Project Design Phase
Solution Architecture

Date	30 June 2025
Team ID	LTVIP2025TMID46284
Project Name	House hunt: Finding your perfect rental home
Maximum Marks	4 Marks

Solution Architecture:

Overview

- The solution architecture for the *HouseHunt* application is designed using the **MERN stack** — MongoDB, Express.js, React.js, and Node.js — to deliver a modern, scalable, and efficient rental platform. This architecture ensures modularity, smooth user experience, and clear separation between client and server responsibilities.

Objectives of the Architecture

- Provide a **responsive and interactive frontend** for renters, owners, and admins.

- Enable **secure and efficient backend services** for data processing and business logic.

- Ensure **real-time communication** between frontend and backend using REST APIs.

- Support **scalable and flexible data storage** using MongoDB.

- Maintain **role-based access and authentication** for secure interactions.

🧱 Architecture Components

1. Frontend (React.js)

- Built using React.js with Ant Design, Material UI, and Bootstrap for responsive design.

- Uses Axios to interact with backend RESTful APIs.

- Supports role-based views: Renter, Owner, Admin.

- Implements client-side routing with react-router.

2. Backend (Node.js + Express.js)

- Node.js provides the runtime environment.

- Express.js handles routing, middleware, and server logic.

- API endpoints are protected using middleware for authentication (JWT).

- Multer is used for handling file uploads like property images.

3. Database (MongoDB)

- A NoSQL database used to store structured and unstructured data.
- Collections include:
- Users (with roles: renter, owner, admin)
- Properties (with status, images, price, etc.)
- Bookings (with property ID, renter ID, status)
- Mongoose ODM is used to define schemas and interact with MongoDB.
- **4. Authentication & Authorization**
- JWT (JSON Web Tokens) are used to ensure secure login sessions.
- Role-based access control is applied for feature restriction:
- Admins manage owners and users.
- Owners manage properties.
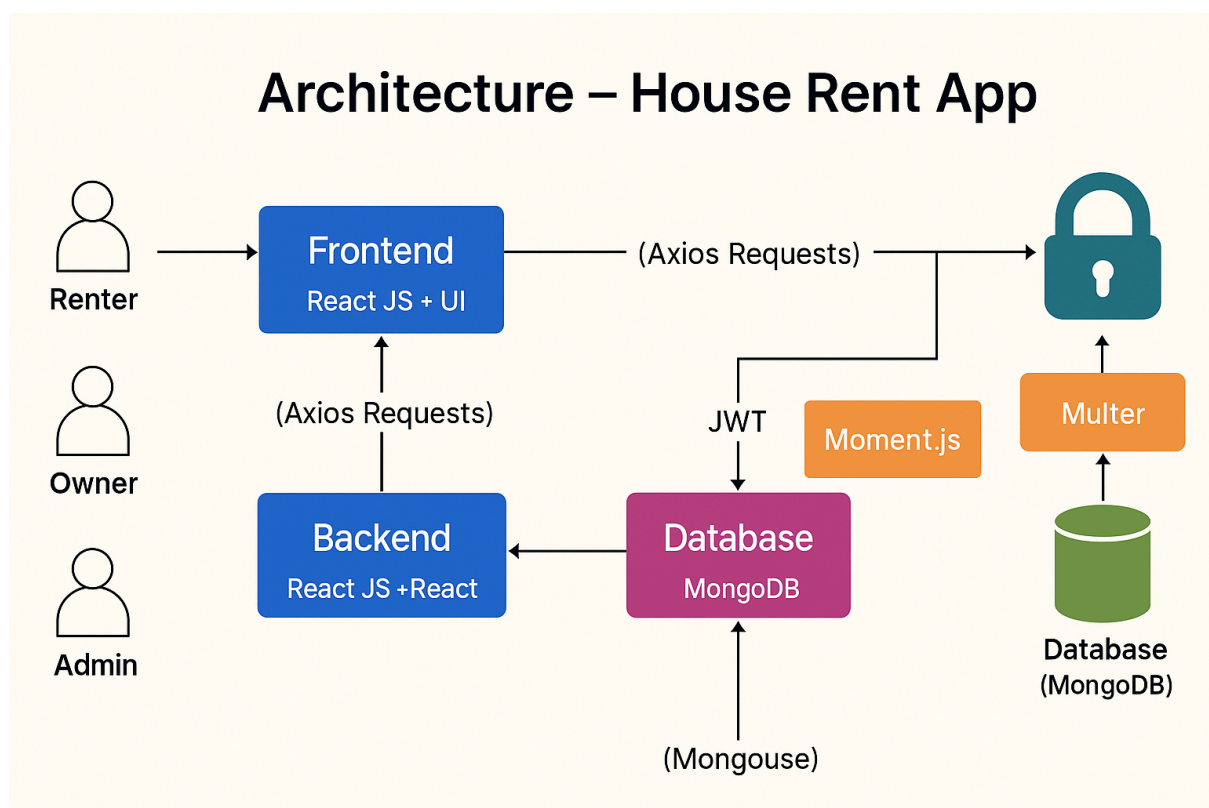- Renters browse and book.

Example - Solution Architecture Diagram:

Figure 1: Architecture and data flow of the House Hunt