**1.ReactJs HOL**

1. **Define SPA and its Benefits**

**SPA (Single Page Application):**A Single Page Application is a web app that loads a single HTML page and dynamically updates content without refreshing the whole page.

**Benefits:**

* Faster performance after initial load.
* Seamless user experience.
* Reduces server load.
* Smooth transitions between views.
* Uses AJAX to update only parts of the page.

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

**React:**React is a JavaScript library developed by Facebook for building user interfaces, especially for single-page applications.

**How React Works:**

* React breaks the UI into reusable components.
* It uses a virtual DOM to track changes.
* When data changes, React updates only the necessary parts of the UI efficiently**.**

**3. Differences between SPA and MPA**

|  |  |  |
| --- | --- | --- |
| **Feature** | **SPA (Single Page App)** | **MPA (Multi Page App)** |
| Page Load | Loads a single HTML page | Loads a new page for each request |
| Speed | Faster after initial load | Slower due to full page reloads |
| User Experience | Smooth and dynamic | May flicker during navigation |
| Routing | Client-side (JavaScript) | Server-side |
| Example | Gmail, Facebook | Amazon, eBay |

1. **Pros & Cons of Single-Page Application**

**Pros:**

* Fast and responsive.
* Better user experience.
* Reduces server requests.
* Easier to turn into a mobile app using frameworks.

**Cons:**

* Poor SEO support.
* Initial load time may be high.
* Browser history and navigation can be complex.
* Requires JavaScript to be enabled.

1. **Explain about React**

React is a front-end library for building UIs using components. It promotes reusable code and makes building complex interfaces easier by handling state and rendering changes efficiently.

React is often used in:

* SPAs
* Dashboards
* Social media interfaces

It’s declarative and component-based.

**6. Define Virtual DOM**

**Virtual DOM:**A virtual representation of the real DOM (Document Object Model) that React uses to improve performance.

* When something changes, React compares the virtual DOM with the previous one.
* It finds the minimal changes needed and updates only those parts in the real DOM (efficient and fast).

**7. Features of React**

* **Component-Based:** UI is broken down into small reusable pieces.
* **Virtual DOM:** Efficient updates to UI.
* **JSX:** HTML-like syntax inside JavaScript.
* **One-Way Data Binding:** Data flows in one direction (parent to child).
* **Declarative UI:** You describe what UI should look like, React handles the rest.
* **React Hooks:** Use state and other features without writing a class.

**React Application : myfirstreact**

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

<https://nodejs.org/en/download/>

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



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



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:**

