# 2. ReactJS-HOL

## Concepts

### 1. Explain React Components

React components are the building blocks of any React application. They allow you to split the UI into independent, reusable pieces, and think about each piece in isolation. Components can be class-based or function-based and must return JSX that represents the UI.

### 2. Differences Between React Components and JavaScript Functions

- React components return JSX, while JavaScript functions return values or perform actions.  
- Components have lifecycle methods (in class components) and can manage state.  
- Components are used to build UI; JS functions are general-purpose logic blocks.

### 3. Types of Components

Class Components: ES6 classes that extend `React.Component`.  
Function Components: JavaScript functions that return JSX.  
Pure Components: Like class components but with shallow prop and state comparison.  
Higher-Order Components (HOC): Functions that take a component and return a new component.

### 4. Class Component

A class component is a JavaScript class that extends React.Component. It must include a render() method that returns JSX.

### 5. Function Component

A function component is a simpler way to write components using JavaScript functions. They return JSX directly and can use hooks like useState and useEffect to manage state and side-effects.

### 6. Component Constructor

The constructor is a method used in class components for initializing state and binding event handlers. It is called before the component is mounted.

### 7. render() Function

The render() function is required in class components. It describes what the UI should look like by returning JSX. It is automatically called whenever a component’s state or props change.

**Hands-on Lab: Student Management Portal (StudentApp)**

### Steps

1. **Create a React App**  
   npx create-react-app StudentApp  
   cd StudentApp
2. **Create a Components Folder under src**
3. **Create Home.jsx with the following code:**

import React, { Component } from 'react';  
  
class Home extends Component {  
 render() {  
 return (  
 <div>  
 <h2>Welcome to the Home page of Student Management Portal</h2>  
 </div>  
 );  
 }  
}  
  
export default Home;

1. **Create About.jsx and Contact.jsx similarly:**

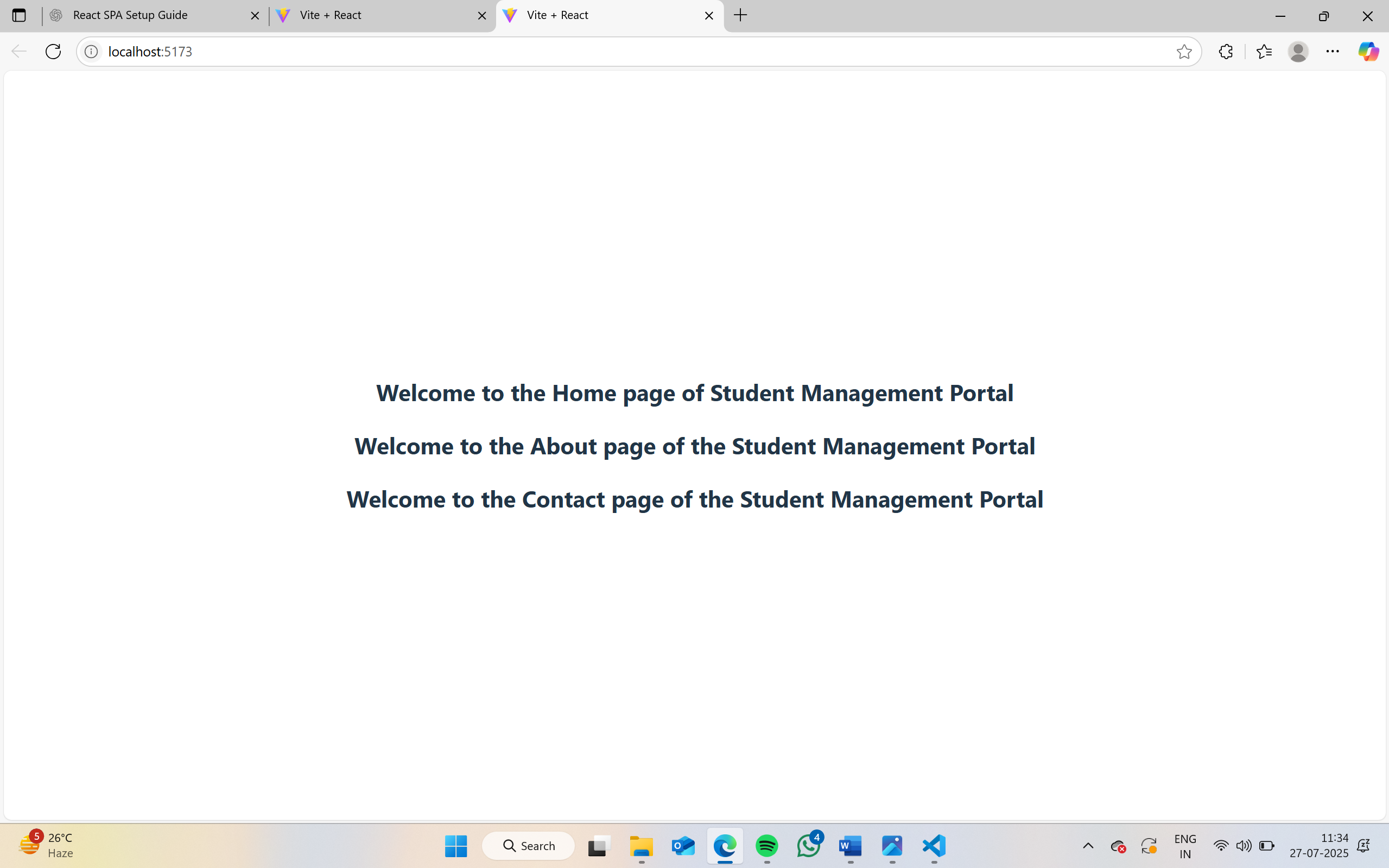
// About.jsx  
import React, { Component } from 'react';  
  
class About extends Component {  
 render() {  
 return (  
 <div>  
 <h2>Welcome to the About page of the Student Management Portal</h2>  
 </div>  
 );  
 }  
}  
  
export default About;  
  
// Contact.jsx  
import React, { Component } from 'react';  
  
class Contact extends Component {  
 render() {  
 return (  
 <div>  
 <h2>Welcome to the Contact page of the Student Management Portal</h2>  
 </div>  
 );  
 }  
}  
  
export default Contact;

1. **Modify App.jsx to render all components:**

import React from 'react';  
import Home from './Components/Home';  
import About from './Components/About';  
import Contact from './Components/Contact';  
  
function App() {  
 return (  
 <div className="App">  
 <Home />  
 <About />  
 <Contact />  
 </div>  
 );  
}  
  
export default App;

1. **Run the App**  
   npm start
2. **Open Browser and Navigate to:**  
   http://localhost:3000

**OUTPUT:**

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