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**A Mini - Project Report**

On

**“DIETARY RECIPE FINDER”**

Submitted in partial fulfillment of the requirements for the **MINI PROJECT (BCD586)**  
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**Bachelor of Engineering  
In  
Computer Science & Engineering (DATA SCIENCE)**

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## **DEPARTMENT OF CS&E (DATA SCIENCE)**

### **CERTIFICATE**

This is to certify that the Mini project work entitled "**DIETARY RECIPE FINDER**" is a bonafied work carried out by **Ms. Bhavana N(4AI22CD007)**, **Ms. Eksha D V(4AI22CD019)**, **Ms. Manmitha N K(4AI22CD033)**, **Ms. Sunaina A G (4AI22CD056)** in partial fulfillment for the **Mini Project (BCD586)** course of 5<sup>th</sup> semester Bachelor of Engineering in **Computer Science and Engineering (Data Science)** of the Visvesvaraya Technological University, Belagavi during the academic year **2024-2025**. It is certified that all corrections and suggestions indicated for Internal Assessment have been incorporated in the report deposited in the department library. The Mini project report has been approved as it satisfies the academic requirements in respect of Project Work prescribed for the said Degree.

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## **ABSTRACT**

The Dietary Recipe Finder is a versatile platform designed to help users discover recipes tailored to their dietary preferences and health needs. With a vast database of recipes, it offers filters for various diets, including gluten-free and low-carb. Users can also refine their searches based on specific health conditions, nutritional goals, or ingredient availability, ensuring a personalized and seamless meal-planning experience. This customization supports individuals in adhering to unique dietary restrictions without compromising on taste or variety.

The platform integrates advanced algorithms to analyze recipes for nutritional content, providing users with a detailed breakdown of calories, macronutrients and micronutrients. It also includes real-time suggestions for ingredient substitutions to accommodate allergies or preferences, making it a practical tool for diverse households. Additionally, the Dietary Recipe Finder offers dynamic meal plans that adapt to users' goals, such as weight management, fitness optimization, or simply maintaining a balanced diet.

By simplifying meal preparation and ensuring access to nutritious and satisfying recipes, the Dietary Recipe Finder promotes healthier eating habits and reduces the stress associated with dietary compliance. Whether for individuals with strict medical requirements or those exploring new culinary trends, this platform empowers users to make informed choices and enjoy a more wholesome lifestyle.

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## Chapter 1

# Introduction

### 1.1 Background

- **Context:** Maintaining a healthy diet is a priority for many individuals, but finding suitable recipes that align with specific dietary requirements can be challenging. Traditionally, people rely on recipe books or manually search for recipes online, which can be time-consuming, overwhelming, and often ineffective in filtering recipes based on unique dietary needs. A smarter, more personalized solution is needed to simplify the process of finding recipes that cater to diverse dietary restrictions, preferences, and nutritional goals.
- **Problem:** Manually searching for recipes that match specific dietary requirements is time-consuming and often inaccurate. It can be difficult to filter through numerous options to find meals that align with allergies, preferences, or nutritional goals, leading to frustration and inconsistency in meal planning.
- **Opportunity:** The growing adoption of digital platforms presents an opportunity to simplify the recipe-finding process, ensuring accuracy and personalization while providing quick access to tailored meal options that meet specific dietary needs.

### 1.2 Problem Statement

- **Overview of the Problem:** To design and implement the dietary recipe finder to simplify meal planning for users with specific dietary needs, promoting healthier eating habits through personalized and accessible recipe options.
- **Specific Issues:**
  - Difficulty in finding recipes that cater to diverse dietary restrictions and preferences.
  - Time-consuming and overwhelming manual searches.
  - Inaccuracies in identifying suitable recipes for specific needs.
  - Lack of tools for personalized meal planning and tracking nutritional goals.

### **1.3 Objective of the System**

The primary objective of the Dietary Recipe Finder is to develop an automated, accurate, and efficient solution for discovering and organizing recipes tailored to individual dietary requirements and preferences.

#### **Key Goals:**

- **Ease of Use:** Provides a simple interface for users to quickly find recipes.
- **Instant Reporting:** Enable real-time access to personalized recipe suggestions, allowing users to view and organize meal plans instantly.
- **Scalability:** Design the system to accommodate a wide variety of recipes and dietary needs.
- **User Access Control:** Offer tailored access for different users, such as individuals, nutritionists and dietitians, ensuring each role has the right level of access.

### **1.4 Significance of the System**

- **Efficiency:** By automating the recipe discovery process, this system saves users time and effort, making it easier to find suitable meals quickly.
- **Accuracy:** With personalized recipe suggestions, the system ensures that meals meet specific dietary requirements.
- **Cost-Effective:** By reducing the need for expensive recipe books or trial-and-error in meal planning, this system helps users save time and money on grocery shopping and meal preparation.

### **1.5 Scope of the Project**

- **In Scope:**
  - Development of a web-based application for dietary recipe finding.
  - Role-based access (Admin, User, Nutritionist, Dietitian).
  - Features to search recipes based on dietary preferences and restrictions.
  - Data security measures to protect user preferences and dietary information.

- **Out of Scope:**
  - Integration with grocery delivery services or food databases (unless specified as part of the project).
  - Features like fitness tracking or exercise plans, unless included as additional requirements.

## 1.6 Methodology

- **Approach:** The system will be developed using a web-based platform, utilizing modern technologies such as HTML, CSS, JavaScript and Node.js.
- **Testing:** The system will undergo a combination of unit testing, integration testing, and user acceptance testing to ensure that all features work as expected, and that the system is intuitive and meets user expectations for accuracy and usability.

## 1.7 Target Audience

- **Individuals (Users):** Users will interact with the system to find recipes tailored to their dietary needs and organize meal plans based on preferences and restrictions.
- **Nutritionists/Dietitians:** Nutrition professionals will use the system to suggest personalized recipes for clients, track nutritional goals, and offer expert recommendations based on dietary requirements.

## 1.8 Overview of the Report

This report is structured into several chapters that detail the development and design of the **Dietary Recipe Finder**.

The following chapters include:

**Chapter 2: System Design** – Describes the architecture and design of the recipe finder systems.

**Chapter 3: Implementation** – Discusses the system's development, the technologies used, and how the application was built.

**Chapter 4: Testing and Validation** – Details the testing process, including unit tests, user feedback, and results.

**Chapter 5: Results and Discussions** – Presents the results obtained from testing and user feedback, and discusses the system's effectiveness and limitations.

**Chapter 6: Conclusion and Future Enhancements** – Summarizes the project and suggests potential improvements or additional features for future versions.

## Chapter 2

# System Design

This chapter describes the technical design of the Dietary Recipe Finder, explaining its architecture, components, and how they work together to help users find, organize, and manage recipes based on their dietary needs. The design approach focuses on providing an accurate, efficient, and user-friendly platform for users to easily discover personalized meal options and track their dietary goals.

## 2.1 System Architecture

- **High-Level Overview:** The system follows a client-server model where users access the Dietary Recipe Finder through a web or mobile interface. The backend processes user requests, handles dietary logic, and interacts with a database to store and retrieve recipe data, user preferences, and meal plans.
- **Components:**

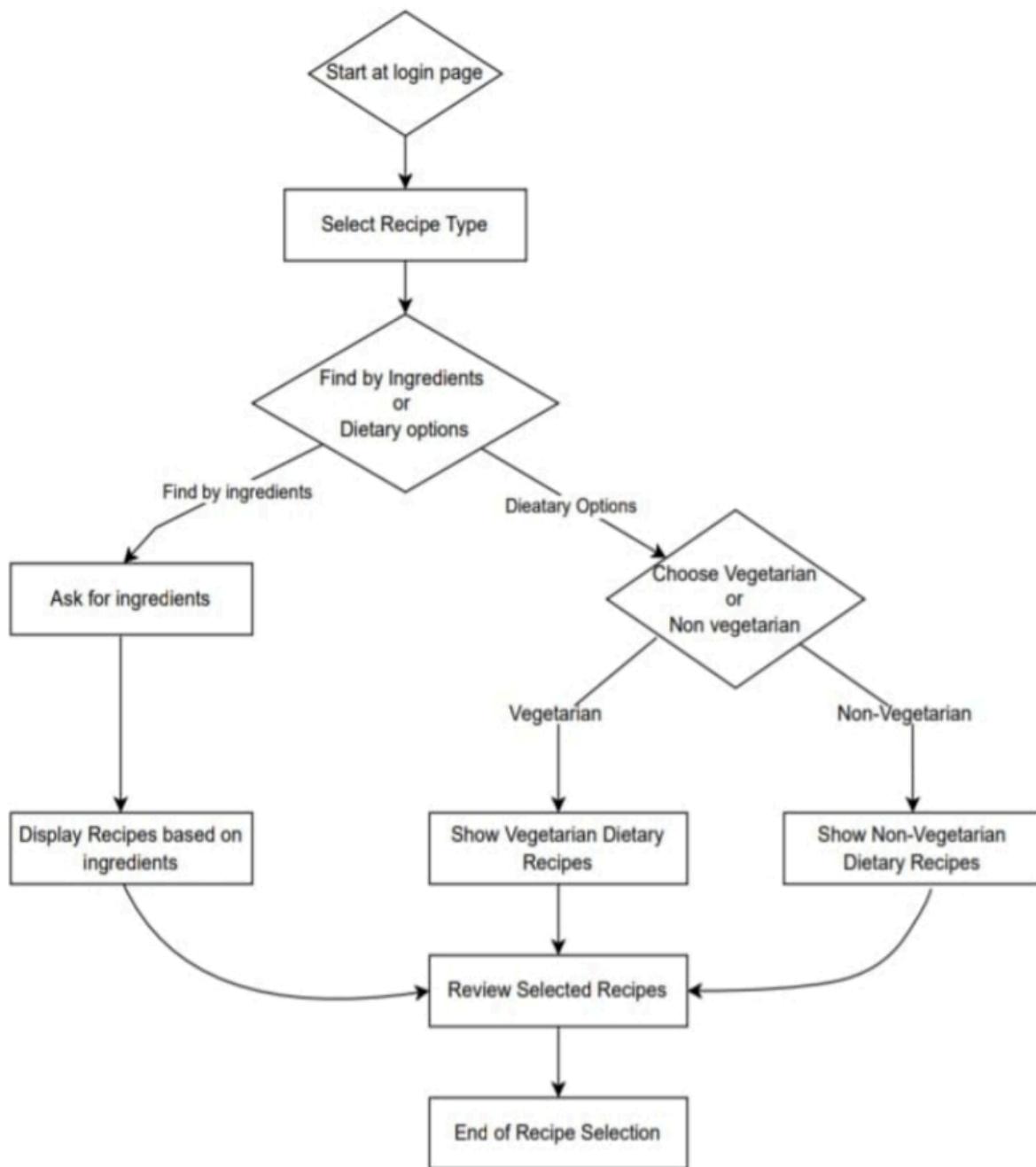
**Frontend:** A web or mobile interface where users (individuals, nutritionists, and dietitians) can search for recipes, input dietary preferences, view recipe details, and create meal plans.

**Backend Server:** Processes requests from the frontend, applies dietary filters, manages user data and preferences, and handles recipe recommendations and organization. It also communicates with the database to store or retrieve user data and recipe information.

**Database:** Stores user profiles, dietary preferences, recipes, ingredients, and meal plans. It allows the backend to fetch relevant recipes based on user input and preferences, ensuring personalized recommendations are provided.

- **Architecture Diagram:**

- Present a diagram showing the key components: frontend, backend server, and database.



## 2.2 Module Design

- The system is divided into functional modules, each handling a specific task.

### 2.2.1 User Authentication Module

- **Login:** Users should be able to log in with their credentials.
- **Password Management:** Users should be able to reset their passwords.

### 2.2.2 Report Generation Module

- **User Input:** dietary preferences like veg and non-veg.
- **Report components:**
  - Recipe Name:** name of dietary recipe.
  - Ingredients:** List of ingredients.
- **Cooking Instructions:** step-by-step instructions for each recipe.

## 2.3 User Interface (UI) Design

- **Main Screens:**
  - **Login Screen:** Users log in with their credentials to access the system.
  - **Dashboard:** A central hub for accessing features like recipe search, saved meals, and dietary tracking, customized based on user roles.
  - **Recipe Search Screen:** Allows users to search for recipes by entering dietary preferences, ingredients, or nutritional goals.
  - **Recipe Details Screen:** Shows detailed information about a recipe, including ingredients, instructions, and nutritional values.
  - **Meal Planning Screen:** Users can organize their meals, plan for the week, and track nutritional intake.
  - **Reports Screen:** Users can generate reports to track meal plans and dietary progress.

## 2.4 Technology Stack

- **Frontend:** HTML, CSS, JavaScript.
- **Backend:** Node.js

## Chapter 3

# Implementation

This chapter describes how the Dietary Recipe Finder was built, including the use of frontend, backend, and database technologies. It explains how the system was organized to help users easily find and manage recipes based on their dietary needs.

## 3.1 Backend Implementation

- The backend was developed as a RESTful API to handle requests from the frontend, process data, and interact with the database.

### API Endpoints

#### Authentication:

**POST /login:** Authenticates users based on role (User, Nutritionist, dietitian) and returns a JSON Web Token (JWT) for session management.

**POST /register:** Allows new users to register and create an account.

#### Recipe Search & Management:

**GET /recipes:** Retrieves a list of recipes based on user-defined filters (e.g., dietary preferences, ingredients).

**POST /recipes:** Allows nutritionists or dieticians to add new recipes to the system.

**GET /recipes: recipe\_id:** Retrieves detailed information about a specific recipe.

#### Report Generation:

**GET /reports:** Generates reports on user dietary trends, meal plan progress, or nutritional intake.

## 3.2 Frontend Implementation

The frontend provides the user interface for individuals, nutritionists, and dieticians to interact with the system.

### User Interface (UI) Components

**Login Page:** Allows users to log in with their credentials, validating input before sending data to the backend.

**Recipe Search Page:** Enables users to search for recipes by entering filters such as dietary preferences, ingredients, or nutritional goals.

**Recipe Details Page:** Displays detailed information about a selected recipe, including ingredients, instructions, and nutritional values.

**Meal Planning Page:** Allows users to organize and save recipes into weekly or monthly meal plans.

**Report Screen:** Provides options to filter and view dietary data, enabling users to generate progress and trend reports.

### 3.3 Database Implementation

- **Database Setup:** Used MySQL/PostgreSQL as the database system to store user, recipe, and meal plan data in a relational structure.
- **Database Schema:**
  - **User Table:** Stores user data, including user\_id, username, password\_hash.
  - **Recipe Table:** Stores recipe-specific data, such as recipe\_id, recipe\_name, ingredients, instructions, and dietary\_tags.
  - **Meal Plan Table:** Records meal plan entries with meal\_plan\_id, user\_id, recipe\_id, date, and meal\_type (e.g., breakfast, lunch, dinner).
  - **Ingredient Table:** Stores ingredient details.

## Chapter 4

# Testing

This chapter explains the testing methods used for the Dietary Recipe Finder. Testing is important to find and fix any issues, ensure the system works as expected, and check its performance in different situations. We test the system to make sure it gives accurate recipe suggestions based on user preferences and dietary needs, while also providing a smooth and secure experience.

### 4.1 Testing Objectives

- Verify that the system functions as expected by executing a series of test cases.
- Ensure that users can access the correct features based on their preferences.
  - Test the accuracy of recipe suggestions and data retrieval based on user input.

### 4.2 Testing Environment

**Hardware:** Laptop/PC with minimum of 8GB RAM and multi-core processor.

**Software:**

- **Backend:** node.js
- **Frontend:** JavaScript, HTML, CSS.
- **Browser:** Google Chrome, ChatGPT, Black Box.

### 4.3 Types of Testing

#### 4.3.1 Unit Testing

- **Explanation:** Unit testing involves testing individual parts of the code in isolation to ensure they function correctly. These tests focus on small units of functionality.
- **Example:** Suppose the system has a function that filters recipes based on the ingredients provided by the user. A unit test could be written to check if the function returns only recipes containing the specified ingredients.
- **Test:** A user selects "chicken" and "broccoli" as ingredients. The unit test would check if the function only returns recipes that include both ingredients.

### 4.3.2 Integration Testing

- **Explanation:** Integration testing focuses on verifying the interaction between different components of the system. This ensures that various parts of the system, such as the front end, backend, and database, work together properly.
- **Example:** If a user searches for "vegetarian" recipes, the front-end search form sends the request to the backend API. The integration test would ensure that when the user selects "vegetarian," the backend correctly fetches and returns the relevant recipes from the database.
- **Test:** A user enters "vegan" in the dietary preference filter, and the backend should return only vegan recipes from the database.

### 4.3.3 Functional Testing

- **Explanation:** Functional testing checks whether the system functions according to the specified requirements. It ensures that each feature works as expected, especially when the user interacts with the system.
- **Example:** The Dietary Recipe Finder might have a filter to search for recipes based on "low-carb" or "gluten-free" preferences. Functional testing would ensure that when users apply these filters, they only see relevant recipes.
- **Test:** A user selects "low-carb" as a dietary preference. The system should only return recipes that fit within the low-carb category.

### 4.3 Test Cases

Below are sample test cases for various components:

**Table 4.1: Test Cases**

Test Case ID	Description	Test Steps	Expected Result	Status
TC-001	Search by Ingredients	Enter specific ingredients (e.g., "chicken, oats) and click "Search".	Recipes containing the specified ingredients are displayed.	Pass
TC-002	View Recipe Details	Select a recipe from the search results.	Detailed information about the recipe, including ingredients and steps, is shown.	Pass

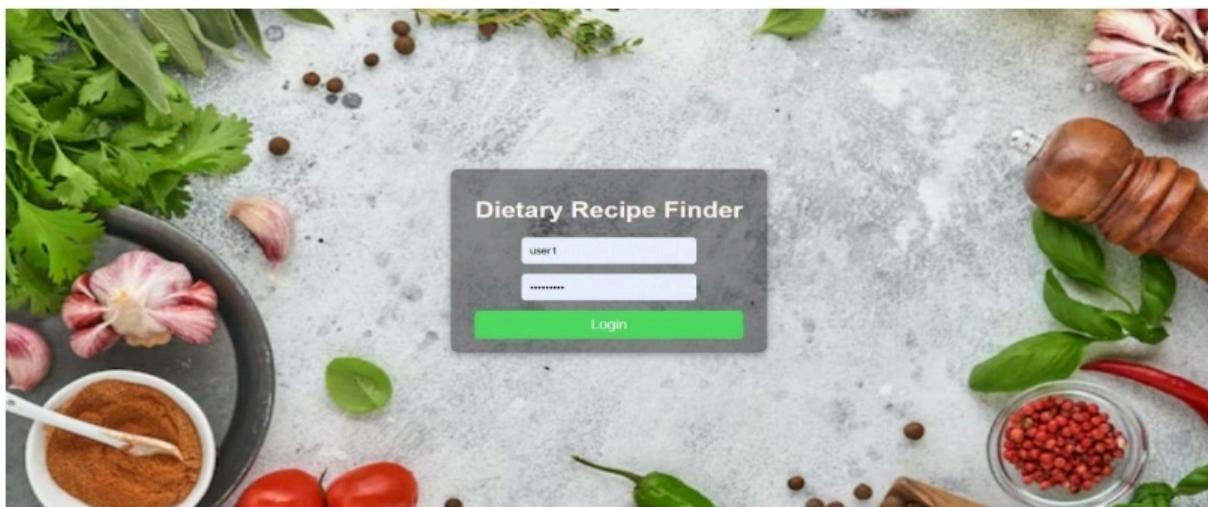
## Chapter 5

# Results and Discussion

This chapter summarizes the results of the Dietary Recipe Finder project, discussing its effectiveness, reliability, and alignment with the intended objectives. The chapter also covers any challenges encountered, key insights, and recommendations for future improvements.

### 5.1 Results

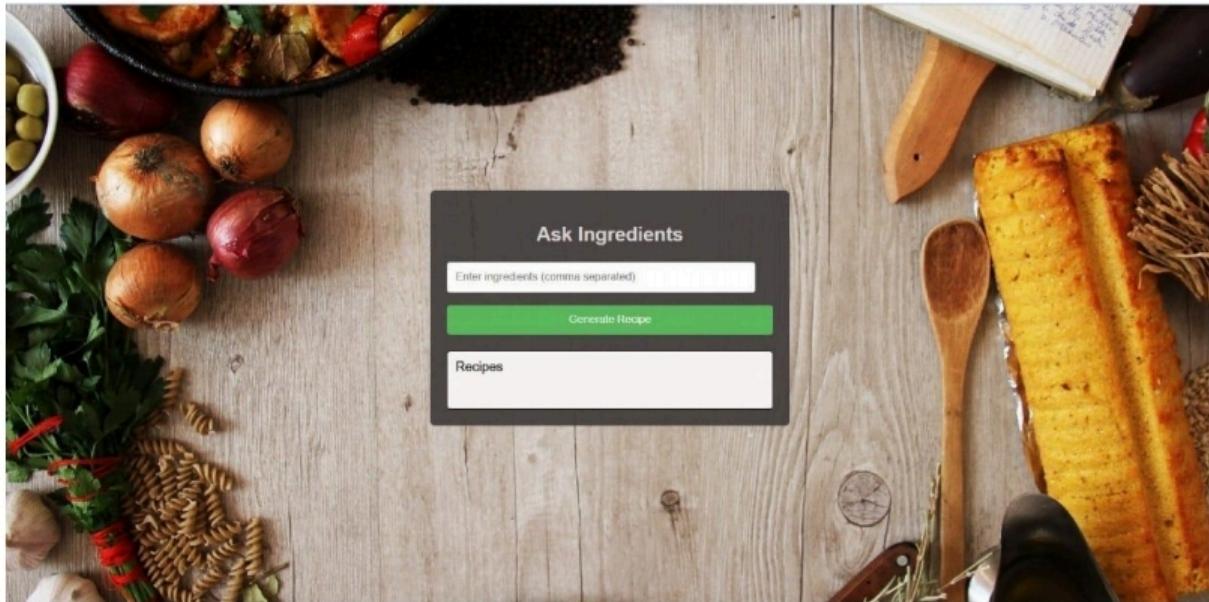
- LOGIN PAGE: login page allows users to enter their username and password to access their accounts.



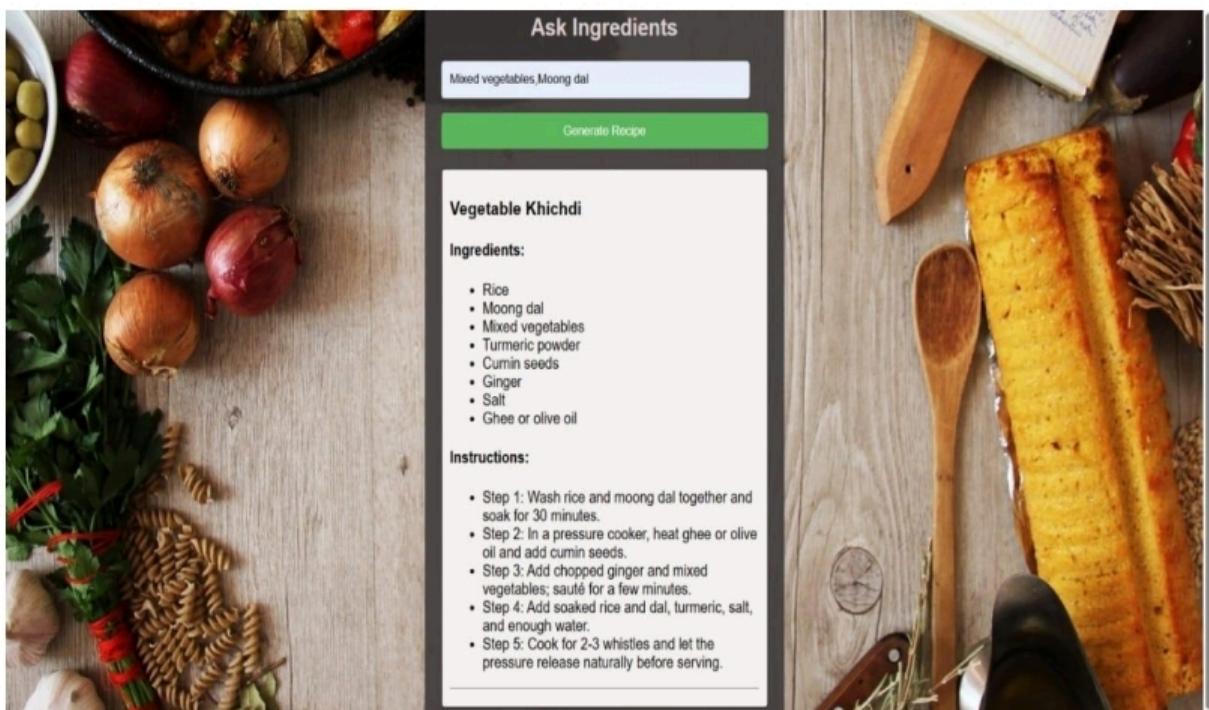
- FIND RECIPE BY



- ASK INGREDIENTS



- For example, clicking on the ingredients will display the corresponding recipe



- RECIPES.



- After selecting 'Vegetarian', you'll get the Vegetarian Dietary Recipes.

### Vegetarian Recipes

A plate featuring two Ragi Dosa (brown rice dosas) served with small bowls of chutney and coconut chutney.

#### Ragi Dosa

[Recipe](#)

A vibrant vegetable stir fry containing broccoli, bell peppers, and other colorful vegetables.

#### Vegetable Stir Fry

[Recipe](#)

- On the Vegetarian Recipes page, each recipe includes detailed instructions and a list of ingredients to help you create delicious meals.

**Vegetarian Recipes****Ragi Dosa****Recipe****Ingredients:**

- 1 cup ragi flour (finger millet flour)
- 1/2 cup rice flour
- 1/4 cup curd (yogurt)
- 1 small onion, finely chopped
- 2-3 green chilies, finely chopped
- 1/2 tsp cumin seeds
- A pinch of asafoetida (hing)
- Salt to taste
- Water as needed
- Oil for cooking

**Instructions:**

- In a mixing bowl, combine ragi flour, rice flour, and salt.
- Add curd and mix well. Gradually add water to make a smooth batter of pouring consistency.
- Stir in chopped onion, green chilies, cumin seeds, and a pinch of asafoetida.
- Heat a non-stick pan and lightly grease it with oil.
- Pour a ladleful of batter and spread it gently into a thin circle.
- Cook on medium heat until the edges start lifting and the dosa turns crisp.
- Flip if necessary and cook the other side for a minute.
- Serve hot with coconut chutney or sambar.

- Selecting 'non-vegetarian', you'll get the Non-Vegetarian Dietary Recipes.

**Non-Vegetarian Recipes****Tandoori Chicken****Recipe****Fish Curry****Resope**

- On the Non-Vegetarian Recipes page, each recipe includes detailed instructions and a list of ingredients to help you create delicious meals.

**Non-Vegetarian Recipes**



**Tandoori Chicken**

Recipe

**Ingredients:**

- 2 skinless chicken legs with thighs
- 1/2 cup Greek yogurt
- 1 tablespoon ginger-garlic paste
- 1 teaspoon red chili powder
- 1 teaspoon turmeric powder
- 1 teaspoon garam masala
- Juice of 1 lemon
- Salt to taste

**Instructions:**

1. Mix yogurt, ginger-garlic paste, spices, lemon juice, and salt to prepare the marinade.
2. Marinate the chicken for at least 2 hours (preferably overnight).
3. Preheat the oven to 375°F (190°C) and bake for 25-30 minutes, turning once halfway through.
4. Garnish with fresh coriander and serve with a side of green chutney.

## 5.2 Discussion

### Effectiveness of the System

- The Dietary Recipe Finder successfully helped users find recipes based on their dietary needs and available ingredients. It made meal planning easier by offering relevant recipe suggestions tailored to specific preferences like vegetarian and non-vegetarian.
- The system's filtering options allowed users to search for recipes that met their exact requirements, improving the overall experience and ensuring more accurate results.
- Overall, the system worked well, providing easy-to-use features and reliable recipe suggestions, making it a helpful tool for people wanting to follow specific diets or make healthier meal choices.

## **Challenges Encountered**

While developing the Dietary Recipe Finder, we faced several challenges that impacted the process and required creative solutions:

- **Data Collection and Accuracy**
  - Finding a large variety of recipes that covered different dietary needs was time-consuming.
- **User-Friendly Design**
  - Creating a simple and easy-to-use interface for all types of users required multiple design revisions.
  - Displaying all the necessary recipe details without cluttering the screen was especially tricky for mobile devices.
- **Search and Recommendation System**
  - Developing a system to filter and recommend recipes based on user preferences (like ingredients or diets) was technically challenging.
  - Search and ingredient matching required extra testing and adjustments.
- **System Compatibility**
  - Making sure the system worked smoothly on different devices and browsers needed careful testing.

## **Limitations of the Current System**

While the Dietary Recipe Finder serves as a helpful tool for users, it has some limitations that can be addressed in future updates:

- **Limited Recipe Database**
  - The current system relies on a predefined database of recipes, which may not cover all possible dietary preferences. Users with very specific requirements might find limited options
- **No Real-Time Update**
  - The system does not support real-time updates, such as adding newly trending recipes or integrating live data from external recipe databases.

- **No Mobile App Support**
  - The system is only available as a web-based platform, limiting its accessibility and usability for users who prefer a dedicated mobile app for convenience.
- **Limited Community Features**
  - The platform does not currently allow users to share their own recipes, provide feedback, or interact with a community, which could make the system more engaging and collaborative.

## **Chapter 6**

### **Conclusion and Future Enhancements**

#### **6.1 Conclusion**

- The Dietary Recipe Finder successfully achieved its primary goal of providing users with an easy-to-use platform for discovering recipes that meet specific dietary needs. By allowing users to filter recipes based on dietary restrictions (e.g., veg and non-veg) and ingredients the system offers a personalized and convenient solution for meal planning.
- Overall, the Dietary Recipe Finder demonstrates the advantages of using technology to simplify the meal planning process, helping users make healthier, more informed food choices. The platform offers an efficient, user-friendly experience and has the potential to be a valuable tool for individuals seeking to manage their diet or make more conscious eating decisions.

#### **6.2 Future Enhancements**

To further increase the effectiveness and usability of the Dietary Recipe Finder, the following enhancements are recommended:

##### **Personalized Meal Recommendations**

- Implementing a personalized meal recommendation system would allow users to receive tailored recipe suggestions based on their dietary preferences. For example, users could input their dietary needs (e.g., veg and non-veg) and receive customized recipes that meet those criteria.

##### **Recipe Customization and Scaling**

- Introducing a recipe customization feature could allow users to adjust serving sizes or modify ingredients based on availability or preference. This would ensure the system remains flexible for various household sizes and dietary needs.

##### **Enhanced User Profiles and Preferences**

- Allowing users to log in to the web application and dietary restrictions would enable the system to provide even more tailored recipe suggestions.

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