Low-Level Design Document

Purpose

To describe the internal working of modules/components and how data flows between them.

Class/Component Descriptions

- User: Attributes - id, email, role; Methods - login(), logout()
- Appointment: Attributes - id, studentId, teacherId, time; Methods - create(), update(), cancel()
- Message: Attributes - id, senderId, receiverId, text, timestamp; Methods - send(), read()

Sequence Diagrams

- Login Sequence: User → Auth Service → Firestore → Validate → Redirect to Dashboard
- Appointment Booking: Student → Appointment Service → Firestore (Write) → Confirm via UI
- Message Flow: Sender → Message Service → Firestore → Receiver

Key LLD Decisions

- Context-based rendering using React Context API.
- Role-guarded routes using PrivateRoute components.
- Service abstraction for Firebase logic (clean separation of concerns).