ShopForHome (AesthHome)

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Table of Contents

1. **Problem Definition**

In today's digital era, customers demand a personalized and seamless online shopping experience, especially in the home décor and furniture sector. Traditional offline shopping methods have several limitations:

- Limited variety of products and designs.

- Inconvenience in comparing prices and specifications.

- No personalization or intelligent recommendation system.

- Difficulty in tracking stock availability and order status.

- Manual and error-prone processes in managing large inventories.

For businesses, managing stock, user data, coupons, and sales reports manually is inefficient, leading to poor customer experience and loss of potential revenue.

To overcome these challenges, businesses require a modern e-commerce solution that integrates:

- A scalable frontend and backend architecture.

- Secure authentication and authorization for users and admins.

- Features like wishlist , shopping cart, product filtering, coupon management, and reporting tools.

- A well-optimized database to handle large-scale queries and transactions efficiently.

Thus, the need is for a full-stack e-commerce web platform (ShopForHome) that provides end-to-end online shopping capabilities, ensuring customer satisfaction and efficient business management.
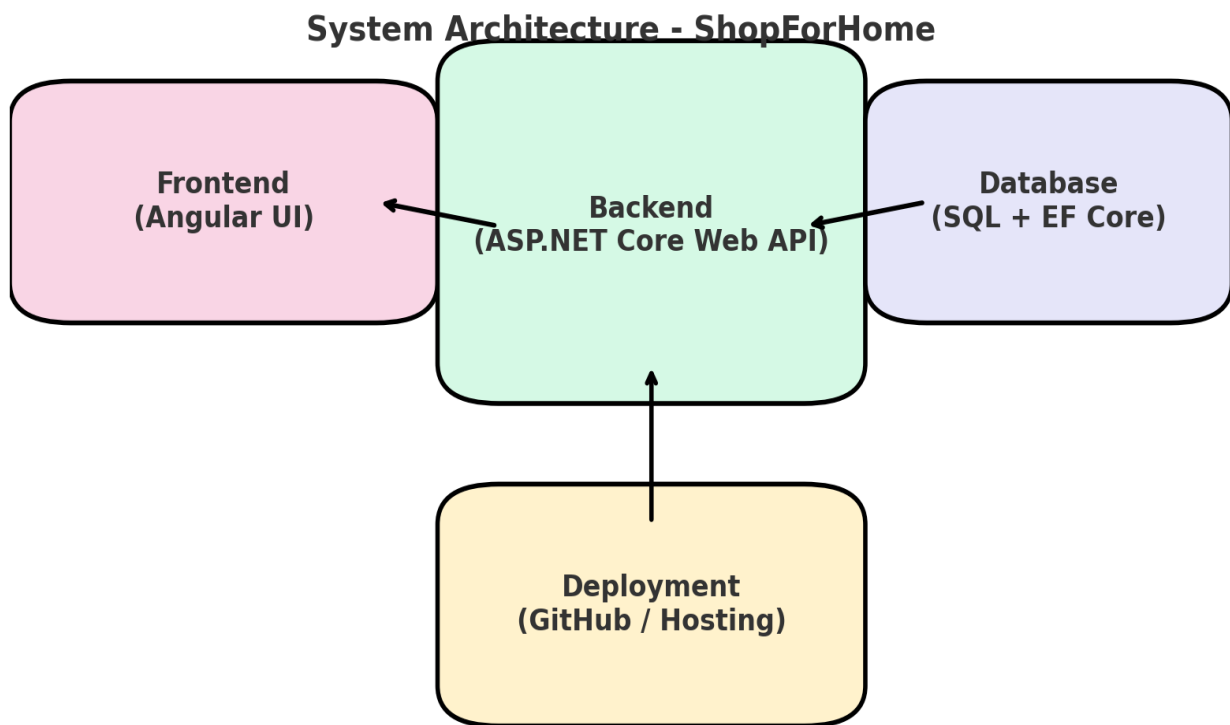
Objectives

The project aims to develop ShopForHome, a full-stack e-commerce web application with the following objectives:
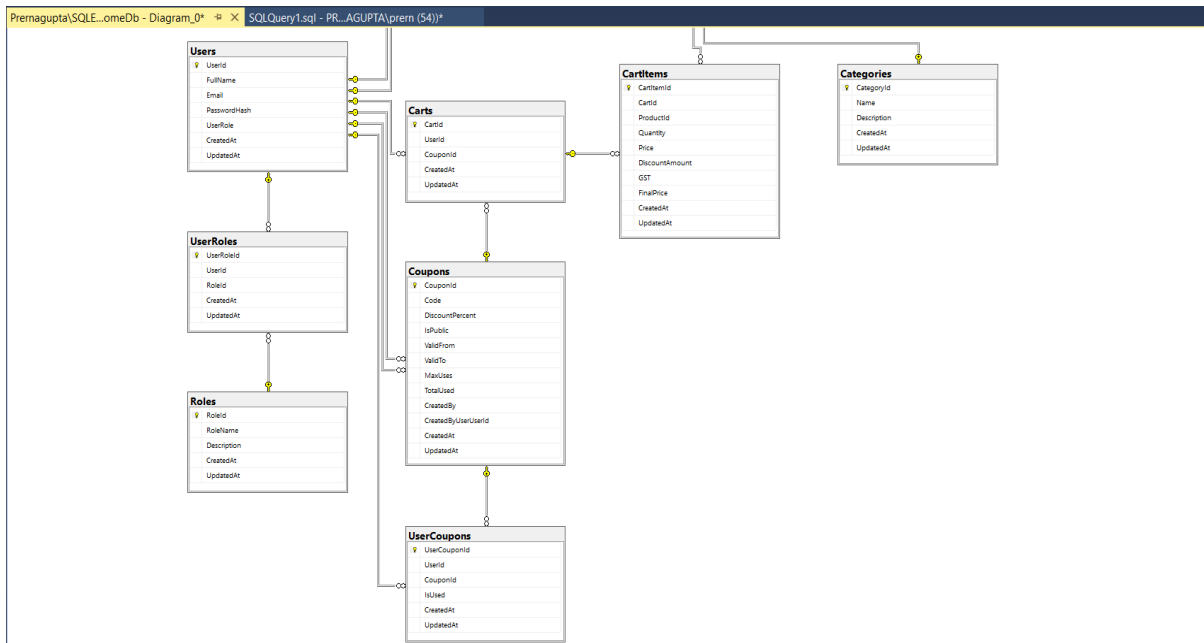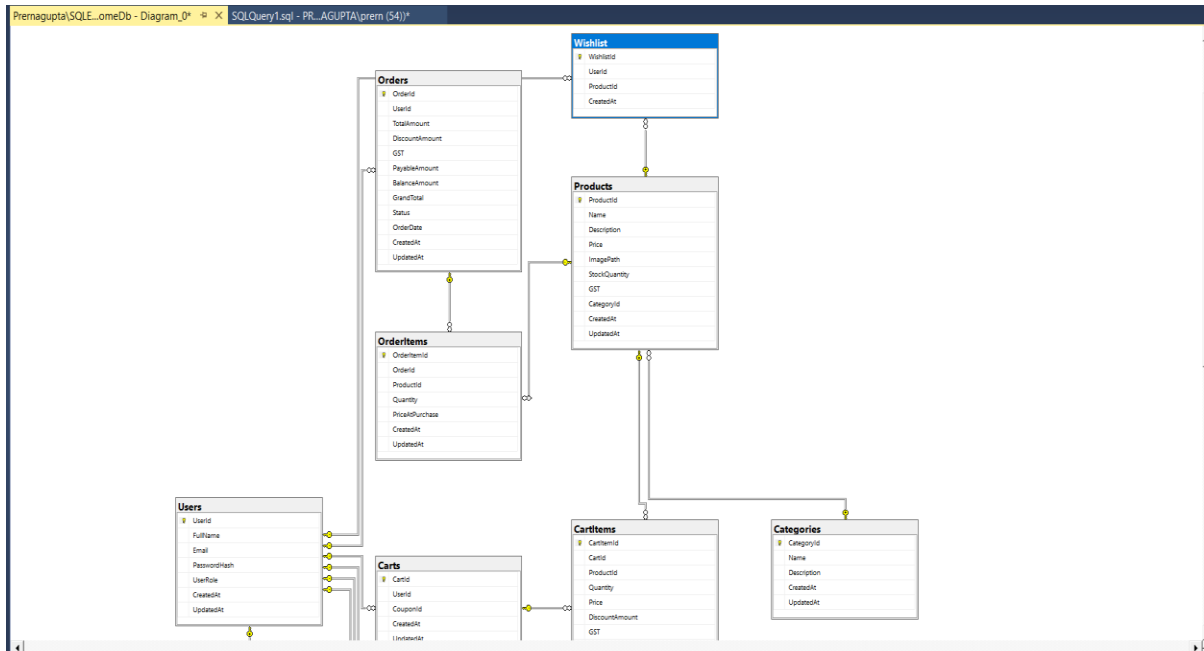
- **User-Centric Objectives**

  - Provide secure login and registration with role-based access control (User/Admin).

  - Implement core e-commerce features:

    - Product browsing and search by category, price, and other filters.

    - Wishlist and cart management for personalized shopping.

    - Discount coupon usage to enhance customer engagement.

    - Order history and tracking for transparency.

- **Admin-Centric Objectives**

  - Provide a dedicated Admin Dashboard for complete control over the system.

  - Enable CRUD operations on products and users.

  - Support bulk product upload via CSV for faster onboarding of new stock.

  - Implement stock management with low-stock alerts (<10 items).

  - Provide sales reporting and analytics for data-driven decision making.

  - Allow admins to assign discount coupons to specific users.

- **Technical Objectives**

  - Use Angular (frontend) for a dynamic and component-driven UI.

  - Use ASP.NET Core Web API (backend) for robust and scalable services.

  - Use Entity Framework and SQL Database for optimized storage and efficient queries.

  - Implement JWT-based authentication and authorization for security.

2. **Frontend & Backend Architecture**

Technology Stack Used:
- **Frontend**: Angular, Bootstrap, TypeScript, HTML, CSS
- **Backend**: ASP.NET Core MVC + Web API
- **Database**: SQL Server (via Entity Framework Core ORM)
- **Authentication**: JWT (JSON Web Token)

System Architecture - ShopForHome

Frontend (Angular UI)	Backend (ASP.NET Core Web API)	Database (SQL + EF Core)

Deployment (GitHub / Hosting)

Wishlist
- WishlistId
- UserId
- ProductId
- CreatedAt

Orders
- OrderId
- UserId
- TotalAmount
- DiscountAmount
- GST
- PayableAmount
- BalanceAmount
- GrandTotal
- Status
- OrderDate
- CreatedAt
- UpdatedAt

Products
- ProductId
- Name
- Description
- Price
- ImagePath
- StockQuantity
- GST
- CategoryId
- CreatedAt
- UpdatedAt

OrderItems
- OrderItemId
- OrderId
- ProductId
- Quantity
- PriceAtPurchase
- CreatedAt
- UpdatedAt

Users
- UserId
- FullName
- Email
- PasswordHash
- UserRole
- CreatedAt
- UpdatedAt

Carts
- CartId
- UserId
- CouponId
- CreatedAt
- UpdatedAt

CartItems
- CartItemId
- CartId
- ProductId
- Quantity
- Price
- DiscountAmount
- GST

Categories
- CategoryId
- Name
- Description
- CreatedAt
- UpdatedAt

Users
- UserId
- FullName
- Email
- PasswordHash
- UserRole
- CreatedAt
- UpdatedAt

CartItems
- CartItemId
- CartId
- ProductId
- Quantity
- Price
- DiscountAmount
- GST
- FinalPrice
- CreatedAt
- UpdatedAt

Categories
- CategoryId
- Name
- Description
- CreatedAt
- UpdatedAt

Carts
- CartId
- UserId
- CouponId
- CreatedAt
- UpdatedAt

UserRoles
- UserRoleId
- UserId
- RoleId
- CreatedAt
- UpdatedAt

Coupons
- CouponId
- Code
- DiscountPercent
- IsPublic
- ValidFrom
- ValidTo
- MaxUses
- TotalUsed
- CreatedBy
- CreatedByUserId
- CreatedAt
- UpdatedAt

Roles
- RoleId
- RoleName
- Description
- CreatedAt
- UpdatedAt

UserCoupons
- UserCouponId
- UserId
- CouponId
- IsUsed
- CreatedAt
- UpdatedAt

3. **Component Breakdown & API Design**

Frontend Components (Angular)

Component	Purpose	Path
Header	Navbar with cart, wishlist, login	/shared/components/header
Product List	Browse & filter products	/pages/products
Product Details	View single product info	/pages/product-details
Cart	Manage cart items, checkout	/pages/cart
Wishlist	Save favorite products	/pages/wishlist
Admin Dashboard	User/product management	/pages/admin
Coupon Management	Add/assign coupons	/pages/admin/coupon-management
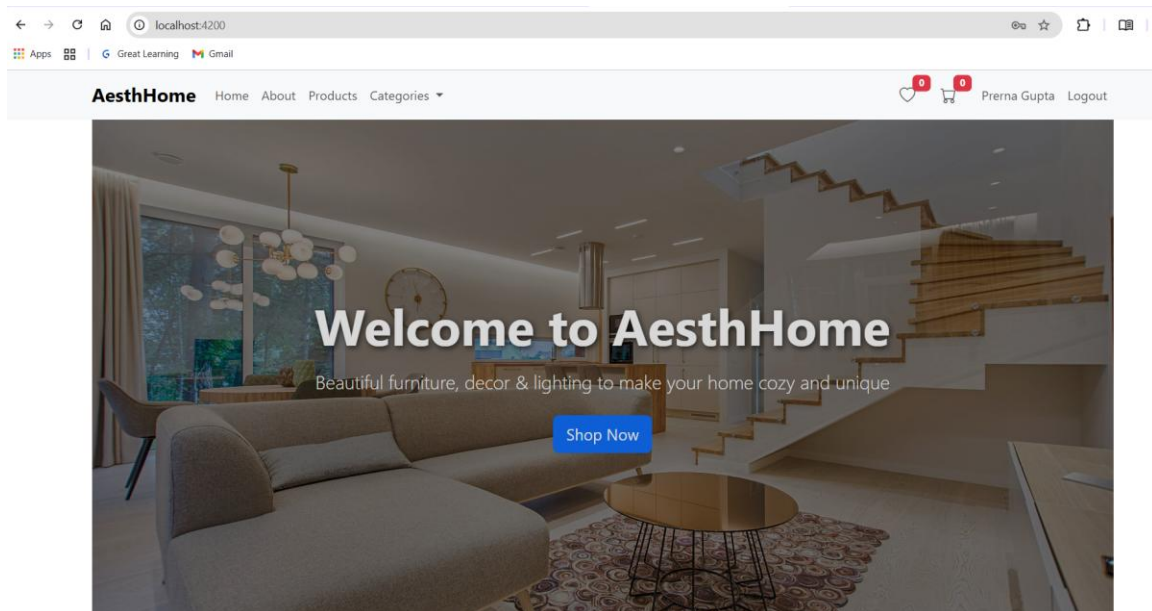
AesthHome   Home   About   Products   Categories ▾   ♡ 0   🛒 0   Prerna Gupta   Logout
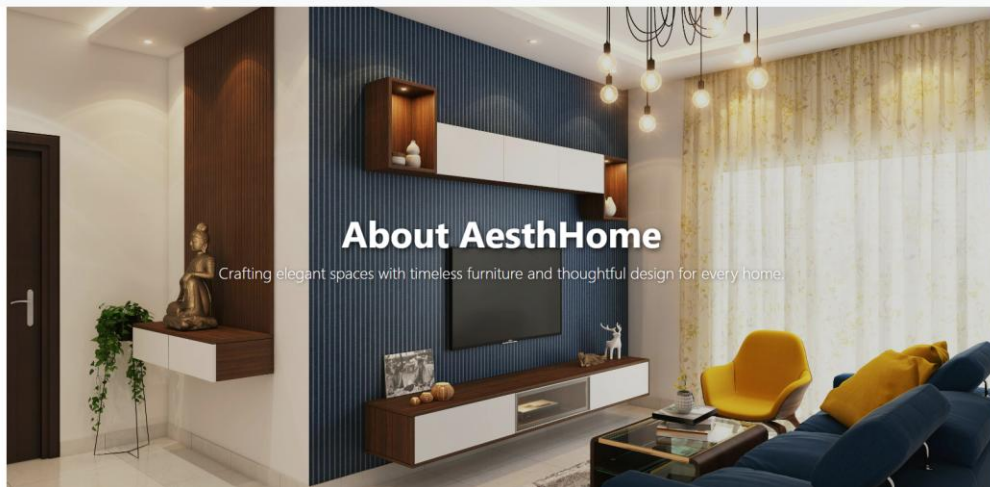
💡
Our Vision
Bring aesthetic, high-quality home products to every home.

♡
Our Mission
Create cozy and beautiful spaces that reflect your personality.

👥
Our Values
Quality, sustainability, and customer satisfaction above all.

Meet the Founder

Hello! I'm Prerna, the creator of AesthHome. AesthHome was born from a simple idea — to make beautiful and premium-quality home products accessible to every family. Our journey started with a passion for design and a belief that a well-designed home creates joy in everyday living."

AesthHome   Home   About   Products   Categories ▾   ♡ 0   🛒 0   Prerna Gupta   Logout

Why Choose AesthHome?

🚚
Fast Delivery
Quick shipping to your doorstep.

💎
Premium Quality
Only the best products for your home.

↻
Easy Returns
Hassle-free exchange or refund.

👥
Customer Care
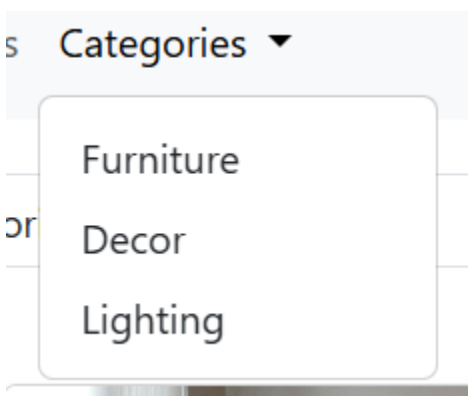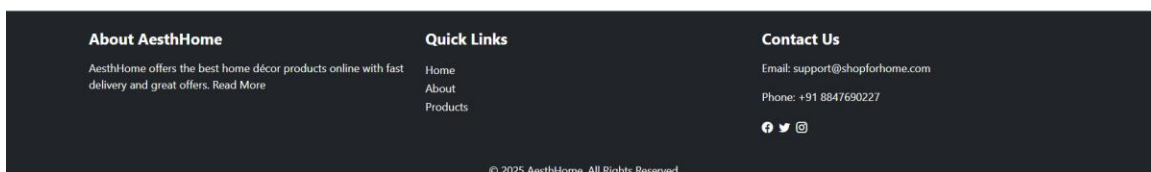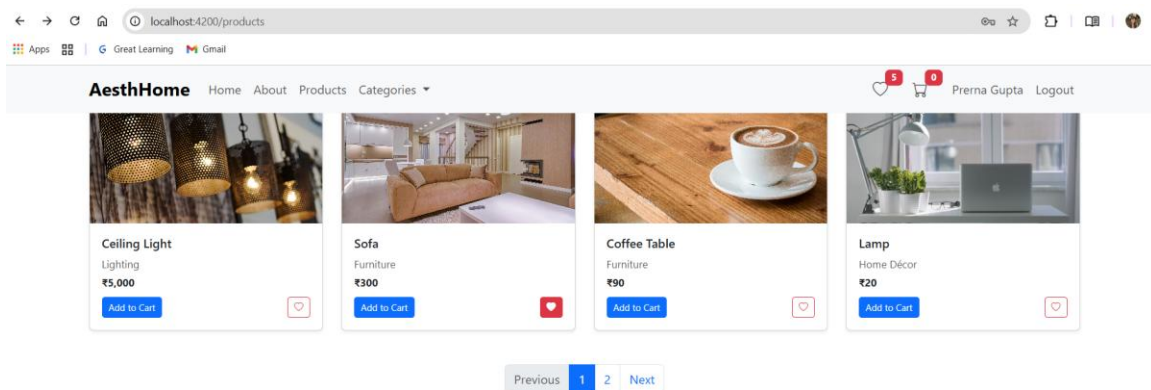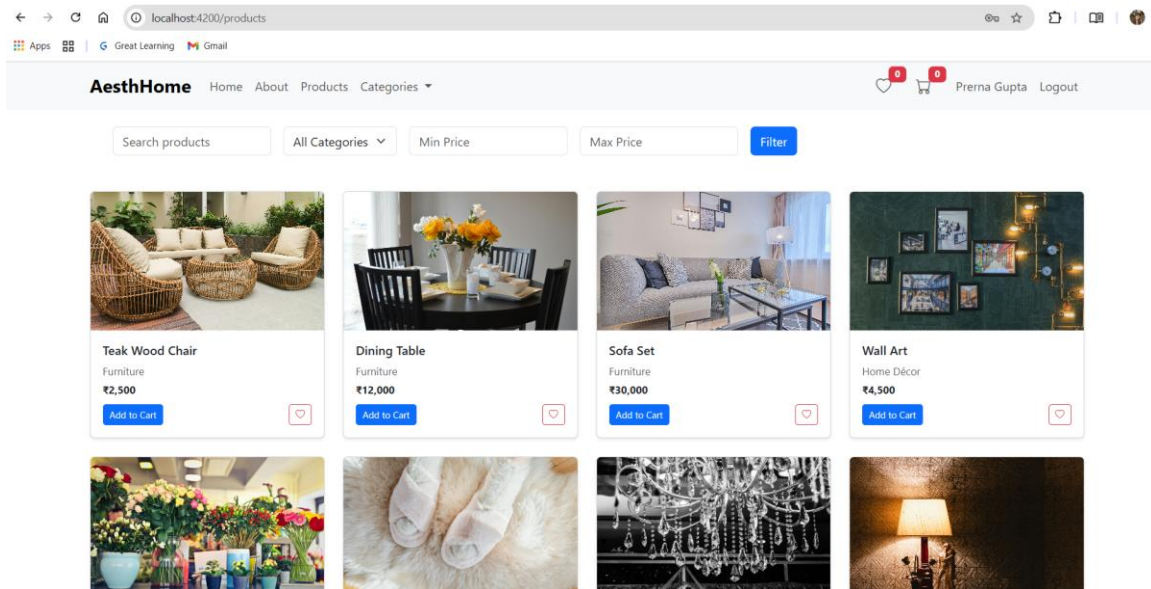We are here to help 24/7.

500+	2000+	1500+
Products	Happy Customers	Orders Delivered

About AesthHome   Quick Links   Contact Us
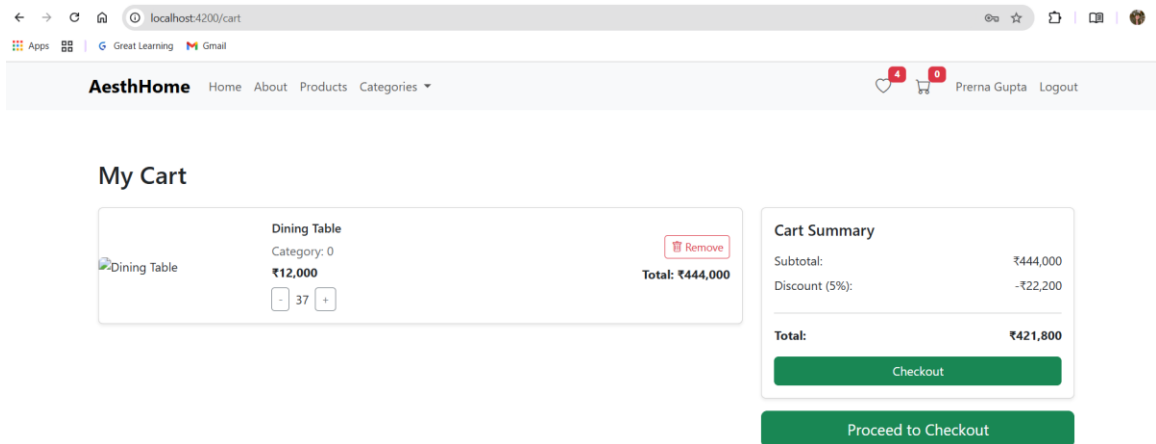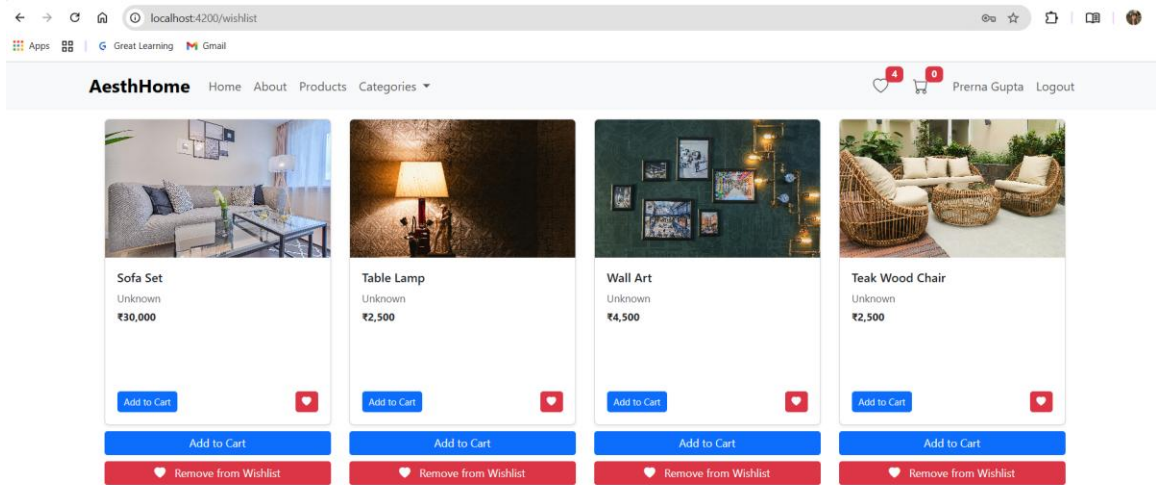
API Endpoints (Backend – ASP.NET Core Web API)

Endpoint	Method	Description	Auth
/api/AccountApi/login	POST	User login with JWT	Public
/api/AccountApi/register	POST	User registration	Public
/api/ProductsApi	GET	Get all products	Public
/api/ProductsApi/{id}	GET	Get product by ID	Public
/api/ProductsApi	POST	Add new product	Admin
/api/CartApi	POST	Add item to cart	User
/api/WishlistApi	POST	Add item to wishlist	User
/api/OrdersApi/checkout	POST	Place an order	User
/api/ReportsApi	GET	Generate sales report	Admin
/api/BulkUploadApi	POST	Bulk upload products (CSV)	Admin

CartApi ∧

PUT	/api/CartApi/update	🔒 ∨
POST	/api/CartApi/add	🔒 ∨
GET	/api/CartApi/me	🔒 ∨
DELETE	/api/CartApi/remove	🔒 ∨

CouponsApi ∧

POST	/api/CouponsApi	🔒 ∨
GET	/api/CouponsApi/{id}	🔒 ∨
POST	/api/CouponsApi/assign	🔒 ∨
POST	/api/CouponsApi/validate	🔒 ∨

OrdersApi ∧

| POST | /api/OrdersApi | 🔒 ∨ |
| GET | /api/OrdersApi | 🔒 ∨ |

GET	/api/OrdersApi	🔒 ∨
GET	/api/OrdersApi/user	🔒 ∨
GET	/api/OrdersApi/{id}	🔒 ∨

ProductsApi ∧

GET	/api/ProductsApi/featured	🔒 ∨
GET	/api/ProductsApi/{id}	🔒 ∨
PUT	/api/ProductsApi/{id}	🔒 ∨
DELETE	/api/ProductsApi/{id}	🔒 ∨
GET	/api/ProductsApi/category	🔒 ∨
GET	/api/ProductsApi/category/{categoryId}	🔒 ∨
POST	/api/ProductsApi	🔒 ∨

ReportsApi ∧

14

4. **Database Design & Storage Optimization**

Tables:

Users, Roles, Products, Categories, Cart, CartItems, Wishlist, Orders, OrderItems, Coupons, UserCoupons.
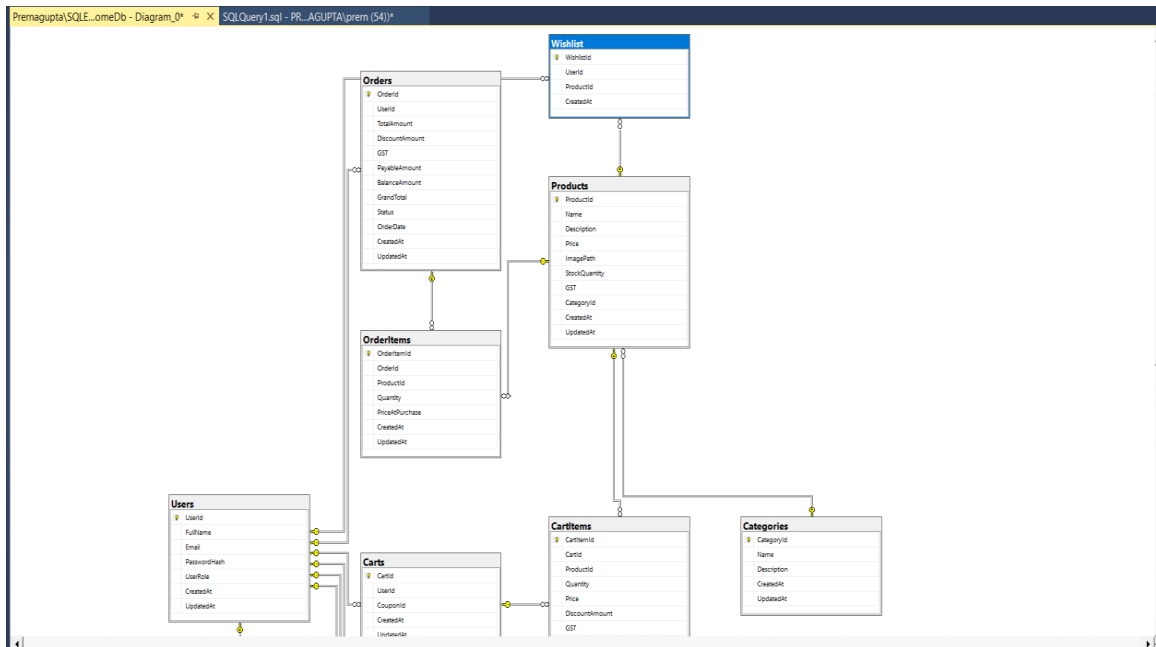
Optimization Techniques :

- Indexed ProductId, CategoryId, UserId for fast lookups.
- Normalized schema to reduce redundancy.
- Used lazy loading in EF Core where applicable.
- Implemented stored procedures for reports.

5. System Design Diagrams

CATEGORY

+INT CATEGORYID
+STRING CATEGORYNAME

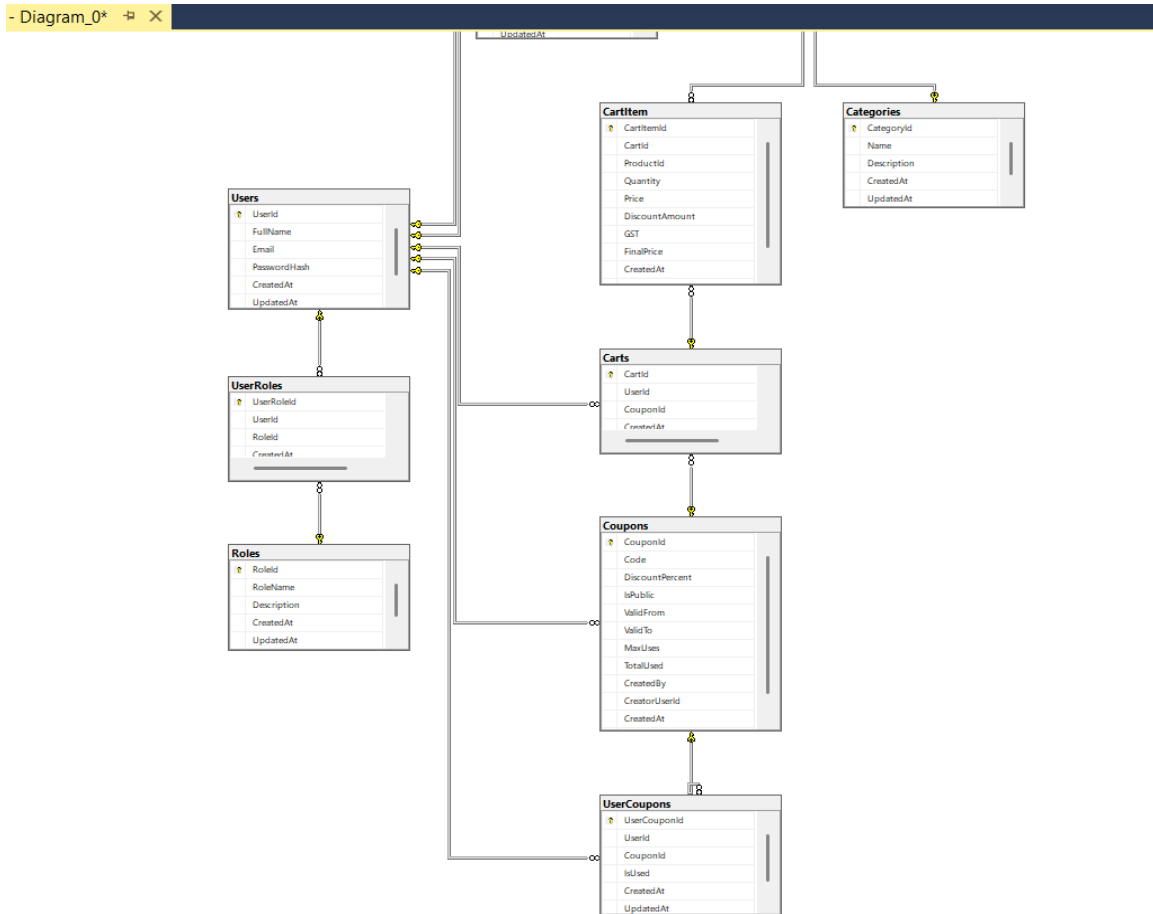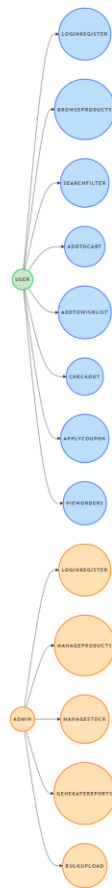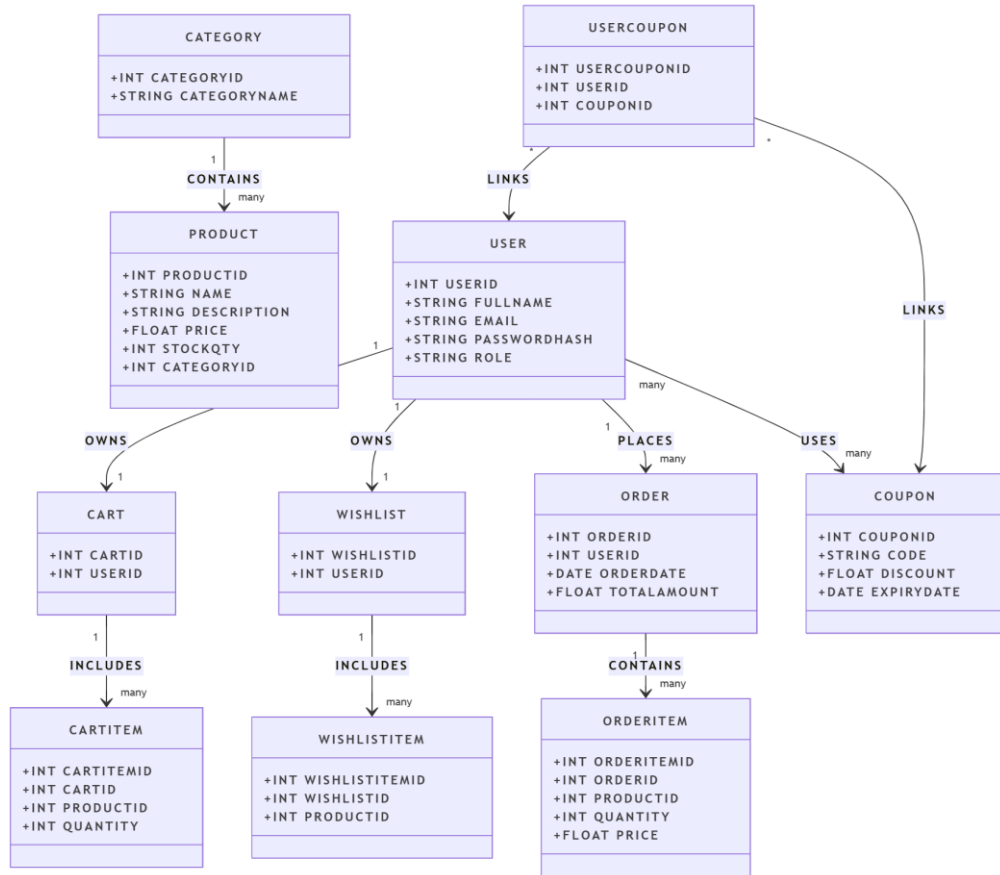**USERCOUPON**

+INT USERCOUPONID
+INT USERID
+INT COUPONID

1

CONTAINS

many

LINKS

LINKS

PRODUCT

+INT PRODUCTID
+STRING NAME
+STRING DESCRIPTION
+FLOAT PRICE
+INT STOCKQTY
+INT CATEGORYID

USER

+INT USERID
+STRING FULLNAME
+STRING EMAIL
+STRING PASSWORDHASH
+STRING ROLE

1

1

many

OWNS

OWNS

PLACES

USES

1

many

many

CART

+INT CARTID
+INT USERID

WISHLIST

+INT WISHLISTID
+INT USERID

ORDER

+INT ORDERID
+INT USERID
+DATE ORDERDATE
+FLOAT TOTALAMOUNT

COUPON

+INT COUPONID
+STRING CODE
+FLOAT DISCOUNT
+DATE EXPIRYDATE

1

1

1

INCLUDES

INCLUDES

CONTAINS

many

many

many

CARTITEM

+INT CARTITEMID
+INT CARTID
+INT PRODUCTID
+INT QUANTITY

WISHLISTITEM

+INT WISHLISTITEMID
+INT WISHLISTID
+INT PRODUCTID

ORDERITEM

+INT ORDERITEMID
+INT ORDERID
+INT PRODUCTID
+INT QUANTITY
+FLOAT PRICE
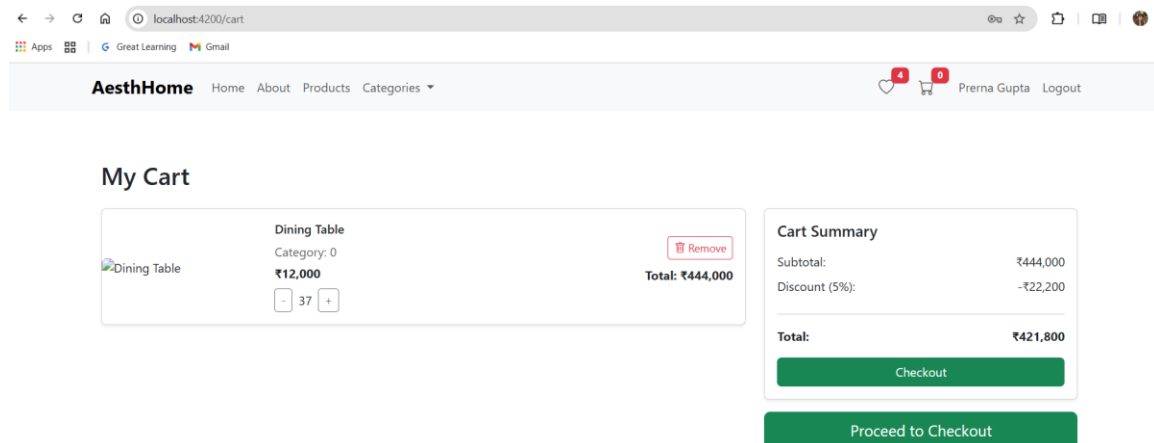
6. Demonstration Overview

- **User Side:** Login/Register, Browse products, Filter, Add to cart, Wishlist, Checkout.
- **Admin Side:** Dashboard, Manage products/users, Stock alerts (<10 items), Assign coupons, Generate sales reports.
- **API Demo:** Swagger documentation, CRUD testing.

7. Conclusion

The ShopForHome(**AesthHome)** e-commerce platform successfully addresses the challenges of traditional offline shopping by providing a modern, user-friendly online marketplace for home décor. The system offers **role-based access**, allowing users to browse, wishlist, and purchase products seamlessly, while giving administrators full control over **stock management, bulk product uploads, coupon assignments, and sales reporting**. The platform ensures **efficient database operations**, optimized queries, and secure authentication, enhancing both performance and user experience.

Key achievements of the project include:

- A **responsive and intuitive UI** that works across devices and screen sizes.

- **Comprehensive backend architecture** with modular API design for scalability and maintainability.

- Integration of **wishlist, cart, and coupon systems** for personalized and convenient shopping.

- Deployment readiness with all **source code versioned in GitHub**, enabling future collaboration and CI/CD pipelines.

Future Enhancements:

- **Integration of payment gateways** (e.g., Razorpay, Stripe, PayPal) for secure online transactions.

- **AI-powered product recommendations** to provide personalized shopping experiences.

- **Cloud deployment** (Azure, AWS, or other hosting platforms) for high availability and scalability.

- **Real-time analytics and notifications** for sales trends, stock alerts, and order updates.

- **Multi-language and multi-currency support** to expand user reach.

Overall, ShopForHome (**AesthHome)** lays a strong foundation for a scalable, efficient, and user-centric e-commerce ecosystem, combining modern web technologies, secure backend services, and optimized database design to provide a seamless online shopping experience for home décor enthusiasts.