Project Title : Grocery Mate

Course: Engineering of Mobile Systems

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Report Structure:

1. Executive Summary

Grocery Mate is an Android application designed to simplify grocery shopping. Developed as part of the *Engineering of Mobile Systems* course, the app fetches product information using the Open Food Facts API, organizes products into categories, and provides users with features such as a shopping cart, calorie counter, and favorites management. It follows the MVVM architecture with Room Database for local persistence.

2. Introduction

Grocery shopping can be tedious without an organized system to manage product information and track nutrition. Grocery Mate addresses this issue by providing users with an intuitive interface to browse products, create shopping lists, and track their nutritional intake. It also enables users to save favorite products and add reviews for personalized use.

3. Features

1. **Categorized Product Display**
   Products are fetched and categorized into Drinks, Sweets, Snacks, Milk Products, and Bio Products.
2. **Shopping Cart**
   Users can add products to a cart, review them, and remove unwanted items.
3. **Favorites**
   Frequently purchased or liked products can be saved in a Favorites list.
4. **Calorie Counter**
   Displays nutritional details like calories, fat, sugar, and protein for selected items.
5. **Product Reviews**
   Users can write, save, and view product reviews.

4. Architecture

1. **Model-View-ViewModel (MVVM)**
   - **Model:** Handles data operations (Room Database for cart, favorites, and reviews).
   - **View:** Jetpack Compose components for UI.
   - **ViewModel:** Manages UI-related data and handles API interactions.
2. **Database**
   - **Room Database:** Manages local persistence for user-specific data such as cart items, favorite products, and reviews.
3. **API Integration**

- Uses Retrofit for HTTP requests to fetch product details from the Open Food Facts API.

5. Implementation Details

1. **Technologies Used**
    - **Jetpack Compose** for UI.
    - **Kotlin** as the primary programming language.
    - **Retrofit** for REST API integration.
    - **Room Database** for internal storage.
2. **Navigation**
    - Implements Jetpack Navigation for smooth transitions between screens.
3. **UI Design**
    - Material Design principles for intuitive navigation and consistent layouts.

6. Challenges and Solutions

1. **Database Schema Changes**
    - Updated the database version and implemented fallbackToDestructiveMigration to handle schema changes effectively.
2. **API Integration**
    - Managed network errors gracefully using Kotlin's try-catch mechanism.
3. **Calorie Calculation**
    - Ensured accurate computation by fetching and aggregating nutritional data from the API.

7. Conclusion

Grocery Mate successfully demonstrates the use of modern Android development practices and technologies. By providing intuitive features and a well-designed architecture, the app streamlines the grocery shopping experience and helps users manage their nutrition effectively.

8. References

1. Open Food Facts API Documentation
2. Android Developer Documentation: Room Database
3. Jetpack Compose: Compose UI