AI Food App - Free Tier Deployment Documentation

# 1. Overview

This project is a full AI-powered Food App built with Flutter Web, free-tier services, and Vercel deployment.  
Features included:  
- User Authentication & Personalization (Firebase Auth + Firestore)  
- Semantic Search (Hugging Face embeddings + Qdrant Cloud)  
- Recommendation System (Qdrant Cloud)  
- AI Chatbot (Google Gemini)  
- Free hosting (Vercel)

# 2. Architecture

Frontend (Flutter Web) → Backend (Vercel Serverless Functions) → Qdrant / Hugging Face / Google Gemini  
User data stored in Firebase Firestore for personalization.

# 3. Free-tier Services Setup

1. Firebase Auth + Firestore  
 - Enable Email/Password authentication  
 - Create Firestore database in test mode  
  
2. Qdrant Cloud  
 - Create free cluster  
 - Create 'foods' collection with fields 'vector' and 'payload'  
 - Optional: insert sample dishes using insert.js  
  
3. Hugging Face  
 - Generate API token  
 - Model: 'sentence-transformers/all-MiniLM-L6-v2'  
  
4. Google Gemini  
 - Sign up for Google AI Studio  
 - Generate API key for chatbot

# 4. Flutter Web Setup

1. Install Flutter SDK (stable)  
2. Navigate to flutter\_app folder:  
 flutter pub get  
 flutter build web  
3. Frontend will be served by Vercel from build/web directory

# 5. Backend Setup (Vercel Serverless)

- api/search.js → semantic search using Hugging Face embeddings + Qdrant  
- api/recommend.js → dish recommendations from Qdrant  
- api/chatbot.js → AI chatbot using Google Gemini  
- api/user.js → user personalization via Firebase Firestore

# 6. Environment Variables (Vercel)

- HUGGINGFACE\_API\_KEY  
- QDRANT\_URL  
- QDRANT\_API\_KEY  
- GEMINI\_API\_KEY  
- FIREBASE\_API\_KEY  
- FIREBASE\_APP\_ID  
- FIREBASE\_PROJECT\_ID  
- FIREBASE\_MESSAGING\_SENDER\_ID  
- FIREBASE\_AUTH\_DOMAIN

# 7. Deployment Steps

1. Push repo to GitHub  
2. Import project in Vercel  
3. Set environment variables  
4. Build command: flutter build web  
5. Output directory: flutter\_app/build/web  
6. Deploy and access live link

# 8. Notes

- Free-tier stack allows demo and interview deployment without cost  
- Replace sample dishes in sample\_foods.json as needed  
- Do not commit API keys, use Vercel environment variables