs, there's only **one HTML page**, and React dynamically **swaps components** based on the URL.
* React Router **listens to changes in the browser's URL** and renders the component that matches the route.
* It uses the **History API** to manipulate the browser history **without page refresh**.

**Example Flow:**

1. User clicks a link → URL changes (e.g., /about)
2. React Router detects the change
3. It renders the <About /> component instead of reloading the page

**Question 2: Explain the difference between BrowserRouter, Route, Link, and Switch components in React Router.**

| **Component** | **Purpose** |
| --- | --- |
| BrowserRouter | Wraps the app and **enables routing using the HTML5 history API** |
| Route | Defines a **path and the component** to render when the path matches |
| Link | Used to **navigate** between routes without reloading the page |
| Switch (v5) / Routes (v6) | Renders **only the first matching <Route>** for cleaner control |

**✅ BrowserRouter Example:**

jsx

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import { BrowserRouter } from 'react-router-dom';

function App() {

return (

<BrowserRouter>

{/\* Your routes and links go here \*/}

</BrowserRouter>

);

}

**✅ Route Example:**

jsx

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import { Route } from 'react-router-dom';

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

✅ In React Router **v6**, element={<Component />} is used instead of component={Component} from v5.

**✅ Link Example:**

jsx

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import { Link } from 'react-router-dom';

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

🔔 Acts like an anchor (<a>), but prevents full-page reloads.

**✅ Switch (React Router v5) / Routes (v6):**

jsx

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import { Routes, Route } from 'react-router-dom';

<Routes>

<Route path="/" element={<Home />} />

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

</Routes>

* In **v6**, Switch is replaced with Routes.

**✅ Summary Table:**

| **Component** | **React Router v5** | **React Router v6+** | **Description** |
| --- | --- | --- | --- |
| BrowserRouter | ✅ | ✅ | Wraps app and enables routing |
| Route | component={} | element={<...>} | Maps URL paths to components |
| Link | ✅ | ✅ | Navigates between routes |
| Switch / Routes | Switch | Routes | Renders the first matching route |