

Analyzing Smart Devices Fitness Data

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Description of **business task**

In order to gain insight into how consumers use **non-Bellabeat smart devices**, analyzing **smart device fitness data** could help unlock new growth opportunities for the company.

Description of Data sources

Are Data Sets Available?	Yes
Dataset List	The Data set can be downloaded from the link given in the below section
Websites to scrape the data needed*	FitBit Fitness Tracker Data Kaggle
About Dataset	This dataset generated by respondents to a distributed survey via Amazon Mechanical Turk between 03.12.2016-05.12.2016 . <u>Thirty eligible Fitbit users</u> consented to the submission of personal tracker data, including minute-level output for physical activity , heart rate , and sleep monitoring .

Checklist followed during Data Cleaning Process

- ❖ Eliminate duplicate data
- ❖ Repair incorrect data
- ❖ Handle missing data
- ❖ Remove irrelevant data
- ❖ Filter outlying data
- ❖ Validate and QA data



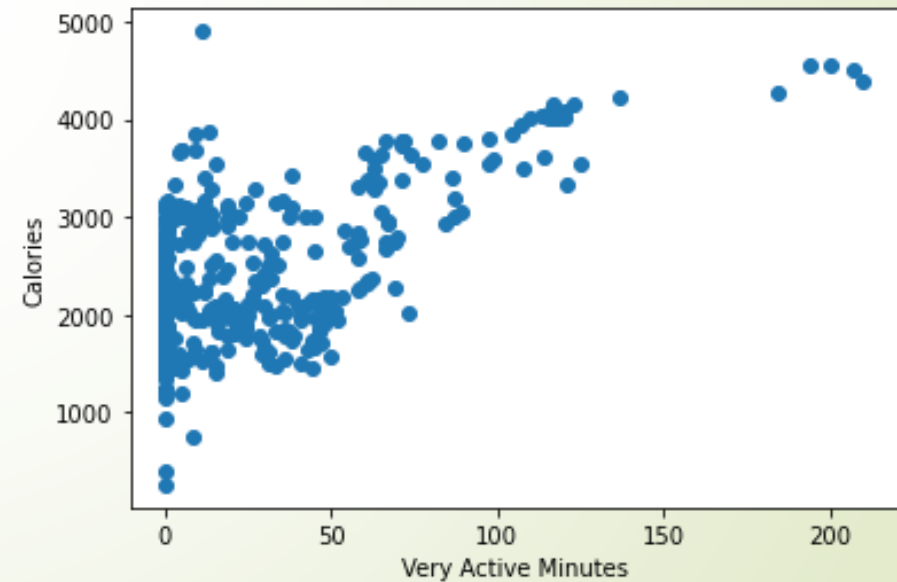
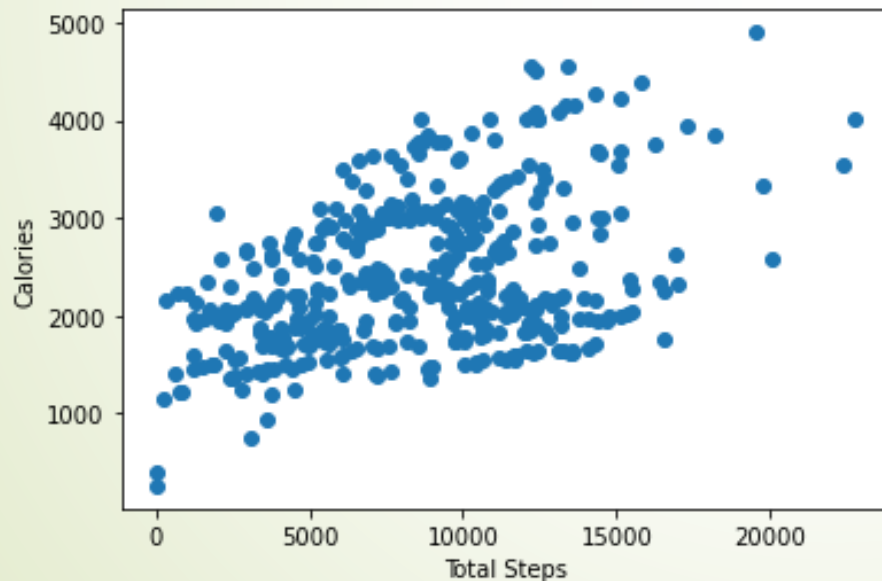
Note:- Documentation of cleaning and manipulation of data is in the attached Markdown file.



***Presenting Data**

There is a positive correlation between Calories vs Total step and Very active Minutes.

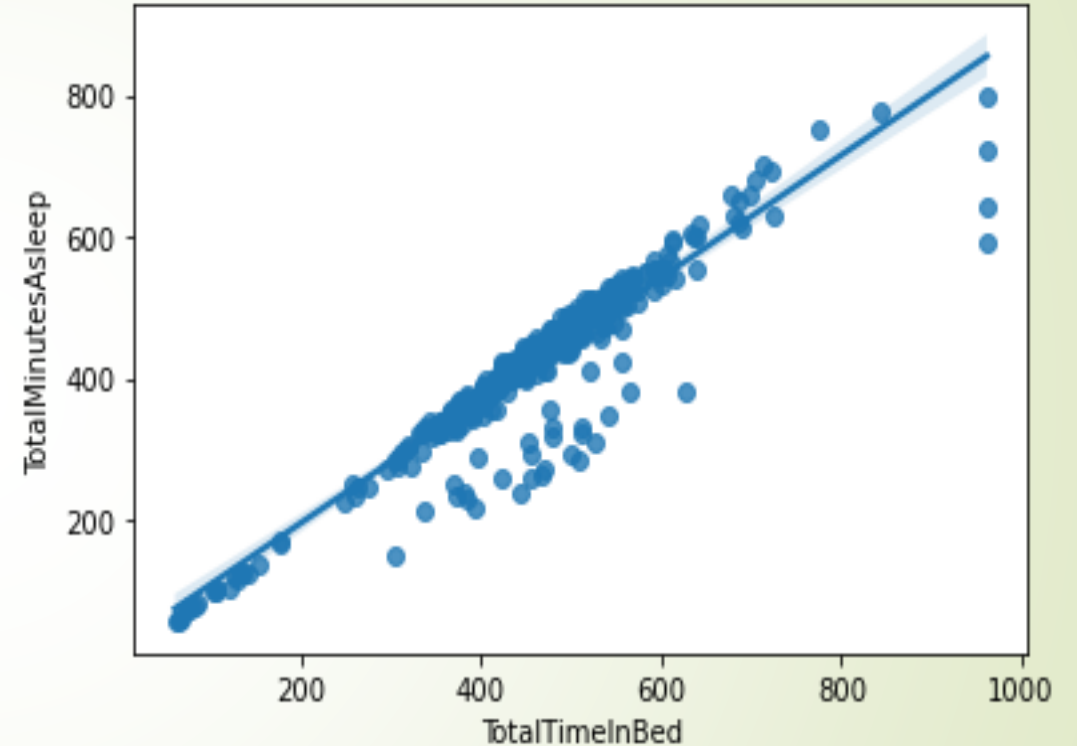
Below two pictures clearly shows that When losing weight, **more physical activity increases the number of calories your body uses for energy or “burns off.”** The burning of calories through physical activity, combined with reducing the number of calories you eat, creates a “calorie deficit” that results in weight loss.



Sleep*

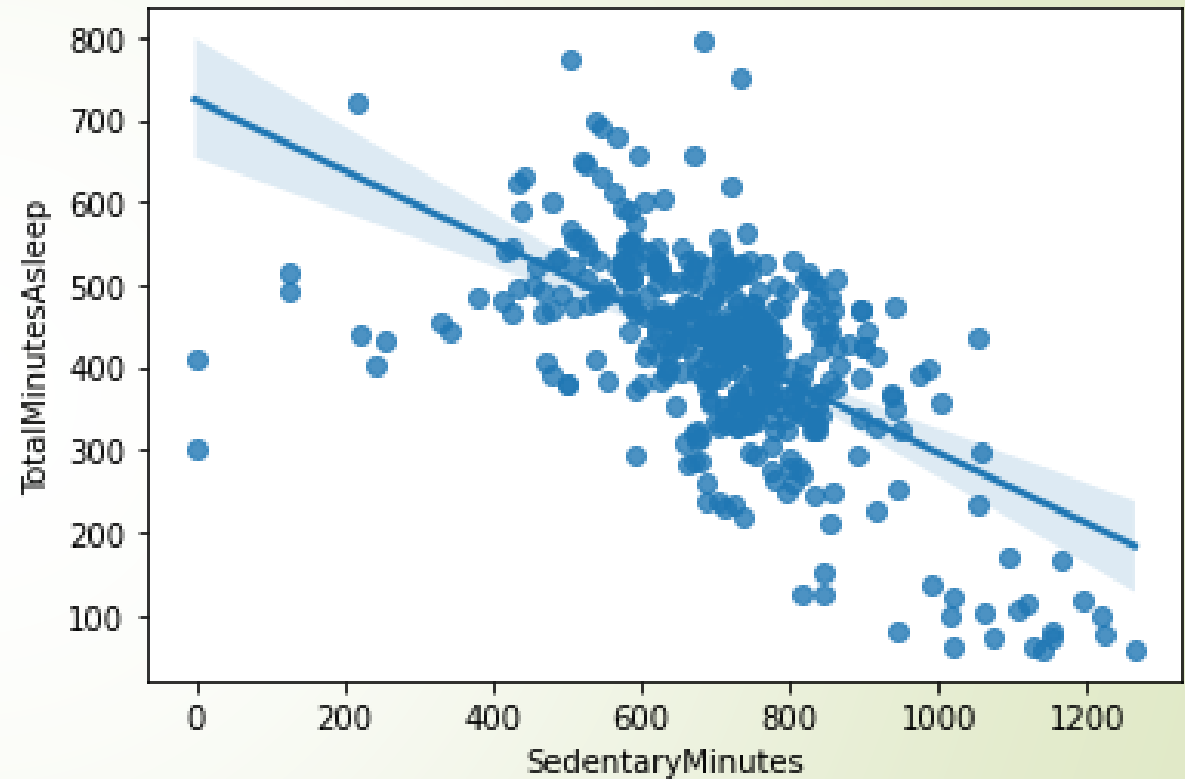
The relationship between Total Minutes Asleep and Total Time in Bed looks *linear*.

So if the Bellabeat users want to improve their sleep, we should consider using notification to go to sleep.



Sedentary Minutes Vs Total Minutes Asleep

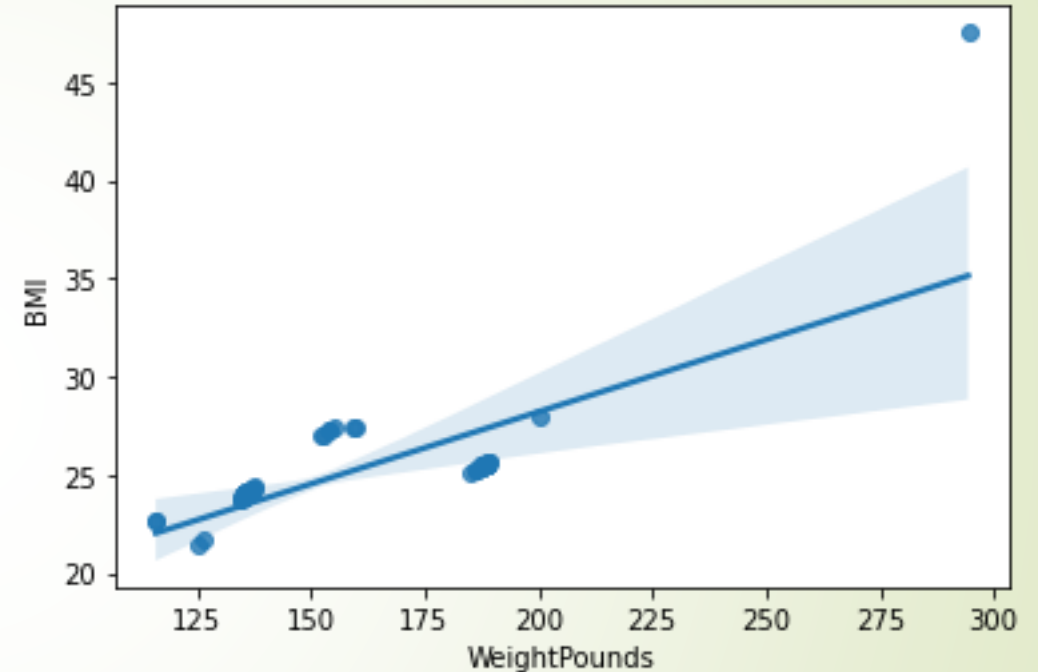
The above plot clearly shows that Sedentary Minutes is *negatively correlated to Total Minutes Asleep. so, if Bellabeat users want to improve their sleep, Bellabeat app can recommend reducing sedentary time.



BMI Vs Weight Pounds

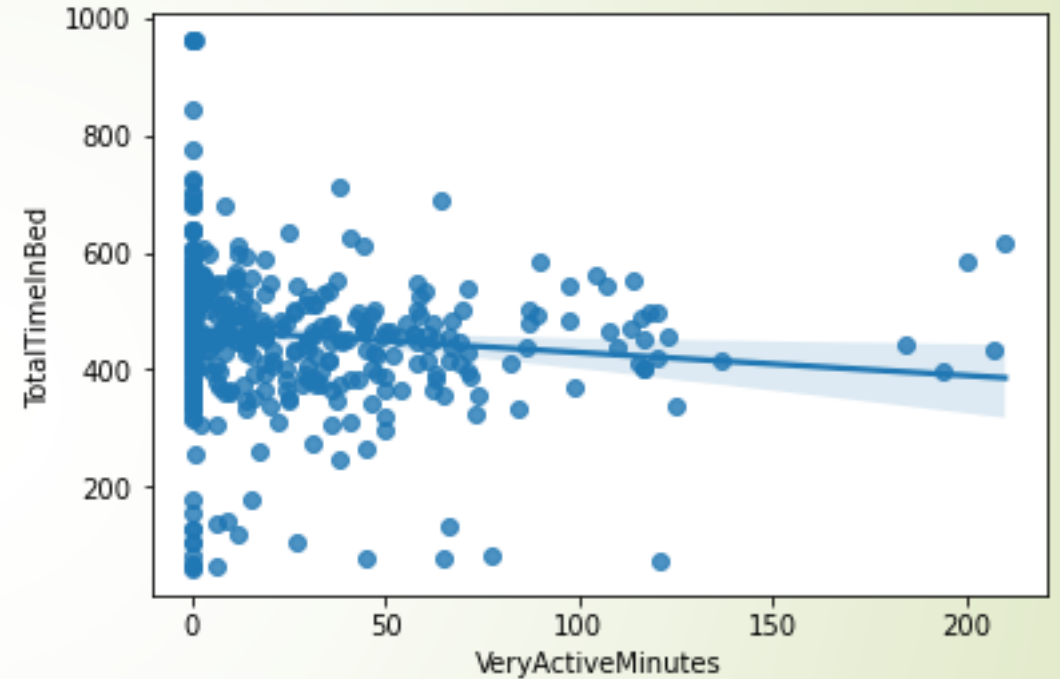
Are weight and BMI correlated?

*BMI is an inexpensive and easy screening method for weight category—underweight, healthy weight, overweight, and obesity. BMI does not measure body fat directly, but **BMI is moderately correlated with more direct measures of body fat.***



Bed Time:-

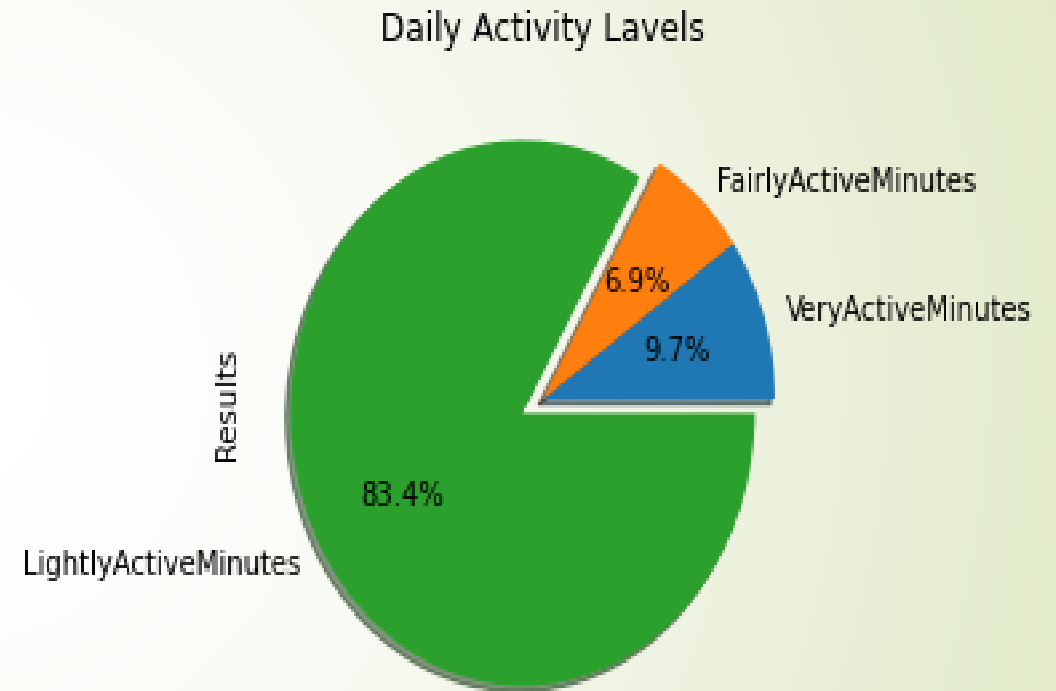
The plot shows that there is less or no correlation between Total Time In Bed and Very Active Minutes.



Active levels of users

This above pie chart is clearly showing that 83% participants are lightly active which is more than majority.

So, At least 150 minutes a week of moderate intensity activity such as brisk walking. At least 2 days a week of activities that strengthen muscles. Activities to improve balance such as standing on one foot. Aim for the recommended activity level but be as active as one is able.



Description of Statistical Summary:-

- * Mean value is average value.
- * Higher standard deviation means maximum value is not closest to the mean.
- * 25% data is less than given value.
- * 50% data is less than given value.
- * 75% data is less than given value.
- * max is the maximum value.
- * min is the minimum value.

	TotalSteps	TotalDistance	TrackerDistance	LoggedActivitiesDistance	VeryActiveDistance	ModeratelyActiveDistance	LightActiveDistance	SedentaryActiveDistance	VeryActiveMinutes	FairlyActiveMinutes	LightlyActiveMinutes	SedentaryMinutes	Calories
mean	7637.911	5.489702	5.475351	0.108171	1.502681	0.567543	3.340819	0.001606	21.16489	13.56489	192.8128	991.2106	2303.61
std	5087.151	3.924606	3.907276	0.619897	2.658941	0.88358	2.040655	0.007346	32.8448	19.9874	109.1747	301.2674	718.1669
min	0	0	0	0	0	0	0	0	0	0	0	0	0
25%	3789.75	2.62	2.62	0	0	0	1.945	0	0	0	127	729.75	1828.5
50%	7405.5	5.245	5.245	0	0.21	0.24	3.365	0	4	6	199	1057.5	2134
75%	10727	7.7125	7.71	0	2.0525	0.8	4.7825	0	32	19	264	1229.5	2793.25
max	36019	28.03	28.03	4.942142	21.92	6.48	10.71	0.11	210	143	518	1440	4900

Conclusion:-

- ❑ *if the Bellabeat users want to improve their sleep, we should consider using notification to go to sleep and Bellabeat app can recommend reducing sedentary time as well.*
- ❑ **more physical activity increases the number of calories your body uses for energy or “burns off.”**
- ❑ **For lightly active people it is recommended that At least 150 minutes a week of moderate intensity activity such as brisk walking is necessary.**
- ❑ BMI is moderately correlated with more direct measures of body fat.

** Doesn't mean there is casual effect.
Further analysis needed.*

***Appendix**



BellabeatCaseStudy - Jupyter Notebook.pdf



Thank You