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COMPUTER SCIENCE & ENGINEERING
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Experiment 2

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Aim: The aim of this implementation is to develop a **secure navigation system** using **Contextbased authentication along with route protection**, ensuring that only logged-in users can access authorized pages of the application.

Objective:

- To manage **user authentication state globally** using Context
- To implement **routing for page navigation**
- To restrict access to protected routes for unauthenticated users
- To allow page switching **only after successful login**
- To redirect unauthenticated users automatically to the **login page**
- To improve application security and user experience
- To maintain clean, scalable, and reusable code structure

Input/Apparatus Used:

- Programming Language: JavaScript (ES6+)
- Framework / Library: React (Functional Components)
- Build Tool: Vite
- Code Editor: Visual Studio Code
- Web Browser: Google Chrome

Files Structure


Context
node_modules
public
src
assets
components
context
AuthContext.jsx
data
pages
DashboardAn...
DashboardLay...
DashboardSu...
Login.jsx
routes
App.css
App.jsx
index.css
main.jsx

Flow of Data

App Load
↓
Check Login Status (Context)
↓
Is User Logged In?
├── **NO → Show Login Page**
└── **YES → Allow Access to Protected Pages**

Steps

1. **Application Starts**
   - index.js renders <App />
   - <App /> is wrapped with AuthProvider

2. **AuthContext Controls Login State**

AuthContext.js
   - Stores:
     - isLoggedIn
     - login()
     - logout()

3. **Routes Are Defined in App.jsx** Routes:

"/login" → Login Page
"/dashboard" → Protected
"/profile" → Protected

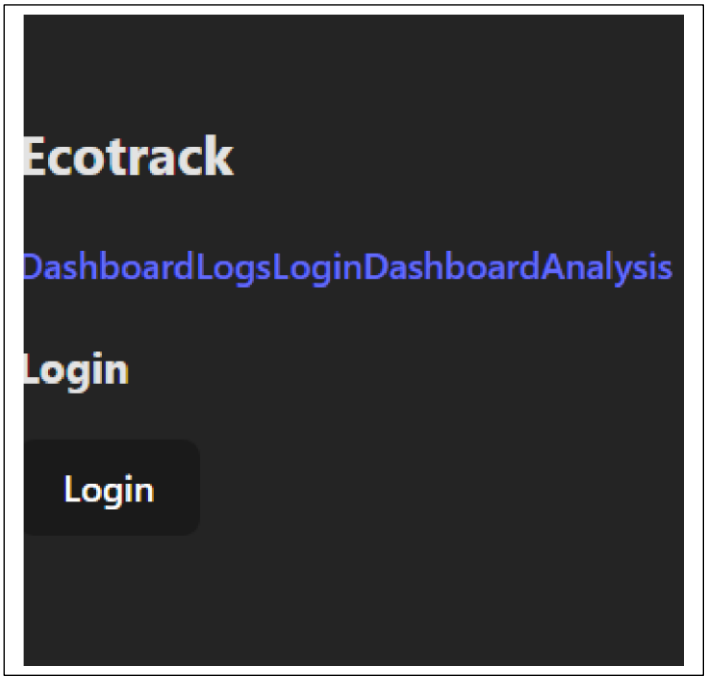
4. **ProtectedRoute Acts as a Guard**

ProtectedRoute.js logic:
IF isLoggedIn === true
→ Render Requested Page
ELSE
→ Redirect to Login Page

5. **User Accesses the App (Not Logged In) Flow:**

User enters /dashboard
↓
ProtectedRoute checks isLoggedIn
↓
FALSE
↓
Redirect → /login

Output



Learning Outcomes

- Learned global state management using Context
- Implemented protected routing for secure navigation
- Controlled access based on authentication status
- Improved security and code maintainability