■■ Furniture E-Commerce Web Application (Full Stack – MERN)

■ Problem Statement

Your uncle owns a furniture shop and wants an online platform where customers can browse, purchase, and pay for furniture just like on Flipkart or Amazon. The web application should allow users to create accounts, add products to their cart or wishlist, place orders, make payments online, and view their order history. It should also include an admin dashboard to manage products, users, and orders. The site must be fully responsive, secure, and user-friendly across all devices.

■ Technology Stack (MERN)

Layer	Technology	Description
Frontend	React.js, React Router, Redux Toolkit, TailwindCSS	Build dynamic UI and manage app state
Backend	Node.js + Express.js	Handle API routes, authentication, and payments
Database	MongoDB + Mongoose	Store users, products, and orders
Authentication	JWT + bcrypt	Secure login and role-based access
Payment Gateway	Razorpay	Online payments for Indian users
Email Services	Nodemailer	Email verification and password reset
Image Hosting	Cloudinary	Store product images securely
Deployment	Vercel (Frontend), Render (Backend), MongoDB Atlas (DB)	Host and connect all services

■ Core Objectives

• Build a fully functional e-commerce web app using MERN stack.
• Provide both user and admin functionalities in a single integrated app.
• Ensure complete authentication, authorization, and secure payments.
• Deliver a responsive, modern UI using TailwindCSS.
• Integrate email verification, password recovery, and order management.
• Deploy the application and make it accessible globally.

■ Functional Modules

User Features:
• User registration, login, logout with JWT authentication
• Email verification upon signup
• Password reset through email
• Browse and search products by category, price, or keyword
• Add/remove products from cart and wishlist
• Place orders with address and payment through Razorpay
• View past orders and order status (Pending, Shipped, Delivered)
• Manage profile and saved addresses

Admin Features:
• Admin login with role-based access
• Dashboard summary for orders, users, and revenue
• CRUD operations on products (Add, Edit, Delete)
• Image upload via Cloudinary
• Manage orders and update delivery status

• View and manage all registered users

■ UI/UX Features

• Responsive design for mobile, tablet, and desktop
• TailwindCSS components for clean, minimal UI
• Interactive navigation bar and footer
• Product grid and detailed product pages
• Toast notifications and loading animations
• Protected routes (redirect unauthorized users)

■ Security & Best Practices

• Encrypted passwords using bcrypt
• JWT tokens with expiry and refresh handling
• Input sanitization and validation
• Rate limiting and HTTPS for deployment
• Environment variables for API keys and secrets

■ Project Phases

Phase	Objective	Key Tasks
1	Project Setup	Initialize MERN stack, connect MongoDB, folder structure
2	Authentication	JWT, bcrypt, role-based routing
3	Product Management	CRUD APIs, Cloudinary image uploads
4	Cart & Wishlist	Cart logic and APIs
5	Orders & Payments	Razorpay integration, order tracking
6	Email Services	Email verification & reset password using Nodemailer
7	Admin Dashboard	Role-based UI, analytics
8	Responsive Design & Deployment	Final UI polish, host frontend/backend

■ Deliverables

• Full-stack MERN e-commerce application
• Responsive frontend built with React + TailwindCSS
• RESTful backend APIs built with Node.js and Express.js
• MongoDB Atlas database integration
• Razorpay payment gateway and email verification system
• Deployed application accessible online

■ Summary

This project serves as a comprehensive full-stack development guide for building a professional-grade, feature-rich Furniture E-Commerce Platform. It combines modern design, robust security, seamless payments, and a powerful admin system—making it an ideal real-world MERN project and a strong portfolio showcase.