E-Commerce Web Application

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1. Project Overview

- This project is a **full-stack E-Commerce Web Application** built using **React** for the frontend and **FastAPI** for the backend.The application supports user authentication, product listing, cart management, and image handling.
- The goal of this project is to demonstrate **end-to-end web application development**, including frontend UI, backend APIs, database integration, and static file handling.

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2. Technology Stack

2.1 Frontend

- React.js
- JavaScript (ES6)
- CSS
- Axios (API communication)

2.2 Backend

- FastAPI
- SQLAlchemy
- SQLite
- JWT Authentication
- Pydantic

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3. Application Features

3.1 User Authentication

- User registration
- Secure login using hashed passwords
- JWT-based authentication

3.2 Product Management

- Product listing from database
- Image rendering using FastAPI static files

3.3 Cart Management

- Add products to cart
- Increase or decrease quantity
- View cart items with price and image

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4. Static Image Handling

- Product images are stored in the backend under the images/ directory.
- FastAPI serves images using StaticFiles.
- Image URLs are stored in the database (e.g., /images/iphone14.png).
- Frontend accesses images via backend base URL.

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5. Database Design

Tables Used

- **users** – Stores user credentials
- **products** – Stores product details and image paths
- **cart_items** – Stores cart data linked to users

SQLite is used for simplicity and easy local development.

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6. How to Run the Project

6.1 Backend

cd backend

uvicorn app.main:app --reload

6.2 Frontend

cd frontend

npm install

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npm run dev
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7. Conclusion

This E-Commerce project demonstrates:

1. Full-stack application development
2. REST API design using FastAPI
3. React-based UI development
4. Database integration with SQLAlchemy
5. Static asset handling and authentication

The project is structured following **industry best practices**, making it suitable for **interviews, portfolios, and real-world applications**.