

GOVERNMENT COLLEGE OF TECHNOLOGY COIMBATORE -13

A SLEEP TRACKING APP FOR A BETTER NIGHT'S REST

An Android Application using kotlin

Submitted by

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1. Introduction

The **SleepTrackerApp** is designed to help users monitor and improve their sleep patterns by tracking sleep duration and quality. With the increasing awareness of the importance of sleep for physical and mental health, this app provides a user-friendly solution to keep track of sleep data over time. It allows users to understand their sleep habits and make necessary adjustments to achieve better sleep health.

1.1 Objectives

- Develop a mobile application to track users' sleep start and stop times.
- Store sleep data and generate logs for users to monitor their sleeping patterns.
- Provide insights into sleep duration over time, helping users identify trends or issues.
- Implement an easy-to-use interface for tracking, viewing, and analyzing sleep data.

1.2 Functionalities

- Start and stop sleep tracking with a simple button interface.
 - Store sleep session data, including start and end times.
 - Display sleep duration statistics and trends.
 - Allow users to view previous sleep sessions.
 - Option to export sleep data for further analysis.
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2. Literature Survey

Sleep tracking has become a common feature in many health and fitness apps. It typically involves using wearable devices or mobile applications that monitor sleep patterns, often analyzing metrics like sleep duration, restlessness, and sleep cycles.

2.1 Existing Solutions

Several popular sleep-tracking apps and wearable devices already exist in the market, such as:

- **Fitbit:** Wearable devices that monitor sleep patterns, heart rate, and activity.
- **Sleep Cycle:** A mobile app that tracks sleep quality and provides a smart alarm.
- **Google Fit:** Tracks health data, including sleep duration.

While these solutions are comprehensive, they often require additional hardware or premium subscriptions to access all features.

2.2 Proposed Solution

The **SleepTrackerApp** simplifies the sleep tracking process without the need for external hardware. It focuses on ease of use by allowing users to manually track their sleep start and end times, making it accessible to anyone with a smartphone. The app provides insightful analytics to help users improve their sleep habits.

3. Theoretical Analysis

3.1 Block Diagram

The block diagram for the **SleepTrackerApp** illustrates the key modules, including:

- **User Interface (UI):** Where the user interacts with the app to start/stop tracking.
- **Database (SQLite):** Stores sleep log data locally on the user's device.
- **Analytics Module:** Processes and displays trends and insights from stored sleep data.

3.2 Hardware and Software Designing

- **Hardware:** The app is designed for Android devices without additional hardware requirements.
- **Software:** The app is developed using:
 - **Kotlin:** Primary language for Android development.
 - **SQLite:** For local storage of sleep data.
 - **Jetpack Compose:** For UI development and seamless user interactions.

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4. Experimental Investigations

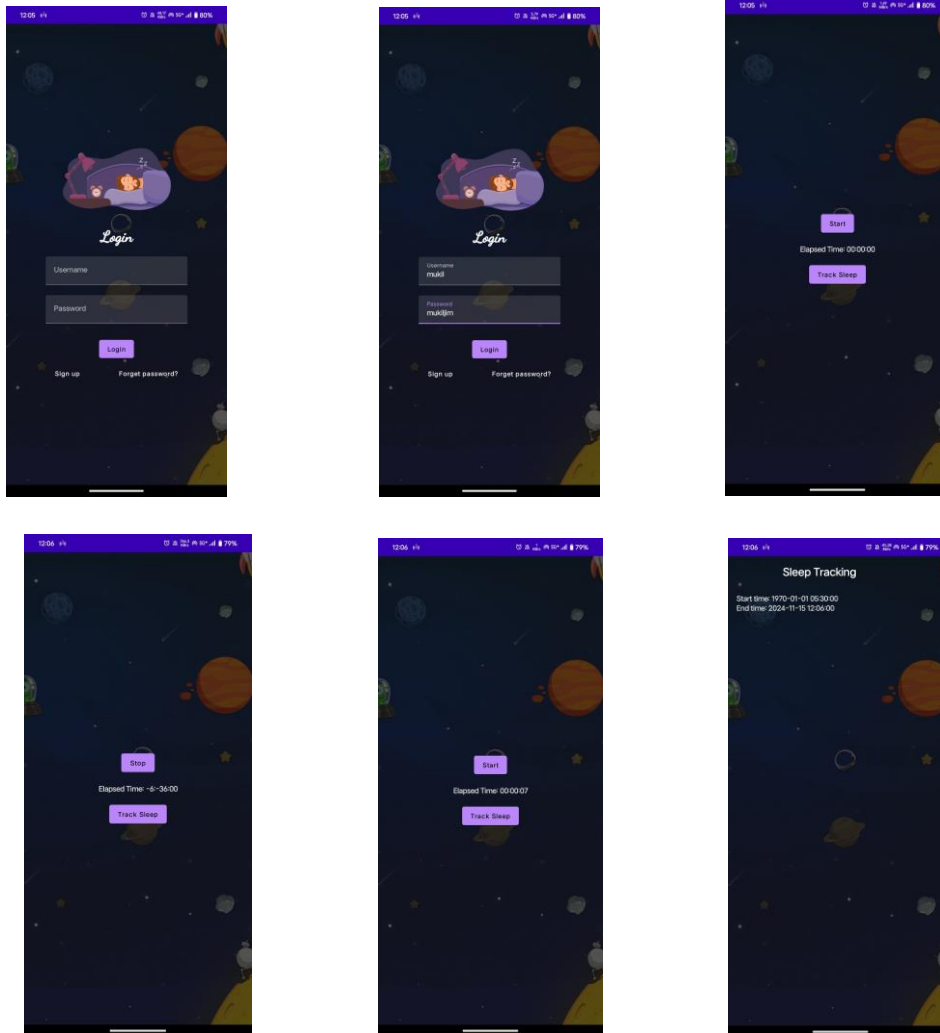
The **SleepTrackerApp** was tested with a small group of users to validate its functionality. During testing, users were asked to track their sleep for one week, and the app successfully recorded sleep times and provided accurate summaries of sleep patterns. Users found the interface easy to use, and the app worked reliably without crashes or major issues.

5. Flow Chart

A flow chart for the **SleepTrackerApp** can be structured as follows:

- Start → Sleep tracking started by user → Timer running → Sleep tracking stopped by user → Data logged in SQLite database → Sleep data summary displayed → End

Output:



6. Advantages and Disadvantages

Advantages

- Simple, user-friendly interface.
- No need for external devices or wearables.
- Accurate logging and visualization of sleep patterns.
- Free and accessible to any Android smartphone user.

Disadvantages

- Requires manual input from users to start and stop tracking.
 - Lacks advanced features like sleep cycle analysis without wearable integration.
 - Limited to Android users.
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7. Applications

- Personal health and wellness monitoring.
 - Data collection for sleep research or self-experiments.
 - Aiding users in understanding and improving their sleep habits.
 - Could be integrated with other health-tracking apps or devices in the future.
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8. Conclusion

The **SleepTrackerApp** serves as an effective tool for users to monitor their sleep patterns, providing valuable insights into their daily sleep routine. With a focus on simplicity, the app makes sleep tracking accessible to a wide audience and offers room for future enhancement, such as integrating with other health devices or implementing more advanced sleep analytics.