Data Engineering Course – Final Project

Project Proposal

Project Title:

FlavorFind - A Recipe Finder & Personal Cookbook

Version: 1.0

Prepared For: Dr. Ahmed Antar

Prepared By:

Name: Mark William

Student ID: 120210348

Course: Data Engineering - CSE 428

1. Introduction

This document proposes the development of "FlavorFind," a dynamic web application with database integration, as the final project for the Data Engineering course (CSE 428). FlavorFind aims to provide users with a dual functionality: the ability to search for recipes from a vast online database via an external API and the capability to create, manage, and store their own personal recipes within the application. This project directly addresses the course requirement to build a functional web application connecting to a database, allowing users to interact with stored data via a web interface.

2. Project Idea & Use Case

2.1. Idea:
FlavorFind will serve as a centralized hub for recipe discovery and personal recipe management. It integrates external data sources with user-specific data, providing a comprehensive recipe solution.

2.2. Primary Use Cases:
The application will support the following key interactions:

- **UC-01: User Registration:** New users can create a secure account providing a username, email, and password.

- **UC-02: User Login:** Registered users can log in using their credentials to access personalized features.

- **UC-03: External Recipe Search:** Authenticated or anonymous users can search for recipes based on ingredients, name, or category using the integrated TheMealDB API. Search results will be displayed dynamically (potentially using AJAX for enhanced user experience).

- **UC-04: View External Recipe Details:** Users can select a recipe from the search results to view its details, including ingredients, instructions, image, and source (provided by the API).

- **UC-05: Create Personal Recipe:** Authenticated users can add their own recipes to their personal cookbook, providing details such as title, description, ingredients list, step-by-step instructions, and optionally, an image URL.

- **UC-06: Read Personal Recipes (List):** Authenticated users can view a list of all recipes they have personally saved.

- **UC-07: Read Personal Recipe (Details):** Authenticated users can select one of their personal recipes to view its full details.

- **UC-08: Update Personal Recipe:** Authenticated users can modify the details of their existing personal recipes.

- **UC-09: Delete Personal Recipe:** Authenticated users can remove recipes from their personal cookbook.

3. Goals & Objectives

The primary goals of the FlavorFind project are:

- To successfully design, develop, and implement a functional web application demonstrating proficiency in frontend-backend integration and database management as required by the course.

- To implement the four core CRUD (Create, Read, Update, Delete) operations for user-managed data (personal recipes).

- To integrate effectively with a third-party, real-world data API (TheMealDB) to provide dynamic recipe searching, fulfilling a project bonus requirement.

- To design and implement a relational database schema (ERD) using MySQL that efficiently stores user account information and personal recipes.

- To develop a user-friendly and intuitive web interface using HTML, CSS, and Vanilla JavaScript for searching, viewing, and managing recipes.

- To utilize AJAX for the external recipe search feature to provide a smoother, more dynamic user experience without full page reloads.

- To deploy the completed application to a public cloud platform (e.g., Render, PythonAnywhere, Heroku alternative) and provide a working URL.

4. Planned Technologies

The following technology stack is planned for the development of FlavorFind:

- **Backend Framework:** Python with Flask (Chosen for its simplicity, flexibility, and suitability for smaller to medium-sized web applications and APIs).

- **Database:** MySQL (A robust, open-source relational database suitable for structured recipe/user data).

- **Database Interaction (ORM):** SQLAlchemy (A powerful Python ORM for interacting with the MySQL database, promoting cleaner code and reducing raw SQL, compatible with Flask).

- **Frontend:** HTML5, CSS3, Vanilla JavaScript (Standard web technologies providing core functionality and allowing for AJAX without framework overhead).

- **API Integration:** Python requests library (For making HTTP requests to TheMealDB API).

- **Password Hashing:** Werkzeug security helpers (Commonly used with Flask for securely hashing user passwords).

- **Version Control:** Github.

5. Scope & Limitations

In Scope:

- User authentication (registration, login).

- CRUD operations for personal recipes linked to authenticated users.

- Integration with TheMealDB API for searching recipes.

- Displaying recipe details (from API and personal storage).

- Basic web interface for all functionalities implemented using HTML/CSS/Vanilla JS.

- API communication primarily using JSON format.

Out of Scope (Initially):

- Advanced search filtering (e.g., dietary restrictions, cooking time - unless easily available from API).

- User recipe ratings or comments.

- Meal planning features.

- Direct image uploading (will use URLs initially for simplicity).

- Admin panel or user roles beyond a standard user.

- Password recovery mechanism (unless time permits).

6. Conclusion

FlavorFind is a well-defined project that aligns perfectly with the final project requirements for the Data Engineering course. It provides ample opportunity to demonstrate core data engineering concepts, including database design (MySQL), backend logic (Flask), API integration, database interaction (SQLAlchemy), and frontend development (HTML/CSS/JS).