

Recipe Finder

A PROJECT REPORT

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CERTIFICATE

Certified that **Namrta Singh 202410116100129, Piyush Jain 202410116100141, and Samay Verma 202410116100177** has/ have carried out the project work having “**A Recipe Finder App**” (**Mini Project-I, K24MCA18P**) for **Master of Computer Application** from Dr. A.P.J. Abdul Kalam Technical University (AKTU) (formerly UPTU), Lucknow under my supervision. The project report embodies original work, and studies are carried out by the student himself/herself and the contents of the project report do not form the basis for the award of any other degree to the candidate or to anybody else from this or any other University/Institution.

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A Recipe Finder App
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ABSTRACT

Recipe Finder is a pioneering web application that uses home ingredients to make searching for recipes easier. It involves providing one or more ingredients so that the platform automatically displays a list of recipes to cook with efficiency, less food waste, an easy-to-use interface, and filter options that are enhanced and based on dietary requirements, cooking time, and the skill level of the user. The project uses modern web technologies such as Python (Flask), HTML, CSS, react, and MongoDB to ensure a robust and scalable application.

Ingredient-based search: Users input ingredients they have, and the system suggests relevant recipes. Advanced filtering: Options to filter recipes by dietary preferences, cooking time, and skill level. Customization: Save, modify, and rate recipes to suit individual tastes.

This project fills some of the lacking gaps in current recipe applications, such as filtering and personalization, by implementing features that would include search functionality by ingredient, full filtering functionalities, and the ability to modify recipes. The Recipe Finder also comes with API integration, such that it avails ample and diverse recipe databases for the users.

Keywords: Recipe Finder, Customization, User Engagement, Dietary Preferences, Web Application

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Chapter 1

Introduction

1.1 Overview

The Recipe Finder is an innovative web application that helps users in meal preparation by suggesting recipes based on the ingredients they have available. It aims to solve the everyday challenge of "what to cook" by providing tailored recipe options that save time and reduce food wastage. This platform allows users to make the best of their available resources and encourages creative cooking at home. Designed with simplicity and efficiency in mind, the Recipe Finder caters to individuals of all culinary skill levels, from beginners to seasoned home chefs.

The development of the Recipe Finder was a collaborative effort. The frontend was developed using HTML, CSS, and JavaScript to ensure that the interface is responsive and user-friendly. This part of the project, concerning the user experience, was handled by Namrta Singh. The connectivity with external APIs, specifically the Spoonacular API, which provides an extensive recipe database and ingredient information, was managed by Piyush Jain. Samay Verma has developed the system with database management to store and retrieve user preferences, recipes, and feedback. Together, all these components make a holistic, efficient system to fulfill the main goal of reducing food waste and improving the meal preparation process.

1.2 Project Description

The Recipe Finder application enables users to input ingredients they have available, and the system intelligently retrieves a list of recipes that match those ingredients. It incorporates advanced filtering options, enabling users

to refine their search based on dietary preferences, cooking time, and skill level. In addition, the platform provides features such as saving favorite recipes and personalizing them according to individual tastes, ensuring a highly engaging user experience.

1.3 Project Scope

- The scope of the Recipe Finder project is as follows:
- Target Audience: Those who want easy meal preparation, especially food waste reducers.
- Features: The search for recipes based on ingredients, advanced filtering, customization of recipes, and save and retrieve favorites.
- Impact: It encourages home cooking, promotes sustainable practices, and reduces food wastage through the effective use of leftover ingredients.

1.4 Hardware / Software Used in the Project

Hardware Requirements:

- Dual-core processor (for example, Intel i3 or equivalent)
- 4 GB RAM (minimum)
- 500 MB of available disk space
- Stable internet connection for API integration

Software Requirements:

- Backend: Python, Flask framework
- Frontend: HTML, CSS, JavaScript
- Database: SQLite or PostgreSQL
- Development Tools: Visual Studio Code, Git for version control

1.5 Functional Requirements

- The Recipe Finder must:
- Allow users to input ingredients and retrieve matching recipes.

- Provide advanced filtering options for dietary preferences, cooking time, and skill levels.
- Enable users to save and modify their favorite recipes.
- Integrate with external APIs to expand the recipe database.
- Generate user-friendly reports like popular recipes or frequently used ingredients.

1.6 Non-Functional Requirements

- Performance: The application must process user queries and display results within 2 seconds.
- Scalability: The system should handle increasing user traffic effectively.
- Availability: Ensure 99.9% uptime, with minimal server downtimes.
- Security: Protect user data with secure authentication and encrypted storage.
- Portability: The application should be accessible on various devices and browsers without compatibility issues.

Chapter 2

Feasibility Study

2.1. Technical Feasibility

This determines whether the technology and tools needed for the Recipe Finder are available and sufficient for development and deployment.

Technology Used:

The project uses well-established technologies such as Flask (backend) and HTML/CSS (frontend).

SQLite/PostgreSQL databases are lightweight yet robust enough to store recipes.

Infrastructure:

The application needs a dual-core processor, 4GB RAM, and stable internet connectivity, all of which are widely available.

Scalability:

The system can be scaled to accommodate more users with an upgrade of the database and hosting environment.

2.2. Operational Feasibility

This assesses how well the system will work in practice.

User Adaptation:

The intuitive design and ingredient-based search make it easy for users to operate the application.

Detailed instructions and a simple interface reduce the learning curve.

Operational Requirements:

Recipe data are constantly updated to ensure relevance and engagement.

It connects seamlessly with APIs for more recipes, which add functionality.

2.3. Behavioural Feasibility

This analyzes the acceptance and use of the system by users.

User-Friendly Design:

The application is designed with minimalist aesthetics and self-explanatory workflows, which are user-friendly.

Customization:

Saving recipes, modifying recipes, and filtering recipes according to dietary preferences enhance user engagement and satisfaction.

Feedback Mechanism:

Enabling rating and reviewing recipes gives a feeling of community and ownership.

2.4. Economic Feasibility

This analyzes the cost-effectiveness of the Recipe Finder application.

Development Costs:

The project utilizes open-source tools like Flask and SQLite, reducing costs.

Minimal hardware requirements ensure no significant upfront investment.

Maintenance Costs:

Routine updates and bug fixes can be handled by a small team, keeping costs low.

Potential Benefits:

Encouraging home cooking and reducing food waste provide long-term societal benefits.

Users are likely to save money by efficiently utilizing available ingredients.

Chapter 3

Project Objectives

The key features of the Recipe Finder project is to create a comprehensive platform that simplifies meal preparation while promoting sustainable practices. By providing a user-friendly interface, the application aims to cater to a diverse audience and ensure that everyone, regardless of their cooking expertise, can enjoy a seamless experience. Key objectives include:

1. **Enhancing User Experience:** The application is designed to make cooking easier and more enjoyable by offering intuitive features like ingredient-based searches and personalized recipe recommendations. It empowers users to explore their culinary creativity without feeling overwhelmed.
2. **Reducing Food Wastage:** By encouraging users to utilize ingredients they already have, the platform promotes responsible consumption and helps minimize food wastage. This aligns with global efforts to reduce environmental impact.
3. **Promoting Home Cooking:** The Recipe Finder fosters a culture of cooking at home by presenting users with accessible and practical recipe options. This not only contributes to healthier eating habits but also strengthens family bonds through shared culinary experiences.
4. **Supporting Diverse Dietary Needs:** Through advanced filtering options, users can search for recipes that align with their dietary preferences, such as vegan, gluten-free, or low-carb options. This inclusivity ensures that the application is relevant to a broad audience.
5. **Providing Customization Options:** The platform allows users to save, modify, and personalize recipes to suit their tastes and needs, making the cooking process more engaging and adaptable to individual lifestyles.

6. Integrating Technology for Efficiency: Leveraging modern web development tools and external APIs, the Recipe Finder ensures a smooth and responsive user experience, along with access to an extensive database of recipes.

- Enhancing User Experience: Give an intuitive platform that offers improved search and filtering options, which make it easy for users to find appropriate recipes in terms of preferences and constraints.
- Promote efficient use of ingredients to minimize waste.
- Customization and Personalization: Allow users to save and customize recipes to their liking and dietary requirements.
- Seamless API Integration: Use external recipe databases for diversity and accuracy in suggestions.
- Data-Driven Insights: Collect and analyze user feedback and preferences to constantly refine the platform.

Through these objectives, Recipe Finder will change the way users approach cooking and ingredient management.

Chapter 4

Hardware and Software Requirements

4.1 Hardware Requirements

- **Development Environment:**
 - Processor: Dual-core (e.g., Intel i3 or equivalent)
 - RAM: 4 GB or higher
 - Storage: Minimum 500 MB for application and database
 - Internet: Stable connection for API access
- **User Environment:**
 - Device: Desktop, laptop, or mobile device
 - Browser: Latest versions of Chrome, Firefox, or Safari

4.2 Software Requirements

- **Development Tools:**
 - Code Editor: Visual Studio Code
 - Version Control: Git
- **Frontend:**
 - HTML, CSS, JavaScript
- **Backend:**
 - Python (Flask Framework)
 - API Integration: Spoonacular API
- **Database:**
 - SQLite or PostgreSQL

Chapter 5

Project Flow

The Recipe Finder project follows a structured methodology to ensure efficient development and deployment:

5.1 Requirement Analysis:

- Identify user needs and common challenges in meal preparation.
- Define project objectives and scope.

5.2 Design Phase:

- Create wireframes and prototypes for the user interface.
- Design the database schema and application architecture.

5.2.1 Entity Relationship Diagram

- ER model stands for an Entity-Relationship model. It is a high-level data model. This model is used to define the data elements and relationship for a specified system.
- It develops a conceptual design for the database. It also develops a very simple and easy to design view of data.
- In ER modelling, the database structure is portrayed as a diagram called an entity-relationship diagram.

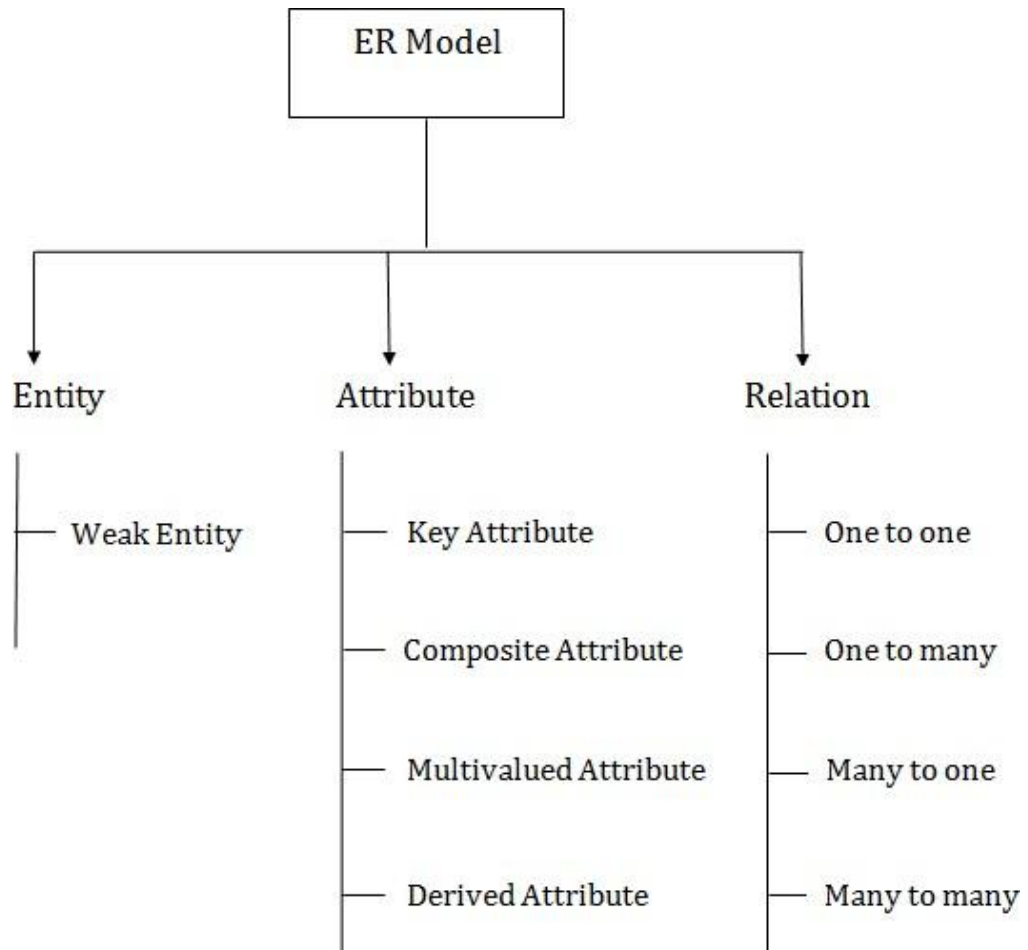


Fig 5.1 Er Model

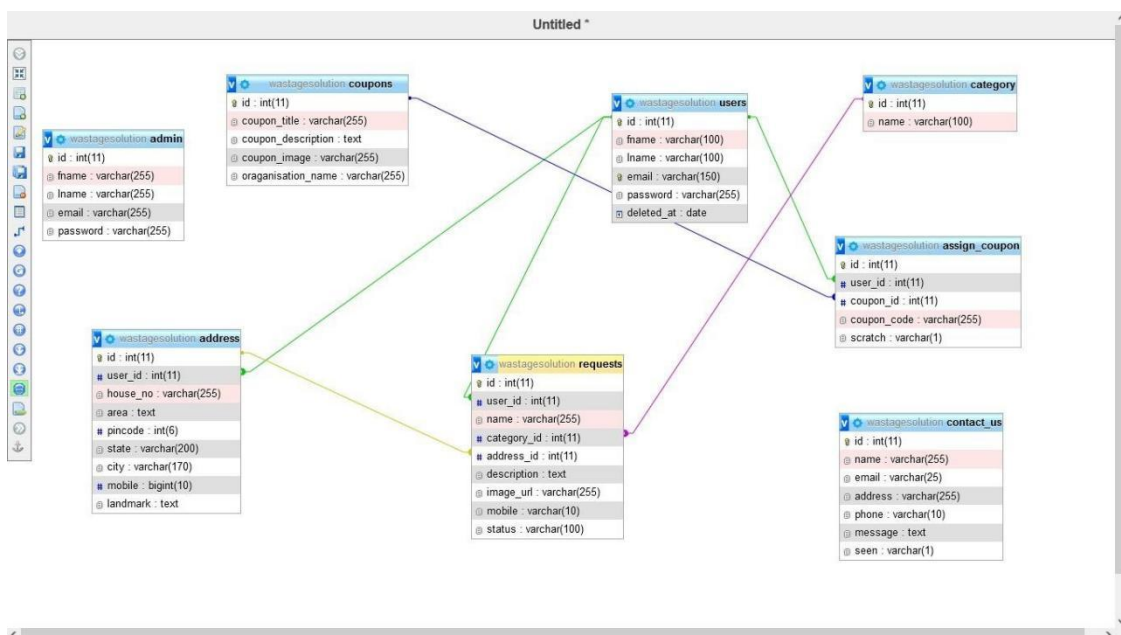


Fig 5.2 Er Diagram

5.2.3 Use Case Diagram

A use case diagram is used to represent the dynamic behavior of a system. It encapsulates the system's functionality by incorporating use cases, actors, and their relationships. It models the tasks, services, and functions required by a system/subsystem of an application. It depicts the high-level functionality of a system and also tells how the user handles a system. Following are the purposes of a use case diagram given below:

- It gathers the system's needs.
- It depicts the external view of the system.
- It recognizes the internal as well as external factors that influence the system.
- It represents the interaction between the actors.

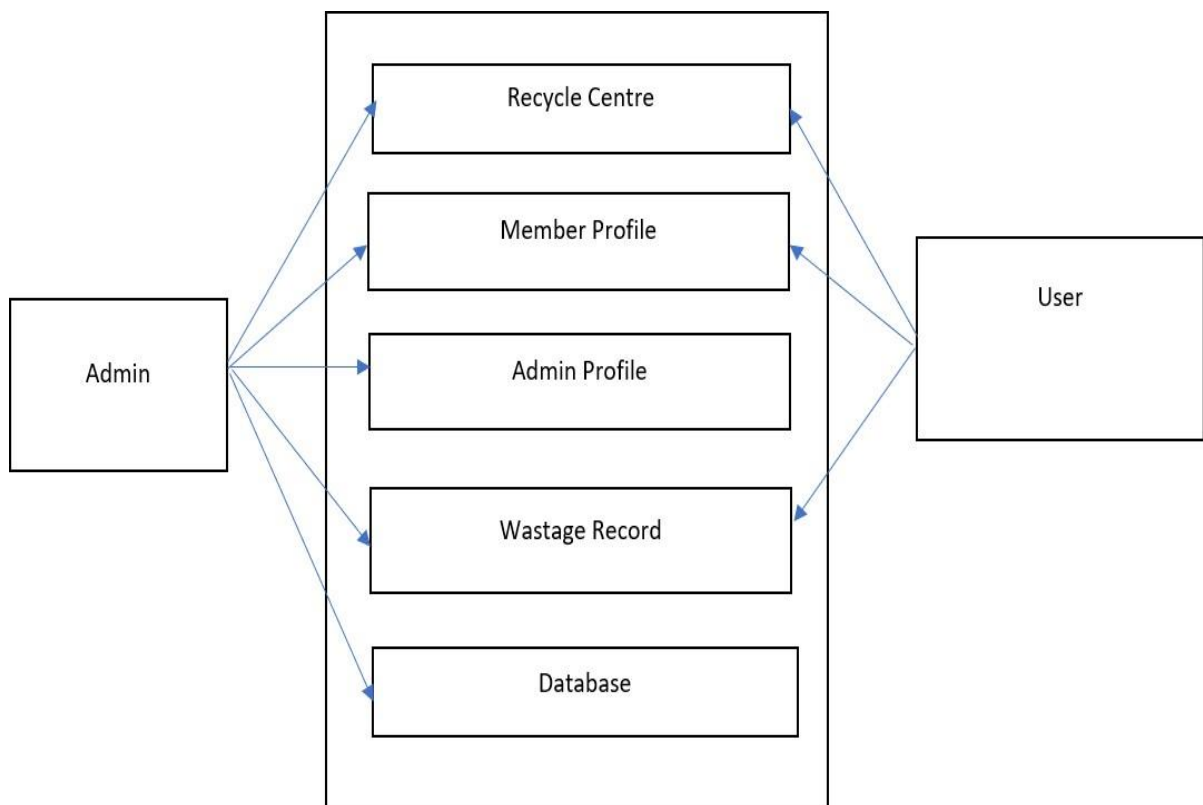


Fig 5.3 Use Case Diagram

5.3 Development:

- Frontend: Build a responsive interface using HTML, CSS, and JavaScript.

- Backend: Implement the application logic using Flask and integrate the Spoonacular API.
- Database: Initialize and tune the database with optimal storage and retrieval features.

5.4 Testing:

- Carry out functional, security and performance testing for reliability and usability.

5.5 Deployment and Feedback:

- Deploy the application and extract user feedback to enhance improvements.

This approach will create a smooth flow from idea generation to deployment and present a reliable, user-focused application.

Chapter 7

Project Outcomes

The Recipe Finder project successfully delivers the following outcomes:

1. **Simplified Meal Preparation:**

- Users can easily find recipes based on available ingredients, solving the daily challenge of "what to cook."
- Advanced filtering options (e.g., cooking time, dietary preferences) make the recipe selection process user-friendly and efficient.

2. **Promotes Sustainability:**

- By utilizing leftover ingredients effectively, the platform minimizes food wastage.
- Encourages responsible consumption and aligns with global sustainability goals.

3. **Enhanced User Experience:**

- Features like saving, modifying, and rating recipes provide a personalized cooking journey.
- A user-friendly dashboard tracks recent searches, saved recipes, and offers tailored suggestions.

4. **Leverages Modern Technologies:**

- Seamless API integration with Spoonacular enhances the recipe database for diverse options.
- Use of Flask for the backend ensures scalability and reliability.

5. **Premium Features:**

- A subscription model offers exclusive recipes, meal plans, and advanced tools like automated shopping lists.
- Supports continuous improvement with user feedback and content updates.

6. **Scalability and Future Scope:**

- The application is scalable to accommodate more users and features.
- Future enhancements include:
 - AI-driven recipe recommendations based on user history.
 - Mobile application support for on-the-go meal planning.
 - Integration with smart kitchen devices for real-time ingredient updates.

Below is the list of outcomes which clearly indicates that the project Recipe Finder has been achieved as per the defined objective.

Search and Filtering Mechanisms:

Users can search for recipes depending on ingredients they have; advanced filtering options enable a sort based on preparation time, dietary preferences, and level of expertise. Integration with the Spoonacular API enhances the recipe database to ensure that returned suggestions are diverse and precise.

User Dashboard:

Landing Page (Fig 7.1) is user dashboard. The dashboard provides users with an overview of their activity, including saved recipes, recent searches, and recommended dishes. This feature enhances user engagement by offering a personalized cooking journey.



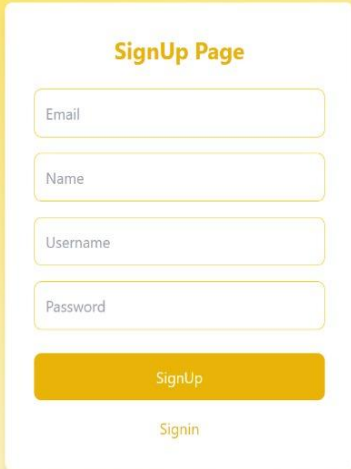
Fig. 7.1: landing page

Login and Registration System:

The application has secured login and registration system facilities provided to the users so they could prepare their personal accounts. By this feature, user's data will be stored, such as preferences and recipes saved. The design provided is intuitive, and one won't have much trouble making his/her registration(Fig.7.2).

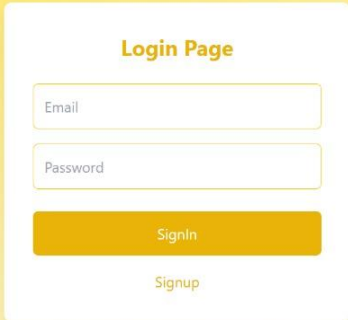
The home page offers an engaging user interface that allows users input ingredients or browse suggested recipes. This central hub will contain popular

recipes, user favorites, and filters for refining searches, thus giving users a more tailored experience when logging in(Fig.7.3).



The image shows a 'SignUp Page' form centered on a yellow gradient background. The form is a white card with a yellow border. It contains four input fields: 'Email', 'Name', 'Username', and 'Password', each with a yellow border. Below these fields is a large yellow 'SignUp' button. At the bottom of the card, there is a yellow link labeled 'Signin'.

Fig.7.2: SignUp page



The image shows a 'Login Page' form centered on a yellow gradient background. The form is a white card with a yellow border. It contains two input fields: 'Email' and 'Password', each with a yellow border. Below these fields is a large yellow 'Signin' button. At the bottom of the card, there is a yellow link labeled 'Signup'.

Fig 7.3: login page

Recipe Management:

A user can view recipes by step-by-step instructions as well as preparation times. Also user can follow 7-Day’s Gym Diet Plan shown in below(Fig.7.4).

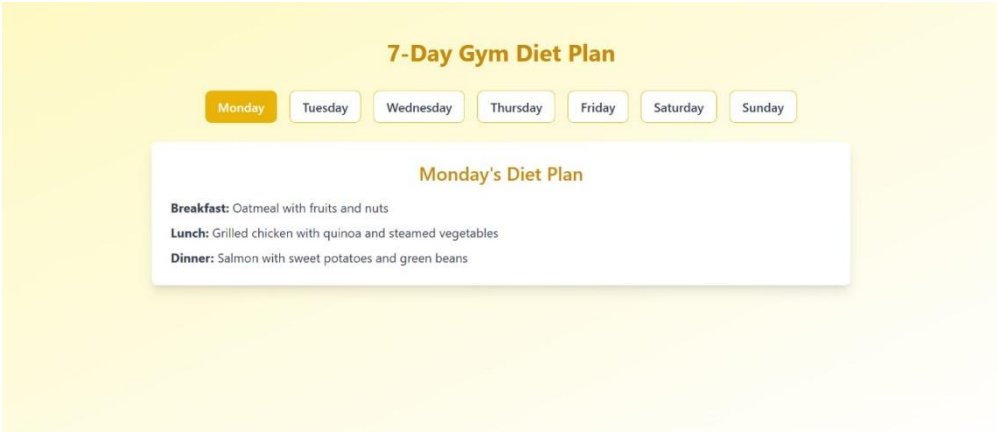


Fig 7.4: Diet Plan Page

Premium Functionality:

In below (Fig.7.5), buy premium can monitor platform usage, manage subscriptions, and review user feedback to ensure content quality and resolve any issues promptly. This back-end feature ensures the system's overall efficiency and reliability.

These outcomes collectively establish the Recipe Finder as a comprehensive tool for simplifying meal preparation and promoting sustainable cooking practices.

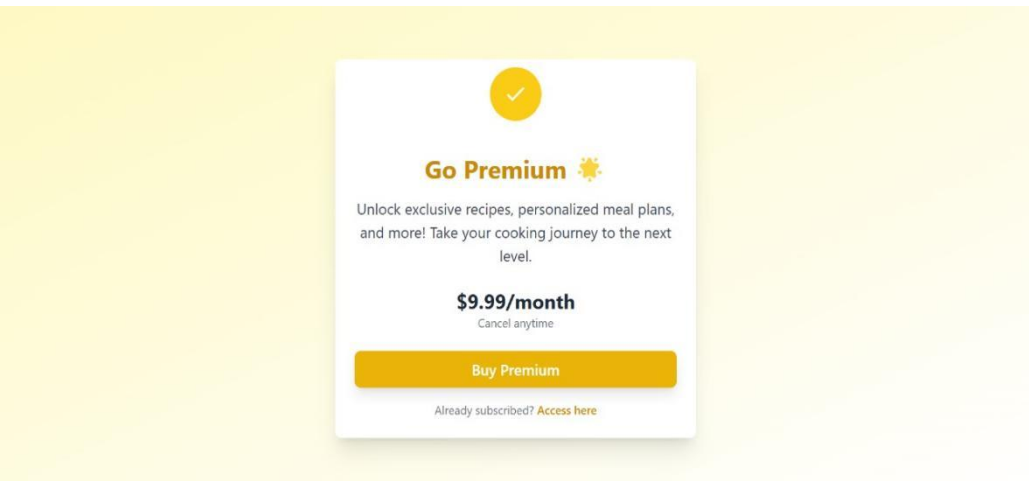


Fig 7.5: Subscription Page

Chapter 8

References

1. Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2010). Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies. U.S. Department of Education.
2. Kim, Y., & Seo, J. (2020). Smart Recipe Recommendation System Based on Ingredients Using Machine Learning. *Journal of Intelligent Information Systems*.
3. Singh, A., & Gupta, P. (2019). Design and Development of a Recipe Recommendation System Using Collaborative Filtering. *International Journal of Computer Applications*.
4. Smith, T., & Jones, H. (2021). Personalized Dietary Suggestions Based on Food Ontologies. *Expert Systems with Applications*.
5. Clark, E., & Lopez, J. (2020). Optimizing Recipe Recommendations with Ingredient-Level Data. *ACM Transactions on Information Systems*.
6. <https://spoonacular.com/food-api>
7. https://www.w3schools.com/html/html_css.asp
8. <https://developer.mozilla.org/en-US/docs/Web/JavaScript>