

SDE MINI PROJECT

STUDYBUDDY

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OVERVIEW

- Web platform connecting university students with study partners.
- Matches based on courses and schedules.

KEY FEATURES:

- Account management
- Matching & course enrollment
- Real-time chat & notifications
- Scheduling & availability
- Responsive UI
- Security & observability

OBJECTIVES

- Restrict matches within the same university
- Secure account creation and profile management
- Add/remove courses with overlap detection
- Match partners by courses + availability
- One-to-one and group chat with history
- Schedule study sessions with availability
- Responsive UI across devices
- Security & monitoring

FUNCTIONAL REQUIREMENTS

ACCOUNT
MANAGEMENT

MATCHING

SCHEDULING

UNIVERSITY
SCOPING

REAL-TIME CHAT

SEARCH/FILTER

COURSE
MANAGEMENT

NOTIFICATIONS

RESPONSIVE UI

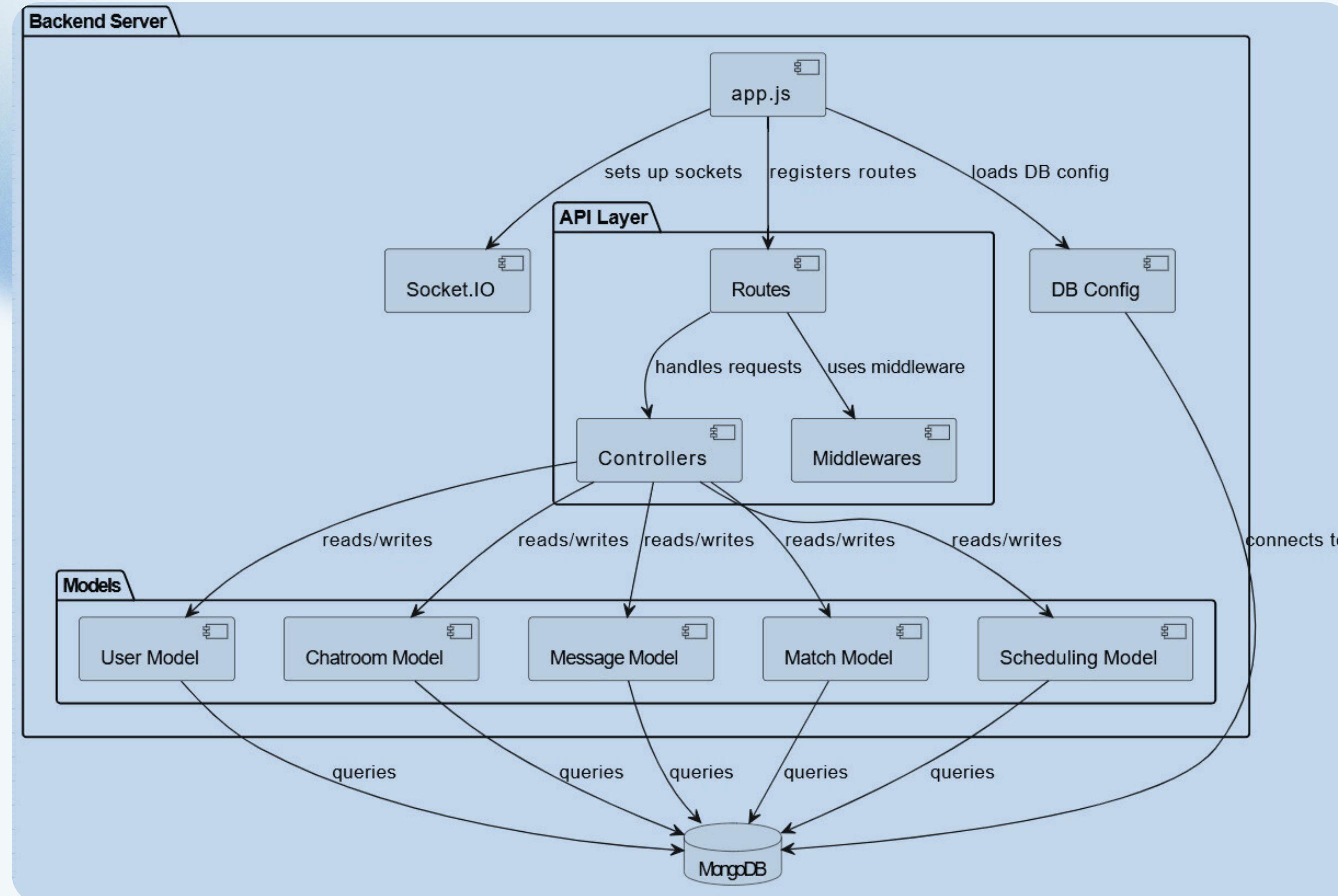
NON-FUNCTIONAL REQUIREMENTS

**SECURITY
&
PRIVACY**

**OBSERVABILITY
&
LOGGING**

**MAINTAINABILITY
(TO SOME EXTENT)**

ARCHITECTURE OVERVIEW



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- Client–Server SPA model
- Frontend: React/TypeScript
- Backend: Node.js + Express
- Database: MongoDB (Mongoose models)
- REST + real-time via Socket.IO
- Middleware: helmet, CORS, session, rate limiting

BACKEND INTERNALS

- app.js initializes routes, middleware, sockets, DB config
- Routes → Controllers → Models → MongoDB
- Socket.IO for chat and scheduling updates
- Strong session-based authentication

DESIGN PATTERNS & QUALITY ATTRIBUTES

- Layered Architecture: routes, controllers, models
- MVC-like structure: React (View), API (Controller), Models
(Data)
- Observer Pattern: real-time updates via Socket.IO
- Singleton DB connection
- Focus on: security, maintainability, observability, usability

CONCLUSION

- StudyBuddy enables secure, scalable, collaborative study sessions
- Provides matching, chat, scheduling, and notifications
- Built with modern full-stack technologies
- Addresses both functional and non-functional requirements
- Future scope: AI recommendations, calendar sync, mobile app