IIT2021191

Project Report

1. Introduction

This project aims to develop a booking system for sports courts, allowing users to check available slots and book a court. It includes a backend to manage data and a frontend for user interaction. The system ensures a smooth booking process and maintains record of bookings efficiently.

2. Design Decisions

The project uses a RESTful API for the backend, built with Node.js and Express, while MongoDB is used for data storage due to its flexibility with schema designs. The frontend is built using React to provide a responsive user interface. Slot booking logic is designed to ensure that users cannot book unavailable time slots.

3. Implementation Details

Technologies used include:

- **Node.js & Express**: For building the backend and API endpoints.
- **MongoDB**: As the database to store court, sport, and booking data.
- **React**: For building the frontend with a user-friendly interface.
- **Mongoose**: For database modeling and schema definition.

These technologies were chosen for their scalability, ease of use, and ability to handle real-time data.

4. Challenges and Solutions

One of the main challenges was handling date and time formatting to ensure consistency across the application. This was resolved by standardizing the date format to 'DD-MM-YYYY'. Another challenge was managing slot availability, especially under concurrent booking conditions, which was addressed by implementing checks before saving a booking.

5. Future Improvements

With more time, the following features could be added:

- **Real-time Slot Updates**: Implementing WebSockets for real-time updates on slot availability.

- **Enhanced UI/UX**: Improving the user interface for a more intuitive booking experience.

- **Mobile App**: Developing a mobile version of the app for better accessibility.

- **Advanced Analytics**: Adding analytics for booking trends to help managers optimize court usage.