FULL STACK DEVELOPMENT WITH MERN PROJECT DOCUMENTATION

1. Introduction

Project Title : ShopSmart : Your Digital Grocery Store Experience

Team id : LTVIP2025TMID54541

Team Members:

1. **Team Leader:**
   Pilla Kusuma– Full Stack Developer & Project Coordinator
   Responsible for overall planning, coordination, GitHub management, and integration of frontend and backend.
2. **Team Member**:
   Manne Suchandra Mehar– Frontend Developer
   Works on the React-based UI, handles component design, page routing, and user interactions.
3. **Team Member**:
   Mani Patnala– Backend Developer
   Builds RESTful APIs using Node.js and Express.js, manages authentication and server logic.
4. **Team Member:**
   Modi Priyanka– Database Administrator
   Designs and manages MongoDB schemas, handles CRUD operations and ensures data consistency.

2. Project Overview

- **Purpose:**

  The purpose of **ShopSmart** is to digitize the traditional grocery shopping process by providing a seamless, fast, and reliable online platform. It aims to:

- Enable users to shop for groceries anytime, anywhere.
- Minimize physical store visits and long queues.
- Connect customers with local grocery vendors.
- Offer a personalized and user-friendly shopping experience.
- Support vendors in managing inventory and increasing sales digitally.

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- **Features**

User Features

- Easy Registration & Login
- Browse Products by Category & Brand
- Add to Cart & Wishlist
- Apply Promo Codes & Discounts
- Secure Payments (UPI, Card, Wallet)
- Live Order Tracking
- View Order History & Reorder

Vendor/Admin Features

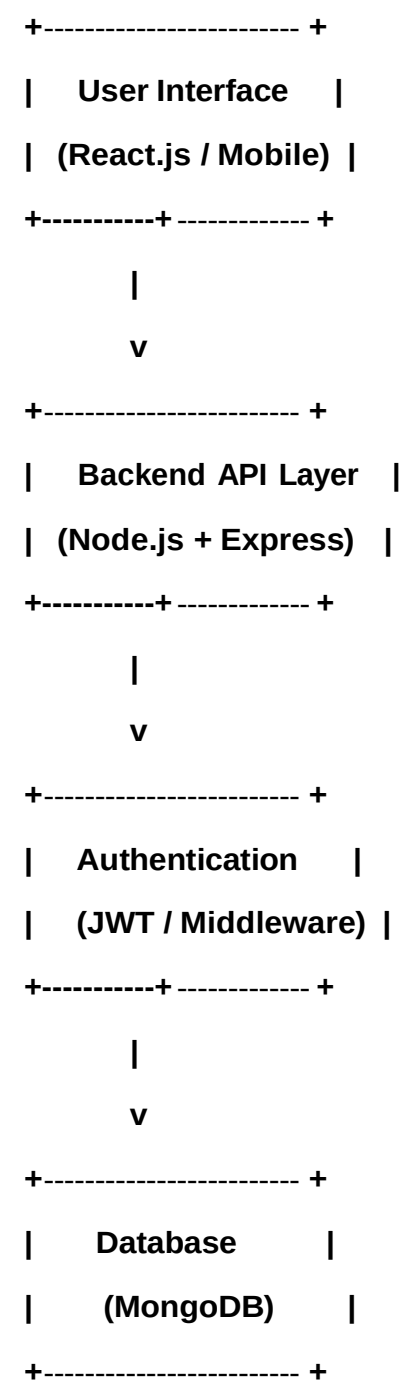
- Add/Edit/Delete Products
- Manage Stock & Pricing
- View Orders & Sales Reports
- Control Product Availability
- Manage User Queries

Other Key Features

- Responsive Design (Web & Mobile)
- Smart Search & Filters
- Personalized Product Recommendations
- Role-Based Access (User, Vendor, Admin)
- Notifications via Email/SMS

3. Architecture

System Architecture Diagram



Components

1. **Frontend (React.js)**
    - Handles UI/UX for customers, vendors, and admins
    - Interacts with backend via REST APIs
    - Responsive design for web and mobile

2. **Backend (Node.js + Express)**
    - REST API layer for handling user requests
    - Routes for user, product, cart, order, and admin operations
    - JWT-based authentication and authorization
3. **Database (MongoDB)**
    - Stores users, products, carts, orders, and vendor data
    - Enables flexible schema and fast querying
4. **Authentication**
    - Secures user sessions using JWT
    - Role-based access: user, vendor, admin
5. **External Services (Optional)**
    - Payment Gateway (e.g., Razorpay/Stripe)
    - Email/SMS Notification APIs
    - Cloud Storage for product images (e.g., Cloudinary)

4. Setup Instructions

Prerequisites

- Node.js >= 18
- MongoDB installed and running (local or cloud - MongoDB Atlas)
- npm or yarn

Installation

```
git clone https://github.com/your-username/ShopSmart.git
cd ShopSmart
cd server
npm install
cd ../client
npm install
```

Environment Variables

Create a .env file in the /server folder with the following content:

PORT=5000

MONGO_URI=mongodb+srv://yourusername:<db_password>@cluster0.mongodb.net/shopsmart?retryWrites=true&w=majority&appName=Cluster0

JWT_SECRET=your_jwt_secret

🔐 Replace <db_password> with your actual MongoDB password.
✅ Make sure your IP is whitelisted in MongoDB Atlas or use 0.0.0.0/0 for open access (development only).

Running the Application

1. **Start the backend server:**

   cd server

   npm start

Runs at http://localhost:5000

2. **Start the frontend:**

   cd ../client

   npm run dev

   Runs at http://localhost:5173

5. Folder Structure

ShopSmart/

```
│
├── client/                # Frontend (React.js)
│   ├── public/            # Static files
│   └── src/
│       ├── assets/        # Images, icons
│       ├── components/    # Reusable UI components
│       ├── pages/         # Route-based page components
│       ├── context/       # React context (e.g., Auth, Cart)
│       ├── services/      # API calls
```

```
│       ├── App.jsx          # Main app component
│       └── main.jsx         # React DOM entry point
│
├── server/                  # Backend (Node.js + Express)
│   ├── config/              # DB connection, JWT config
│   ├── controllers/         # Request handlers
│   ├── models/              # Mongoose models (User, Product, Order)
│   ├── routes/              # API route files
│   ├── middleware/          # Auth, error handling
│   ├── utils/               # Helper functions
│   ├── .env                 # Environment variables
│   └── server.js            # Entry point for backend
│
├── .gitignore               # Files/folders to ignore in Git
├── README.md                # Project documentation
└── package.json             # Root config (optional if monorepo)
```

5.Running the Application

Frontend:

- cd client
- npm start

Backend:

- cd server
- npm start

7. API Documentation

Authentication & Users

Method	Endpoint	Description	Access
POST	/api/auth/register	Register a new user	Public
POST	/api/auth/login	Login and receive JWT token	Public

GET	/api/users/me	Get current user info	Private

□ Products

Method	Endpoint	Description	Access
GET	/api/products	Get all products	Public
GET	/api/products/:id	Get product by ID	Public
POST	/api/products	Create new product	Admin/Vendor
PUT	/api/products/:id	Update product details	Admin/Vendor
DELETE	/api/products/:id	Delete a product	Admin/Vendor

□ Cart

Method	Endpoint	Description	Access
GET	/api/cart	Get user cart	Private
POST	/api/cart	Add item to cart	Private
PUT	/api/cart/:id	Update item quantity	Private
DELETE	/api/cart/:id	Remove item from cart	Private

□ Orders

Method	Endpoint	Description	Access
POST	/api/orders	Place a new order	Private
GET	/api/orders	Get current user's orders	Private
GET	/api/orders/all	Get all orders (admin only)	Admin
PUT	/api/orders/:id	Update order status (e.g. shipped, delivered)	Admin

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🗀 Admin/Vendor Management

Method	Endpoint	Description	Access
GET	/api/users	Get all users	Admin

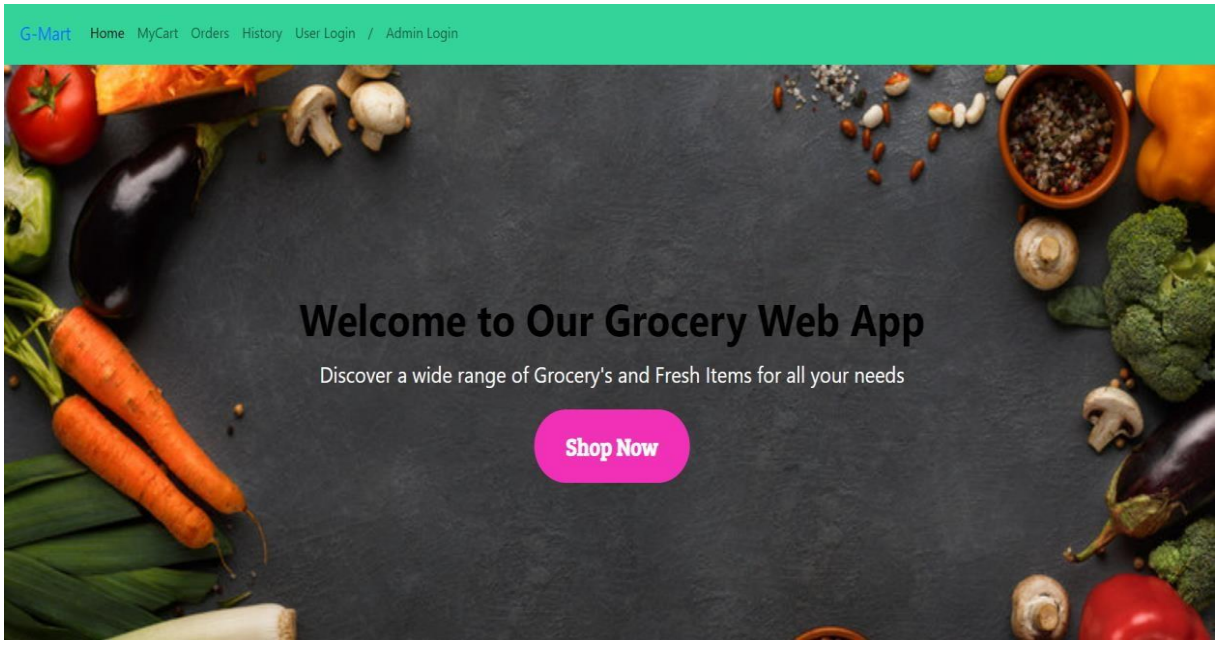
DELETE	**/api/users/:id**	**Delete a user**	**Admin**
GET	**/api/dashboard/stats**	**Get overall statistics**	**Admin**

8. Authentication

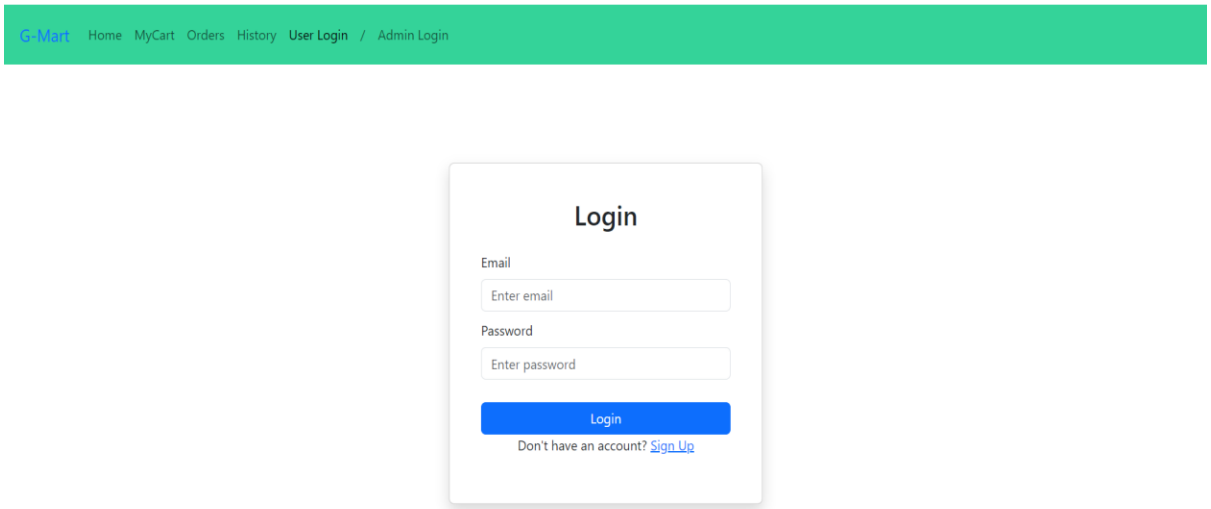
1. User Registers/Login
2. Server verifies credentials
3. If valid, server returns a JWT token
4. Token is stored in client (localStorage/cookies)
5. Protected routes require the token in headers

9. User Interface

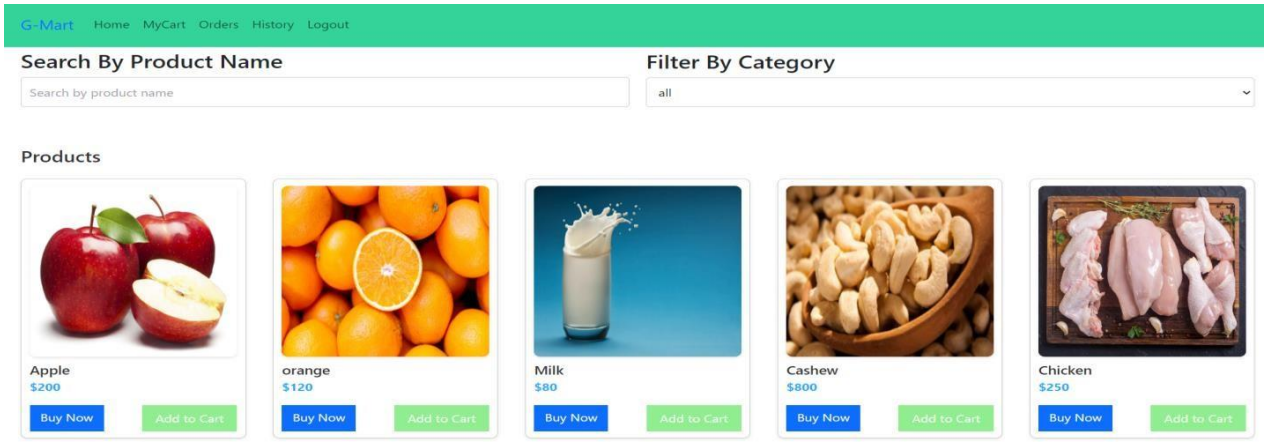
Home Page with flight search



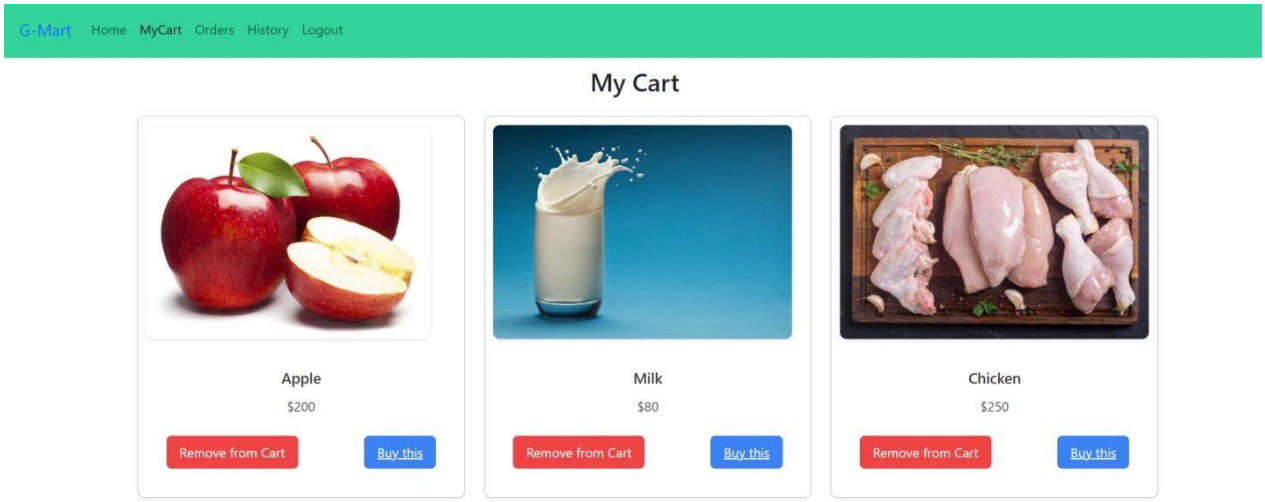
Login form



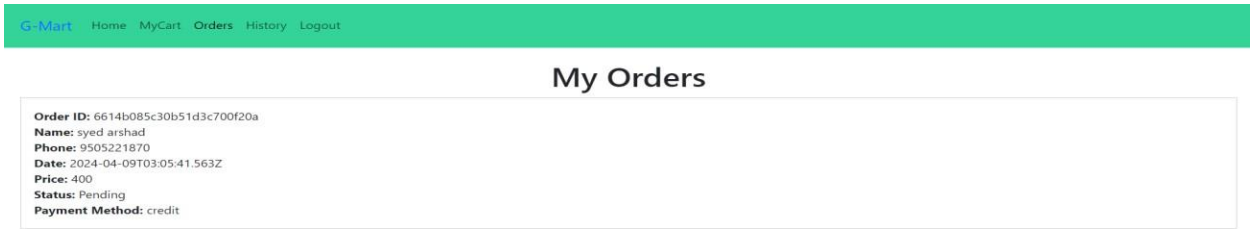
Items Page:-



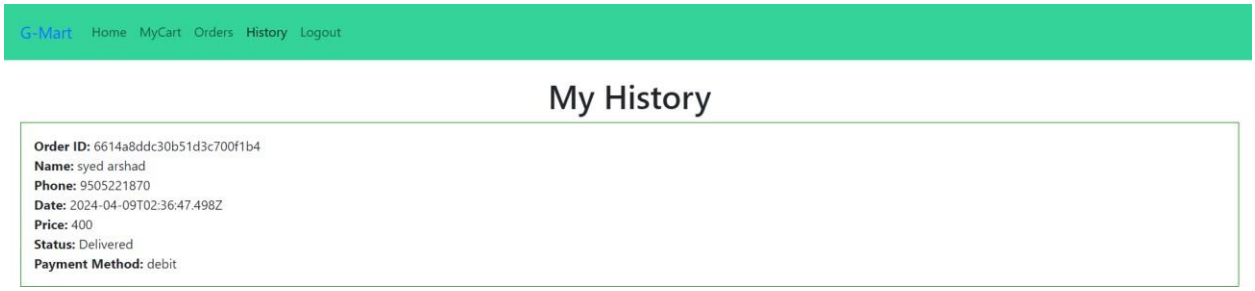
My Cart:-



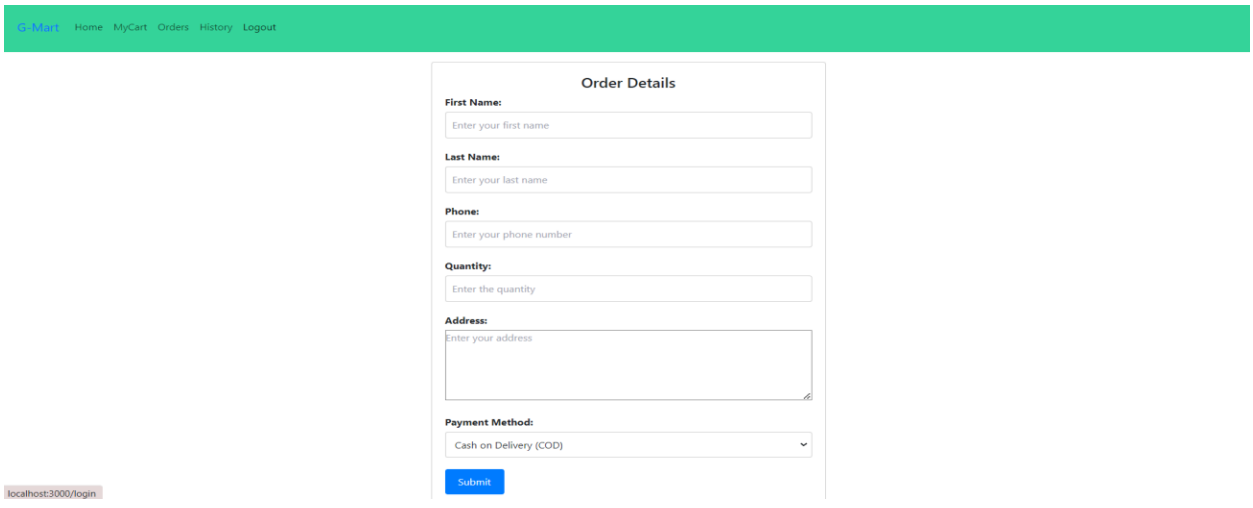
My Orders Page:-



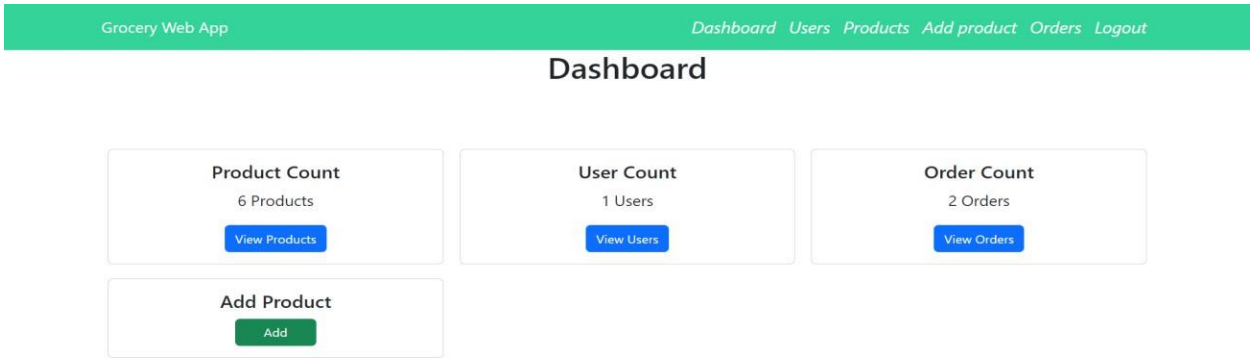
My History Page:-



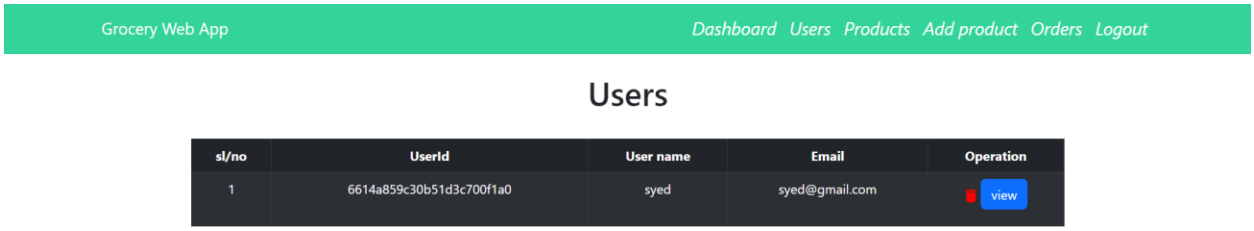
Place Order Page:-



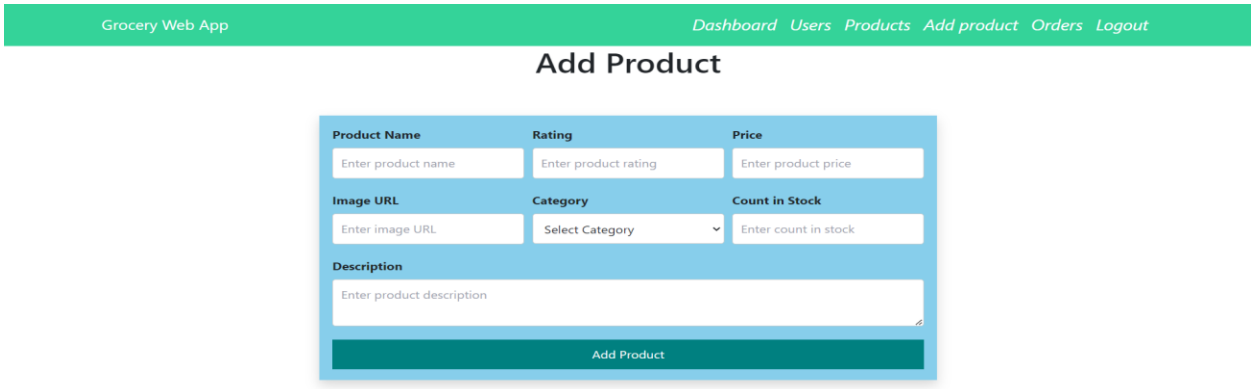
Admin Dashboard Page:



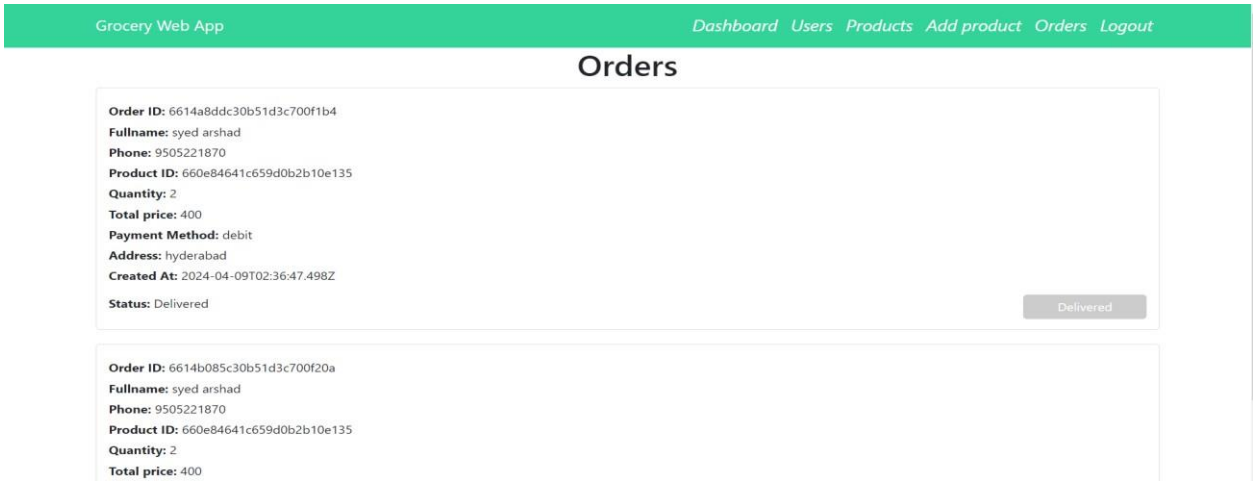
Users Page:-



Add Product page:-



Admin Orders Page:-



10. Testing

The ShopSmart application is tested using **Postman** for API endpoint validation and **manual UI testing** to ensure smooth user experience across registration, login, cart, and checkout flows. Automated testing can be added using **Jest** and **Super test** for backend coverage.

11. Demo

Link:

https://drive.google.com/file/d/1IASuHTlv2TI_arKlpXn0_FCMEDnpB9EI/view?usp=drive_link

12. Known Issues

 ❌ **No automated test coverage** – Testing is currently manual; missing unit and integration tests.

 ⚠️ **Limited error handling** – Some API responses lack detailed validation or error messages.

 📄 **No pagination or filtering in product APIs** – May affect performance with large datasets.

 🔐 **Token expiration handling not implemented** – JWT tokens do not auto-refresh, requiring manual re-login.

13. Future Enhancements

 Add Refresh Tokens – Implement secure token renewal to improve authentication flow.

 Mobile App Version – Build a native mobile app using React Native or Flutter.

 Inventory Auto-Update – Integrate real-time stock tracking for vendors.

- **AI-Powered Suggestions** – Use machine learning to improve product recommendations.
- **Chat Support System** – Enable live chat between customers and vendors.
- **Subscription/Auto-Order Feature** – Allow users to set recurring grocery orders.
- **Multi-language Support** – Expand user base by adding regional language options.
- **Invoice & Billing Module** – Generate downloadable order invoices for customers.
- **Analytics Dashboard** – Provide vendors/admins with real-time sales insights.

Github link: https://github.com/Priyanka9390/shopsmart-your-digital-grocery-store-experience.git