



**Grocery  
webapp  
using MERN  
stack NM1042**

Presented by

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# Abstract

This project is a comprehensive grocery web application developed (Fresh Today) using the MERN stack (MongoDB, Express.js, React.js, and Node.js). The app is designed to provide a seamless and efficient online grocery shopping experience with features such as product browsing, real-time cart management, and secure checkout.

The frontend, built with Angular, delivers a dynamic, interactive, and responsive user interface. React's component-based architecture ensures reusability and maintainability, while Bootstrap enhances the design with modern, mobile-friendly aesthetics.

The backend, powered by Node.js and Express.js, facilitates robust server-side operations, including secure RESTful APIs and efficient data handling. MongoDB, a NoSQL database, provides a scalable solution for managing user, product, and order data.

This grocery app highlights expertise in full-stack development, leveraging the MERN stack to build a practical, user-friendly, and feature-rich e-commerce solution.

# Introduction

"Introducing a user-friendly grocery app built (Fresh Today) using the MERN stack . Fresh Today aims to simplify grocery shopping with features like seamless browsing, secure checkout, and efficient admin management."

This web application is designed to revolutionize the way users shop for groceries by offering a smooth, efficient, and user-friendly experience. It allows customers to browse a wide range of products, manage their cart in real time, and complete purchases securely.

For administrators, the app provides powerful tools to manage inventory, update product details, and oversee orders. This project showcases modern web development practices, robust backend functionality, and a visually appealing frontend interface, all aligned to deliver a seamless e-commerce experience."

# Features

## User

- Browse products by category.
- Add products to the cart.
- Update or remove items from the cart.
- Secure checkout process.

## Admin

- Add/edit/delete products.
- View and manage orders.

# Architecture

## Frontend

The frontend is built with Angular for a dynamic, modular structure and Bootstrap for responsive, user-friendly design. Angular handles real-time updates and navigation, while Bootstrap ensures a modern and mobile-friendly interface.

## Backend

The backend uses Node.js and Express.js to create RESTful APIs for data handling. Node.js ensures scalability, while Express.js manages routing, authentication, and error handling efficiently.

## Database

The app uses MongoDB to store data in collections for users, products, and orders. Its flexible JSON-like structure allows for fast and efficient data retrieval.

# Frontend



The frontend of the grocery app is developed using Angular and Bootstrap to provide a dynamic, responsive, and user-friendly interface. Angular ensures a seamless user experience with features like two-way data binding for real-time updates and routing for smooth navigation between pages such as product listings, the cart, and checkout. Bootstrap enhances the design with pre-styled components, creating a modern, mobile-responsive layout. Together, these technologies deliver a visually appealing and highly interactive platform for users.

# Backend

## API Development

- Created RESTful APIs for seamless communication between the frontend and database.
- Handles CRUD operations for products, users, and orders.

## Authentication

- Implemented secure user authentication using JSON Web Tokens (JWT).
- Ensures session management and protects sensitive data.

## Middleware

- Manages request validation and error handling.
- Handles logging for better debugging and tracking

# Backend

## Order Management

- Processes user orders, including adding items, calculating totals, and updating statuses.
- Stores order history for user reference.

## Admin Features

- APIs for managing inventory (add, update, delete products).
- Provides insights into user orders for better business operations.

## Scalability and Efficiency

- Non-blocking architecture of Node.js ensures quick handling of concurrent requests.
- Optimized database queries for faster response times.

# Workflow

- User Interaction:

Users browse products, add items to the cart, and place orders through a responsive React.js frontend.

- Frontend to Backend Communication:

The frontend sends user requests (like adding products or logging in) to the Node.js and Express.js backend via RESTful APIs.

- Backend Processing:

The backend handles business logic, such as validating inputs, managing carts, and processing orders. It uses JWT for secure user authentication.

- Database Operations:

The backend interacts with MongoDB to store and retrieve data for users, products, and orders.

- Admin Panel:

Admins manage inventory and orders through a dedicated interface connected to the backend.

# Testing

## Frontend

- Verified functionality like product listing, cart updates, and checkout flow.
- Tested responsiveness across multiple devices using browser tools

## Backend

Conducted API testing with Postman to ensure endpoints handled requests correctly. Validated authentication processes, including JWT generation and verification.

## Database

Verified MongoDB queries for accuracy and efficiency. Ensured data consistency for user orders, cart updates, and inventory management.

# Challenges & Solution

- Challenge: Real-Time Cart Updates

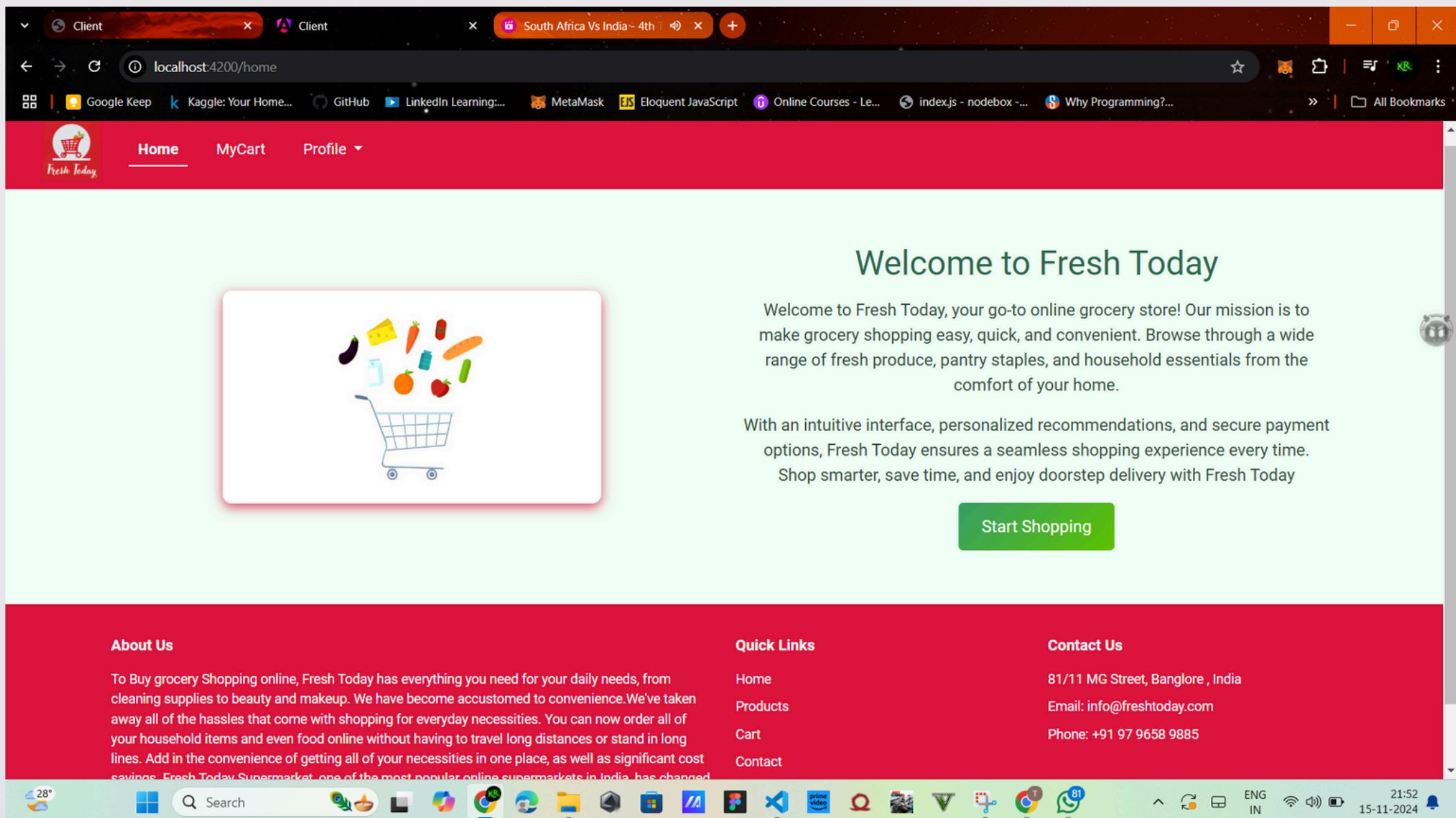
Problem: Ensuring that the cart reflects changes (adding/removing items) instantly for a smooth user experience.  
Solution: Implemented Angular's two-way data binding to dynamically update the cart in real time, avoiding page reloads.

- Challenge: Secure User Authentication

Problem: Protecting sensitive user data during login and transactions.  
Solution: Integrated JSON Web Tokens (JWT) for secure authentication and encrypted sensitive data using industry-standard algorithms.

# Photo showcase

## Home Page



# Login Page

The screenshot shows a web browser window with a red header bar. The address bar displays "localhost:4200/login". The main content area features a red header with the "Fresh Today" logo and navigation links for "Home", "MyCart", and "Profile". Below this is a large white space containing a central illustration of a person sitting at a desk working on a laptop. To the right of the illustration is a "Login" form with fields for "Email" and "Password", each accompanied by an "Enter email" placeholder text. A red "Sign In" button is positioned below the password field. At the bottom of the page, there is a link "Don't have an account? click here". The browser's taskbar at the bottom shows various pinned icons, including a weather icon (28°), a search bar, and several application icons like Google Chrome, Microsoft Word, and Microsoft Excel.

Client Client South Africa Vs India- 4th T

localhost:4200/login

Home MyCart Profile

Fresh Today

Enter email

Enter password

Sign In

Don't have an account? [click here](#)

28° Search

ENG IN 21:52 15-11-2024

# Landing Page

The screenshot shows a web browser window with the URL `localhost:4200/shopping`. The page has a red header bar with the logo "Fresh Today". Below the header, there are sections for "Filters" and "Category". The "Category" section includes a search bar and checkboxes for Fruits, Vegetables, Dairy, Meat, Bakery, Beverages, and Others. The main content area is titled "Products" and displays four items: Apple, orange, strawberries, and Banana. Each product card includes an image, the fruit name, a brief description, price, a star rating, and buttons for "Add" and "Buy Now". The status bar at the bottom shows various system icons and the date/time `17-11-2024 18:33`.

## Fresh Today

### Filters

Search

### Category

Fruits  Vegetables  Dairy  Meat  Bakery  Beverages  Others

### Products

**Apple**  
Apples are sweet and crisp fruits that come in a variety of colors, including red, green, and yellow. They are rich in fiber and vitamin C and make a healthy snack.  
price: 60/kg/l/g 4 ★

**orange**  
Oranges are juicy and tangy citrus fruits known for their high vitamin C content. They are typically peeled and eaten fresh or used to make orange juice.  
price: 45/kg/l/g 4.2 ★

**strawberries**  
Strawberries are sweet and fragrant berries with a bright red color. They are rich in antioxidants, vitamin C, and fiber.  
price: 80/kg/l/g 3.5 ★

**Banana**  
Bananas are a soft, sweet fruit with a creamy texture, covered by a yellow peel when ripe.  
price: 25/kg/l/g 5 ★

Add

ENG IN 18:33 17-11-2024

# Cart Page

The screenshot shows a web browser window titled "Client" with the URL "localhost:4200/my-cart". The browser's toolbar includes various bookmarks such as Google Keep, Kaggle: Your Home..., GitHub, LinkedIn Learning, MetaMask, Eloquent JavaScript, Online Courses - Le..., index.js - nodebox..., Why Programming?..., and All Bookmarks. The main content area has a red header with the "Fresh Today" logo, "Home", "MyCart" (which is active), and "Profile" menu items. Below the header, the title "My Cart" is displayed. The cart contains three items:

- Apple**: Price: 60 /-. A "Buy" button is present.
- Carrot**: Price: 45 /-. A "Buy" button is present.
- Broccoli**: Price: 55 /-. A "Buy" button is present.

The bottom of the screen shows the Windows taskbar with icons for File Explorer, Microsoft Edge, and other applications, along with system status indicators like battery level, signal strength, and date/time (15-11-2024).

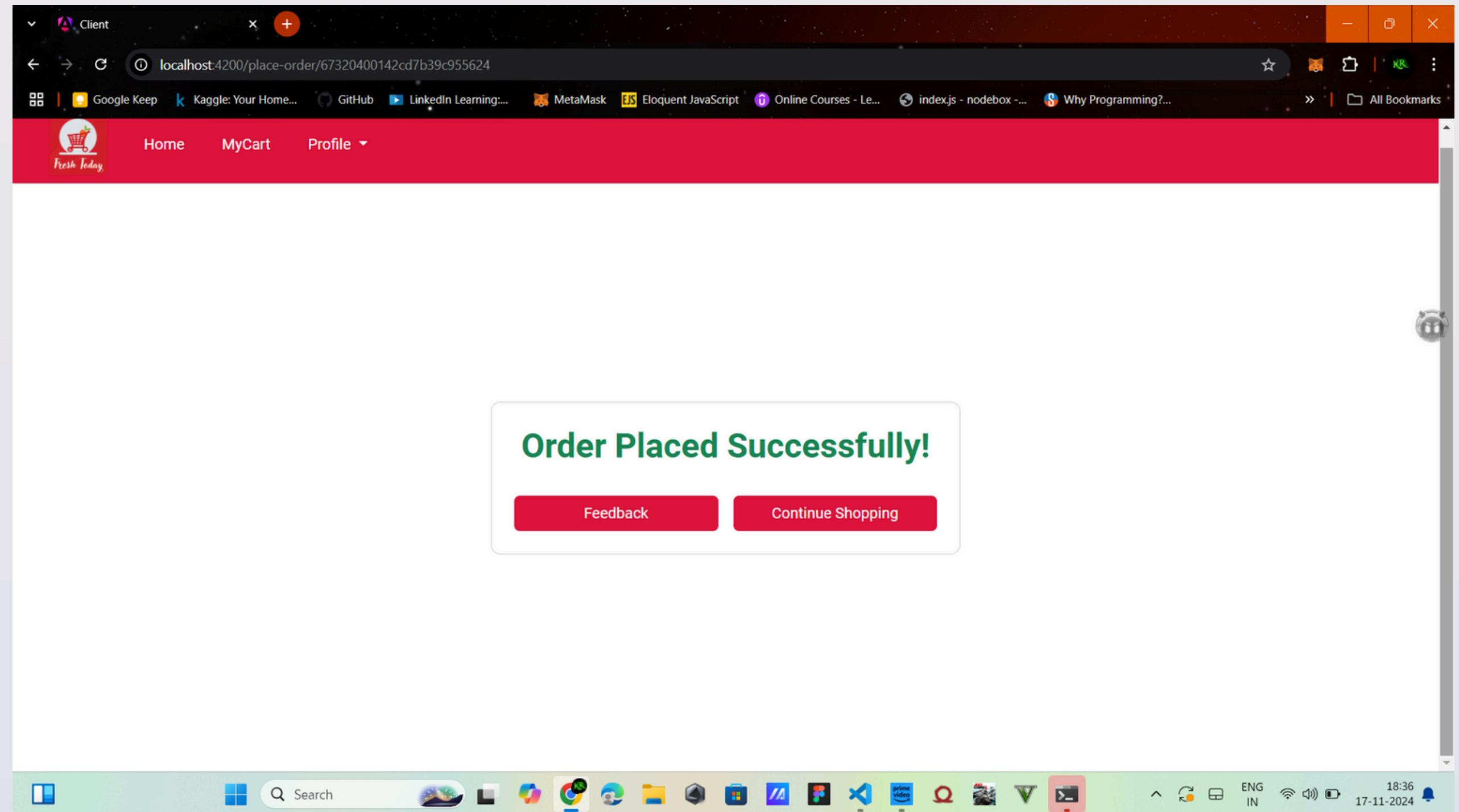
# Order Page

The screenshot shows a web browser window titled "Client" with the URL "localhost:4200/place-order/67320400142cd7b39c955624". The browser's address bar also displays "localhost:4200/place-order". The page header includes a logo for "Fresh Today" with a shopping cart icon, and navigation links for "Home", "MyCart", and "Profile". The main content area is titled "Order Details" and contains the following fields:

- Firstname: A text input field with placeholder text "Enter firstname".
- Lastname: A text input field with placeholder text "Enter lastname".
- Phone: A text input field with placeholder text "Enter phone".
- Quantity: A text input field.
- Address: A text input field with placeholder text "Enter full address".
- Payment method: A dropdown menu labeled "Payment method:".

The browser's taskbar at the bottom shows various pinned icons, and the system tray indicates the date and time as "17-11-2024 18:34".

# Order Successfull Page



# Conclusion

The grocery app, developed using the MERN stack, successfully meets the needs of both users and administrators by providing a seamless shopping experience and efficient management tools. The frontend, built with Angular and Bootstrap, offers a dynamic, responsive, and user-friendly interface. The backend, powered by Node.js and Express.js, ensures secure and efficient communication between the frontend and database, while MongoDB provides a flexible and scalable data storage solution. Despite the challenges of implementing real-time cart updates, secure authentication, and maintaining scalability, the project overcame these hurdles through thoughtful design and robust solutions. Rigorous testing with tools like Postman ensured the app's reliability, security, and performance.

# Thank You

