Game Theory Assignment

Introduction

The sports booking app is designed to streamline the reservation and management of sports facilities across multiple centres. The main objectives are to:

- **Enable Efficient Bookings**: Allow customers to easily view available sports slots and book their preferred times.

- **Facilitate Operations Management**: Provide centre managers with tools to oversee and manage bookings for various sports and courts.

- **Enhance User Experience**: Ensure seamless communication through email confirmations and easy access to booked slots.

This project aims to improve operational efficiency while providing a user-friendly interface for both customers and management teams.

Design Decisions

An API-driven architecture was chosen, utilizing a RESTful API design to separate concerns between the frontend and backend, facilitating scalability and maintenance.

state management approach was implemented in the frontend to efficiently handle the application state, ensuring smooth data flow and timely UI updates.

Consistent error handling was established across the APIs to provide clear feedback to the frontend, enhancing user experience.

Implementation Details

- **Technologies Used**:

  - **Backend**: MongoDB was used for data storage, with Express.js employed to build the APIs.

  - **Frontend**: HTML, CSS, and JavaScript were utilized for the frontend development to create an interactive user interface.

- **Rationale**:

  - MongoDB was selected for its flexibility in handling unstructured data and ease of scaling, while Express.js allowed for rapid API development.

Challenges and Solutions

1. **Challenge: Preventing Double Bookings**:

   o Checks were implemented in the Create Booking API to verify slot availability before creating a new booking.

2. **Challenge: Ensuring Data Consistency**:

   o Appropriate validations were implemented to maintain data integrity during the booking process.

Future Improvements

1. **User Authentication**: The implementation of user authentication is planned to secure the booking process and maintain user sessions.

2. **Admin Dashboard**: A comprehensive admin dashboard for analytics and reporting on booking trends is in consideration for future development.

3. **Payment Integration**: The introduction of payment processing for bookings is anticipated to enhance the customer experience.

4. **Mobile Application**: Development of a mobile app version of the booking system is being considered to reach a wider audience.

5. **Notifications**: The implementation of push notifications or reminders for upcoming bookings is intended to enhance customer engagement.