FinalProjectReport - Thomas Li - 101273291

Project Option 2
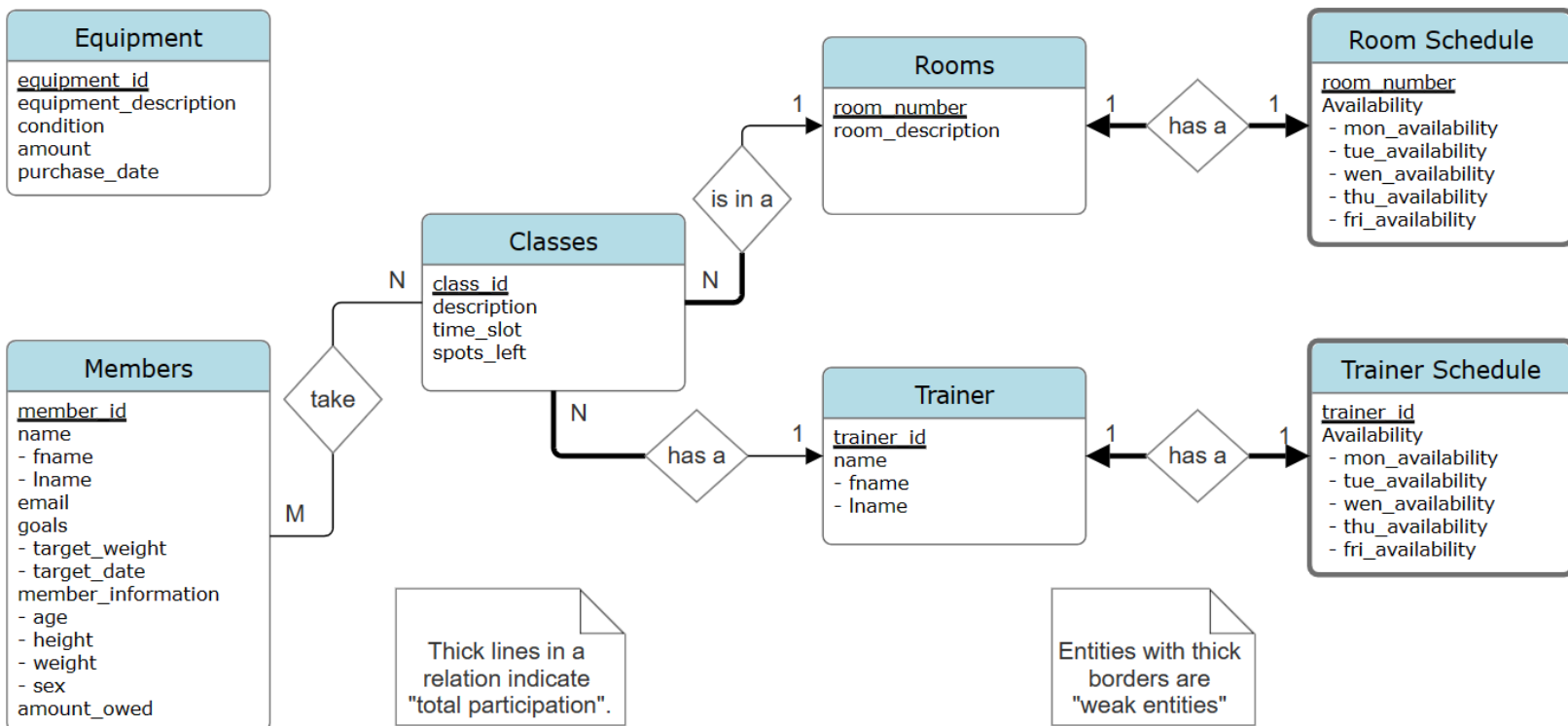
Assumptions

Requirements	Assumptions	Representation in ER diagram
Members should be able to register and manage their profiles, establish personal fitness goals (you can determine suitable fitness goals such as weight and time, and members will set the values), and input health metrics	NA	Members table has a first name and last name Goals in members table are set as a target weight and date Health metrics are: weight, height, age ,sex Name and email are also attributes (member profile) PK of the members table is the member ID
They should have access to a personalized dashboard that tracks exercise routines, fitness achievements, and health statistics.	Members take classes, which involve specific exercise routines, described in the description attribute of the classes table. Each member can choose to participate in as many classes as they want, even none.	Health statistics are in the Members table (health, age etc.) Exercise routines are a list of classes they would be attending (Members, takes, and classes table) Fitness achievements can be calculated as amount of classes taken and if there goal has been reached (weight <= target weight, date <= target date) For every class a member participates in, the amount they owed would change

| Members can schedule, reschedule, or cancel personal training sessions with certified trainers. Additionally, they should be able to register for group fitness classes. | Every class can have any number of members taking them, including 0.

Each class must have a single trainer.

Each class must have a single room associated with them. | Classes table includes class description, maximum number of members who can attend, and a time slot it takes place in (limited to the days of the work week)

Group classes and personal training sessions are all under classes table, they are differentiated by the maximum number of members and description

PK of classes table is class_id

Many to many relationship with members table (takes). Partial participation for both sides.

One to many relationship with trainers table (has a) Total participation for classes. Partial participation for trainers

One to many relationship with rooms table (is in a) Total participation for classes. Partial participation for trainers |
| Trainers should have the ability to manage their schedules and view member profiles. | Each trainer must have one trainer schedule

Each trainer schedule must have one trainer

Each trainer can teach any number of classes, including 0

Trainer schedule can only | Trainer Schedules are broken up into the 5 workdays of a week, each with a specific availability.

Trainer table includes first and last name of trainer

PK of trainer and trainer_schedule table is trainer_id |

	be defined when a trainer exists (weak entity)	Trainer has a one to one relationship with trainer schedules (has a), total participation for both sides One to many relationship with class table (has a) Total participation for classes. Partial participation for trainers
Administrative Staff should be equipped with features to manage room bookings, monitor fitness equipment maintenance, update class schedules, oversee billing, and process payments for membership fees, personal training sessions, and other services	Each room must have one room schedule Each room schedule must have one room Each room can have any number of classes be taught in them, including 0 Room schedule can only be defined when a room exists (weak entity)	Room Schedules are broken up into the 5 workdays of a week, each with a specific availability. Rooms table includes room number and description of room PK of room and room_schedule table is room_num Room has a one to one relationship with room schedules (has a), total participation for both sides One to many relationship with classes table (is in a) Total participation for classes. Partial participation for rooms Equipment table has, equipment description, condition of equipment, amount of equipment, and purchase date Equipment ID is PK

ER Diagram

Equipment
- equipment_id
- equipment_description
- condition
- amount
- purchase_date

Classes
- class_id
- description
- time_slot
- spots_left

Rooms
- room_number
- room_description

Room Schedule
- room_number
- Availability
  - mon_availability
  - tue_availability
  - wen_availability
  - thu_availability
  - fri_availability

Members
- member_id
- name
  - fname
  - lname
- email
- goals
  - target_weight
  - target_date
- member_information
  - age
  - height
  - weight
  - sex
- amount_owed

Trainer
- trainer_id
- name
  - fname
  - lname

Trainer Schedule
- trainer_id
- Availability
  - mon_availability
  - tue_availability
  - wen_availability
  - thu_availability
  - fri_availability

N — take — M

N — is in a — 1

N — has a — 1

1 — has a — 1

Thick lines in a relation indicate "total participation".

Entities with thick borders are "weak entities"

Relational Schema

Equipment
- equipment_id
- equipment_description
- condition
- amount
- purchase_date

Classes
- class_id
- class_description
- time_slot
- spots_left
- room_num (FK)
- trainer_id (FK)

Rooms
- room_number
- room_description
- mon_availability
- tue_availability
- wen_availability
- thu_availability
- fri_availability

Classes_Members
- class_id (FK)
- member_id (FK)

Members
- member_id
- fname
- lname
- email
- target_weight
- target_date
- age
- height
- weight
- sex
- amount_owed

Trainers
- trainer_id
- fname
- lname
- mon_availability
- tue_availability
- wen_availability
- thu_availability
- fri_availability

Class Members table has a combination of class_id and member_id as PK

Room/Trainer Schedule tables were weak entities that had a one-to-one, total participation relationship with Rooms/Trainers

Therefore, to reduce the number of tables, I just took the attributes in the Room/Trainer Schedule tables and added them to Rooms/Trainers