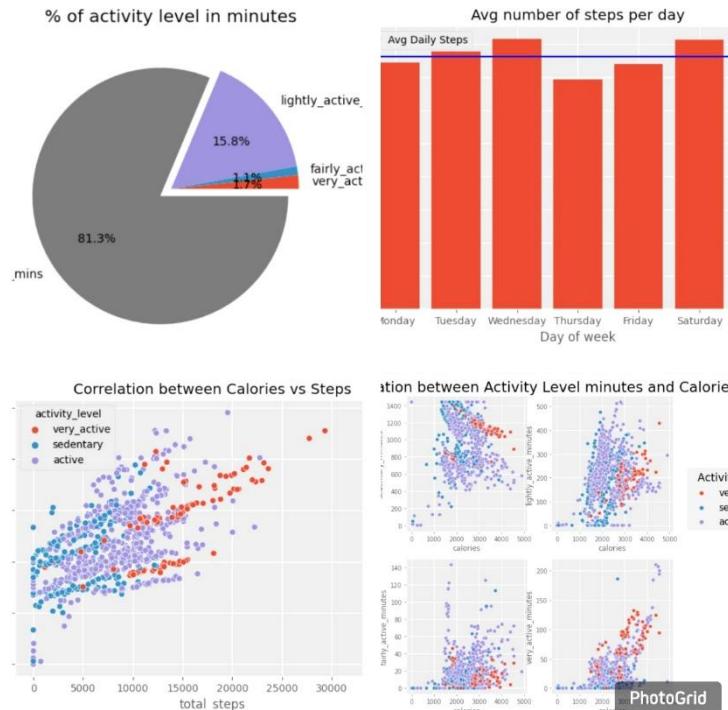


Bella beat Wellness Insights Analysis

Tool: Python (Jupyter Notebook)

Libraries: Pandas, NumPy, Matplotlib, Seaborn



1. Executive Summary

The goal of this project is to analyze smart device fitness data from Fitbit to unlock new business opportunities for Bella beat, a high-tech manufacturer of health-focused products for women. The analysis focuses on understanding how consumers use non-Bella beat smart devices to inform Bella beat's marketing strategy.

2. Key Performance Indicators (KPIs)

- **Total Steps:** Tracking daily physical activity levels across users.
- **Calories Burned:** Measuring energy expenditure in relation to activity.
- **Active vs. Sedentary Minutes:** Categorizing the intensity of daily movement.
- **Usage Frequency:** Monitoring how many hours per day users keep their devices active.

3. Charts & Visualizations Developed

- **Scatter Plot (Steps vs. Calories):** Visualizing the positive correlation between physical activity and calorie burn.
- **Bar Chart (Average Steps by Day of Week):** Identifying which days (e.g., Wednesday and Saturday) are the most active.
- **Pie Chart (Activity Minutes %):** A breakdown showing that 81% of user time is Sedentary.
- **Multi-Plot Analysis:** Comparing different activity levels (Lightly, Fairly, and Very Active) against calories.
- **User Segmentation Chart:** Categorizing users into Sedentary, Active, and Very Active groups.

4. Analytical Insights (EDA Findings)

- **Activity Patterns:** Users are most active on Wednesdays and Saturdays, while activity dips significantly on Thursdays and Fridays.
- **Sedentary Dominance:** The majority of users (81%) spend their day in a sedentary state, representing a massive opportunity for health intervention.
- **Usage Trends:** Wearing a device for more than 16 hours does not automatically lead to high activity, suggesting users need motivational prompts.

- **Correlation:** A strong positive correlation exists between total steps and calories burned, validating the importance of movement for weight management.

5. Data Processing & Cleaning (Python Workflow)

- **Data Import:** Loading multiple CSV files using Pandas.
- **Data Transformation:** Converting date columns into proper datetime objects for time-series analysis.
- **User Segmentation:** Creating a custom function to categorize users based on their average daily step counts.
- **Merging Datasets:** Combining activity data with hourly intensity to find deeper behavioural patterns.
- **Deduplication:** Removing any redundant entries to ensure the integrity of the 33-user sample size.

6. Strategic Recommendations

1. **Personalized Marketing:** Develop targeted campaigns for the "Sedentary" segment to encourage them to reach the "Active" threshold.
2. **Motivational Nudges:** Use app notifications specifically on Thursdays and Fridays to combat the identified mid-week activity slump.
3. **Engagement Strategy:** Promote device usage during sleep and low-activity hours to provide a more holistic health picture to the user.