

The database schema is in **Third Normal Form (3NF)** because:

1. All attributes are atomic and each table has a primary key (1NF).
2. No table uses a composite primary key, so no partial dependencies exist (2NF).
3. No non-key attribute depends on another non-key attribute; all fields depend solely on their table's primary key (3NF).

Assumptions:

1. Capacity does not depend on the room, is session-dependent
2. weightGoal can change per updated health metric

Additional Notes:

- Fields marked @id are primary keys.
- Fields marked @unique ensure no duplicate entries where appropriate (e.g. email).
- Indexes (@@index) are used on foreign keys and timestamped metrics to optimize queries such as "all sessions for a trainer, filtered by date if wanted"



The conceptual **ER model** of the Health and Fitness Management System was translated into relational tables using Prisma ORM. Each entity in the ERD corresponds to a Prisma model, with attributes represented as fields. Relationships from the ERD are implemented using Prisma's syntax, which creates foreign key constraints in the database.

The entity's name in the ERD (e.g. Member) is the same in the Prisma model (found in the schema.prisma file).

Relationships Mapping

- **One-to-many (1:N):** Implemented using @relation fields. For example, a Trainer had many Sessions (sessions: Session[]), and each Session references one trainer (trainer: Trainer @relation(fields: [trainerId], references: [id])).
- **Many-to-many (M:N) via join table:** Member enrollments in sessions are modeled through the Booking table, which serves as a join table with a unique constraint to prevent duplicates (@@unique([memberId, sessionId])).