Conceptual Text

DiaTrack - A Habit Tracker for Diabetic Patients

Purpose & Overview

Managing diabetes requires consistent adherence to daily habits such as blood glucose monitoring, medication intake, nutrition, physical activity, hydration, and sleep. Many diabetic patients struggle with maintaining these routines, often due to forgetfulness, lack of feedback, or limited integration between tracking behaviors and health awareness. **DiaTrack** is specifically for diabetic patients. Its primary function is to support users in establishing and maintaining daily routines that contribute to effective blood sugar control and overall well-being. The app will combine personalized habit tracking with user-friendly design and data visualization, enabling patients to take control of their condition while generating structured data for potential sharing with caregivers or healthcare professionals.

Core Components & Functionality

1. Habit Class & Data Model

- Habit is the core class object in the app.
- Each habit instance contains:
    - habit_id
    - habit_type (e.g., glucose logging, medication, physical activity , hydration, meal)
    - frequency (e.g., daily, weekly)
    - completion_status
    - reminder_time
    - log_data (values, notes)

Predefined Habits include:

- **Blood Glucose Monitoring** (e.g., fasting, postprandial)
- **Timely Medication Use** (e.g., insulin, metformin)
- **Physical Activity** (e.g., daily step goals or custom exercise logs)
- **Hydration Tracking**
- **Sleep Hygiene** (hours and sleep quality)
- **Foot Care** (daily foot inspection checklist)
- **Informed Meal Logging** (focus on balanced carbs, portion size, sugar intake)

2. User Flow Overview

i. **User Registration/Login**

ii. **Profile Setup**

- Type of diabetes
- Medication regimen
- Preferred habitat

iii. **Dashboard**

- Overview of daily habits
- Habit progress/streaks

iv. **Habit Logging**

- Input for glucose, medication taken, steps walked, etc.
- Visual trend reports

v. **Notifications**

- Timely reminders for habits

vi. **Report Export**

- PDF summary for health professionals

3. System Logic

- Reminders are triggered using local notifications.
- All entries are stored in a local + cloud-synced database.
- Reports are generated weekly using backend logic that aggregates habit logs.

User Interaction Design

- Users interact with the app primarily via:
  - The **dashboard**, where daily tasks are visualized
  - The **habit logger**, where they record glucose levels, meds, etc.
- Completion of habits triggers positive reinforcement (badges, streaks)
- Users can review historical data and spot trends (e.g., glucose stability over 7 days)

Why This Structure?

- The class-based approach makes the app modular and scalable.
- It supports the easy addition of new habit types (e.g., foot care).
- Storing logs with timestamps ensures accurate tracking and longitudinal insight.
- By separating visual (UI) layers from logic (habit data & reminders), the app remains lightweight and responsive.

Technologies & Tools

- **Frontend:** Flutter (cross-platform mobile UI)
- **Backend:** Firebase (authentication, Firestore database, cloud sync)
- **Visualization:** D3.js or built-in Flutter chart libraries
- **Data Export:** CSV/PDF via backend formatting
- **Security:** End-to-end encryption for health-related logs

Diagram: Simplified UML Class Diagram (Habit Flow)

Below is a UML-style diagram showing interaction between core components: