

Bellabeat Case Study Analysis

Isa A.

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```
dailyactivity <- read.csv("dailyactivity.csv")
head(dailyactivity)
```

```
##           Id ActivityDate TotalSteps TotalDistance TrackerDistance
## 1 1503960366   3/25/2016     11004           7.11           7.11
## 2 1503960366   3/26/2016     17609          11.55          11.55
## 3 1503960366   3/27/2016     12736           8.53           8.53
## 4 1503960366   3/28/2016     13231           8.93           8.93
## 5 1503960366   3/29/2016     12041           7.85           7.85
## 6 1503960366   3/30/2016     10970           7.16           7.16
##   LoggedActivitiesDistance VeryActiveDistance ModeratelyActiveDistance
## 1                        0                2.57                    0.46
## 2                        0                6.92                    0.73
## 3                        0                4.66                    0.16
## 4                        0                3.19                    0.79
## 5                        0                2.16                    1.09
## 6                        0                2.36                    0.51
##   LightActiveDistance SedentaryActiveDistance VeryActiveMinutes
## 1                4.07                  0                33
## 2                3.91                  0                89
## 3                3.71                  0                56
## 4                4.95                  0                39
## 5                4.61                  0                28
## 6                4.29                  0                30
##   FairlyActiveMinutes LightlyActiveMinutes SedentaryMinutes Calories
## 1                12                205                804        1819
## 2                17                274                588        2154
## 3                 5                268                605        1944
## 4                20                224               1080        1932
## 5                28                243                763        1886
## 6                13                223               1174        1820
```

Summary Statistics

```
summary_stats <- dailyactivity %>%
  summarise(
    avg_steps = mean(TotalSteps, na.rm = TRUE),
    min_steps = min(TotalSteps, na.rm = TRUE),
    max_steps = max(TotalSteps, na.rm = TRUE),
    avg_calories = mean(Calories, na.rm = TRUE),
    min_calories = min(Calories, na.rm = TRUE),
    max_calories = max(Calories, na.rm = TRUE),
    avg_very_active_minutes = mean(VeryActiveMinutes, na.rm = TRUE),
```

```

avg_fairly_active_minutes = mean(FairlyActiveMinutes, na.rm = TRUE),
avg_lightly_active_minutes = mean(LightlyActiveMinutes, na.rm = TRUE),
avg_sedentary_minutes = mean(SedentaryMinutes, na.rm = TRUE)
)
summary_stats

##   avg_steps min_steps max_steps avg_calories min_calories max_calories
## 1  6546.562      0      28497   2189.453      0      4562
##   avg_very_active_minutes avg_fairly_active_minutes avg_lightly_active_minutes
## 1             16.62363             13.07002             170.07
##   avg_sedentary_minutes
## 1             995.2823

```

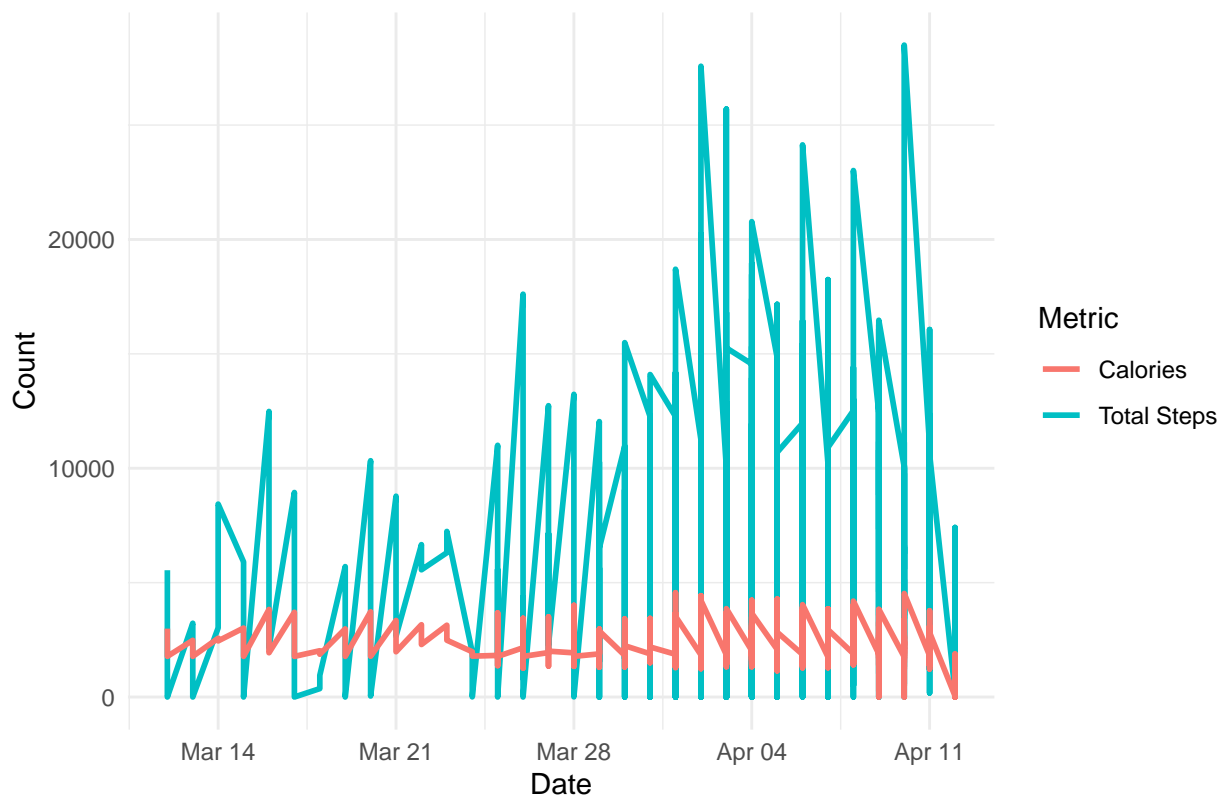
Trend Analysis: Steps and Calories Over Time

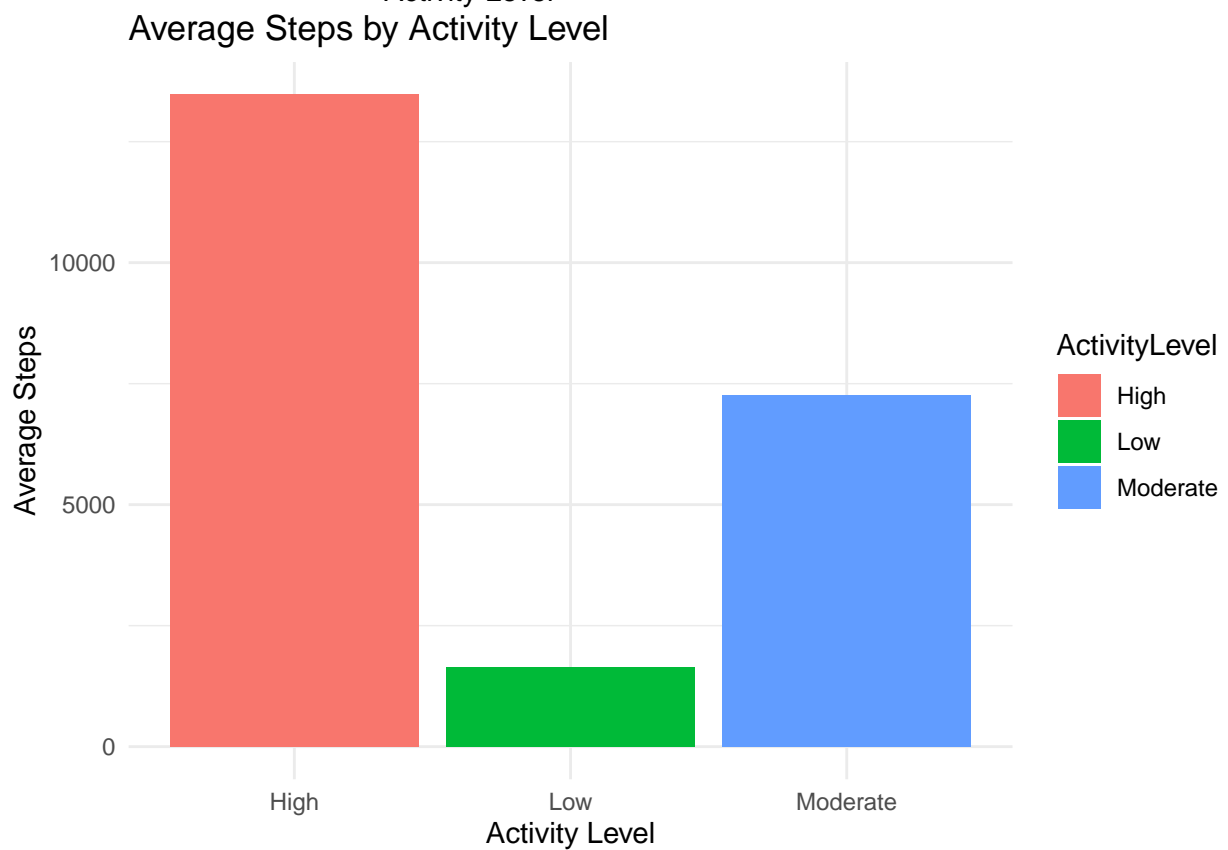
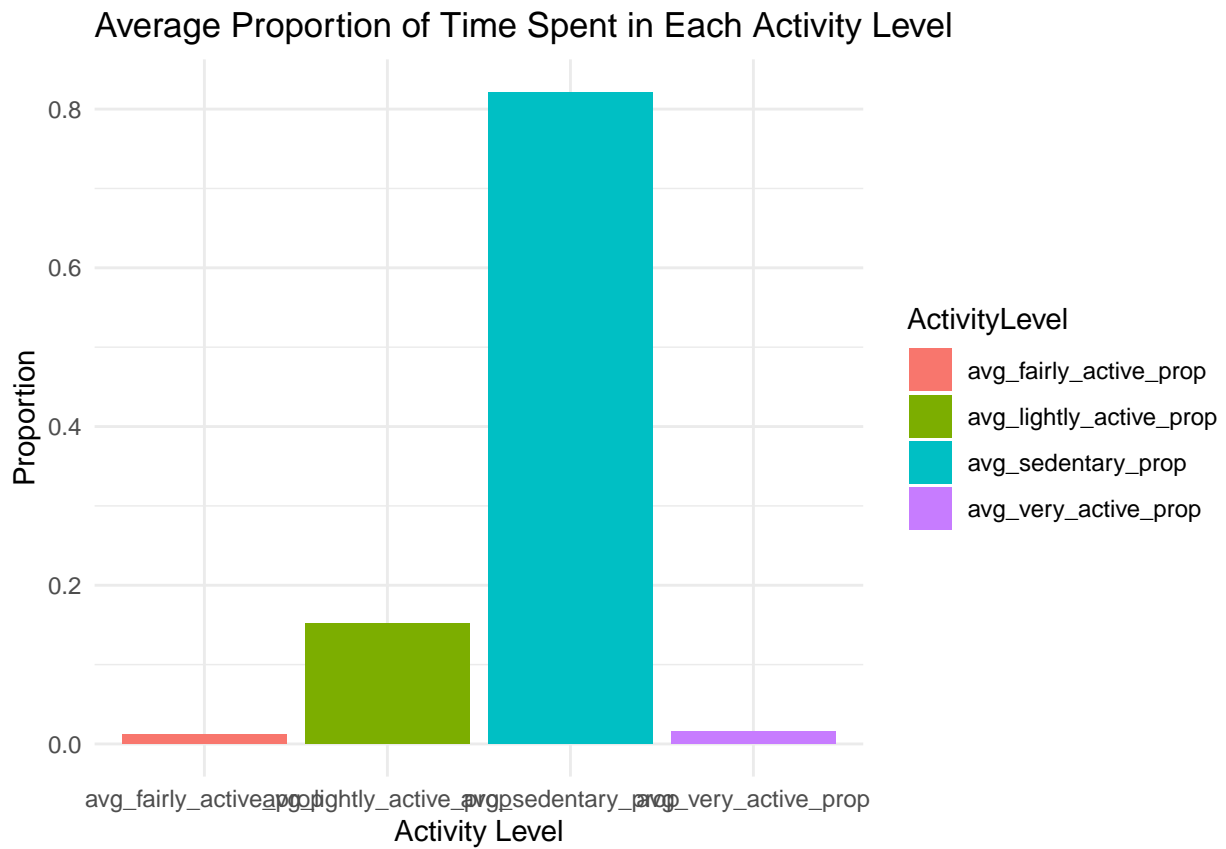
```

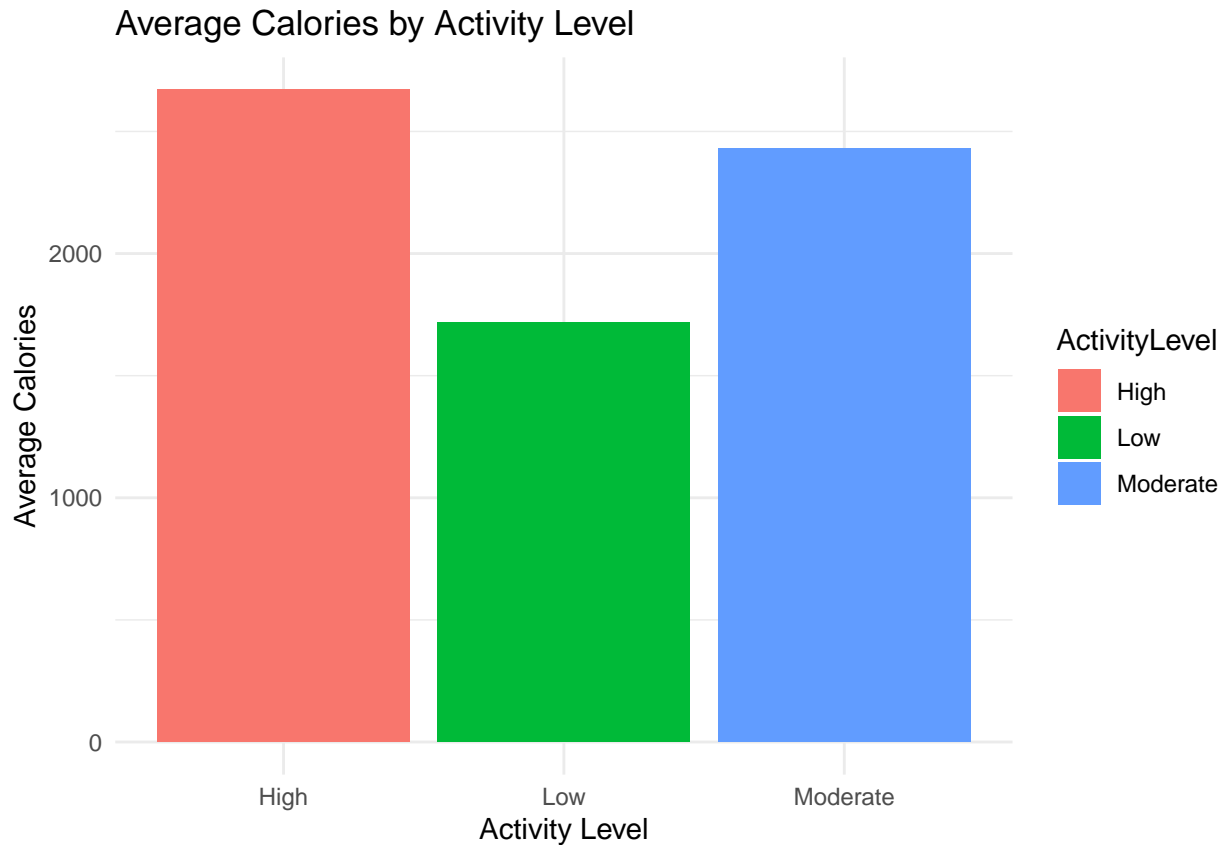
## Warning: Using `size` aesthetic for lines was deprecated in ggplot2 3.4.0.
## i Please use `linewidth` instead.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.

```

Daily Steps and Calories Burned Over Time







Conclusion

The analysis of Bellabeat's daily activity data reveals several insights into user behaviors and engagement patterns:

1. Activity Levels and Calorie Burn:

- The correlation analysis showed a positive relationship between steps, very active minutes, and calories burned. This suggests that higher-intensity activities play a significant role in increasing daily calorie expenditure.
- **Recommendation:** Encourage users to increase their active minutes, particularly very active minutes, by setting personalized daily and weekly goals within the app.

2. Daily Trends in Activity:

- The trend analysis of steps and calories over time highlighted fluctuations in user engagement, with noticeable peaks on certain days.
- **Recommendation:** Bellabeat could implement motivational nudges, such as reminders to move or daily challenges, to promote consistent activity levels, especially on lower-activity days.

3. Time Allocation in Activity Levels:

- Users spend a considerable portion of their time in sedentary or lightly active states, with only a small fraction in very active minutes.
- **Recommendation:** Introduce reminders or suggestions for brief, frequent active breaks to help users reduce sedentary time. These notifications could be tailored based on user behavior patterns.

4. User Segmentation by Activity Level:

- Segmenting users into Low, Moderate, and High activity groups revealed distinct differences in steps, calories burned, and time spent in various activity levels. High-activity users consistently had greater step counts and calorie expenditure, while low-activity users had lower engagement.
- **Recommendation:** Bellabeat could personalize in-app notifications and suggestions based on user activity levels. For instance, low-activity users could receive encouragement to achieve higher

step counts, while high-activity users might receive tips for optimizing performance.

Overall, these insights suggest opportunities for Bellabeat to enhance user engagement through tailored activity goals, motivational nudges, and personalized feedback. By aligning product features with user activity patterns, Bellabeat can better support users on their wellness journeys.