Personalised Health for a Healthier Germany

Tackling obesity in Germany with wearable data: a data-driven, personalised wellness solution that empowers individuals to take control of their health.

Project done by: Modris, Shima, Sheryll

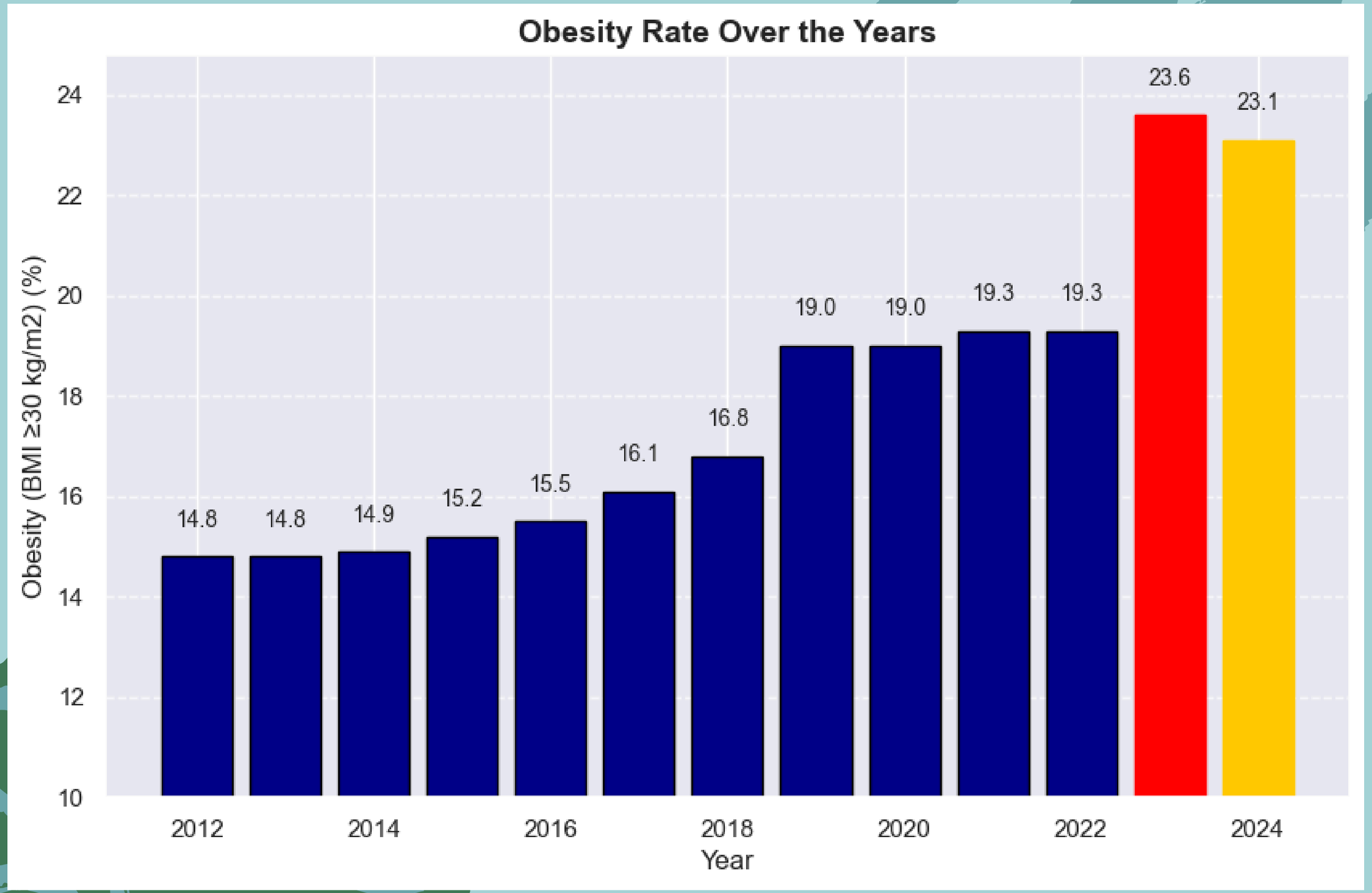
FITBIT Wellness App

Features per user:

- *Sleep duration*
- *Activity duration*
- *Activity intensity*
- *Calories burned*

Users in Germany:

- *9.8 million overall users*
- *almost 500 thousand active user base*


Obesity Rate Over the Years
Obesity (BMI ≥30 kg/m2) (%)
24
22
20
18
16
14
12
10
14.8
14.8
14.9
15.2
15.5
16.1
16.8
19.0
19.0
19.3
19.3
23.6
23.1
2012
2014
2016
2018
2020
2022
2024
Year

Health Risks of Obesity

- Type 2 diabetes
- Heart disease
- Hypertension
- Sleep apnea
- Joint problems
- Certain cancers

Body Mass Index (BMI)

$$\text{BMI} = \frac{\text{Weight in kilogram}}{\left(\text{Height in meter}\right)^2}$$

BMI Categories:

Underweight = <18.5
Normal weight = 18.5–24.9
Overweight = 25–29.9
Obesity = BMI of 30 or greater

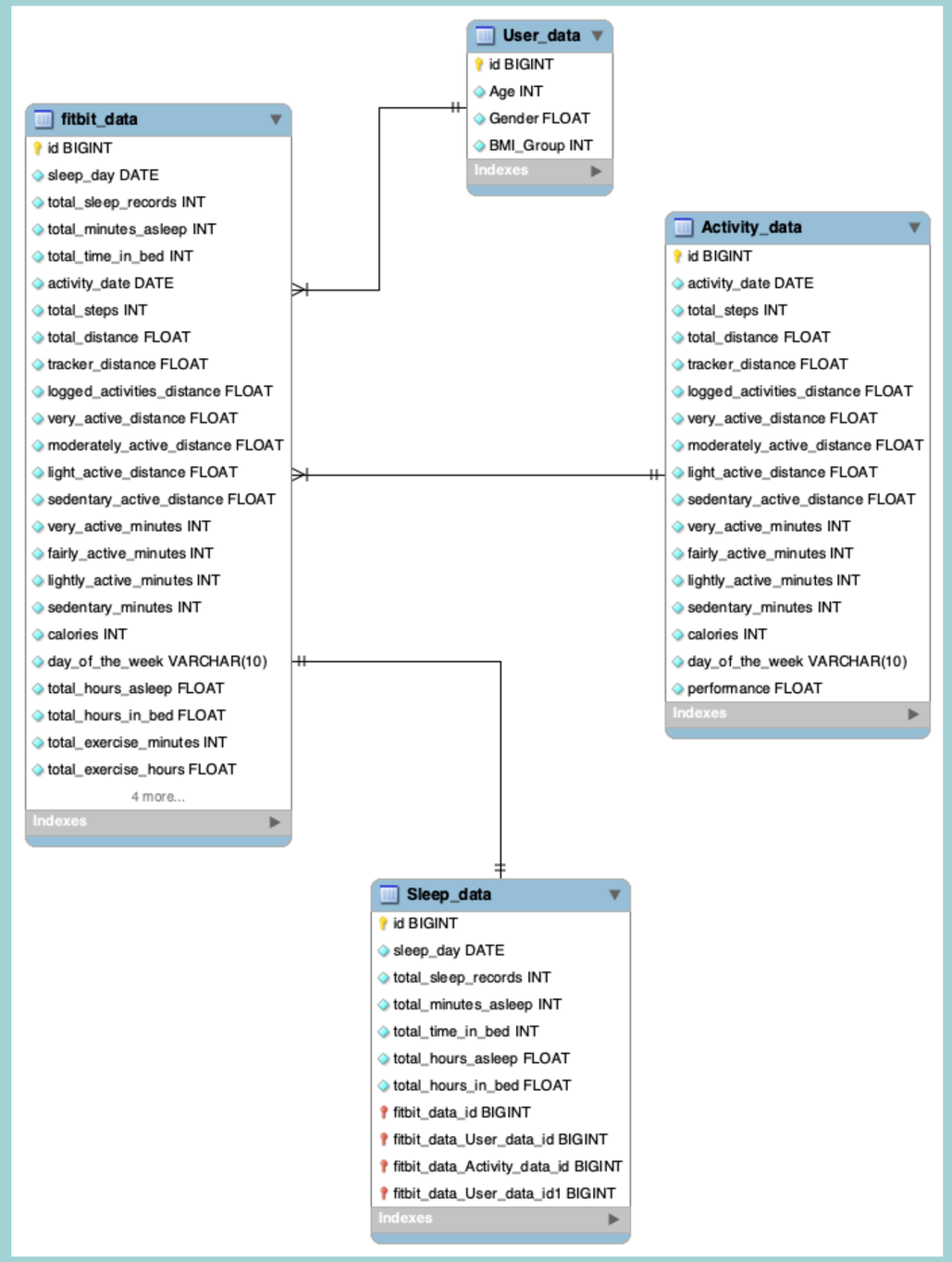
Dataset:

Dataset 1: Fitbit

Dataset 2: Obesity growth over the years in Germany

Dataset 3: Current obesity distribution across age and gender in Germany

EERD Model in SQL



Data Cleaning & Processing

Python:

- Loaded and reviewed datasets structure.
- Removed duplicates and handled missing values.
- Standardised formats and converted categorical values for analysis.
- Converted ActivityDate and SleepDay to DATE format

SQL:

- Aggregations (AVG, SUM)
- GROUP BY, CASE, ORDER BY
- Composite filtering
- Joins across user, sleep, and activity data

Hypothesis 1:

Sufficient sleep is closely linked to an active lifestyle, contributing to overall well-being.

Hypothesis 2: Physical activity patterns vary significantly by day of the week.

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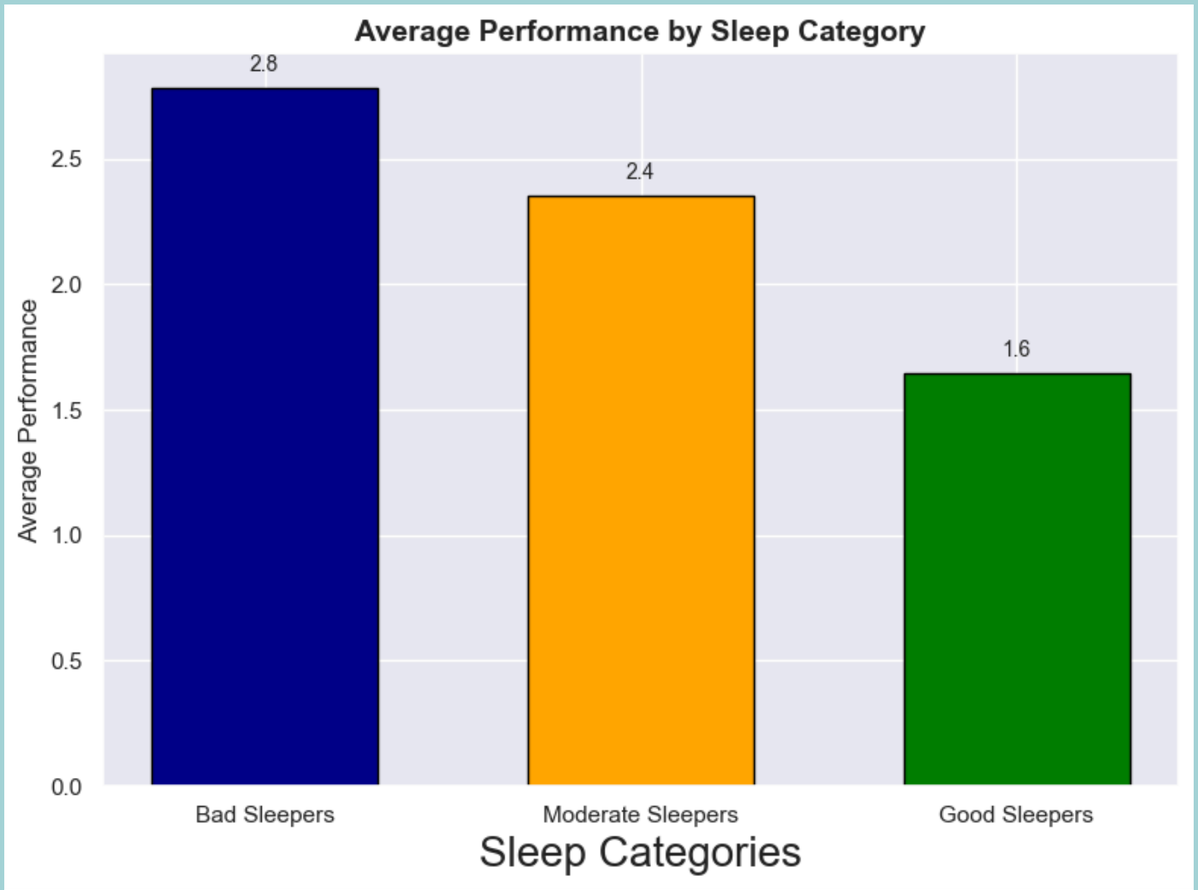
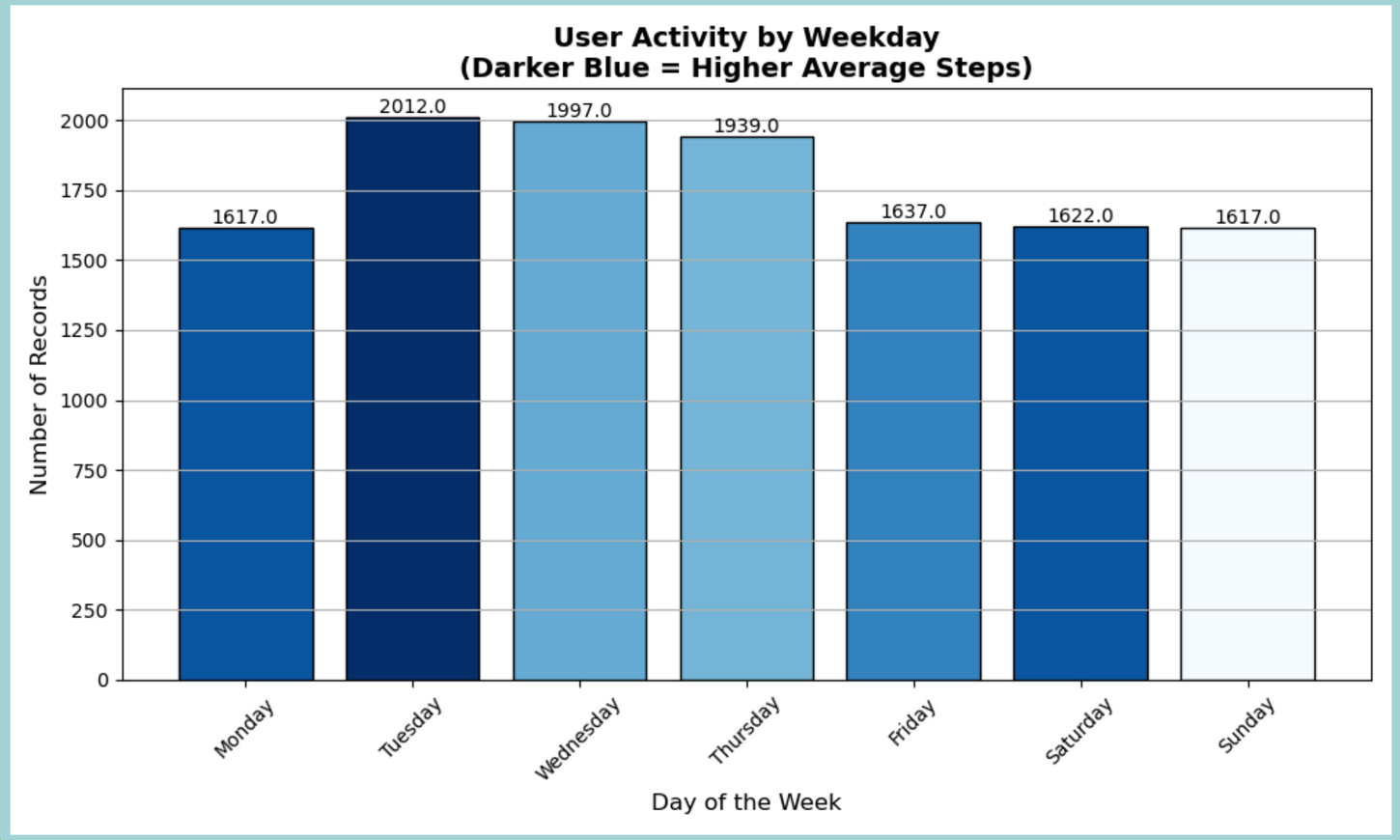
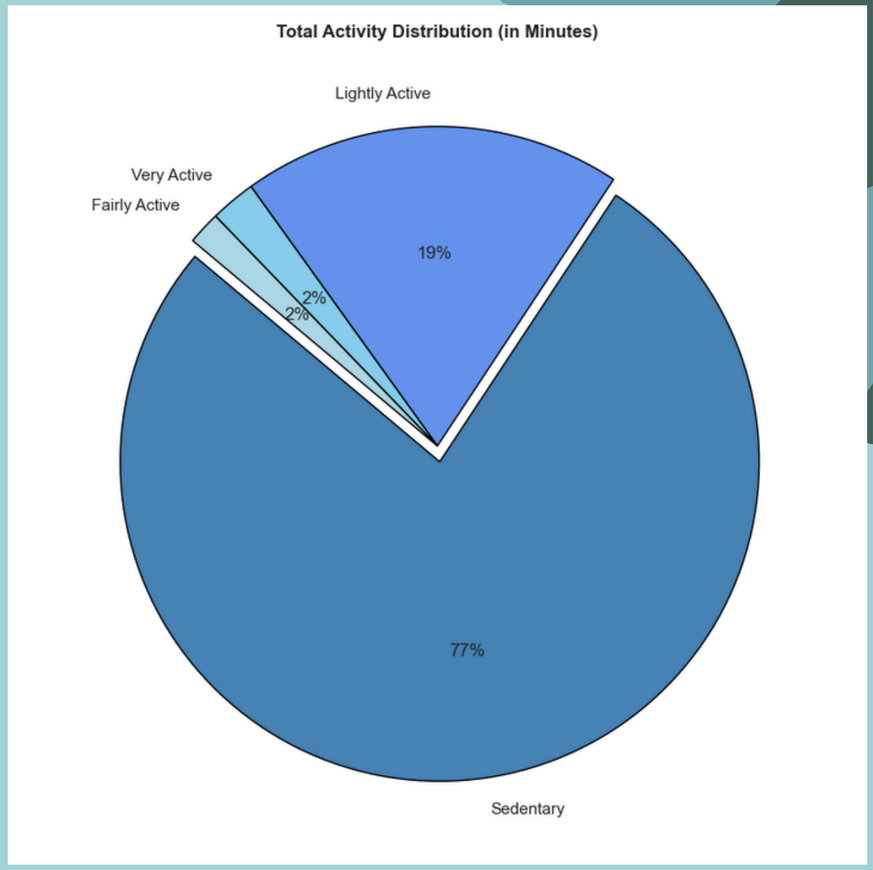


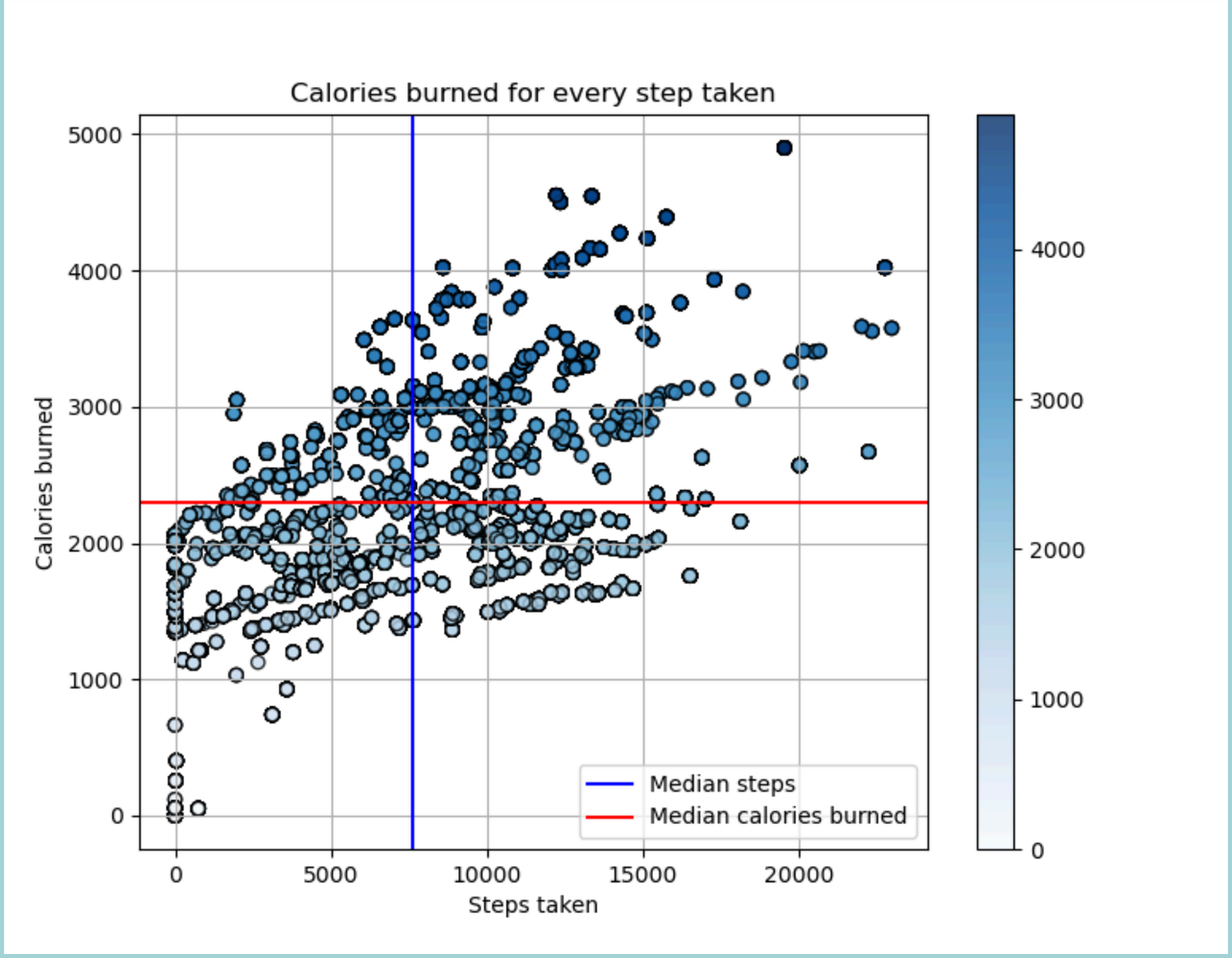
- ***Bad Sleepers: sleep < 6h***
- ***Moderate Sleepers: 6h < sleep < 7h***
- ***Good Sleepers: sleep > 7h***

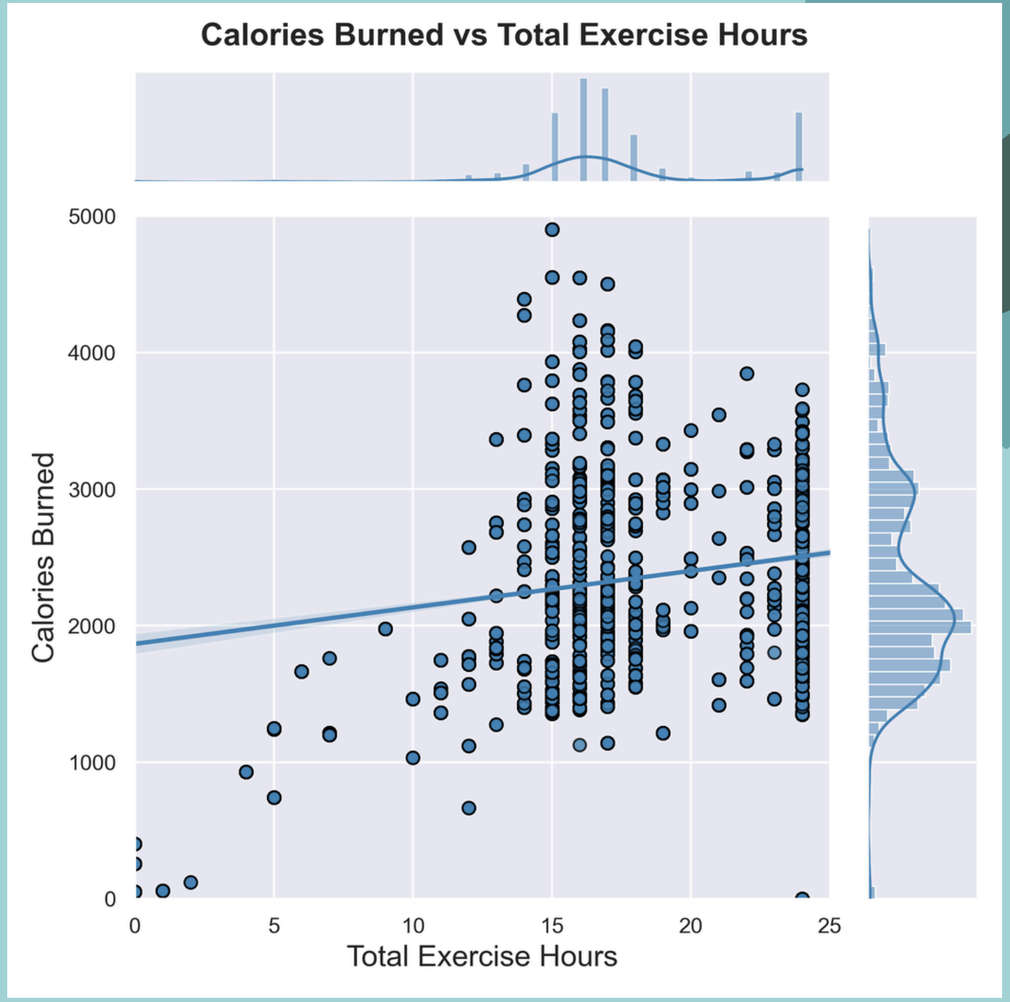
Hypothesis 2: Physical activity patterns vary significantly by day of the week.





Additional insights





Key Findings:

1. ***Sleep Alone Doesn’t Guarantee High Performance***

   - *“Bad Sleepers” outperformed “Moderate” and “Good Sleepers” in average performance scores.*

2. ***Weekday Activity Peaks Midweek***

   - *Highest average steps: Tuesday & Wednesday*
   - *Lowest activity: Sunday*

3. ***Obesity in Germany Is Rising Rapidly***

   - *From 15% (2012) to 23.6% (2023)*

Business Implications

Target Group:
People with overweight and obesity

Insurance Companies Incentive:

- Improving customer health leads to lower healthcare costs
- over 1700 studies proves the effectiveness of wellness apps

Clients Incentive:

- accessible through health insurance reimbursement removing financial barriers and supporting public health goals.
- data-driven insights can make a real difference

Thank You & Final Thoughts

Project Title:
“Personalised Health for a Healthier Germany”

Final Thoughts:

"Our data journey revealed that even small behavioral patterns — like daily steps or sleep hours — can carry powerful insights. By translating these into action, we open the door to scalable health solutions that benefit individuals and entire systems."

Team Members:

- Modris
- Shima
- Sheryll