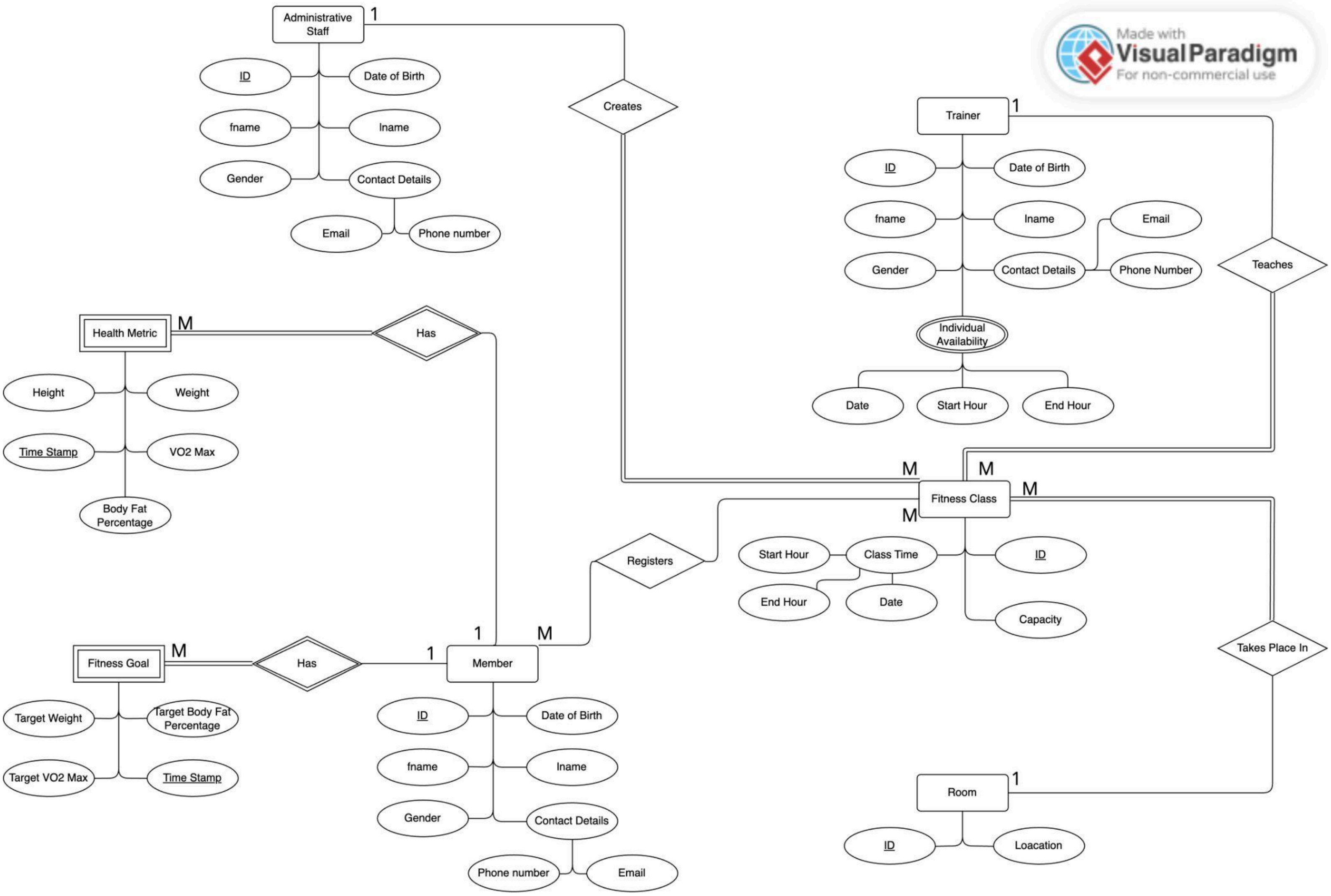
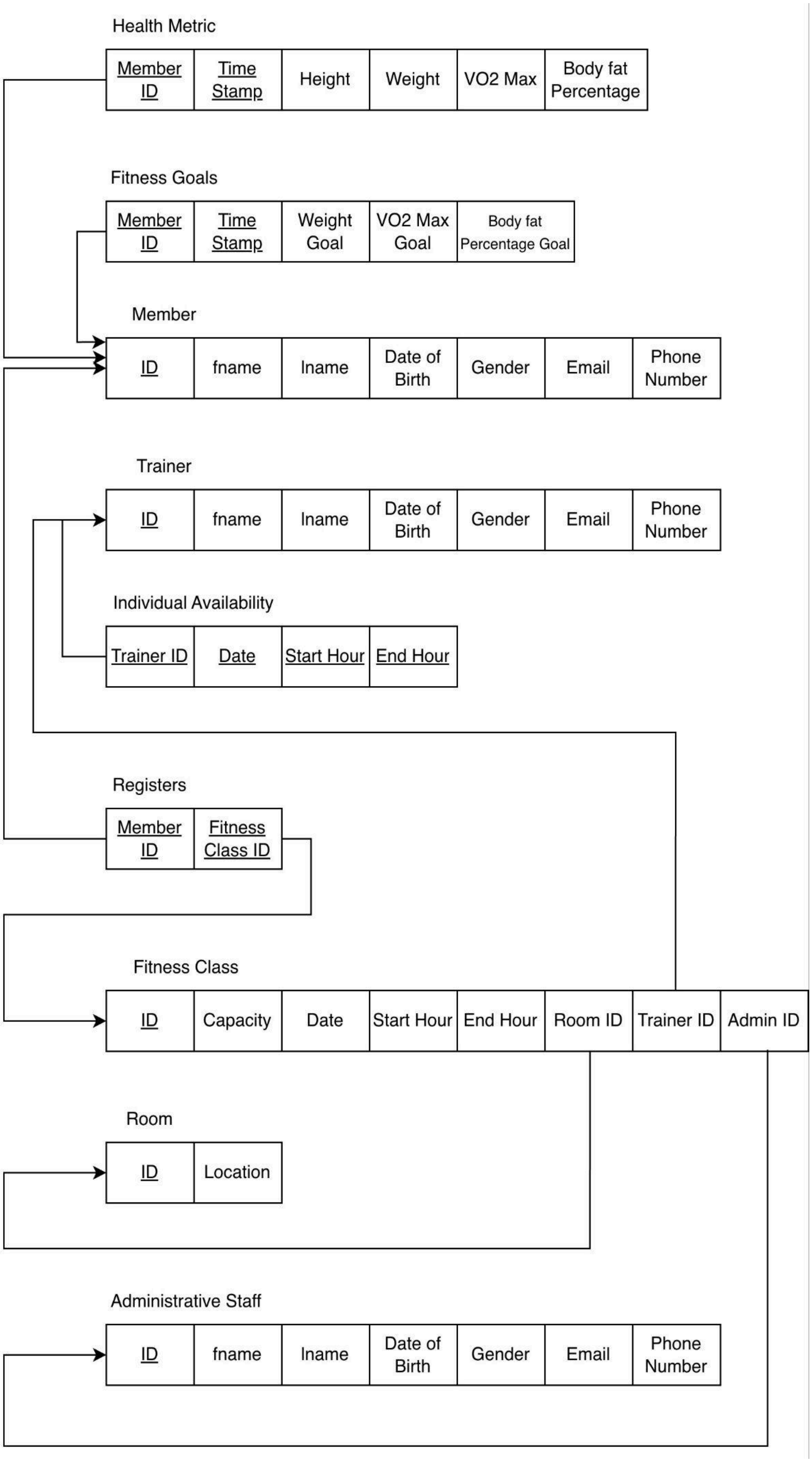
COMP 3005 Final Project Ahmed Omer

ER Model:



Schema:



Health Metric

Member ID	Time Stamp	Height	Weight	VO2 Max	Body fat Percentage

Fitness Goals

Member ID	Time Stamp	Weight Goal	VO2 Max Goal	Body fat Percentage Goal

Member

ID	fname	lname	Date of Birth	Gender	Email	Phone Number

Trainer

ID	fname	lname	Date of Birth	Gender	Email	Phone Number

Individual Availability

Trainer ID	Date	Start Hour	End Hour

Registers

Member ID	Fitness Class ID

Fitness Class

ID	Capacity	Date	Start Hour	End Hour	Room ID	Trainer ID	Admin ID

Room

ID	Location

Administrative Staff

ID	fname	lname	Date of Birth	Gender	Email	Phone Number

Implementing the following operations:

- **Member:**
    - User Registration
    - Profile Management
    - Health History
    - Group Class Registration
- **Trainer:**
    - Set Availability
    - Schedule View
- **Administration Staff**
    - Room Booking
    - Class Management

Assumptions Table:

Requirement	Assumption	Representation in ER Model
A member should be able to register by providing personal information such as name, date of birth, gender, and contact details, and later manage or update these details as needed. **User Registration:** Create a new member with unique email and basic profile info. **Profile Management:** Update personal details	"Contact Details" entails a composite attribute with an email and a phone number attribute. They are also not necessarily unique	Member Entity: attributes include: ID (PK), fname, lname, Date of Birth, Gender, and Contact Details (composite with email and phone number attributes)
Members will have the ability to establish and track personalized fitness goals—such as achieving a target body weight or reducing body fat percentage—and store health metrics like height, weight, heart rate, and other measurable indicators of physical performance. These metrics should not overwrite previous entries but instead be recorded historically so that trends and progress can be analyzed over time. **Profile Management:** Update fitness goals (e.g., weight target), and input new health metrics (e.g., weight,	Members do not need to have Health Metric entries or Fitness Goals.	Weak Entity Health Metric and 'Has' relationship with Member Entity: Health Metric Attributes include: Timestamp (Partial Key), Height, Weight, VO2 Max and Body Fat Percentage. The 'Has' relationship is a 1 to Many relationship (1 Member and many Health Metrics), with full participation on the Health Metric's side. Weak Entity Fitness Goals and 'Has' relationship with Member Entity: Fitness Goals Attributes include: Timestamp (Partial Key), Weight Goal, VO2 Max Goal and Body Fat Percentage Goal. The 'Has'

heart rate). **Health History:** Log multiple metric entries; do not overwrite. Must support time-stamped entries.		relationship is a 1 to Many relationship (1 Member and many Health Metrics), with full participation on the Health Metric's side.
Members should be able to register for group fitness classes, subject to class capacity and schedule constraints. **Group Class Registration:** Register for scheduled classes if capacity permits.	Members do not have to register in a class, and a class does need to have members.	Fitness Class Entity: attributes include: Capacity, ID (PK), Class Time (composite attribute with Start hour, End hour and Date attributes). 'Registers' Relationship with Member Entity: Many to Many Relationship with partial participation on both sides.
From the trainer's perspective, the system must provide features that allow them to define and manage their work schedules efficiently. Trainers should be able to specify their availability periods—either as recurring weekly slots or as individual time intervals—and update these schedules as needed. **Set Availability:** Define time windows when available for sessions or classes. Prevent overlap.	Trainers will have to specify every availability period as individual time intervals	Trainer Entity: attributes include: ID (PK), fname, lname, Date of Birth, Gender, Contact Details (composite with email and phone number attributes) and Individual Availability (composite, multi valued attribute with Start Hour, End Hour, and Date attributes)
Trainers will also need to view their upcoming sessions and class assignments, allowing them to prepare for each session in advance. **Schedule View:** See assigned PT sessions and classes	Trainers do not need to have a class	'Teaches' Relationship with Fitness Class Entity: 1 to Many relationship (1 trainer to Many Classes) with partial participation on the trainer's side.
Administrative users are responsible for defining and maintaining the class schedule, which includes creating new classes, assigning trainers, setting class capacities, and updating or canceling sessions when necessary. The system must ensure logical enforcement of business rules such as preventing overlapping bookings, ensuring that room capacities are not exceeded, and verifying trainer availability before confirming any reservation Administrators will have the capability to	Rooms don't need to have a class. Admins don't need to make a class.	Administration Staff Entity: attributes include: ID (PK), fname, lname, Date of Birth, Gender, and Contact Details (composite with email and phone number attributes) Room Entity: attributes include: ID (PK), location 'Takes Place in' relationship between Fitness Class and Room: 1 to Many relationship (1 room and many fitness classes) with complete participation on the Fitness class' side.

manage room bookings to ensure that physical spaces—such as studios or training rooms—are properly allocated for classes and personal sessions, while avoiding conflicts in scheduling. **Class Management:** Define new classes, assign trainers/rooms/time, update schedules. **Room Booking:** Assign rooms for sessions or classes. Prevent double-booking.		‘Creates’ Relationship with Fitness Class: 1 to Many relationship (1 Admin to Many Classes) with complete participation on the Fitness class’ side.