**Database Design**

The database technology I will use for my application is the PostgreSQL database. PostgreSQL offers robust capabilities and features that will be beneficial for the fitness application I will be building. PostgreSQL supports a wide range of data types that offers flexibility when dealing with a variety of fitness data, including workout routines and nutrition plans that may have different structures. PostgreSQL will be able to support complex relationships such as users having multiple workouts and meals. PostgreSQL support for being able to handle these relationships will allow me to create structured and normalized databases, ensuring data integrity. PostgreSQL offers robust security features, including authentication, access control, encryption, and auditing capabilities, which are essential for securing sensitive health and fitness data. PostgreSQL is a powerful and versatile relational database system that is well-suited for my fitness application.

**Data Structure**

**Table 1: Users**

**user\_id (Primary Key): Unique identifier for each user.**

**name: User's name.**

**age: User's age.**

**gender: User's gender.**

**fitness\_goals: User's fitness goals.**

**dietary\_preferences: User's dietary preferences.**

The users table will store user profile information. Users will be able to use their profile to customize fitness goals and dietary preferences within the app. This information helps to personalize the user experience by tailoring workout and meal recommendations to meet specific objectives.

**Table 2: Workouts**

**workout\_id (Primary Key): Unique identifier for each workout.**

**user\_id (Foreign Key): Relates each workout to a user.**

**exercise\_type: Type of exercise (e.g., cardio, strength, flexibility).**

**duration: Duration of the workout in minutes.**

**date: Date of the workout.**

**notes: Optional notes about the workout.**

The workouts table is where user’s workout data is stored. This table allows for users to track their fitness journey over time. They will enter data after each workout, view their workout history, and monitor progress. Users can analyze performance and set new fitness goals based on this data.

**Table 3: Meals**

**meal\_id (Primary Key): Unique identifier for each meal.**

**user\_id (Foreign Key): Relates each meal to a user.**

**date\_time: Date and time of the meal.**

**food\_items: List of food items in the meal, including name, portion size, and nutritional information.**

The meal table stores data related to the user’s meal log. Logging meals will help the user be able to keep track of their dietary intake, monitor calorie consumption, and make informed decisions about their meals. This data will help align the user nutrition and fitness goals.

**Table 4: Workout Routines**

**routine\_id (Primary Key): Unique identifier for each workout routine.**

**title: Title of the routine.**

**description: Description of the routine.**

**categories: Categories of the routine (e.g., cardio, strength, flexibility).**

This table stores workout routines that users can access. It will provide access to a library of workout routines. Users can explore different routines, choose the ones aligned with her fitness goals, and follow structured workout plans.

**Table 5: Exercises (for Workout Routines)**

**exercise\_id (Primary Key): Unique identifier for each exercise.**

**routine\_id (Foreign Key): Relates each exercise to a workout routine.**

**name: Name of the exercise.**

**instructions: Instructions on how to perform the exercise.**

The exercise table contains exercise details, including exercise names, instructions on how to perform each exercise. These exercises are part of the workout routines. This table enriches the workout experience by providing detailed instructions and guidance on how to perform each exercise correctly.