Calorify   
  
Calorify **App** is a mobile application designed to help users track their nutritional intake, manage meal plans, and achieve personal health goals like weight loss, weight gain, or weight maintenance. By combining AI-powered food recognition, health data integration, and personalized recommendations, the app provides a holistic solution for nutrition and fitness tracking. It also connects with **Apple Health** and **Google Fit** for seamless activity tracking and generates tailored plans based on user preferences and goals.  
   
**Frontend (User Interface)**

For cross-platform development (Android + iOS):

* **Framework**: **Xamarin.Forms** (C#)
  + A cross-platform UI toolkit using C#.
  + Integrates well with your C# backend.
  + Native-like performance and easy access to device features (camera, health APIs).

**Alternative**:

* **React Native** (if you're open to JavaScript/TypeScript)
  + Great community support.
  + Offers a rich ecosystem of libraries.

**Backend**

For processing user requests, handling AI, and managing data:

* **Language**: **C#**
  + Matches your experience and preference.
  + Ensures consistent integration with Xamarin.Forms.
* **Framework**: **ASP.NET Core**
  + High performance and scalability.
  + Suitable for APIs to handle authentication, AI integration, meal plans, and subscription management.

**Database**

To store user data, meal plans, and food database:

* **Database**: **MongoDB (Free Tier)**
  + Flexible schema design for user-specific data and nutrition records.
  + Ideal for rapid prototyping and limited budgets.
  + Free tier provides 512 MB of storage and shared cluster hosting.

**AI/ML for Image Recognition**

For analyzing meal photos:

* **Option 1: Azure Cognitive Services (Custom Vision)**
  + Easiest to integrate with your C# backend.
  + Free tier: Up to 5,000 API transactions/month.
  + Simple REST API for sending images and receiving results.
* **Option 2: TensorFlow Lite (with ONNX Runtime)**
  + Use pre-trained models like **Food-101** for local inference.
  + Ideal if you want more control and avoid API costs.
  + Works well with limited AI experience.

**Health Data Integration**

For accessing Apple Health and Google Fit data:

1. **Apple HealthKit** (iOS)
   * Native API for integrating with iPhone health data.
   * Requires a developer account with Apple.
2. **Google Fit API** (Android)
   * Syncs health and activity data from Android devices.

**Subscription and Payment Handling**

For offering monthly and yearly plans:

* **Apple In-App Purchases** (iOS):
  + Integrates seamlessly with the App Store.
  + Automatically manages recurring payments.
* **Google Play Billing** (Android):
  + Handles subscriptions for Android users.

**Authentication**

For user account management:

* **Identity Framework** in **ASP.NET Core**
  + Built-in support for email/password authentication.
  + Add third-party login options (Google, Apple ID).

**Hosting**

For deploying your backend:

* **Azure App Service**
  + Works natively with ASP.NET Core and MongoDB.
  + Offers free and low-cost tiers for startups.
  + Includes scalability options for future growth.

**Alternative**:

* **Heroku** or **AWS Free Tier**
  + Both offer free tiers but may require extra configuration for C# apps.

**Development Tools**

1. **Visual Studio** (Community Edition)
   * Ideal for C# development (frontend + backend).
   * Integrates with Xamarin.Forms and ASP.NET Core.
2. **Postman**
   * For testing APIs.
3. **MongoDB Atlas Dashboard**
   * For managing your database.

**Version Control & Collaboration**

* **Git + GitHub/GitLab**
  + For source code management.

**Push Notifications (Optional)**

To remind users about plans or progress:

* **Firebase Cloud Messaging** (for Android)
* **APNs (Apple Push Notification Service)** (for iOS)

**Summary of Core Technologies**

| **Component** | **Technology** |
| --- | --- |
| **Frontend** | Xamarin.Forms |
| **Backend** | ASP.NET Core |
| **Database** | MongoDB (Free Tier) |
| **AI/ML** | Azure Cognitive Services (Custom Vision) |
| **Health Integration** | Apple HealthKit, Google Fit API |
| **Payments** | Apple IAP, Google Play Billing |
| **Hosting** | Azure App Service |