

Bellabeat Case Study Presentation

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Bellabeat Case Study

BellaBeat is a high-tech company dedicated to empowering women around the world with knowledge about their health and habits. Founded in 2013 by Urška Sršen and Sando Mur, our mission is to design innovative technology that informs and inspires women on their unique wellness journeys.

At BellaBeat, we believe that knowledge is power, and by providing women with data-driven insights into their daily activities, sleep patterns, and overall health metrics, we can help them make more informed decisions to lead happier, healthier lives. Our cutting-edge smart products seamlessly blend advanced sensors with user-friendly interfaces, putting valuable health information right at your fingertips.

Product Line

- **BellaBeat App** (provides users with health data related to their activity, sleep, stress, menstrual cycle and mindfulness habits)
- **Leaf** (Can be used as bracelet, necklace or clip that tracks activity, sleep and stress)
- **Time** (A smartwatch that tracks activity, sleep and stress. Works with the BellaBeat App)
- **Spring** (A smart bottle that tracks liquid intake and hydration levels)
- **BellaBeat membership** (Provides 24/7 professional and personalized health guidance)

Business Task

Analyze the data produced from consumer usage of a non-Bellabeat smart device and apply the results to the comparable BellaBeat product offering

Questions to answer

What are the trends in smart device usage? How could these trends apply to Bellabeat customers? How could these trends help influence Bellabeat marketing strategy?

Data Sources

FitBit Fitness Tracker Data (CC0: Public Domain, dataset made available through Mobius): *This Kaggle data set contains personal fitness tracker from thirty fitbit users. Thirty eligible Fitbit users consented to the submission of personal tracker data, including minute-level output for physical activity, heart rate, and sleep monitoring. It includes information about daily activity, steps, and heart rate that can be used to explore users' habits.)*

##Data Sets to use

The results of this analysis using the fitbit data will be used and applied to the BellaBeat Time as it is the flagship product and the more comparable to fitbit

#After installing and loading the required packages and libraries we move to uploading the dataset. The dataset contains many large csv files and not all of them have data that fits our scenario. For this case study I am using the following

I have selected the following Data frames to explore

Activity Calories Heartrate Intensities Steps Weight

After loading the sets we need to make sure that the data is clean and in a proper format prior to our analysis

##Cleaning the Sets

Activity Set

Calories Set

Heartrate Set

Intensities Set

Steps Set

Weight Set

Summarizing the dataset

```
#MY SUMMARY
```

```
#Activity
```

```
Clean_Activity %>%
```

```
  select(TotalDistance, LightlyActiveMinutes,
         SedentaryMinutes, Calories) %>%
```

```
  summary()
```

```
## TotalDistance    LightlyActiveMinutes SedentaryMinutes    Calories
## Min.   : 0.000    Min.   : 0.0          Min.   : 2.0      Min.   : 403
## 1st Qu.: 2.260    1st Qu.:114.5        1st Qu.: 739.5    1st Qu.:1795
## Median : 4.430    Median :203.0         Median :1077.0    Median :2064
## Mean   : 4.430    Mean   :191.5         Mean   :1012.7    Mean   :2168
## 3rd Qu.: 6.615    3rd Qu.:272.0         3rd Qu.:1258.5    3rd Qu.:2560
## Max.   :13.340    Max.   :461.0         Max.   :1440.0    Max.   :3879
```

```
#Calories
```

```
Clean_Calories %>%
```

```
  select(Calories) %>%
```

```
  summary()
```

```
##      Calories
## Min.   : 403
## 1st Qu.:1836
## Median :2134
## Mean   :2304
## 3rd Qu.:2783
## Max.   :4236
```

#HeartRate

```
Clean_HeartRate %>%
  select(BPM) %>%
  summary()
```

```
##      BPM
##  Min.   : 36.00
## 1st Qu.: 63.00
##  Median : 73.00
##   Mean  : 75.63
## 3rd Qu.: 86.00
##   Max.  :125.00
```

#Intensities

```
Clean_Intensities %>%
  select(SedentaryMinutes, LightlyActiveMinutes, FairlyActiveMinutes, VeryActiveMinutes, LightActiveDistance, ModeratelyActiveDistance, VeryActiveDistance) %>%
  summary()
```

```
## SedentaryMinutes LightlyActiveMinutes FairlyActiveMinutes VeryActiveMinutes
##  Min.   : 0.0   Min.   : 0.0   Min.   : 0.000   Min.   : 0.00
## 1st Qu.: 736.8 1st Qu.:108.0   1st Qu.: 0.000   1st Qu.: 0.00
##  Median :1073.5 Median :202.0   Median : 1.000   Median : 0.00
##   Mean  :1009.3 Mean  :189.6   Mean  : 8.548   Mean  :12.04
## 3rd Qu.:1261.5 3rd Qu.:271.2   3rd Qu.:15.000   3rd Qu.:19.00
##   Max.  :1440.0 Max.  :461.0   Max.  :47.000   Max.  :77.00
## LightActiveDistance ModeratelyActiveDistance VeryActiveDistance
##  Min.   :0.000   Min.   :0.0000   Min.   :0.0000
## 1st Qu.:1.587   1st Qu.:0.0000   1st Qu.:0.0000
##  Median :3.300   Median :0.0400   Median :0.0000
##   Mean  :3.185   Mean  :0.3556   Mean  :0.7644
## 3rd Qu.:4.747   3rd Qu.:0.5900   3rd Qu.:1.1500
##   Max.  :8.790   Max.  :2.0000   Max.  :4.9300
```

#Steps

```
Clean_Steps %>%
  select(TotalSteps) %>%
  summary()
```

```
##      TotalSteps
##  Min.   : 0
## 1st Qu.: 3760
##  Median : 7348
##   Mean  : 7418
## 3rd Qu.:10621
##   Max.  :21129
```

```
#Weight
Clean_Weight %>%
  select(WeightKg, WeightPounds, BodyMassIndex) %>%
  summary()
```

```
##      WeightKg      WeightPounds      BodyMassIndex
##  Min.   :52.60   Min.   :116.0   Min.   :21.69
##  1st Qu.:61.40   1st Qu.:135.4   1st Qu.:23.96
##  Median :62.45   Median :137.7   Median :24.37
##  Mean   :71.02   Mean   :156.6   Mean   :24.85
##  3rd Qu.:84.92   3rd Qu.:187.2   3rd Qu.:25.56
##  Max.   :85.80   Max.   :189.2   Max.   :27.46
```

##Data Merging for Analysis and Data Visualization

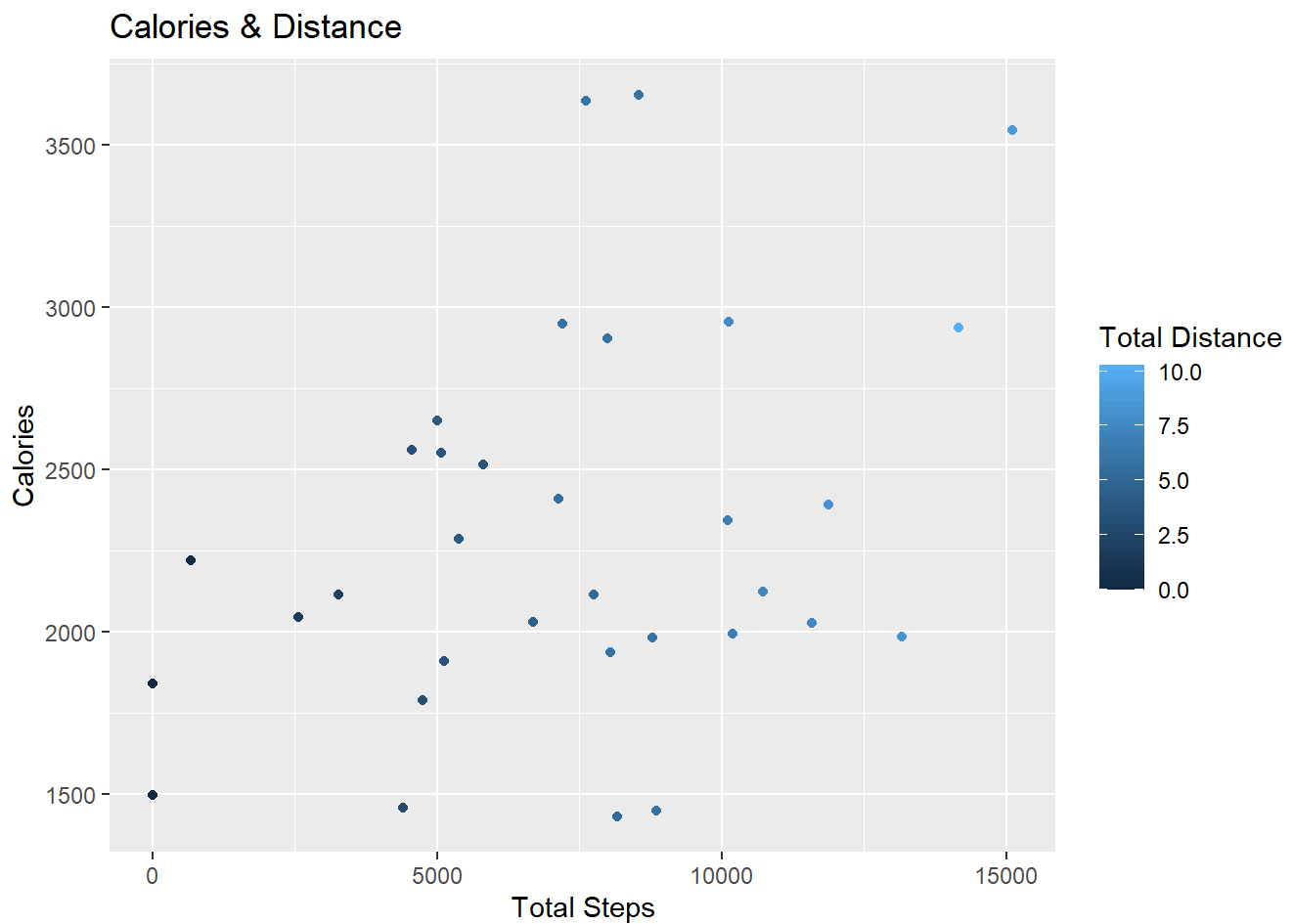
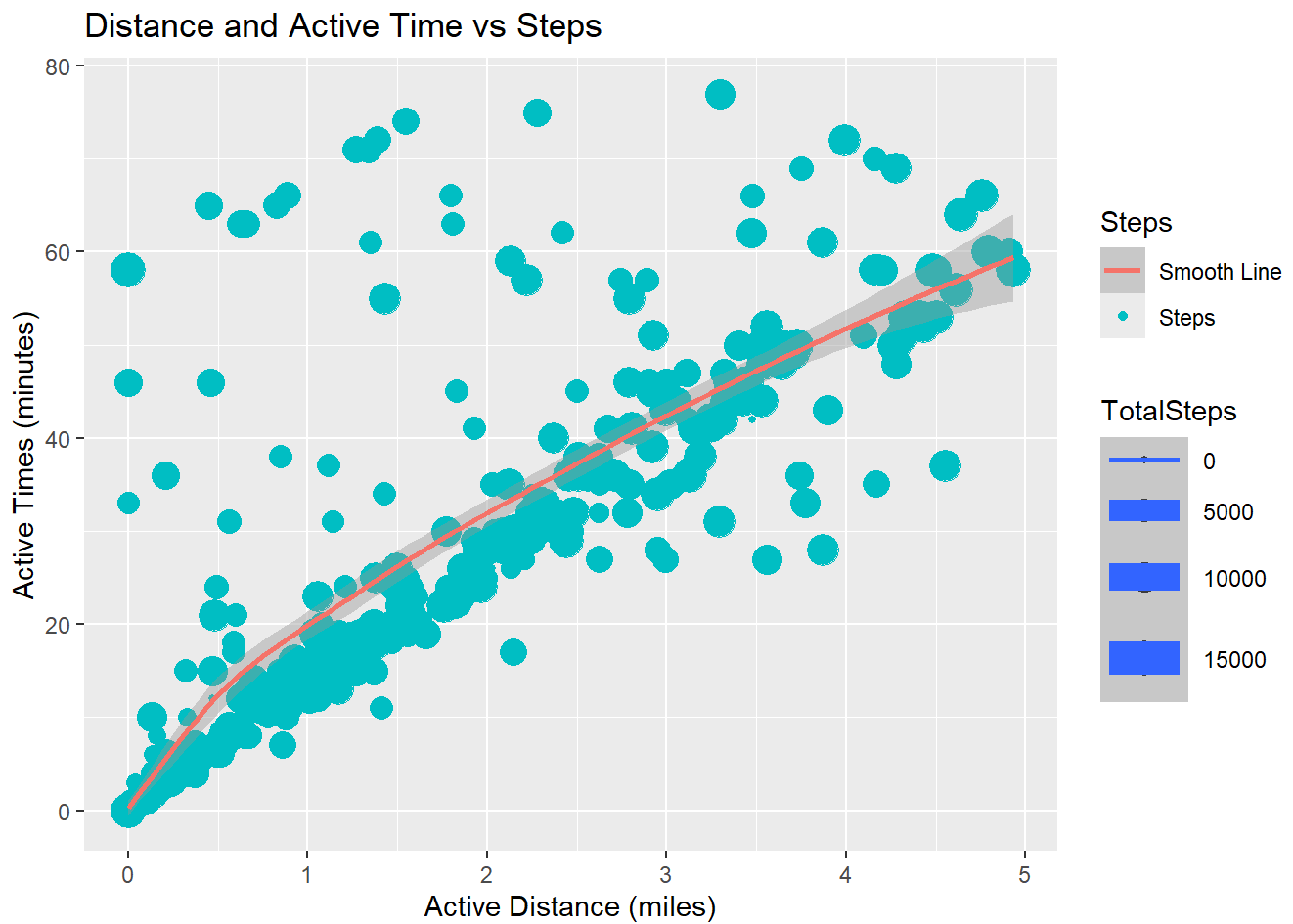
After thoroughly exploring, structuring, cleaning and manipulating the data, we proceed to merging some sets so that we can have a better view of the insights that the data is telling us.

#Activity + Intensities = Active_Intensities #Weight + Calories = Weight_Calories #Steps + Heartrate = Steps_vs_Heartrate

```
## 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.
```

```
## `geom_smooth()` using formula = 'y ~ x'
```

```
## Warning: The following aesthetics were dropped during statistical transformation: size.
## i This can happen when ggplot fails to infer the correct grouping structure in
## the data.
## i Did you forget to specify a `group` aesthetic or to convert a numerical
## variable into a factor?
```



Weight_Calories

```
## [1] "Id"           "WeightKg"      "WeightPounds"  "BodyMassIndex"
## [5] "IsManualReport" "ActivityDay"   "Calories"
```

```
## [1] 1932    7
```

```
## 'data.frame': 1932 obs. of 7 variables:
## $ Id : num 1.5e+09 1.5e+09 1.5e+09 1.5e+09 1.5e+09 ...
## $ WeightKg : num 52.6 52.6 52.6 52.6 52.6 ...
## $ WeightPounds : num 116 116 116 116 116 ...
## $ BodyMassIndex : num 22.6 22.6 22.6 22.6 22.6 ...
## $ IsManualReport: logi TRUE TRUE TRUE TRUE TRUE TRUE ...
## $ ActivityDay : Date, format: "2016-04-14" "2016-05-11" ...
## $ Calories : int 1776 1783 1797 1898 1788 1985 1775 1827 1745 1863 ...
```

```
## Rows: 1,932
## Columns: 7
## $ Id <dbl> 1503960366, 1503960366, 1503960366, 1503960366, 1503960...
## $ WeightKg <dbl> 52.6, 52.6, 52.6, 52.6, 52.6, 52.6, 52.6, 52.6, 52.6, 5...
## $ WeightPounds <dbl> 115.9631, 115.9631, 115.9631, 115.9631, 115.9631, 115.9...
## $ BodyMassIndex <dbl> 22.65, 22.65, 22.65, 22.65, 22.65, 22.65, 22.65, 22.65,...
## $ IsManualReport <lgl> TRUE, TRUE, TRUE, TRUE, TRUE, TRUE, TRUE, TRUE, TRUE, T...
## $ ActivityDay <date> 2016-04-14, 2016-05-11, 2016-04-13, 2016-04-28, 2016-0...
## $ Calories <int> 1776, 1783, 1797, 1898, 1788, 1985, 1775, 1827, 1745, 1...
```

```
## [1] 0
```

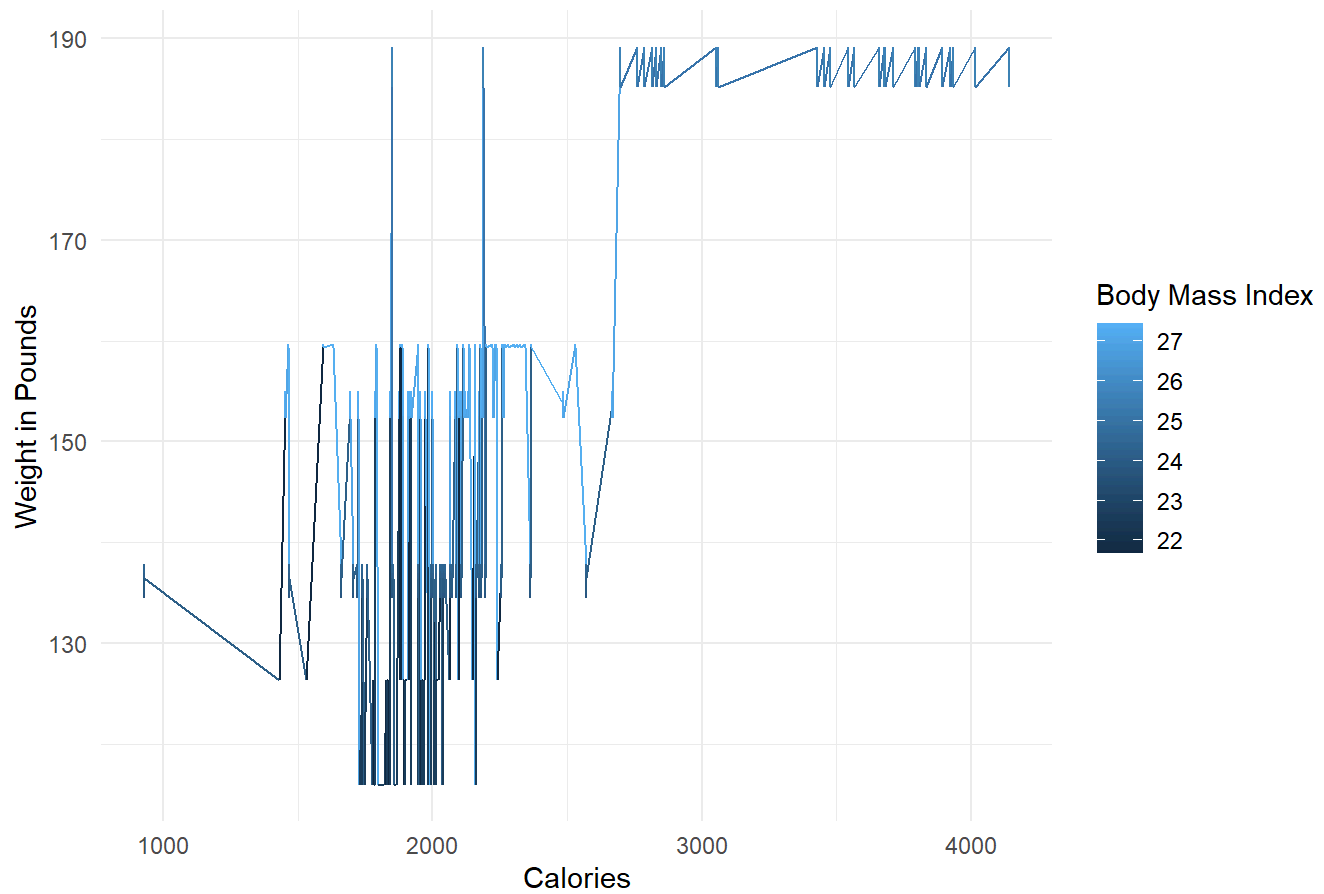
```
##           Id      WeightKg  WeightPounds  BodyMassIndex  IsManualReport
##           0           0           0           0           0
## ActivityDay      Calories
##           0           0
```

```
## $stats
## [1] 115.9631 135.3638 137.5685 187.1725 189.1566
##
## $n
## [1] 1932
##
## $conf
## [1] 135.7061 139.4308
##
## $out
## numeric(0)
```

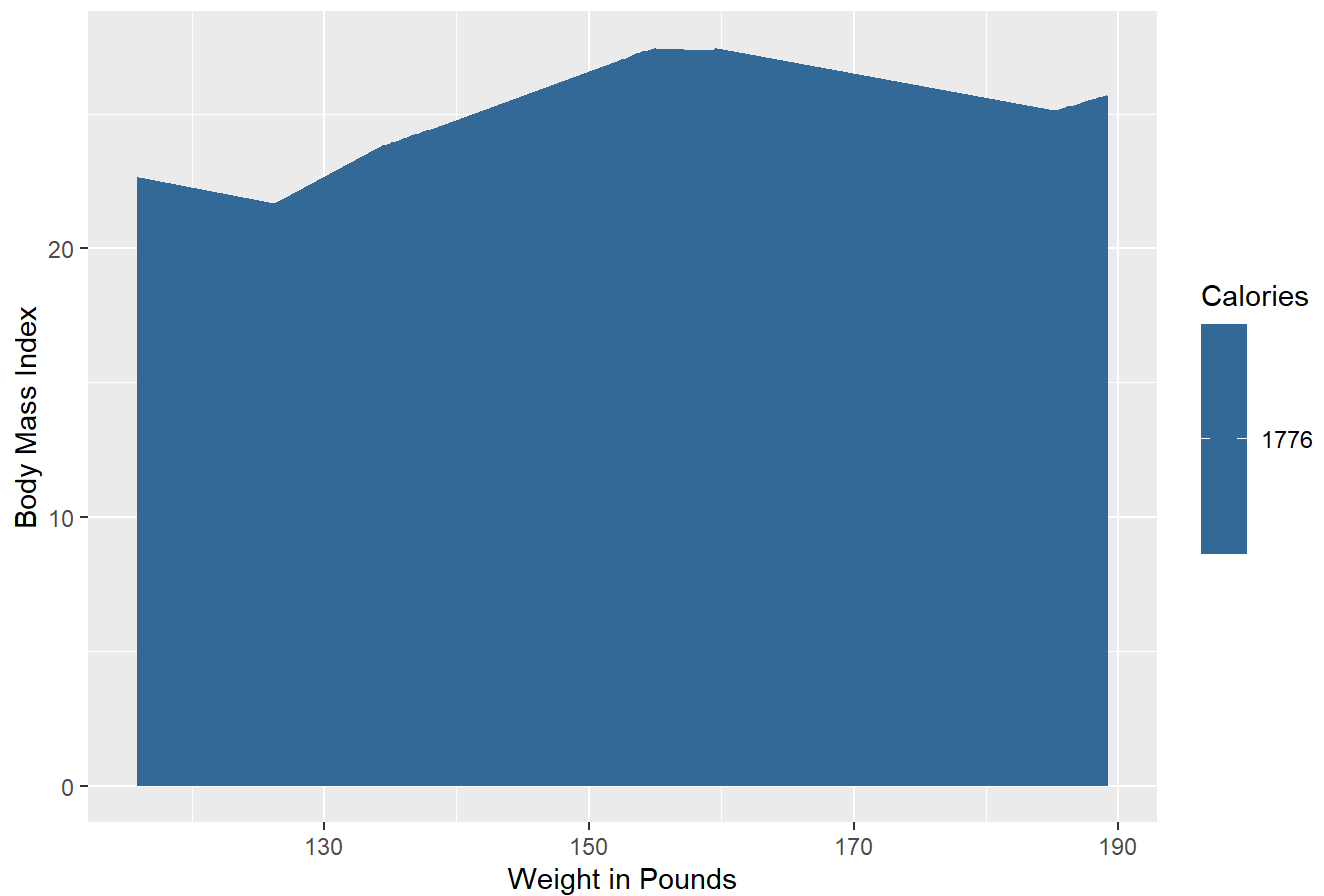
```
## $stats
## [1] 21.69 23.96 24.35 25.56 27.46
##
## $n
## [1] 1932
##
## $conf
## [1] 24.29249 24.40751
##
## $out
## numeric(0)
```

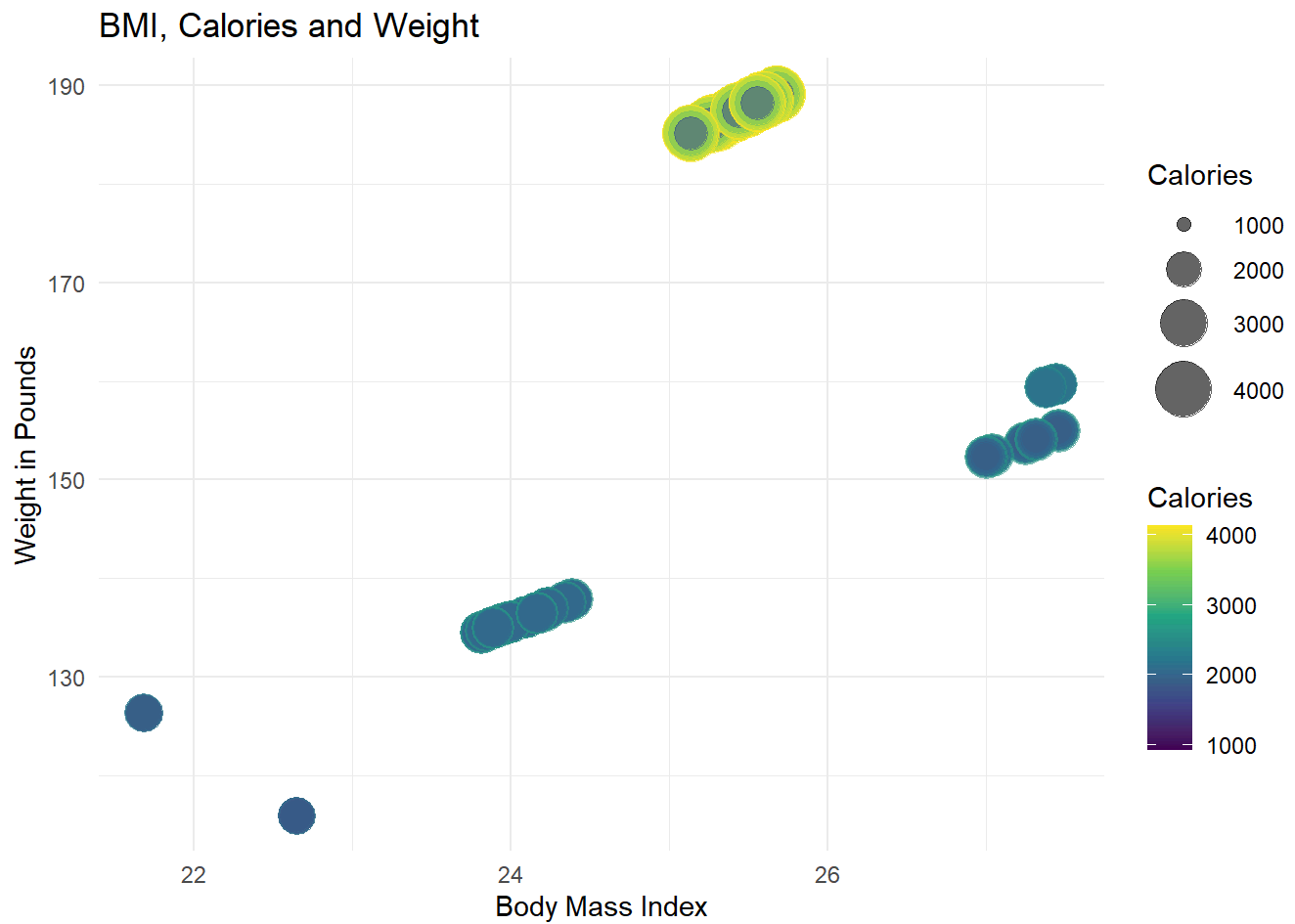
```
## $stats
## [1] 928 1990 2173 2860 4142
##
## $n
## [1] 1932
##
## $conf
## [1] 2141.727 2204.273
##
## $out
## integer(0)
```

Calories, Weight, and Body Mass



Calories effect on Weight and Mass





Steps_vs_Heartrate

```
#Line Plot
ggplot(df_unique_clean, aes(x = TotalSteps, y = BPM, color = BPM)) +
  geom_line() +
  scale_color_gradient(low = "red", high = "gold", name = "BPM") +
  labs(title = "Steps vs Heartrate", x = "Total Steps", y = "BPM", color = "BPM")
```

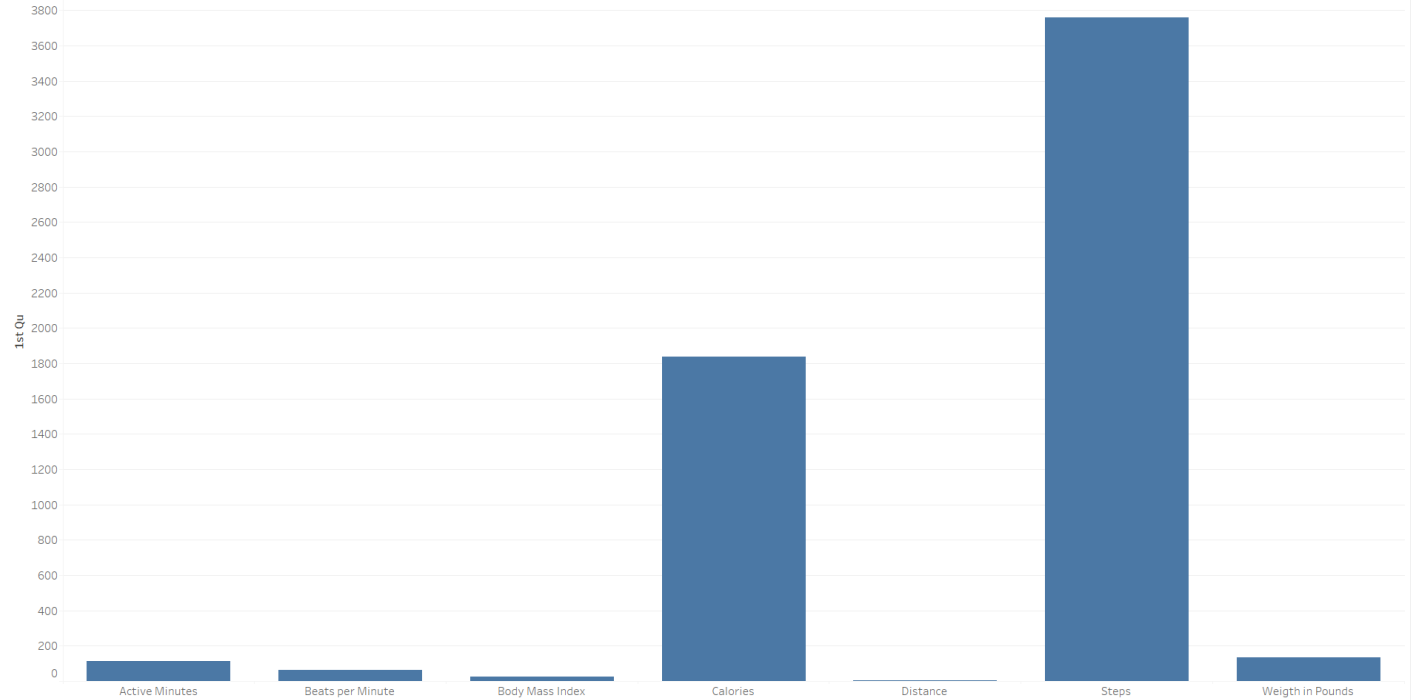
Steps vs Heartrate



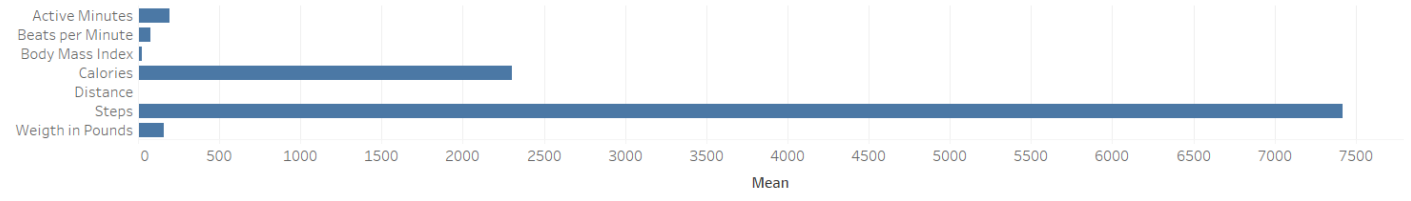
Overview of Fitbit Usage

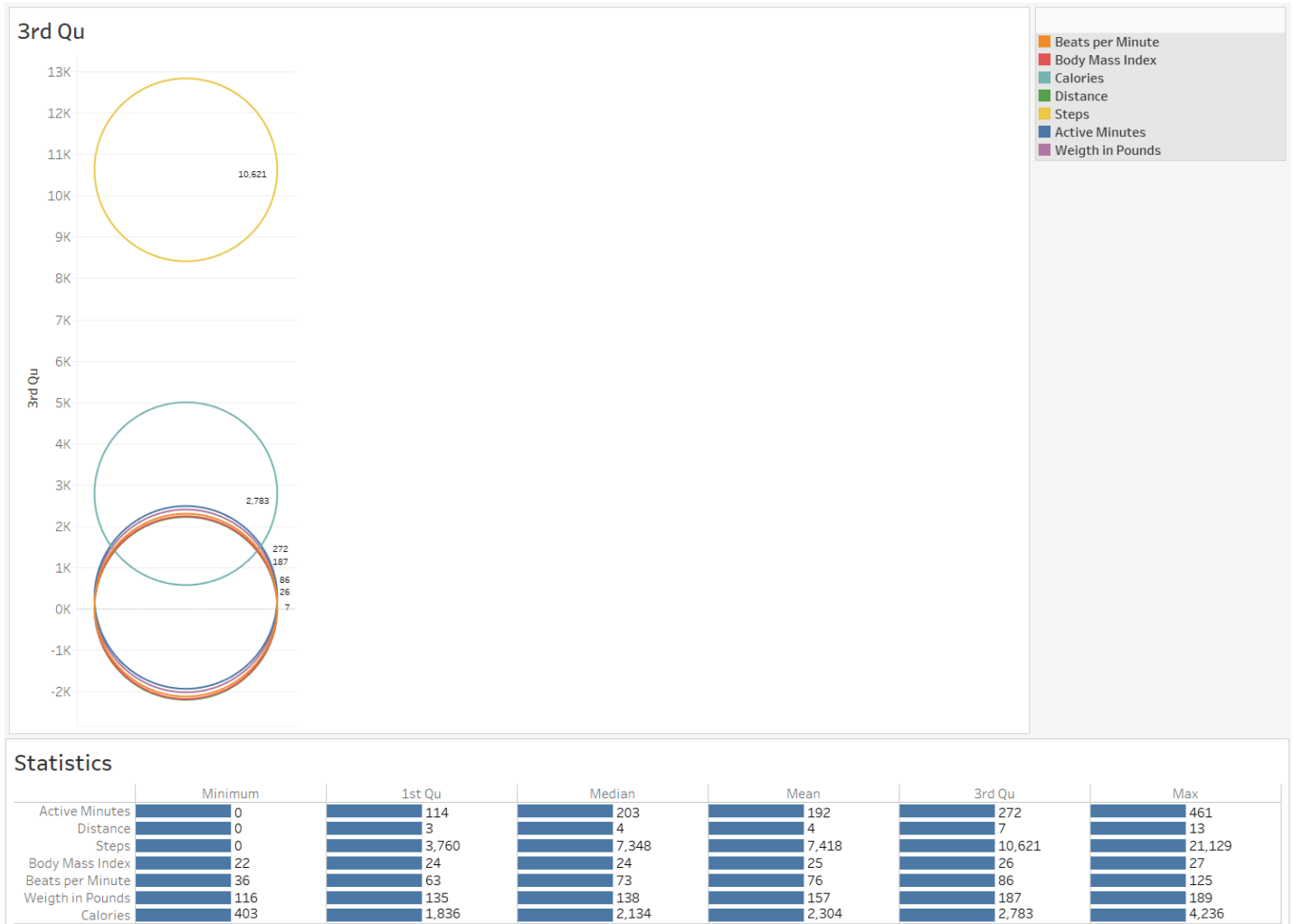


1st Qu



Mean of the Data





#Recommendations from Data Insights

When we begin this analysis we set up to answer the following questions

#1.- What are the trends in smart device usage?

In this analysis, we used the data generated by 30 Fitbit users. We approached the data as a template for Bellabeat's Time smartwatch as it is the most robust offering and fits the profile of the data generated by Fitbit users. The data yields some interesting correlations. From the 6 sets that we used for the analysis, we learned the following

There are strong patterns in usage between the Activity Time and the Distance the results show that most of the active time is between 15 minutes to about 60 minutes with a distance of 2.6 miles and 4.4 miles

Now let's look at the insights we learned when looking at the results of Calories and Steps. We have a range of daily steps between 3760 and 10,621 with a daily caloric expenditure between 1836 and 2783. According to MayoClinic.com the typical middle-aged woman in the US falls in a range of 1747 to 2500 calories per day

Let's focus now on the following metrics:

Beats per Minute, show a range of 63 to 86

Weight ranges from 135 lb to 187

Body Mass Index is between 23.96 to 25.56

If we take the metrics above and reference them to the average in the US we can get some context. The average resting rate for adult women is between 78 - 82. The body mass index spectrum is the following

BMI 18.5 = Underweight BMI 18.5 -24.9 = Normal Weight BMI 25 - 29 = Overweight

The data shows that the users are within the higher part and outlying the spectrum of what is considered standard in the US. That gives us a glimpse of the users of this type of health product. Most females are caught in the day-to-day grind whether they are students, mothers, or career professionals. Their time is limited but they are doing something about it, they are conscious of the importance of health and are committed to reaching that goal of being healthy, energetic, and above the unhealthy statistics of the population. The BMI metric is a perfect illustration, as 25% is considered overweight and the majority of the users are below and fall within the normal weight percentage. The time, distance, steps, and calories show us that the users are normal people aiming to be less sedentary by staying active (distance & step, time) and watching their calories.

#2.- How could this trend apply to Bellabeat customers?

By emphasizing a lifestyle change that is within reach of everybody. Good health is a necessity for today's woman, not a luxury, and even though time can sometimes be limited, just the fact that being active counts and makes a big difference. That leads to the importance of tracking and measuring what you do in the simplest way possible. You can not improve what you do not measure and that's where Bellabeat empowers women by offering a platform that measures and tracks the important metrics needed to develop a healthy and productive lifestyle Highlight the affordability, comfort, and ease of use of the Bellabeat healthy women lifestyle. Your lifestyle change starts with your Time smartwatch so that you can measure the healthy metrics of your day-to-day, then you store and track the info in your Bellabeat App and finally you commit to daily improvement by joining the Bellabeat membership club.

#3.- How could these trends help influence Bellabeat's marketing strategy?

The data clearly shows that the users are people trying to make an impactful change in their lives but there is a lack of professional guidance. The fad diets and exercise gadgets are popular because they promise quick results, with no effort, and play on the emotions of the people. However, they are very popular and profitable. By using this data the marketing team can consider tailoring an online educational campaign about health and lifestyle they go together, change will not be easy or fast but it is within reach of everybody. Put a face to it so that it can be personable and relatable and share the story of how the person changed her lifestyle by measuring, tracking, and committing to the Bellabeat healthy woman lifestyle.