

Report: Health and Fitness Club Management System:

2.1 Conceptual Design – Assumptions

All Entities:

| Requirement | Assumption | Representation in ER Model |
|---|---|---|
| System will serve as a comprehensive platform catering to the diverse needs of club members, trainers, and administrative staff | Because it must serve members, trainers and administrative staff, all 3 entities require account information that cannot be NULL since email and password are for login and names are for identifying them on display | 3 Entities: members, staff, trainers Each will have attributes email, password, first_name, last_name (All NOT NULL), and primary key for id |

MEMBERS:

| Requirement | Assumption | Representation in ER Model/Relation Schema |
|---|--|---|
| Creating the bill for members - Administrative Staff processes the payment for the member | When a member creates an account, a \$60/month bill is automatically generated and gets sent to the Administrative staff to process. As a result, initial payment status is set to false, because it's not processed yet | <u>Entities: members, billing</u> members - billing: 1: Many (Each member will have multiple billing records, one generated per month) members <-> billing: Total Participation (Every billing record associated with member and member will have automatic billing when signed up) |
| Members should be able to 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 | We assume goals and metrics will be a block of text, hence we don't split it into more attributes. For example, some members might not want to display their weight due to personal reasons. However, we allow members to type in what they would like for exercise routines, fitness goals and health metrics and all members must do this. | Dashboard is in total participation with Member in a 1 to 1 relationship. |
| They should have access to a personalized dashboard that tracks exercise routines, fitness | Like the previous requirement, we assume that fitness achievements and goals are the same | Dashboard only has 4 attributes: member_id, exercise_routines, fitness_goals, health_statistics |

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| achievements, and health statistics. | | |
| Personal Sessions: Members can schedule, re-schedule, or cancel personal training sessions with certified trainers. | Members can only schedule a session if trainer is available. Thus, a trainer's availability is managed through <i>schedule</i> table which a time-slot gets added/updated/deleted into a <i>personalsessions</i> table | <p><u>Entity: personalsession, schedule</u></p> <p>member-personalsessions: 1-Many (Member can book multiple sessions) (Partial Participation: Not all member have to book a session)</p> <p>personalsessions - members: Total Participation (personal session have to be linked to a members)</p> <p>personalsessions - schedule: 1:1 (Each personal session corresponds to a time-slot so Total participation from personalsessions but time slots from schedule can be empty)</p> |
| Group Sessions: Member be able to register for group fitness classes | Member can find group sessions scheduled by Admin through <i>groupsession</i> | <p><u>(In relationa Schema: sessionmembers, groupsessions)</u></p> <p>members-sessionmembers: 1-Many (Member can attend multiple group sessions) * Partial Participation since not all member attends one</p> <p>sessionmembers-members: Total participation (Must have a member attending if creating a data for sessionmembers)</p> <p>groupsessions-sessionmembers: 1-Many (Group can consists of multiple members) * Partial participation since not all groups have members</p> <p>sessionmembers-groupsessions * All session members associated to groupsessions (Full participation)</p> <p>Sessionmembers is a weak entity as it equires both member_id and groupsession_id for enrolment.</p> |

Admin:

| Requirement | Assumption | Representation in ER Model |
|--|--|---|
| Room: | | |
| Room booking management update class schedules | These 2 functions overlap for us and we assume that the class schedule must be apart of and the room booking | The room management booking can update/create the class schedule |
| Equipment: | | |
| Billing and Payment Processing: Administrative Staff should be equipped with feature to oversee billing and process payments for membership fees, personal and training sessions | Personal and Training sessions are included in membership thus, membership is linked to the individual members. Once member have membership, they are free to book any personal or training session they have: | <p>billing - staff: M-1 (Each billing is processed by one staff and staff can process multiple billings)</p> <p>billing->staff (Total Participation) Every billing processed by staff</p> <p>staff->billing (Partial Participation) Not all staff involved in billing</p> |
| Booking Classes - (Group Sessions) Administrative Staff should be equipped with updating class schedules | Administrative staff can book group sessions through group sessions which tracks trainer, time slots, and room | <p><u>Entity: groupsessions, schedule, rooms.</u></p> <p>staff-groupsessions: 1:M (Admin can schedule multiple group sessions) * From staff, partial participation (not all admin need to schedule a session) * From groupsessions, total participation (needs to be schedule member)</p> <p>groupsessions-schedule: 1:1 (A group session corresponds to the available time slots set by trainer) * From groupsessions requires a time slot so Total Participation * From schedule, it can be empty so partial participation</p> <p>groupsessions-rooms: 1:1 (A group session held in one room)</p> |

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| | | * All groupsessions need a room (Total Participation) * From room, Not all room need to host a group session (Partial Participation) |
|--|--|---|

Trainer:

| Requirement | Assumption | Representation in ER Model |
|---|---|--|
| Schedule: Trainers should have the ability to manage their schedules | When trainer registers, as well as going into the schedule management, they have the ability to set their availability, which converts to 1-hr time slots in <i>schedule</i> table | Entity: schedule trainers - schedule: 1:M (Trainer can set multiple availability time slots) * Partial participation from trainer (trainers don't have to set availability) * Total participation from schedule (Time slot must have a trainer_id) |
| Personal Training and Group Sessions with Trainer | Although members book a personal sessions, it must be booked with a trainer. Similarly, a group session booked by an admin must be with a trainer | Entity: groupsessions, personalsessions trainers-personalsessions: 1:M (Trainer can have multiple personal sessions) trainers-groupsessions: 1:M (Trainer can have multiple group) From the personalsessions/groupsessions, it requires a trainer (Total participation) However, trainer don't necessary need a session booked, so partial participation |

In code

| Requirement | Assumption | Representation in Code |
|---|---|---|
| Maintaining MemberShip Status: | When a member logs in, the system checks membership status to ensure that staff has processed the bill before the due date. | It checks by referring to the attributes due_date and paid in the billing tables If paid is set to false and the due date is past the current date, they are not allowed in |
| Admin Staff processing billing/payment | When admin processes the bill, the attributes in billing due_date and paid gets changed | When admin processes a bill for example, for the month of April, the attribute paid gets updated to true, and the due_date originally for May 1st gets updated to the next month (June 1st). |
| Dashboard Display (Displaying exercise routines, fitness achievements, health statistics) | Display not only the requirement but also display personal information | When user wants to see the dashboard display it shows: email, password, first name, last name, exercise routines, fitness achievements and health statistics |
| Scheduling personal training sessions or group fitness classes. | Each personal session and group fitness class is an hour each | We break up the trainer's availability in one hour blocks and members can join an established fitness class or create a personal session with a specific trainer based on a date and trainer's availability |
| Member Profile Viewing (Search by Member's name) | Display all the members information and you must search by member's first name and last name | When searching you must enter the member's first and last name and it is case sensitive and it displays email, first name, last name, exercise routines, fitness achievements and health statistics |
| Class Schedule Updating | We assume staff can only create a new group session class and you can only update it by the date and you can choose which trainer/time based off of the new date. You can also change the session type and room location. | When entering a new date for the class, you will see all the available trainer's and their times available. When changing the room location, it also updates the room table as the room table showcases not only other events but shows group sessions. |
| Room Booking Management | Staff can only delete or create a new room booking and if they want to create a new group session with a room it takes them to class schedule updating | If staff delete a room booking and it is being used a group session, the group session also gets deleted. |

2.1 Conceptual Design – ER Diagram

<https://github.com/Shirly8/COMP3005ProjectV2/blob/main/Diagrams/ER%20diagram.png>

2.2 Reduction to Relation Schemas

<https://github.com/Shirly8/COMP3005ProjectV2/blob/main/Diagrams/Relation%20Schema.png>

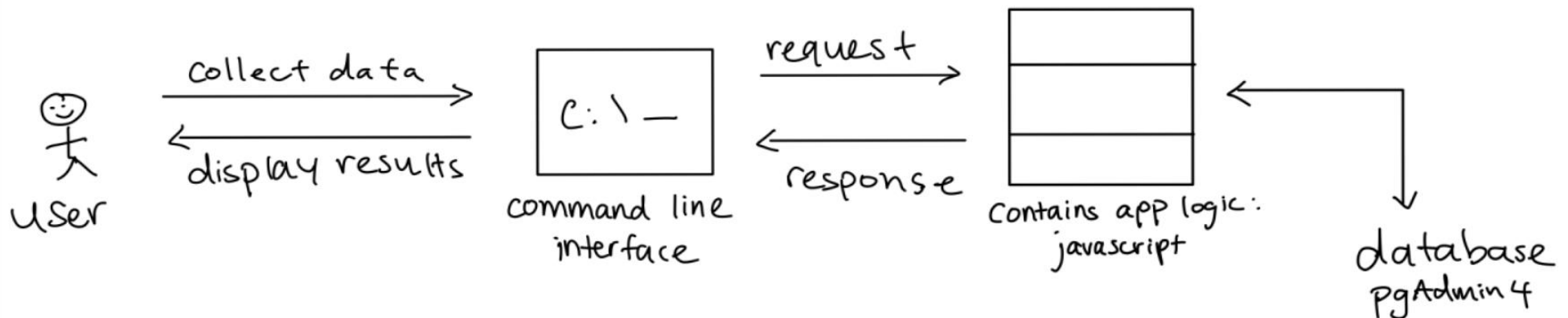
2.3 DDL file

<https://github.com/Shirly8/COMP3005ProjectV2/blob/main/SQL/DDl.sql>

2.4 DML file

<https://github.com/Shirly8/COMP3005ProjectV2/blob/main/SQL/DML.sql>

2.5 Implementation



The application uses a command line interface which interacts with the user and it is coded with javascript Node.js. It uses pgAdmin4 as its database to store all the tables in the relational schema.

2.6 Bonus Feature

Bonus Feature: Prorated amount for the first Month. It is calculated based on the number of days remaining in the month. For example, if a member joins on April 10th, amount is \$40 instead of the \$60

Membership status is also checked when members login. If they have not paid their monthly bills (Not processed), they aren't allowed into the membership menu

2.7 GitHub Repository

<https://github.com/Shirly8/COMP3005ProjectV2>