FitPantry:

A smart meal-planning app that connects your pantry, recipes, and fitness goals

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Abstract

FitPantry is an iOS application designed to help users achieve their nutrition and fitness goals through personalized meal and workout planning. Users can interact with a virtual pantry by uploading items they currently have at home. The app then generates customized meal plans that incorporate those ingredients and align with the user's dietary needs. In addition to meal planning, FitPantry provides tailored workout routines based on the user's fitness level and preferred workout duration. By combining pantry tracking, smart planning, and fitness support, FitPantry empowers users to make informed decisions, reduce food waste, and build long-lasting, healthy habits.

Main Goals

- **Personalized Meal Plans** – Create meals using your dietary goals and what's already in your pantry.
- **Smart Pantry Tracking** – Upload your ingredients to get tailored recipe suggestions.
- **Custom Workout Plans** – Generate workouts based on your experience and preferred duration
- **Healthy Habit Building** – Supports long-term fitness and nutrition goals
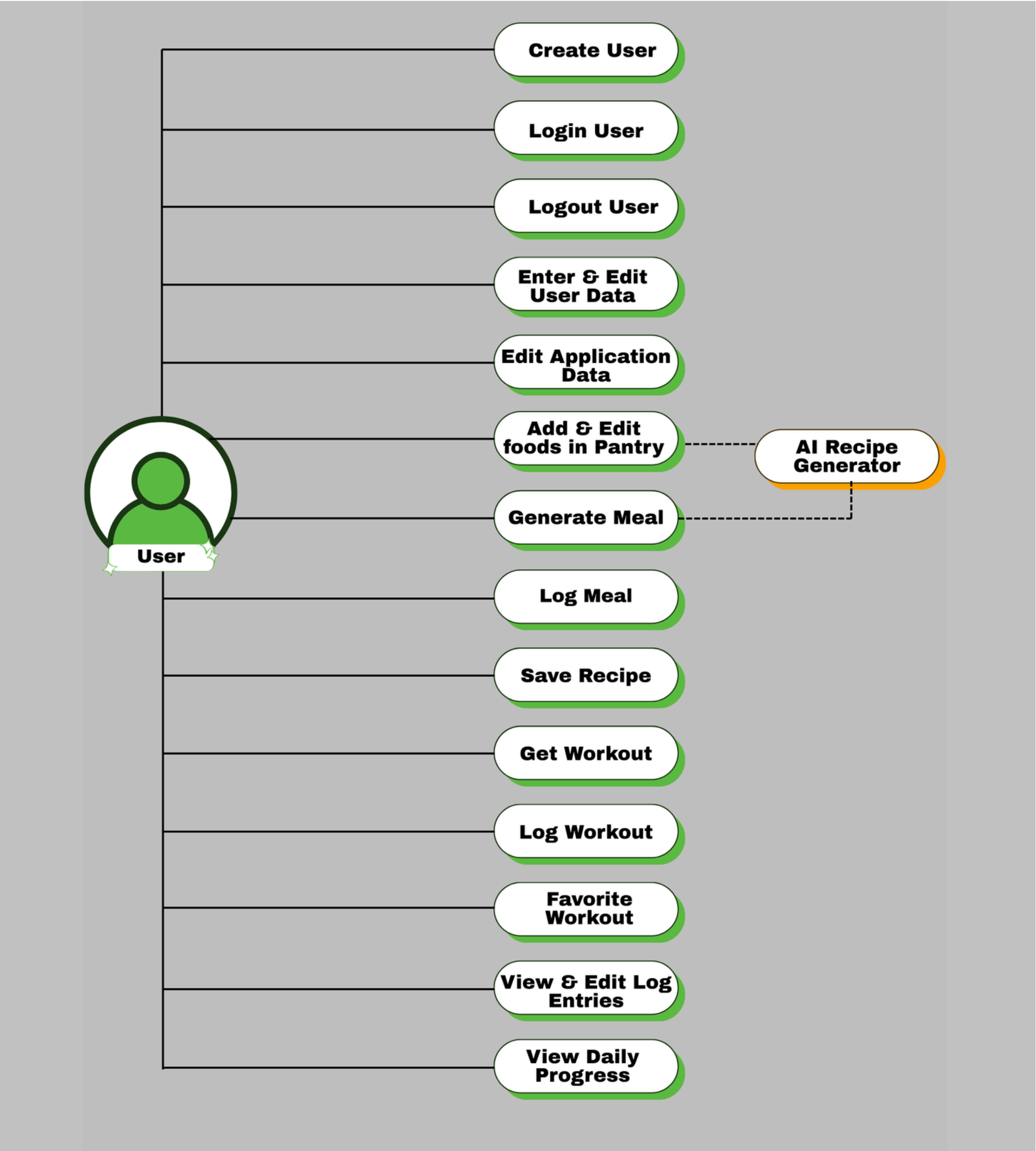
The above diagram visualizes FitPantry's user-centered functionality through a structured use case model.

Website

CSE

Fitness Tracking & Support

Shopping List

Pantry Management

Focus on Healthy Eating

FitPantry

AI-Powered Meal Planning

Healthy Recipe Suggestions

AI Recipes

Weekly Workouts

Food from Pantry

Track your food. **Plan** your meals. **Fuel** your **Fitness** all in one app.

Methods

- **Swift & SwiftUI** – Used for iOS frontend development and creating a dynamic, user-friendly UI.
- **Xcode** – Primary development environment for building and testing the iOS app
- **Firebase Firestore** – NoSQL cloud database for storing user data, food logs, workout plans, and preferences
- **Firebase Authentication** – Secure login system supporting Apple, Google, email, and anonymous sign-ins
- **PyTorch** – AI framework used to generate personalized meal plans based on pantry contents and user preferences
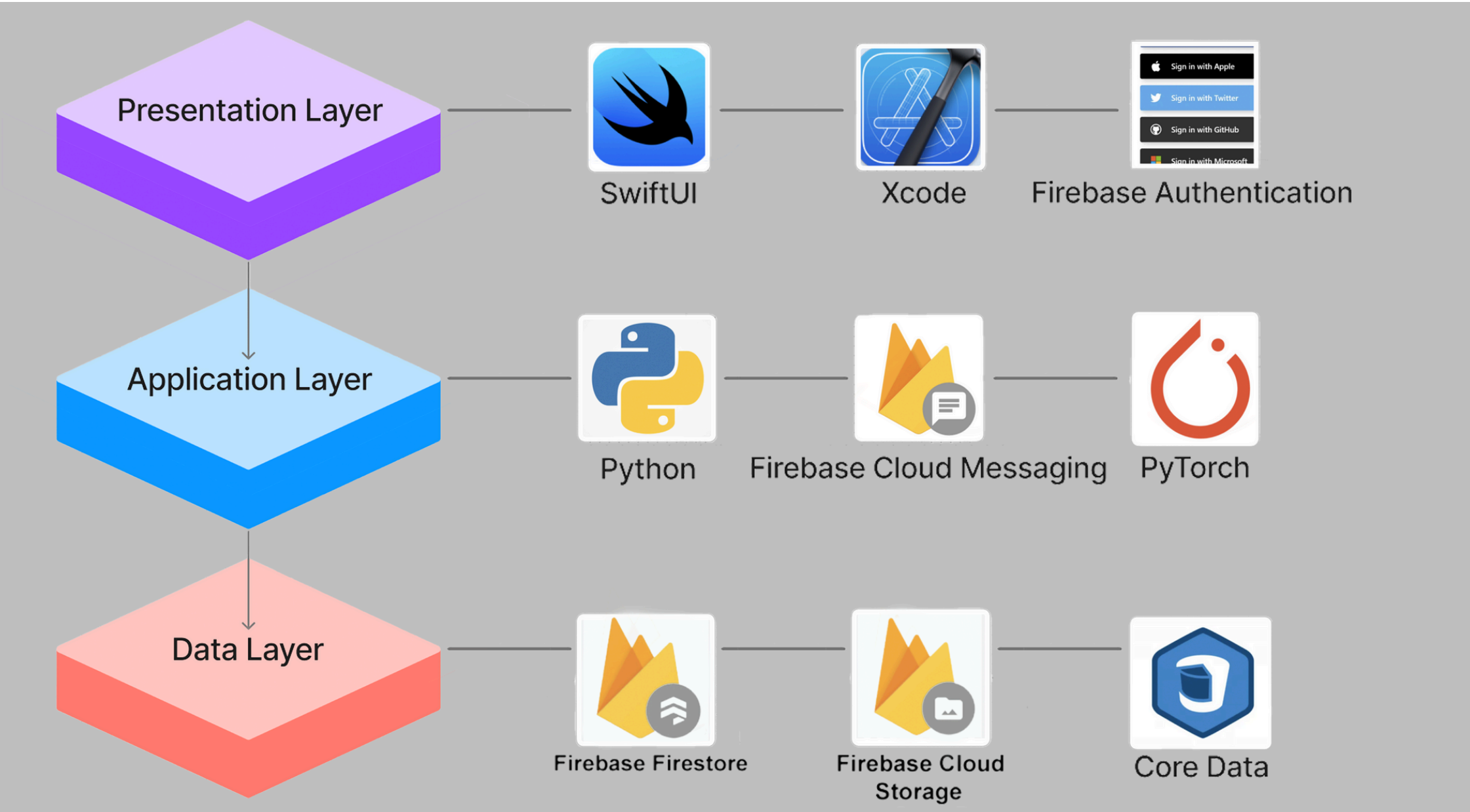
The above diagram shows FitPantry's layered architecture, connecting the UI, logic, and data through tools like SwiftUI, PyTorch, and Firebase.

Future Work

- **Share Recipes** – Link FitPantry to social media to share recipes and fitness progress.
- **Barcode Scanner Integration** – Allow users to scan food packages to auto-add items to their pantry and instantly get nutritional info.
- **Fitness Friends** – Users can add friends and even create groups where they can share their goals and progress. Allow users to send each other encouragement. Users can can also participate in daily, weekly, or monthly competitions with friends.
- **Edit Recipes** – Allow users to modify AI-generated recipes by swapping ingredients, adjusting portions, or adding personal notes, enabling greater customization and flexibility.

Conclusion

FitPantry has successfully integrated several key features that allow users to meet their nutrition and fitness goals. The app generates personalized meal plans based on available ingredients in the user's virtual pantry. FitPantry also provides customized workout routines based on each user's fitness level and preferences. These features are significant because they promote healthier habits and help reduce food waste and cost by ensuring users make the most out of what they already own.

Currently, FitPantry is fully functional and offers a complete experience in meal and workout planning. FitPantry is a valuable tool for anyone looking to improve their lifestyle through smarter planning and healthier choices.

Notice