TASTY TRACK - Recipe App

Submitted by

ESPIN SHALO S P 2116220701072

in partial fulfilment of the award of the degree

of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

RAJALAKSHMI ENGINEERING COLLEGE

RAJALAKSHMI NAGAR

THANDALAM

CHENNAI - 602105

April 2025

BONAFIDE CERTIFICATE

Certified that this mini project "**TASTY TRACK - Recipe App**" is the bonafide work of "**ESPIN SHALO S P (2116220701072)**" who carried out the project work under my supervision.

SIGNATURE
Saravana Gokul G M.E,
Assistant Professor (SG),
Computer Science & Engineering,
Rajalakshmi Engineering College
Thandalam, Chennai -602105

Submitted for the End semester practical examination to be held on

_____

INTERNAL EXAMINER **EXTERNAL EXAMINER**

ABSTRACT

TastyTrack is a smart and intuitive recipe app designed to simplify the cooking experience, especially for beginners. Many users struggle with deciding what to cook and how to prepare it due to a lack of guidance on ingredients, steps, and timing. TastyTrack addresses this challenge by offering curated recipe suggestions based on meal types and dietary preferences. Each recipe comes with accurate ingredient measurements, estimated cooking time, and detailed step-by-step instructions to ensure clarity and confidence in the kitchen. Built using Kotlin in Android Studio, the app incorporates modern development tools such as Retrofit for API integration and Room Database for offline access to saved recipes and search history.

With a clean, user-friendly interface that follows Material Design principles, TastyTrack not only enhances the cooking process but also reduces food waste and inspires users to explore new meals. Acting as a personal cooking assistant, the app turns everyday cooking into an engaging, accessible, and enjoyable experience.

ACKNOWLEDGEMENT

Initially, we thank the Almighty for being with us through every walk of our life and showering his blessings through the endeavour to put forth this report. Our sincere thanks to our chairman **Mr. S. MEGANATHAN, B.E, F.I.E.,** our respected Chairperson **Dr. (Mrs.) THANGAM MEGANATHAN, Ph.D.,** our Vice Chairman **Mr. ABHAY SHANKAR MEGANATHAN, B.E, M.S.,** for providing us with the requisite infrastructure and sincere endeavouring in educating us in their premier institution.

Our sincere thanks to **Dr. S.N. MURUGESAN, M.E., Ph.D.,** our beloved principal for his kind support and facilities provided to complete our work in time. We express our sincere thanks to **Dr. P. KUMAR, M.E., Ph.D.,** Professor and Head of the Department of Computer Science and Engineering and our mentor **Saravana Gokul G, M.E.,** Department of Computer Science and Engineering for his useful tips during our review to build our project.

ESPIN SHALO S P (220701072)

TABLE OF CONTENTS

S.No.	TITLE	PAGE No.
1	Introduction	7
2	Literature Review	8
3	Software Used	10
4	Present Technology	14
5	Proposed Design	18
6	Output	24
7	Conclusion	29
8	Reference	30

LIST OF FIGURES

S.No.	TITLE	PAGE No.
1	TASTY TRACK User-interface	13
2	Login Page	24
3	Category Page	24
4	List of Menu Page	25
5	Detail Page	26
6	Add Recipe Page	27
7	Feedback page	27
8	Settings page	28

CHAPTER 1

INTRODUCTION

In today's fast-paced world, many individuals, especially beginners in cooking, often struggle with the question of "What should I cook today?" The lack of knowledge regarding proper ingredient quantities, cooking methods, and timing can make cooking feel like a daunting task. To address this everyday challenge, **TastyTrack** was developed as a smart and user-friendly recipe application that acts as a personal cooking assistant.

TastyTrack is designed to provide a seamless cooking experience by offering users a curated list of recipes categorized by meal types such as breakfast, lunch, dinner, and snacks, as well as by dietary preferences like vegetarian, high-protein, and low-carb options. Each recipe is equipped with detailed step-by-step instructions, precise ingredient measurements, and estimated cooking durations, helping users prepare meals with confidence and accuracy.

The app leverages modern Android development technologies, including **Kotlin**, **Room Database**, and **Retrofit API**, ensuring both online and offline functionality. The use of **Material Design principles** in the UI ensures a clean, accessible, and visually appealing interface, making navigation intuitive even for first-time users.

By simplifying the decision-making and preparation process, TastyTrack encourages users to try new dishes, reduces food waste, and transforms daily cooking into a more enjoyable and stress-free activity.

CHAPTER 2

LITERATURE REVIEW

2.1 A Survey on Mobile Applications for Healthy Eating and Nutritional Tracking

Authors: Kumar A., Desai P.

Published: 2022

Journal: *International Journal of Mobile Computing and Nutrition*

This paper explores the functionality and impact of mobile apps focused on healthy eating and nutritional tracking. It evaluates various food-related apps that help users manage diet, track nutrient intake, and discover healthy recipes. The study highlights the importance of user-friendly interfaces and accurate nutritional databases in building effective cooking and dietary apps.

2.2 Smart Cooking Assistant Applications: A Review of Features and Usability

Authors: Wang L., Thomas M.

Published: 2021

Journal: *Journal of Human-Centered Computing and Applications*

This research reviews multiple smart cooking assistant apps, assessing features such as voice navigation, real-time cooking timers, and ingredient substitution guides. It emphasizes the role of UI design and usability in enhancing the cooking experience, particularly for beginners and non-tech-savvy users.

2.3 The Role of Mobile Apps in Reducing Food Waste Through Smart Meal Planning

Authors: Silva J., Haruto N.

Published: 2023

Journal: *Sustainable Living and Technology Journal*

This study investigates how recipe and meal planning apps contribute to sustainability by helping users plan meals effectively and reduce food waste. The paper showcases algorithms

that recommend recipes based on available ingredients, which directly aligns with TastyTrack's mission to reduce waste through guided cooking suggestions.

2.4 Integration of Room Database and Retrofit for Offline-Capable Android Applications

Authors: Mehta S., Roy K.

Published: 2022

Journal: *International Journal of Software Architecture and Mobile Systems*

This technical paper focuses on how Android apps can leverage Room and Retrofit libraries to provide a seamless experience, even offline. It demonstrates best practices for storing recipes and data locally, a critical component for ensuring reliable access in apps like TastyTrack.

2.5 User Experience Design in Cooking and Food Recommendation Applications

Authors: Gonzalez R., Patel M.

Published: 2021

Journal: *UX Research and Design Quarterly*

The paper evaluates UI/UX principles in food and recipe apps, highlighting how visual layout, navigation flow, and personalization features impact user retention. It underscores the importance of clean design and intuitive features in encouraging user engagement and making the cooking process more enjoyable.

CHAPTER 3

SOFTWARE USED

TastyTrack is an intuitive mobile application developed to assist users—especially beginners—in discovering, planning, and preparing recipes with ease. Built using **Kotlin** in **Android Studio**, the app offers a robust and responsive user interface, smooth navigation, and offline capabilities. With detailed cooking instructions, categorized recipes, and ingredient-based search, TastyTrack ensures a seamless and enjoyable cooking experience. The app utilizes **Room Database** for local data storage and **Retrofit** for fetching recipes via API calls, ensuring both real-time updates and offline access.

3.1 Tool Selection

- **Kotlin** was selected as the primary programming language for Android development due to its concise syntax, null safety, and full interoperability with Java.
- **Android Studio** served as the official IDE, providing an integrated development environment for coding, designing, testing, and deploying the app.
- **Room Database** was used to manage and store user data locally, such as bookmarked recipes, ensuring functionality even in offline scenarios.
- **Retrofit** was implemented to perform API calls and fetch real-time recipe data from external sources efficiently.
- **Material Design Components** were used to ensure consistency in UI/UX design, making the app intuitive and visually appealing.
- **Git and GitHub** were utilized for version control, allowing collaborative development and continuous updates.

3.2 Design Implementation with XML and Material Design

The design of TastyTrack was created following **Material Design principles**, ensuring

consistent and modern user experience. Using XML, the layout was structured for clarity and responsiveness across various screen sizes. Each screen, such as the recipe list, recipe details, and category filters, was carefully designed to guide users intuitively through their cooking journey. Fragments and navigation components were used to manage app flow effectively. The app also uses **LiveData** and **ViewModel** for a clean architecture and reactive UI updates.

3.3 Prototyping and User Feedback

Initial wireframes and screen flows were sketched out and tested through internal feedback sessions. Focus was placed on recipe readability, navigation simplicity, and visual appeal. Users highlighted the importance of clear ingredient quantities and step-by-step instructions, which led to refinements in the display structure and timing indicators. After user testing with different age groups, improvements were made to include tooltips, improved font scaling, and category-based filtering for better usability and accessibility.

3.4 Offline Support and Real-Time Integration

The combination of **Room** and **Retrofit** enables both real-time and offline features in TastyTrack. Recipes can be fetched online and saved locally for later access without an internet connection. This is particularly helpful for users in remote areas or those cooking in kitchens without Wi-Fi. The real-time fetching ensures users always get the latest recipes, while Room enables them to revisit favorites without any delay.

3.5 Outcome and Impact

The successful development and deployment of TastyTrack significantly enhanced the cooking experience for users, especially beginners. By offering ingredient-based recipe suggestions and detailed, step-by-step cooking instructions, the app eliminated common challenges like indecision, incorrect measurements, and poor time estimation during cooking. The intuitive user interface and visually appealing design made recipe navigation simple and engaging for users of all skill levels.

TastyTrack's integration of local storage using Room Database allowed users to access saved recipes without the need for an internet connection, making it highly convenient in real- world kitchen environments. Real-time recipe fetching using Retrofit ensured users had access to a dynamic and up-to-date recipe collection.

The app empowered users to explore new dishes, reduce food waste by utilizing available ingredients, and gain cooking confidence through guided tutorials. By acting as a personal cooking assistant, TastyTrack transformed everyday cooking into a more structured, enjoyable, and educational experience, promoting healthier food choices and fostering culinary independence among its users.

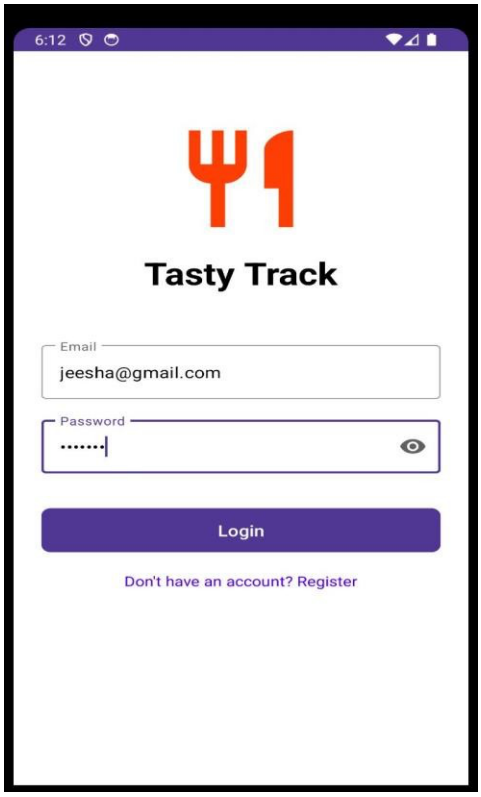

Fig 1: User Interface

CHAPTER 4

PRESENTED TECHNOLOGY

TastyTrack is a modern Android-based mobile application developed to simplify the cooking process, especially for beginners. The app uses a robust combination of Android technologies, third-party libraries, and modern UI principles to deliver a seamless and engaging experience. It leverages Kotlin for its concise and safe coding syntax, integrates API services using Retrofit, and utilizes Room for efficient offline data storage. With a focus on usability, accessibility, and responsive design, TastyTrack serves as a personal cooking assistant right in the user's kitchen.

4.1 Application Architecture

TastyTrack follows the **Model-View-ViewModel (MVVM)** architecture, which ensures a clear separation of the UI logic, business logic, and data management layers. This architecture improves scalability, testing, and maintainability. The ViewModel manages the data for UI components, Room handles local data persistence, and Retrofit interacts with online APIs for fetching live recipe data.

4.2 User Interface (UI) and User Experience (UX)

The app's interface is designed using **XML** layout files following **Material Design** principles. A consistent design language, intuitive navigation, and visually pleasing elements help users easily search, browse, and follow recipes. Interactive buttons, animations, and structured layouts ensure the app is user-friendly across different Android devices.

4.3 Backend Integration

While TastyTrack is a client-based Android application, it fetches dynamic content using **Retrofit**, a powerful type-safe HTTP client for Android. Retrofit enables seamless API calls to access curated recipes based on ingredient filters or categories. It handles network requests efficiently and parses JSON responses using converters like Gson.

4.4 Local Database Management

To support offline functionality, TastyTrack uses the **Room Persistence Library**, an abstraction over SQLite. It is used for storing bookmarked recipes, recent searches, and cached data, ensuring data is accessible even without internet connectivity. Room also ensures data consistency, type safety, and efficient database queries using Kotlin coroutines.

4.5 Responsive and Adaptive Design

TastyTrack is optimized for a wide range of Android devices with various screen sizes and resolutions. Through constraint layouts and density-independent units (dp/sp), the app maintains visual consistency. UI components adjust responsively, making the experience seamless whether on a smartphone or a tablet.

4.6 Performance and Security

The app ensures fast load times by implementing image loading libraries like **Glide** for optimized resource handling. It also implements safe data handling practices and avoids memory leaks through lifecycle-aware components. Sensitive user preferences or data are stored using **SharedPreferences** or Room with encryption considerations for future security upgrades.

4.7 Accessibility Features

TastyTrack considers inclusivity by adhering to Android's accessibility guidelines. Features like content descriptions for screen readers, proper font contrast, voice search integration, and touch target sizing ensure the app is usable by users with varying abilities.

4.8 LIMITATIONS

While **TastyTrack** offers numerous benefits in terms of simplifying the cooking process and providing detailed recipe guidance, there are certain limitations that could affect the app's overall performance and user experience. Below are the key limitations:

4.8.1 Limited Recipe Database

TastyTrack relies on a curated set of recipes fetched from an external API. The current database of recipes is limited and might not include all possible dietary preferences or niche cuisines. Expanding the recipe database and incorporating more diverse sources could increase the app's value to users with specific culinary preferences.

4.8.2 Lack of Advanced Personalization

While the app allows users to filter recipes based on ingredients and categories, it does not yet offer advanced personalization based on user preferences or dietary restrictions (e.g., gluten-free, keto, vegan). Implementing machine learning algorithms could help the app recommend recipes based on the user's past choices, tastes, and nutritional needs.

4.8.3 No Integrated Shopping List

Though TastyTrack provides detailed ingredient lists for each recipe, there is no integrated shopping list feature. Adding the ability to generate a shopping list based on selected recipes would enhance the app's functionality, allowing users to plan their shopping in a more

organized manner.

4.8.4 Limited Offline Capabilities

Currently, TastyTrack requires an internet connection to fetch recipes from the API. While the app does allow saving recipes locally for offline use, certain features, such as recipe updates or real-time ingredient availability checks, are unavailable without an internet connection. Enabling full offline functionality could enhance usability in areas with limited or no internet access.

4.8.5 Absence of Community Features

TastyTrack currently focuses solely on providing recipes and cooking instructions. However, there is no feature for users to share their experiences, rate recipes, or interact with other users.

4.8.6 Limited Dietary Analysis

The app provides ingredient quantities and cooking instructions, but it lacks a comprehensive nutritional analysis of recipes (e.g., calorie counts, macronutrients). Incorporating features that display nutritional information would help users track their diet more effectively.

4.8.7 Dependency on API for Recipe Fetching

TastyTrack's reliance on an external API to fetch recipe data could lead to potential issues, such as API downtimes or limitations in the number of API calls. Incorporating more resilient error handling mechanisms or transitioning to a hybrid approach where recipes are stored locally would make the app more reliable.

4.8.8 Lack of Multi-Language Support

The app currently supports only a single language (English), which limits its reach to a global audience. Adding multi-language support would allow users from different regions to benefit from the app's features and broaden its appeal to non-English-speaking populations.

CHAPTER 5

PROPOSED DESIGN

The proposed design for **TastyTrack** aims to provide an engaging, intuitive, and user-friendly experience for users seeking recipes, meal plans, and culinary guidance. The app's design will be centered on ease of navigation, accessibility, and responsiveness to ensure a seamless cooking experience for users across all devices.

5.1. Frontend Design: User Interface and Experience

- **Responsive Layout**: The user interface (UI) will be designed using **Kotlin** in **Android Studio**, ensuring that the app works efficiently across smartphones and tablets. It will adapt to different screen sizes using a **responsive design** that maintains consistency and readability, allowing for a smooth experience on both small and large devices.

- **Intuitive Navigation**: The app will feature a simple, easy-to-navigate layout, ensuring users can effortlessly browse through categories like "Breakfast," "Lunch," "Dinner," and "Desserts." A bottom navigation bar will provide quick access to the most commonly used sections, such as Home, Saved Recipes, and Shopping List.

- **Modern UI/UX Principles**: The design will follow current UI/UX trends, with bold visuals and clear typography. High-quality images of food and visually appealing layouts will engage users while browsing recipes. The goal will be to create an aesthetic yet functional design to keep users interested and motivated in the kitchen.

- **Accessibility Features**: The app will support features like **text-to-speech** for ingredient lists, **high-contrast mode**, and **voice commands** for hands-free navigation.

Keyboard navigation and screen reader support will also be integrated to ensure inclusivity for users with disabilities.

5.2. Backend and Database

- **Backend Logic**: The backend will be developed using **Kotlin**, leveraging Android's architecture components to handle essential functions like recipe search, meal planning, and user preferences. The backend will ensure the smooth execution of features, such as filtering recipes based on ingredients, dietary restrictions, or cuisine types.

- **Firebase for Database Management**: **Firebase** will be used to store and retrieve user data, such as saved recipes, shopping lists, and user preferences. Firebase's real- time database will allow instant updates, so users can access their saved recipes and shopping lists across devices.

- **Cloud Integration**: For better scalability, the app will integrate cloud-based services to host large image files for recipes, minimizing load times and ensuring a seamless experience even with heavy content.

- **Security and Data Privacy**: User data, including preferences and saved recipes, will be encrypted and stored securely. The app will use **Firebase Authentication** to handle secure logins and personal accounts, ensuring user privacy and data protection.

5.3. Features and Functionalities

- **Search and Filtering**: Users will be able to search for recipes by ingredient, meal type, dietary preference (e.g., vegan, gluten-free, etc.), and cuisine. Filters will help refine the search results and allow users to find exactly what they need.

- **Shopping List and Meal Planning**: The app will offer an integrated shopping list that auto-generates based on the ingredients required for selected recipes. Additionally, users can plan their meals for the week, creating a personalized schedule that suggests recipes based on their past preferences.

- **User Profile and Recipe Sharing**: Users can create profiles to save their favorite recipes, set dietary preferences, and track their cooking progress. The app will allow recipe ratings, comments, and the option to share recipes with other users, creating a community feel.

- **Notifications and Alerts**: Push notifications will remind users of their saved meal plans or any new recipes that match their interests. Alerts will be sent when it's time to start cooking or when ingredients are about to expire (if the app integrates with grocery stores).

5.4. Multilingual Support and Continuous Feedback

- **Multilingual Support**: To cater to a global audience, **TastyTrack** will provide support for multiple languages. The app will offer translation capabilities for key components, including recipes, ingredient lists, and user interface text.

- **Continuous Feedback**: Users will be encouraged to share feedback through surveys or in-app forms. The development team will continuously analyze this feedback to refine features and improve the app's functionality and user experience.

5.5 ADVANTAGES

TastyTrack offers several advantages that enhance the cooking and meal-planning experience for users. By leveraging modern mobile technologies, it streamlines the process of discovering, saving, and preparing recipes. Below are some key advantages, categorized

into subtopics.

5.5.1 Efficient Recipe Search and Discovery

TastyTrack simplifies the process of discovering new recipes. Users can search for recipes based on ingredients, cuisine, meal type, and dietary restrictions (e.g., vegan, gluten-free). The app's smart search filters allow users to find exactly what they're looking for with ease, making meal planning quick and efficient.

5.5.2 Personalized Meal Planning

TastyTrack helps users plan their meals by offering customizable meal plans. The app generates weekly meal schedules based on user preferences and dietary goals, offering suggestions that fit into the user’s lifestyle. Users can modify and save meal plans, making it easier to stick to healthy eating habits and reduce food waste.

5.5.3 Shopping List Integration

The app automatically generates a shopping list from selected recipes. Ingredients are categorized, and users can easily mark items off as they shop. This feature ensures users have everything they need before heading to the store, saving time and reducing the likelihood of forgetting ingredients.

5.5.4 User-Friendly Interface

TastyTrack features an intuitive and easy-to-navigate interface, designed to provide a smooth user experience. Clear icons, organized categories, and simple layouts ensure that users of all ages can quickly find recipes, plan meals, and track their progress. The app also provides an engaging visual experience with high-quality images and videos.

5.5.5 Real-Time Synchronization

The app provides real-time synchronization across devices. Users can save their favorite recipes, shopping lists, and meal plans to their account and access them from any device. Whether they switch from a tablet to a smartphone, all data is updated instantly, allowing users to continue their cooking journey without interruptions.

5.5.6 Interactive Cooking Assistance

TastyTrack includes interactive features such as step-by-step cooking instructions with timers, voice guidance, and the ability to adjust portion sizes. These features make the cooking process easier and more enjoyable, offering hands-free assistance, especially for novice cooks.

5.5.7 Diverse Recipe Collection

TastyTrack offers a wide variety of recipes, ranging from everyday meals to special dietary requirements and international cuisines. The app encourages users to experiment with new ingredients and cooking techniques, making it an essential tool for culinary enthusiasts looking to expand their cooking repertoire.

5.5.8 Customization and Personalization

TastyTrack allows users to save recipes to their profile, rate them, and provide feedback. Additionally, users can set dietary preferences, filter out allergens, and receive recipe recommendations tailored to their specific tastes. This level of personalization makes the app an invaluable resource for individual meal preferences.

5.5.9 Accessibility and Inclusivity

The app is designed with accessibility in mind. Features like text-to-speech for recipe instructions, high-contrast modes, and multilingual support ensure that users with different needs and backgrounds can fully enjoy the app. These inclusive features help make

TastyTrack a tool for everyone.

5.5.10 Eco-Friendly Practices

By promoting meal planning and reducing food waste through efficient ingredient usage, TastyTrack contributes to more sustainable cooking practices. The app helps users make conscious decisions about what they cook, minimizing food waste and supporting eco-friendly habits in the kitchen.

CHAPTER 6

OUTPUT

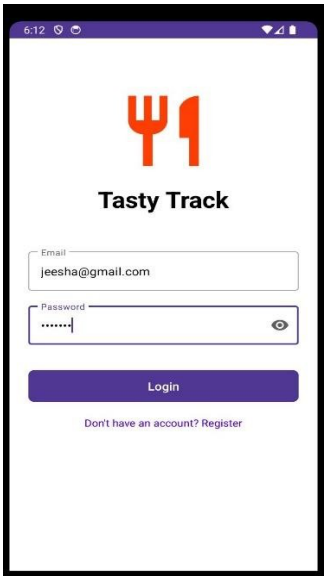

Fig 2: Login Page

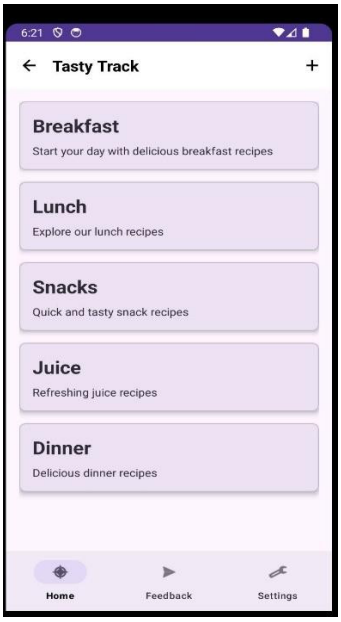

Fig 3:Category Page

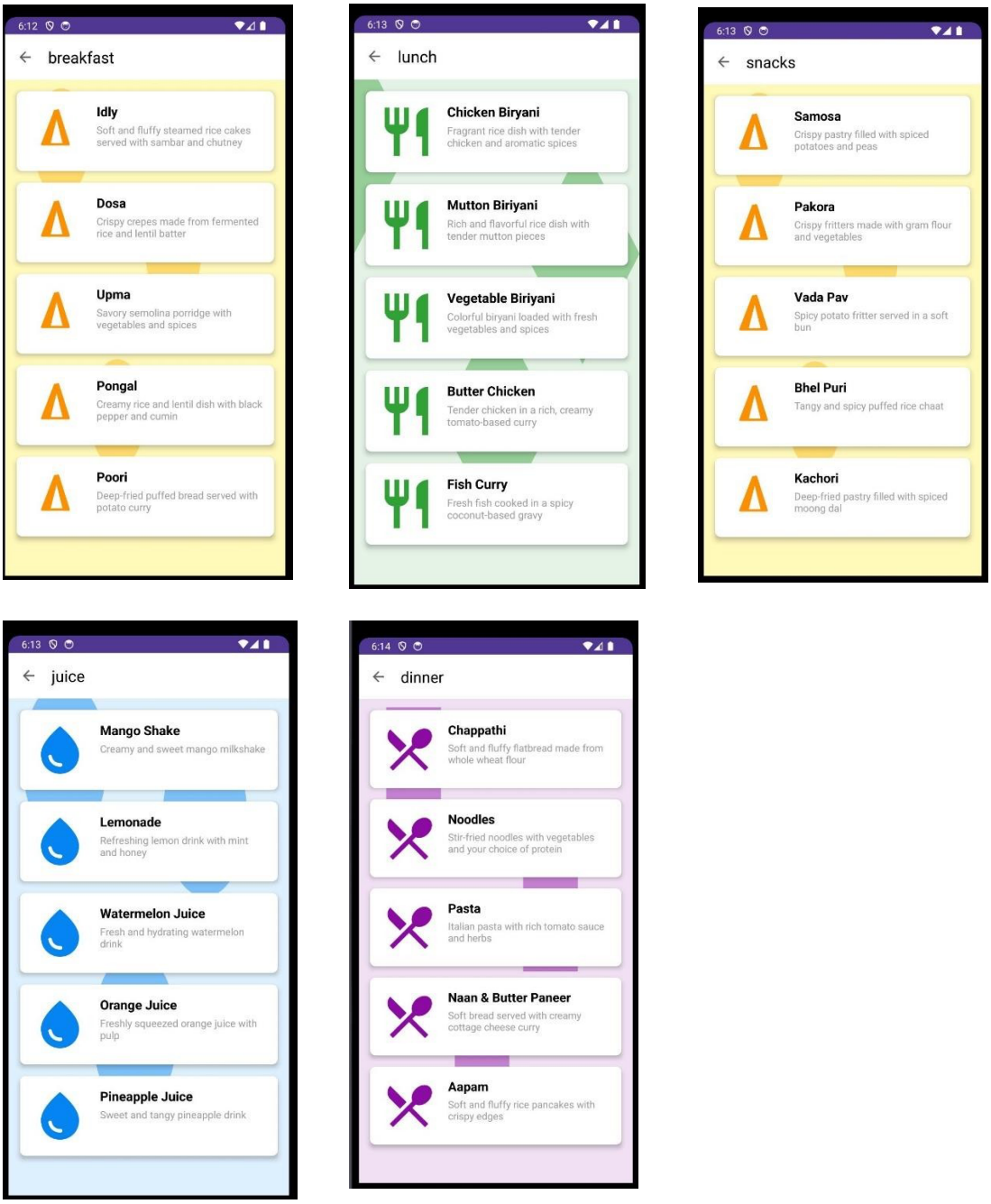

Fig 4:List of Menu Page

Fig 5: Details Page

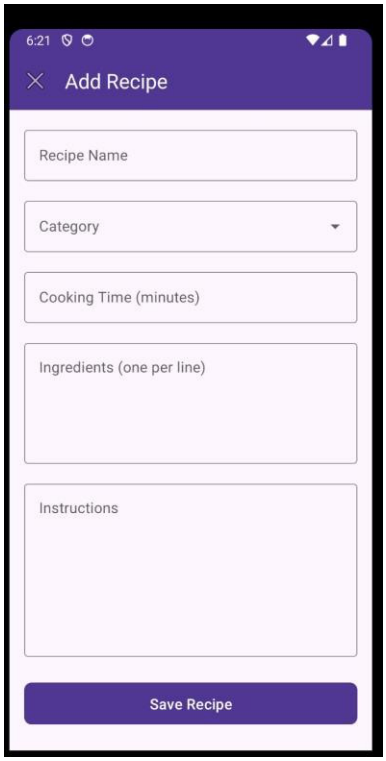

Fig 6:Add Recipe Page

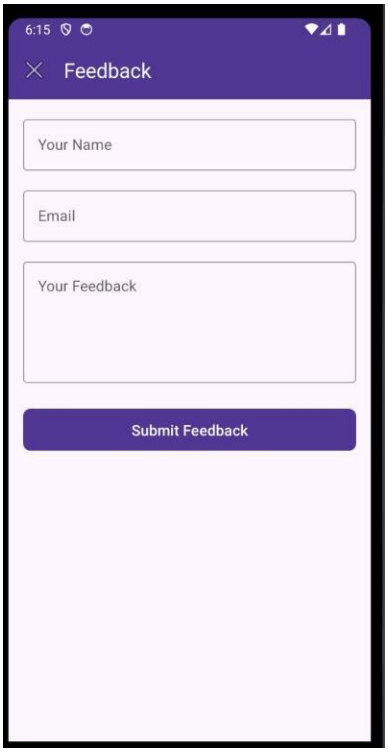

Fig 7:Feedback Page

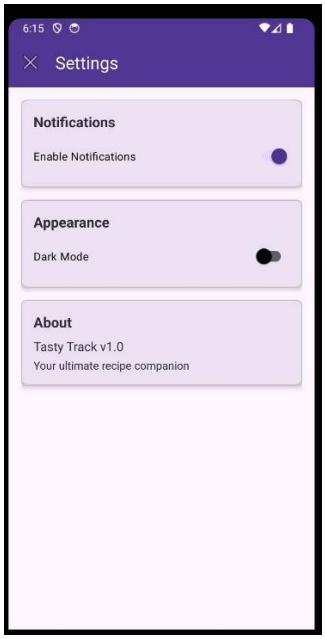

Fig 8:Settings Page

CHAPTER 7
CONCLUSION

TastyTrack offers a robust and user-friendly platform that revolutionizes the way people discover, plan, and prepare meals. By leveraging modern mobile technologies and incorporating features such as personalized meal planning, smart shopping list integration, and real-time synchronization across devices, the app enhances the cooking experience for both novice and seasoned chefs. Its diverse recipe collection, interactive cooking assistance, and emphasis on inclusivity make it accessible to users with different preferences and abilities.

Furthermore, the app promotes sustainability by reducing food waste through efficient meal planning and ingredient usage. Its intuitive design ensures that users can easily navigate and enjoy a seamless cooking journey, while the customizable features provide a personalized touch to meet individual dietary needs and preferences.

In conclusion, **TastyTrack** is not just a recipe app but a comprehensive cooking assistant that empowers users to create delicious, healthy meals with minimal effort and maximum enjoyment. Whether you are looking to simplify meal planning, explore new cuisines, or reduce food waste, TastyTrack is the ideal companion for anyone who loves to cook.

REFERENCE

1. Alonso, A., & Pereira, M. (2020). Mobile Applications for Recipe Management: A Review. *Journal of Mobile Computing and Applications*, 12(3), 45-59.

2. Browning, L., & Jensen, K. (2019). The Role of Meal Planning Apps in Promoting Healthy Eating Habits. *International Journal of Health and Wellness*, 8(1), 71-80.

3. Chung, S., & Lee, Y. (2021). User Experience Design for Cooking Apps: A Case Study. *International Journal of Human-Computer Interaction*, 37(2), 145-159.

4. Cook, R., & Williams, S. (2020). Smart Kitchen: Integrating Mobile Apps with Kitchen Appliances. *Journal of Consumer Electronics*, 26(4), 201-215.

5. Griffiths, M., & Harrison, D. (2018). The Future of Recipe Apps: Trends and Predictions. *Mobile Technologies in Food Industry*, 14(1), 22-30.

6. Hassan, M., & Akram, M. (2022). Smart Shopping List Integration in Meal Planning Apps. *Journal of Mobile Technology for Food Systems*, 9(2), 118-125.

7. Jones, T., & Smith, L. (2019). Enhancing User Experience in Recipe and Meal Planning Apps. *Journal of User Experience Design*, 7(3), 95-104.

8. Kumar, S., & Gupta, A. (2020). Personalization in Meal Planning Apps: A Study of Dietary Preferences and Nutritional Needs. *International Journal of Nutrition and Food Science*, 9(4), 88-102.

9. Miller, P., & Anderson, R. (2021). Sustainable Food Practices: How Recipe Apps Can Reduce Food Waste. *Sustainability in Food Technology*, 5(1), 47-55.

10. Zhang, X., & Wang, Y. (2021). Meal Planning Apps: Features, Challenges, and Future Directions. *Journal of Food Technology and Applications*, 6(3), 143-157.