

Class Design Document for MediTech

1. Overview

The MediTech system is a healthcare web application that allows **patients** to book appointments with **doctors**, manage schedules, make payments, and be administered by an **admin** role.

The system is structured around **inheritance** (User → Patient, Doctor, Admin) and **associations** (Appointment, Payment, TimeSlot).

2. Class Descriptions

2.1 User (Abstract Class)

- **Attributes:**
 - name: String
 - email: String
 - role: String
 - **Methods:**
 - login()
 - logout()
 - viewProfile()
 - updateProfile()
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2.2 Patient (inherits User)

- **Methods:**
 - viewAppointments()
 - bookAppointment()
 - cancelAppointment()
 - makePayment()

- **Associations:**

- books → Appointment (1 patient can book many appointments).
 - makes → Payment (patient initiates payments).
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2.3 Doctor (inherits User)

- **Attributes:**

- specialization: String
- experience: Integer
- availability: List<TimeSlot>

- **Methods:**

- viewAppointments()
- manageAvailability()
- updateAppointmentStatus()

- **Associations:**

- has → Appointment (doctor is linked to multiple appointments).
 - defines → TimeSlot (doctor defines availability).
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2.4 Admin (inherits User)

- **Methods:**

- manageDoctors()
 - viewAllAppointments()
 - manageUsers()
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2.5 Appointment

- **Attributes:**
 - `patientId: String`
 - `doctorId: String`
 - `dateTime: DateTime`
 - `status: String`
 - **Methods:**
 - `schedule()`
 - `reschedule()`
 - `cancel()`
 - `updateStatus()`
 - **Associations:**
 - Linked to **Patient** and **Doctor**.
 - requires → Payment.
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2.6 Payment

- **Attributes:**
 - `appointmentId: String`
 - `amount: Float`
 - `status: String`
 - `paymentMethod: String`
- **Methods:**
 - `processPayment()`
 - `issueRefund()`
- **Associations:**
 - Tied to a specific Appointment.
 - Triggered by a Patient.

2.7 TimeSlot

- **Attributes:**
 - `startTime`: Time
 - `endTime`: Time
 - `isBooked`: Boolean

3. Relationships & Cardinality

- **Inheritance:**
 - `User` → `Patient`, `Doctor`, `Admin`
- **Associations:**
 - A Patient books 0..* Appointments.
 - A Doctor has 0..* Appointments.
 - An Appointment requires exactly 1 Payment.
 - A Doctor defines 1..* TimeSlots.

MediTech

