Project 2: Health and Fitness Club Management System

COMP 3005

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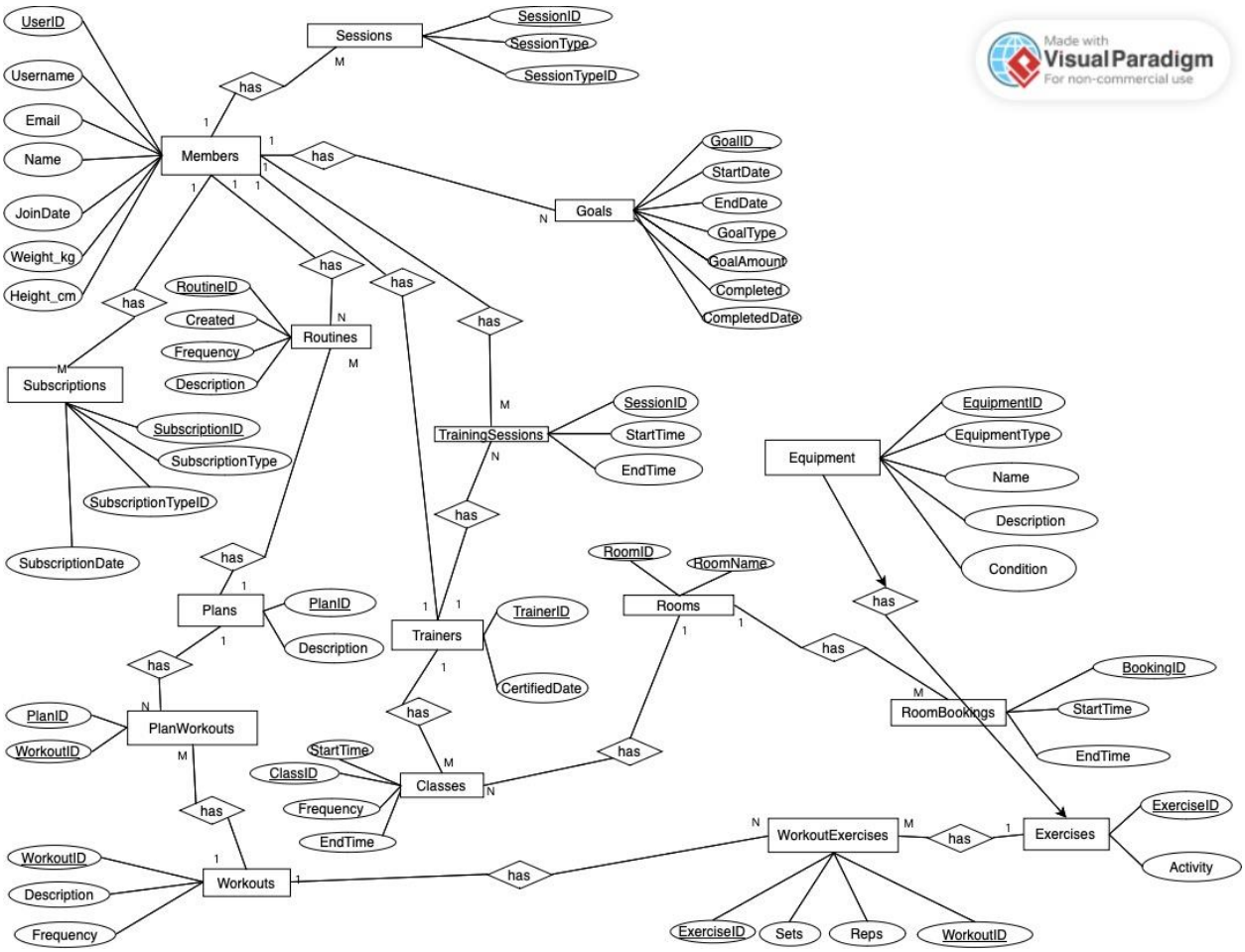
2.1 Conceptual Design (ER Diagram in Chen Notation)

We've developed an ER diagram to show the relationships and entities related to the club's operations. The most important part of our design is the **Members** entity, which holds member-specific details and connects to various aspects of the club, such as workout **Sessions**, personal **Goals**, and **Routines**. We've also incorporated **Subscriptions** to track membership plans and tied **Members** to **Plans** for personalized workout strategies. **Trainers** have their dedicated entity, reflecting their availability and qualifications, and they're linked to the **TrainingSessions** they conduct. We've also added **Classes**, **Workouts**, and **Exercises** to cover group activities, individual workout components, and specific exercises, respectively. The **Equipment** and **Rooms** entities ensure that the physical resources of the club are managed properly, with **RoomBookings** handling the reservations. By connecting these entities, our ER diagram aims to present an organized and efficient database schema that represents the functionalities expected of the club's management system.



2.2 Reduction to Relation Schemas

Our relational schema diagram directly translates the entities and relationships from the ER diagram into tables and keys, reflecting how our database will be structured. Each entity from the ER diagram becomes a table, such as **Members**, **Trainers**, **Classes**, and **Equipment**, with attributes. The relationships in the ER diagram are shown as foreign keys in our tables. For example, the **Members** to **Goals** one-to-many relationship in the ER diagram becomes a foreign key reference from **Goals** to **Members** in the relational schema. Foreign keys are also italicized, and primary keys are underlined for each entity.