

GYM'S MANAGEMENT SYSTEM

Course: Data Base and Information Systems

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Specification

FitActive's Gym is a state-of-the-art fitness facility that caters to a wide range of fitness enthusiasts. Each member receives personalized attention from a dedicated trainer who customizes exercise routines to fit individual needs. The gym boasts modern equipment and offers a variety of subscription packages that include different exercise combinations to meet diverse fitness goals. Within these packages, customized exercise routines, identified by a RoutineID, are tailored to fit individual member needs and include specific exercises, sets, and repetitions. Trainers are responsible for customizing these routines for each member. Members can subscribe to these packages based on their fitness needs and goals.

MemberID uniquely identifies each member. They can enroll through the official website and enjoy comprehensive support and guidance throughout their fitness journey. The gym maintains meticulous records of each member's progress and payments to ensure a personalized and effective fitness program.

In addition to fitness services, FitActive's Gym provides an opportunity for members to participate in team sports. Each team comprises members and is led by a trainer who must possess a federation license to participate in championships. Team trainers can coach a maximum of 3 teams to ensure a diverse training environment.

FitActive's Gym prides itself on offering a seamless member experience. This includes easy enrollment, and comprehensive fitness regimens combining strength training, cardio, flexibility exercises, and more, all under the guidance of experienced professionals. FitActive's Gym also provides an opportunity for members to purchase official gym merchandise, ensuring they have the gear to enhance their workout experience.

By integrating top-tier fitness facilities, professional trainers, diverse subscription packages, and a customer-centric approach, FitActive's Gym aims to provide an unparalleled fitness experience.

Requirements:

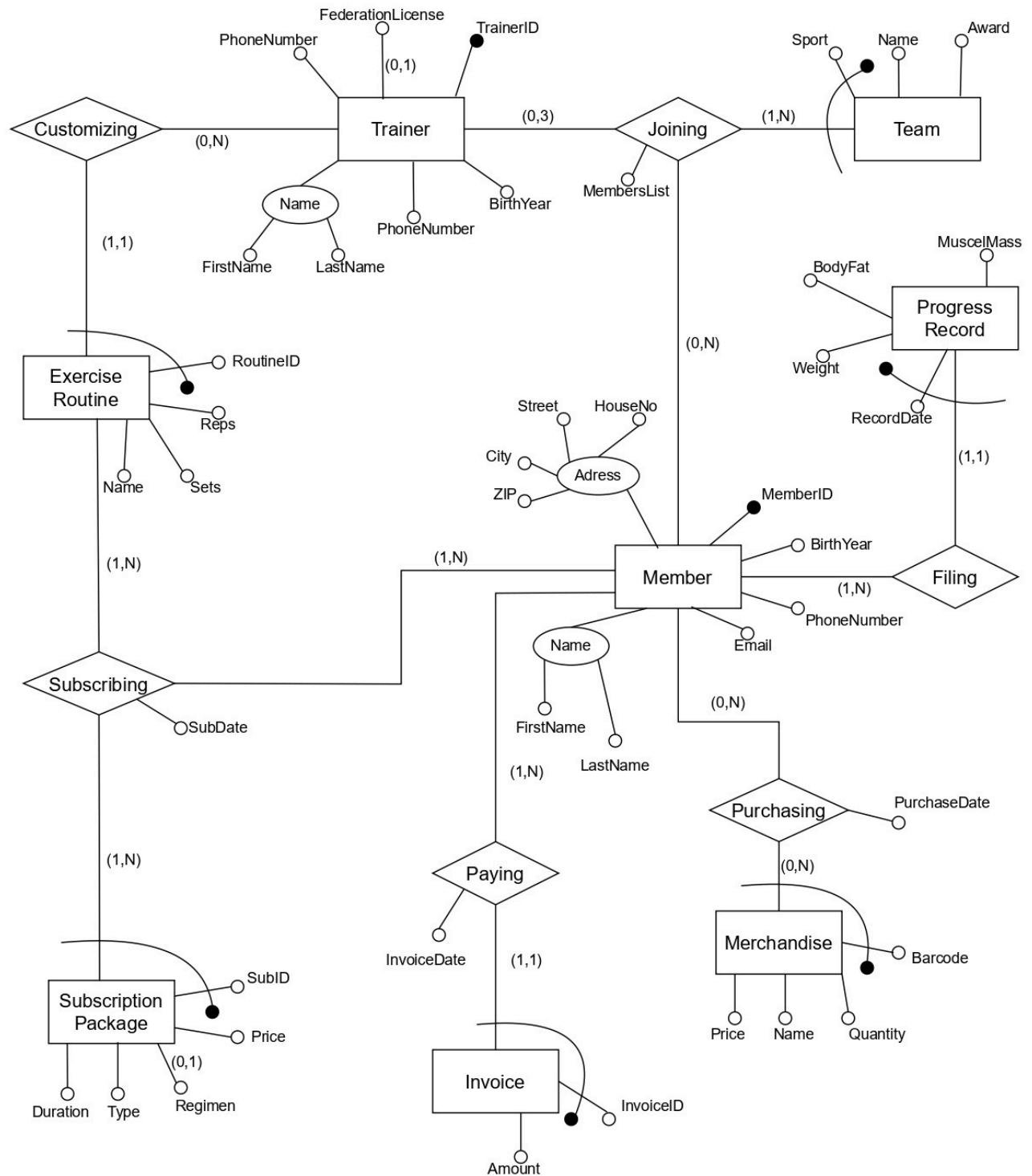
1. Model the database using the Entity-Relationship (E/R) conceptual methodology.
2. Translate the result of the conceptual design into a relational logical model.
3. Write SQL queries that allow:
 - a. Listing all the members assigned to a specific trainer.
 - b. Finding all members participating in a specific team.
 - c. Counting the number of teams each trainer is coaching
 - d. Listing all invoices of the payments made by a specific member.

Glossary of Terms

Term	Description	synonyms	links
Member	A person who has joined FitActive's Gym and uses its services.	Individual	Team, Subscription Package, Exercise Routine, Trainer, Invoice, Merchandise, Progress Record
Trainer	A fitness professional who helps members with their workouts and leads teams.		Team, Exercise Routine, Member
SubscriptionPackage	A membership plan that includes a selection of exercise routines and other gym services, available for a specific duration at a certain price.		Member, Exercise Routine
ExerciseRoutine	A set of exercises tailored to meet specific fitness goals, often customized by trainers.		Trainer, Member, Subscription Package
Team	A group of members who play sports together, led by a trainer.		Trainer, Member
Merchandise	Gym products that members can buy, like clothes and accessories.		Member

Progress Record	A log maintained by members to track their fitness progress, including metrics like body fat, weight, and muscle mass.		Member
Invoice	A financial transaction made by a member for subscribing to packages or purchasing merchandise.		Member

Entity-Relationship Schema



Data Dictionary

Entity	Description	Attributes	Identifier
Member	An individual who subscribes to the gym's services and participates in exercise routines and teams.	MemberID, BirthYear, FirstName, LastName, Email, PhoneNumber, City, Street, House NO, Zip	<u>MemberID</u>
Trainer	A fitness professional responsible for customizing exercise routines and leading fitness teams.	TrainerID, FederationLicense, PhoneNumber, FirstName, LastName, BirthYear	<u>TrainerID</u>
subscription package	A membership plan that includes a selection of exercise routines and other gym services, available for a specific duration at a certain price.	SubID, Type, Duration, Price, Regimen	<u>SubID</u> , <u>RoutineID</u> , <u>MemberID</u> , <u>TrainerID</u>
ExerciseRoutine	A set of exercises tailored to meet specific fitness goals, often customized by trainers.	RoutineID, Name, Sets, Reps	<u>RoutineID</u> , <u>TrainerID</u>
Team	A group of members led by a trainer, often participating in collective fitness activities and competitions	Sport, Name, Award	<u>Sport</u> , <u>TrainerID</u> , <u>MemberID</u>
Merchandise	Items sold at the gym, such as fitness apparel and equipment.	Barcode, Name, Price, Quantity	<u>Barcode</u> , <u>MemberID</u>

Invoice	A financial transaction made by a member for subscribing to packages or purchasing merchandise.	InvoiceID, InvoiceDate, Amount	<u>InvoiceID, MemberID, InvoiceDate</u>
ProgressRecord	A log maintained by members to track their fitness progress, including metrics like body fat, weight, and muscle mass.	RecordDate, BodyFat, Weight, MuscleMass	<u>RecordDate, MemberID</u>

Relation	Description	Entities involved	Attributes
Customizing	Associate a Trainer with an exercise routine for customization	Trainer (0,N) Exercise Routine(1,1)	
Joining	Associate Team with trainer and member	Team (1,N) Trainer(0,3) Member(0,N)	Sport,TrainerID,MemberID,MemberList
Subscribing	Associate Member with subscription package and Exercise Routine.	Subscription package(1,N) Member(1,N) Exercise Routine(1,N)	SubDate, SubID,MemberID,RoutineID,TrainerID
Paying	Associate Member with Invoice.	Invoice(1,1) Member(1,N)	InvoiceDate
Purchasing	Associate Member with merchandise.	Merchandise(0,N) Member(0,N)	PurchaseDate,MemberID,Barcode,
Filing	Associate progress record with the member.	ProgressRecord(1,1) Member(1,N)	

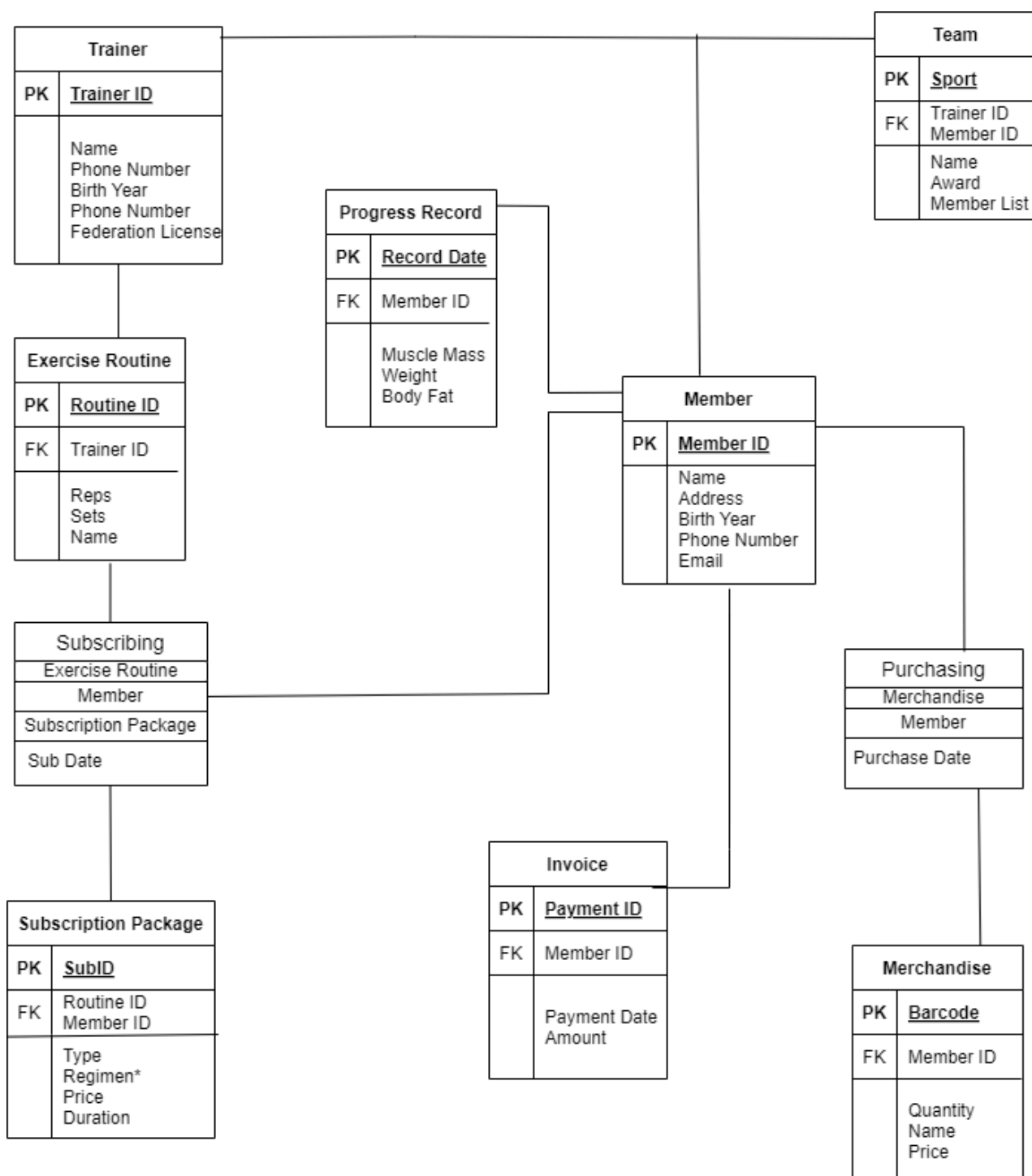
Business Rules

1. Each team must be led by a certified trainer with a federation license.
2. Members must register for a specific team to count as the participant of that team.
3. FitActive's Gym must maintain sessional detailed progress records for each member, including weight, body fat percentages, and measurements.

4. A trainer may coach a maximum of 3 teams.

5. Members must request for the regimen to be contained in the subscription package.

Relational Model



SQL Queries

1.Listing all the members assigned to a specific trainer.

```
SELECT m.MemberID, m.Name AS MemberName,  
       t.Name AS TrainerName  
FROM Member m  
INNER JOIN SubscriptionPackage sp ON sp.MemberID = m.MemberID  
INNER JOIN EerciseRoutine er ON er.RoutineID = sp.RoutineID  
INNER JOIN Trainer t ON t.TrainerID = er.TrainerID;
```

2.Finding all members participating in a specific team.

```
SELECT  
       t.MemberID,  
       m.Name AS MemberName  
FROM  
       Team t  
INNER JOIN  
       Member m ON t.MemberID = m.MemberID  
WHERE  
       t.TrainerID = 'KM1323'  
       AND t.Sport = 'Basketball';
```

3.Counting the number of teams each trainer is coaching

```
SELECT t.TrainerID,  
       t.Name AS TrainerName,  
       COUNT(tm.Sport) AS NumberOfTeams  
FROM  
       Trainer t
```

LEFT JOIN

Team tm ON t.TrainerID = tm.TrainerID

GROUP BY

t.TrainerID, t.Name

HAVING

COUNT(tm.TeamID) <= 3;

4.Listing all invoices of the payments made by a specific member

SELECT py.PaymentID, py.MemberID, py.PaymentDate, py.Amount

FROM Invoice py

WHERE py.MemberID = 'BA1212';