1. **Define SPA and its Benefits**

**SPA (Single Page Application)** is a web application that interacts with the user by dynamically rewriting the current page rather than loading entire new pages from the server.

**Benefits of SPA:**

* Faster loading after initial load
* Seamless user experience (no full-page reloads)
* Easy to debug using browser dev tools
* Efficient data usage via APIs (no need to resend full HTML)

1. **Define React and Identify its Working**

**React** is an open-source JavaScript library developed by Facebook for building fast and interactive user interfaces, especially SPAs.

**Working:**

* Uses component-based architecture
* Implements Virtual DOM to optimize UI rendering
* Re-renders only the necessary parts of the UI upon state or prop changes

1. **Differences Between SPA and MPA**

| **Feature** | **SPA** | **MPA** |
| --- | --- | --- |
| Page Reloads | No | Yes |
| Speed | Fast after initial load | Slower due to full-page reloads |
| Server Requests | Minimal | Multiple |
| Development Focus | Frontend-heavy (JS frameworks) | Backend-focused (templating) |
| Example Frameworks | React, Angular, Vue.js | PHP, JSP, ASP.NET |

1. **Pros & Cons of SPA**

**Pros:**

* Better user experience
* Faster navigation
* Efficient resource usage

**Cons:**

* SEO is harder (requires SSR or prerendering)
* Initial load can be slow
* May not work well without JavaScript

1. **Explain about React**

React is:

* **Declarative**: Describe what you want, React makes it happen
* **Component-based**: Build encapsulated components
* **Efficient**: Updates only the part of the UI that changed
* **Flexible**: Can be used with other libraries and frameworks

1. **Define Virtual DOM**

**Virtual DOM** is a lightweight copy of the actual DOM. React uses it to:

* Detect changes
* Batch updates
* Efficiently render UI changes

1. **Features of React**

* Virtual DOM for fast rendering
* JSX syntax (HTML in JS)
* Component-based structure
* Unidirectional data flow
* State and props management
* Developer tools and large ecosystem