1. **Define SPA and its benefits:**
   * **SPA (Single Page Application):** A web application that loads a single HTML page and dynamically updates content without reloading the whole page.
   * **Benefits:**
     + Faster user experience (no full-page reloads)
     + Seamless navigation
     + Reduced server load
     + Better performance with client-side routing
2. **Define React and identify its working:**
   * **React:** A JavaScript library by Meta for building user interfaces using a component-based approach.
   * **How it works:**
     + Uses virtual DOM to efficiently update only parts of the real DOM
     + Component-based reusable code
     + Unidirectional data flow (props and state)
3. **Differences between SPA and MPA:**

| **Feature** | **SPA (Single Page App)** | **MPA (Multi Page App)** |
| --- | --- | --- |
| Page Loading | Loads once, updates content | Loads new page per request |
| Speed | Faster | Slower due to reloads |
| Routing | Handled on client-side | Server-side routing |
| SEO | Harder (requires SSR) | Better SEO |
| Examples | Gmail, Facebook | Amazon, Wikipedia |

1. **Pros & Cons of SPA:**

**Pros:**

* Fast and dynamic user experience
* Fewer server requests
* Can work offline with service workers

**Cons:**

* SEO challenges
* Longer initial load time
* Requires JavaScript enabled in browser

1. **React Explanation:**
   * Component-based, declarative, reusable UI library.
   * Built using JavaScript and JSX.
   * Ideal for SPAs.
2. **Virtual DOM:**
   * A lightweight JavaScript object representation of the actual DOM.
   * React compares current vs previous virtual DOM using diffing algorithm and updates only changed parts in real DOM.
3. **Features of React:**
   * Declarative syntax
   * Component-based structure
   * Virtual DOM
   * One-way data binding
   * JSX (JavaScript XML)
   * Ecosystem support (Redux, React Router, etc.)