

# Rust courseproject report Teemu Aitomeri

## Chosen project – “Backend Application”

I made a simple e-commerce backend using the Axum framework. The backend fetches product data from the FakeStoreAPI and allows adding, updating, and deleting products from a shopping cart that is stored in memory.

I also created a small Next.js frontend to test and visualize the backend, but the main focus of the project was on the Rust backend itself.

What I learned the most was:

- How to set up a Rust backend with the Axum framework.
- How to handle shared mutable state safely in Rust using `Arc<Mutex<>>`.
- How to organize routes, models, and middleware in a modular project structure.
- How to handle errors properly and return meaningful JSON responses.
- How to connect a Rust backend to a React/Next.js frontend.

## Features done

- Fetching product data from an external API (FakeStoreAPI).
- Displaying products at `/api/products` and viewing individual product details.
- Adding, updating, and removing products from a cart stored in memory.
- Clearing the entire cart.
- Custom data structures for Product, Cart, and CartProduct.
- Using `Arc<Mutex<>>` for shared state management between routes.
- Logging middleware to show incoming requests and responses.
- CORS configuration for frontend connection.
- Frontend built with Next.js using Zustand for state management.

## Link to video

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