

# Week 4 Internship Report

**Name:** Akalya Ravichandran

**Role:** Frontend Developer Intern

**Week:** Week 4

**Duration:** Monday – Friday

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## 1. Objective of the Week

The objective of Week 4 was to apply React knowledge in real-world scenarios, implement advanced routing and state management using TanStack Router and Query, perform schema validation with Zod, and integrate GraphQL APIs using Apollo Client.

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## 2. Custom Hooks

### Topics Covered

- Creation of reusable logic using custom hooks
- Sharing stateful logic between components

### Practical Exercises

- Built 2 custom hooks to manage common stateful logic
  - Integrated hooks into multiple components for reuse
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## 3. TanStack Router

### Topics Covered

- Routing and navigation setup
- Route parameters and loaders
- Dynamic page rendering

### Practical Exercises

- Implemented multiple routes for a multi-page React application
- Configured route parameters and data loaders
- Ensured smooth navigation and page transitions.

## 4. TanStack Query

### Topics Covered

- useQuery for fetching data
- useMutation for updating/deleting data
- Caching, refetching, and background updates

### Practical Exercises

- Fetched REST API data and displayed it using TanStack Query
  - Performed mutations to update data
  - Implemented caching for improved performance
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## 5. TanStack Form + Zod Validation

### Topics Covered

- Introduction to TanStack Form
- Form validation using Zod schemas

### Practical Exercises

- Created a form with validation using Zod
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## 6. GraphQL Fundamentals & Apollo Client

### Topics Covered

- GraphQL queries, mutations, and fragments
- Apollo Client setup and integration with React

### Practical Exercises

- Implemented GraphQL queries and mutations in the app
- Managed data fetching, caching, and error handling using Apollo Client

**Outcome:** Learned to integrate and manage GraphQL APIs in React applications effectively.

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## 7. Project Codebase Exploration

### Activities

- Navigated through the project repository
  - Understood folder structure, components, and routing logic
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## 8. Deliverables Summary

- Multi-page React app with TanStack Router implemented
  - Two custom hooks created for reusable logic
  - Form built with Zod validation
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## 9. Challenges Faced

- Understanding complex state and routing patterns in TanStack
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## 10. Learnings & Takeaways

- Custom hooks significantly improve code reusability
- TanStack Router and Query simplify advanced routing and data management
- Zod enables strict and maintainable form validation
- Familiarity with a real project codebase enhances practical understanding