**Routing in React**

1. What is React Router? How does it handle routing in single-page applications?

* React Router is a routing library for React that enables navigation between different views (components) in a single-page application (SPA).
* It allows React apps to have multiple pages or views without requiring a full page reload.
* In a single-page application, there is only **one HTML file** (typically index.html), and React dynamically renders components based on the URL.
* **React Router** helps manage this by modifying the browser's history API to update the URL without reloading the page.
* BrowserRouter : BrowserRouter: Uses **HTML5 history API** (pushState, replaceState) for clean URLs (e.g., /home, /about).
* Routes & Route Components: Define different paths and specify which component to render.
* Link Component: Instead of <a href="/about">, use <Link> to prevent full-page reloads.
* When a user **clicks a link**, React Router **intercepts** the navigation request.
* Instead of a **full-page reload**, React updates the component **based on the URL**.
* The browser history is updated **without sending a new request to the server.**

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

* These are core components of **React Router**, used to handle navigation in a **Single-Page Application**
* BrowserRouter (<BrowserRouter>)
* **Purpose**: It **wraps the entire application** and enables client-side routing using the **HTML5 History API** (pushState and replaceState).
* **Function**: It manages URL changes and re-renders components accordingly without reloading the page.
* Route (<Route>)
* **Purpose**: Defines a specific **URL path** and the corresponding **component** to render when the URL matches.
* **Function**: It listens to URL changes and displays the associated component.
* Link (<Link>)
* **Purpose**: Creates a **navigation link** to different routes **without reloading the page**.
* **Function**: Works like <a> in HTML but prevents full-page reload.
* Switch (<Switch>)
* **Purpose**: Ensures that **only one route** matches at a time.
* **Function**: Stops checking further routes once a match is found.