1. **REACT HANDS ON**

**1. Define SPA and its benefits**

**SPA (Single Page Application)** is a web application that loads a single HTML page and dynamically updates the content as the user interacts with the app without refreshing the page.

**Benefits:**

* Faster user experience
* Reduces server load
* Seamless navigation
* Improves performance after the initial load
* Better for building dynamic, responsive interfaces

**2. Define React and identify its working**

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

**How it works:**

* Uses a **component-based architecture**
* Maintains a **virtual DOM** for efficient rendering
* Updates only the changed parts of the UI using **diffing algorithm**
* Components can manage their own state and be reused across the application

**3. Identify the differences between SPA and MPA**

| **Feature** | **SPA (Single Page App)** | **MPA (Multi Page App)** |
| --- | --- | --- |
| Page Load | Loads once, then updates dynamically | Loads a new page for every user interaction |
| Speed | Faster navigation after initial load | Slower, full page reload on every interaction |
| Complexity | Needs client-side routing and state handling | Easier with traditional server-side rendering |
| Example | Gmail, Facebook | Amazon, LinkedIn (older versions) |

**4. Explain Pros & Cons of Single-Page Application**

**Pros:**

* Fast and responsive UI
* Reduced server load
* Enhanced user experience
* Works well with mobile apps and APIs

**Cons:**

* Poor SEO (Search Engine Optimization)
* Heavier initial load
* More complex to develop (routing, state management)
* Needs JavaScript to be enabled in the browser

**5. Explain about React**

React is a JavaScript library used to build interactive and dynamic user interfaces.

**Key Points:**

* Component-based
* Declarative syntax
* Efficient rendering using virtual DOM
* Can be used with other libraries or frameworks (e.g., Redux, React Router)
* React can be rendered on the server using frameworks like Next.js

**6. Define Virtual DOM**

**Virtual DOM** is a lightweight, in-memory representation of the real DOM.

**How it helps:**

* React creates a virtual DOM tree
* On state change, it creates a new virtual DOM and compares it with the old one
* Only the changed parts are updated in the real DOM (efficient updates)
* Speeds up UI rendering and improves performance

**7. Explain Features of React**

* **JSX:** JavaScript syntax extension that lets you write HTML in React
* **Components:** Reusable building blocks (Functional or Class)
* **Virtual DOM:** Efficient DOM updates
* **Unidirectional Data Flow:** One-way data binding from parent to child
* **React Hooks:** Enables functional components to manage state and side effects
* **Declarative UI:** You describe the UI and React manages it
* **React Developer Tools:** For debugging React applications in browser

**HANDS-ON**

**CODE: App.js**

import React from 'react';

function App() {

  return (

      <h1>Welcome to the first session of React</h1>

  );

}

export default App;

**OUTPUT**

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