Fitbit Tracker Analysis Report

Analysing activity, sleep, and caloric trends using Fitbit data

## Problem Statement

Despite the abundance of wearable fitness devices, users often struggle to interpret their data in a meaningful way. This project seeks to analyse behavioural patterns captured through Fitbit data to answer key questions related to physical activity, sleep quality, calorie expenditure, and lifestyle consistency. The goal is to convert raw data into actionable health insights for individual users and help product teams design better dashboards and interventions.

## Business Questions

1. Which days of the week show the highest and lowest physical activity across users?
2. How consistent are users in meeting daily activity goals (e.g., 7500+ steps)?
3. Is there a correlation between more sleep and greater calorie expenditure?
4. How are users distributed across sedentary, lightly active, and very active lifestyle bands?
5. How does sleep duration affect daily step counts and energy burned?

## Tools Used:

* MS SQL Server (for querying, data cleaning, and aggregating Fitbit data)
* Tableau Desktop (for data visualization and dashboard creation)
* Excel (for data merging)

## Key Insights

1. **Activity Consistency**

* Users averaged 6,547 daily steps, with considerable variance.
* Activity spikes appear mid-week, while Sunday shows the lowest movement.

1. **Caloric Expenditure Trends**

* Strong correlation between total steps and calories burned, confirming physical movement is the primary driver of caloric output.

1. **Sleep Behaviour**

* The average sleep per user is only 3.4 hours/day, well below the recommended 7–9 hours.
* Poor sleep correlates with slightly lower steps and less active minutes, though the relationship is not strictly linear.

1. **Activity Intensity Breakdown**

* Most users fall in the “Lightly Active” category across all days.
* A small subset regularly achieves “Very Active” classification, indicating an opportunity for improvement.

1. **Day-of-Week Patterns**

* Tuesday and Wednesday show the highest average step counts and calories burned.
* Weekend activity drops off sharply, particularly among lightly active users.

## Recommendations

* **For End Users:**
  + Aim for 7+ hours of sleep to support activity consistency and energy levels.
  + Set weekday step goals to counter weekend drop-offs.
* **For Product Teams:**
  + Introduce “Consistency Score” badges for users maintaining 7500+ steps/day.
  + Add smart sleep nudges for users averaging <5 hours per night.
  + Provide weekly insights dashboards using similar layout: Steps + Sleep + Calories