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Project Report: Fitness Centre Database Design

Executive Summary

This report presents the design of a relational database for a fitness center. The database is designed to manage members, trainers, schedules, fitness goals, rooms, bills, and administrative staff. Two ER diagrams are included to depict the logical structure and relationships of the data.

Introduction

The aim of the database is to streamline operations at the fitness centre by maintaining records of members, trainers, fitness goals, schedules, billing, and administrative tasks. The database will support various functionalities including membership management, scheduling, billing, and administration.

Database Design Overview

The design is articulated through Entity-Relationship (ER) diagrams, which are graphical representations of the database schema. The diagrams show how entities are related to each other and the nature of these relationships.

Entity Descriptions

Member

The Member entity represents individuals who are registered with the fitness center. Each member has attributes such as first name, last name, email, password, phone, and registration date.

Trainer

The Trainer entity represents fitness professionals who provide training to the members. Attributes include first name, last name, and email.

Schedule

The Schedule entity manages the training appointments and links trainers, members, and rooms. It includes attributes for the date and time of workouts.

Room

The Room entity corresponds to the physical spaces within the fitness centre where activities take place.

Bill

The Bill entity manages financial transactions, recording the fees and payment details for the services offered to members.

FitnessGoal

The FitnessGoal entity tracks the fitness objectives set by members, including target goals and the dates set for these goals.

Admin

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The admin entity represents the administrative staff responsible for managing the backend operations of the fitness centre.

Relationships

The diagrams illustrate various relationships such as:

- Members pay Bills.

- Members follow a Schedule.

- Trainers train Members and set their FitnessGoals.

- Activities in the Schedule are hosted in Rooms.

Cardinality and Participation

The cardinality of the relationships is depicted with standard notations, indicating one-to-many or many-to-one relationships, and participation is signified by the connecting lines.

Detailed Schema Representation

The relationship schema diagram provides a detailed view of the database tables, primary keys (PK), and foreign keys (FK) that enforce referential integrity among tables.

Constraints and Keys

Primary keys and foreign keys are identified for each entity. The primary key ensures each record is unique, and foreign keys maintain the referential integrity between related tables.

Implementation Strategy

The database will be implemented using an SQL-based relational database management system (RDBMS). The ER diagrams serve as the blueprint for creating tables, defining relationships, and enforcing data integrity.

Conclusion

The fitness centre database is designed to capture all necessary data and relationships to support operational efficiency. The ER diagrams provide a clear and organized visual representation of the database schema, ensuring a robust and scalable database structure.