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### Term Project Report

We created a database for collection, management and access information for a Health and Fitness Club. We have created tables for all of the members, trainers and administrative staff, along with other important information such as the rooms in this club, equipment in each room, schedules, workshops, membership option available and other information they are key in running this club.

#### ER Diagram:

For our ER diagram, we tried to incorporate all of the aspects that go into running a Health and Fitness Club. For our ER diagram, here is the detailed explanation and the assumptions we made for this model:

1) Members have the option to opt for individual or group sessions (classes), and workout plans. Some of the availability of these options will depend upon the member's membership type. We are assuming that the application that adds these members, will add the member information without any errors into the database, and assuming that all members must have a membership.

2) The administrative staff are incharge of managing the members, trainers, classes and workout plans. We are assuming that the staff manage the members and other related entities, we just didn't include that in our project. We are also assuming that transactions made by the members are handled in a safe and secure way.

3) Trainers have the option to individually train, have group sessions, or host workout plans. And, all trainers must be managed by at least one administrative staff.

4) All members have a schedule for whenever they want to do a 1 on 1 session. We are assuming that the group sessions and the workout plans have their own schedule and/or timings as we did not include them.

5) For the Rooms and the equipment in them, here we are assuming that the non-activity rooms will be managed in a different way as those won't have equipment that need regular maintenance.

Normalization:

No further decomposition was needed as each table was designed to avoid redundancy and maintain a normalized form (2NF and 3NF), functional and transitive dependencies for each table are as follows:

1. Members Table:

- Functional dependencies: member\_id -> {f\_name, l\_name, DOB, statistics, email, fitness-achievements, password, payment\_dates, loyalty\_points, billing\_info, membership\_id}
- No transitive dependencies

2. Membership Table:

- Functional dependencies: membership\_id -> {name, price}
- No transitive dependencies

3. Administrative\_staff Table

- Functional dependencies: staff\_id -> {f\_name, l\_name}
- No transitive dependencies

4. Room Table

- Functional dependencies: None
- No transitive dependencies

5. Equipment Table

- Functional dependencies: equipment\_id -> {room\_number, maintenance\_needed, maintenance\_date}
- No transitive dependencies

6. Trainer Table

- Functional dependencies:  $\text{trainer\_id} \rightarrow \{\text{f\_name}, \text{l\_name}\}$
- No transitive dependencies

#### 7. Classes Table

- Functional dependencies:  $\text{session\_id} \rightarrow \{\text{session\_date}, \text{session\_time}\}$
- No transitive dependencies

#### 8. Workout\_plan table

- Functional dependencies:  $\text{plan\_id} \rightarrow \{\text{price}, \text{plan\_instructor}\}$
- No transitive dependencies

#### 9. Schedule Table

- Functional dependencies:  $\text{schedule\_id} \rightarrow \{\text{trainer\_id}, \text{member\_id}, \text{schedule date}, \text{type}\}$
- No transitive dependencies

#### 10. Attend Table

- Functional dependencies: none
- No transitive dependencies

#### 11. Individually\_trains table

- Functional dependencies: none
- No transitive dependencies

#### 12. Instructs Table

- Functional dependencies: none
- No transitive dependencies

#### 13. Manage Table

- Functional dependencies: none

- No transitive dependencies

#### 14. Supervises Table

- Functional dependencies: none
- No transitive dependencies

#### 15. Handles Table

- Functional dependencies: none
- No transitive dependencies

#### 16. Member\_schedules Table

- Functional dependencies: none
- No transitive dependencies

#### 17. Trainer\_schedules Table

- Functional dependencies: none
- No transitive dependencies

#### 18. Member\_workoutplan Table

- Functional dependencies: none
- No transitive dependencies

#### 19. Provided\_by Table

- Functional dependencies: none
- No transitive dependencies

#### 20. Oversees\_Table

- Functional dependencies: none
- No transitive dependencies