



PES UNIVERSITY, Bengaluru

Department of Computer Science and Engineering

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UE21CS341A – Software Engineering

PROJECT REPORT
on

Recipe Recommendation System

Submitted by : Team #01

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5th Sem. C/J Sec.

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1. Project Proposal / Synopsis

Proposed Project Description

The Recipe Recommendation System is a personalized, dynamic platform that leverages machine learning algorithms and user preferences to suggest the top 10 recipes you can make based on the ingredients you have in your pantry. Aimed at a diverse range of users—from aspiring home cooks to fitness enthusiasts to individuals with specific dietary needs—this system strives to eliminate the dilemma of "What should I cook today?" by offering tailored culinary suggestions. Whether you're craving a specific cuisine or have certain health or allergy considerations, the system will curate recipes that align with your needs and tastes.

Functional Features

1. Customizable Pantry : Users can create, edit, and update their digital pantry with ingredients they currently have.
2. Personalised Recommendations : Once the pantry is set, the system offers a list of the top 10 recipes that can be made from those ingredients.
3. Culinary Preferences : Users can set preferences such as cuisine type and dietary health requirements (e.g., vegetarian, gluten-free, low-sodium).
4. Recipe Ratings : Users have the option to rate recipes they've tried, providing valuable feedback for both themselves and other users.
5. Bookmark Favourites : Users can bookmark their favourite recipes for easy access in the future.
6. Recipe Details : Detailed recipe with ingredients, step-by-step instructions, and nutritional information.

Plan of Work and Product Ownership

Data Collection and Cleaning and Labelling : Shubha Masti

- Develop a data cleaning and preprocessing pipeline to prepare the recipe dataset.
- Create labels for cuisine, dietary requirements, etc
- Use filters to integrate for any filters by user

Database Setup : Shriansh Mohanty

- Design and define the database schema (for pantry, recipes, and user data)
- Develop the data retrieval and display functions to fetch recipes from the database.
- Populate the database with the cleaned and labelled recipe data.
- Database connection interface
- Testing Backend

Frontend Design and Development : Shreya Sridhar

- Design the landing page, user profile, and pantry management interfaces on the frontend, ensuring a user-friendly experience.
- Implement the pantry management feature on the frontend, allowing users to add and edit ingredients.

Frontend Development : Shyam Krishna

- Design recipe rating and history features
- Implement recipe rating and history features on the frontend, allowing users to rate and save recipes.

Frontend and Connection Integration : Shreya Sridhar, Shyam Krishna, Shriansh Mohanty

- Integrate the connection layer with the frontend, enabling users to retrieve appropriate recipes and view their history.

Testing and Debugging : All

- Testing fully integrated software

3. Software Requirements Specification [SRS]

1. Overall Description

1.1 Product Perspective

The Recipe Recommendation System described in this SRS is a new, self-contained product developed to meet the growing demand for personalized recipe recommendations based on available pantry ingredients and user preferences. It is not a replacement for any existing systems but rather a standalone solution aimed at enhancing the culinary experiences of a diverse user base.

1.2 Product Functions

In terms of prioritization, while all user classes offer valuable insights, the Novice Home Cooks, Fitness Enthusiasts, and Users with Dietary Restrictions are most critical. They are expected to form the bulk of the user base and will most frequently rely on the system's core functionalities.

Recommend Dish

- Analyses user's input and available pantry items.
- Utilizes an algorithm to generate tailored recipe suggestions
- Returns a curated list of dishes based on preferences and ingredients.

Retrieve Past Recipes

- Accesses the user's history in the database
- Retrieves and lists bookmarked recipes.
- Helps users recall and revisit their favourite or recent dishes.

Browse Recipe Catalogue

- Displays the entire repository of available recipes
- Allows users to manually search, view, and select dishes.
- Organizes recipes in categories for easier navigation.

Apply Advanced Filters

- Offers specialized filtering options to users.
- Sets criteria like calorie count, allergies, or dietary preferences.
- Refines and narrows down the recipe list based on the applied filters.

1.3 User Classes and Characteristics

Novice Home Cooks

- Frequency of Use: Might use the system intermittently, particularly during weekends or special occasions.
- Functionalities Used: Primarily use basic recipe recommendations based on pantry ingredients.
- Technical Expertise: Basic to moderate. Prefer straightforward, user-friendly interfaces.
- Pertinent Characteristics: Interested in easy-to-follow recipes, may prefer video or pictorial step-by-step instructions.
- Importance: High. This group constitutes a significant portion of potential users.

Fitness Enthusiasts

- Frequency of Use: Regular users, especially around workout schedules.
- Functionalities Used: Recipe recommendations, with emphasis on health and dietary requirements.

- Technical Expertise: Moderate. Comfortable with advanced filtering and preference settings.
- Pertinent Characteristics: Focused on nutritional data, lean proteins, low carbs, etc.
- Importance: High. Their feedback can enhance the health-centric aspects of the system.

Users with Dietary Restrictions

- Frequency of Use: Regular, each time they plan a meal.
- Functionalities Used: Detailed filtering for allergies, vegan, vegetarian, gluten-free options, etc
- Technical Expertise: Moderate to high. Require detailed customization.
- Pertinent Characteristics: Need accurate and trustworthy recipe recommendations, avoiding allergens or specific ingredients.
- Importance: Crucial. Ensuring safety and satisfaction for this group is paramount.

Culinary Experts

- Frequency of Use: Occasional, looking for unique or exotic recipes.
- Functionalities Used: Advanced recipe search, might contribute or rate recipes.
- Technical Expertise: High. Might delve deep into recipe intricacies and variations.
- Pertinent Characteristics: Interested in gourmet recipes, rare ingredients, and culinary techniques.
- Importance: Moderate. Their expertise can enhance the system's credibility and diversity.

Casual Browsers

- Frequency of Use: Infrequent, might use the system on a whim or out of curiosity.
- Functionalities Used: Basic browsing and random recipe exploration.
- Technical Expertise: Basic.
- Pertinent Characteristics: Not particularly focused on cooking; more exploratory in nature.
- Importance: Low to moderate. Can offer insights into user-friendliness and general appeal.

1.4 Operating Environment

The Recipe Recommendation System is designed as a web application intended for optimal operation in the following environment:

- *Hardware Platform:* The software is platform-independent and can be accessed from any device with sufficient processing capabilities, including desktops, laptops
- *Operating System:* The system is OS-agnostic. However, for the best user experience, it's recommended to use updated versions of mainstream operating systems such as Windows, macOS, Linux
- *Web Browsers:* The software is specifically optimized for modern web browsers, with primary focus on:
 - Google Chrome (latest version recommended for best performance and compatibility).
 - Mozilla Firefox (again, latest version is recommended).
- *Network:* A stable internet connection is necessary for accessing the web app and its full range of features.
- *Coexistence:* The application is designed to peacefully coexist with other web applications and will not interfere with other browser tabs or processes. It is developed adhering to standard web protocols ensuring compatibility and smooth integration.

1.5 Design and Implementation Constraints

Language and Framework Limitations

- Python and Flask Performance dips might be observed if concurrent users exceed 10,000 in real-time.

Dataset Collection

- Aim to gather 50,000 diverse and high-quality recipes by Q4 2023.
- Implement periodic data quality checks every 6 months.

Memory and Storage

- Pandas: Ensure backend server has at least 16GB RAM to efficiently handle large CSV files.
- Optimize data reading mechanisms by Q1 2024 to reduce memory overhead by 20%.

Integration and Compatibility

- Dedicate Q3 2023 for thorough testing and integration between Flask and React.
- Ensure 98% responsive design compatibility across devices ranging from 5-inch screens to 32-inch monitors by Q1 2024.

Deployment and Scalability

- Aim for a backend capable of scaling to handle up to 15,000 concurrent requests by Q2 2024.

Maintenance and Updates

- Schedule biannual updates for Flask to address potential browser and dependency changes.
- Allocate 4 weeks in Q2 and Q4 of each year for maintenance and updates.

External Libraries and Dependencies:

- Conduct quarterly reviews of all external libraries for potential updates or known issues.
- Set aside a 2-week buffer in Q3 2023 for addressing unexpected dependency-related issues.

1.6 Assumptions and Dependencies

Assumptions

- *Data Availability:* It is assumed that a sufficient and reliable dataset of recipes with detailed information, including ingredients, instructions, and nutritional data, will be available for use in the Recipe Recommendation System. The accuracy and completeness of this data could affect the system's performance.
- *Internet Connectivity:* The system assumes that users will have access to a stable internet connection to interact with the software. A lack of internet access could limit the system's functionality, especially when retrieving recipes or updates.

Dependencies

- *Third-Party Libraries and APIs:* The project may depend on third-party libraries or APIs for various functionalities, such as machine learning algorithms for recipe recommendations, nutritional data sources, or user authentication. Any changes or disruptions to these external dependencies could affect the system's functionality.
- *Database Management System (DBMS):* The project relies on a database system for storing user data, recipes, and pantry information. The choice of the DBMS and its proper functioning are critical to the system's performance and data integrity.
- *Hardware and Hosting:* The system's deployment depends on suitable hardware and hosting infrastructure. The availability and reliability of these resources could impact system uptime and performance.

- *External Data Sources:* The system may rely on external data sources for real-time information, such as ingredient prices or availability. Changes or unavailability of these sources may affect certain features, such as cost estimation for recipes.

2. External Interface Requirements

2.1 User Interfaces

Login Page:

- Purpose: The login page allows users to access their accounts and personalize their experience.
- Components:
 - i. Username and password fields.
 - ii. Veg/Non-veg
 - iii. Allergen List
 - iv. "Sign Up" link or button for new users.
 - v. Error Handling: Display error messages for incorrect login credentials.

Landing Page

- Purpose: The landing page provides an initial user experience, suggesting recipes based on previous history and viewed recipes.
- Components
 - i. Recipe recommendations based on user preferences.
 - ii. Navigation to browse and search for more recipes.
 - iii. Option to customize preferences.

Profile Page

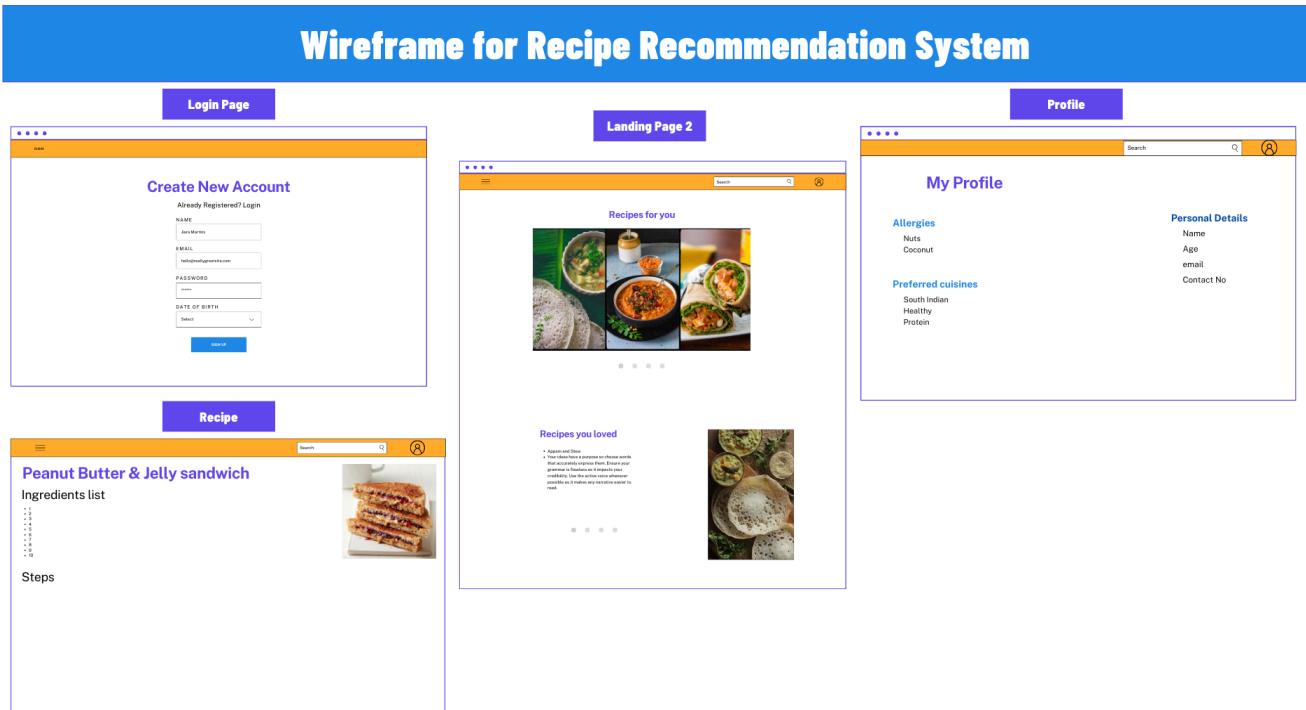
- Purpose: The profile page allows users to manage their account settings and view personalized information.
- Components
 - iv. User information (e.g., name).
 - v. Dietary requirements and preferences (e.g., vegetarian).
 - vi. Preferred cuisines (e.g., Italian, Asian).
 - vii. Option to edit profile information.

User History:

- Display a list of saved favourites.

Recipe Page:

- Purpose: The recipe page presents detailed information about a selected recipe.
- Components
 - viii. Recipe name, cuisine type, and cooking time.
 - ix. Ingredients list with quantities.
 - x. Step-by-step cooking instructions.
 - xi. Serving size and cooking tips.



2.2 Software Interfaces

Database: MySQL (Version: 8.0)

- Connection is established using the Python MySQL connector for data transfers.
- Incoming data includes user registration details, ingredient data, user preferences, feedback, and bookmarks.

- Outgoing data consists of recipe recommendations, user profile data, bookmarked recipes, and historical data of user interactions.

Backend Framework: Flask (Version: 2.x)

- Flask directly interfaces with the React frontend using HTTP/HTTPS requests.
- Incoming data from the frontend consists of user inputs like ingredients added to the pantry, user preferences, and feedback.
- Outgoing data sent to the frontend includes recipe recommendations, user data, and other relevant information.

Frontend Framework: Flask (Latest Version)

- Sends and receives HTTP/HTTPS requests to and from Flask.
- Incoming data from Flask includes recipe recommendations and user profile details.
- Outgoing data to Flask consists of user inputs like registration details and preferences.

Services & Communications:

- Flask acts as the middleman, processing frontend requests, and sending appropriate responses back to the frontend after interacting with the MySQL database.
- Communications between the frontend and backend follow RESTful API standards.

Data Sharing Mechanism:

- JSON (JavaScript Object Notation) format is used for data exchange between Back-end and Flask.

Implementation Constraints:

- ACID (Atomicity, Consistency, Isolation, Durability) properties will be maintained within MySQL.
- Global data areas should be minimized to prevent potential data inconsistencies.

2.3 Communications Interfaces

Web Browser Communications:

- Purpose: For users to interact with the Recipe Recommendation System.
- Protocol: HTTP/HTTPS for browser-server communication.
- Message Format: JSON for data exchange between frontend and backend.
- Security: Communications, especially user data and credentials, will be encrypted using HTTPS. SSL/TLS certificates will ensure data privacy.

- Data Transfer Rates: Approximate rate of 100-500 requests per second, depending on server scalability and user traffic.

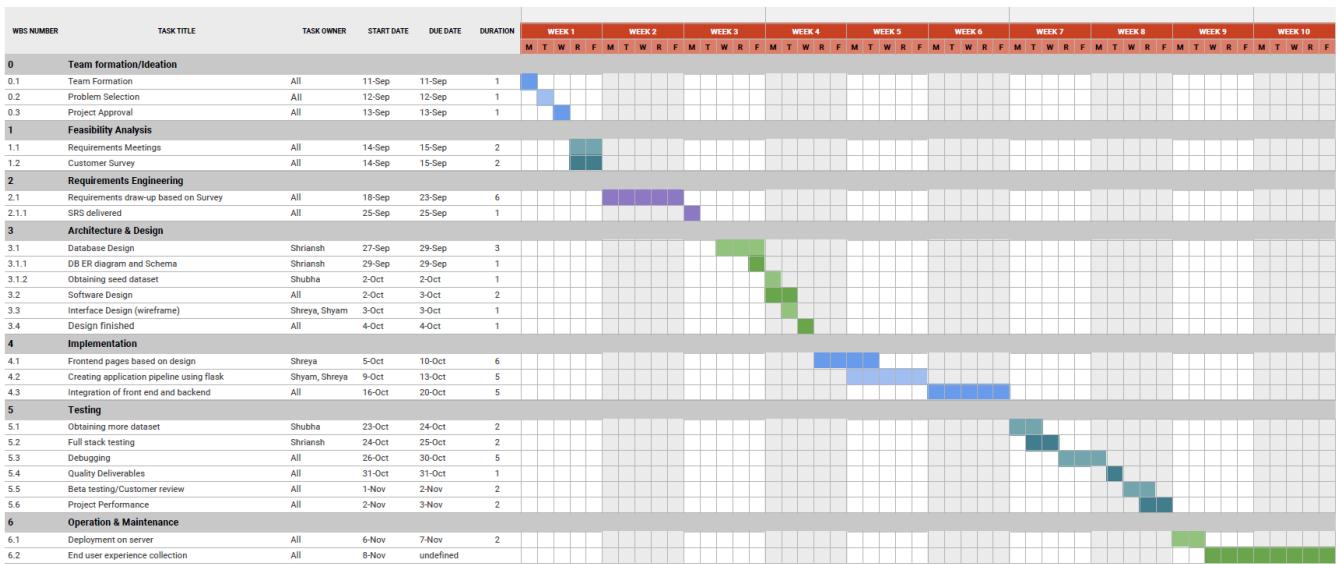
Database Communications:

- Purpose: Fetching and storing user data, recipes, and other information.
- Protocol: MySQL's native protocol for interaction with the Flask backend.
- Message Format: SQL queries for data operations.
- Security: Connections use encrypted MySQL connections. Passwords and data will be hashed or encrypted before storage.
- Data Transfer Rates: Approximate rate of 50-200 queries per second, based on query efficiency and database optimization.

3. Project Plan with Gantt Chart (Baseline)

GANTT CHART

PROJECT TITLE - RECIPE RECOMMENDATION SYSTEM



4. Architecture & Design Choices and Diagrams

Architecture & Design Choices

Database: MySQL (Version: 8.0)

- Connection is established using the Python MySQL connector for data transfers.
- Incoming data includes user registration details, ingredient data, user preferences, feedback, and bookmarks.
- Outgoing data consists of recipe recommendations, user profile data, bookmarked recipes, and historical data of user interactions.

Backend Framework: Flask (Version: 2.x)

- Flask directly interfaces with the React frontend using HTTP/HTTPS requests.
- Incoming data from the frontend consists of user inputs like ingredients added to the pantry, user preferences, and feedback.
- Outgoing data sent to the frontend includes recipe recommendations, user data, and other relevant information.

Frontend Framework: React (Latest Version)

- React sends and receives HTTP/HTTPS requests to and from Flask.
- Incoming data from Flask includes recipe recommendations and user profile details.
- Outgoing data to Flask consists of user inputs like registration details and preferences.

Services & Communications:

- Flask acts as the middleman, processing frontend requests, and sending appropriate responses back to the frontend after interacting with the MySQL database.
- Communications between the frontend and backend follow RESTful API standards.

Data Sharing Mechanism:

- JSON (JavaScript Object Notation) format is used for data exchange between React and Flask.

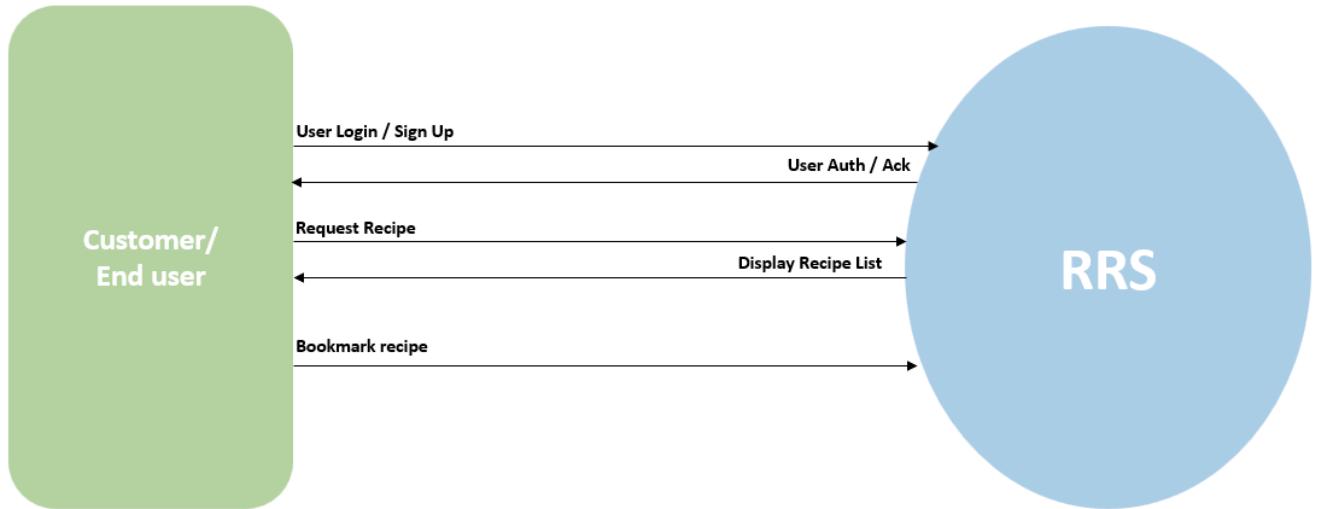
Implementation Constraints:

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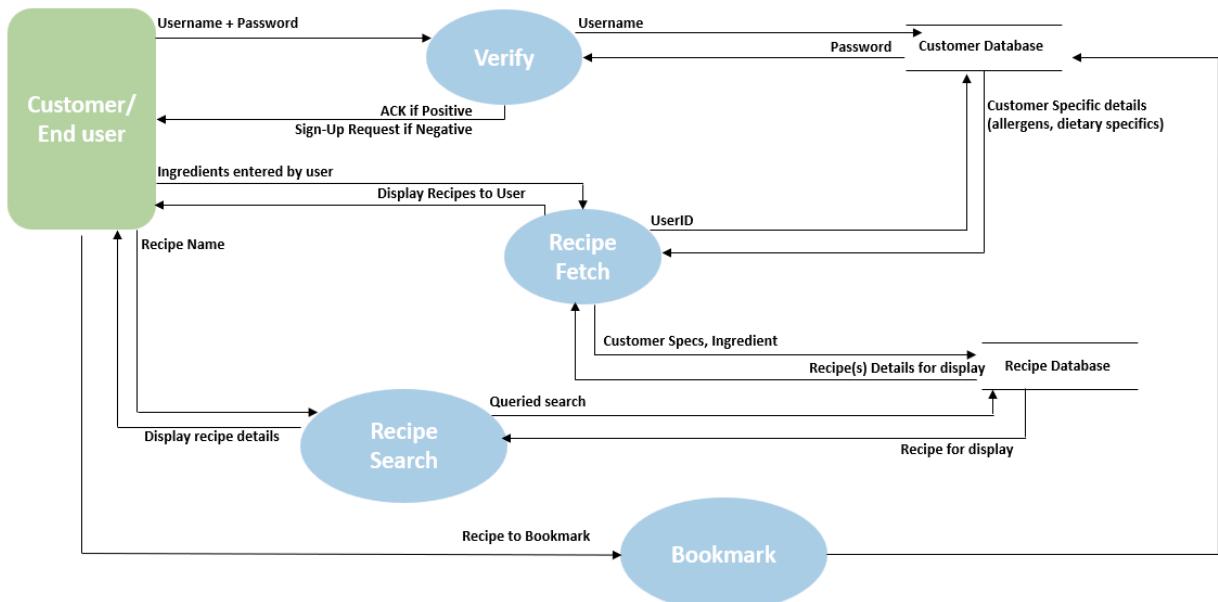
Design Diagrams

Diagrams of Levels of DFD

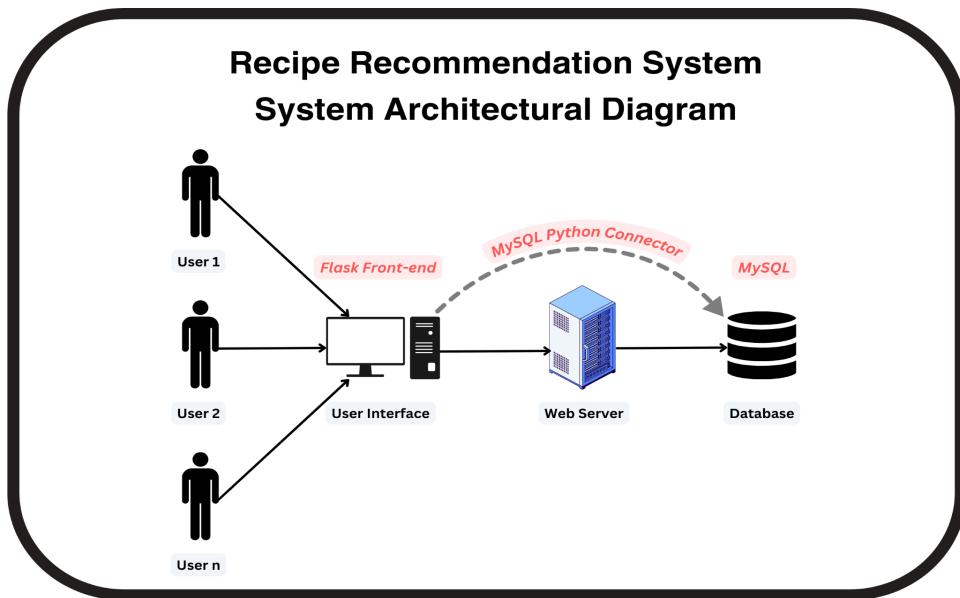
Level - 0 DFD:



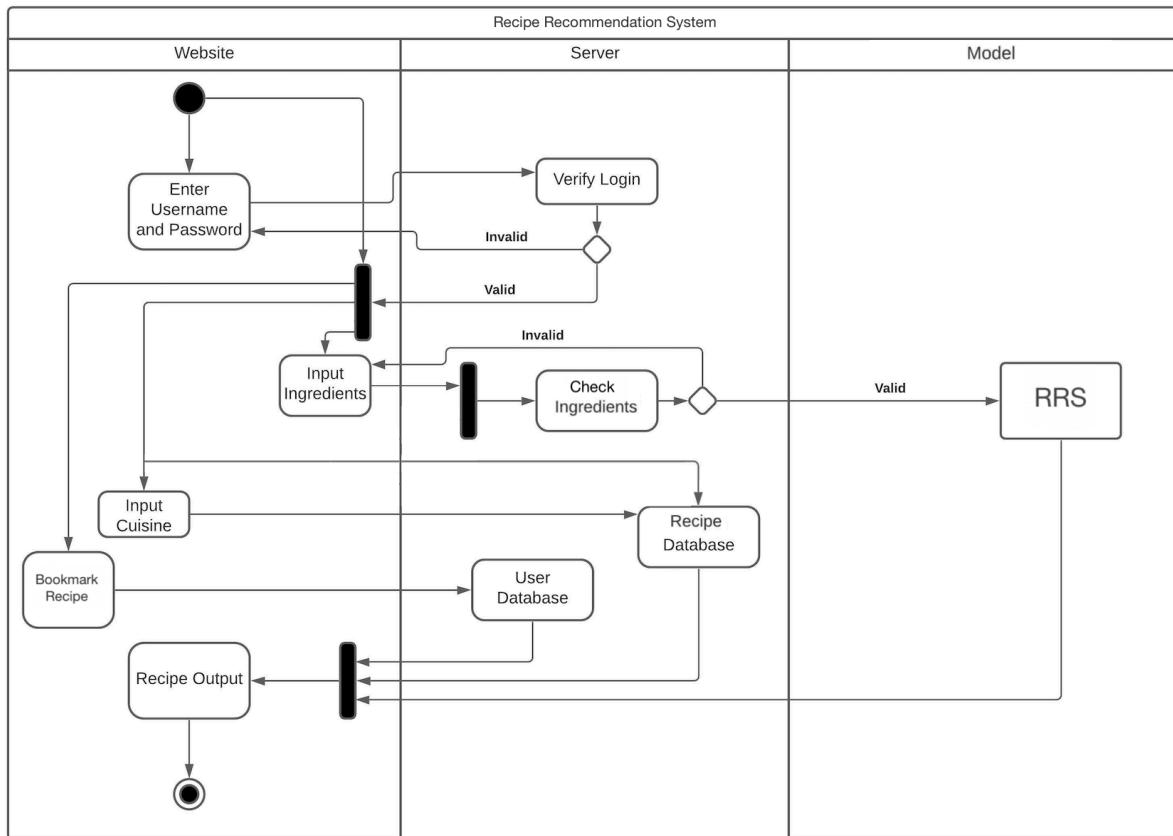
Level - 1 DFD



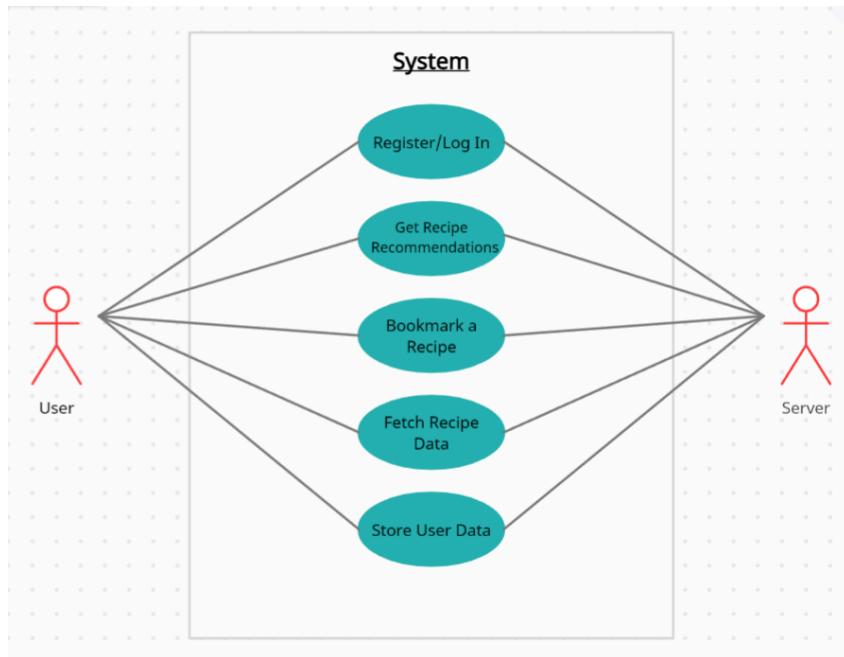
Architectural Design



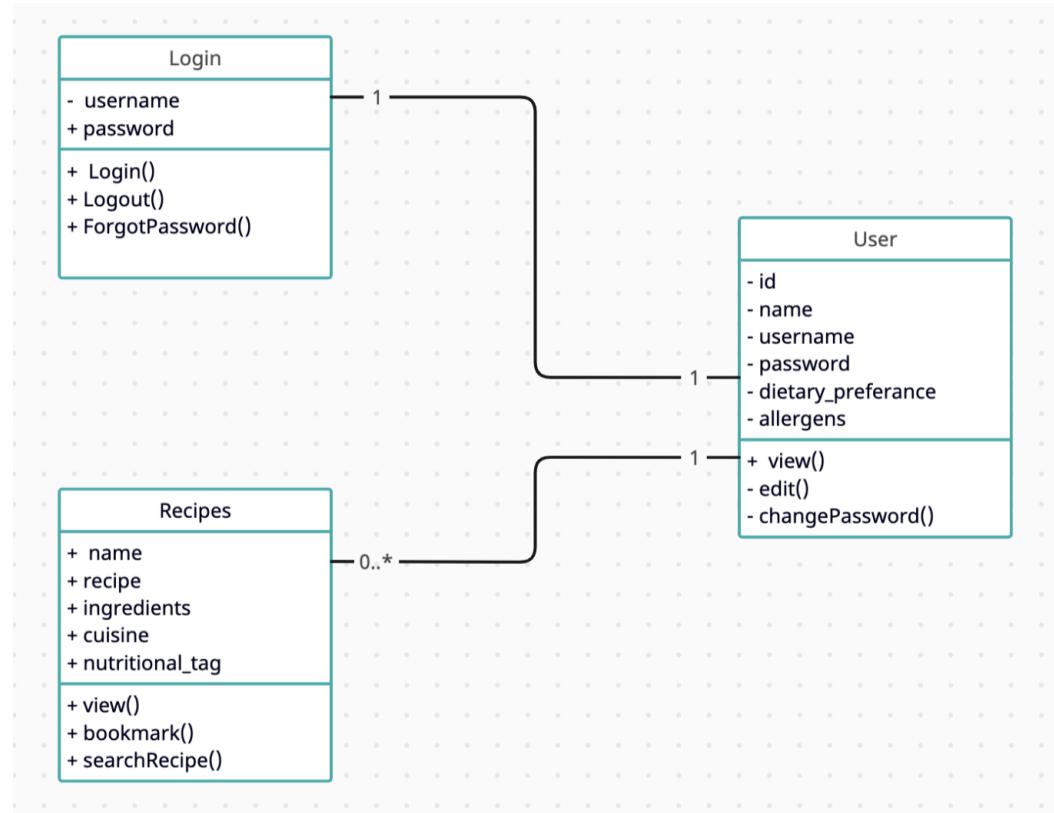
UML



Use Case Diagram



Class Diagram



5. Development - Code Files [Git link]

URL: <https://github.com/objectage/RecipeRec>

6. Test Plans

Purpose of the Plan

The purpose of this Test Plan is to outline a structured approach to the testing of the Recipe Recommendation System (RRS). This document will serve as a guide for the testing team, stakeholders, and project management to understand the testing strategies, objectives, and processes that will be employed to ensure the system's functionality, reliability, performance, and security. It acts as a roadmap for all testing activities and a benchmark against which the testing phase can be evaluated.

Objectives and Goals of Testing-

The primary objectives and goals of testing the RRS are as follows:

- Verify Functionality: Ensure that all features of the RRS work according to the requirements and design specifications.
- Ensure Reliability: Confirm that the system performs consistently under various conditions and can handle expected loads.
- Assess Performance: Evaluate the system's responsiveness, speed, and stability under various workloads.
- Check Usability: Make sure the user interface is intuitive, accessible, and provides a positive user experience.
- Facilitate Maintenance: Identify and document defects and areas for improvement to assist in future maintenance efforts.

The goal is not only to identify defects but also to provide confidence in the software's quality and to ensure that it meets user expectations.

Test Cycle and Phases

The testing of the RRS will be succinct and focused, proceeding through the following streamlined phases up to unit testing:

1. Test Planning: Establishing the scope and approach for unit testing, defining resources, and identifying the units or components to be tested.
2. Test Preparation: Setting up a test environment with the necessary tools and frameworks, and preparing test data for individual units.
3. Unit Testing: Isolating each part of the application to verify its correctness in isolation. This includes:

- Testing individual functions and methods for expected behavior.
 - Ensuring that each unit handles both valid and invalid inputs gracefully.
 - Verifying that each unit returns the correct output for a given input.
4. Test Review: Assessing unit test coverage and results, documenting any defects or issues discovered, and providing feedback to the development team.
5. Defect Rectification: Addressing any issues found during unit testing, making necessary code adjustments, and retesting to confirm fixes.

7. Test Cases & Test Results Matrix

Test Case ID	Name of Module	Test Case Description	Pre-conditions	Test Steps	Test Data	Expected Results	Actual Results	Test Result
UT-01	Sign-up module	Testing the Sign-up functionality	Access to Google Chrome	1. Go to the Sign-up page 2. Enter all form related details 3. Click on Sign-up	Username - Y Password - 123 Vegnonveg - nonveg Allergens - 'nuts, egg'	Should print Sign-up Complete and redirect to login page	Prints Sign-up Complete and redirect to login page	Pass

← → C 127.0.0.1:8000/register

Recipe Recommendation System.

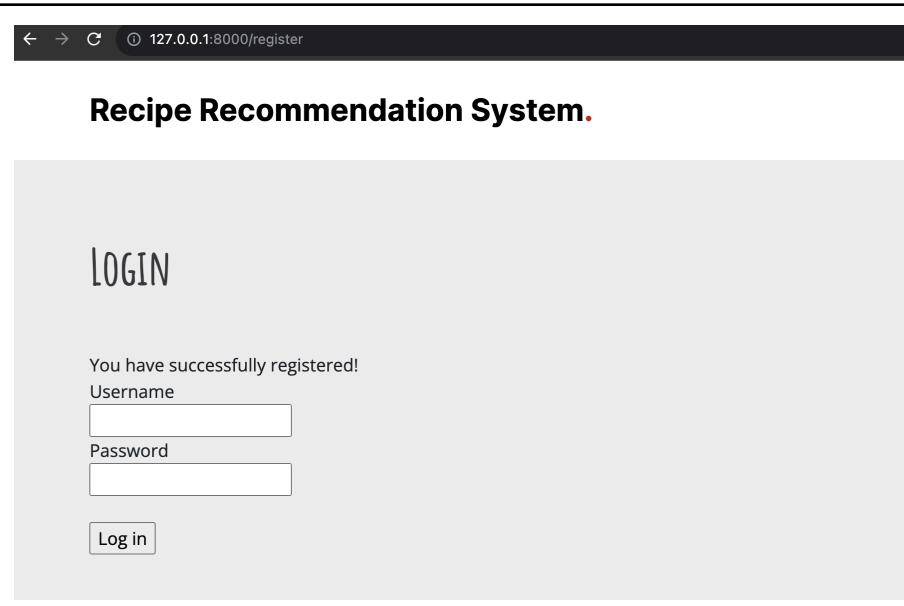
REGISTER

Username

Password

Veg/Non-Veg

Allergen List

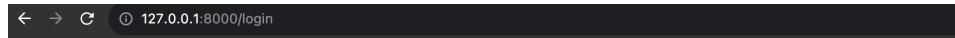
A screenshot of a web browser window. The address bar shows "127.0.0.1:8000/register". The page title is "Recipe Recommendation System." Below it, a large "LOGIN" header is displayed. A success message "You have successfully registered!" is shown. There are two input fields: "Username" and "Password", both currently empty. A "Log in" button is at the bottom.

UT-02	Sign-up module	Testing the Sign-up functionality	Access to Google Chrome	1. Go to the Sign-up page 2. Enter all form related details 3. Click on Sign-up	Username - shyam Password - 123 Vegnonveg - veg Allergens - 'nuts, egg'	Should print Sign-up Complete and redirect to login page	Prints Sign-up Complete and redirect to login page	Pass
UT-03	Sign-up module	Testing the Sign-up functionality	Access to Google Chrome	1. Go to the Sign-up page 2. Enter all form related details 3. Click on Sign-up	Username - ansh Password - 123 Vegnonveg - soya Allergens - 'nuts, egg'	Should print Invalid VegNonVeg entered and take an input again.	Prints Invalid VegNonVeg entered and take an input again.	Pass

UT-04	Sign-up module	Testing the Sign-up functionality	Access to Google Chrome	1. Go to the Sign-up page 2. Enter all form related details 3. Click on Sign-up	Username - foodie123 Password - 123 Vegnonveg - veg Allergens - 'nuts'	Should print Sign-up Complete and redirect to login page	Prints Sign-up Complete and redirect to login page	Pass
UT-05	Sign-up module	Testing the Sign-up functionality	Access to Google Chrome	1. Go to the Sign-up page 2. Enter all form related details 3. Click on Sign-up	Username - foodie Password - 123 Vegnonveg - nonveg Allergens - 'nuts'	Should print Sign-up Complete and redirect to login page	Prints Sign-up Complete and redirect to login page	Pass
UT-06	Sign-up module	Testing the Sign-up functionality	Access to Google Chrome	1. Go to the Sign-up page 2. Enter all form related details 3. Click on Sign-up	Username - ansh Password - 123 Vegnonveg - yolk Allergens - 'nuts, egg, soya'	Should print Invalid VegNonVeg entered and take an input again.	Prints Invalid VegNonVeg entered and take an input again.	Pass

UT-07	Sign-up module	Testing the Sign-up functionality	Access to Google Chrome	1. Go to the Sign-up page 2. Enter all form related details 3. Click on Sign-up	Username - foodie Password - 123 Vegnonveg - nonveg Allergens - 'nuts, egg, soya'	Should print Sign-up Complete and redirect to login page	Prints Sign-up Complete and redirect to login page	Pass
UT-08	Sign-up module	Testing the Sign-up functionality	Access to Google Chrome	1. Go to the Sign-up page 2. Enter all form related details 3. Click on Sign-up	Username - foodie Password - 123 Vegnonveg - nonveg Allergens - ''	Should print Sign-up Complete and redirect to login page	Prints Sign-up Complete and redirect to login page	Pass
UT-09	Sign-up module	Testing the Sign-up functionality	Access to Google Chrome	1. Go to the Sign-up page 2. Enter all form related details 3. Click on Sign-up	Username - _foodie_ Password - 123 Vegnonveg - veg Allergens - 'nuts, egg, soya'	Should give invalid username error.	Prints Sign-up Complete and redirect to login page	Fail
UT-10	Sign-up module	Testing the Sign-up functionality	Access to Google Chrome	1. Go to the Sign-up page 2. Enter all form related details 3. Click on Sign-up	Username - !heythere Password - 123 Vegnonveg - yolk Allergens - 'nuts, egg, soya'	Should give invalid username error.	Prints Sign-up Complete and redirect to login page	Fail

Test Case ID	Name of Module	Test Case Description	Pre-conditions	Test Steps	Test Data	Expected Results	Actual Results	Test Result
UT-11	Login module	Testing the Login functionality	Access to Google Chrome	1. Go to the Login page 2. Enter Username and password 3. Click on Signup	Username - foodie Password - 123	Should redirect to home page	Redirects to home page	Pass



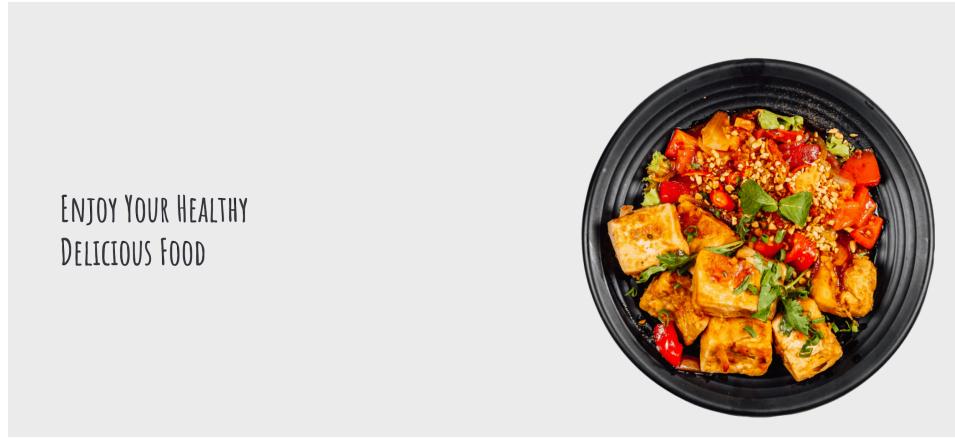
Recipe Recommendation System.

The screenshot shows a light gray background with the word "LOGIN" in large, bold, black capital letters at the top left. Below it is a form with two input fields: "Username" containing "foodie" and "Password" containing "...". At the bottom is a single button labeled "Log in".



Recipe Recommender.

[Recipe Recommender](#) [Bookmarks](#) [My Profile](#)



UT-12	Login module	Testing the Login functionality	Access to Google Chrome	1. Go to the Login page 2. Enter Username and password 3. Click on Signup	Username - foodie Password - 1234	Should print incorrect username or password prompt, back to login page	Prints incorrect username or password prompt, back to login page	Pass
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← → ⌛ 127.0.0.1:8000/login

Recipe Recommendation System.

LOGIN

Username

Password

← → ⌛ 127.0.0.1:8000/login

Recipe Recommendation System.

Error: Incorrect username/password!

Don't have an account? [Register](#)

Username

Password

UT-13	Login module	Testing the Login functionality	Access to Google Chrome	1. Go to the Login page 2. Enter Username and password 3. Click on Signup	Username - foodie1 Password - 123	Should redirect to home page	Redirects to home page	Pass
UT-14	Login module	Testing the Login functionality	Access to Google Chrome	1. Go to the Login page 2. Enter Username and password 3. Click on Signup	Username - foodie1 Password - 1234	Should print incorrect username or password prompt, back to login page	Prints incorrect username or password prompt, back to login page	Pass
UT-15	Login module	Testing the Login functionality	Access to Google Chrome	1. Go to the Login page 2. Enter Username and password 3. Click on Signup	Username - foodie1 Password - "	Should print incorrect username or password prompt, back to login page	Prints incorrect username or password prompt, back to login page	Pass
UT-16	Login module	Testing the Login functionality	Access to Google Chrome	1. Go to the Login page 2. Enter Username and password 3. Click on Signup	Username - " Password - 1234	Should print incorrect username or password prompt, back to login page	Prints incorrect username or password prompt, back to login page	Pass

UT-17	Login module	Testing the Login functionality	Access to Google Chrome	1. Go to the Login page 2. Enter Username and password 3. Click on Signup	Username - foodie2 Password - 123	Should redirect to home page	Redirects to home page	Pass
UT-18	Login module	Testing the Login functionality	Access to Google Chrome	1. Go to the Login page 2. Enter Username and password 3. Click on Signup	Username - foodie2 Password - 1234	Should print incorrect username or password prompt, back to login page	Prints incorrect username or password prompt, back to login page	Pass
Test Case ID	Name of Module	Test Case Description	Pre-conditions	Test Steps	Test Data	Expected Results	Actual Results	Test Result
UT-19	Recipe Search module	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Recipe Name- Masala Karela	Should display the list of recipes that contain the requested recipe	Display the list of recipes that contain the requested recipe	Pass

The screenshot shows a web browser window with the URL `127.0.0.1:8000/recipe_recommender`. The page title is "Recipe Recommender". The main content area contains a search form with the following fields:

- Recipe Name:** A text input field containing "masala karela".
- Ingredients (to include):** A text input field containing "Enter Ingredients to include".
- Ingredients (to exclude):** A text input field containing "Enter Ingredients to exclude".
- Cuisine:** A text input field containing "Enter Cuisine".
- Exclude Allergen:** A checkbox labeled "Exclude Allergen" which is unchecked.
- Non-Veg:** A dropdown menu currently set to "Non-Veg".
- Submit:** A red rectangular button labeled "Submit".

TOP 20 RECIPES

Sl No	Name	Time (mins)	Cuisine	Ingredients	Chef's Rating	
1	Masala Karela Recipe	45	Indian	salt,amchur (dry mango powder),karela (bitter gourd pavakkai),red chilli powder,gram flour (besan),onion,cumin seeds (jeera),coriander powder,turmeric powder,sunflower oil	10	Lets make it!

← → C 127.0.0.1:8000/recipe_recommender Relaunch to update

Recipe Recommender.

[Recipe Recommender](#) [Bookmarks](#) [My Profile](#)

Recipe Name:

Ingredients (to include):

Ingredients (to exclude):

Cuisine:

Exclude Allergen
Non-Veg

SEARCH BY

TOP 20 RECIPES

Sl No	Name	Time (mins)	Cuisine	Ingredients	Chef's Rating
No recipes found					

UT-21	Recipe Search module With allergen flag	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on allergen flag tab 4. Click on search	Recipe Name - Cake Allergen list- 'Egg'	Should display the list of recipes that contain the requested recipe without the specified allergens	Displays the list of recipes that contain the requested recipe without the specified allergens	Pass
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MY PROFILE

Username	foodie
Dietary Preference	veg
Allergen List	egg

Recipe Recommender.

[Recipe Recommender](#) [Bookmarks](#) [My Profile](#)

Recipe Name:

Ingredients (to include):

Ingredients (to exclude):

Cuisine:

Exclude Allergen

SEARCH BY

TOP 20 RECIPES

Sl No	Name	Time (mins)	Cuisine	Ingredients	Chef's Rating	
1	Leftover Carrot Cake Mini Trifle Recipe	60	Continental	cheese,britannia,butter cold,sugar,vanilla,icing sugar (ml),instant oats (oatmeal),flour (maida),butter,carrot cake recipe leftover,walnuts	9	Lets make it!
2	Shanghai Style Chap Nian Gao Recipes (Stir Fried Rice Cakes Recipes)	100	Chinese	salt,corn flour,bok choy,carrot,dark soy sauce,sugar,bean paste,button mushrooms,rice flour,red chilli sauce,cabbage (patta gobi muttaikose),sunflower oil	9	Lets make it!
3	Eggless Whole wheat And Orange Almond Cake Recipe	45	Continental	baking powder,wheat flour,salt,cinnamon powder (dalchini),pistachios,butter cold,baking soda,orange juice canned,almond meal (badam powder),vanilla,badam (almond),condensed milk,buttermilk,walnuts,sunflower oil	9	Lets make it!
4	Buckwheat Apple Cinnamon Loaf Cake Recipe	40	Continental	baking powder,corn flour,brown sugar (demerara sugar) (alternatively icing sugar),milk,apple,gram butter soft,vanilla,buckwheat flour (kuttu ka atta),icing	8	Lets make it!

UT-22	Recipe Search module With allergen flag	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on allergen flag tab 4. Click on search	Recipe Name - Masala Karela Kaju Katli Allergen list- 'Egg, soya'	Should display error message saying requested recipe not found.	Displays error message saying requested recipe not found	Pass
UT-23	Recipe Search module With allergen flag	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on allergen flag tab 4. Click on search	Recipe Name - Masala Karela Allergen list- ''	Should display the list of recipes that contain the requested recipe without the specified allergens	Displays the list of recipes that contain the requested recipe without the specified allergens	Pass

UT-24	Recipe Search module With allergen flag	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on allergen flag tab 4. Click on search	Recipe Name - Masala Karela Kaju Katli Allergen list-“	Should display error message saying requested recipe not found.	Displays error message saying requested recipe not found	Pass
UT-25	Recipe Search module	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Recipe Name- Rice Balls	Should display the list of recipes that contain the requested recipe	Display the list of recipes that contain the requested recipe	Pass
UT-26	Recipe Search module	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Recipe Name- Rice Ball	Should display the list of recipes that contain the requested recipe	Display the list of recipes that contain the requested recipe	Pass

Test Case ID	Name of Module	Test Case Description	Pre-conditions	Test Steps	Test Data	Expected Results	Actual Results	Test Result
UT-27	Recipe Search with ingredients module	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Recommender Page 2. Enter Ingredients 3. Click on search	Ingredients - 'pepper, potato'	Should display all recipes that contain the requested ingredients, with hyperlinks to each recipe.	Displays all recipes that contain the requested ingredients, with hyperlinks to each recipe.	Pass

Recipe Recommender.[Recipe Recommender](#) [Bookmarks](#) [My Profile](#)

SEARCH BY

Recipe Name:

Ingredients (to include):

Ingredients (to exclude):

Cuisine:

Exclude Allergen
 Non-Veg

TOP 20 RECIPES

Sl No	Name	Time (mins)	Cuisine	Ingredients	Chef's Rating	
1	Moroccan Lentil Stew Recipe With Raisins	45	African	tomato,coriander (dhania) leaves,paprika powder,virgin olive oil,carrot,onion,garlic powder,cumin seeds (jeera),turmeric powder,sweet potato,salt,raisins,lemon,stalk celery,vegetable stock,white pepper powder,water,green moong dal (split) hour,ginger,cinnamon stick (dalchini),coriander powder,cloves (laung)	10	Lets make it!
2	Fenugreek Vegetable Lu Vegetable Recipe - Sweet Own & Fangrik Layaves Vegetable	40	North Indian	salt,sweet potato skin,green chilli,methi leaves (fenugreek leaves),cumin seeds (jeera),black pepper powder,coriander powder,turmeric powder	10	Lets make it!
	Vegetarian Pot	yellow bell pepper (capsicum),(or milk,tme leaves,corn kernels,cloves garlic,carrot,onion,sunflower oil,salt,wheat flour,red bell pepper (capsicum),potato (aloo) (or sweet potato),eggs,broccoli cauliflower florets,tme leaves,tabasco	...	Lets

UT-28	Recipe Search with ingredients module	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Recommender Page 2. Enter Ingredients 3. Click on search	Ingredients - 'pepper, pen'	Should display all recipes that contain the requested ingredients, with hyperlinks to each recipe.	Displays all recipes that contain the requested ingredients, with hyperlinks to each recipe.	Pass
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Recipe Recommender.[Recipe Recommender](#) [Bookmarks](#) [My Profile](#)

SEARCH BY

TOP 20 RECIPES

SI No	Name	Time (mins)	Cuisine	Ingredients	Chef's Rating
No recipes found					

UT-29	Recipe Search with ingredients module	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Recommender Page 2. Enter Ingredients 3. Click on search	Ingredients - 'pen'	Should display a message saying no recipes found.	Display a message saying no recipes found.	Pass
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UT-30	Recipe Search with ingredients module	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Recommender Page 2. Enter Ingredients 3. Click on search	Ingredients - 'pepper, potato, pasta'	Should display all recipes that contain the requested ingredients, with hyperlinks to each recipe.	Displays all recipes that contain the requested ingredients, with hyperlinks to each recipe.	Pass
UT-31	Recipe Search with ingredients module	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Recommender Page 2. Enter Ingredients 3. Click on search	Ingredients - 'Pen, paper'	Should display a message saying no recipes found.	Display a message saying no recipes found.	Pass
UT-32	Recipe Search with ingredients module	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Recommender Page 2. Enter Ingredients 3. Click on search	Ingredients - ''	Should display all recipes present	Display all recipes present.	Pass
UT-33	Recipe Search with ingredients module	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Recommender Page 2. Enter Ingredients 3. Click on search	Ingredients - 'curry leaves, ginger'	Should display all recipes that contain the requested ingredients, with hyperlinks to each recipe.	Displays all recipes that contain the requested ingredients, with hyperlinks to each recipe.	Pass

UT-34	Recipe Search with ingredients module	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Recommender Page 2. Enter Ingredients 3. Click on search	Ingredients - 'tomato, coriander'	Should display all recipes that contain the requested ingredients, with hyperlinks to each recipe.	Displays all recipes that contain the requested ingredients, with hyperlinks to each recipe.	Pass
Test Case ID	Name of Module	Test Case Description	Pre-conditions	Test Steps	Test Data	Expected Results	Actual Results	Test Result
UT-35	Recipe Filter module with cuisine	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Cuisine - Italian	Should display all the recipes that are under the requested cuisine along with hyperlinks.	Display all the recipes that are under the requested cuisine along with hyperlinks	Pass

Recipe Recommender.[Recipe Recommender](#) [Bookmarks](#) [My Profile](#)

SEARCH BY

Recipe Name:

Ingredients (to include):

Ingredients (to exclude):

Cuisine:

Exclude Allergen

TOP 20 RECIPES

Sl No	Name	Time (mins)	Cuisine	Ingredients	Chef's Rating	
1	Baked Pasta Recipe With Spinach And Artichoke	75	Italian	salt,penne pasta,milk,virgin olive oil,cloves garlic,feta cheese other soft cheese,onion,artichokes,spinach bunches,black olives,flour (maida),pepper,butter,dried oregano	10	Lets make it!
2	Italian Style Broccoli And Cauliflower Soup Recipe	30	Italian	tomato,salt,vegetable stock,cheese,paprika powder,black pepper powder,coriander (dhania) leaves,cauliflower (gobi),red chilli flakes,virgin olive oil,italian,onion,broccoli,garlic,carrot (red)	10	Lets make it!
3	Stuffed Mushroom Recipe With Italian Sausage	35	Italian	cheese,salt,pork sausage (italian sausage used here),britannia,paprika powder,button mushrooms (or portobello mushrooms),cheese (cheddar parmesan),parsley leaves,black pepper powder,virgin olive oil (virgin),dried oregano	10	Lets make it!
4	Creamy Mushroom Risotto Recipe	50	Italian	cheese,salt,vegetable stock,dried oregano powder,cloves garlic,onion,black pepper powder,green bell pepper (capsicum),button mushrooms,arborio rice,butter	9	Lets make it!

UT-36	Recipe Filter module with cuisine	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Cuisine - Italiano	Should throw an error for cuisine not being found.	Throws an error for cuisine not being found.	Pass
UT-37	Recipe Filter module with cuisine	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Cuisine - Udupi	Should display all the recipes that are under the requested cuisine along with hyperlinks	Display all the recipes that are under the requested cuisine along with hyperlinks	Pass
UT-38	Recipe Filter module with cuisine	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Cuisine - Udupi	Should throw an error for cuisine not being found.	Throws an error for cuisine not being found.	Pass

UT-39	Recipe Filter module with cuisine	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Cuisine - Mexican	Should display all the recipes that are under the requested cuisine along with hyperlinks.	Display all the recipes that are under the requested cuisine along with hyperlinks	Pass
UT-40	Recipe Filter module with cuisine	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Cuisine - "	Should throw an error for cuisine not being found.	Throws an error for cuisine not being found.	Pass
UT-41	Recipe Filter module with cuisine	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Cuisine - French	Should display all the recipes that are under the requested cuisine along with hyperlinks.	Display all the recipes that are under the requested cuisine along with hyperlinks	Pass
UT-42	Recipe Filter module with cuisine	Testing the recipe searching functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Cuisine - France	Should throw an error for cuisine not being found.	Throws an error for cuisine not being found.	Pass
Test Case ID	Name of Module	Test Case Description	Pre-conditions	Test Steps	Test Data	Expected Results	Actual Results	Test Result
UT-43	Recipe Book-marking	Testing the recipe book-marking functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	RecipeName : Egg Dosa Recipe	Should save the bookmark info in db and give confirmation.	Saves the bookmark info in db and gives confirmation.	Pass

Recipe Recommender.[Recipe Recommender](#) [Bookmarks](#) [My Profile](#)

EGG DOSA RECIPE

PREP TIME: 28 MINS

INGREDIENT COUNT: 7

[Bookmark](#)**Recipe Recommender.**[Recipe Recommender](#) [Bookmarks](#) [My Profile](#)

EGG DOSA RECIPE

PREP TIME: 28 MINS

INGREDIENT COUNT: 7

Recipe bookmarked!

[Bookmark](#)

← → ⌂ 127.0.0.1:8000/bookmarks

Relaunch to update

Recipe Recommender.[Recipe Recommender](#) [Bookmarks](#) [My Profile](#)YOUR FAVOURITE
RECIPES

Name	Time (mins)	Cuisine	Ingredient Count	Chef's rating	Action
Egg Dosa Recipe	28	South Indian	12	7	Lets make it!

UT-44	Recipe Book-marking	Testing the recipe book-marking functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Username-foodie Recipe ID - 4	Should save the bookmark info in db and give confirmation.	Saves the bookmark info in db and gives confirmation.	Pass
UT-45	Recipe Book-marking	Testing the recipe book-marking functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Username-D5G3G Recipe ID - 4	Should give invalid username/recipe_id error.	Gives invalid username/recipe_id error.	Pass
UT-46	Recipe Book-marking	Testing the recipe book-marking functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Username-D5G3G Recipe ID - R45T	Should give invalid username/recipe_id error.	Gives invalid username/recipe_id error.	Pass
UT-47	Recipe Book-marking	Testing the recipe book-marking functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Username-“ Recipe ID - 1	Should give invalid username/recipe_id error.	Gives invalid username/recipe_id error.	Pass
UT-48	Recipe Book-marking	Testing the recipe book-marking functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Username-foodie Recipe ID - “	Should give invalid username/recipe_id error.	Gives invalid username/recipe_id error.	Pass
UT-49	Recipe Book-marking	Testing the recipe book-marking functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Username-foodie3 Recipe ID - 543	Should save the bookmark info in db and give confirmation.	Saves the bookmark info in db and gives confirmation.	Pass

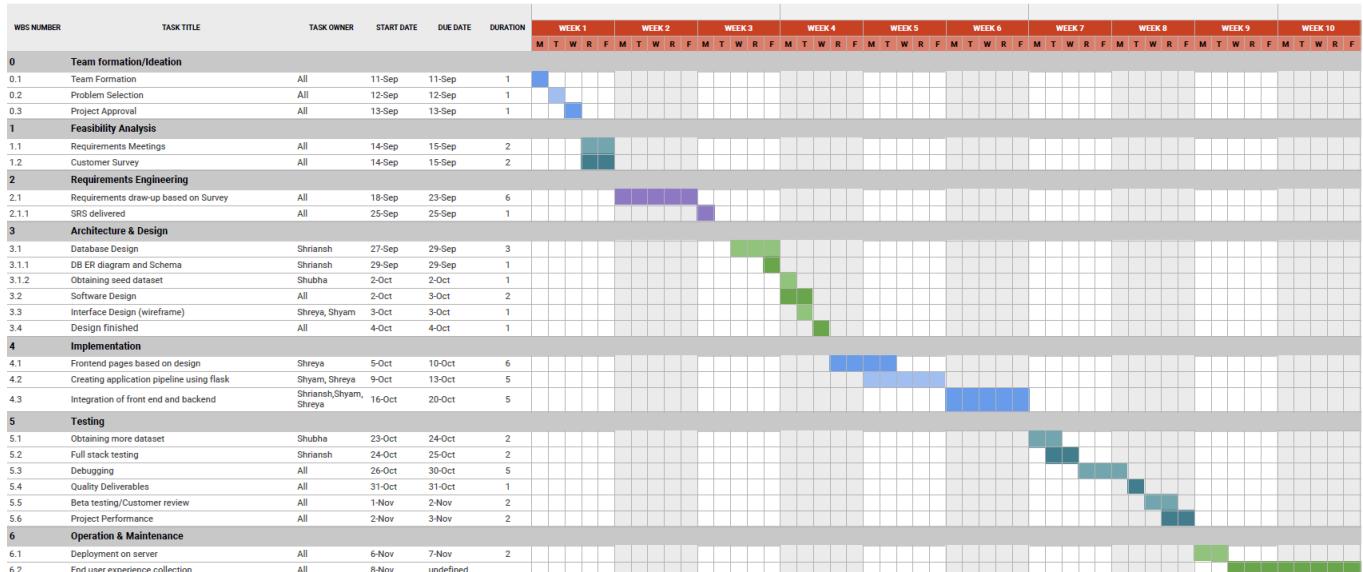
UT-50	Recipe Book-marking	Testing the recipe book-marking functionality	Access to Google Chrome and logged into RRS	1. Go to the Home page 2. Enter recipe name 3. Click on search	Username- ILUVU Recipe ID - 453	Should save the bookmark info in db and give confirmation.	Saves the bookmark info in db and gives confirmation.	Pass
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8. Final Gantt Chart (Baseline and Final Timelines)

Baseline Chart—

GANTT CHART (BASELINE)

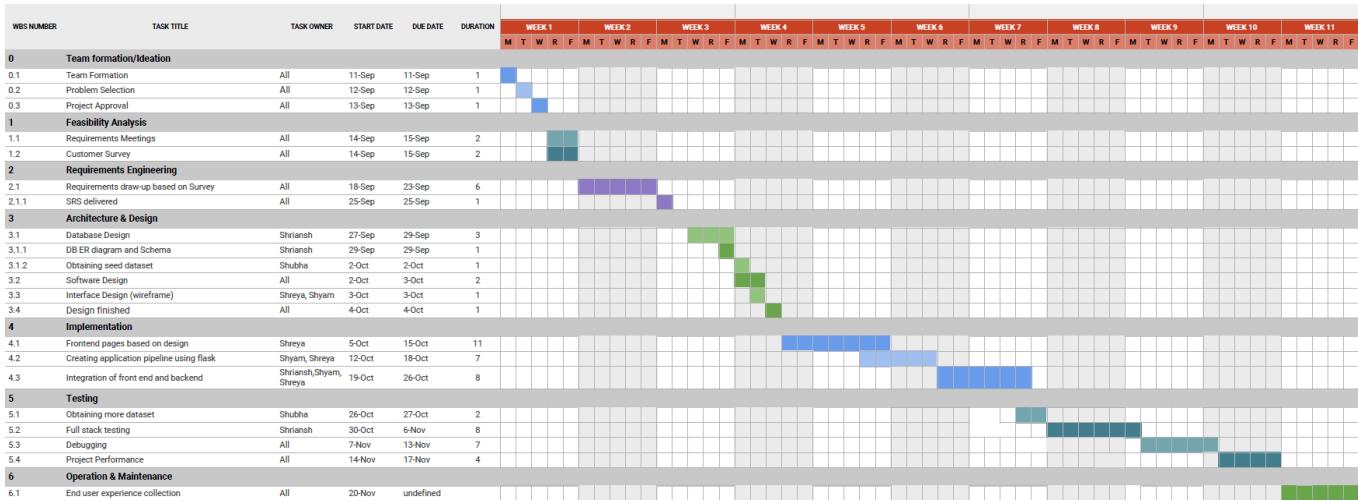
PROJECT TITLE - RECIPE RECOMMENDATION SYSTEM



Final Timeline Chart-

GANTT CHART (FINAL)

PROJECT TITLE - RECIPE RECOMMENDATION SYSTEM



9. Conclusions

The Recipe Recommendation System (RecipeRec) project successfully demonstrates a functional and user-friendly solution to everyday meal planning challenges. By integrating Flask and MySQL, the system efficiently processes user input to deliver personalized recipe suggestions that cater to a wide array of dietary preferences and restrictions.

Key achievements of this project include:

- A robust user interface that simplifies the process of finding and managing recipes based on individual pantry items and dietary needs.
- Implementation of a flexible and responsive design that allows for seamless use across various devices.
- Development of a secure system that respects user privacy and ensures data protection, particularly for users with specific health-related dietary restrictions.
- Creation of a scalable platform ready to expand its recipe database and user base.
- The project underscores the potential of combining modern web technologies with smart data handling to create practical tools for daily life. Future enhancements could include integrating machine learning algorithms to further personalize recommendations and utilizing user feedback to continuously improve the accuracy of recipe suggestions.

In conclusion, RecipeRec stands as a testament to how technology can make a tangible difference in simplifying daily tasks, like meal preparation, and enhancing the user experience in the kitchen.

10. Appendix A: Glossary of Abbreviations and Acronyms

Adaptability: The system's ability to adjust to changing dietary trends, preferences, and culinary data sources to remain relevant over time.

Allergen Warnings: Notifications provided by the system for recipes containing allergenic ingredients, especially catering to users with specific food allergies or dietary restrictions.

Allergy-Prone Individuals: People with specific dietary restrictions or allergies who often find it challenging to locate suitable recipes.

Aspiring Home Cooks: Individuals interested in expanding their culinary skills and looking for new recipes to try.

Avoiding Harmful Recommendations: The requirement that the system does not suggest recipes or ingredients that may be harmful to a user's health, considering dietary restrictions and health requirements.

Backend Framework: The software framework used to develop the backend of the system, which is Flask in this case.

Bookmark Favourites: The feature allows users to mark and save their preferred recipes for easy access.

Coexistence: The ability of the system to operate peacefully alongside other web applications without interfering with their functionality.

Concurrent User Handling: The system's capability to support a specified number of users simultaneously without a significant decrease in performance.

Correctness: The requirement that the system provides accurate recipe recommendations and nutritional information, ensuring the fulfilment of its core purpose.

Database: MySQL (Version 8.0): The database management system used in the system, which is MySQL in this case, specifying the version.

Database Communications: The processes and mechanisms related to the exchange of data between the system and the database.

Database Query Time: The requirement that database queries, including user data and recipe retrieval, should execute within a specified time frame.

Dataset Collection: The process of gathering a diverse and high-quality dataset of recipes with detailed information, including ingredients, instructions, and nutritional data.

Data Sharing Mechanism: The method or format used for data exchange between system components, often specified as JSON (JavaScript Object Notation) in this context.

Data Synchronisation Time: The requirement that data synchronisation across different user devices should occur within a specified time frame.

Deployment and Scalability: The system's capability to scale to handle a specified number of concurrent requests and the processes involved in deploying the system.

Description and Priority: The detailed explanation and importance level assigned to a specific feature or requirement within the system.

Developers: Individuals responsible for building and developing the system's software components and features.

Dietary Requirements: The dietary restrictions and preferences specified by users, such as vegetarian or gluten-free, that the system must accommodate in its recommendations and features.

Documentation Writers: Individuals responsible for creating comprehensive and accurate documentation for the software system.

Efficiency and Convenience: Characteristics ensuring the software performs its functions in a timely, effective manner and is user-friendly.

End Users: The individuals or entities who will interact with and utilise the software product upon its completion.

ER Diagram: (Entity-Relationship Diagram) - A visual representation of different entities within a system and their interrelationships.

External Libraries and Dependencies: Third-party codes, frameworks, or tools that the software relies upon to perform certain functions.

Frontend Framework: React (Latest Version): A JavaScript library utilised for developing the user interface of the application.

Functional Requirements: Descriptions of specific behaviours or functions of the system under defined conditions.

Gym Freaks: A user persona which may prioritise recipes and food recommendations conducive to a gym-friendly diet.

Hardware Platform: The physical technological environment (e.g., servers, computers, or mobile devices) where the software system will be deployed and operated.

Image Loading Time: The duration taken to successfully display an image on the user interface once requested.

Implementation Constraints: Limitations and restrictions that could affect the development and deployment of the software.

Incident Response Plan: A predetermined strategy or approach detailing the processes to follow when a cybersecurity incident occurs.

Integration and Compatibility: The software's ability to operate with and alongside other systems or platforms without conflict.

Interoperability: The capability of the software to exchange and utilise information across different systems and environments.

Landing Page: The initial web page users encounter, often serving as an introduction or overview of the application.

Language and Framework Limitations: The restrictions or shortcomings experienced due to the chosen programming languages and frameworks.

Logging and Monitoring: The practice of recording system activities and overseeing operational processes to ensure system health and security.

Login Authentication: The process of verifying a user's identity by validating their credentials upon login.

Login Page: A web page where users provide credentials (e.g., username, password) to access personalised or restricted content.

Maintainability: The ease with which the software system can be modified to change or add functionalities, fix issues, and improve performance.

Maintenance and Updates: Ongoing activities to ensure the software continues to perform as required, including modifications, corrections, and enhancements.

Marketing Staff: Team members responsible for promoting the recipe recommendation system to users and stakeholders.

Memory and Storage: Pertaining to the hardware and software capabilities that manage and store data for the system.

Network: The infrastructure that facilitates the data exchange and communication between different parts of the system.

Operating System: The software that supports the system's basic functions, such as scheduling tasks and controlling peripherals.

Password Handling: Procedures and protocols employed to securely manage user password creation, storage, and verification.

Performance: The efficiency and capability of the system in processing requests and delivering services.

Personalization: Customising user experiences and recommendations based on their preferences and historical data.

Portability: The system's ability to operate and adapt across various environments and platforms without extensive reconfiguration.

Profile Page: A user interface that displays and allows the user to interact with their personal data and preferences.

Project Managers: Individuals tasked with planning, executing, and closing the project, ensuring it meets its goals and success criteria.

Recipe Details: Specific information about a recipe, such as ingredients, instructions, and possible variations.

Recipe Nutritional Information: Data relating to the nutritional content of a recipe, including calories, macronutrients, and micronutrients.

Recipe Page: A user interface that presents detailed information and instructions for a specific recipe.

Recipe Recommendations: Suggested recipes provided to the user based on various criteria, such as ingredients available and preferences.

Recommendation System: A subsystem or algorithm designed to provide personalised content suggestions to users.

Reliability: The system's ability to consistently perform its intended functions under specified conditions.

Response Time: The duration between a user's action/request and the system's reaction/response.

Safety Education and Disclaimer: Information and warnings provided to users about safe cooking practices and a disclaimer regarding dietary advice.

Scalability: The system's capacity to handle growth in users and data without compromising performance.

Secure API Communication: The safeguarded and encrypted exchange of data and information between the system and external data sources or APIs, ensuring data privacy and integrity (Reference: Glossary - Services & Communications).

Security: The protection of the system's data and user information from unauthorised access, breaches, and threats, encompassing measures to maintain data confidentiality, integrity, and availability (Reference: Glossary - Security Requirements).

Security Considerations: The set of requirements and strategies to ensure the safety and integrity of the system, including measures to safeguard against potential threats and vulnerabilities (Reference: Glossary - Security Requirements).

Services & Communications: The components and processes related to data exchange and interactions within the system, encompassing communication protocols and data transfer mechanisms (Reference: Glossary - Services & Communications).

Stimulus/Response Sequences: The series of actions or events initiated by the user (stimulus) and the corresponding system reactions (responses) that describe how the system should behave in various scenarios (Reference: Glossary - Stimulus/Response Sequences).

Testers: Individuals responsible for creating test cases and scenarios to validate that the system meets its requirements and functions as intended.

Usability: The degree to which the system's user interfaces are intuitive and user-friendly, ensuring a low learning curve and high user satisfaction.

Use Case Diagram: A visual representation that illustrates the interactions between system components and external actors, helping to understand and document system functionality.

User Authentication: The process of verifying the identity of users accessing the system, typically involving secure login procedures.

User History: A record of a user's interactions and activities within the system, often used for personalization and tracking purposes.

User Interaction Safety: Design considerations to ensure that the user interface does not encourage unsafe cooking practices or risky behaviour.

User Profile Management: Functionality allowing users to create, edit, and update their profiles, including personal information and preferences.

User Profiles: Individual user accounts with personal information and preferences that the system uses to customize the user experience.

User Registration/Login: The combination of user registration (account creation) and user login (access to the system with credentials).

Web Browser Communications: The means by which users interact with the system using web browsers, often involving HTTP/HTTPS protocols for communication.

Web Browsers: Software applications used to access and interact with web-based systems, including modern web browsers like Google Chrome and Mozilla Firefox.

11. Appendix B: RTM

Sl. no.	Requirement ID	Requirement Description	Justification	Test Case ID
1	RE-01	User Registration	Only safe and secure usernames allowed	UT-09
2	RE-01	User Registration	Only safe and secure usernames allowed	UT-10

12. Appendix C: Technology stack and References

Python Documentation-

Python Official Documentation

URL: <https://www.python.org/doc/>

MySQL Connector/Python Developer Guide-

Connecting MySQL and Python

URL: <https://dev.mysql.com/doc/connector-python/en/>

Flask Documentation-

Web Development with Python and Flask

URL: <https://flask.palletsprojects.com/en/2.0.x/>

CSS Documentation-

MDN Web Docs (CSS)

URL: <https://developer.mozilla.org/en-US/docs/Web/CSS>

HTML Documentation -

MDN Web Docs (HTML)

URL: <https://developer.mozilla.org/en-US/docs/Web/HTML>

pandas Documentation-

pandas 2.1.3 documentation

URL: <https://pandas.pydata.org/pandas-docs/version/2.1.3/>

Python `re` Module Documentation-

Python 3.12.0 documentation for regular expression operations

URL: <https://docs.python.org/3/library/re.html>