**Report on A Sleep Tracking App for a Better Night's Rest**

**Project Overview**

The **Sleep Tracker App** is an Android-based application designed to enhance users' understanding and tracking of their sleep patterns. Built using **Android Jetpack Compose**, this app offers a user-friendly UI that integrates modern Android development principles. The app provides features like sleep tracking, quality assessment, and detailed sleep analysis, making it an essential tool for improving sleep hygiene and overall well-being.

**Project Features**

1. **Sleep Tracking**
   * Users can start a timer when they go to bed.
   * The timer runs in the background until manually stopped after waking up.
2. **Sleep Quality Rating**
   * After tracking, users rate their sleep quality based on their experience.
3. **Sleep Analysis**
   * The app displays an overview and analysis of the previous night's sleep.

**Architecture**

The application follows a **modern Android app architecture** using the following components:

* **Jetpack Compose** for UI creation.
* **Room Database** for local data storage.
* **MVVM (Model-View-ViewModel)** design pattern to ensure a clean separation of concerns and maintainability.
* **Coroutines** for asynchronous tasks, ensuring smooth UI interactions.

**Learning Outcomes**

By the end of this project:

1. Proficiency in **Android Studio** for building applications.
2. Experience integrating and managing a **local database** using Room.
3. Understanding of UI development with **Jetpack Compose**.
4. Familiarity with project workflows for Android apps.

**Project Workflow**

1. **User Registration:**  
   Users register for an account to access app features.
2. **Login:**  
   Registered users log in to the app.
3. **Main Page Access:**  
   After login, users access the main page, where they can:
   * Start sleep tracking.
   * Stop the timer after waking up.
   * Rate and analyze their sleep quality.
4. **Sleep Record Management:**  
   The app records and stores sleep data in the local database for future analysis.

**Tasks Completed**

1. **Required Initial Steps:**
   * Set up the development environment with **Android Studio** and necessary tools.
   * Created a GitHub repository for version control.
2. **Creating a New Project:**
   * Initialized a new project in Android Studio with Jetpack Compose support.
3. **Adding Dependencies:**
   * Added required dependencies for Room, Jetpack Compose, and other libraries in the build.gradle file.
4. **Database Classes:**
   * Designed database schema with Room.
   * Created DAO (Data Access Objects) and entity classes for sleep data.
5. **UI Development and Database Integration:**
   * Built the main UI components using Jetpack Compose, including:
     + Timer screen.
     + Sleep quality rating screen.
     + Sleep analysis screen.
   * Integrated UI with the database for seamless data storage and retrieval.
6. **AndroidManifest Configuration:**
   * Configured the app’s AndroidManifest.xml file with necessary permissions, activities, and services.
7. **Running the Application:**
   * Successfully ran the application, ensuring all features work as intended.

**Challenges Faced and Solutions**

1. **Challenge:** Managing database operations efficiently.  
   **Solution:** Used Coroutines and ViewModel to handle background tasks smoothly.
2. **Challenge:** Designing an intuitive UI.  
   **Solution:** Utilized Jetpack Compose's flexible tools to create a user-friendly design.
3. **Challenge:** Debugging timer functionality in the background.  
   **Solution:** Leveraged Android's lifecycle-aware components to manage the timer service.

**Conclusion**

The **Sleep Tracker App** successfully demonstrates the integration of modern Android development tools and practices. It serves as a practical tool for users to monitor and analyze their sleep, contributing to healthier habits and lifestyles. The project also provided valuable learning experiences in Android app development, UI design, and database management.

**Future Improvements**

1. **Cloud Sync:** Enable data synchronization across multiple devices using cloud services.
2. **Advanced Analytics:** Incorporate AI-based analysis for deeper insights into sleep patterns.
3. **Push Notifications:** Add reminders for tracking sleep or improving bedtime routines.
4. **Dark Mode:** Enhance the UI with a dark mode for better usability at night.

**GitHub Repository**

The complete project code is available at: [GitHub - Sleep Tracker App](https://github.com/Samrocz05/sleep-tracker-app)

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