React Native Project
Recipe Finder Application
Under Supervision of

Dr. Ahmed Hussien

Eng. Rania

Team Names :

Mohamed Hassan Mohamed Ahmed Youssef
Ahmed Abdelgleel Saeed
Ahmed Hassan Ibrahim
Ahmed Emad
Mohamed Ezzat Mohamed

Recipe Finder Mobile Application: Technical Report

May 13, 2025

The Recipe Finder is a React Native mobile application integrated with Firebase Cloud Firestore, designed to provide users with personalized recipe suggestions based on dietary preferences and caloric goals. This report details the application's architecture, key features, user interface design, and integration with Firebase for real-time data management. The application includes screens for home navigation, gluten-free recipes, calorie-based meal planning, recipe search, and user authentication, offering a seamless and interactive experience for users seeking healthy meal options.

Introduction

The Recipe Finder mobile application addresses the growing demand for accessible, personalized meal planning solutions that cater to specific dietary needs. Built using React Native, the application ensures cross-platform compatibility for iOS, Android, and web environments. By leveraging Firebase Cloud Firestore, the app provides real-time data synchronization, enabling users to browse recipes, plan meals based on calorie targets, and manage favorite dishes efficiently. This report provides a comprehensive overview of the application's design, functionality, and technical implementation, highlighting its user-centric features and robust backend integration.

Application Overview

The Recipe Finder application is designed to assist users in discovering recipes tailored to their dietary preferences, such as gluten-free options, or specific caloric requirements. The app features an intuitive interface with multiple screens, each serving a distinct purpose:

- **Home Screen**: Central navigation hub with links to other functionalities and social media integration.
- **Gluten-Free Screen**: Displays curated gluten-free recipes with favoriting and notification features.
- **Calorie Planner Screen**: Suggests meals based on user-specified calorie targets.
- **Recipe Details Screen**: Showcases a collection of chef-recommended recipes with detailed preparation instructions.
- **Search Recipes Screen**: Allows users to search for recipes using a fuzzy matching algorithm.

- **Authentication Screens**: Facilitate user sign-in and sign-up with secure Firebase authentication.

Technical Architecture

The application is built using the following technologies:

- **React Native**: Provides a cross-platform framework for building the user interface, ensuring consistency across iOS, Android, and web platforms.
- **Firebase Cloud Firestore**: Serves as the backend database for storing and retrieving recipe data in real-time.
- **Firebase Authentication**: Manages user sign-in and sign-up processes securely.
- **Expo**: Enhances development with tools like Expo AV for video playback and Expo Notifications for push notifications.
- **React Navigation**: Handles navigation between screens with a smooth user experience.

The application follows a modular architecture, with each screen implemented as a separate React component. Firebase integration is centralized in a configuration file (`firebase.js`), ensuring maintainability and scalability.

Key Features

The Recipe Finder application offers the following key features:

Home Screen

The Home Screen serves as the entry point, featuring a dynamic video background and a scrollable taskbar for quick access to other screens. Social media icons link to external platforms, and authentication buttons direct users to sign-in or sign-up screens. The use of `Expo AV` ensures smooth video playback across platforms.

Gluten-Free Recipes

The Gluten-Free Screen fetches recipes from the Firestore `recipes` collection, filtered by the "Gluten Free" category. Users can favorite dishes, triggering push notifications via `Expo Notifications`. The screen uses `FlatList` for efficient rendering and `Animated` from `react-native-reanimated` for smooth expand/collapse animations.

Calorie Planner

The Calorie Planner Screen allows users to input a target calorie value and receive meal suggestions from the `caloriePlans` collection. Recipes are categorized into calorie ranges

(e.g., 0-400, 401-700), and users can toggle descriptions for detailed information. The screen employs `ScrollView` for a responsive layout.

Recipe Details

The Recipe Details Screen displays chef-recommended recipes from the `chiefChoice` collection. Each recipe card includes an image, calorie count, ingredients, and preparation instructions. Users can favorite recipes, with changes synced to Firestore in real-time.

Search Recipes

The Search Recipes Screen implements a fuzzy search using the Levenshtein distance algorithm to match user queries against recipe names in the `SearchRecipes` collection. Results include images, calorie information, and ingredient lists, presented in a visually appealing card format.

User Authentication

The Sign-In and Sign-Up Screens use Firebase Authentication to manage user accounts. Input validation ensures robust security, requiring valid email formats and strong passwords (minimum 8 characters, including letters, numbers, and special characters). The screens are optimized for accessibility with `KeyboardAvoidingView`.

User Interface Design

The application's user interface is designed for simplicity and engagement:

- **Consistent Theme**: A dark background with white text and vibrant accents (e.g., #FF6347 for buttons) ensures readability and visual appeal.
- **Responsive Layout**: Components like `FlatList` and `ScrollView` adapt to different screen sizes using `Dimensions`.
- **Interactive Elements**: Touchable buttons, expandable cards, and animated transitions enhance user interaction.
- **Accessibility**: Text inputs include placeholders and validation feedback, while alerts guide users through errors.

Firebase Integration

Firebase Cloud Firestore is used to store recipe data in collections such as `recipes`, `caloriePlans`, `chiefChoice`, and `SearchRecipes`. Real-time queries with `where` clauses filter data efficiently, and `updateDoc` ensures seamless updates for favoriting functionality. Firebase Authentication secures user data, with error handling for failed login or registration attempts.

Challenges and Solutions

During development, the following challenges were encountered:

- **Notification Permissions**: Cross-platform notification support required handling iOS, Android, and web environments separately. Solution: Implemented platform-specific logic using `Expo Permissions` and browser `Notification` API.
- **Image Loading**: Local image assets needed consistent mapping. Solution: Used a dictionary to map recipe IDs or names to image paths.
- **Real-Time Data**: Ensuring low latency for Firestore queries. Solution: Optimized queries with indexing and cached results where applicable.

Conclusion

The Recipe Finder application successfully delivers a user-friendly, feature-rich platform for discovering and managing recipes. Its integration with Firebase ensures reliable data management, while the React Native framework provides a seamless cross-platform experience. With its intuitive design and robust functionality, the app meets the needs of users seeking personalized meal planning solutions. Future enhancements will further elevate its capabilities, making it a valuable tool for health-conscious individuals.