

Final Report

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

The primary goal of our project remained unchanged, as we successfully developed an application that generates meal suggestions based on a provided list of ingredients. However, we streamlined several functionalities. Initially, we had planned to incorporate features such as selecting specific cuisines and displaying nearby grocery stores for acquiring missing ingredients. However, we were unable to implement these additional elements within the scope of the project.

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

Our application has fulfilled the primary objective of our project. It allows users to input a list of ingredients and discover meals they can prepare with those ingredients. While this significantly narrows down the meal options, we could enhance its utility by implementing a threshold for meal selection. For instance, if a user possesses 70% of the required ingredients for a meal, it would be included in the recommendations. This refinement would greatly reduce the number of meals listed overall.

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

We did not make any changes to the source of our data.

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 adjusted our ER diagram and table implementations slightly. We added a user pantries table. This would allow users to have multiple pantries (each with unique pantryIDs). This also allowed

us to add quantities to the table to represent the amount of each ingredient that the user had. This allowed us to have a clearer and easier to understand table on our end when designing the tables and accessing values. I believe that our new implementation is a more suitable design.

Discuss what functionalities you added or removed. Why?

We removed our planned functionality of allowing our users to create their own meal plans in the table and display the meal plan of each user in a UI. We removed this because we thought adding this functionality doesn't really provide much for our users since it only offers a way to keep track of the meal plans and a lot of other applications can provide a similar functionality.

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

I think our advanced database queries enhanced our application by combining multiple tables that relate to each other and executing a specific functionality. For example, our search engine for recipes given ingredients is powered by an advanced database query that joins multiple tables to output the results.

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.

Divya: One technical challenge I encountered was connecting our Flask frontend with our Google Cloud Platform. Due to the unfamiliarity of these softwares, as well as the outdated lectures of connecting these two sources, I faced many struggles. My approach involved diving deep into various YouTube channels and online blogs, going through tutorials, forums, and documentation to gather insights and potential solutions. I engaged in trial and error, testing different configurations, adjusting parameters, and troubleshooting errors along the way.

Frank: A really large problem we faced multiple times during our development of the project was that every once in a while (this happened three times to us), our database on gcp would disappear as if someone has deleted it. This is likely due to either our gcp instance being hacked by someone who was able to connect our instance or one of our update actions to the database was not executed correctly or carefully and we accidentally deleted the database. This would

obviously be a huge issues since although we can re-upload our tables, recreating the tables as well as the features like indexing would take a long time. However, we were able to restore the database with the automatic backups that are saved daily on gcp. An advice for other teams that work on this project would be to save a backup version of the database after every update to it since although the gcp automatic updates are nice, once a day isn't enough sometimes.

Kathryn: One of the technical problems that we faced was learning front end development. This included how to create pages that users could interact with, which lead to the other issue of how we tie in the user's input to the database to yield a result. We overcame this obstacle through digging through web development pages and YouTube video tutorials similar to how we learned how to connect the frontend with GCP. One thing that I would recommend is to use the office hours because almost all my questions were answered there.

Samvit: One issue we faced early on in developing the database was importing and converting the csv data into MySQL tables. The dataset was from Kaggle, and it had quite a few errors that made it hard to parse and directly convert into tables. We wrote code in python to clean the data, and convert some of the columns which were in a list format into multiple rows, which could be added in as tables. It was helpful to be able to use python to verify, clean, and format the data because the pandas library is very powerful, and modules can make it relatively easy to convert the data in a format that is easy to parse into MySQL.

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

There have been a few changes in the implementations of features in our final application as compared to the initial application. We had to adjust the database schema to fit the data source, some tables like the calorie intake table had to be dropped because of inadequate data. The threshold management feature has been tweaked a little bit by adding a search feature to filter recipes based on ingredients available.

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

There can be more features added like a calendar plugin that could suggest meals based on timelines and is synced with the calendar. We could also add some tables to the database such as a grocery stores table, so that if the user picks a meal, and has inadequate ingredients, they could be directed to a grocery store that has those ingredients.

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

The final division of work was based along the lines of the project proposal. All the team members contributed to all the portions of the project.