ReactJS Hands-On Lab Report

# Objectives

- Define SPA and its benefits  
- Define React and identify its working  
- Identify the differences between SPA and MPA  
- Explain Pros & Cons of Single-Page Application  
- Explain about React  
- Define Virtual DOM  
- Explain Features of React

# Single-Page Application (SPA) vs Multi-Page Application (MPA)

## What is SPA?

SPA (Single-Page Application) is a type of web application that interacts with the user by dynamically rewriting the current page rather than loading entire new pages from the server. Examples: Gmail, Facebook, Twitter.

## Benefits of SPA

- Faster page load after the initial load  
- Better user experience  
- Reduced server load  
- Easier mobile optimization

## What is MPA?

MPA (Multi-Page Application) loads a new HTML page from the server every time the user interacts with the app. Examples: Amazon, Flipkart.

## Differences Between SPA and MPA

- SPA loads a single HTML page and dynamically updates, while MPA loads a new page every time.  
- SPA is faster after initial load; MPA is slower due to frequent page reloads.  
- SPA is ideal for dynamic platforms; MPA is better for SEO.

# Pros and Cons of Single-Page Application

Pros:  
- Smooth user experience  
- Fast interactions after first load  
- Efficient for dynamic platforms  
  
Cons:  
- SEO limitations  
- Initial load time may be longer  
- JavaScript heavily required

# React and Virtual DOM

## What is React?

React is a JavaScript library developed by Facebook for building user interfaces. It allows developers to create large web applications that can update and render efficiently.

## What is Virtual DOM?

The Virtual DOM is a lightweight JavaScript representation of the actual DOM. React updates the Virtual DOM first, compares it with the previous state, and then efficiently updates the actual DOM, improving performance.

## Features of React

- Component-Based Architecture  
- Virtual DOM for performance  
- Unidirectional Data Flow  
- JSX Syntax (HTML + JavaScript)  
- Strong community and ecosystem

# Hands-On Lab: Creating a React App

Follow these steps to create a simple React application displaying a heading.

## Step-by-Step Instructions

1. 1. Install Node.js and npm from: https://nodejs.org/en/download/
2. 2. Install Visual Studio Code from: https://code.visualstudio.com/
3. 3. Open command prompt and run: npm install -g create-react-app
4. 4. Create a new project: npx create-react-app myfirstreact
5. 5. Navigate into project folder: cd myfirstreact
6. 6. Open project in VS Code: code .
7. 7. Open src/App.js and replace its content with the code below.
8. 8. Run the application: npm start
9. 9. Visit http://localhost:3000 in your browser to see the result.

## Code Used in App.js

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





