Final Report

1. **Please list out changes in directions of your project if the final project is different from your original proposal (based on your stage 1 proposal submission).**

Compared to our original proposal, our final project was different in the sense that we focused more on exercises, rather than caloric tracking. We still track restaurant orders for the users, but the restaurant orders don't track caloric intake. Instead, we implemented an exercise recommendation system that would recommend exercises within a certain calorie range. Otherwise, our final project was similar to the original proposal because we had a health goal for each customer, and our recommended exercises would help them achieve their goal.

2. **Discuss what you think your application achieved or failed to achieve regarding its usefulness.**

Regarding its usefulness, our application was able to allow a user to log in and successfully keep track of their own health goal. It also provides recommended exercises based on their individualized health goals and customer profile. In addition, our application was able to track the restaurant orders that the user placed. One functionality that our application failed to achieve was tracking the food items that the user ate within their restaurant orders, or some sort of food recommendation feature regarding desired calorie intake (similar to the exercise recommendation feature).

3. **Discuss if you changed the schema or source of the data for your application**

For the most part, our application's schema stayed the same (i.e. the tables and relationships stayed the same). If anything did change, it was small modifications regarding the key names of our entities. For example, initially we had the Restaurant entity contain a MenuID, but that idea was soon dropped. Additionally, in our HealthGoals table, we originally set the primary key name to be GoalTitle, but later it changed to simply Goal.

4. **Discuss what you change to your ER diagram and/or your table implementations. What are some differences between the original design and the final design? Why? What do you think is a more suitable design?**

We decided to change the relationship between Customer to health goal from a many to many to a many to one because we realized that focusing on one health goal would allow the app to make a better plan for the user. This design was more suitable because our trigger ended up modifying the health goal based on the user's input instead of having to go through all of the user's health goals to find the right one to modify. We originally wanted food items to be served at different restaurants, but for simplicity reasons we decided to have each food item be unique to a restaurant. In some ways this made sense because every restaurant will serve dishes with

different amounts of macros, but the more ideal design would be to remove the primary key from ItemName and replace it with an ID because food names will not be unique in the real world.

5. **Discuss what functionalities you added or removed. Why?**

We added a login screen that would search in the customer database because our app is designed to be a personalized app that adjusts to each customer. We allowed for inserts, edits, and deletes on the restaurants table so users could track their food activity. We also added a personalized health plan to recommend exercises based on user info: this info was the user's calorie ceiling and calorie floor but could be improved to include targetWeight, targetCarbs, and targetProtein.

6. **Explain how you think your advanced database programs complement your application.**

For our advanced database programs we chose the combination of a trigger and stored procedure. We thought this complemented our application because our goal was to create a dynamic rather than static health planner that dynamically updated its recommendations based upon your current health goals. The stored procedure we created (a procedure to get a personalized exercise recommendation based on an individual's target calorie burn range in their health goal) fit well with this as it allowed us to create a recallable feature that provides new recommendations based upon the current state of the health goal, which can change at any time. The trigger we created (updating a customer's target fat intake in their health goal according to the quantity of their current restaurant orders) also fit well with this goal as it was another dynamic feature that ensured automatic updates to a customers health goal based upon their food intake.

7. **Each team member should describe one technical challenge that the team encountered. This should be sufficiently detailed such that another future team could use this as helpful advice if they were to start a similar project or where to maintain your project.**

Minal - One technical challenge that we encountered was that we found it difficult to start implementing the CRUD applications initially. That required us to edit and modify the modal.js file, and we as a team had difficulty understanding how that javascript file tied with the rest of the source code of the application.

Ashna - Another technical challenge the team encountered was the data generation. We were initially confused on how to generate synthetic data that still made sense, or where to find a dataset sufficient to our needs. In the end, we stuck with automatic synthetic data generation with a simple python script to generate random names/values for tables such as Customers and Health Goals.

Jasmine - We also struggled with the UI component of the application. Although the UI wasn't the focus of this project, we came into the project with no experience in HTML and CSS, so

figuring out how to link our HTML files to our flask backend was a challenge. Specifically, editing the routes in our routes.py file and adding routes within our modal.js file was how we were able to link the right HTML files to the correct queries and information we wanted to display.

Chris - For the database implementation of advanced queries, we had difficulties implementing Group By in the MySQL database and found it hard to analyze our indexing data because of the large database and lack of efficiency in the indexing.

8. **Are there other things that changed comparing the final application with the original proposal?**

Besides the minute changes regarding schema naming mentioned above in #3 and the directional changes mentioned in #1, there were not any major changes when comparing the final application with the original proposal.

9. **Describe future work that you think, other than the interface, that the application can improve on**

One potential improvement is the addition of a food recommendation feature. Since our application is a health app that currently recommends only exercises based on people's target calorie burning range, we think it would be a useful addendum if we similarly recommend food items/restaurants based on people's desired calorie intake. Another potential improvement for our application is the data generation. While our current approach was generating synthetic data through a python script, the usability and sensibility of the application could be improved with the addition of real relevant datasets for our Restaurants or Food Items, as well as our Exercises.

10. **Describe the final division of labor and how well you managed teamwork.**

We as a team were able to successfully collaborate and implement this application together. There was no precise division of labor, rather everybody met at a set time and place, and we all worked on the application at the same time from one machine. General timeline of things was → creating the initial outline for the proposal, then doing data generation, setting up flask and connecting it to our host, getting a hang of the front-end tools, implementing basic CRUD, and lastly implementing the stored procedure/triggers. For all of these tasks, we all met up and worked on it together.