COMP3005 Project\_V2 Report

## Conceptual Design

A diagram of a software

Description automatically generated

Assumptions

* Trainers’ availabilities (multi-value field) are in blocks of one hour for simplicity (i.e. if there’s block of availability that starts at 8:00, it will end at 9:00). A block is removed from the availabilities when a member books for that block so no other member might also book it.
* A class always has one trainer. A trainer can teach multiple classes.
* Classes are also in blocks of one hour for simplicity.
* A class is always located in a room. A room does not necessarily need to have a class.
* An equipment is always located in a room. A room does not need to have any equipment.
* Room booking is only made for classes.
* A class is always created by an administration staff. Not all administration staff need to create classes.
* A class can have many members, and members can join multiple classes.
* A trainer can train multiple members (but only one at a time). He can also train the same member more than once (assumed that the maximum amount of time a trainer can train a member in one day is only one). A member can be trained by multiple trainers (but only one at a time). He can also be trained by the same trainer more than once (assumed that the maximum amount of time a member can be trained by a trainer in one day is only one).
* A member can have multiple routines. A routine is always associated with a member.
* A routine can be empty or have 1 or more exercises. An exercise does not need to be attached to a routine.
* A member does not need to have any fitness goals. A fitness goal must always be linked to a member.
* A member can have zero, one or more achievements (multi-value field).
* An invoice is always created by an administration staff and assigned to a member. Not all administration staff need to create invoices, and not all members need to have an invoice (for example, new members). The same applies to payments.

## Reduction to Relation Schemas

A screenshot of a computer program

Description automatically generated

Explanation

* There is no 1-to-1 relationship set.
* Most of the relationship sets are a 1-to-Many relationship.
* All the 1-to-Many relationships are also Total Participation. Therefore, no extra tables were needed to map them.
* There are two Many-to-Many relationship sets (between Trainer and Member, and between Member and Class). A table was required for each one of them.
* There are 2 multi-value fields. A table was required for each one of them.

## DDL File

Link:

<https://github.com/MathCU/COMP3005_Project/blob/main/SQL/DDL.sql>

Explanation

* Most of the attributes are required, therefore the “NOT NULL” constraint has been added to most of them.
* Tables with Foreign Keys are created after the tables they refer to.

## DML File

Link:

<https://github.com/MathCU/COMP3005_Project/blob/main/SQL/DML.sql>

Explanation

* Values were added to testing purposes.
* Attributes categorized as “SERIAL” in the DDL don’t need any data input since they will be automatically generated.

## Implementation

Link:

<https://github.com/MathCU/COMP3005_Project/blob/main/Health_and_Fitness_Club_System.py>

Explanation

* The navigation consists of 4 menus. There is the main menu, the menu for existing users, the menu for trainers and the menu for the administration staff.
* Users just need to follow the prompts to navigate around the system.
* New users can be created from the main menu.
* To access their menu/account, the user will need to select is role (existing user, trainer, administration staff) on the menu then enter their credentials (ID and password).
* Users can logout when they are done using the system.
* Existing users can see their personal information, see their dashboard, see their bookings, schedule/cancel personal training sessions, join/leave classes, update their personal information/health metrics, create/delete goals, add achievements, lookup/create//modify/delete routines and see the list of exercises they can add to their routines.
* Trainers can search for members by their names. They can also show/add/delete their own availabilities.
* Staff members can search for members by their names, create invoices, receive payments, see a list of equipment, update the maintenance date of the equipment, see a list of classes, create/delete classes.

## Bonus Features (Optional)

* Accounts have passwords. Users can login with their credentials. They can also logout when they are done using the systems.

## GitHub Repository

Link:

<https://github.com/MathCU/COMP3005_Project>