**1. ReactJS-HOL**

### Single-Page Application (SPA)

A Single-Page Application (SPA) is a web application that loads a single HTML page and dynamically updates that page as the user interacts with the app. SPAs use AJAX and HTML5 to create fluid and responsive web apps, without constantly reloading the page from the server.

### Benefits of SPA

• Improved user experience due to faster navigation

• Reduced server load

• Faster page reloads using AJAX

• Client-side rendering improves performance

### Multi-Page Application (MPA)

An MPA reloads the entire page and its resources when navigating between pages. Each interaction requests a new page from the server.

### Differences between SPA and MPA

• SPA loads a single HTML page; MPA loads a new page on each request.

• SPA uses client-side rendering; MPA uses server-side rendering.

• SPA provides better user experience; MPA is better for SEO.

• SPA is faster after initial load; MPA is slower due to full page reloads.

### Pros and Cons of SPA

Pros:

* • Better user experience
* • Faster interactions
* • Less bandwidth usage

Cons:

* • Initial load time can be slow
* • SEO limitations
* • Client-side JavaScript dependency

### React and Virtual DOM

React is a JavaScript library for building user interfaces, developed by Facebook. It allows developers to create reusable UI components and manage the application state efficiently.

### Virtual DOM

The virtual DOM is a lightweight JavaScript representation of the actual DOM. React uses it to optimize rendering by updating only the parts of the DOM that changed.

### Features of React

• JSX – JavaScript syntax extension

• Components – Reusable UI pieces

• Virtual DOM – Efficient updates

• One-way Data Binding

• Declarative UI

## Hands-On Lab Instructions

• Create a new React application: npx create-react-app myfirstreact

• Navigate to project folder: cd myfirstreact

• Open the project in Visual Studio Code.

• Open App.js located in the src folder.

• Delete all existing content in App.js and replace with the below code:

* App.js:

import React from 'react';  
  
function App() {  
 return (  
 <div>  
 <h1>Welcome to the first session of React</h1>  
 </div>  
 );  
}  
  
export default App;

• To run the React application, use the command: npm start

• Open a web browser and go to: http://localhost:3000