DEPARTMENT OF
COMPUTER SCIENCE & ENGINEERING
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Experiment 2

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Semester: 6th | **Date of Performance:19/01/26**
Subject Name: Full Stack Development-II | **Subject Code: 23CSH-309**

1. Aim:

To implement Single Page Application (SPA) navigation in the EcoTrack application using React Router, secure application routes using context-based authentication, and extend nested dashboard routing through follow-up enhancements.

2. Objective:

- To implement seamless Single Page Application (SPA) navigation in EcoTrack using React Router.
- To secure application routes through context-based authentication and protected routing.
- To design nested dashboard routes for modular and scalable UI navigation.
- To manage user session state globally using React Context API.
- To enhance dashboard functionality with future-ready, extensible routing architecture.

3. Implementation/Code:

dashboard.jsx:

```
import { logs } from '../data/logs';

const Dashboard = () => {
   const totalcarbon = logs.reduce((total, log) => total + log.carbon, 0);

   return (
      <div className="dashboard">
         <header className="dashboard-header">
            <h2 className="dashboard-title">Dashboard</h2>
            <p className="dashboard-summary">Total Carbon Footprint:
<strong>{totalcarbon} kg CO2</strong></p>
         </header>
```

```
            <section className="logs">
              <ul className="log-list">
                {logs.map((log) => (
                  <li className="log-item" key={log.id}>
                    <span className="activity">{log.activity}</span>
                    <span className="carbon">{log.carbon} kg CO2</span>
                  </li>
                ))}
              </ul>
            </section>
          </div>
        );
    };

    export default Dashboard;
```

login.jsx:

```
import {useAuth} from '../context/AuthContext';
import{useNavigate} from 'react-router-dom';
const LoginPage=()=>useAuth();
const {setIsAuthenticated}=useAuth();
const navigate=useNavigate();
const handleLogin=()=>{
   // Perform authentication logic here (e.g., API call)
   // On successful authentication:
   setIsAuthenticated(true);
   navigate('/'); // Redirect to a protected route after login

return(
   <>
   <div>
      <h2>Login Page</h2>
      <button onClick={handleLogin}>Login to ECOTRACK</button>
   </div>
   </>
);}

export default handleLogin;
```

ProtectedRoute.jsx:

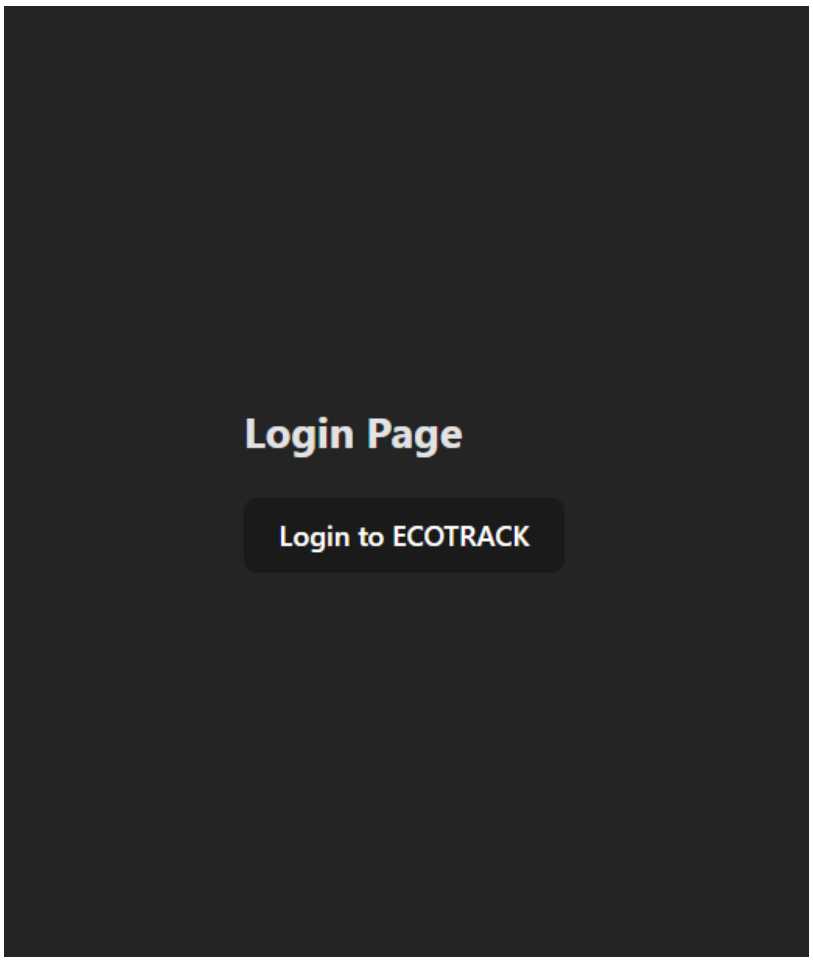
```
import { Navigate } from "react-router-dom";
import { useAuth } from
"../context/AuthContext";

const ProtectedRoute = ({ children }) => {
  const { isAuthenticated } = useAuth();

  return isAuthenticated ? children : <Navigate to="/login" />;
};

export default ProtectedRoute;
```

4. Output:



5. Learning Outcome:

- Understand how to build Single Page Applications using React Router for smooth client-side navigation.
- Learn to implement protected routes using Context API–based authentication.
- Gain hands-on experience with nested routing for structured dashboard layouts.
- Develop skills in managing global user state and session handling in React.
- Learn to design scalable and maintainable routing architectures for real-world applications.