

1. Abstract

I am designing a database system to support fitness tracking and workout management for individual users and personal trainers. The system will store information about users, workouts, exercises, equipment used, progress logs, and fitness goals. Users will be able to log details of their workouts, track performance over time, and view suggested plans or progress summaries. Trainers may access shared data to monitor their clients and adjust plans accordingly. The database will be used to organize structured workout data and support meaningful analysis and tracking.

2. Business Rules

- Each user can log multiple workouts, but each workout is associated with exactly one user.
- Each workout consists of multiple workoutExercise records to maintain exercise order.
- Each workoutExercise entry can be linked to multiple exercise details via workoutExerciseDetail.
- Each workoutExerciseDetail entry must be associated with exactly one workoutExercise and exactly one exercise.
- Each exercise can be linked to multiple equipment items, but each record in exerciseEquipment links to exactly one exercise and one equipment item.
- Each equipment item can be linked to multiple exercises, but each record in exerciseEquipment links to exactly one equipment item.
- Each progress entry must be associated with exactly one workoutExerciseDetail (i.e., specific exercise in a workout).
- Each user can set multiple goals, but each goal is linked to exactly one user.

3. Queries

- What exercises did a user perform during a specific workout session?
- What is the total number of calories burned by a user over the last 30 days?
- Which equipment is used most frequently in logged exercises?
- How has a user progressed in weight lifted for a specific exercise over time?
- What are the names and dates of workouts that include exercises targeting a specific muscle group?

4. Tables

user (**userId**, firstName, lastName, email, birthDate, gender, heightCm, weightKg)

workout (**workoutId**, *userId, workoutDate, durationMinutes, workoutType, notes)

exercise (**exercisId**, name, muscleGroup, difficultyLevel, isBodyweight)

workoutExercise (**workoutExercisId**, *workoutId, sequenceOrder)

workoutExerciseDetail (**workoutExerciseDetailId**, *workoutExercisId, *exercisId, sets, reps, weightUsed, restSeconds)

equipment (**equipmentId**, name, description, category)

exerciseEquipment (**exerciseEquipmentId**, *exercisId, *equipmentId)

progressEntry (**progressId**, *workoutExerciseDetailId, weightLifted, repsCompleted, caloriesBurned, moodRating, perceivedExertion, notes)

goal (**goalId**, *userId, goalDescription, targetDate, isAchieved, goalType)

user

userId	firstName	lastName	email	birthDate	gender	heightCm	weightKg
1	Jordan	Smith	jordan.s@example.com	1995-03-12	M	180	75
2	Riley	Johnson	riley.j@example.com	1990-07-25	F	165	60
3	Casey	Lee	cllee@fitmail.com	1988-11-02	M	175	82
4	Avery	Chen	achen@trainer.net	1992-04-14	F	170	68
5	Taylor	Brooks	tb@wellness.org	1998-09-30	NB	168	70

workout

workoutId	*userId	workoutDate	durationMinutes	workoutType	notes
1	1	2025-08-01	45	strength	Chest day: push-ups, bench variations
2	2	2025-08-02	30	cardio	Indoor cycling: steady pace
3	3	2025-08-03	60	strength	Leg focus: squats, lunges
4	4	2025-08-04	50	full body	Trainer-led mixed circuit

5	5	2025-08-05	40	HIIT	Short high-intensity bursts
6	1	2025-08-08	55	strength	Back & posterior chain
7	2	2025-08-09	40	strength	Upper body push
8	3	2025-08-10	60	strength	Pull day
9	4	2025-08-11	35	cardio	Tempo intervals
10	5	2025-08-12	65	strength	Leg emphasis

exercise

<u>exerciseld</u>	name	muscleGroup	difficultyLevel	isBodyweight
1	Push-Up	Chest	Medium	TRUE
2	Barbell Squat	Legs	Hard	FALSE
3	Jumping Jacks	Full Body	Easy	TRUE
4	Deadlift	Back	Hard	FALSE
5	Mountain Climbing	Core	Medium	TRUE

workoutExercise

<u>workoutExerciseld</u>	*workoutId	sequenceOrder
1	1	1
2	2	1
3	3	1
4	4	1
5	5	1
8	6	1
9	6	2
10	7	1
11	7	2

12	8	1
13	8	2
14	9	1
15	9	2
16	10	1
17	10	2

workoutExerciseDetail

<u>workoutExerciseDetailId</u>	*workoutExerciseId	*exerciseId	sets	reps	weightUsed	restSeconds
1	1	1	3	12	0	60
2	2	3	4	8	100	90
3	3	2	5	5	120	90
4	4	4	2	25	0	30
5	5	5	3	20	0	20
6	8	4	4	6	110	120
7	9	2	4	5	120	150
8	10	1	4	12	25	60
9	11	4	3	5	85	120
10	12	2	5	5	105	120
11	13	1	3	20	0	45
12	14	3	4	30	0	30
13	15	5	4	40	0	30
14	16	2	5	5	110	110
15	17	4	4	5	120	150

equipment

<u>equipmentId</u>	name	description	category
1	Barbell	Standard Olympic barbell	free weight
2	Kettlebell	12kg kettlebell	free weight
3	Yoga Mat	Non-slip surface mat	accessory
4	Stationary Bike	Indoor cycling machine	cardio
5	Pull-up Bar	Wall-mounted bar	bodyweight

exerciseEquipment

<u>exerciseEquipmentId</u>	*exerciseld	*equipmentId
1	2	1
2	4	1
3	3	3
4	5	3
5	1	5

progressEntry

<u>progressId</u>	*workoutExerciseDetailId	weightLifted	repsCompleted	caloriesBurned	moodRating	perceivedExertion	notes
1	1	0	12	80	7	6	Felt strong on push-ups
2	2	0	30	150	8	5	Good cardio warm-up
3	3	100	5	220	8	8	Challenging squats; good depth
4	4	90	6	200	7	8	Solid deadlifts; grip slightly tired
5	5	0	20	120	8	6	Core burn, steady pace
6	7	120	5	210	7	9	Heavy squats today
7	10	105	5	200	7	8	Solid depth on sets
8	14	110	5	210	7	8	Leg day, heavy but stable
9	6	110	6	220	7	8	DL sets completed; last set RPE 9
10	9	85	5	180	7	7	Pulled smooth, no grinders
11	15	120	5	220	7	9	Deadlift technique
12	12	0	30	180	8	5	Good cardio block
13	13	0	40	190	7	6	Core & conditioning

14	8	25	12	160	8	7	Weighted push-ups felt strong
15	11	0	20	140	8	6	Bodyweight volume

goal

goalId	*userId	goalDescription	targetDate	isAchieved	goalType
1	1	Increase bench press	2025-10-01	0	Strength
2	2	Complete 5k run in 25 min	2025-09-01	1	Endurance
3	3	Reduce weight to 78kg	2025-11-15	0	Weight loss
4	4	Improve core stability	2025-08-30	1	Flexibility
5	5	Maintain weekly workouts	2025-12-31	0	Consistency
6	2	Complete PT check-in	2025-07-30	0	Rehab

ERD

