BellaBeat User Data Analysis

Lewis Rincon Castano

8/5/2021

Installing Packages

Using the following libraries: dplyr, tidyverse, ggpubr, knitr, readr, psych, kableExtra, skimr, gtsummary, and rmarkdown.

Importing CSV file to RMarkdown

Importing two csv files to create rmarkdown tables. These tables were filtered out and combined previously. This information is described on main_file.

- dailyActivities_csv<- read_csv("dailyActivities.csv").
- dailyActivities_summary_csv<- read_csv("dailyActivities_summary.csv").
- heartrate_seconds_csv<- read_csv("heartrate_seconds_merged.csv")

Summary of the daily activties and heart rate files

Table 1: Daily Activities Summary

	TotalSteps	TotalDistance	TrackerDistance	LoggedActivitiesDistance
	Min. : 0	Min. : 0.000	Min. : 0.000	Min. :0.0000
	1st Qu.: 3790	1st Qu.: 2.620	1st Qu.: 2.620	1st Qu.:0.0000
	Median : 7406	Median : 5.245	Median : 5.245	Median :0.0000
	Mean : 7638	Mean : 5.490	Mean : 5.475	Mean :0.1082
	3rd Qu.:10727	3rd Qu.: 7.713	3rd Qu.: 7.710	3rd Qu.:0.0000
	Max. :36019	Max. :28.030	Max. :28.030	Max. :4.9421

Table 2: Daily Activities Summary

	VeryActiveDistance	ModeratelyActiveDistance	LightActiveDistance	SedentaryActiveDistance
	Min. : 0.000	Min. :0.0000	Min. : 0.000	Min. :0.000000
	1st Qu.: 0.000	1st Qu.:0.0000	1st Qu.: 1.945	1st Qu.:0.000000
	Median : 0.210	Median :0.2400	Median : 3.365	Median :0.000000
	Mean : 1.503	Mean :0.5675	Mean : 3.341	Mean :0.001606
	3rd Qu.: 2.053	3rd Qu.:0.8000	3rd Qu.: 4.782	3rd Qu.:0.000000
	Max. :21.920	Max. :6.4800	Max. :10.710	Max. :0.110000

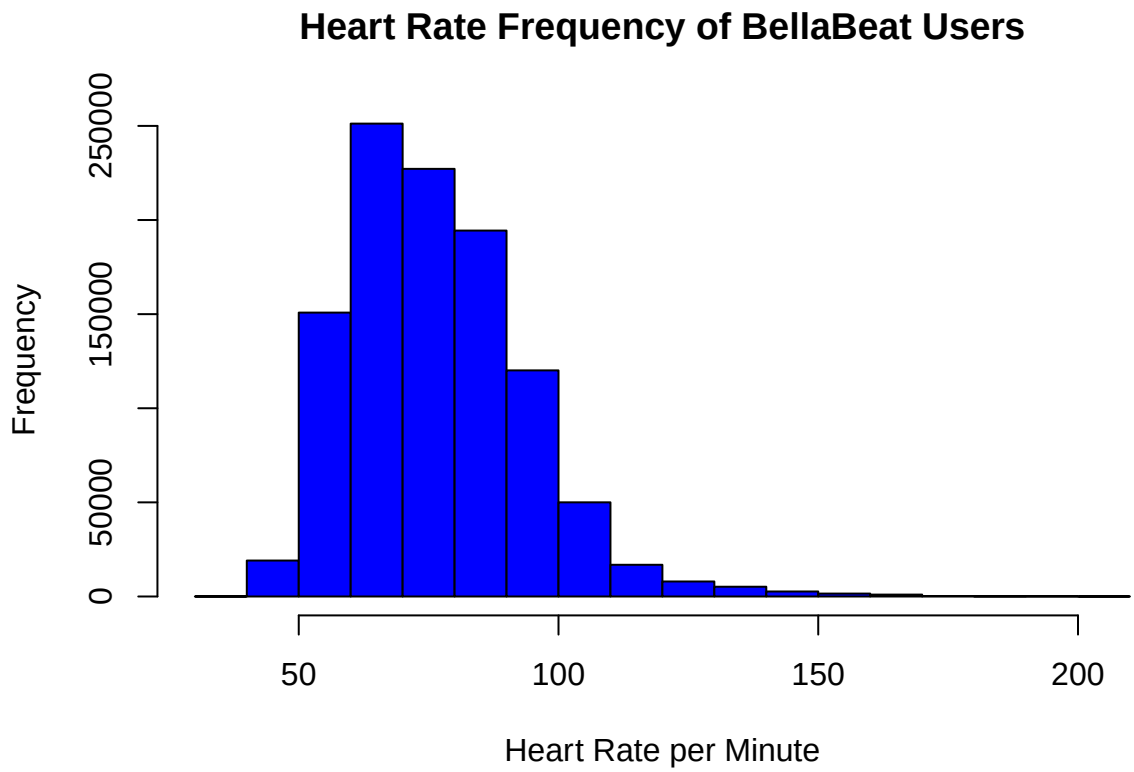
Table 3: Daily Activities Summary

	VeryActiveMinutes	FairlyActiveMinutes	LightlyActiveMinutes	SedentaryMinutes	Calories
	Min. : 0.00	Min. : 0.00	Min. : 0.0	Min. : 0.0	Min. : 0
	1st Qu.: 0.00	1st Qu.: 0.00	1st Qu.:127.0	1st Qu.: 729.8	1st Qu.:1828
	Median : 4.00	Median : 6.00	Median :199.0	Median :1057.5	Median :2134
	Mean : 21.16	Mean : 13.56	Mean :192.8	Mean : 991.2	Mean :2304
	3rd Qu.: 32.00	3rd Qu.: 19.00	3rd Qu.:264.0	3rd Qu.:1229.5	3rd Qu.:2793
	Max. :210.00	Max. :143.00	Max. :518.0	Max. :1440.0	Max. :4900

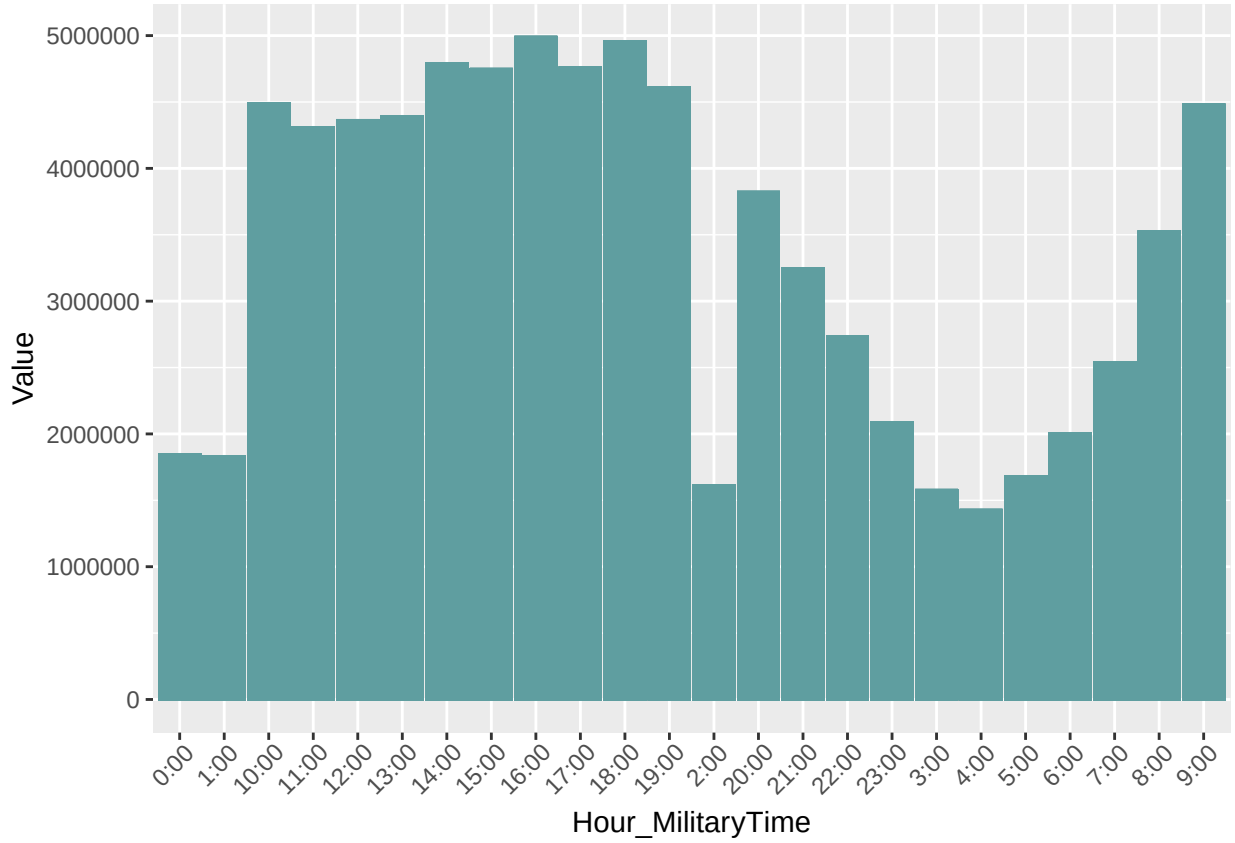
Heart Rata Analysis

```
##      Value
##  Min.   : 38.00
##  1st Qu.: 64.00
##  Median : 75.00
##  Mean   : 77.02
##  3rd Qu.: 87.00
##  Max.   :203.00
```

```
hist(heartrate_seconds_csv$Value, main="Heart Rate Frequency of BellaBeat Users", xlab="Heart Rate per M
     col="blue")
```



```
options(scipen=999)
ggplot(data=heartrate_seconds_csv, aes(x=Hour_MilitaryTime, y=Value)) +
  geom_bar(stat="identity", color='#5F9EA0')+
  theme(axis.text.x=element_text(angle=45, hjust=0.9))
```



Regression model and graphs from the daily activties file

```
model_dailyActivities = lm(formula = Calories ~ TrackerDistance + VeryActiveDistance + ModeratelyActivel
summary(model_dailyActivities)
```

```
##
## Call:
## lm(formula = Calories ~ TrackerDistance + VeryActiveDistance +
##     ModeratelyActiveDistance + LightActiveDistance + SedentaryActiveDistance +
##     VeryActiveMinutes + FairlyActiveMinutes + LightlyActiveMinutes +
##     SedentaryMinutes, data = dailyActivities_csv)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1703.27  -291.65    -5.49   347.39  1201.10
##
## Coefficients:
```

```
##                              Estimate Std. Error t value             Pr(>|t|)
## (Intercept)                1185.43544   76.65286  15.465 < 0.0000000000000002 ***
## TrackerDistance             185.86953   21.79561   8.528 < 0.0000000000000002 ***
## VeryActiveDistance         -205.01224   24.12508  -8.498 < 0.0000000000000002 ***
## ModeratelyActiveDistance -503.05744   58.90848  -8.540 < 0.0000000000000002 ***
## LightActiveDistance          77.10136   27.43992   2.810              0.00506 **
## SedentaryActiveDistance  2303.99597 2012.67349   1.145              0.25261
## VeryActiveMinutes            12.37041    0.89095  13.885 < 0.0000000000000002 ***
## FairlyActiveMinutes          15.59427    2.51612   6.198      0.0000000008597 ***
## LightlyActiveMinutes         -2.05916    0.30121  -6.836      0.0000000000147 ***
## SedentaryMinutes              0.35961    0.05586   6.438      0.0000000001942 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 444.8 on 930 degrees of freedom
## Multiple R-squared:   0.62,  Adjusted R-squared:  0.6163
## F-statistic: 168.6 on 9 and 930 DF,  p-value: < 0.00000000000000022
```

Correlation formula and result:

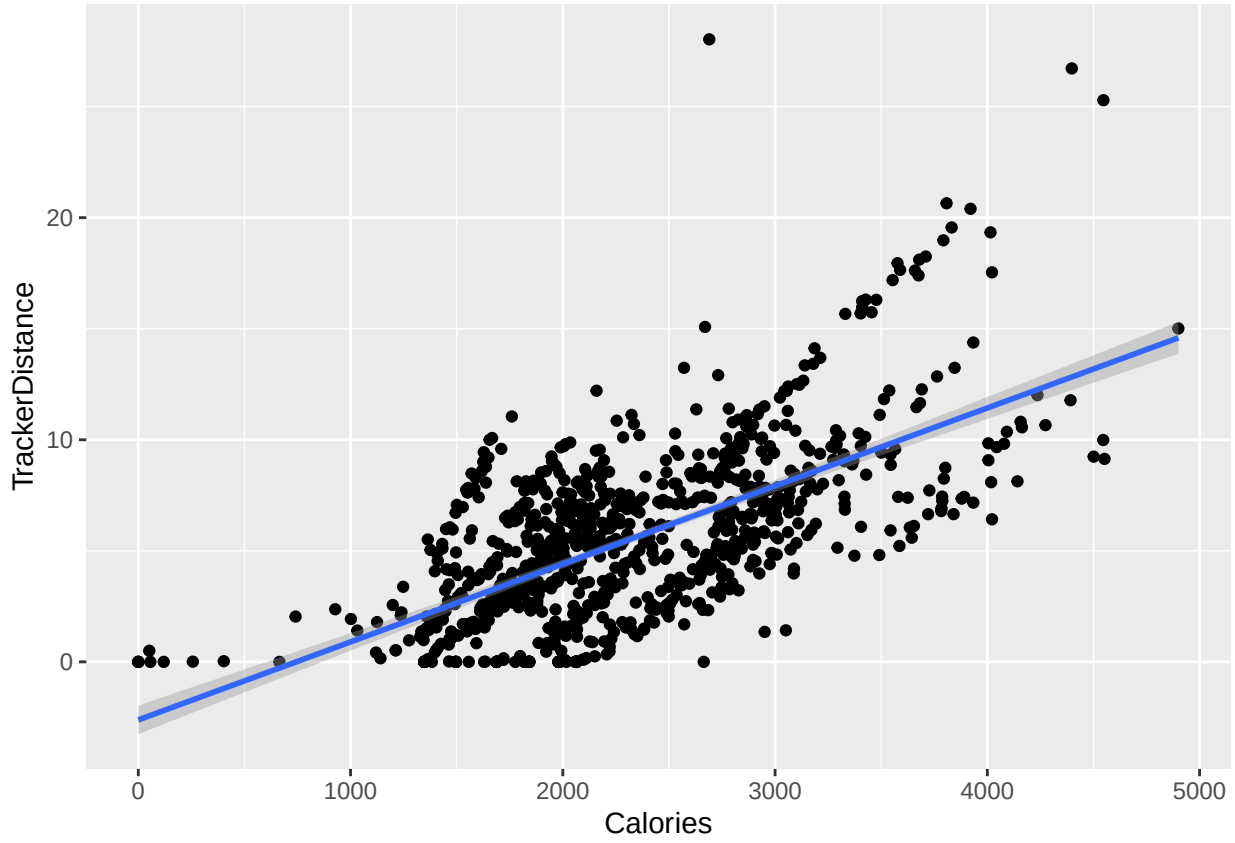
```
cor(dailyActivities_csv$Calories, dailyActivities_csv$TrackerDistance)^2
```

```
## [1] 0.4164293
```

Scatterplox graphic for Calories vs Trtacker Distance

```
plot(ggplot(dailyActivities_csv, aes(Calories, TrackerDistance)) +
  geom_point() +
  stat_smooth(method = lm))
```

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



Conclusions:

We can conclude that Bellabeat users burned an average of 2304 calories, 7638 steps, and more than 35 minutes of active movement on their daily activities using their smart band. Additionally, the number of burn calories is positively correlated to the amount of distance walked. The Bellabeat users reported more heart rate usage between 3 pm and 6 pm with an average of 75-85 pulses per minute.