Tribhuwan University

Institute of Engineering

Thapathali Campus

Subject: Web Application Programming

LAB #4

Lab Report on: Introduction to React JS

Submitted By

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Submitted To

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OBJECTIVES

To learn the fundamental structure and uses of React JS

To build a basic CRUD web application using React

THEORY

React is a JavaScript library used for building user interfaces, especially modern web applications that require dynamic and interactive components. It allows developers to divide applications into reusable components and efficiently update the UI when data changes.

React provides several advantages for frontend development:

- Fast rendering using Virtual DOM
- Reusable components
- Efficient state handling through hooks
- Clean separation of UI and logic
- Large ecosystem and strong community support

Single Page Application (SPA)

This project follows the Single Page Application architecture. In an SPA, the application loads a single HTML page and updates content dynamically without reloading the entire page.

Component-Based Architecture

React applications are structured using components. A component represents a reusable and independent piece of the user interface.

Example:

```
function Header() {
return <h1>Student Attendance System</h1>;
}
```

React Hooks

Hooks allow functional components to manage state and lifecycle features.

useState()

Used to store and manage dynamic data within components.

Example:

const [students, setStudents] = useState([]);

useEffect()

Used to handle side effects such as storing data or performing operations after rendering.

State Management

State represents dynamic data within the application.

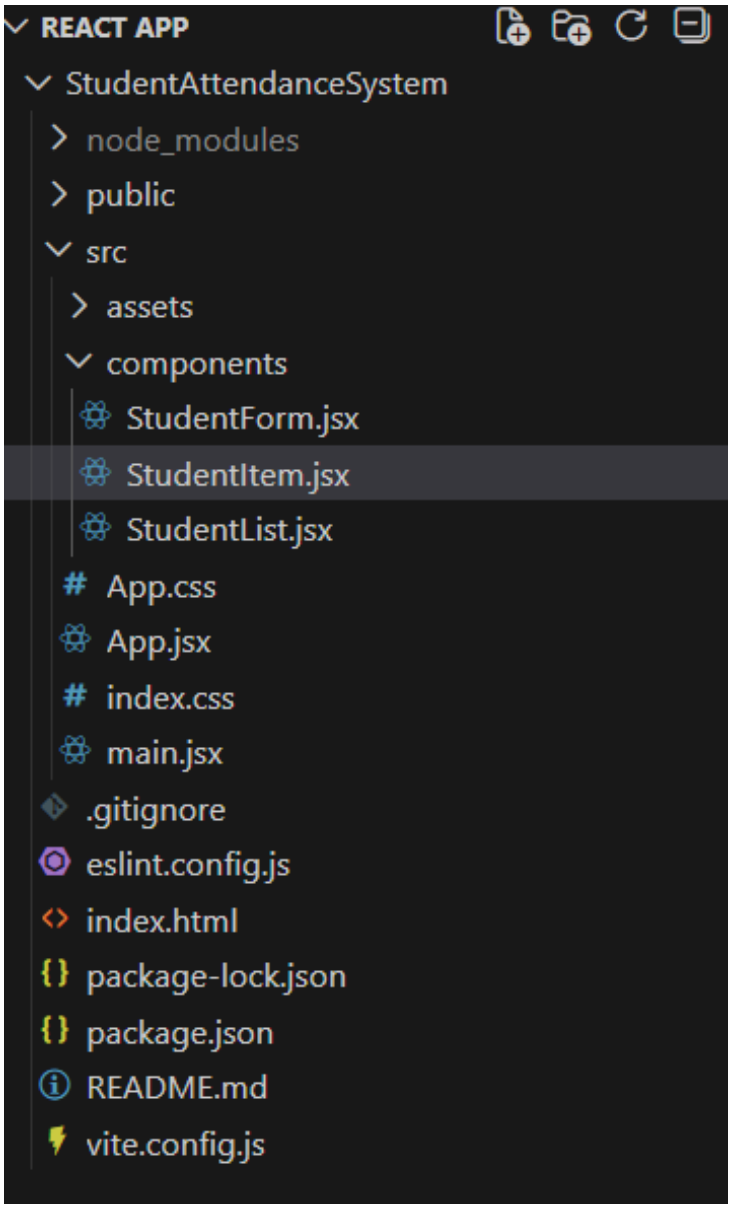
In this project:

- Student records are stored in state.
- Attendance status updates dynamically.
- The UI automatically re-renders when state changes.

Project Features

- Add new students
- Mark attendance as Present or Absent
- Delete student records
- Search students by name or roll number
- Real-time attendance statistics
- Persistent data storage using Local Storage
- Responsive user interface

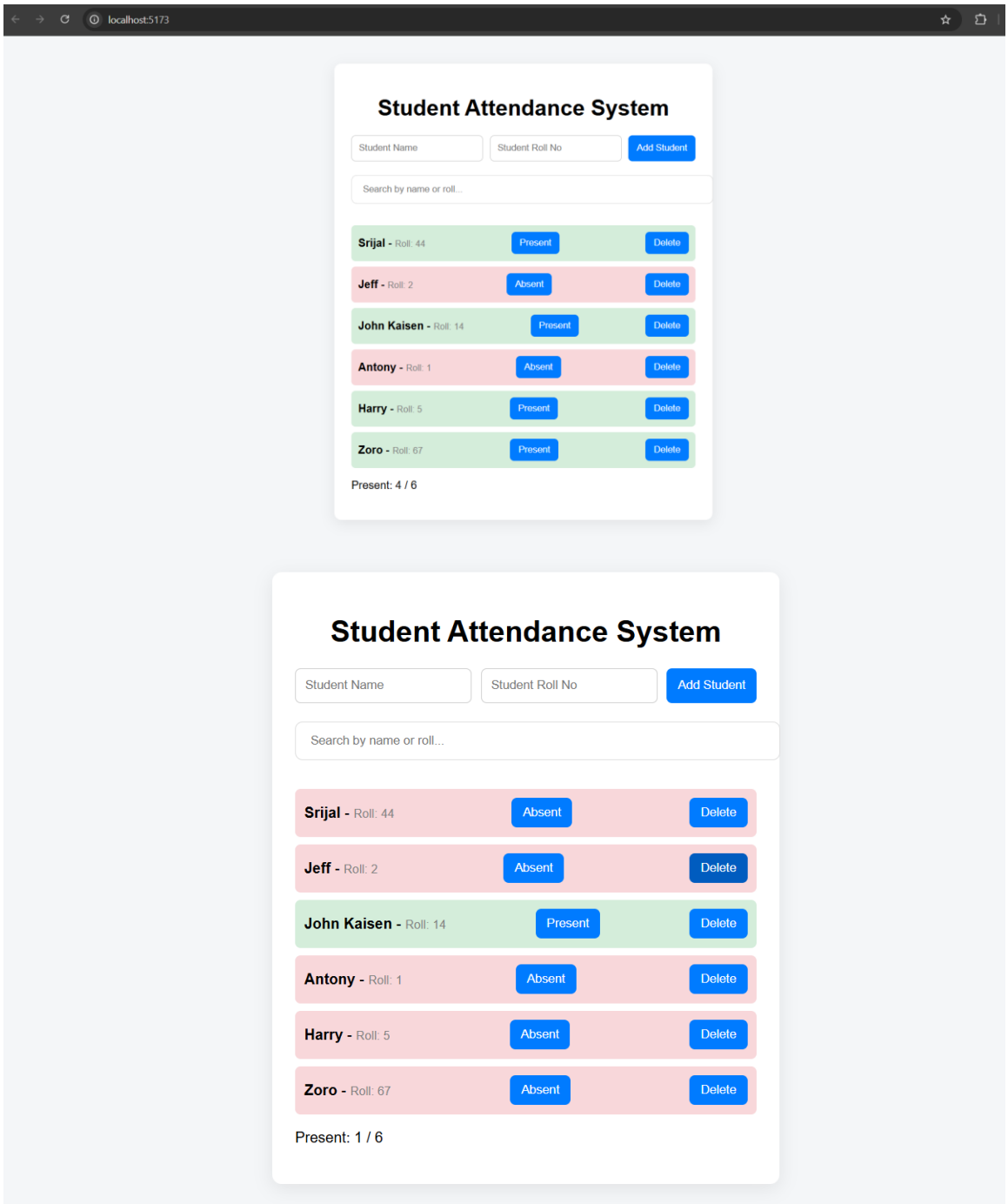
Project Folder Structure

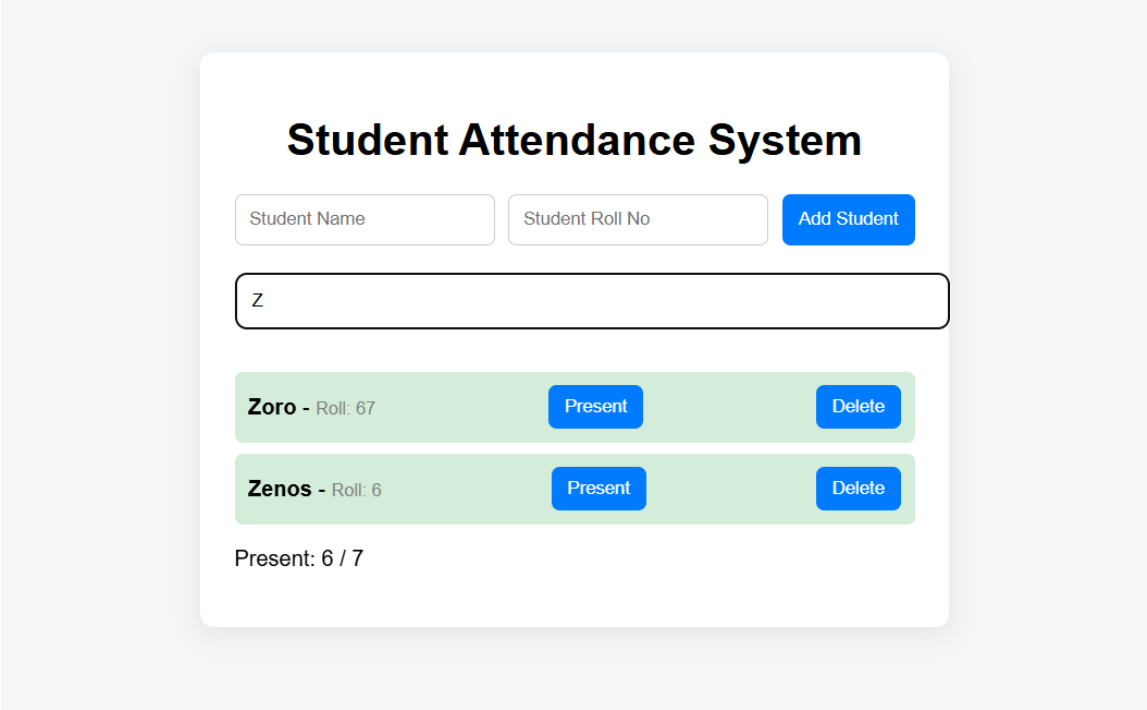


SOURCE CODE

https://github.com/Srijal-Basnet/Student-Registration-System.git

OUTPUT





DISCUSSION AND CONCLUSION

The development of this student attendance application provided practical experience in building dynamic and interactive web interfaces using modern frontend technologies. By using React.js, the application was structured into reusable components, allowing efficient management of student data and real-time updates of the user interface. The implementation demonstrated how client-side state management enables responsive behaviour without requiring page reloads, improving overall user interaction.

This lab also emphasized the importance of modern development tools such as Vite for faster builds and improved development workflow. Overall, the project demonstrates that React provides a flexible and efficient approach for creating scalable single-page applications with clean structure and responsive user experience. The knowledge gained from this implementation can be extended to more advanced applications involving backend integration, authentication, and database connectivity.