COMP 3005 Final Project

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Conceptual Design:

The ER model is made up of 9 strong entities:

Member (representing a member at the club), Trainer (representing a trainer at the club), Event (representing an event at the club), Billing (representing a billing), Class (representing a class at the club), Equipment (representing an equipment at the club), Admin (representing an administrative staff at the club), Room (representing a room at the club), and Payment (representing a payment).

The ER model also has 6 relationships between these entities, which are:

Register (between Member and Event entities), with the assumption being a member might register for many events (partial) and an event might be registered by many members (partial).

Schedule (between Member and Trainer entities), with the assumption being a single trainer might have many members assigned to him/her (partial) and a member might have a single trainer (partial). This relationship has a few foreign attributes, which are schedule date, schedule time, schedule status, and notes (made by the trainer after the session is completed).

Oversee (between Billing and Admin), with the assumption that a single admin will always oversee many billings (total) and a billing is always overseen by a single admin (total).

Monitor (between Equipment and Admin), with the assumption that any form of equipment is always monitored by a single admin (total) and a single admin always monitors all forms of equipment (total).

Booking (between Admin and Room), with the assumption that a single admin always books many rooms (total) and that any room might be booked by a single admin (partial).

Process (between Admin and Payment), with the assumption that a single admin always processes many payments (total) and a payment is always processed by a single admin (total).

Relation Schemas (same relations after normalization + the relationship tables since relations already obeyed 2nf and 3nf):

Equipment (columns: equipment_id (primary key), equipment_name, admin_id, needs_maintenance)

Room (columns: room_id (primary key), room_name, is_available, admin_id (foreign key))

Billing (columns: bill_id (primary key), bill_description, bill_amount, bill_date, admin_id (foreign key))

Admin (columns: admin_id (primary key), first_name, last_name, email, phone, admin_role)

Payment (columns: payment_id (primary key), member_id (foreign key), admin_id (foreign key), date, points, amount, service_attained)

Member (columns: member_id (primary key), first_name, last_name, email, phone, join_date, loyalty_points, trainer_id (foreign key))

Trainer (columns: trainer_id (primary key), first_name, last_name, email, phone, certification)

Event (columns: event_id (primary key), event_type, event_date, event_time, capacity)

Class (columns: class_id (primary key), class_type, class_date, class_time, capacity)

Fitness_goals (columns: member_id (primary key), Fitness_goals)

Fitness_achievements (columns: member_id (primary key), Fitness_achievements)

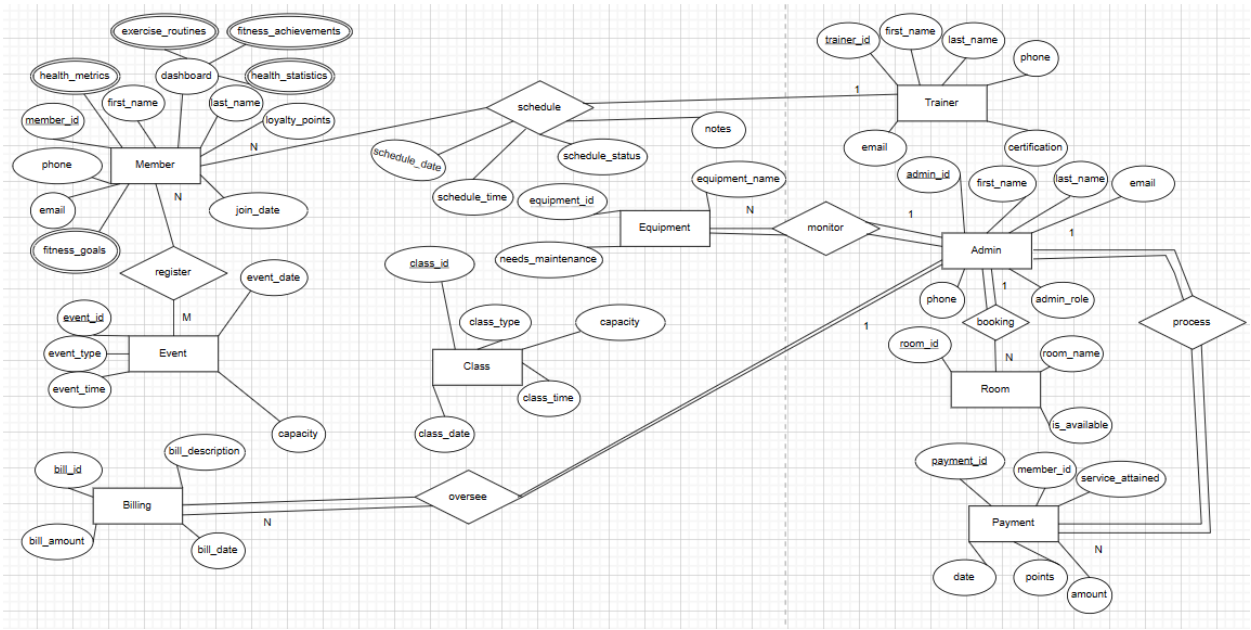
Exercise_routines (columns: member_id (primary key + foreign key), Exercise_routines)

Register (columns: event_id (primary key + foreign key), member_id (primary_key + foreign key))

Schedule (columns: member_id (primary key + foreign key), trainer_id (foreign key), schedule_date, schedule_time, schedule_status, notes)

Health_metrics (columns: member_id (primary key + foreign key), Health_metrics)

Health statistics (columns: member_id (primary key + foreign key), Health_statistics)



Functional dependencies (will be denoted as "fd" for the rest of the report):

fds for 'Member' table:

member_id -> first_name

member_id -> last_name

member_id -> email

member_id -> phone

member_id -> join_date

member_id -> loyalty_points

member_id -> trainer_id

fd for 'Trainer' table:

trainer_id -> first_name

trainer_id -> last_name

trainer_id -> phone

trainer_id -> email

trainer_id -> certification

fd for 'Event' table:

event_id -> event_type

event_id -> event_date

event_id -> event_time

event_id -> capacity

fd for 'Class' table:

class_id -> class_type

class_id -> class_date

class_id -> class_time

class_id -> capacity

fd for 'Admin' table:

admin_id -> first_name

admin_id -> last_name

admin_id -> email

admin_id -> phone

admin_id -> admin_role

fd for 'Equipment' table:

equipment_id -> equipment_name

equipment_id -> needs_maintenance

equipment_id -> admin_id

fd for 'Room' table:

room_id -> room_name

room_id -> is_available

room_id -> admin_id

fd for 'Billing' table:

bill_id -> bill_description

bill_id -> bill_amount

bill_id -> bill_date

bill_id -> admin_id

fd for 'Payment' table:

payment_id -> date

payment_id -> member_id

payment_id -> admin_id

payment_id -> points

payment_id -> amount

payment_id -> service_attained

fd for 'Exercise_routines' table:

member_id -> Exercise_routines

fd for 'Fitness_achievements' table:

member_id -> Fitness_achievements

fd for 'Fitness_goals' table:

member_id -> Fitness_goals

fd for 'Health_statistics' table:

member_id -> Health_statistics

fd for 'Health_metrics' table:

member_id -> Health_metrics

Database Schema Diagram: