



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Discover. Learn. Empower.

Experiment 2

Student Name: S S Sneha

Branch: BE- CSE(AIML)

Semester: 6th Subject Name:

Full Stack

UID: 23BAI70259

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1. Aim: To implement centralized state management in the EcoTrack application using Redux Toolkit and to handle asynchronous data operations using Redux async thunks with proper loading and error states.

2. Objective:

After completing this experiment and its follow-up task, the student will be able to:

1. Configure a Redux store in a React application using Redux Toolkit
2. Create and integrate Redux slices for managing application data
3. Implement asynchronous actions using Redux async thunks
4. Manage loading, success, and error states during asynchronous operations
5. Connect React components to Redux state using React-Redux hooks
6. Trigger asynchronous data fetching through Redux actions from UI components
7. Use Redux state to derive filtered views without modifying the global store
8. Enhance user experience by handling refresh actions and improving async UI feedback.

3. Implementation/Code:

Header.js:

```
import {Link} from "react-router-dom";
```

```
const Header = ({ title }) => {  
  return (  
    <header style= {{
```

```

padding:"1rem",
backgroundColor:"#27ae60",
color:"white",
textAlign:"center",
}}>
<h2>{title}</h2>
<nav>
  <Link to="/" style={{marginRight:"1rem",color:"#79e44f"}}>
    Dashboard
  </Link>
  <Link to="/logs"
style={{marginRight:"1rem",color:"#79e44f"}}>
    Logs
  </Link>
  <Link to="/login"
style={{marginRight:"1rem",color:"#79e44f"}}>
    Login
  </Link>

  <Link to="/logout"
style={{marginRight:"1rem",color:"#79e44f"}}>
    Logout
  </Link>

</nav>
</header>
);
};

exportdefault Header;

```

AuthContext.js:

```

import { createContext,useContext,useState } from "react";

const AuthContext = createContext(null);

export const AuthProvider =({children})=>{
  const [ isAuthenticated, setIsAuthenticated] = useState(false);

```

```

    return(
      <AuthContext.Provider value = {{ isAuthenticated,
        setIsAuthenticated}}>
        {children}
      </AuthContext.Provider>
    )
  }
}

```

```
export const useAuth = () => useContext(AuthContext);
```

logs.js:

```

export const logs = [
  { id: 1, activity: "Car Travel", carbon: 4 },
  { id: 2, activity: "Electricity Usage", carbon: 6 },
  { id: 3, activity: "Cycling", carbon: 0 },
  { id: 4, activity: "Bus Travel", carbon: 3 },
  { id: 5, activity: "Solar Energy Usage", carbon: 1 },
  { id: 6, activity: "Flight Travel", carbon: 8 },
];

```

```
export default logs;
```

Dashboard.js:

```

import logs from '../data/logs'
import Header from '../components/header'
const totalCarbon = logs.reduce ((sum, log) => sum+log.carbon,0)

const Dashboard = () => {
  return (

    <div >
      <h2>{Header}</h2>
      <p style={{padding
        : "1rem", backgroundColor: "#3175a2", color: "#d6eaf8", textAlign: "center"
      }}>Total Carbon Footprint: {totalCarbon}</p>

      <ul style={{padding
        : "1rem", backgroundColor: "white", color: "#111", textAlign: "center"}}>

```

```

        {logs.map((log)=>(
          <li key={log.id}>
            {log.activity}:{log.carbon} kgs
          </li>
        ))}
      </ul>
    </div>

  )
}
export default Dashboard;

```

DashboardAnalytics.js:

```

const DashboardAnalytics = ()=>{
  return (
    <p>This is Dashboard Analytics</p>
  )
};
export default DashboardAnalytics;

```

DashboardSummary.js:

```

const DashboardSummary = ()=>{
  return (<p>This is Dashboard Summary</p>)
}

export default DashboardSummary;

```

DashboardLayout.js:

```

import { Link,Outlet } from "react-router-dom";
const DashboardLayout = ()=>{

  return (
    <div style={{padding:"1rem"}}>
      <h3>Dashboard</h3>

      <nav>
        <Link to="/summary">Summary</Link> |{" "}
        <Link to="/analytics">Analytics</Link>
      </nav>

```

```

        <hr/>
        <Outlet/>

    </div>

)
};

export default DashboardLayout;

Login.js:

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

const Login = () => {
    const {setIsAuthenticated}=useAuth();
    const navigate = useNavigate();

    const handleLogin = () => {
        setIsAuthenticated(true);
        navigate("/");
    };

    return (
        <div style={{padding:"1rem"}}>
            <h3>Login Page</h3>
            <button onClick={handleLogin}>Login</button>
        </div>
    )
}

export default Login;

```

Logout.js:

```

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

const Logout = () => {
    const {setIsAuthenticated}=useAuth();
    const navigate = useNavigate();

```

```

const handleLogout = () => {
  setIsAuthenticated(false);
  navigate("/");
};

return (
  <div style={{padding: "1rem"}}>
    <h3>LogoutPage</h3>
    <button onClick={handleLogout}>Logout</button>
  </div>
)
}

```

export default Logout;

ViewLogs.js:

```
import logs from "../data/logs";
```

```

const Viewlogs = () => {
  return (
    <div>
      <h2>Experiment Logs</h2>
      <ul>
        {logs.map((log, index) => (
          <li key={log.id}>
            {log.activity}: {log.carbon} kg CO2
          </li>
        ))}
      </ul>
    </div>
  )
}

```

export default Viewlogs;

ProtectedRoute.js:

```

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

```

```

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

```

```

    if(!isAuthenticated){
      return <Navigate to="/login" replace/>
    }

    return children;
  }

```

```

export default ProtectedRoute;

```

LogSlice.js:

```

import { createSlice,createAsyncThunk } from "@reduxjs/toolkit";

```

```

export const fetchLogs = createAsyncThunk(
  "logs/fetchLogs",
  async()=> {
    await new Promise ((resolve) =>setTimeout(resolve,1000));
    return [
      { id: 1, activity: "Car Travel", carbon: 4 },
      { id: 2, activity: "Electricity Usage", carbon: 6 },
      { id: 3, activity: "Cycling", carbon: 0 },
      { id: 4, activity: "Bus Travel", carbon: 3 },
      { id: 5, activity: "Solar Energy Usage", carbon: 1 },
      { id: 6, activity: "Flight Travel", carbon: 8 },
    ];
  }
)

```

```

const logsSlice = createSlice({
  name: "logs",
  initialState:{
    data:[],
    status:"idle",
    error:null,
  },
  reducers: {},
  extraReducers :(builder)=>{
    builder.addCase(fetchLogs.pending,(state)=>{
      state.status="loading";
    })
    .addCase(fetchLogs.fulfilled,(state,action)=>{
      state.status ="success";
    })
  }
})

```

```

        state.data = action.payload;
    })
    .addCase(fetchLogs.rejected,(state,action)=>{
        state.status = "failed";
        state.error = action.error.message;
    })
}
})

```

export default logsSlice.reducer;

Store.js:

```

import {configureStore} from "@reduxjs/toolkit"
import logsReducer from "./logsSlice";

```

```

const store = configureStore({
  reducer :{
    logs: logsReducer,
  },

```

```

});

```

export default store;

App.js:

```

import Header from "./components/header";

```

```

import { BrowserRouter,Routes,Route } from "react-router-dom";
import Login from "./pages/login";
import Viewlogs from "./pages/Viewlogs";
import DashboardLayout from "./pages/DashboardLayout";
import DashboardAnalytics from "./pages/DashboardAnalytics";
import DashboardSummary from "./pages/DashboardSummary";
import ProtectedRoute from "./routes/ProtectedRoutes";
import Logout from "./pages/logout";

```

```

function App (){
  return (
    <BrowserRouter>

```



```

<Header title="Eco Track : Experiment 2 "/>
  <Routes>
    <Route path= "login" element={<Login/>}/>
    <Route path= "/" element=
    {
      <ProtectedRoute>
        <DashboardLayout />
      </ProtectedRoute>
    }>

    <Route index />
    <Route path="Summary" element={<DashboardSummary/>}/>
    <Route path="Analytics" element={<DashboardAnalytics/>}/>
    <Route path="logs" element={<Viewlogs/>}/>

    </Route>
  </Routes>
</Routes>
  <Route path="logout" element={<Logout/>}/>
</Routes>

</BrowserRouter>
)
}
exportdefault App;

```

4. Output:

Login page:

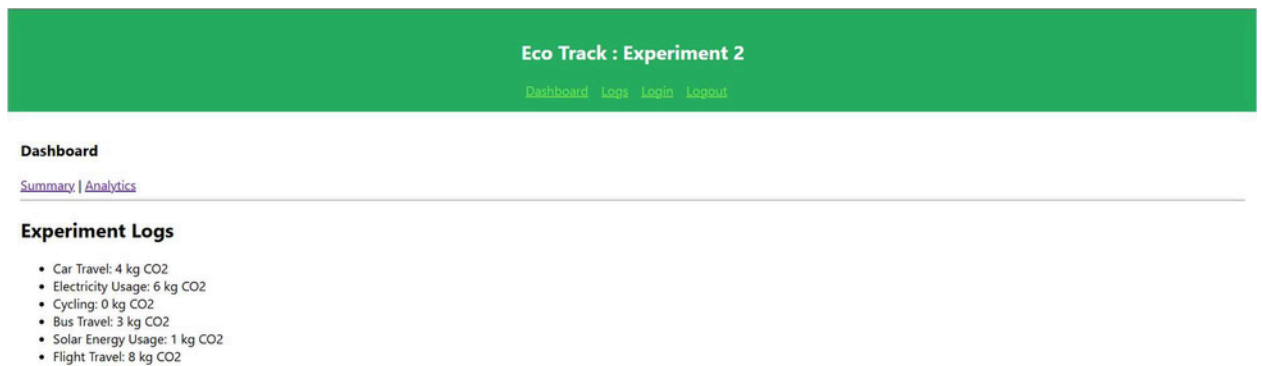
Login Page

Login

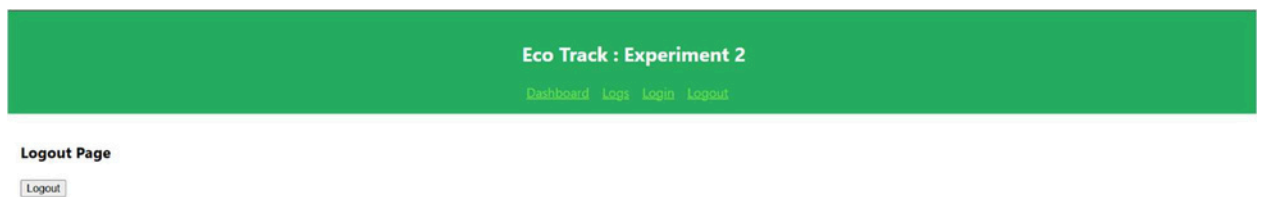
Dashboard Page:

Dashboard Summary Page:

Logs Page:



Logout Page:



5. Learning Outcome

1. Learnt about react files.
2. Learnt Design and apply redux and its uses.
3. Learnt Implement nested routing to build dashboard-style layouts.