## Define SPA and its benefits

A Single Page Application (SPA) is a web application or website that loads a single HTML page and dynamically updates the content as the user interacts with the app without reloading the entire page. SPAs use JavaScript frameworks/libraries like React, Angular, or Vue to handle routing and view updates on the client side.  
Benefits:

* Rich User Experience
* Reduced Server Load
* Fast Navigation
* Code Reusability

## Define React and identify its working

React is a JavaScript library developed by Meta (Facebook) for building user interfaces (UI), especially for Single Page Applications (SPAs).  
It enables developers to create reusable UI components that manage their own state and efficiently render changes in the UI.  
How React Works:

* Component-Based Architecture
* Virtual DOM
* State & Props
* Unidirectional Data Flow

## Identify the differences between SPA and MPA

* SPA loads a single HTML page and updates content dynamically. MPA Loads a new HTML page for every request/navigation
* For SPA, no full page reload. For MPA, full page reload occurs on each link click or action
* SPA is harder to optimize for SEO while MPA is better for SEO by default due to distinct pages
* SPA is easier for interactive, dynamic UIs while MPA is better suited for content-heavy sites like blogs

## Explain Pros and cons of Single-Page application

Pros:

* Fast & Smooth User Experience
* Improved Performance After Initial Load
* Reduced Server Load
* Easy to Build Dynamic, Interactive UIs
* Reusable Components
* Simplified Frontend Development

Cons:

* SPAs are harder to optimize for SEO
* The first load can be heavy
* Managing client-side routing, state, and security can add complexity

## Explain about React

React is an open-source JavaScript library developed by Meta (formerly Facebook) for building user interfaces (UIs), especially for Single Page Applications (SPAs).  
It focuses on creating interactive, fast, and dynamic web applications using a component-based architecture.

## Define virtual DOM

The Virtual DOM (VDOM) is a lightweight, in-memory representation of the real DOM used by React and similar libraries to efficiently update the user interface.

Instead of manipulating the actual browser DOM directly (which is slow), React updates the Virtual DOM first. It then compares the new Virtual DOM with the previous version (a process called diffing) and calculates the minimal number of changes needed to update the real DOM.

## Explain features of React

Features:

* Component-Based Architecture
* Virtual DOM
* JSX (JavaScript XML)
* Unidirectional Data Flow
* State Management
* React Hooks