

E-commerce Project: Complete Study Guide

Yeh guide aapko project mein use hui har technology ko samajhne mein madad karegi.

MERN Stack Kya Hai?

Humne is project ko MERN Stack par banaya hai. MERN ek acronym (short form) hai:

- **MongoDB: Database**
- **Express.js: Backend Framework**
- **React.js: Frontend Library**
- **Node.js: Backend Environment**

Yeh saari technologies JavaScript par chalti hain, isliye isko "Full-Stack JavaScript" bhi kehte hain.

Backend (Website ka Engine)

Backend woh hissa hai jo server par chalta hai aur user ko dikhta nahi hai. Yeh saara data manage karta hai.

1. Node.js

- **Yeh Kya Hai?** Yeh ek JavaScript ka "Runtime Environment" hai. Aasan bhasha mein, yeh ek aisa software hai jo aapke computer ko JavaScript code (jo server par chalna hai) samjhne aur chalne ki power deta hai.

- **Aapko Kya Padhna Hai?**

- Node.js kya hai? (Yeh ek environment hai, language nahi).
- `npm` (Node Package Manager) kya hai? (Yeh Node.js ka library/store hai).

2. Express.js

- **Yeh Kya Hai?** Yeh Node.js ka ek framework hai. Yeh server banane, routes (API endpoints) manage karne, aur middleware use karne ko aasan banata hai.

- **Aapko Kya Padhna Hai?**

- Routes kya hote hain? (`app.use('/api/products', ...)`)
- Middleware kya hota hai? (`authMiddleware.js`)

3. MongoDB (Atlas)

- **Yeh Kya Hai?** Yeh hamara database hai. Yeh ek NoSQL database hai, jiska matlab hai ki ismein data Documents (JSON format mein) mein store hota hai.

- **Aapko Kya Padhna Hai?**

- NoSQL vs SQL database mein kya fark hai?
- Collections aur Documents kya hote hain?

4. Mongoose

- **Yeh Kya Hai?** Yeh Express.js aur MongoDB ke beech ka translator hai. Yeh data ko ek structure (Schema) deta hai.

- **Aapko Kya Padhna Hai?**

- Schema aur Model kya hote hain? (`productModel.js`)

5. bcrypt.js aur JWT (JSON Web Tokens)

- **Yeh Kya Hain?** Yeh dono security ke liye hain.

- **bcrypt.js:** Password ko encrypt (hash) karta hai.
- **JWT:** Login karne par user ko ek "Token" (digital ID card) deta hai.

- **Aapko Kya Padhna Hai?**

- Password Hashing kyun zaroori hai?
- Token-based authentication kaise kaam karta hai?

Frontend (Website ka Showroom)

Frontend woh hissa hai jo user ko browser mein dikhta hai.

1. React.js

- **Yeh Kya Hai?** Yeh ek JavaScript library hai jisse User Interfaces (UI) banaye jaate hain. Iski sabse khaas baat hai Components.

- **Aapko Kya Padhna Hai?**

- Components, State (`useState`), Props, aur Hooks (`useEffect`) kya hote hain?

2. React Router DOM

- **Yeh Kya Hai?** Yeh library website mein alag-alag pages (routes) manage karti hai.

- **Aapko Kya Padhna Hai?**

- ``, ``, `` components kya karte hain?

3. Axios

- **Yeh Kya Hai?** Yeh frontend ka "delivery boy" hai jo backend se data laata hai (API call karta hai).

- **Aapko Kya Padhna Hai?**

- ``axios.get()`` aur ``axios.post()`` kya karte hain?

4. Redux Toolkit

- **Yeh Kya Hai?** Yeh ek "State Management" library hai. Yeh poori website ke liye ek central data store banata hai.

- **Aapko Kya Padhna Hai?**

- Store, Slice, Reducer, Action kya hote hain?

5. Framer Motion

- **Yeh Kya Hai?** Yeh ek animation library hai.

- **Aapko Kya Padhna Hai?**

- ``motion.div`` component kya karta hai?

Viva ke liye Tip

Agar aapse poocha jaaye ki "Jab user kisi product par click karta hai, toh kya hota hai?", toh aap aise samjha sakte ho:

1. "Sir/Mam, jab user product card par click karta hai, toh React Router URL ko ``/product/123`` mein badal deta hai."
2. "Is URL ke badalte hi, hamara ``ProductScreen`` component load hota hai."
3. "Component load hote hi, ``useEffect`` hook chalta hai, jo Axios ka use karke backend ko request bhejta hai."
4. "Backend mein, Express.js is request ko receive karke ``productRoutes.js`` file ko deta hai."
5. "Wahan, Mongoose ka use karke hum database se us ID waale product ko dhoondte hain."
6. "Database se data milne ke baad, Express usko JSON format mein wapas Axios ko bhejta hai."
7. "Frontend mein, Axios us data ko receive karke ``useState`` ki madad se state mein daal deta hai, aur humein screen par product ki details dikh jaati hain."