# Smart Device Trends

Michael B - November 12, 2022

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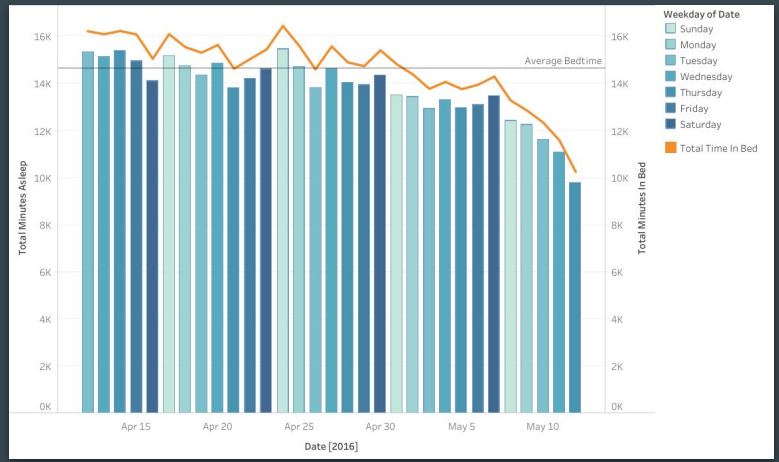
# Objective

Identify any patterns based on recorded sleep patterns and physical activity to gain a better understanding on how to better utilize and market the Bellabeat Wellness app.

# Sleep and Bedtime Patterns

- Average Cumulative Bed Time is around 13.2 K minutes (220 hours).
- High correlation between sleep and bedtime
- Both were slowly decreasing around end of April.

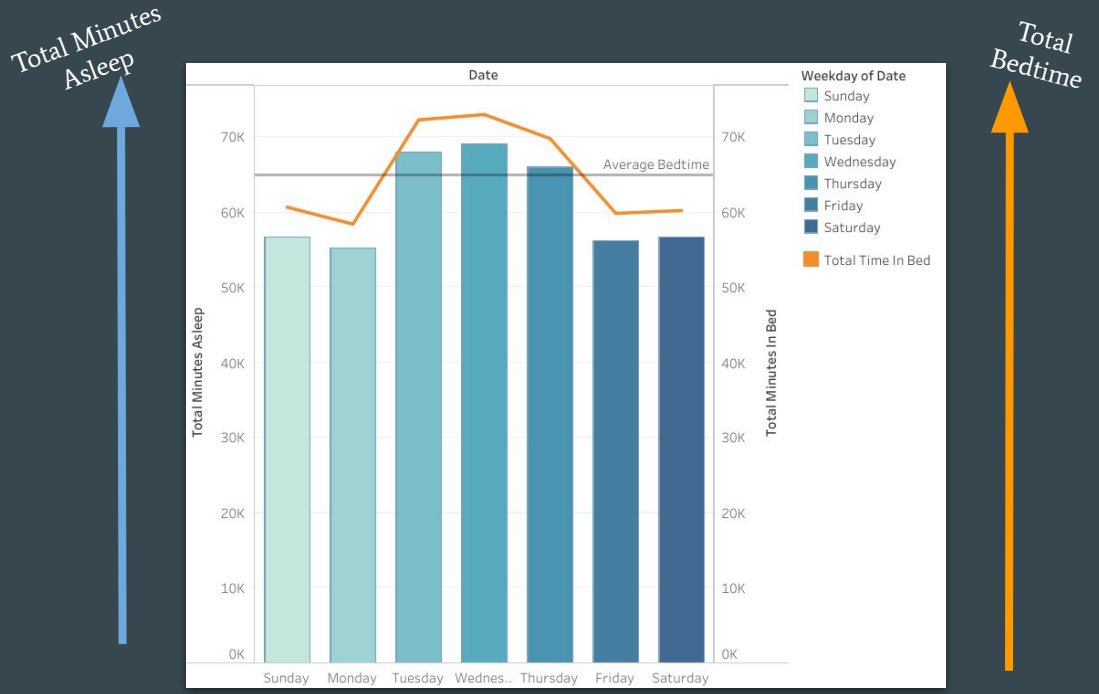
Total Sleep




Total Bedtime

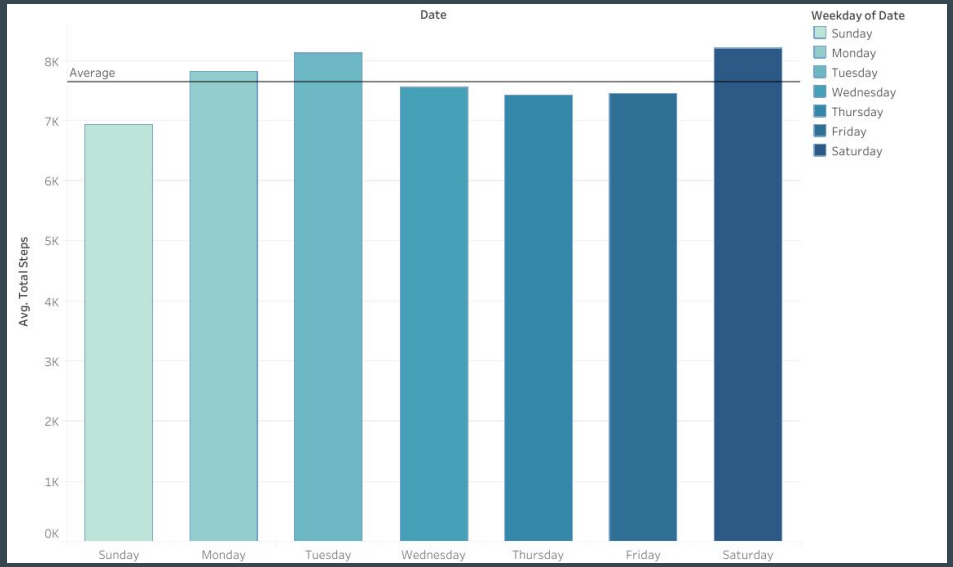
# Sleep by the Day

- Average bed time total is approx. 58.8K minutes (980 hours) each week.
- Both sleep time and bedtime peak at the middle of the week.
- Day of the week seems to be a strong indicator on the amount of sleep/bedtime.



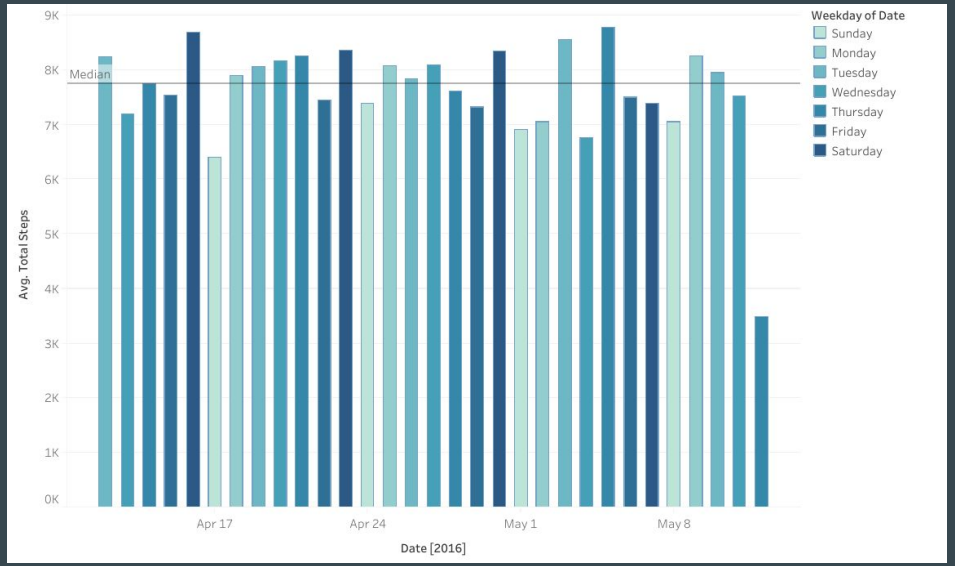
# Average Steps by Weekday

- Average steps taken gradually rises at the beginning and peaks again at the end of the week.
- More research can be done in the future to further look into this observation.



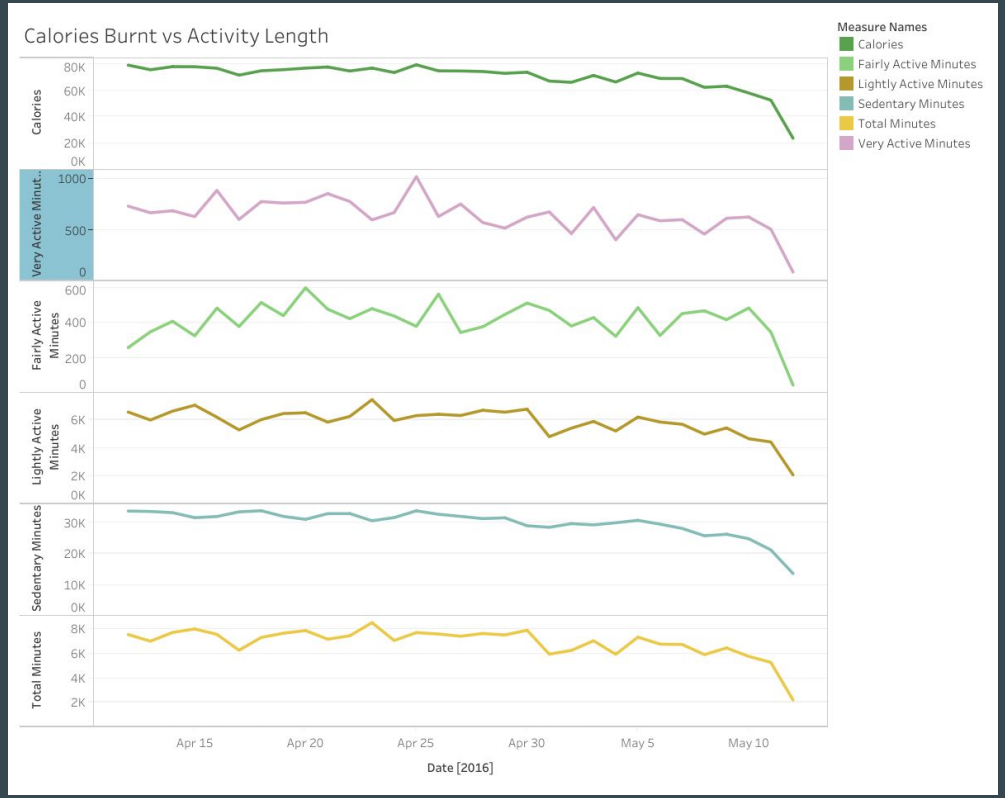
# Date's impact on average step activity?

- May 12 has the lowest average step count by far, making it an outlier from other dates
- Outlier is not enough to confidently say that there exists a downward trend.
- Step activity is typically neutral over time.



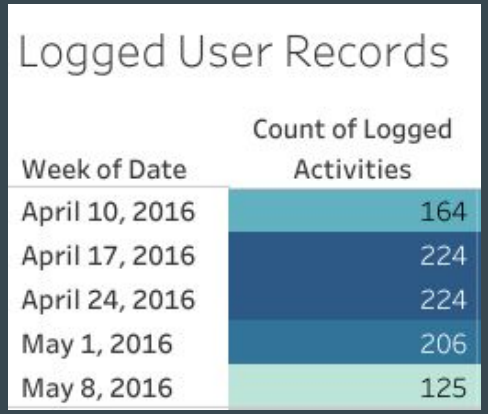
# Distance Trends

- Common peaks are at around mid to the end of April. Some at early May.
- Common regression is likely due to lack of data from later dates.



# Logged User Records

- Hypothesis: Lack of records in the last week skewed the data in total steps, activity time, and sleep time which is what's causing a downward trend in each




The higher the number, the more times a user's data was recorded.

# Main Takeaways

1. People tend to sleep more in the middle of the week than in the beginning or the end.

2. * The total amount of sleep and bed from users is on a slight decline

3. The day of the week is not a strong indicator on the amount of steps walked by users.

4. * Total time spent on physical activity step count, and calories burnt are possibly on a decline as well.

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*Further research is desired as there is a possibility of the results being skewed due to a lack of data in later weeks.

# Recommendations

1. Motivate users to sleep more during the beginning and end of each week through optional push notifications / messages
2. Prioritize user encouragement for more sleep and physical activity during the first two weeks of the month.
3. Give users the option to send their sleep and activity data when first opening the app. May be toggled in the app settings.
4. Give an incentive for users to do a survey on sleep/activity habits via the app.
    a. Maybe through a discount code for a Bellabeat product?

# Appendix / Extra Notes

- Dataset used:
  - Fitbit Fitness Tracker Data Kaggle Dataset (CC0 Public Domain) by MÖBIUS:
    - https://www.kaggle.com/datasets/arashnic/fitbit
- Datasets recording to daily activity and sleep day were briefly cleaned using Sheets before being imported into SQL (BigQuery)
- For sleep/bed activity, not every user had everything recorded. To clean my data, I had to make some assumptions when filling in null/blank values:
  - Any null value for time slept will be set to the ideal number of hours an adult should sleep for:
    - 8 * 60 minutes = 480
  - According to Sleep Foundation, an organization that focuses on sleep wellness, A typical adult would take anywhere from “15 to 20 minutes” to fall asleep on a “typical night.” [1]
    - As such, default bedtime will be set to 500 minutes (480+20)
- Data is visualized through Tableau

[1] https://www.sleepfoundation.org/sleep-faqs/how-long-should-it-take-to-fall-asleep