1. **ReactJS – HOL**

**1.Define SPA and its benefits?**

**SPA (Single Page Application):**

A web application that loads a single HTML page and dynamically updates content without refreshing the whole page.

**Benefits:**

* Faster loading after initial load
* Smooth user experience (like using a mobile app)
* Saves bandwidth
* Works well with APIs
* Easy to debug with browser dev tools

**2. Define React and Identify Its Working?**

**React:**

* A JavaScript library developed by Facebook to build user interfaces, mainly for SPA.

**How React Works:**

* Uses a virtual DOM to track changes
* Only updates parts of the page that changed
* Components are the building blocks
* Data flows in one direction (from parent to child)

**3. Identify the Differences Between SPA and MPA**

|  |  |  |
| --- | --- | --- |
| **Feature** | **SPA (Single Page App)** | **MPA (Multi Page App)** |
| Pages | One main HTML page | Multiple HTML pages |
| Speed | Faster after first load | Slower due to full page reloads |
| Navigation | Dynamic with JavaScript | Full page reload on each click |
| Dev Complexity | Easier with frameworks like React | Harder to manage states |
| SEO | Harder to optimize | Better SEO support |

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

**Pros:**

* Fast and smooth navigation
* Better user experience
* Works well with mobile apps
* Reduces server load

**Cons:**

* Not SEO-friendly
* Longer initial load time
* Needs JavaScript to function fully
* Browser history and analytics are harder to manage

**5. Explain About React**

* React is a JavaScript library for building fast and interactive UIs
* Uses component-based architecture
* Created by Facebook
* Efficient with Virtual DOM
* Used to build SPA
* Makes UI code reusable and easier to manage

**6. Define Virtual DOM**

Virtual DOM (VDOM): A lightweight copy of the real DOM

* React uses it to track changes efficiently

When a change occurs:

* 1. React updates the Virtual DOM
  2. Compares (diffs) it with the old version
  3. Applies only the necessary changes to the real DOM (fast!)

**7. Explain Features of React**

* Component-based: Reusable and modular blocks
* JSX (JavaScript + HTML): Easy syntax for creating UI
* Virtual DOM: Faster UI updates
* One-way Data Binding: Easier to track data flow
* Reusable Components: Saves time and avoids duplication
* React Hooks: Functional way to manage state and lifecycle
* Rich Ecosystem: Works with tools like Redux, React Router

**React Application : myfirstreact**

1. To create a new React app, Install Nodejs and Npm from the following link:

[**https://nodejs.org/en/download/**](https://nodejs.org/en/download/)

1. Install Create-react-app by running the following command in the command prompt:

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1. To create a React Application with the name of “myfirstreact”, type the following command:

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1. Once the App is created, navigate into the folder of myfirstreact by typing the following command:



1. Open the folder of myfirstreact in Visual Studio Code
2. Open the App.js file in Src Folder of myfirstreact
3. Remove the current content of “App.js”
4. Replace it with the following:



1. Run the following command to execute the React application:



1. Open a new browser window and type “localhost:3000” in the address bar

**Final Output:**

