### ****What is SPA (Single Page Application)?****

A Single Page Application (SPA) is a web app that loads a single HTML page and dynamically updates it as the user interacts with it.

**Benefits of SPA:**

Fast and seamless navigation

No full page reloads

Better user experience

Reduces server load

**What is React and How Does It Work?**

**React** is a JavaScript library developed by Facebook for building user interfaces (UIs).

It works by breaking the UI into **reusable components** and uses a **virtual DOM** to efficiently update only the parts of the page that change.

**SPA vs MPA (Multi Page Application)**

| **Feature** | **SPA** | **MPA** |
| --- | --- | --- |
| Page Reloads | No (dynamic updates) | Yes (full reloads on navigation) |
| Speed | Faster | Slower |
| Complexity | Higher (routing handled in app) | Lower |
| SEO Friendliness | Less SEO-friendly (JS-heavy) | More SEO-friendly |
| Use Cases | Dashboards, Gmail, Facebook | Blogs, News sites, E-commerce |

**Pros and Cons of SPA**

**Pros:**

Fast performance

Better user experience

Reusable components

**Cons:**

SEO limitations

JavaScript must be enabled

Slightly complex architecture

**What is Virtual DOM?**

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

React uses it to **compare changes** and efficiently update only the affected parts of the UI — improving performance.

**Features of React**

Component-Based Architecture

Virtual DOM for faster UI updates

JSX (HTML + JS in one file)

One-way data binding

Reusable Components

Declarative UI

### 🔧 ****Environment Setup & Execution****

Uses **Node.js** and **NPM** for package management.

Employs **Create React App** to scaffold the project.

Opens the project folder in **Visual Studio Code**.

Modifies the **App.js** file in the **src** folder to render the welcome heading.

Launches the application, which automatically runs on **localhost:3000**. **Final Code for** src/App.js

import React from 'react';

function App() {

return (

<div>

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

</div>

);

}

export default App;

Once the app is running locally, you'll see the specified heading displayed in your browser.