INSIGHTS FROM OTHER SMART DEVICES TO DEVELOP MARKETING STRATEGY OF BELLABEAT

A DATA ANALYTICS CASE STUDY

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Case Study Roadmap

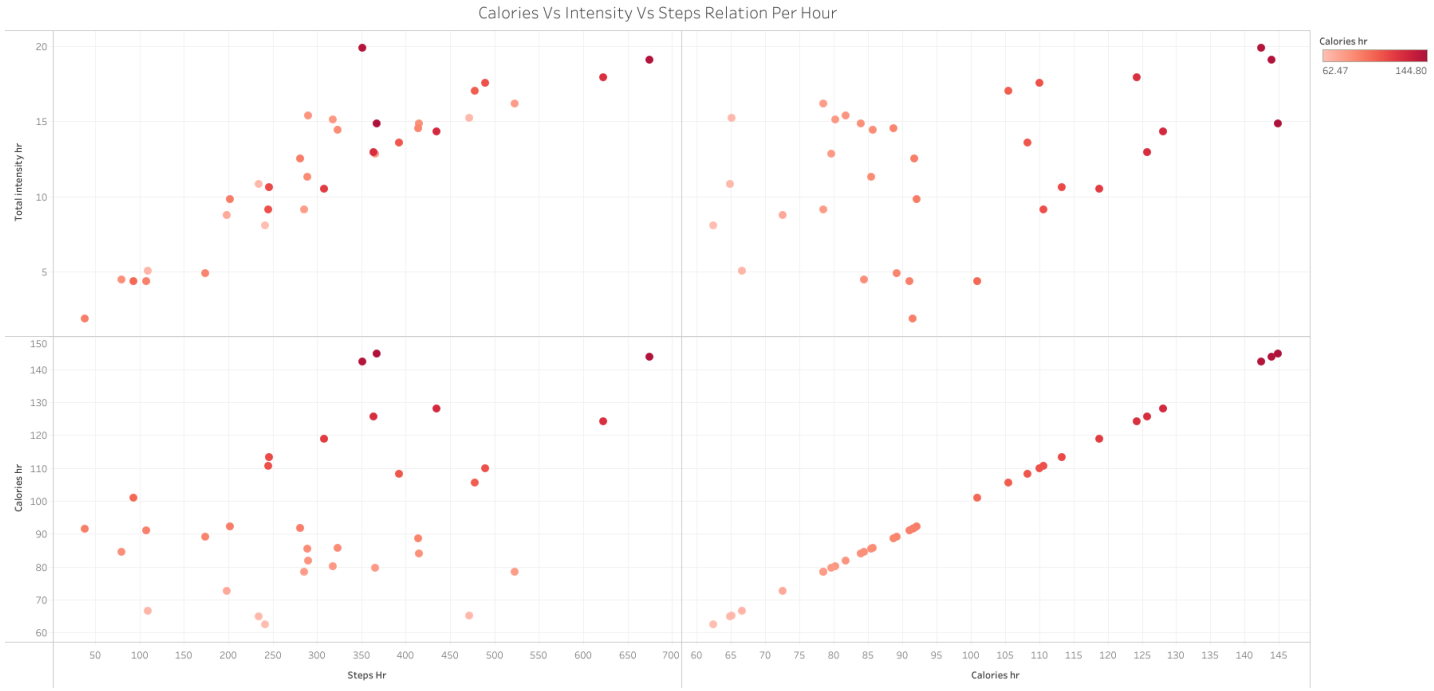
Title	Analyze smart device data to gain insight into how consumers are using their smart devices.
Industry focus	To develop a marketing strategy for the Bellabeat products.
Problem statement	Dive deep into concepts of data analytics to analyze existing smart watch devices in the market to gain insights on the user's usage before launching the products of Bellabeat in the market.
Business use case	1. How do users use the device to track sleep, and weight? 2. How do users use the device during weekends and weekdays? 3. How does the device keep track of hourly, minute, and daily details of user's calorie, intensity, etc.? 4. Insights from the behavior of user's usage.
Goals/metrics	Deliverables
Deliverables	1. A clear statement of the business task 2. A description of all data sources used 3. Documentation of any cleaning or manipulation of data 4. A summary of your analysis 5. Supporting visualizations and key findings 6. Top recommendations based on your analysis

Are datasets available?	Yes
Tools	Spreadsheets, Tableau, Jupyter Notebook
Websites to scrape the data needed	Link to data: https://www.kaggle.com/datasets/arashnic/fitbit Data Source: https://zenodo.org/record/53894#.X9oeh3Uzaao License: CC0: Public Domain

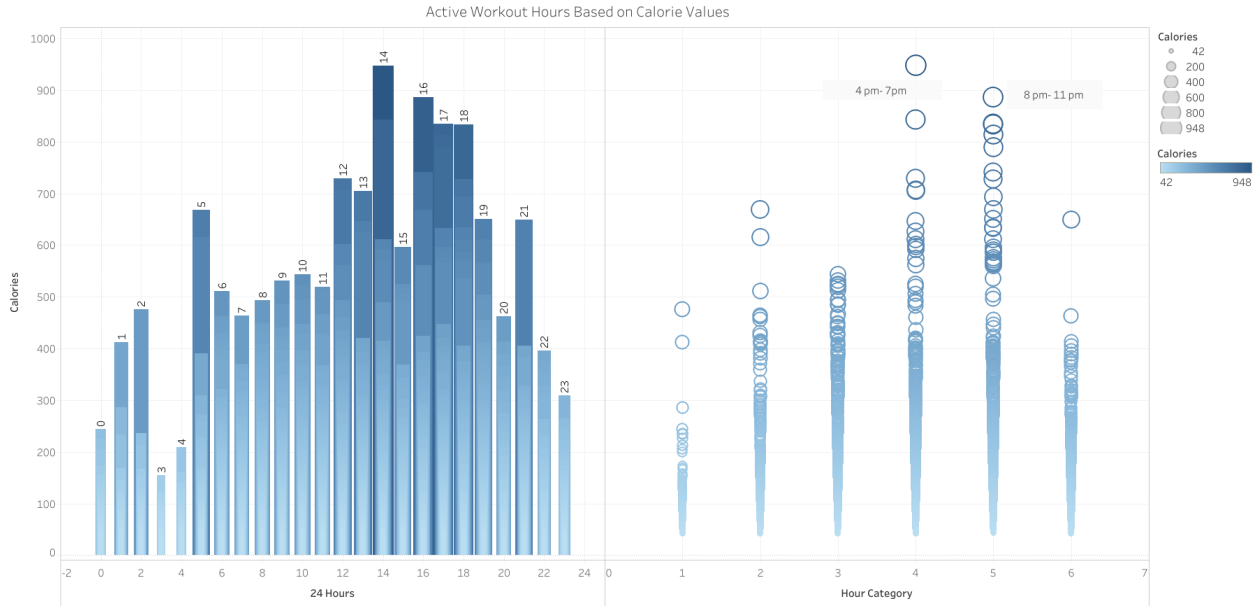
Observations

Hours Based Observations:

1. we have three hourly details of the users, hourly calories, hourly intensities, hourly steps
2. Hourly details of users are available for all 33 users
3. Calories, intensities, and steps per hour are positively correlated with each other. However, there is a maximum correlation between Total intensity and total steps per hour of 0.89. The correlation between calories and these variables is 0.41 and 0.42, respectively.



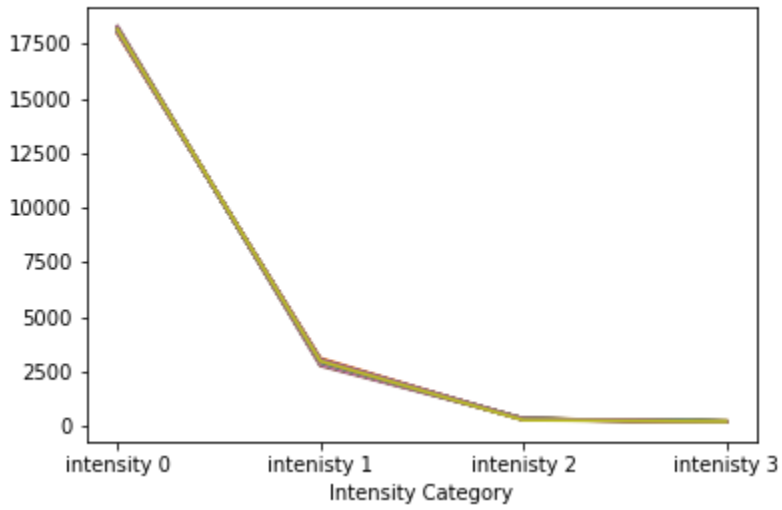
4. Another key observation from the hourly analysis is that most of the users are active during the evening hours from 4 pm to 11 pm



Analysis from Minute data:

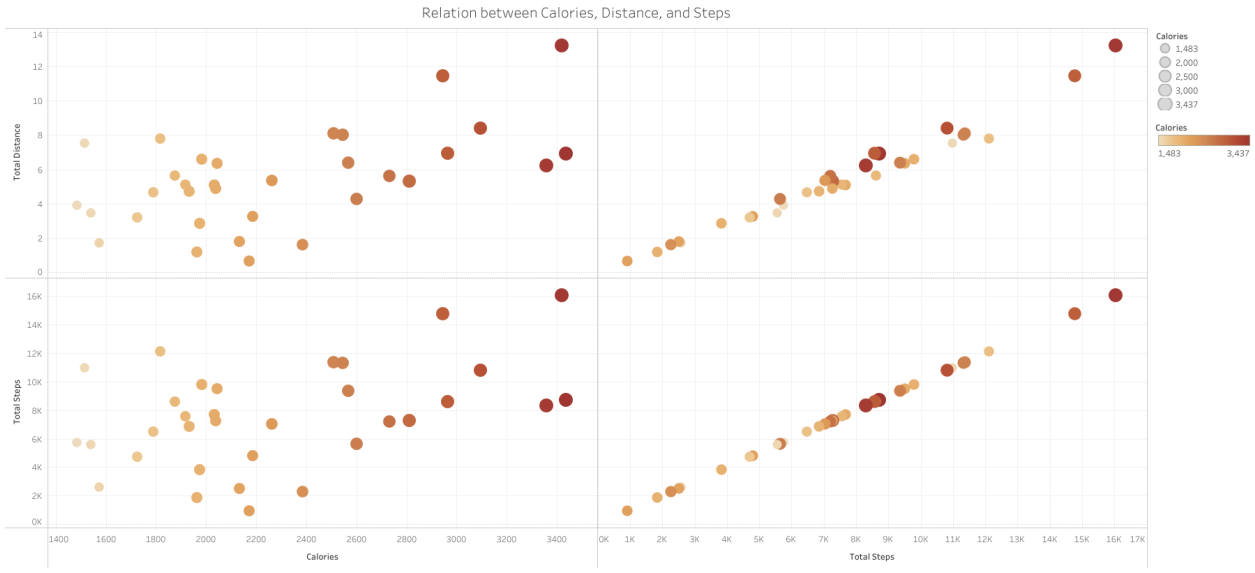
1. This data is also available for all 33 users.
2. The minute data contains information of all the 60 minutes in an hour and it would be interesting the see if the calorie, steps, or intensities depends on the minute of the hour.

3. After analysis we have observed that there is no correlation between how much calorie is burned or how much steps are walked, on the minute of the hour.
4. However, we obtained a very interesting insight on what is the proportion of maximum and minimum intensity of users over the period of workout: 84% is intenisty_0 (minimum intensity), 14% is intenisty_1, 0.02% is intenisty_2, 0.01% is intenisty_3 (maximum intensity).

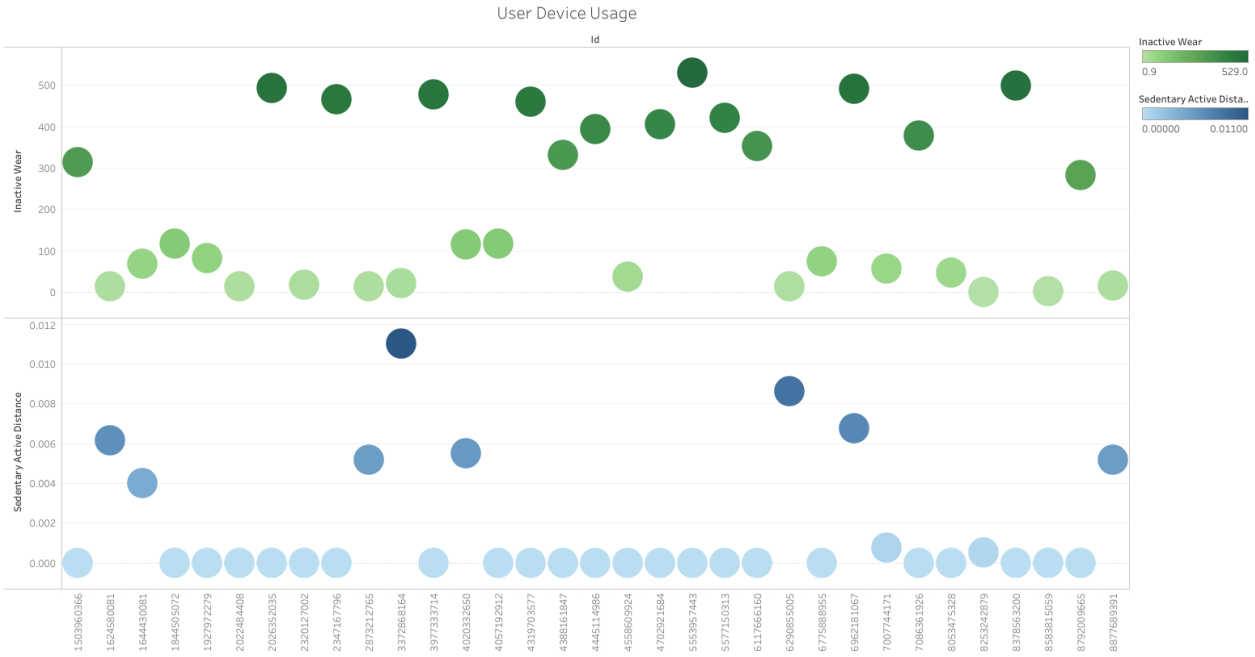


<u>Analysis based on daily data:</u>

1. Daily details of users are available for all 33 users
2. Average values between weekend and weekday are very similar for the users.
3. However, the average value of "Logged activities Distance" during weekends is 0.
4. Also there is a substantial difference in the mean of "Sedentary Active Distance" between weekdays and weekends
5. "very active minutes" are between 0-40 mins, and "very active distance" is between 0-3. Very few users have higher active minutes and distances
6. Moderately active minutes range from 0-30 minutes, and moderately active ditance ranges from 0-1.5 miles.
7. Light active minutes ranges from 0 to 300 minutes, while light distance ranges from 0-6 miles
    - This shows that most of the users spend more time doing light activities.
    - Distance above 1.5 miles within 40 mins of workout is considered intense.
    - The average time spent on moderate or intense workouts is 0-40 mins by the users.



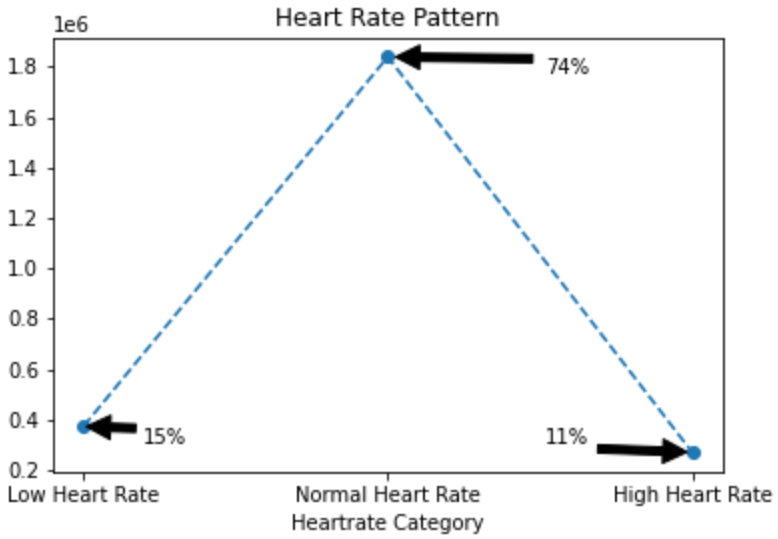
8. I have also calculated the time period of users not wearing the device. This time may include sleep time, shower time, etc.

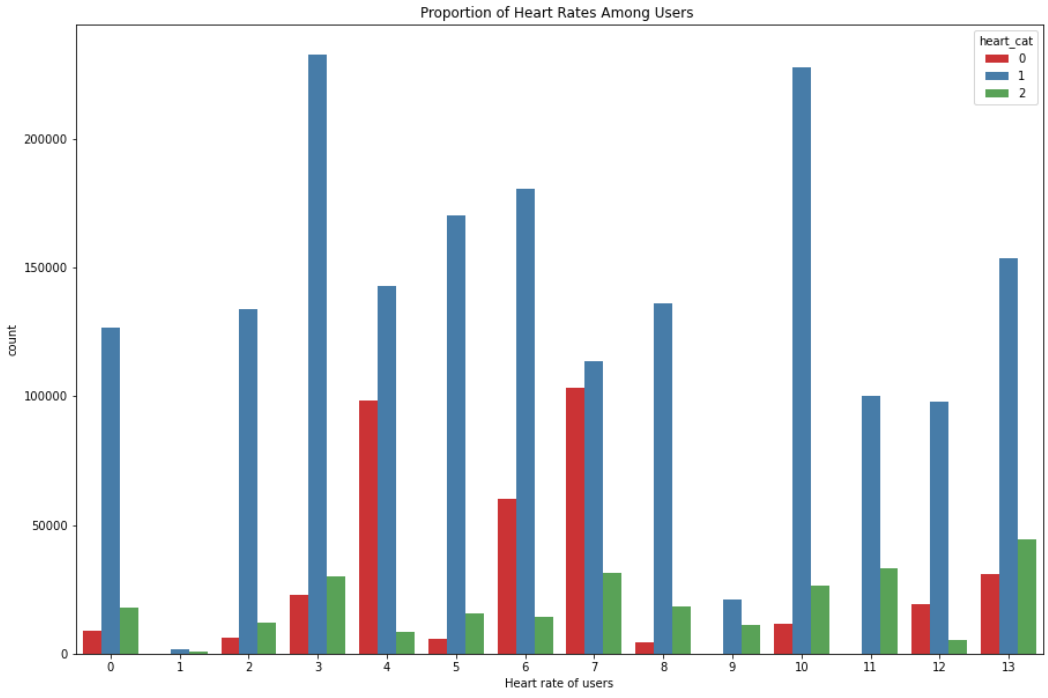


- 50% of the users have not used the device for more than 116 mins
- 45% of the users have not used the device for more than 250 mins
- 27% of the users have not used the device for more than 400 mins

Analysis based on heart rate tracking:

1. Heart-rate tracking data is only available for 14 users
2. Data checks the heart rate of users each second
3. In adults, the heart usually beats between 60 and 100 times per minute. Doctors usually consider a heart rate of over 100 beats per minute to be too fast, though this varies among individuals.
4. I categorized the heart rate as too fast, normal, or too slow: (<60) = too slow, 0, (60-100) = normal 1, (>100) = too fast 2



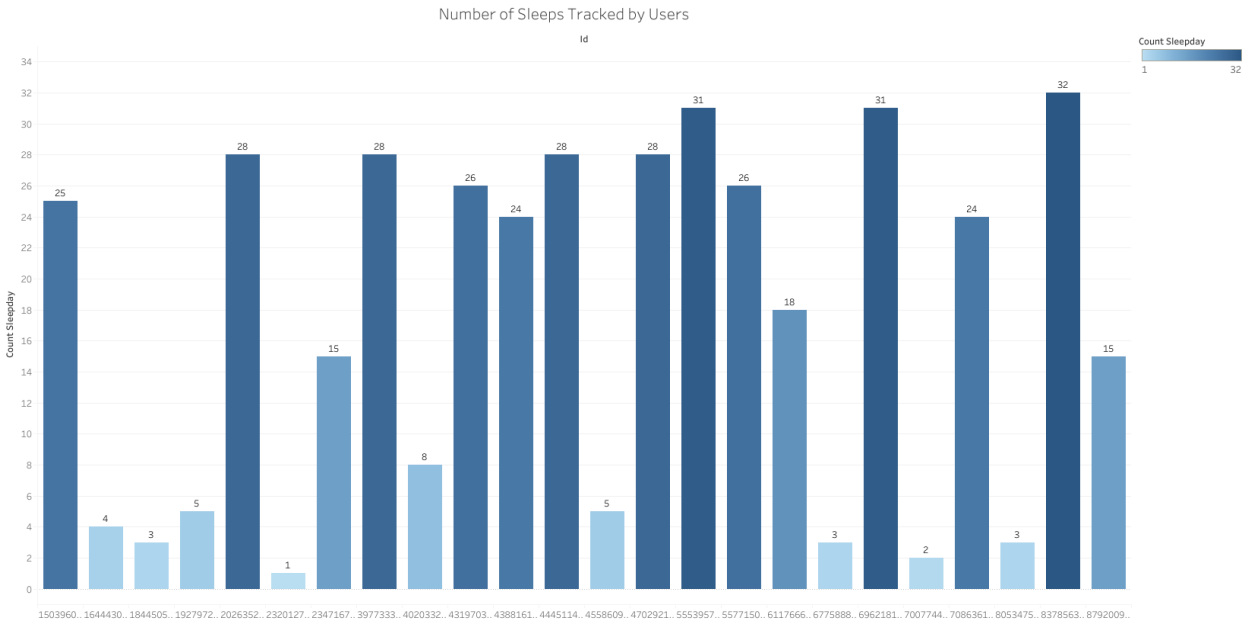


- 74% of heart rate falls under Normal for all users
- 15% falls under Low heart rate
- 11% falls under High heart rate
- The pattern of heart rate varies from user to user.

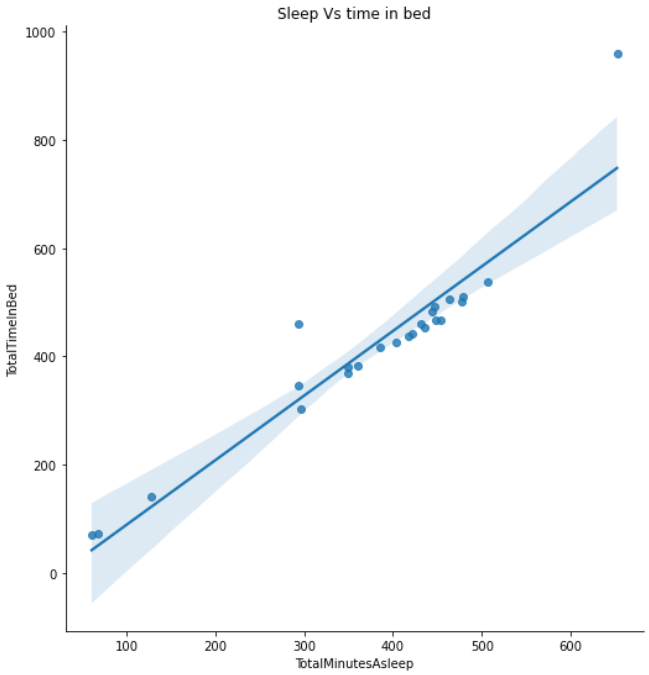
- Some users are observed to have a good account of low heart rate and high heart rate, and this can be used to alert the user about the same.
- For some reason the data is only available for 14 users out of 33 users.
- We should further look into the reason for data non-availability.
- question arises: Is the data not available because the user has not switched on the feature to track heart rate?
- Since most of the users have other details of the device it clearly shows that more than 14 users have worn the device most of the time. Therefore, it can be suggested that the feature of tracking the heart rate is not switched on by the users.
- Or, for some reason, such as the improper wearing of the device might be a reason of not detecting the heart rate.

Analysis based on sleep data of the device:

1. Data is available only for 24 users out of 33 users.
2. The maximum usage of users is for 32 days out of 61 days, while the least usage is of 1 day out of 61 days
3. 37% of the users used it for less than 10 days to track their sleep.



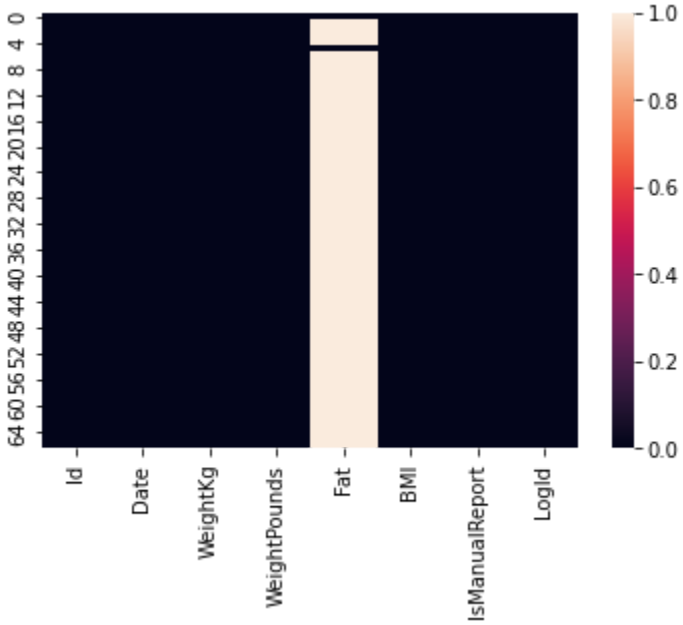
4. The device could efficiently differentiate between time spent in bed vs time of actual sleep.



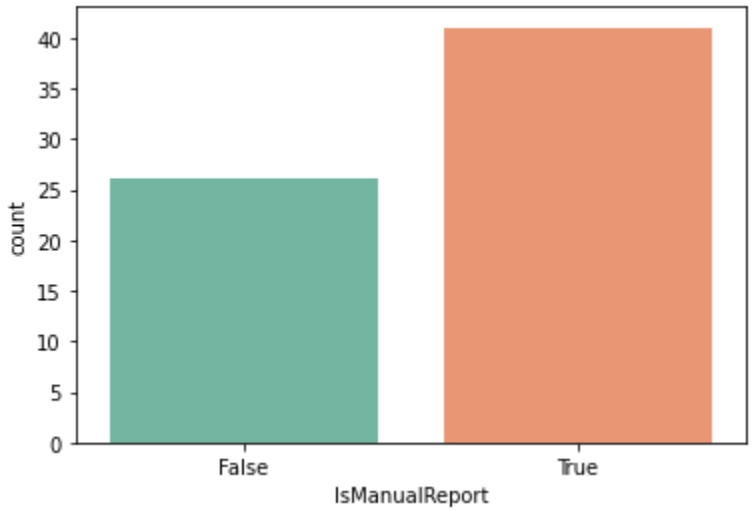
This shows that there is a high positive correlation between the two factors.

Analysis based on weight data:

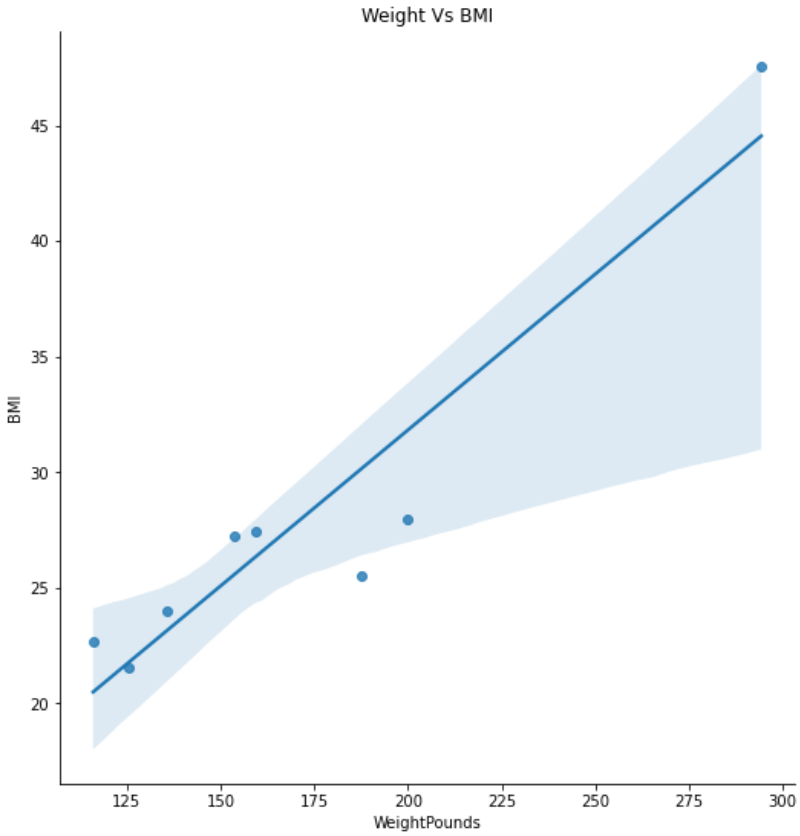
1. Data is only available for 8 users, which shows that the device is not efficient to track the weight information or the users are not proactive in keeping track of the weight.
2. We also observed that the fat details are entirely missing for the users except for two users.



3. This observation shows that most of the values are filled manually by the user. This can be one of the reasons behind low data as most users find it difficult many times to calculate BMI and fill that in.
   It might be easier to keep track of the BMI if it is calculated automatically, given that the user only has to fill in the weight values.



5. Weight and BMI are positively correlated to each other and therefore it can be said the device is working effectively.



RECOMMENDATIONS

1. There is insufficient data on users' weight, BMI, and Fat. Marketing focus can be given in this field to encourage the users to fill in these information and also make the device usage easy to fill in these information.
2. Most of the users are active between 4 pm to 11 pm, so marketing can focus on putting advertisements on users with such habits.
3. Data for tracking heart rate is only available for 24 users out of 33 users. This clearly means that the device was inefficient in collecting the data. Bellabeat can focus on the area of tracking heart rate, as it is one of the most important aspects in tracking the health of the user and can be a good selling point for the smart device.
4. It is observed that informations that requires manual filling of data, are mostly empty, and the reason is lack of interest of users to fill those informations. Bellabeat can focus in marketing device with is easy to use and also does most of the task automatically.
5. Sleep data is not available for most of the users. Bellabeat can focus on developing a marketing strategy that encourages the users to use the device to track their sleep.

* Data Visualization: https://public.tableau.com/app/profile/songhita.misra

*Source code: https://github.com/missonu