Shopez – MERN Full Stack E-Commerce

1. Introduction

Project Title: Shopez – MERN Full Stack E-Commerce

Shopez is a full-stack e-commerce web application developed using the MERN stack (MongoDB, Express.js, React.js, and Node.js). The project provides a complete online shopping platform with secure authentication, product browsing, cart management, order processing, and an admin dashboard.

2. Project Overview

The Shopez application follows a modular and scalable technical architecture to ensure high performance, security, and ease of maintenance

3. Technical Architecture

The Shopez application follows a scalable and modular architecture to ensure performance, security, and maintainability. The system is divided into frontend, backend, API services, and database layers.

User Interface (UI) :

The frontend is built using React.js and styled with Tailwind CSS. Users can browse products, search by category, view product details, add items to cart, and place orders. The UI is fully responsive and optimized for all devices.

Web Server :

The backend server is built using Node.js and Express.js to handle HTTP requests and business logic.

Authentication Service

Authentication is implemented using JWT (JSON Web Tokens). Passwords are encrypted using bcrypt, ensuring secure access.
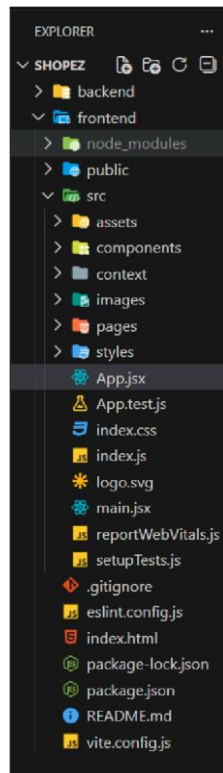
Database :

MongoDB stores user information, product details, cart items, and order data.
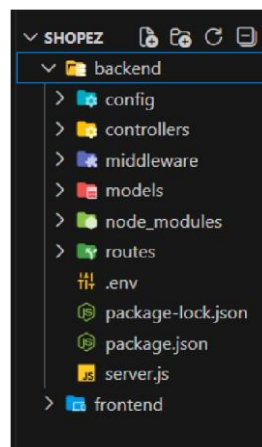
4. Features

- User registration and secure login
- Product browsing with category filtering
- Add to cart and checkout functionality
- Order placement and order tracking
- Admin dashboard for managing products and orders
- Role-based authentication
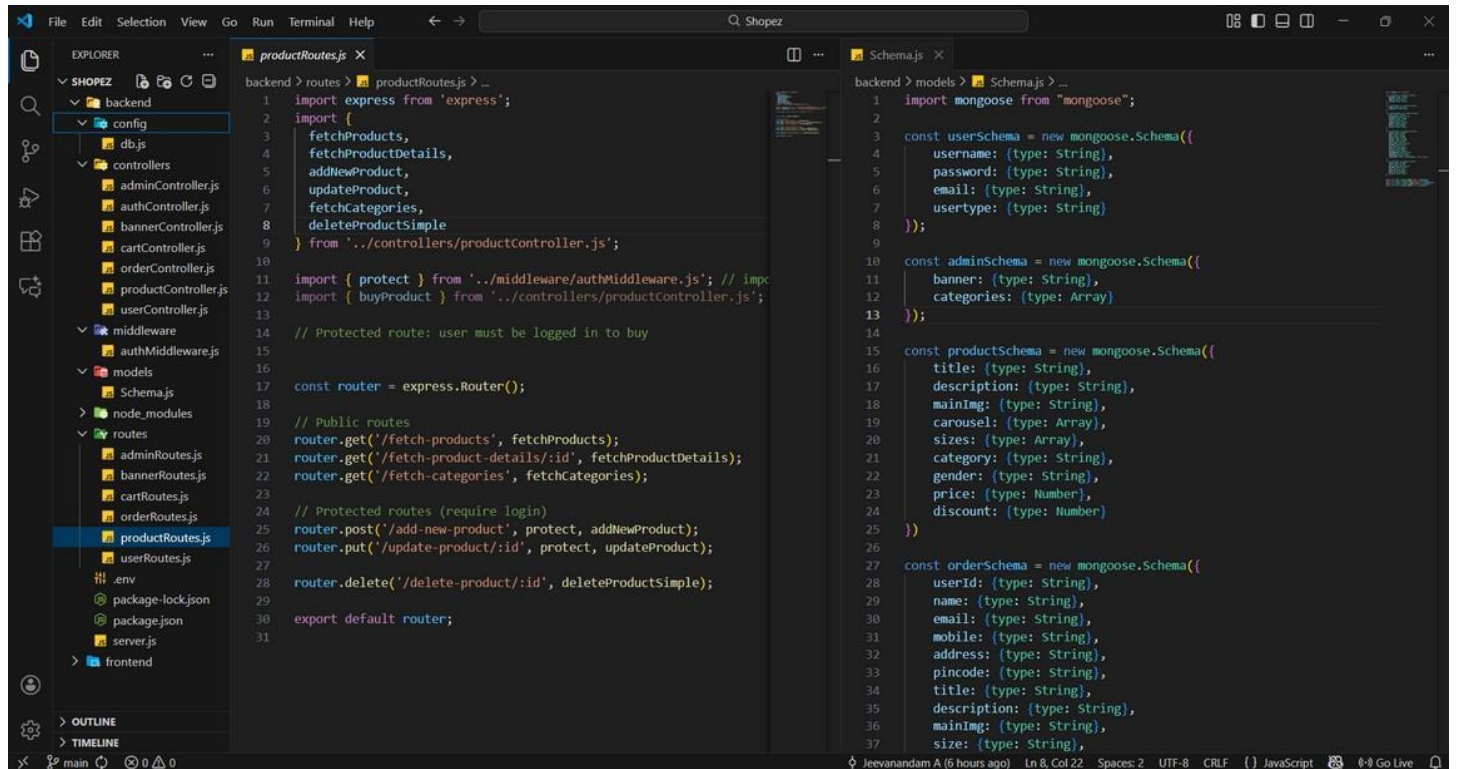- Responsive UI design

5.Folder Structure

Client: React frontend.
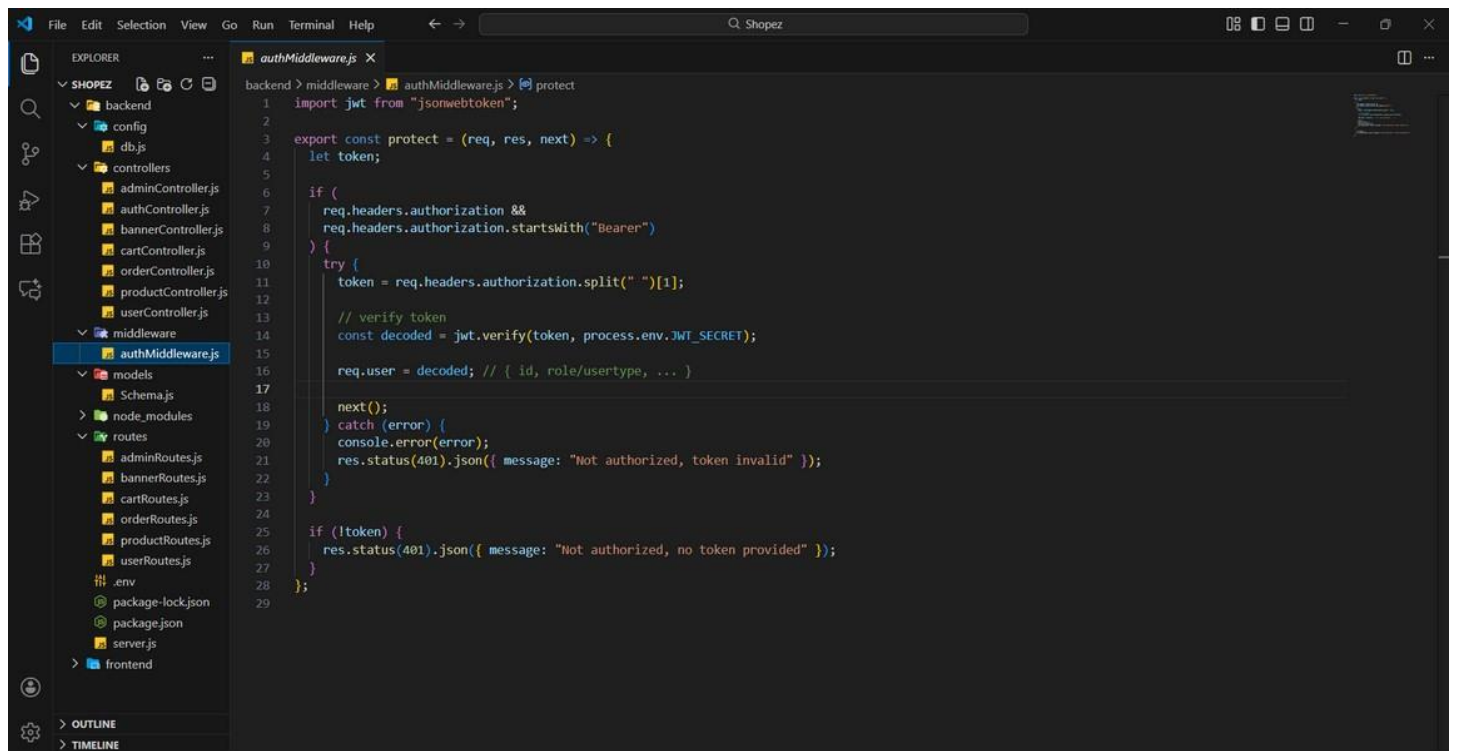

Server: Node.js backend.

6.API Documentation

7.Authentication

Authentication uses JWT stored in cookies for secure sessions. Authorization ensures only logged-in users can access protected routes while admin routes require an admin role. Passwords are securely hashed using bcrypt. Middleware validates tokens, checks user roles, and prevents unauthorized access.
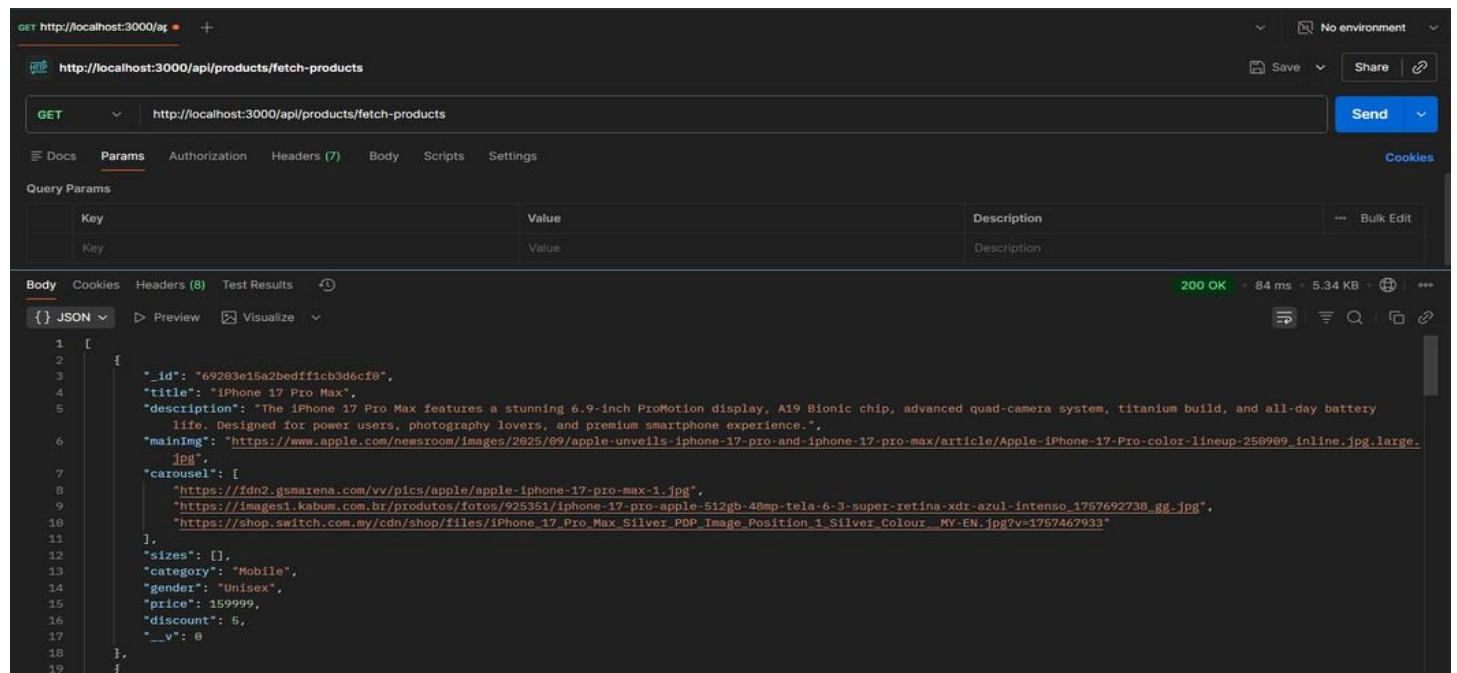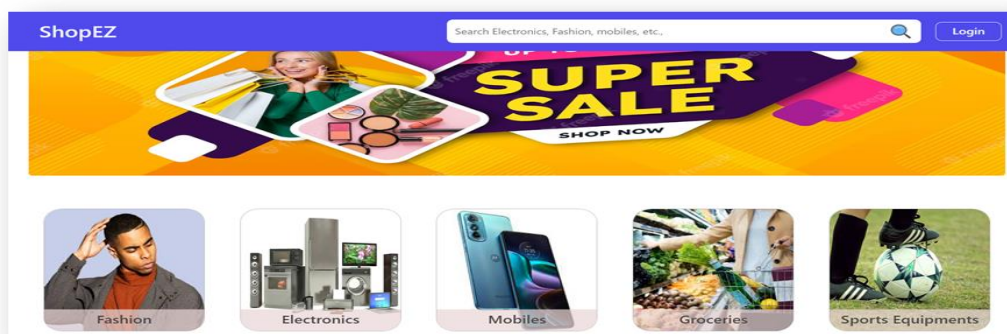
8.Testing

Testing is done using Postman for backend APIs and browser dev tools for frontend validation. Console logs, error boundaries, and custom middleware help identify issues. Manual testing ensures function reliability and user experience.
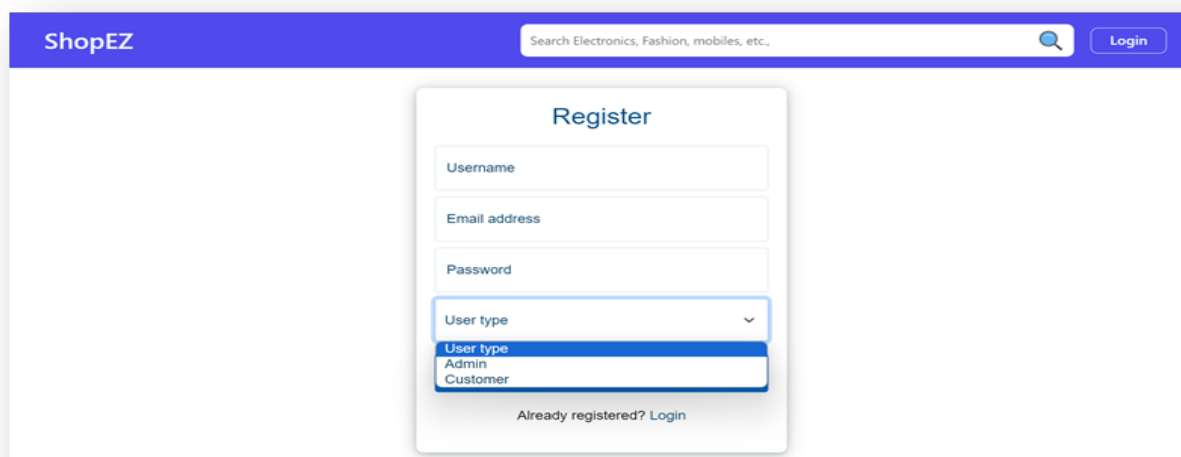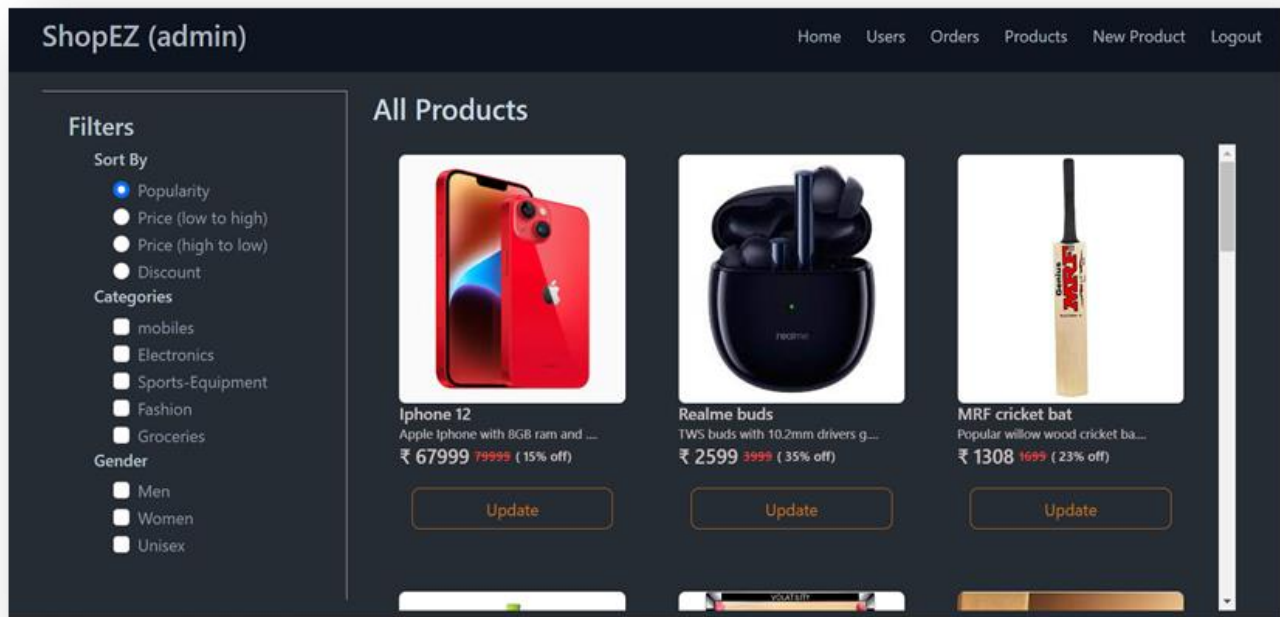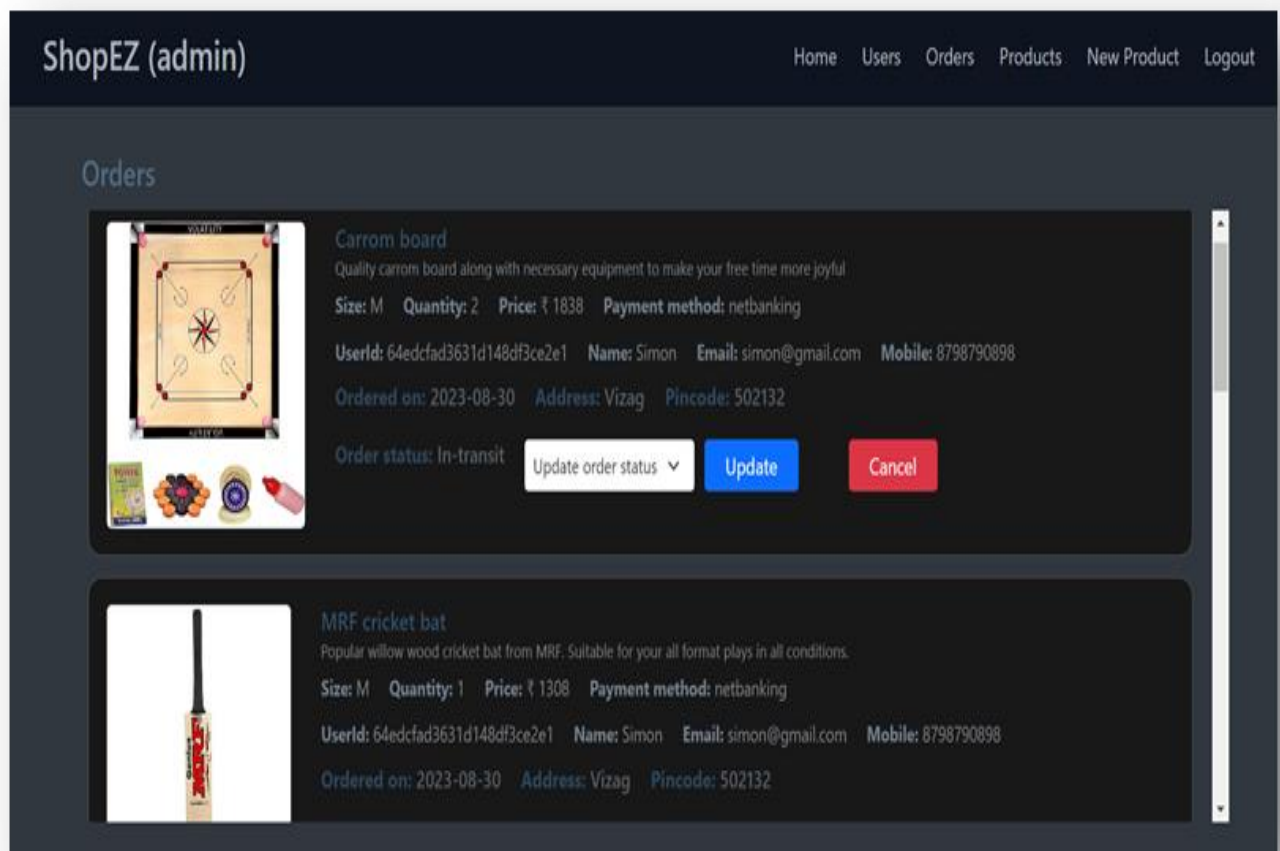

9.Screenshots or Demo
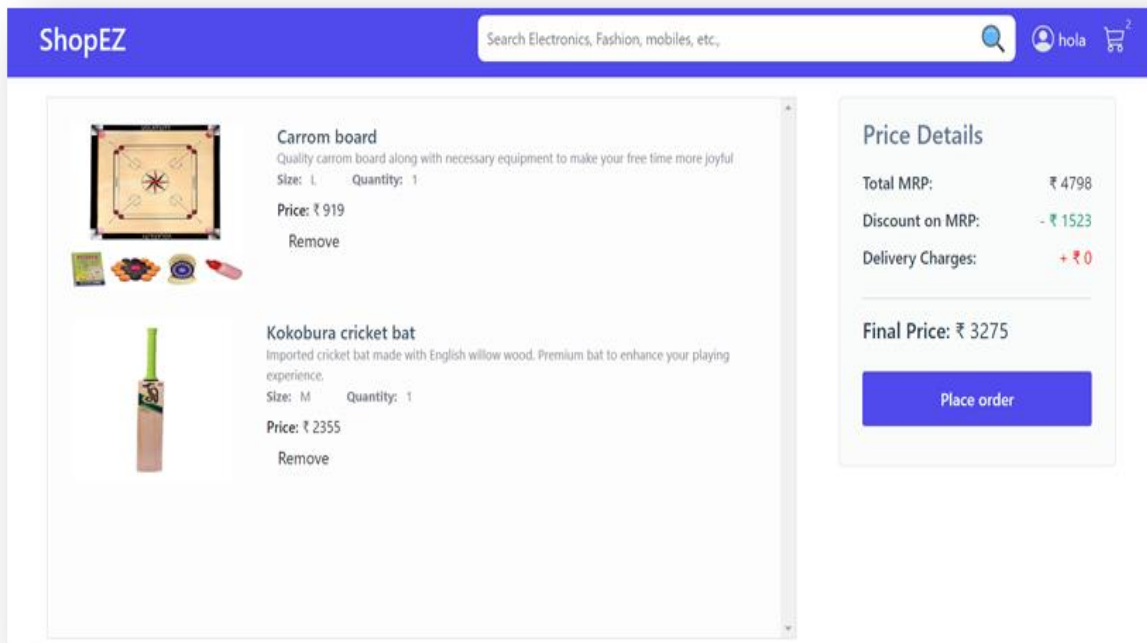
Admin dashboard
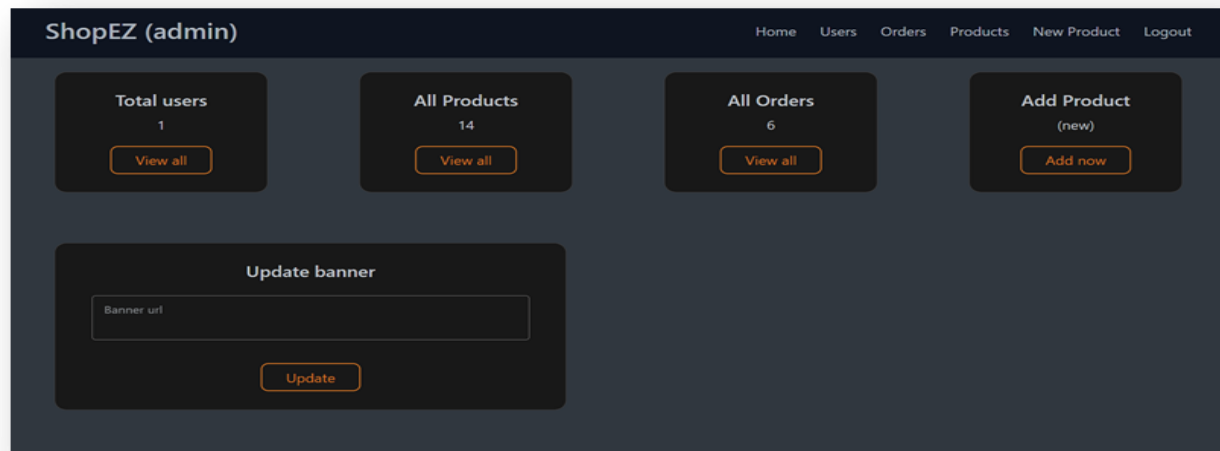

Authentication Page

All Products Page

Cart Page

Orders Page

Admin page

10.Known Issues

- Payment gateway not integrated yet
- Email notifications pending
- Pagination for admin dashboard can be improved
- UI optimization needed for very small screens

11.Future Enhancements

- Add online payment gateway (Razorpay/Stripe)
- Add wish list feature
- Add delivery tracking
- Add analytics dashboard for admin
- Add email + SMS notifications
- Add product comparison
- Add AI-based product recommendations

12.Conclusion

Shopez demonstrates a real-world implementation of a MERN stack e-commerce application. The project highlights secure authentication, responsive UI design, and efficient backend architecture, making it suitable for academic submission.