1. **ReactJS-HOL – Documentation**

**Objective :**

* Set up a react environment
* Use create-react-app

**Prerequisties :**

The following is required to complete this hands-on lab:

* Node.js
* NPM
* Visual Studio Code

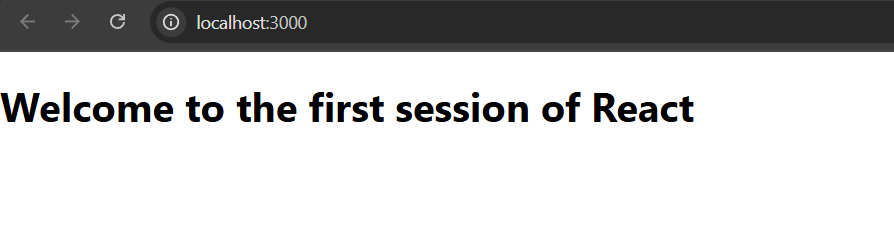
**Project Folder Name :**

* myfirstreact

**Procedure :**

(Follow up the steps given in hands on)

**Output Snapshot :**



**Knowledge Gain :**

Ques. Define SPA and its benefits

A Single-Page Application (SPA) is a web application that dynamically rewrites the current page rather than loading entire new pages from the server. All content is delivered initially, and user interactions update the interface via JavaScript without a full page reload.

Benefits:

* Faster navigation (no reloads between pages)
* Better user experience (smooth transitions)
* Efficient data handling via APIs
* Reusable components and cleaner architecture
* Ideal for modern web apps and mobile responsiveness

Ques. Define React and identify its working

React is a JavaScript library developed by Meta (formerly Facebook) for building user interfaces, especially SPAs.

How It Works:

* Based on components: small, reusable chunks of UI
* Uses a virtual DOM for fast updates
* Responds to changes via state and props
* Efficient rendering using a declarative approach

Ques. Identify the differences between SPA and MPA ?

| Feature | SPA | MPA |
| --- | --- | --- |
| Page Reloads | No (dynamic content updates) | Yes (each page loads separately) |
| Speed | Fast (after initial load) | Slower due to multiple page loads |
| Backend Interaction | Uses APIs heavily | Direct server-side rendering |
| SEO | Harder without SSR | Easier (each page has metadata) |
| Complexity | Ideal for simpler workflows | Better for large-scale sites |

Ques. Explain Pros & Cons of Single-Page Application

Pros:

* Quick interactions
* Easier to develop with frontend frameworks
* Efficient data loading

Cons:

* SEO limitations
* Long initial load time
* Potential security challenges if not configured correctly

Ques. Explain about React

React is all about building UI by breaking it into smaller components that manage their own state and lifecycle. It updates the browser UI efficiently and helps build complex apps with minimal code.

React supports:

* Component-based architecture
* Lifecycle methods
* Hooks for functional components
* JSX syntax to combine HTML + JS

Ques. Define virtual DOM

Virtual DOM is an in-memory representation of the real DOM. React uses it to:

* Compare changes (diffing algorithm)
* Apply minimal updates to the actual DOM
* Boost performance and responsiveness

Instead of modifying the real DOM directly, React calculates the difference and updates only what's necessary.

Ques. Explain Features of React ?

* JSX – Combines HTML with JavaScript logic
* Components – Build complex UIs with reusable building blocks
* Unidirectional Data Flow – Data flows from parent to child via props
* State Management – Control dynamic data in components
* Hooks – Functional components can use state and lifecycle
* Virtual DOM – Speeds up rendering
* Ecosystem Support – Integrates with Redux, Router, and more