Smart Time-Table & Substitution Manager

1. Overview

The Smart Time-Table & Substitution Manager aims to streamline class schedule management, faculty substitutions, class cancellations, and announcements of special classes. This ensures students and faculty have real-time visibility and academic continuity.

2. Objective

To build a web-based CRUD system that allows:

- Admins to manage class schedules and faculty availability.
- Faculty to view and update their schedules (e.g., mark unavailable days).
- Students to access real-time time-table updates including substitutions and cancellations.

3. Target Users

- Admin/Coordinator: Manages master schedules, updates substitutions, cancels/reschedules classes.
- Faculty: Views and updates availability.
- Students: Views real-time timetable updates.

4. Functional Requirements

Create

- Admin can:
 - o Add new class schedules.
 - o Input faculty availability.
 - Assign faculty to classes.

Read

- Faculty/Students can:
 - o View the current day's timetable.
 - o Check future class schedules.

Update

- Admin can:
 - Mark a class as cancelled.
 - o Assign a substitute faculty.
 - o Schedule special classes.

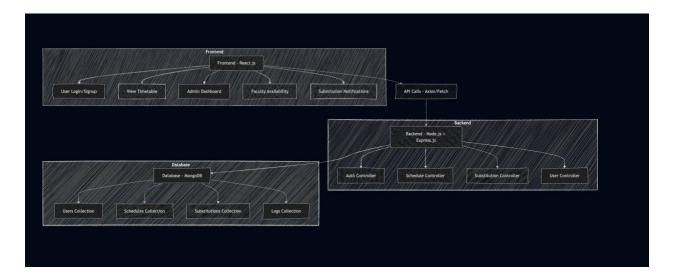
Delete

- Admin can:
 - Delete outdated schedules.
 - o Remove duplicate or erroneous entries.

5. Tech Stack (MERN)

- MongoDB: Stores schedules, user roles, class info, and updates.
- Express.js: Backend API server.
- **React.js**: Frontend interface for students, faculty, and admin.
- **Node.js**: Runs the backend logic.

6. System Architecture



7. Database Schema (MongoDB)

```
User
 "name": "Dr. Smith",
 "email": "smith@college.edu",
 "role": "faculty", // or "student", "admin"
 "availability": ["Monday", "Wednesday"]
Schedule
 "date": "2025-05-21",
 "class": "CS301",
 "time": "10:00 - 11:00",
 "faculty": "Dr. Smith",
 "room": "B201",
 "status": "active", // cancelled, substituted, special
```

```
"substituteFaculty": "Dr. John" // optional
```

8. User Interfaces

a. Admin Dashboard

- Add/Edit/Delete schedules
- Assign substitutes
- Broadcast special class info

b. Faculty Panel

- View personal schedule
- Update availability
- Accept substitution requests

c. Student View

- Real-time view of daily schedule
- Notifications for cancellations/special classes

9. Non-Functional Requirements

- Authentication: JWT-based role management.
- Responsive UI: Mobile and desktop compatibility.
- Notification System: Real-time updates using WebSockets or polling.
- Audit Logging: Changes in schedules should be logged.

10. Impact

- Reduces miscommunication
- ✓ Ensures academic continuity

✓ Enhances institutional productivity