FITNESSTRACKER – PROJECT REPORT FOR CS 5200

Group Name: DineshPHosahalliKotrappaVKrishnaS

PRANAMYA DINESH NUID: 002916838

SAURAV KRISHA NUID: 002783327

VINAYAKA HOSHALLI KOTRAPPA: 002914598

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INTRODUCTION:

A fitness and gym tracking database are a system for managing and storing information about workouts and gym memberships. Users can track their progress, establish and meet fitness goals, and keep tabs on their general health and wellbeing with the aid of this database applying. A wide range of data, including exercise logs, nutritional data, etc., can be stored in the database. Additionally, it can store data about gym memberships, including the type of membership and payment details. Users can use it to set and reach their fitness goals, track their advancement, and maintain motivation throughout their fitness journey.

Description and Functionality.

A fitness tracking and gym database system would be a comprehensive solution for managing gym operations and tracking users' fitness progress. The system would be designed to support the following features:

User Management: The database would allow gym administrators to create and manage user accounts, including personal information such as name, email.

Fitness Tracking: The database would allow users to track their fitness progress by recording

information such as workouts, body measurements, nutrition intake, and sleep patterns.

Group Fitness Class Management: The database would allow gym administrators to manage group fitness classes, including class schedules, instructor assignments, and class attendance.

Personal Training Management: The database would allow gym administrators to manage personal training sessions, including trainer assignments, session schedules, and client progress tracking.

Payment Processing: The database would allow gym administrators to manage payment processing, including billing and payment tracking.

Rewards System: The database would allow users to earn rewards for meeting their fitness goals and gym attendance.

Trainers: The database would to track Trainers who has attributes such as Name, Certification, Specialties.

Gym tracking: The database would to track Gym which has attributes such as Name, address, etc

READ ME:

1) fitnessfinal.sql – the SQL dump file

2) config.json- Add the username and password details to connect to MYSQL

3) entry_page.py – The python application

a. Run the SQL dump file in the MySQL workbench to save the procedures and data

b. Run the python file using the command python -m streamlit entry_page.py

4) tables.py - Once you run entry_page as a streamlit application, you can use the sidebar to naviagate to tables to view all the tables that are available to the database

5) user.py - Once you run entry_page as a streamlit application, you can use the sidebar to naviagate to user and perform all the operations that an user can perform

6) owner.py - Once you run entry_page as a streamlit application, you can use the sidebar to naviagate

to owner and perform all the operations that an owner can perform

7) trainer.py - Once you run entry_page as a streamlit application, you can use the sidebar to naviagate to trainer and perform all the operations that a trainer can perform

SQL vs NO SQL

Criteria used for selecting SQL over NO SQL database.

- Data does not contain streaming data.
- ACID properties are to be applied.
- Occurrence of schema change is rare.
- Schema needs to be normalized.
- Schema does not grow rapidly.
- Hierarchical dependency among the columns is absent.
- Column dependencies are flat.

Technical Stack

- Front End: Python Streamlit
- Back End: MySQL Server
- Operating Systems: Windows

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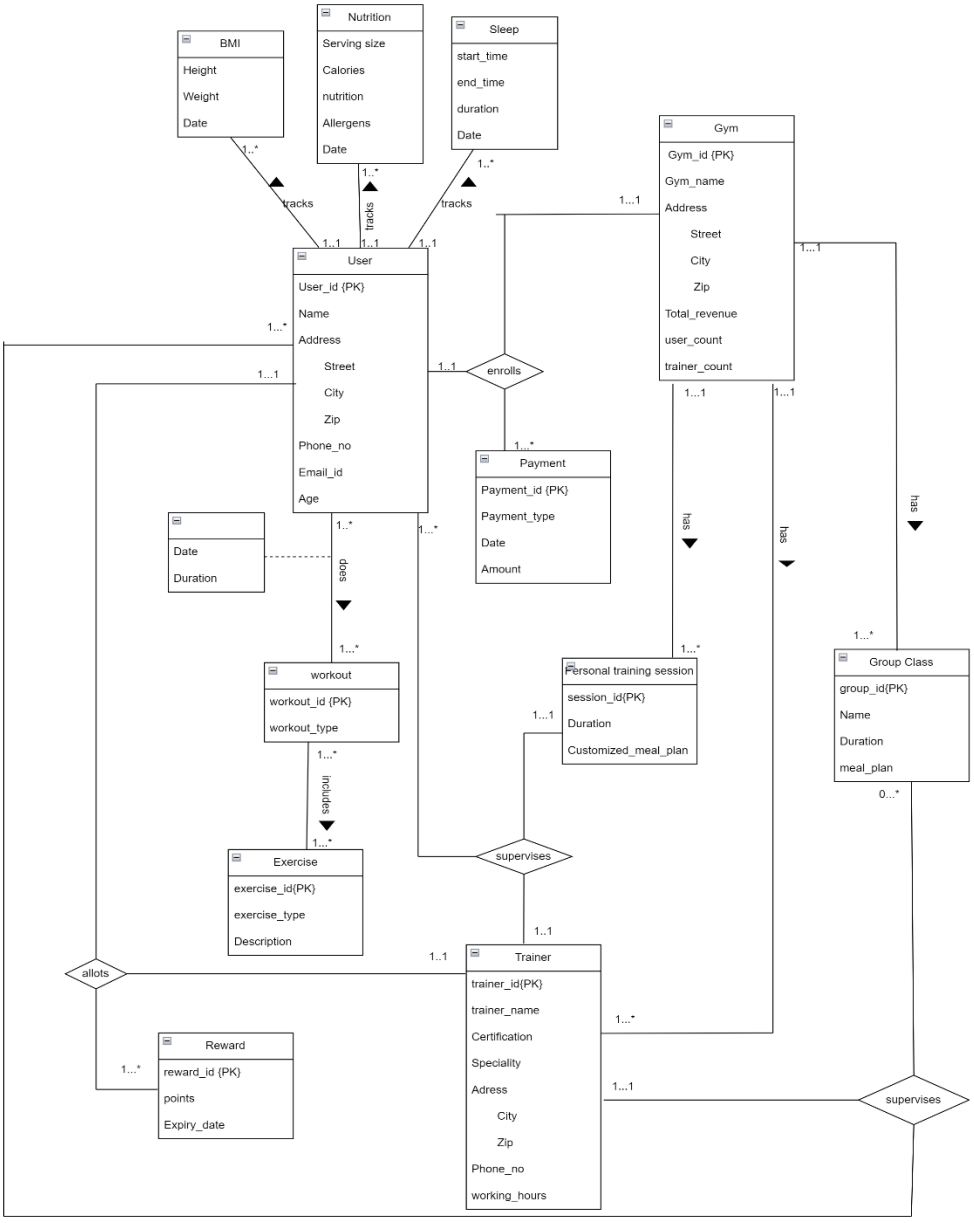
MOTIVATION

A fitness tracking system can be a powerful tool for individuals looking to improve their physical fitness, manage their health, and achieve their wellness goals. Fitness tracking can help individuals personalize their fitness and nutrition plans. By monitoring their progress, they can adjust their goals and routines to better suit their needs and preferences. It can be a Data-driven decision-making, data that can be used to make informed decisions about fitness and health. By analyzing the data collected, individuals can identify trends and patterns in their behavior and make adjustments to optimize their health and wellness.

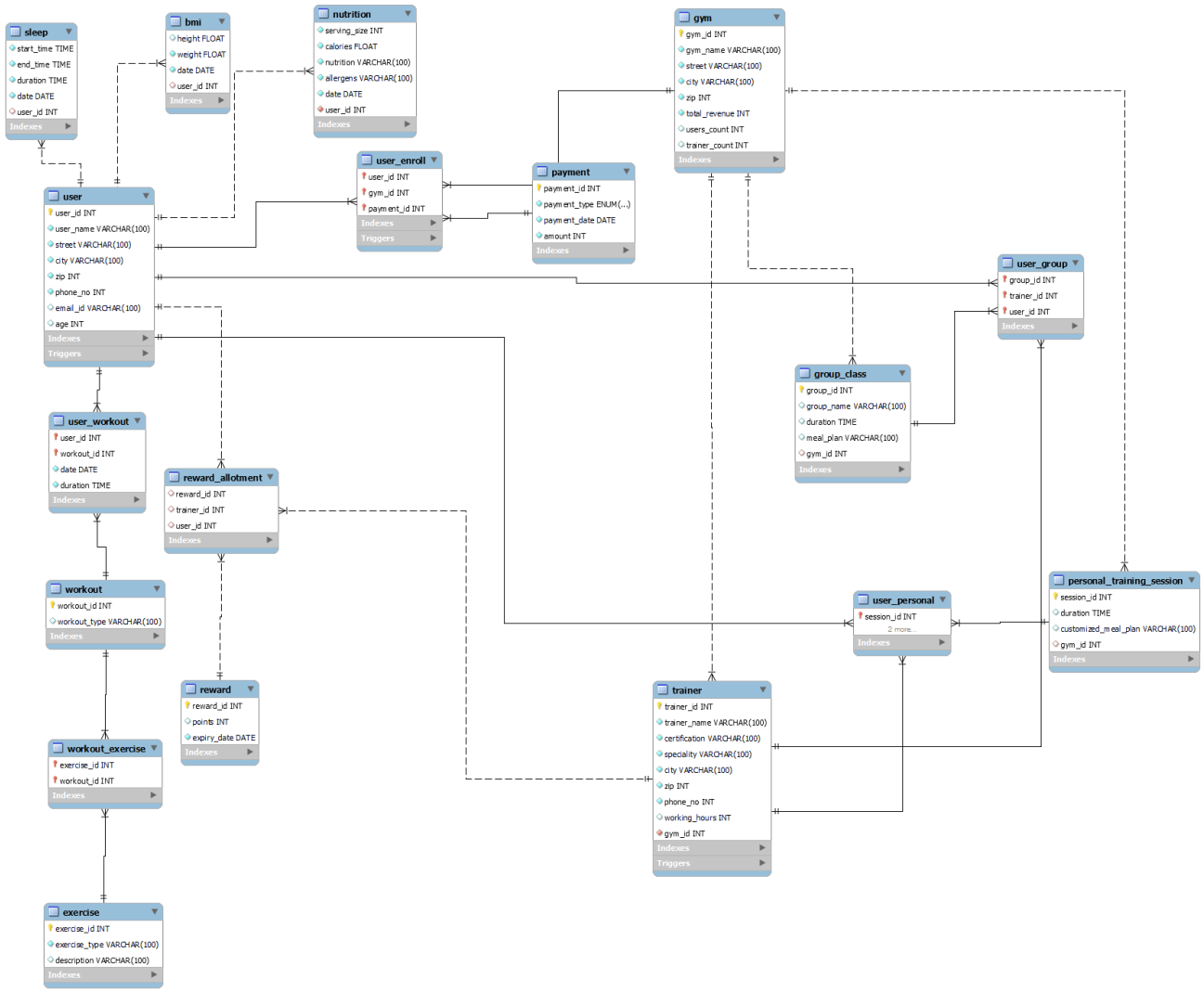
Fitness and gym tracking databases can also benefit gym owners and managers. They can use the data to track member engagement and satisfaction, identify trends, and improve gym operations. For example, they can use the data to identify popular classes or equipment, adjust class schedules, and improve member retention.

Overall, a fitness and gym tracking database can be a valuable tool for anyone looking to improve their fitness and wellness.

UML DIAGRAM

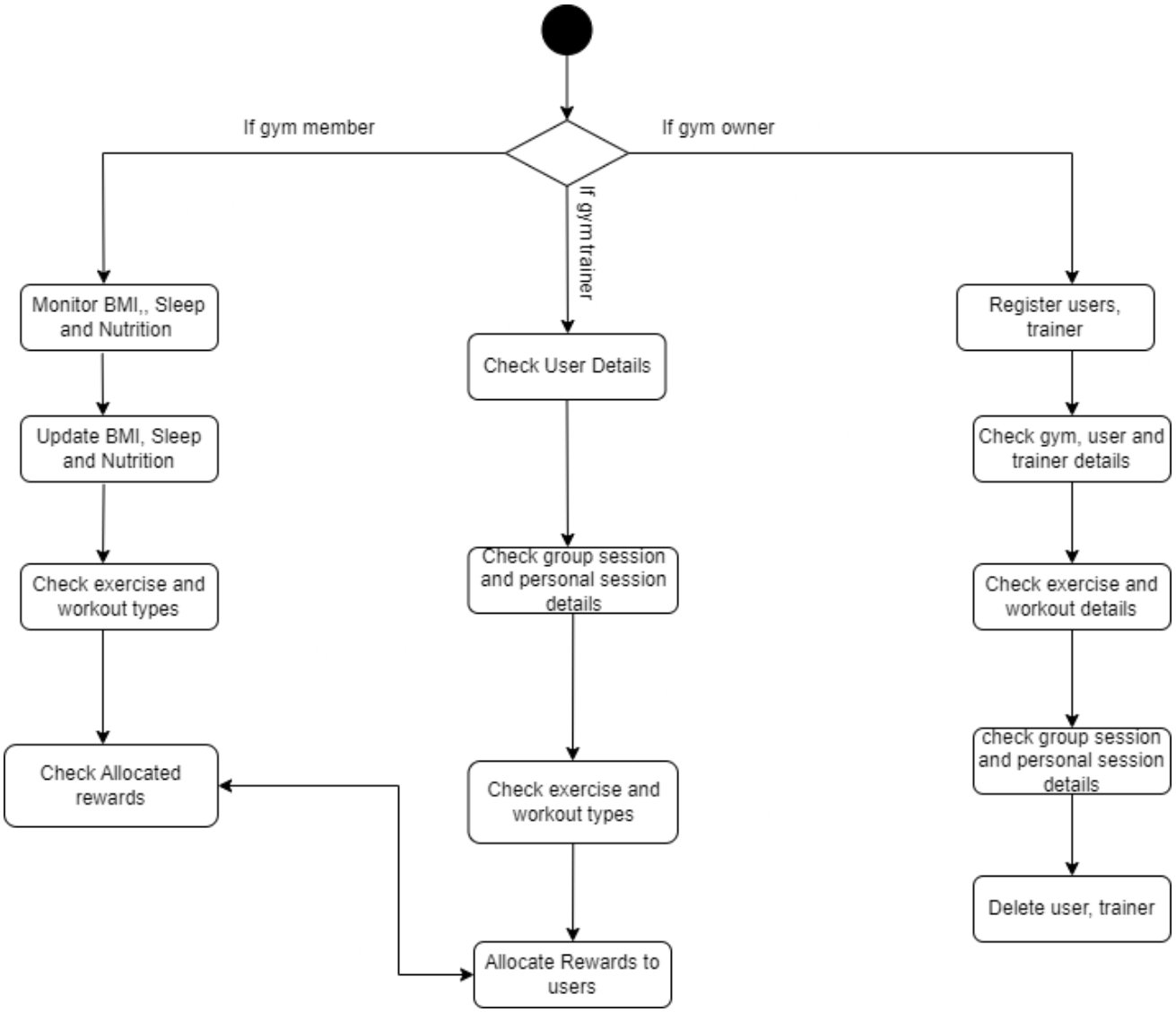


1)ENROLL:A User enrolls to a gym with multiple payments
2)Allots:A trainer can allot multiple rewards to the user
3)Supervises: A trainer supervises a personal training session for a user
4)Supervises: A trainer supervises a group training session for user group.



Reverse Engineered UML Diagram

Activity Diagram



Packages

- Pymysql
- Streamlet

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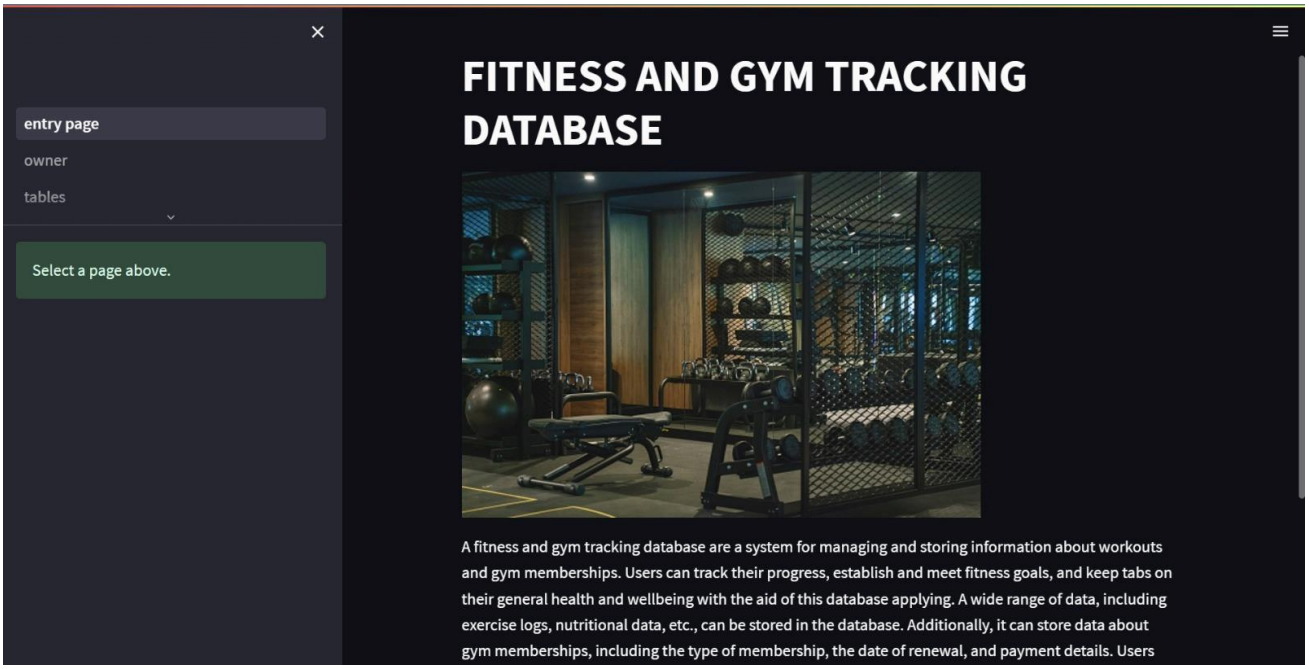
Textual Description of the Flow

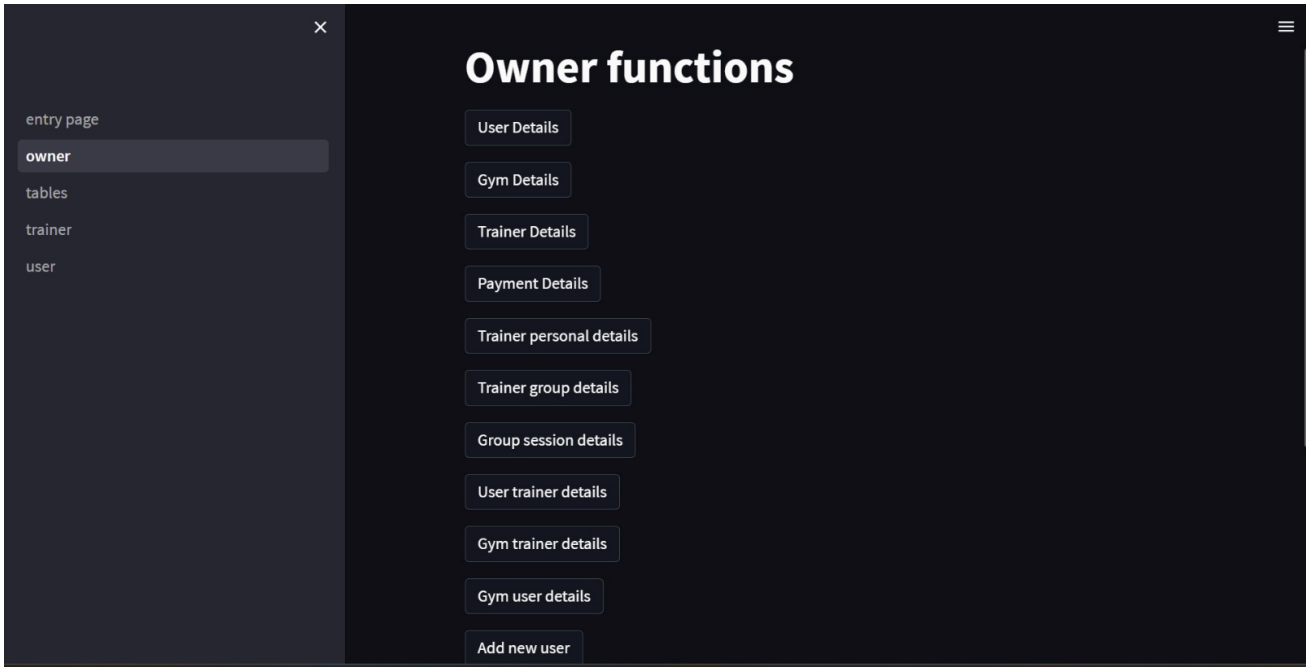
On the successful opening of https://localhost:8501/, the following page appears.



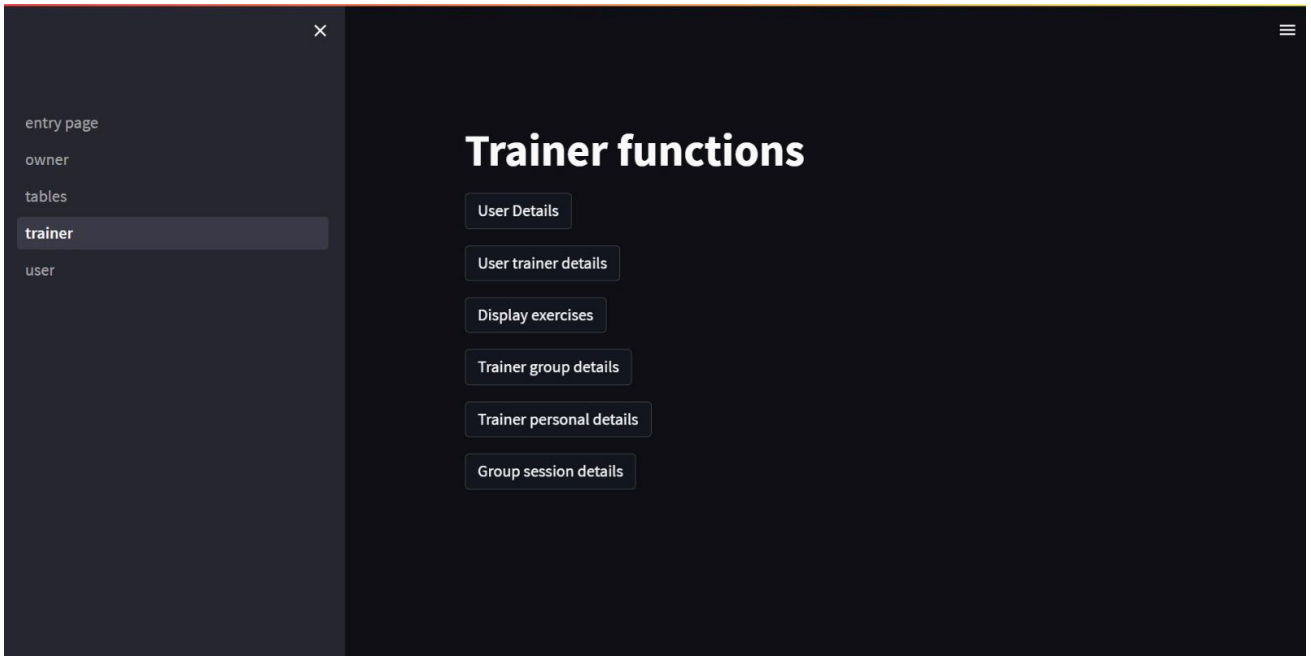
This page is the landing page on the left you can choose

Users i.e., owner, trainer, user

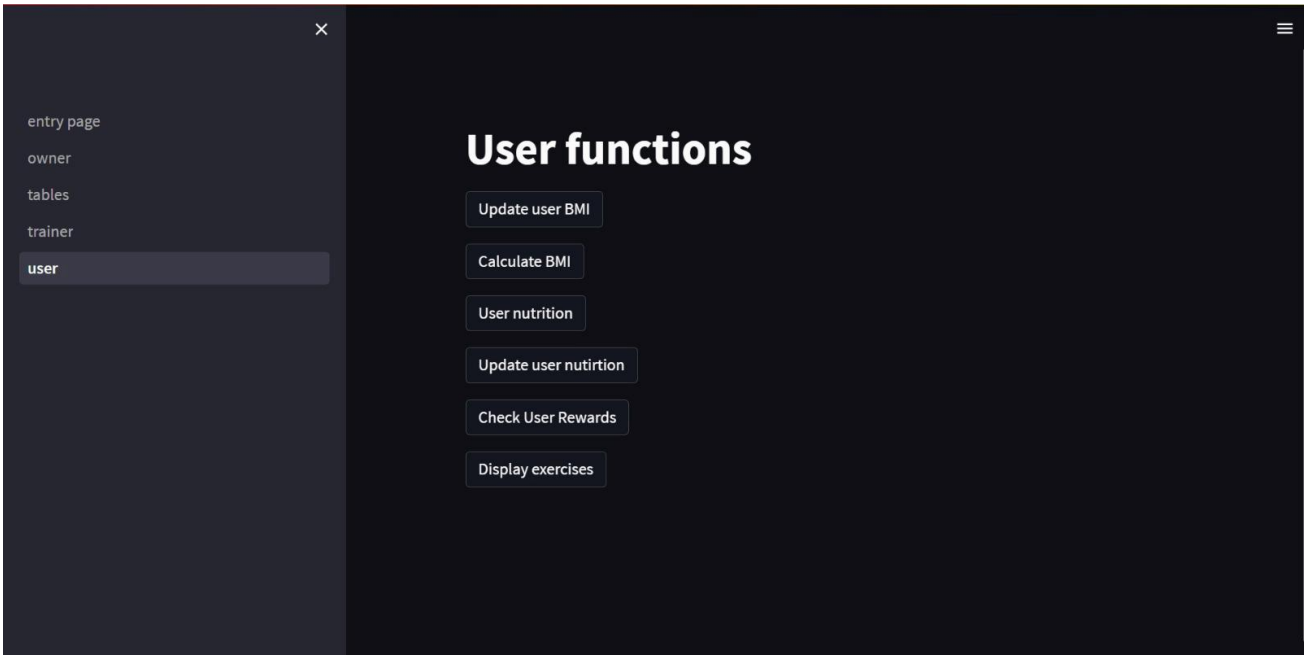
On click of owner , the owner has access to following



On the click of trainer , trainer has access to



On the click of the user, user has access to



FEW CRUD OPERATIONS IMPLEMENTED

1. GYM OWNER CAN CREATE(REGISTER) NEW USER
2. GYM OWNER CAN CREATE(REGISTER) NEW TRAINER
3. A USER CAN UPDATE HEIGHT AMD WEIGHT IN BMI TABLE
4. A USER CAN UPDATE NUTRITION
5. USER COUNT, REVENUE,TRAINER COUNT ARE UPDATED USING TRIGGER
6. GYM OWNER CAN DELETE USER
7. GYM OWNER CAN TRAINER
8. OWNER CAN VIEW GYM DETAILS,USER DETAILS,TRAINER DETAILS, PAYMENT DETAILS
9. USER CAN CALCULATE BMI,CHECK REWRADS, EXCERSCISE , WORKOUT TYPES
10. TRAINER CAN SEE USER DETAILS,GROUP SESSION AND PERSONAL SESSION DETAILS, EXCERSISE

Extra Credits Attempted

- Implemented multi-joins of the tables for the data pull.
- Front end for user interaction.
- Created more than 15 tables.

Lessons Learned

- We were able to figure out the entities and the dependencies between them.
- From the UML diagram, we deduced the needed tables and were able to create them in the schema using SQL CREATE Command.
- Tables deduced from the UML are normalized in order to avoid redundant data.
- Integrity Constraints were applied to the tables with the dependencies to avoid unpredictable changes in the data.
- To avoid this condition SQL Procedures were used.
- So, the user cannot access the data tables and the database directly.
- Complex SQL queries were written to do operations on multiple tables simultaneously.
- Complex JOINS were also written to retrieve data from multiple tables.
- Instead of creating the tables we decided to create UML first so that we can see the way the data is present and interacts so that we can work on iterations faster and hence save us a lot of time.
- We were able to successfully implement the Triggers.

Future Work

Planned Use of the Database

The planned use of the fitness tracking and gym database system is to manage gym operations and track users fitness progress. The database is intended to support features such as user management, fitness tracking, group fitness class management, personal training management, payment processing, rewards systems, and tracking of trainers and gyms.

The system is designed to allow gym administrators to manage gym operations more efficiently, including scheduling classes and personal training sessions, tracking user attendance and progress, processing payments, and managing rewards for users who meet their fitness goals. Users would also benefit from the system, as they could track their fitness progress, access class schedules, and sign up for personal training sessions, all through the database system.

Overall, the fitness tracking and gym database system is intended to provide a comprehensive solution for managing gym operations and tracking users' fitness progress, with the goal of improving the user experience and helping gym administrators optimize their operations for maximum efficiency.

Potential Areas for Added Functionality:

- Front-end and User interaction enhancement: We can use better front end for web creation, with node, middleware, React, express. Instead of python streamlit which is very basic and can't handle complex operations with better error handling.

- Machine Learning and AI Integration: Integration with machine learning and AI algorithms could provide personalized workout and nutrition recommendations to users based on their fitness goals, preferences, and health data. This would enhance the overall user experience and help users achieve their goals more efficiently.

- Virtual Training Sessions: The addition of virtual training sessions could allow users to access personal training sessions remotely, making the service more accessible and convenient. This could also help gym administrators expand their reach and offer more personalized training sessions to a wider audience.

- Social Integration and gamification: Integration with other users, gamification could allow users to share their fitness progress and achievements with their friends and family, creating a sense of community and providing motivation for users to achieve their goals.

- Mobile App Integration: The addition of a mobile app that integrates with the database would allow users to access their fitness progress, class schedules, and personal training sessions on the go. This would enhance the user experience and increase engagement with the system.\

- Advanced Reporting and Analytics: The addition of advanced reporting and analytics features could provide gym administrators with more detailed insights into gym operations, user behavior, and performance metrics. This could help gym administrators make data-driven decisions and optimize their operations for maximum efficiency.