

## Final Project: A Database for a Local Climbing Gym

### Step 1: Background Story of the Business

**Business Overview:** The business chosen for this project is a local climbing gym called "Rocky Top Climbing Gym." Rocky Top is a community-focused indoor climbing facility offering various climbing walls, bouldering areas, and training classes. The gym caters to climbers of all skill levels, from beginners to advanced. It also hosts climbing competitions, workshops, and social events.

**Business Needs:** Rocky Top needs a relational database to manage member information, track class registrations, monitor equipment rentals, and organize events. The database will help streamline operations, provide insights into membership trends, and enhance member engagement by personalizing class recommendations and managing event registrations efficiently.

### Step 2: Assumptions and ER Model

#### Assumptions:

1. **Members** have attributes like MemberID, name, contact information, membership type, and expiration date.
2. **Classes** have attributes like ClassID, name, date, time, and instructor.
3. **ClassRegistrations** for classes have attributes like RegistrationID, MemberID, and ClassID.
4. **Equipment Rentals** have attributes like RentalID, MemberID, equipment type, rental date, and return date.
5. **Events** have attributes like EventID, event name, date, time, and description.

#### ER Model:

##### Entities:

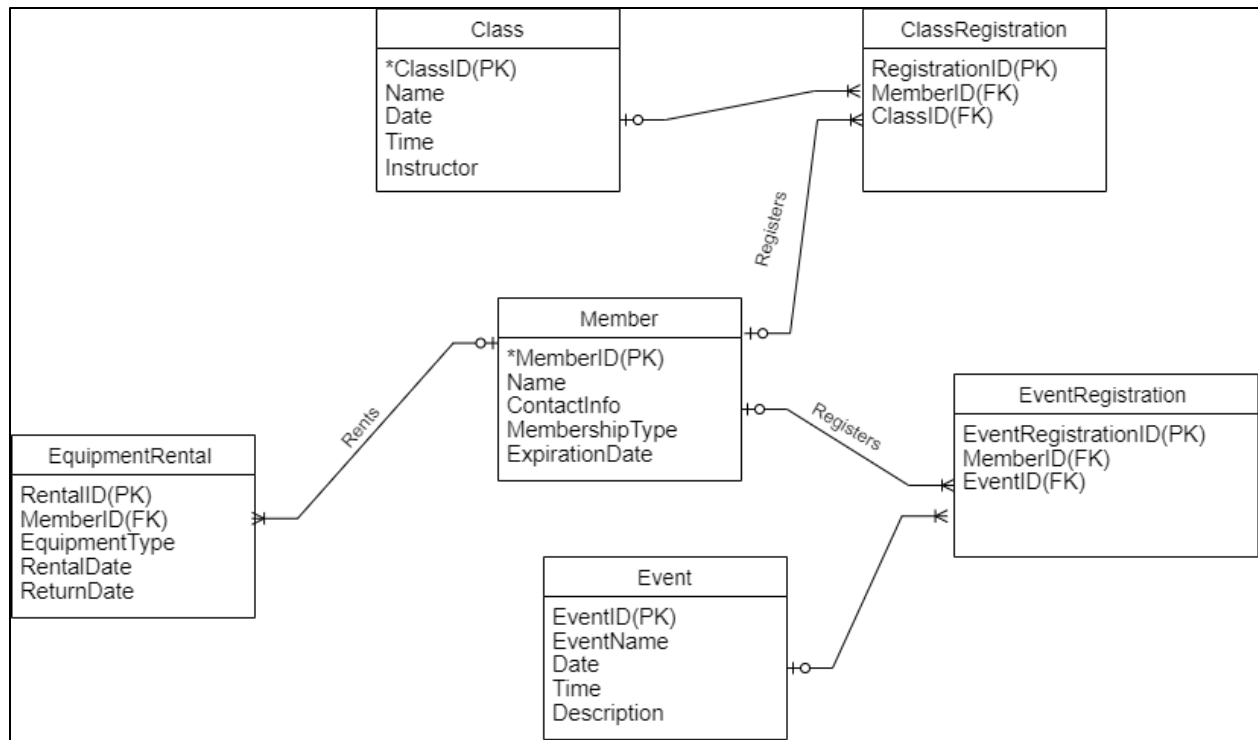
1. **Member** (MemberID, Name, ContactInfo, MembershipType, ExpirationDate)
2. **Class** (ClassID, Name, Date, Time, Instructor)
3. **ClassRegistration** (RegistrationID, MemberID, ClassID)
4. **EquipmentRental** (RentalID, MemberID, EquipmentType, RentalDate, ReturnDate)
5. **Event** (EventID, EventName, Date, Time, Description)

##### Relationships:

1. **Member** - registers for - **Class** (Many-to-Many through **ClassRegistration**)
2. **Member** - rents - **Equipment** (One-to-Many through **EquipmentRental**)
3. **Member** - attends - **Event** (Many-to-Many through **EventRegistration**)

### Step 3: ERD

#### ERD Diagram:



#### Step 4: Relational Model

1. **Member** (MemberID, Name, ContactInfo, MembershipType, ExpirationDate)
2. **Class** (ClassID, Name, Date, Time, Instructor)
3. **ClassRegistration** (RegistrationID, MemberID, ClassID)
4. **EquipmentRental** (RentalID, MemberID, EquipmentType, RentalDate, ReturnDate)
5. **Event** (EventID, EventName, Date, Time, Description)
6. **EventRegistration** (EventRegistrationID, MemberID, EventID)

#### Step 5: Normalization to 3NF

1. **Member** is already in 3NF as all attributes are atomic and fully dependent on the primary key.
2. **Class** is in 3NF as all attributes are atomic and fully dependent on the primary key.
3. **ClassRegistration** is in 3NF as all attributes are atomic and fully dependent on the primary key.
4. **EquipmentRental** is in 3NF as all attributes are atomic and fully dependent on the primary key.
5. **Event** is in 3NF as all attributes are atomic and fully dependent on the primary key.

6. **EventRegistration** is in 3NF as all attributes are atomic and fully dependent on the primary key.

### **Step 6: Final Model**

#### **Finalized Relational Model in 3NF:**

1. **Member** (MemberID, Name, ContactInfo, MembershipType, ExpirationDate)
2. **Class** (ClassID, Name, Date, Time, Instructor)
3. **ClassRegistration** (RegistrationID, MemberID, ClassID)
4. **EquipmentRental** (RentalID, MemberID, EquipmentType, RentalDate, ReturnDate)
5. **Event** (EventID, EventName, Date, Time, Description)
6. **EventRegistration** (EventRegistrationID, MemberID, EventID)