Tableau Analysis Of strava Fitness App

Note:

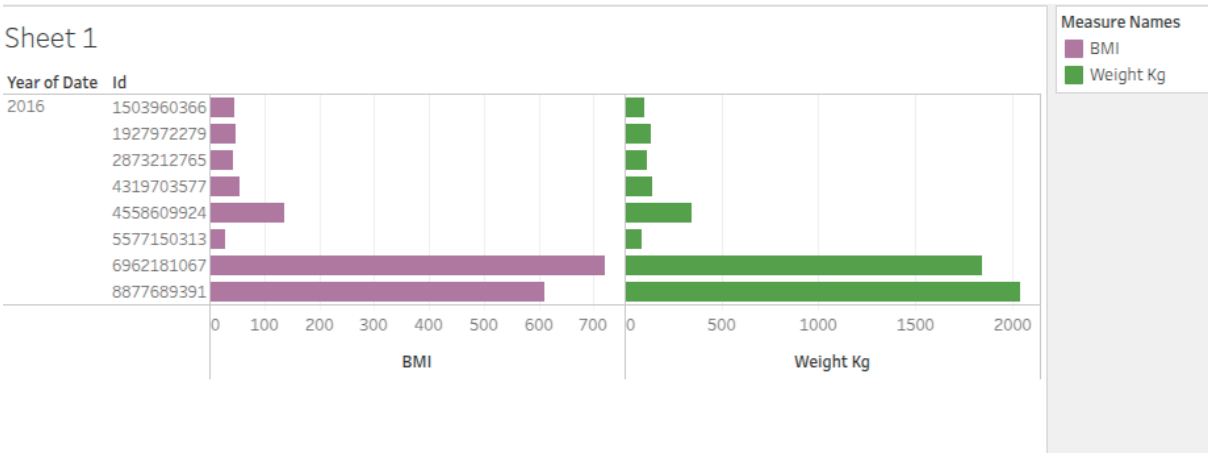
This Tableau analysis for the Strava Fitness App project was completed using Tableau Public (online version) due to my OS limitations. As my laptop runs on Ubuntu (Linux), I was unable to download the .twbx or .pbix file, which is supported only on Windows/Mac. Therefore, I have exported all the dashboards and sheets as PDFs.

Problem Statement:

The rise of wearable devices like Fitbit has led to the collection of large-scale user health data. However, this data remains underutilized without proper analysis.

This project uses Tableau to explore Fitbit user data and uncover insights into physical activity, calorie burn, sleep patterns, and body metrics. The goal is to identify user behavior trends, spot anomalies, and provide actionable insights that support better health tracking and engagement.

Data Analysis:



Sheet 1: BMI vs Weight by User

Chart Type:
Horizontal bar chart using Measure Names and Measure Values to compare BMI and Weight for each user.

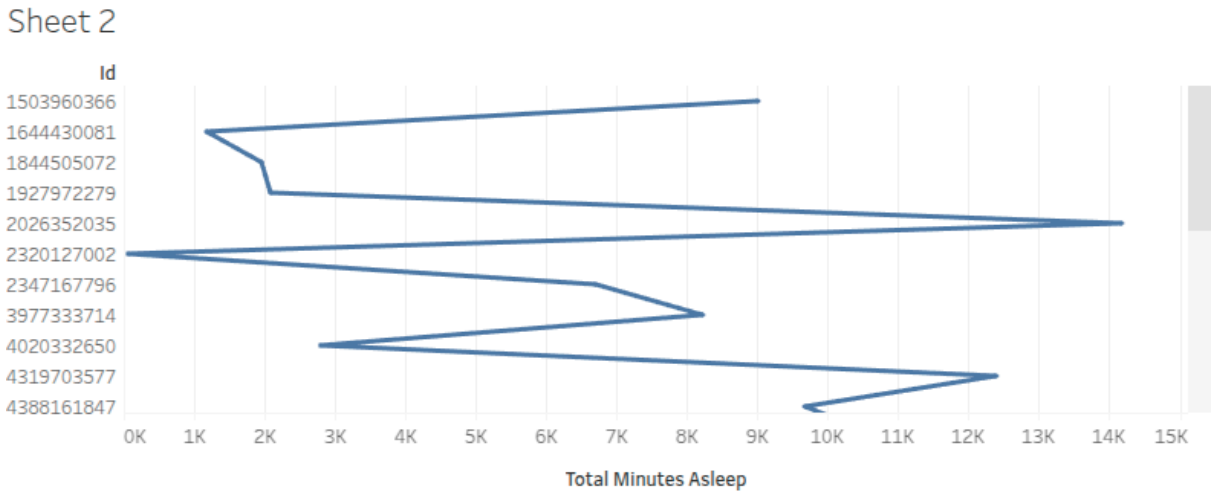
Purpose:
To visually compare BMI and weight across users and identify patterns or inconsistencies in body measurements.

Visual Interpretation:
Most users have realistic and proportionate BMI and weight values. However, certain users like 6962181067 and 8877689391 show extremely high values—BMI over 700 and weight over 2000 kg—which appear highly unrealistic.

Explanation:
The visualization highlights both healthy patterns and potential data issues. Several users fall within expected BMI ranges (18–30), indicating good health. However, a few entries have abnormally large values, suggesting either unit errors (like grams instead of kilograms or incorrect inputs in the dataset.

Insights:

- Some users, such as 6962181067 and 8877689391, exhibit extreme BMI and weight values (e.g., BMI over 700 or weight over 2000 kg), which are biologically implausible. This strongly suggests issues like incorrect data input or unit conversion errors (e.g., grams vs kilograms). Such anomalies should be flagged for data cleaning to prevent skewed analyses.
- The majority of users fall into a healthy or mildly overweight BMI range (18.5–29.9), suggesting that Fitbit users are generally health-conscious or attempting to improve their physical health.
- Balanced user profiles like 1503960366 and 4319703577 reflect accurate tracking and possibly healthy lifestyle habits, providing reliable data for behavioral analysis or future health recommendations.
- This chart highlights the importance of ensuring input validation in wearable technology systems and opens the door for early detection of obesity trends in users with abnormal but genuine values.



Sheet 2: Total Minutes Asleep by ID

Chart Type: Line Chart showing total sleep duration per user.

Purpose:
To evaluate sleep patterns and total minutes asleep per user across the dataset.

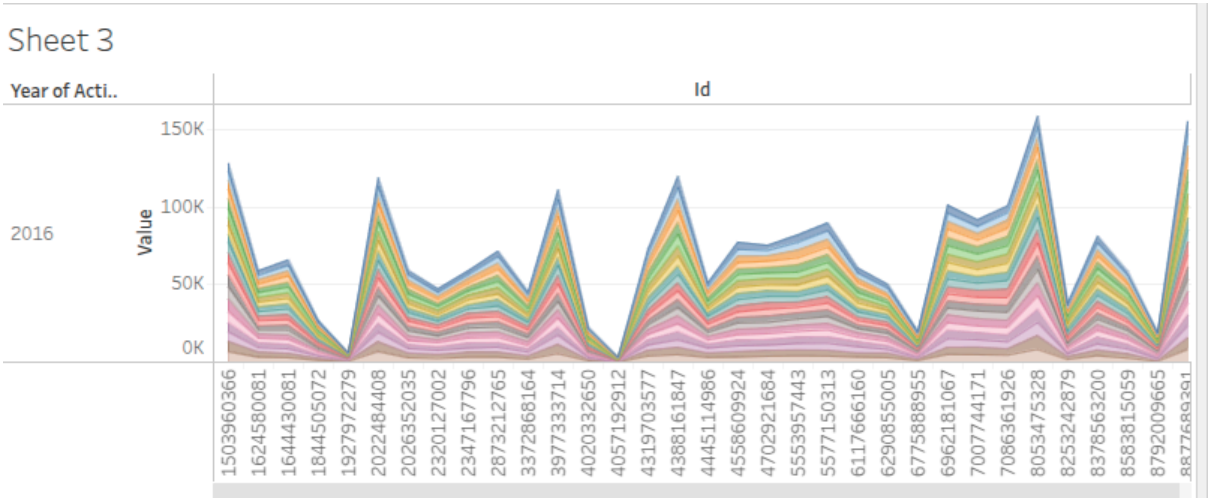
Visual Interpretation:

- Values vary widely from under 1,000 minutes to over 14,000.
- A few users stand out with significantly high totals, while some trail at the bottom.

Explanation:
Sleep is crucial for recovery and health. This chart identifies sleep consistency, outliers, and potential wellness red flags.

Insights:

- Users with over 12K minutes are likely consistent sleepers.
- Extremely low totals could indicate:
    - Incomplete sleep tracking.
    - Sleep issues or irregular patterns.
- Combine with activity levels for fatigue-risk modeling or sleep–activity balance feedback.
- Target low-sleep users with prompts: “Improve your sleep score – tips inside!”



Sheet 3: Activity Over Time by User

Chart Type:
Stacked area chart showing activity Value by Id across the year 2016.

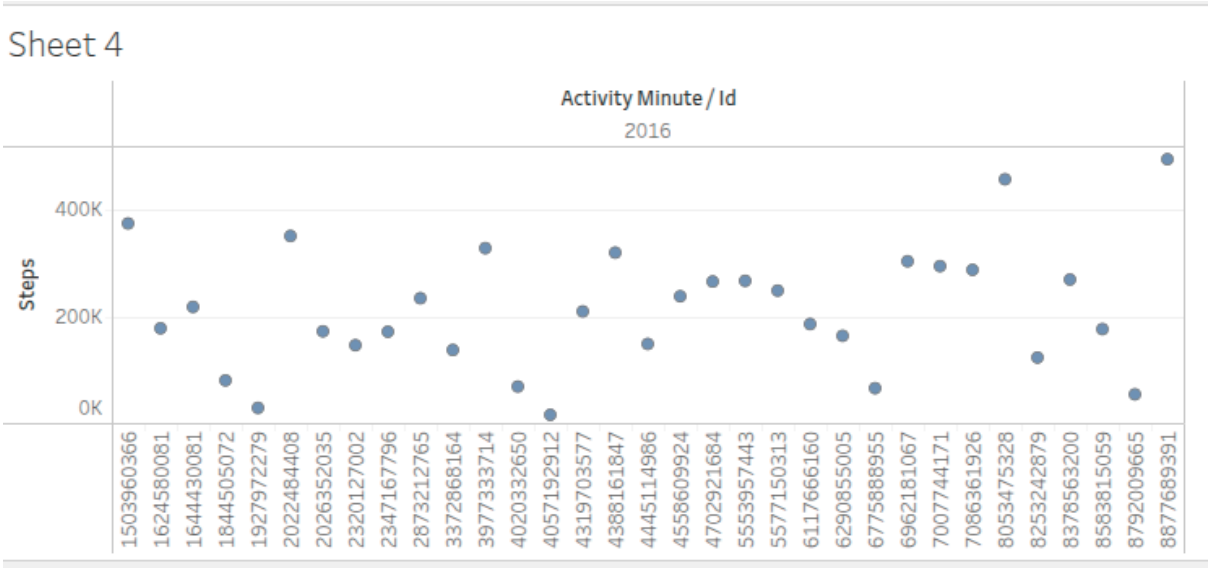
Purpose:
To analyze how activity levels fluctuate across users and time, revealing engagement trends or patterns.

Visual Interpretation:
The chart reveals clear, recurring peaks across users, indicating cycles of high and low activity throughout the year.

Explanation:
These stacked patterns help identify both user consistency and engagement spikes (e.g., possibly during challenges or seasonal shifts). Differences in layer sizes also show how some users dominate activity contribution.

Insights:

- Consistent peaks may represent weekly or monthly activity cycles.
- Sharp drops could suggest inactivity or gaps in data collection.
- Users with the thickest bands show the highest overall contribution—potentially high-value or fitness-driven users.
- Layer consistency can be used to track loyalty or identify drop-off risks.
- Encouraging inactive users to follow top patterns may boost platform engagement.



Sheet 4: Steps by ID

Chart Type: Scatter Plot (Steps by User ID)

Purpose:
To visualize overall user movement through step count data.

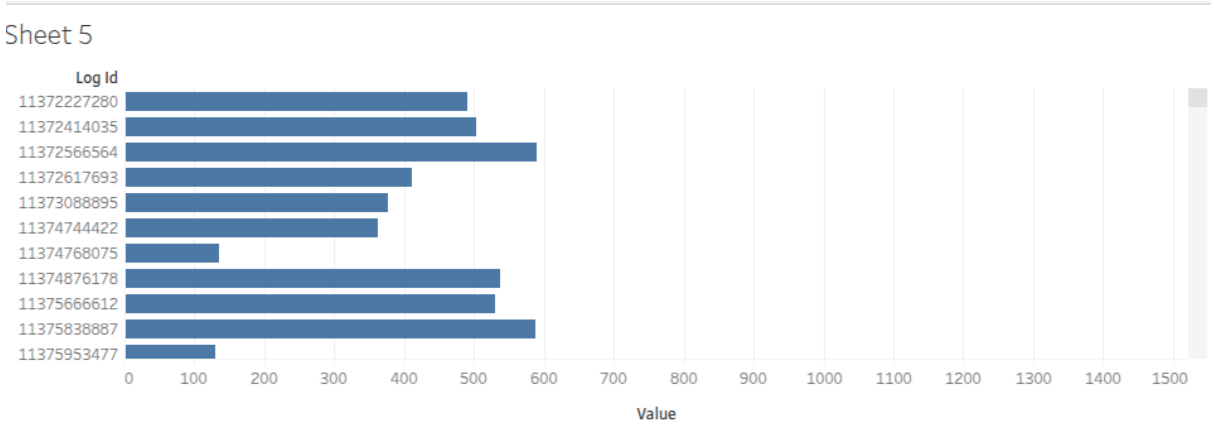
Visual Interpretation:

- Most users cluster between 150K–300K steps.
- A few high-activity outliers exceed 400K (e.g., 8776909391), while others fall under 50K.

Explanation:
Step count is a direct proxy for general mobility. This helps identify sedentary users or power walkers.

Insights:

- Users with <50K steps may need nudges or have poor tracking behavior.
- Super-active users are valuable for feature testing or beta groups.
- Can be used for gamification (badges: “Step Master”).
- Pair with calories/sleep for cross-metric trends.



Sheet 5: Sleep Duration by Log ID

Chart Type:
Horizontal bar chart representing minutes of sleep per log entry.

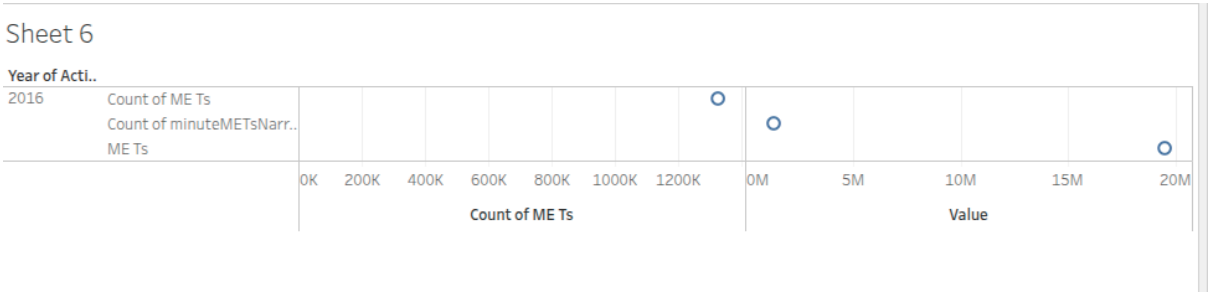
Purpose:
To assess individual sleep durations and identify irregular patterns or insufficient sleep.

Visual Interpretation:
The majority of logs show sleep between 400 and 600 minutes (6.5–10 hours), with a few anomalies under 200 minutes that may reflect poor sleep or faulty data.

Explanation:
Adequate sleep is essential for recovery and wellness. This chart helps identify both healthy and problematic sleep patterns based on user logs.

Insights:

- Users consistently sleeping 7–9 hours show healthy patterns and are likely to experience better physical and mental well-being.
- Log entries under 200 minutes are concerning and may indicate sleep disruption, stress, or tracking issues.
- Poor sleep entries could be used to trigger sleep hygiene tips or smart recommendations (e.g., screen time limits or sleep reminders).
- Users with healthy sleep logs can be monitored for long-term trends, like linking better sleep to higher activity the next day.



Sheet 6: METs Summary for 2016

Chart Type:
Dot plot comparing Count of ME Ts, minuteMETsNarrative, and Value.

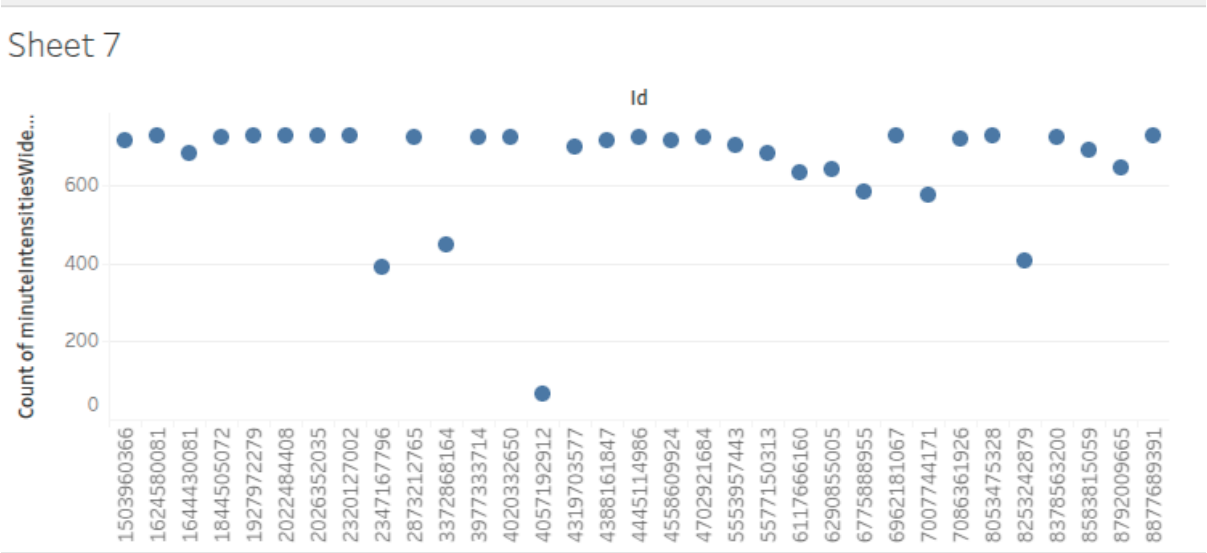
Purpose:
To understand how users are exerting effort—both in terms of duration (minuteMETs) and intensity (METs).

Visual Interpretation:
The dots show high values for minuteMETsNarrative and slightly lower values for MET counts, reflecting that users spend more time in moderate effort than high intensity.

Explanation:
This sheet helps evaluate the energy output of users. By comparing different MET-based metrics, it becomes easier to recommend activity type (duration vs intensity focus).

Insights:

- Higher minuteMETs suggests long sessions of moderate activity (e.g., walking, cycling).
- Lower MET counts with high value may indicate users are active but with lower intensity.
- Users with low MET and value could need personalized activity nudges.
- Data can guide wellness plans: e.g., increase MET count for cardio benefits.
- Useful for segmenting users: endurance-focused vs. high-intensity focused.



Sheet 7: Count of Minute Intensities (Wide Format)

Chart Type: Dot Plot

Purpose:
To track how many minute-level intensity records are logged per user.

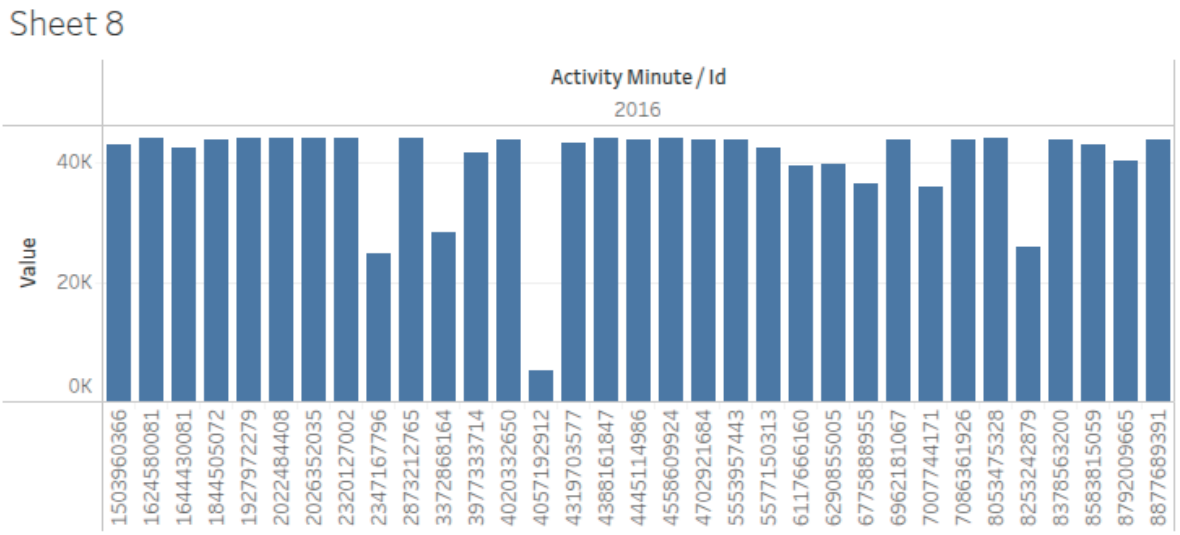
Visual Interpretation:

- Most users have 600–700 logged records.
- Outliers (e.g., 4388161847, 3372688164) have significantly fewer, indicating sparse usage.

Explanation:
This reflects the consistency of detailed activity tracking.

Insights:

- Users with full records are engaged and reliable for in-depth behavior modeling.
- Missing data could mean:
    - Tracking device not used continuously.
    - App not synced properly.
- Use to filter quality data or offer device sync reminders.



Sheet 8: Total Activity Minutes by User (2016)

Chart Type:
Vertical bar chart representing total active minutes for each user during the year.

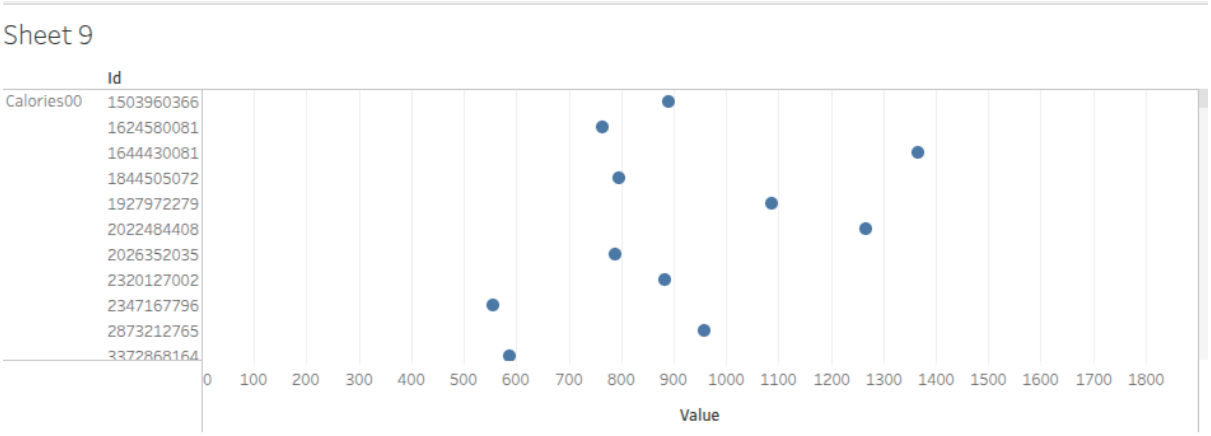
Purpose:
To assess the overall physical activity level of users by summing up their yearly active minutes.

Visual Interpretation:
Most users have between 40,000 and 45,000 total activity minutes, equivalent to around 110–120 minutes per day. A few users show significantly lower totals, indicating limited activity.

Explanation:
This visualization reveals which users maintain consistent physical activity and which may lead sedentary lifestyles. High totals suggest good exercise habits, while low values may signal a lack of engagement or incomplete tracking.

Insights:

- Most users meet or exceed the recommended daily physical activity levels, which is a strong indicator of health-conscious behavior.
- Users like 1927972279 and 405719292 have notably low activity totals, suggesting poor engagement or irregular tracking habits.
- These findings can help segment users into active vs. inactive categories, offering targeted fitness recommendations or intervention plans.
- The chart also emphasizes the importance of encouraging sustained user interaction with fitness devices to maintain long-term health awareness.



Sheet 9: Calories Burned by Users

Chart Type:
Scatter plot showing user IDs vs. total calories burned.

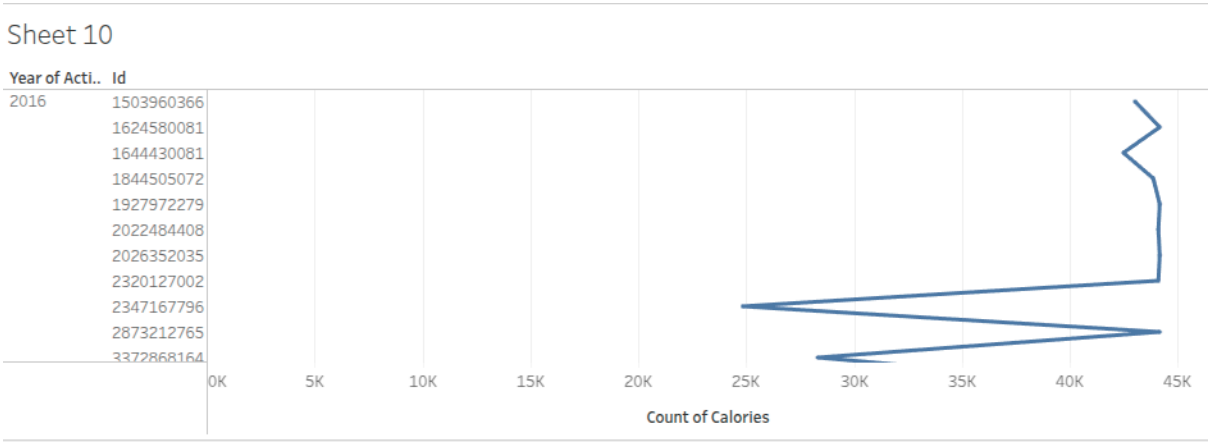
Purpose:
To measure and compare energy expenditure across users.

Visual Interpretation:
Most users are clustered between 800 and 1300 calories/day. Some users, such as 2022484408, exhibit higher calorie burns, while a few log unusually low values.

Explanation:
This chart helps track physical effort levels and metabolic activity. Higher calorie burn may result from intense physical activity or higher BMR, while lower values may reflect inactivity or inconsistent tracking.

Insights:

- The majority of users fall within healthy energy expenditure ranges, aligning with average adult requirements.
- Users with high calorie burns likely engage in regular, high-intensity activities and may benefit from performance tracking or recovery advice.
- Low-calorie burners may need encouragement to increase movement or be checked for incomplete device usage.
- The data can be used to create fitness goals, offer personalized feedback, or integrate diet-tracking features for better health outcomes.



Sheet 10: Count of Calories Records by User ID

Chart Type:
Line chart showing the count of calorie records per user.

Purpose:
To assess how frequently users log their calorie data.

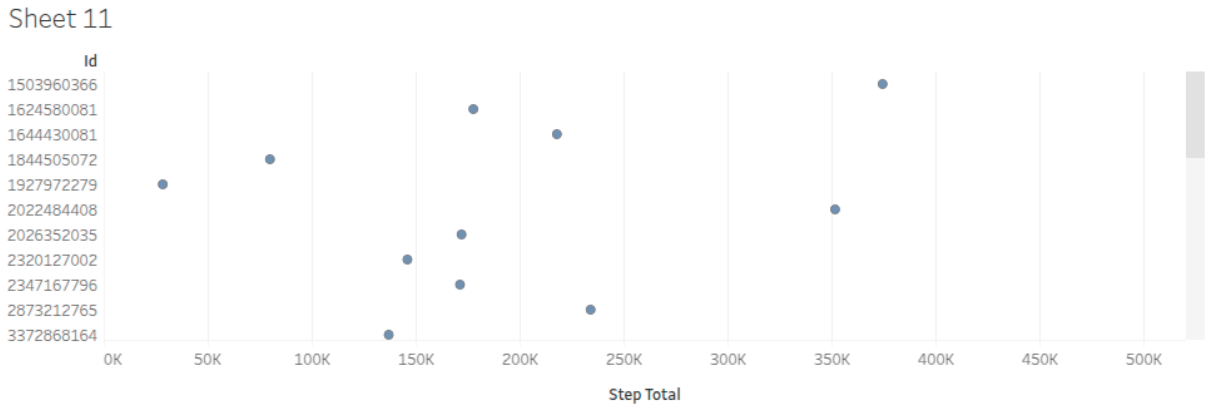
Visual Interpretation:

- Count of entries ranges widely, with some users having close to 45K records.
- Few users log calories consistently.

Explanation:
More frequent logging often indicates better health awareness and commitment.

Insights:

- Users with 40K+ entries (e.g., multiple top IDs) are likely consistent and motivated to track health.
- Sparse entries (below 25K) may result from user disengagement or app usability issues.
- Strong logging behavior correlates with better outcomes in fitness journeys.
- Encourage low-frequency users to log daily for more accurate progress tracking.



Sheet 11: Step Total by User

Chart Type:
Scatter plot mapping Id to total steps (Step Total).

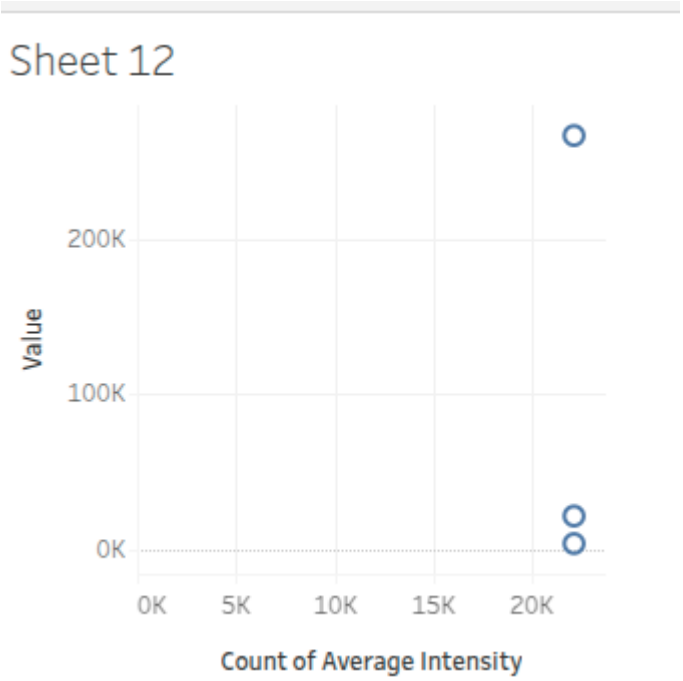
Purpose:
To view the spread of total physical activity (steps) across users and identify highly active or inactive individuals.

Visual Interpretation:
Step totals vary significantly. Some users exceed 400K steps, while others remain under 100K, showing a wide engagement range.

Explanation:
Total step count is a clear indicator of physical movement. This chart helps spot top performers and users with low engagement.

Insights:

- Users with >350K steps are highly active and may respond well to fitness challenges or rewards.
- Users under 100K steps might be new, disengaged, or inactive—ideal for re-engagement campaigns.
- Gaps between users show behavioral variability that could be used for clustering or targeting.
- Data helps in setting dynamic daily goals or notifications.
- Could trigger recommendations: “Try walking 2K more steps this week” based on history.



Sheet 12: Count of Average Intensity vs Value

Chart Type: Scatter Plot

Purpose:
To relate workout intensity to overall output (e.g., calories/steps).

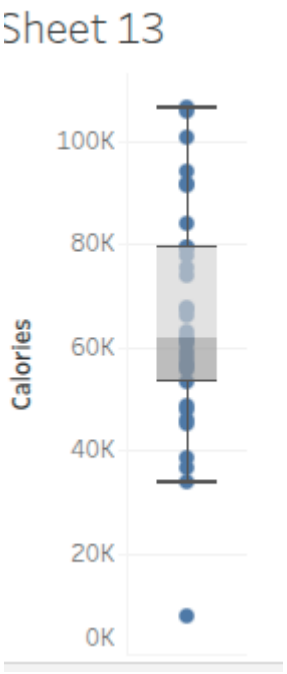
Visual Interpretation:

- Most users cluster low on both axes.
- A few users show extreme high values, possibly representing heavy workouts or long durations.

Explanation:
Captures how active a user is not just in time, but effort.

Insights:

- High-value, high-intensity users = top performers. Ideal for premium fitness features.
- Low values suggest low motivation or need encouragement (“Start small, stay consistent!”).
- Helps tailor workout plans and recommend goals.



Sheet 13: Calories Burned Distribution

Chart Type:
Box plot showing calorie burn spread across users.

Purpose:
To understand variation in total calories burned and identify extreme users (low or high).

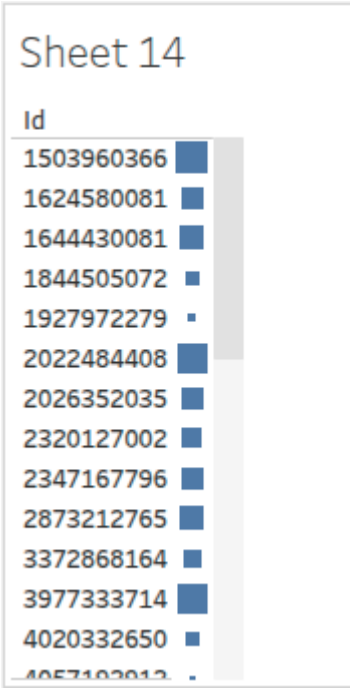
Visual Interpretation:
Most users fall in the 40K–90K calorie range, with a few outliers including one near zero, possibly due to tracking issues or inactivity.

Explanation:
Calories burned reflects user effort and energy expenditure. This chart allows quick assessment of who is active, who needs help, and where anomalies exist.

Insights:

- Users in the mid-range (60K–80K) are likely maintaining consistent activity.
- Extremely low burn (e.g., <10K) could flag disengaged or inactive users—perfect for reactivation.
- High burners (>100K) may be intense users or athletes—ideal for premium targeting or advanced features.
- Useful for correlating calories with steps, sleep, or METs to create holistic user profiles.

- Can guide feedback: “You’re in the top 10% for calorie burn.



Sheet 14: Frequency of Data Logs by User

Chart Type:
Vertical bar chart showing number of data logs per user.

Purpose:
To understand how frequently users record data, which reflects device usage and engagement.

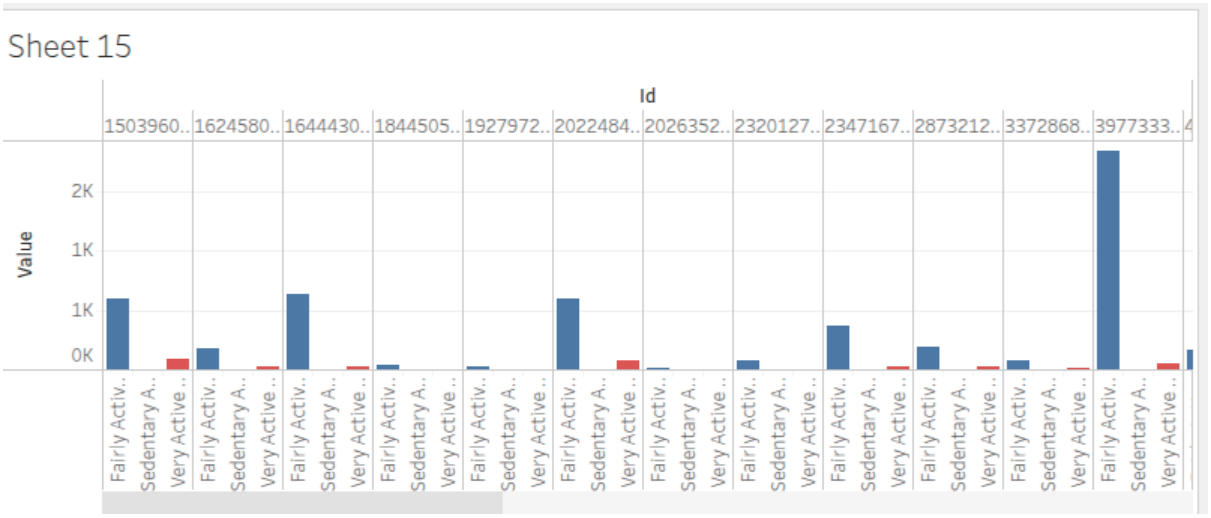
Visual Interpretation:
Users such as 1503960366 and 2022484408 have consistently high logging frequencies, while others like 1927972279 show very few entries.

Explanation:
This chart categorizes users based on engagement levels. Frequent loggers are likely more committed to health tracking, whereas users with fewer entries may have dropped off or use the device sporadically.

Insights:

- High-frequency users show strong device engagement, making them ideal for premium features or targeted fitness challenges.
- Low-frequency users may need prompts, simplified interfaces, or educational nudges to resume usage.
- Logging frequency strongly correlates with data accuracy—users with consistent logs provide higher quality insights for health programs.

- Re-engagement strategies can be tailored based on this segmentation to reduce user drop-off rates.



Sheet 15: Activity Intensity by ID (Bar Chart)

Chart Type: Grouped Bar Chart (Fairly Active, Very Active, Sedentary)

Purpose:
To analyze how users divide their time among different activity levels.

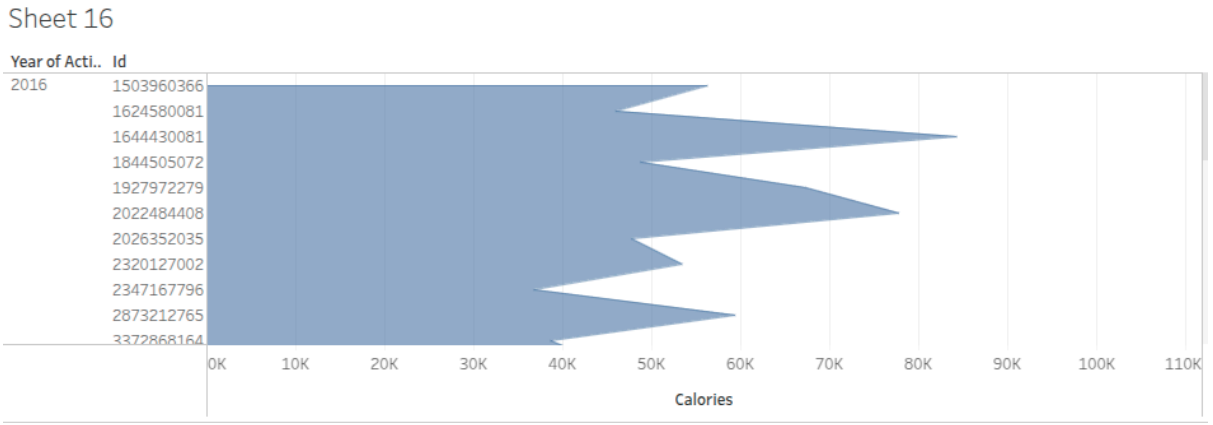
Visual Interpretation:

- “Fairly Active” dominates across most users.
- Very little time spent in “Very Active” zone.
- “Sedentary” is minimal—possibly underreported.

Explanation:
Shows how balanced or lopsided a user’s activity profile is.

Insights:

- Focus on increasing “Very Active” minutes in app prompts.
- Fairly active users are good candidates for challenges: “Boost your intensity today!”
- Helps create intensity-based segmentation for personalized coaching.



Sheet 16: Calories Burned by User ID (2016)

Chart Type:
Horizontal area chart representing calories burned by each user.

Purpose:
To identify users with high and low energy expenditure.

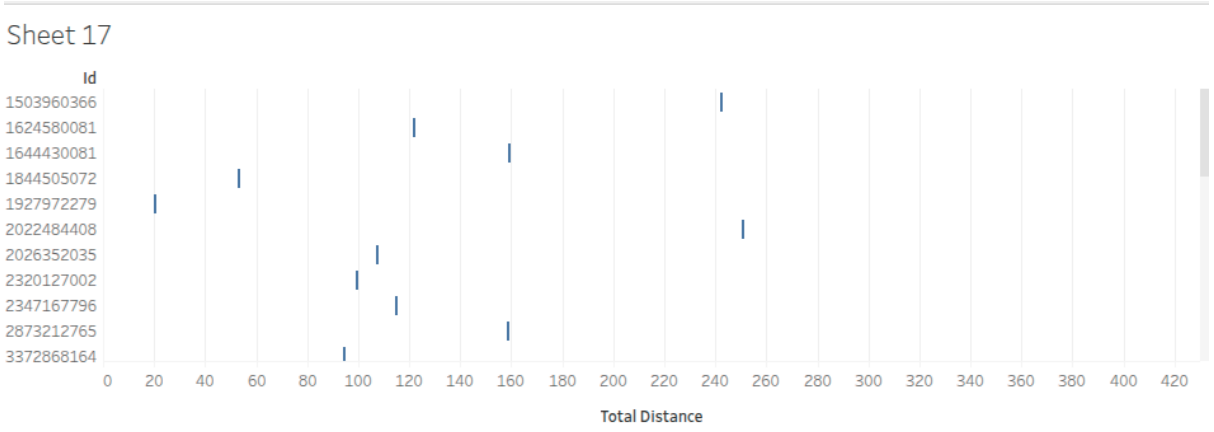
Visual Interpretation:

- Wide variability in calorie burn, peaking around 80K for some users.
- Some users have minimal calorie values.

Explanation:
Calories burned is a reflection of both activity duration and intensity.

Insights:

- IDs like 1644430081 and 1844505072 are top performers, suggesting either long duration workouts or high-intensity sessions.
- IDs with lower values could be inactive or under-tracked.
- Users with high calorie outputs may need adjusted nutrition guidance.
- A comparison with sleep and step data can reveal overall lifestyle balance.



Sheet 17: Total Distance by ID

Chart Type: Vertical Bar Chart

Purpose:
To see how far users walk or run in total.

Visual Interpretation:

- A few users cover over 200 km.
- Several users are under 100 km total.

Explanation:
Total distance shows the extent of physical movement—not just duration but reach.

Insights:

- High-distance users = consistent movers, potentially into endurance or walking goals.
- Short-distance users may need motivational messages or goal nudges.
- Combine with step length to calculate stride patterns.

Conclusion:

This data analysis revealed key patterns in user health behavior. Most users showed consistent activity, sleep, and calorie tracking, reflecting healthy habits and strong engagement. However, some outliers—such as unrealistic BMI values and inconsistent logs—highlight data quality issues.

The insights help segment users by engagement and health levels, enabling targeted feedback and personalized support. Overall, the visual analysis supports smarter health monitoring and user-centric improvements in fitness platforms.