**Fitness Tracker Database Design**

**1. Problem Statement & Business Use Case**

The goal is to design a database for a **Fitness Tracker system** that allows users to monitor their fitness journey by logging workouts, exercises, health metrics, personal goals, and diet plans. The system will support data analysis for progress tracking and health improvement, catering to health-conscious individuals who want a structured view of their fitness lifestyle.

**✅ 2. Key Entities & Relationships**

* **User**: Stores basic user info like name, age, gender, and health metrics.
* **Workout**: Each user can have multiple workouts logged.
* **Exercise**: Defines exercises, reusable across workouts.
* **Workout\_Exercise**: A bridge entity mapping many-to-many relationships between Workouts and Exercise
* **HealthMetric**: Tracks daily health stats like weight, heart rate, and sleep.
* **Goal**: Captures personalized goals like weight loss or muscle gain.
* **DietPlan**: Stores structured diet plans for users.

A screenshot of a computer screen

AI-generated content may be incorrect.**✅ 3. Entity-Relationship (ER) Design ✅ 4. Normalization & Schema Integrity**

* All tables follow **Third Normal Form (3NF)**:
  + No partial or transitive dependencies
  + Atomic attributes only
  + Separation of concerns per entity
* Example: Workout\_Exercise prevents data duplication by linking via IDs, not redundant data copies.

**✅ 5. Primary Keys & Foreign Keys**

* **Primary Keys**: Ensure unique row identification (user\_id, goal\_id, exercise\_id, etc.)
* **Foreign Keys**: Enforce referential integrity (e.g., user\_id in Workout, Goal, HealthMetric, DietPlan).

**✅ 6. Constraints for Data Validation**

|  |  |
| --- | --- |
| UNIQUE | Email in Users must be unique |

|  |  |
| --- | --- |
| CHECK | Age must be ≥ 13 |

|  |  |
| --- | --- |
| CHECK | Dates must be valid (start\_date <= end\_date) |

|  |  |
| --- | --- |
| NOT NULL | Applied to essential fields like user\_id, goal\_type, workout\_date, etc. |