# Group Training Scheduling System
# for
# Gymnasium
## (Part 1)

## CS 4347.006
## (Database Systems)

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# Group Training Classes in a Gym

We are developing a scheduling system for a gymnasium. The scope of this example includes gym members, instructors, and the group training facilities. Out of the scope is accounting, HR, inventory, facility management , and areas or functions of the Gym not related to group training.

**Business Rules**

1. Each member of the gymnasium must have a name, address, email, phone number, membership ID, and a number of class credits along with their expiry dates. A member may have a medical condition and associated waiver from a doctor. A member may sign up for a particular class, or a package of classes at a discounted rate.

2. Each gym class will have a time, room, members signed up, instructor, class number, class type, and standard number of credits required to attend the class or discounted number of credits to attend the class as part of a class package

3. The number of member credits may be an actual number, or the the member may be on an unlimited plan that terminates at the end of the month or year.

4. A class may have a minimum required attendees, in which case below required signup will result in class cancellation.

5. Attending each class deducts required number of credits from member's account, unless the member has unlimited credits and is using it prior to expiration date.

6. Each Instructor will have a name, address, email, phone, instructor ID,, and a list of certifications (i.e. credentials)

7. For an instructor to teach a class of a certain type, they must have a corresponding certification.

8. The Gym has multiple group exercise rooms. Each room  has a maximum capacity, room ID, and a list of class types that the room can be used for. Each room also has a schedule. The schedule coordinates classes with trainers and members.

9.  Instructors may also give personal training sessions, which do not require a room but do require a certification in personal training, member, and time.

10. Instructors may also offer some promotional classes each year, as part of marketing effort, as part of a health-fair seminar that would be open to public - i.e. membership is not required.

**Assumptions**

The Gym is expected to have at most 7 full-time trainers, 4 studio rooms, and up to 6 classes per day per room.
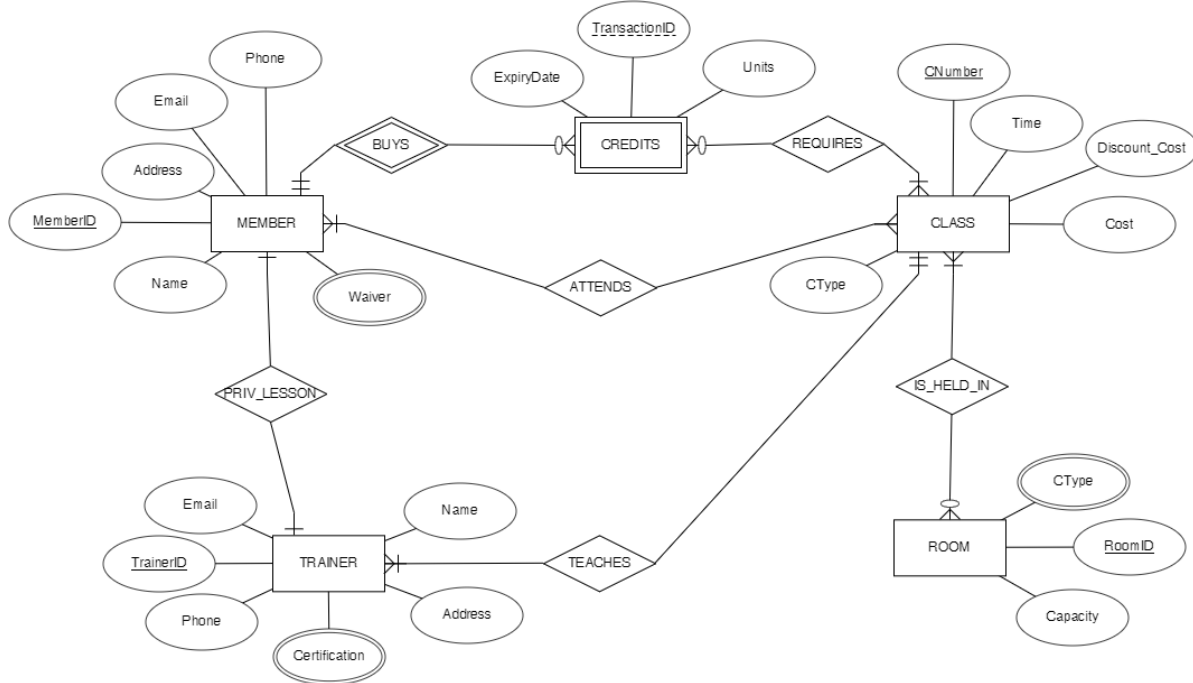
A room can accommodate up to 20 members during a class session.

We estimate conducting up to 6,000 classes in a given year, serving up to 5,000 members annually.

**Provided Functionality**

-   A web portal for members to view their membership status, available classes and how many members have signed up in each for a given day, ability to sign up for a class, ability to view weekly class schedule, and ability to display and print their own weekly schedule.

-   A web portal for instructors to view room availability, schedule a class, cancel a class, and display/print their weekly or monthly training schedule.

-   A dashboard that summarizes group training related key measures for a given period of time.
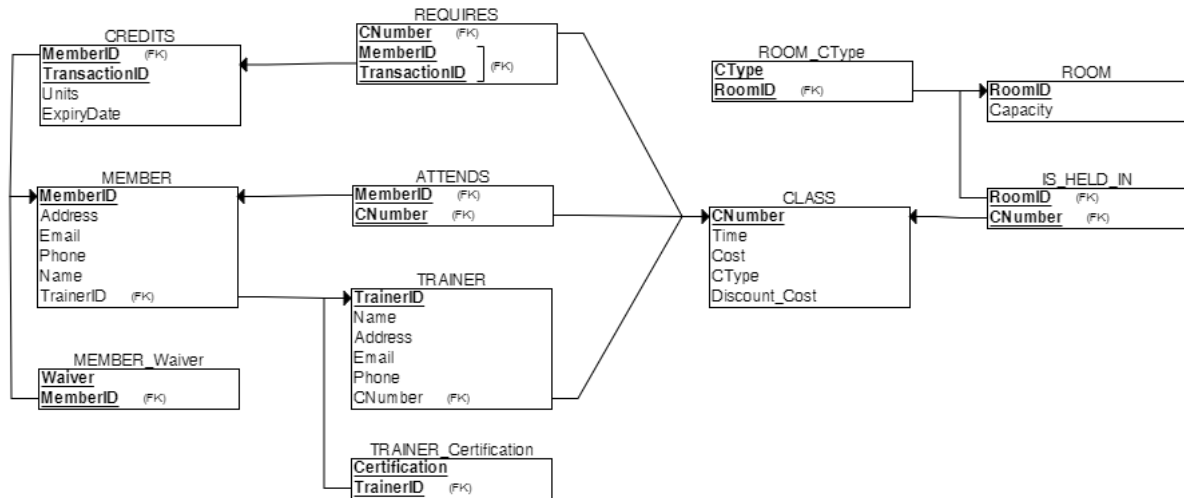
## ER Diagram



## Data Dictionary

| Entity Type | Description | Keys | Relationships | Attributes |
|---|---|---|---|---|
| MEMBER | A person enrolled in private lessons at a gym. | MemberID | PRIV_LESSON, BUYS, ATTENDS | MemberID, Name, Waiver, Address, Email, Phone |
| TRAINER | An instructor that may be teaching at least one class at a gym. | TrainerID | PRIV_LESSON, TEACHES | TrainerID, Email, Phone, Certification, Address, Name |
| ROOM | A room in the gym that is made to support a specific type of class. | RoomID | IS_HELD_IN | RoomID, CType, Capacity |
| CLASS | A gym class taught by one instructor, with at least one student enrolled. | CNumber | ATTENDS, TEACHES, IS_HELD_IN | CNumber, Time, Discount_Cost, Cost, CType |
| CREDITS | A unit of currency, bought by real currency, used in a gym to be able to sign up for classes. | TransactionID | BUYS, REQUIRES | TransactionID, ExpiryDate, Units |

## Schema Diagram



## Data Dictionary for Schema

| Table | Column | Data Type | PK | FK | Description |
|---|---|---|---|---|---|
| CREDITS | MemberID | smallint | T | T | Foreign key and part of CREDITS SuperKey to identify CREDITS of MEMBER |
| | TransactionID | int | T | | Unique number to identify individual CREDIT purchase transactions |
| | Units | smallint | | | Represents CREDITS belonging to MEMBER. Negative = unlimited CREDITS |
| | ExpiryDate | date | | | Represents the date at which the CREDITS become void |
| REQUIRES | CNumber | int | T | T | Foreign key and part of SuperKey for CLASS requiring CREDITS |
| | MemberID | smallint | T | T | Foreign key and part of SuperKey for MEMBER having CREDITS |
| | TransactionID | int | T | T | Foreign key and part of SuperKey for available CREDITS |
| MEMBER | MemberID | smallint | T | | Primary Key - is a unique number used to identify MEMBER |
| | Address | tinytext | | | MEMBER's mailing address |
| | Email | varchar | | | MEMBER's email address |
| | Phone | varchar | | | MEMBER's phone number |
| | Name | varchar | | | MEMBER's name |
| | TrainerID | tinyint | | T | Foreign Key for MEMBERs taking private lesson from a TRAINER |
| ATTENDS | MemberID | smallint | T | T | Foreign key and part of SuperKey for MEMBER attending a CLASS |
| | CNumber | int | T | T | Foreign key and part of SuperKey for CLASS a MEMBER signed up |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | for |
| MEMBER_Waiver | Waiver | BLOB | T | | Part of SuperKey to identify medical limitation and doctor's note for a MEMBER |
| | MemberID | smallint | T | T | Part of SuperKey to uniquily identify MEMBER with limitation and Waiver on file |
| TRAINER | TrainerID | tinyint | T | | Primary Key to uniquily identify each TRAINER |
| | Name | varchar | | | TRAINER's name |
| | Address | tinytext | | | TRAINER's mailing address |
| | Email | varchar | | | TRAINER's email address |
| | Phone | varchar | | | TRAINER's phone number |
| | CNumber | int | | T | Foreign Key to associate which CLASS(es) a TRAINER is assigned to teach |
| TRAINER_Certification | Certification | ENUM | T | | Part of SuperKey to record what kind of Certifications a TRAINER has on file |
| | TrainerID | tinyint | T | T | Foreign Key and Part of SuperKey for TRAINER with these Certification credentials |
| ROOM_CType | CType | ENUM | T | | Part of SuperKey to outline the type of CLASSes a ROOM is suited for |
| | RoomID | tinyint | T | T | Foreign Key and part of SuperKey to associate ROOM suited for CType CLASSes |
| ROOM | RoomID | tinyint | T | | Uniquily identifies each training ROOM in the gym |
| | Capacity | tinyint | | | Represents the maximum number of MEMBERs a ROOM can accommodate |
| CLASS | CNumber | int | T | | Primary Key to uniquely identify each CLASS offered by the gym |
| | Time | datetime | | | Represents day/time a CLASS is scheduled for |
| | Cost | tinyint | | | Represents number of CREDITS Units required to take the CLASS |
| | CType | ENUM | | | Identifies the CType of the CLASS to help match it with appropriate ROOM |
| | Discount_Cost | tinyint | | | Represents number of CREDITS Units required for MEMBERs who bought a package |
| IS_HELD_IN | RoomID | tinyint | | T | Part of SuperKey to record the ROOM a CLASS will be held in |
| | CNumber | int | | T | Part of SuperKey to associate a CLASS to a ROOM it will be held in |

**Tool Used for ER and Schema Diagrams**
Used ERDPlus found at: https://erdplus.com