Floor Plan Management System

-by Dishant Gupta

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1. Introduction

Overview:

The Intelligent Floor Plan Management System is a seamless workspace experience application designed for managing meeting rooms within a building. It allows administrators to manage room details, track seat capacity, and optimize meeting room usage. Users can easily book, modify, and free meeting rooms as per their requirements.

Features:

1. Add, modify, and delete room information (room number, floor number, capacity, etc.).
2. Manage the availability and occupancy of rooms.
3. Offline mechanism for admin access.
4. Book meeting rooms based on seat capacity and availability.
5. Suggestions for best-fit rooms based on proximity and capacity.
6. View and modify existing bookings.
7. Free occupied meeting rooms.

2. Tech Stack

Frontend:

React.js: User interface development.

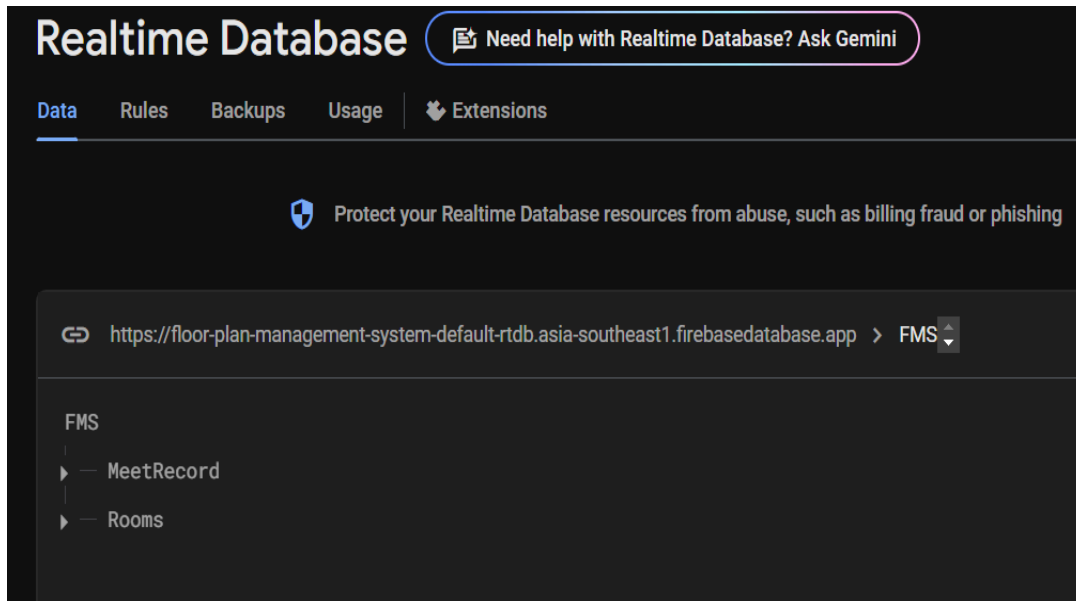Tailwind CSS: Styling and responsive design.

Backend:

Firebase: Real-time database for room and booking management firebase authentication for robust authentication.

Database:

Firebase Realtime Database:

Rooms: Stores room details such as room number, floor, capacity, and occupancy status.

MeetRecord: Stores booking records including user ID, room details, and timestamps.

3. Features

Add Room :

Modify Room:

Admin can change the details of existing rooms, such as increasing/decreasing seat capacity, changing the floor number, or adjusting room details.

Modify Room

Floor Number

Enter Floor Number

Room Number to Modify

Room Number

Load Room Details

Remove Room:

Remove Room

Floor Number

Enter Floor Number

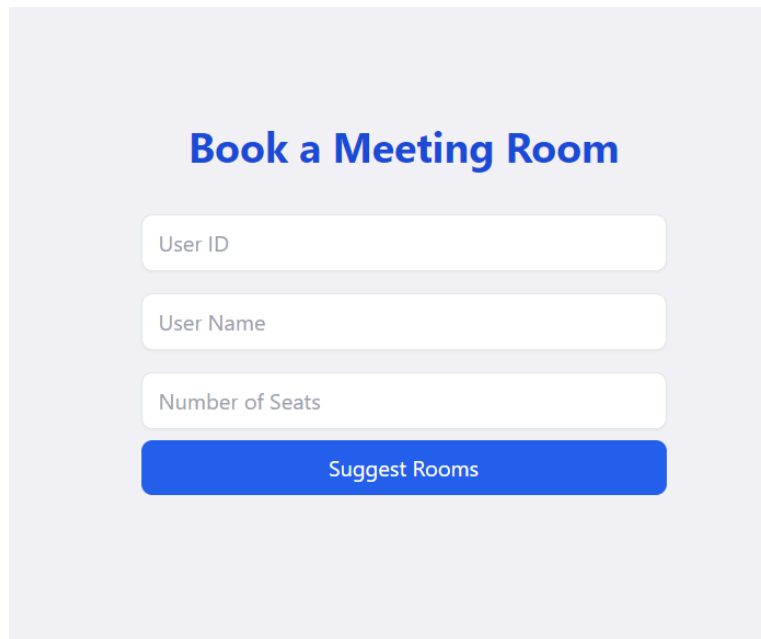**Room Number to Remove**

Room Number

Remove Room

Book Meeting:

Users can book a room by specifying the number of required seats. The system suggests the best-fit rooms based on:

1. Proximity (same or nearest floor).
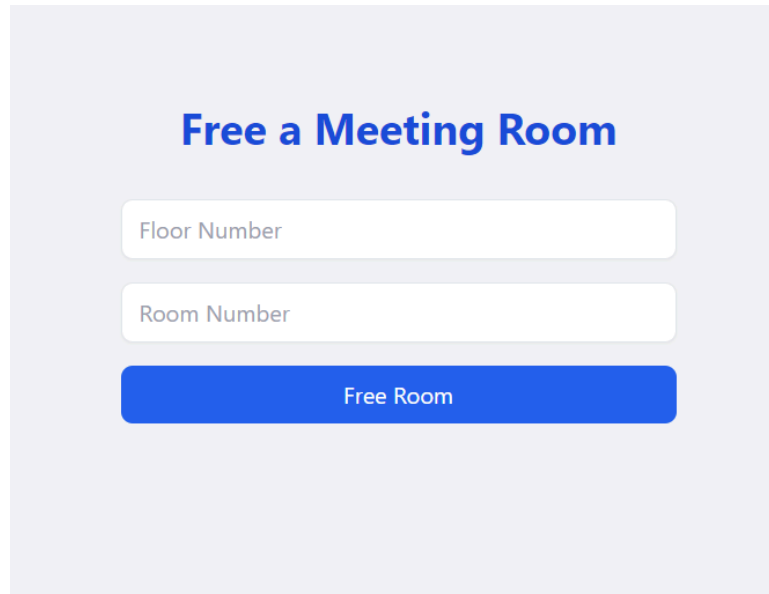2. Capacity (rooms that best fit the seat requirements).

Once a room is booked, the occupancy status is updated and a record is saved in the MeetRecord database.

Free Room:

Allows users to free an occupied room by specifying the room and floor number. If the room is already free, the system displays a message

Free a Meeting Room

Floor Number

Room Number
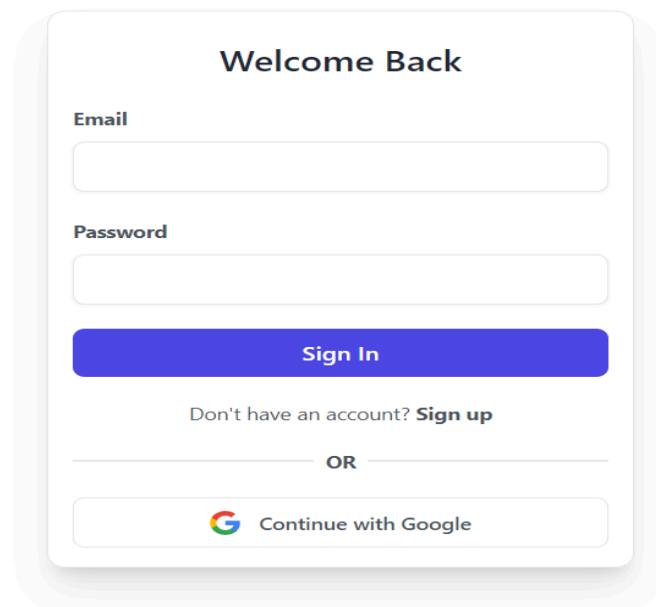
Free Room

4. User Interface

The system includes a responsive navigation bar where users can access the following:

- View All Rooms
- Add Room
- Modify Room
- Delete Room
- Book Meeting
- Free Occupied Rooms
- View Meeting Records

5. Authentication

The system includes user authentication where:

- Users must log in or register to access any functionality.
- Admin privileges allow additional room management options.
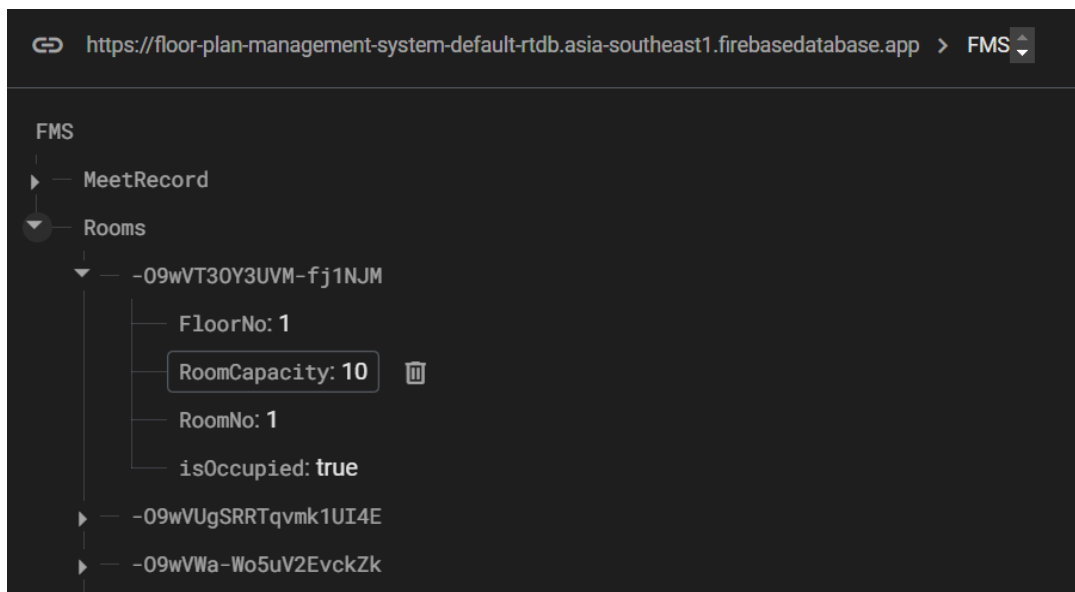- Firebase Authentication is used for secure user login and registration.
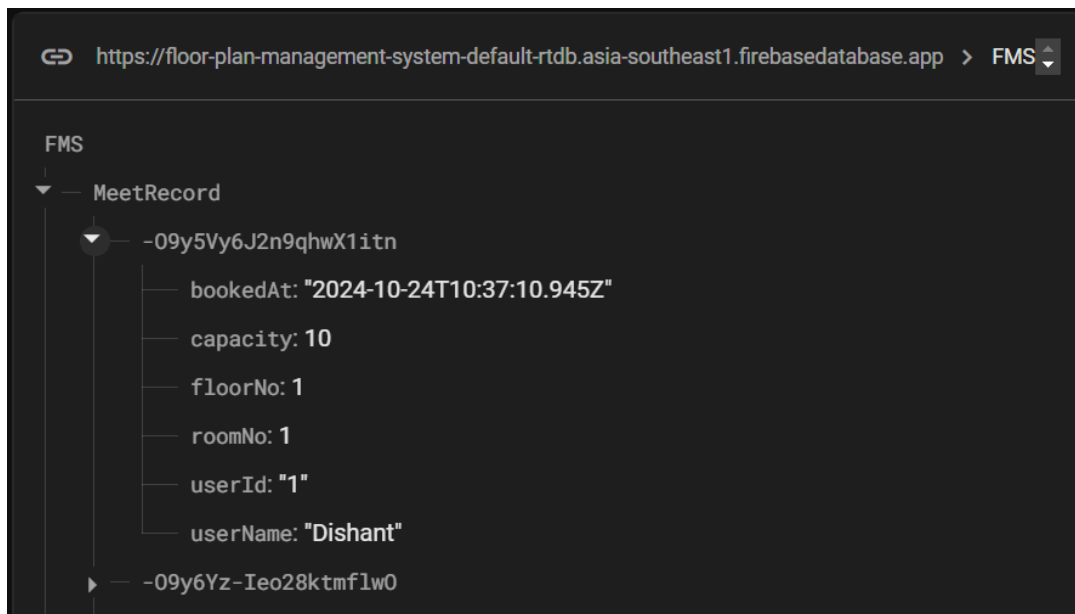
6. Database Structure

Rooms: Stores room data under FMS/Rooms.

1. RoomNo: Integer representing room number.
2. FloorNo: Integer representing the floor where the room is located.
3. RoomCapacity: Integer representing seat capacity.
4. isOccupied: Boolean representing room availability.

MeetRecord: Stores meeting bookings under FMS/MeetRecord.

1. userId: ID of the user who booked the meeting.
2. userName: Name of the user.
3. roomNo: Booked room number.
4. floorNo: Booked floor number.
5. bookedAt: Time of the booking.

7. Usage Instructions (Admin Actions)

- Add a Room: Navigate to the "Add Room" page, fill in the room details, and submit.
- Modify a Room: Go to the "Modify Room" page, select a room, and edit its details.
- Delete a Room: Select the "Delete Room" option, enter the room and floor number, and confirm deletion.
- Book a Room: Enter the number of seats needed, and the system will suggest rooms. Confirm the booking to finalize.
- Free a Room: Enter the room and floor number to free an occupied room.
- View All Rooms: Displays a list of rooms with their current availability.

8. Future Enhancements

Potential future improvements to the system:

- Develop a local storage mechanism for admins to make changes offline.
- Implement synchronization to update the server when the internet or server connection is re-established.

9. Project Link

https://floor-plan-management-system.firebaseapp.com/