

Bellabeat.rmd

```
#install packages
install.packages("tidyverse")

## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
## (as 'lib' is unspecified)
install.packages("rmarkdown")

## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
## (as 'lib' is unspecified)
install.packages("lubridate")

## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
## (as 'lib' is unspecified)
install.packages("dplyr")

## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
## (as 'lib' is unspecified)
install.packages("ggplot2")

## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
## (as 'lib' is unspecified)
install.packages("tidyr")

## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
## (as 'lib' is unspecified)
install.packages("here")

## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
## (as 'lib' is unspecified)
install.packages("skimr")

## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
## (as 'lib' is unspecified)
install.packages("janitor")

## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
## (as 'lib' is unspecified)
#load packages
library("tidyverse")

## -- Attaching packages ----- tidyverse 1.3.2 --
## v ggplot2 3.3.6      v purrr   0.3.4
## v tibble  3.1.7      v dplyr   1.0.10
## v tidyr   1.2.0      v stringr 1.4.0
```

```
## v readr 2.1.2 v forcats 0.5.1
## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag() masks stats::lag()

library("lubridate")

##
## Attaching package: 'lubridate'
##
## The following objects are masked from 'package:base':
##
## date, intersect, setdiff, union

library("dplyr")
library("ggplot2")
library("tidyr")
library("here")

## here() starts at /cloud/project

library("skimr")
library("janitor")

##
## Attaching package: 'janitor'
##
## The following objects are masked from 'package:stats':
##
## chisq.test, fisher.test

daily_activity <- read.csv("dailyActivity_merged.csv")
hourly_calories <- read.csv("hourlyCalories_merged.csv")
hourly_intensities <- read.csv("hourlyIntensities_merged.csv")
sleep <- read.csv("sleepDay_merged.csv")
heartrate <- read.csv("heartrate_seconds_merged.csv")
weight <- read.csv("weightLogInfo_merged.csv")

head(daily_activity)

##           Id ActivityDate TotalSteps TotalDistance TrackerDistance
## 1 1503960366 4/12/2016      13162          8.50          8.50
## 2 1503960366 4/13/2016      10735          6.97          6.97
## 3 1503960366 4/14/2016      10460          6.74          6.74
## 4 1503960366 4/15/2016       9762          6.28          6.28
## 5 1503960366 4/16/2016      12669          8.16          8.16
## 6 1503960366 4/17/2016       9705          6.48          6.48
## LoggedActivitiesDistance VeryActiveDistance ModeratelyActiveDistance
## 1              0              1.88              0.55
## 2              0              1.57              0.69
## 3              0              2.44              0.40
## 4              0              2.14              1.26
## 5              0              2.71              0.41
## 6              0              3.19              0.78
## LightActiveDistance SedentaryActiveDistance VeryActiveMinutes
## 1              6.06              0              25
## 2              4.71              0              21
```

```
## 3          3.91          0          30
## 4          2.83          0          29
## 5          5.04          0          36
## 6          2.51          0          38
##   FairlyActiveMinutes LightlyActiveMinutes SedentaryMinutes Calories
## 1          13          328          728      1985
## 2          19          217          776      1797
## 3          11          181         1218      1776
## 4          34          209          726      1745
## 5          10          221          773      1863
## 6          20          164          539      1728
```

```
colnames(daily_activity)
```

```
## [1] "Id"          "ActivityDate"
## [3] "TotalSteps"  "TotalDistance"
## [5] "TrackerDistance" "LoggedActivitiesDistance"
## [7] "VeryActiveDistance" "ModeratelyActiveDistance"
## [9] "LightActiveDistance" "SedentaryActiveDistance"
## [11] "VeryActiveMinutes" "FairlyActiveMinutes"
## [13] "LightlyActiveMinutes" "SedentaryMinutes"
## [15] "Calories"
```

```
str(daily_activity)
```

```
## 'data.frame':   940 obs. of  15 variables:
## $ Id          : num  1.5e+09 1.5e+09 1.5e+09 1.5e+09 1.5e+09 ...
## $ ActivityDate : chr   "4/12/2016" "4/13/2016" "4/14/2016" "4/15/2016" ...
## $ TotalSteps   : int  13162 10735 10460 9762 12669 9705 13019 15506 10544 9819 ...
## $ TotalDistance : num  8.5 6.97 6.74 6.28 8.16 ...
## $ TrackerDistance : num  8.5 6.97 6.74 6.28 8.16 ...
## $ LoggedActivitiesDistance: num  0 0 0 0 0 0 0 0 0 0 ...
## $ VeryActiveDistance : num  1.88 1.57 2.44 2.14 2.71 ...
## $ ModeratelyActiveDistance: num  0.55 0.69 0.4 1.26 0.41 ...
## $ LightActiveDistance : num  6.06 4.71 3.91 2.83 5.04 ...
## $ SedentaryActiveDistance : num  0 0 0 0 0 0 0 0 0 0 ...
## $ VeryActiveMinutes : int  25 21 30 29 36 38 42 50 28 19 ...
## $ FairlyActiveMinutes : int  13 19 11 34 10 20 16 31 12 8 ...
## $ LightlyActiveMinutes : int  328 217 181 209 221 164 233 264 205 211 ...
## $ SedentaryMinutes : int  728 776 1218 726 773 539 1149 775 818 838 ...
## $ Calories       : int  1985 1797 1776 1745 1863 1728 1921 2035 1786 1775 ...
```

```
head(sleep)
```

```
##           Id          SleepDay TotalSleepRecords TotalMinutesAsleep
## 1 1503960366 4/12/2016 12:00:00 AM              1              327
## 2 1503960366 4/13/2016 12:00:00 AM              2              384
## 3 1503960366 4/15/2016 12:00:00 AM              1              412
## 4 1503960366 4/16/2016 12:00:00 AM              2              340
## 5 1503960366 4/17/2016 12:00:00 AM              1              700
## 6 1503960366 4/19/2016 12:00:00 AM              1              304
##   TotalTimeInBed
## 1          346
## 2          407
## 3          442
## 4          367
```

```
## 5          712
## 6          320
```

```
colnames(sleep)
```

```
## [1] "Id"          "SleepDay"      "TotalSleepRecords"
## [4] "TotalMinutesAsleep" "TotalTimeInBed"
```

```
str(sleep)
```

```
## 'data.frame':  413 obs. of  5 variables:
## $ Id          : num  1.5e+09 1.5e+09 1.5e+09 1.5e+09 1.5e+09 ...
## $ SleepDay     : chr   "4/12/2016 12:00:00 AM" "4/13/2016 12:00:00 AM" "4/15/2016 12:00:00 AM"
## $ TotalSleepRecords : int  1 2 1 2 1 1 1 1 1 1 ...
## $ TotalMinutesAsleep: int  327 384 412 340 700 304 360 325 361 430 ...
## $ TotalTimeInBed   : int  346 407 442 367 712 320 377 364 384 449 ...
```

```
head(hourly_calories)
```

```
##           Id           ActivityHour Calories
## 1 1503960366 4/12/2016 12:00:00 AM      81
## 2 1503960366 4/12/2016 1:00:00 AM      61
## 3 1503960366 4/12/2016 2:00:00 AM      59
## 4 1503960366 4/12/2016 3:00:00 AM      47
## 5 1503960366 4/12/2016 4:00:00 AM      48
## 6 1503960366 4/12/2016 5:00:00 AM      48
```

```
colnames(hourly_calories)
```

```
## [1] "Id"          "ActivityHour" "Calories"
```

```
str(hourly_calories)
```

```
## 'data.frame':  22099 obs. of  3 variables:
## $ Id          : num  1.5e+09 1.5e+09 1.5e+09 1.5e+09 1.5e+09 ...
## $ ActivityHour: chr   "4/12/2016 12:00:00 AM" "4/12/2016 1:00:00 AM" "4/12/2016 2:00:00 AM" "4/12/2016 3:00:00 AM"
## $ Calories    : int  81 61 59 47 48 48 48 47 68 141 ...
```

```
head(hourly_intensities)
```

```
##           Id           ActivityHour TotalIntensity AverageIntensity
## 1 1503960366 4/12/2016 12:00:00 AM           20          0.333333
## 2 1503960366 4/12/2016 1:00:00 AM            8          0.133333
## 3 1503960366 4/12/2016 2:00:00 AM            7          0.116667
## 4 1503960366 4/12/2016 3:00:00 AM            0          0.000000
## 5 1503960366 4/12/2016 4:00:00 AM            0          0.000000
## 6 1503960366 4/12/2016 5:00:00 AM            0          0.000000
```

```
colnames(hourly_intensities)
```

```
## [1] "Id"          "ActivityHour" "TotalIntensity" "AverageIntensity"
```

```
str(hourly_intensities)
```

```
## 'data.frame':  22099 obs. of  4 variables:
## $ Id          : num  1.5e+09 1.5e+09 1.5e+09 1.5e+09 1.5e+09 ...
## $ ActivityHour : chr   "4/12/2016 12:00:00 AM" "4/12/2016 1:00:00 AM" "4/12/2016 2:00:00 AM" "4/12/2016 3:00:00 AM"
## $ TotalIntensity : int  20 8 7 0 0 0 0 0 13 30 ...
## $ AverageIntensity: num  0.333 0.133 0.117 0 0 ...
```

```
head(heartrate)
```

```
##           Id           Time Value
## 1 2022484408 4/12/2016 7:21:00 AM    97
## 2 2022484408 4/12/2016 7:21:05 AM   102
## 3 2022484408 4/12/2016 7:21:10 AM   105
## 4 2022484408 4/12/2016 7:21:20 AM   103
## 5 2022484408 4/12/2016 7:21:25 AM   101
## 6 2022484408 4/12/2016 7:22:05 AM    95
```

```
colnames(heartrate)
```

```
## [1] "Id"      "Time"    "Value"
```

```
str(heartrate)
```

```
## 'data.frame':    2483658 obs. of  3 variables:
## $ Id      : num  2.02e+09 2.02e+09 2.02e+09 2.02e+09 2.02e+09 ...
## $ Time    : chr   "4/12/2016 7:21:00 AM" "4/12/2016 7:21:05 AM" "4/12/2016 7:21:10 AM" "4/12/2016 7:21:20 AM" ...
## $ Value   : int   97 102 105 103 101 95 91 93 94 93 ...
```

```
head(weight)
```

```
##           Id           Date WeightKg WeightPounds Fat   BMI
## 1 1503960366 5/2/2016 11:59:59 PM    52.6    115.9631  22 22.65
## 2 1503960366 5/3/2016 11:59:59 PM    52.6    115.9631  NA 22.65
## 3 1927972279 4/13/2016 1:08:52 AM   133.5    294.3171  NA 47.54
## 4 2873212765 4/21/2016 11:59:59 PM    56.7    125.0021  NA 21.45
## 5 2873212765 5/12/2016 11:59:59 PM    57.3    126.3249  NA 21.69
## 6 4319703577 4/17/2016 11:59:59 PM    72.4    159.6147  25 27.45
##   IsManualReport      LogId
## 1             True 1.462234e+12
## 2             True 1.462320e+12
## 3            False 1.460510e+12
## 4             True 1.461283e+12
## 5             True 1.463098e+12
## 6             True 1.460938e+12
```

```
colnames(weight)
```

```
## [1] "Id"           "Date"         "WeightKg"     "WeightPounds"
## [5] "Fat"          "BMI"          "IsManualReport" "LogId"
```

```
str(weight)
```

```
## 'data.frame':    67 obs. of  8 variables:
## $ Id      : num  1.50e+09 1.50e+09 1.93e+09 2.87e+09 2.87e+09 ...
## $ Date    : chr   "5/2/2016 11:59:59 PM" "5/3/2016 11:59:59 PM" "4/13/2016 1:08:52 AM" "4/21/2016 11:59:59 PM" ...
## $ WeightKg : num  52.6 52.6 133.5 56.7 57.3 ...
## $ WeightPounds : num  116 116 294 125 126 ...
## $ Fat      : int   22 NA NA NA NA 25 NA NA NA NA ...
## $ BMI      : num  22.6 22.6 47.5 21.5 21.7 ...
## $ IsManualReport: chr   "True" "True" "False" "True" ...
## $ LogId     : num  1.46e+12 1.46e+12 1.46e+12 1.46e+12 1.46e+12 ...
```

```
n_distinct(daily_activity$Id)
```

```
## [1] 33
```

```
n_distinct(sleep$Id)
```

```
## [1] 24
```

```
n_distinct(hourly_calories$Id)
```

```
## [1] 33
```

```
n_distinct(hourly_intensities$Id)
```

```
## [1] 33
```

```
n_distinct(heartrate$Id)
```

```
## [1] 14
```

```
n_distinct(weight$Id)
```

```
## [1] 8
```

```
summary(daily_activity)
```

```
##           Id           ActivityDate       TotalSteps   TotalDistance
##  Min.      :1.504e+09   Length:940       Min.       :    0   Min.       : 0.000
## 1st Qu.:2.320e+09   Class :character 1st Qu.: 3790   1st Qu.: 2.620
## Median :4.445e+09   Mode  :character Median : 7406   Median : 5.245
## Mean    :4.855e+09                Mean  : 7638   Mean    : 5.490
## 3rd Qu.:6.962e+09                3rd Qu.:10727  3rd Qu.: 7.713
## Max.    :8.878e+09                Max.    :36019  Max.    :28.030
## TrackerDistance   LoggedActivitiesDistance   VeryActiveDistance
##  Min.       : 0.000   Min.       :0.00000   Min.       : 0.000
## 1st Qu.: 2.620   1st Qu.:0.00000   1st Qu.: 0.000
## Median : 5.245   Median :0.00000   Median : 0.210
## Mean    : 5.475   Mean    :0.1082    Mean    : 1.503
## 3rd Qu.: 7.710   3rd Qu.:0.00000   3rd Qu.: 2.053
## Max.    :28.030   Max.    :4.9421    Max.    :21.920
## ModeratelyActiveDistance   LightActiveDistance   SedentaryActiveDistance
##  Min.       :0.0000    Min.       : 0.000   Min.       :0.000000
## 1st Qu.:0.0000    1st Qu.: 1.945   1st Qu.:0.000000
## Median :0.2400    Median : 3.365   Median :0.000000
## Mean    :0.5675    Mean    : 3.341   Mean    :0.001606
## 3rd Qu.:0.8000    3rd Qu.: 4.782   3rd Qu.:0.000000
## Max.    :6.4800    Max.    :10.710   Max.    :0.110000
## VeryActiveMinutes   FairlyActiveMinutes   LightlyActiveMinutes   SedentaryMinutes
##  Min.       : 0.00   Min.       : 0.00   Min.       : 0.0   Min.       : 0.0
## 1st Qu.: 0.00   1st Qu.: 0.00   1st Qu.:127.0   1st Qu.: 729.8
## Median : 4.00   Median : 6.00   Median :199.0   Median :1057.5
## Mean    :21.16   Mean    :13.56   Mean    :192.8   Mean    : 991.2
## 3rd Qu.:32.00   3rd Qu.:19.00   3rd Qu.:264.0   3rd Qu.:1229.5
## Max.    :210.00   Max.    :143.00   Max.    :518.0   Max.    :1440.0
##           Calories
##  Min.       :    0
## 1st Qu.:1828
## Median :2134
## Mean    :2304
## 3rd Qu.:2793
## Max.    :4900
```

```
summary(sleep)
```

```
##           Id           SleepDay      TotalSleepRecords TotalMinutesAsleep
##  Min.      :1.504e+09   Length:413      Min.       :1.000      Min.       : 58.0
## 1st Qu.:3.977e+09   Class :character 1st Qu.:1.000      1st Qu.:361.0
## Median :4.703e+09   Mode  :character Median :1.000      Median :433.0
## Mean    :5.001e+09                Mean    :1.119      Mean    :419.5
## 3rd Qu.:6.962e+09                3rd Qu.:1.000      3rd Qu.:490.0
## Max.    :8.792e+09                Max.     :3.000      Max.     :796.0
## TotalTimeInBed
##  Min.       : 61.0
## 1st Qu.:403.0
## Median :463.0
## Mean    :458.6
## 3rd Qu.:526.0
## Max.     :961.0
```

```
# activity
```

```
daily_activity$ActivityDate=as.POSIXct(daily_activity$ActivityDate, format="%m/%d/%Y", tz=Sys.timezone())
daily_activity$date <- format(daily_activity$ActivityDate, format = "%m/%d/%y")
```

```
# sleep
```

```
sleep$SleepDay=as.POSIXct(sleep$SleepDay, format="%m/%d/%Y %I:%M:%S %p", tz=Sys.timezone())
sleep$date <- format(sleep$SleepDay, format = "%m/%d/%y")
```

```
merged_data <- merge(sleep, daily_activity, by=c('Id', 'date'))
head(merged_data)
```

```
##           Id      date  SleepDay TotalSleepRecords TotalMinutesAsleep
## 1 1503960366 04/12/16 2016-04-12                1                327
## 2 1503960366 04/13/16 2016-04-13                2                384
## 3 1503960366 04/15/16 2016-04-15                1                412
## 4 1503960366 04/16/16 2016-04-16                2                340
## 5 1503960366 04/17/16 2016-04-17                1                700
## 6 1503960366 04/19/16 2016-04-19                1                304
## TotalTimeInBed ActivityDate TotalSteps TotalDistance TrackerDistance
## 1          346    2016-04-12      13162           8.50           8.50
## 2          407    2016-04-13      10735           6.97           6.97
## 3          442    2016-04-15       9762           6.28           6.28
## 4          367    2016-04-16      12669           8.16           8.16
## 5          712    2016-04-17       9705           6.48           6.48
## 6          320    2016-04-19      15506           9.88           9.88
## LoggedActivitiesDistance VeryActiveDistance ModeratelyActiveDistance
## 1              0              1.88              0.55
## 2              0              1.57              0.69
## 3              0              2.14              1.26
## 4              0              2.71              0.41
## 5              0              3.19              0.78
## 6              0              3.53              1.32
## LightActiveDistance SedentaryActiveDistance VeryActiveMinutes
## 1              6.06              0              25
## 2              4.71              0              21
## 3              2.83              0              29
## 4              5.04              0              36
```

```
## 5          2.51          0          38
## 6          5.03          0          50
##   FairlyActiveMinutes LightlyActiveMinutes SedentaryMinutes Calories
## 1          13          328          728    1985
## 2          19          217          776    1797
## 3          34          209          726    1745
## 4          10          221          773    1863
## 5          20          164          539    1728
## 6          31          264          775    2035
```

```
merged_data %>%
  select(TotalSteps, TotalDistance, SedentaryMinutes, Calories,
         TotalSleepRecords, TotalMinutesAsleep, TotalTimeInBed) %>%
  summary()
```

```
##   TotalSteps   TotalDistance   SedentaryMinutes   Calories
## Min.   :   17   Min.   : 0.010   Min.   :   0.0   Min.   : 257
## 1st Qu.: 5206   1st Qu.: 3.600   1st Qu.: 631.0   1st Qu.:1850
## Median : 8925   Median : 6.290   Median : 717.0   Median :2220
## Mean   : 8541   Mean   : 6.039   Mean   : 712.2   Mean   :2398
## 3rd Qu.:11393   3rd Qu.: 8.030   3rd Qu.: 783.0   3rd Qu.:2926
## Max.   :22770   Max.   :17.540   Max.   :1265.0   Max.   :4900
## TotalSleepRecords TotalMinutesAsleep TotalTimeInBed
## Min.   :1.000   Min.   : 58.0   Min.   : 61.0
## 1st Qu.:1.000   1st Qu.:361.0   1st Qu.:403.0
## Median :1.000   Median :433.0   Median :463.0
## Mean   :1.119   Mean   :419.5   Mean   :458.6
## 3rd Qu.:1.000   3rd Qu.:490.0   3rd Qu.:526.0
## Max.   :3.000   Max.   :796.0   Max.   :961.0
```

```
daily_activity %>%
  select(TotalSteps, TotalDistance, SedentaryMinutes, Calories) %>%
  summary()
```

```
##   TotalSteps   TotalDistance   SedentaryMinutes   Calories
## Min.   :    0   Min.   : 0.000   Min.   :   0.0   Min.   :    0
## 1st Qu.: 3790   1st Qu.: 2.620   1st Qu.: 729.8   1st Qu.:1828
## Median : 7406   Median : 5.245   Median :1057.5   Median :2134
## Mean   : 7638   Mean   : 5.490   Mean   : 991.2   Mean   :2304
## 3rd Qu.:10727   3rd Qu.: 7.713   3rd Qu.:1229.5   3rd Qu.:2793
## Max.   :36019   Max.   :28.030   Max.   :1440.0   Max.   :4900
```

```
sleep %>%
  select(TotalSleepRecords, TotalMinutesAsleep, TotalTimeInBed) %>%
  summary()
```

```
##   TotalSleepRecords TotalMinutesAsleep TotalTimeInBed
## Min.   :1.000   Min.   : 58.0   Min.   : 61.0
## 1st Qu.:1.000   1st Qu.:361.0   1st Qu.:403.0
## Median :1.000   Median :433.0   Median :463.0
## Mean   :1.119   Mean   :419.5   Mean   :458.6
## 3rd Qu.:1.000   3rd Qu.:490.0   3rd Qu.:526.0
## Max.   :3.000   Max.   :796.0   Max.   :961.0
```

```
summary(merged_data)
```

```
##           Id           date           SleepDay
```



```

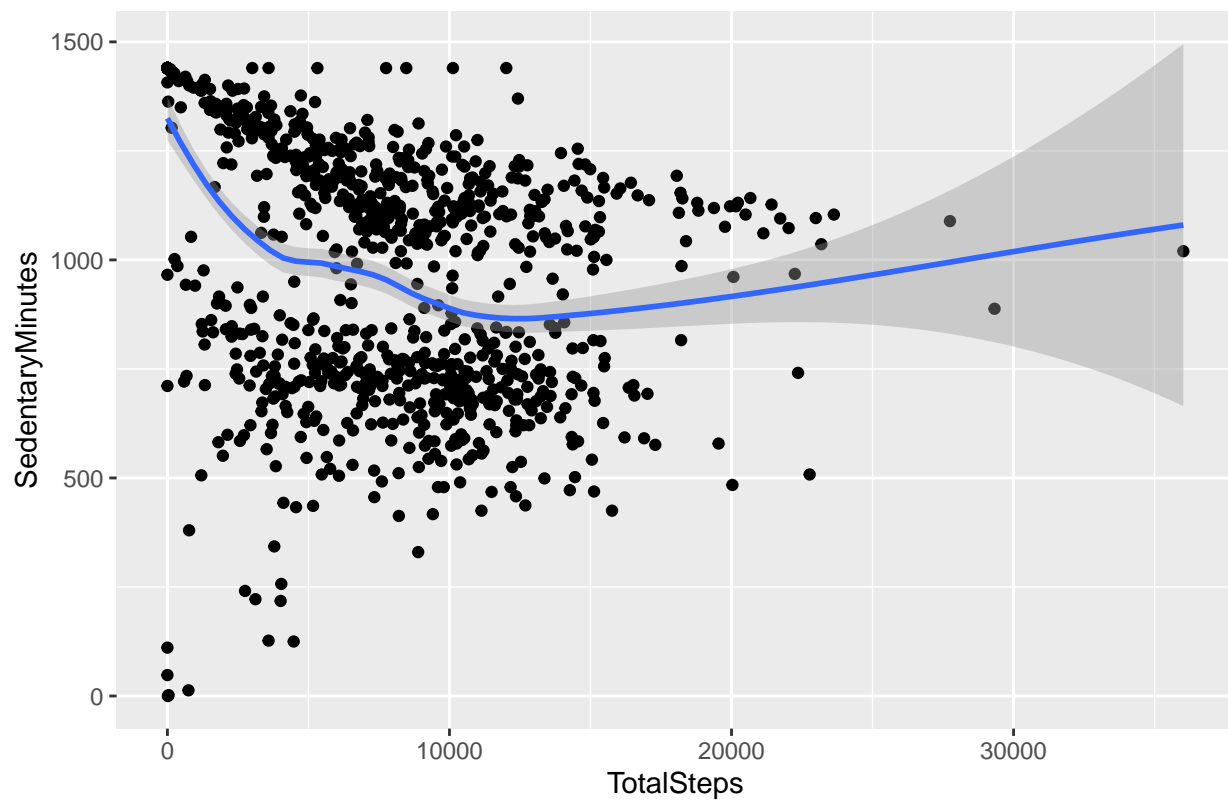
## Min.      :1.504e+09   Length:413      Min.      :2016-04-12 00:00:00.00
## 1st Qu.:3.977e+09   Class :character  1st Qu.:2016-04-19 00:00:00.00
## Median :4.703e+09   Mode  :character  Median :2016-04-27 00:00:00.00
## Mean    :5.001e+09                      Mean    :2016-04-26 12:40:05.80
## 3rd Qu.:6.962e+09                      3rd Qu.:2016-05-04 00:00:00.00
## Max.    :8.792e+09                      Max.    :2016-05-12 00:00:00.00
## TotalSleepRecords TotalMinutesAsleep TotalTimeInBed
## Min.      :1.000      Min.      : 58.0      Min.      : 61.0
## 1st Qu.:1.000      1st Qu.:361.0      1st Qu.:403.0
## Median :1.000      Median :433.0      Median :463.0
## Mean    :1.119      Mean    :419.5      Mean    :458.6
## 3rd Qu.:1.000      3rd Qu.:490.0      3rd Qu.:526.0
## Max.    :3.000      Max.    :796.0      Max.    :961.0
## ActivityDate                TotalSteps    TotalDistance
## Min.      :2016-04-12 00:00:00.00  Min.      : 17      Min.      : 0.010
## 1st Qu.:2016-04-19 00:00:00.00  1st Qu.: 5206      1st Qu.: 3.600
## Median :2016-04-27 00:00:00.00  Median : 8925      Median : 6.290
## Mean    :2016-04-26 12:40:05.80  Mean    : 8541      Mean    : 6.039
## 3rd Qu.:2016-05-04 00:00:00.00  3rd Qu.:11393      3rd Qu.: 8.030
## Max.    :2016-05-12 00:00:00.00  Max.    :22770      Max.    :17.540
## TrackerDistance  LoggedActivitiesDistance VeryActiveDistance
## Min.      : 0.010      Min.      :0.0000      Min.      : 0.00
## 1st Qu.: 3.600      1st Qu.:0.0000      1st Qu.: 0.00
## Median : 6.290      Median :0.0000      Median : 0.57
## Mean    : 6.034      Mean    :0.1131      Mean    : 1.45
## 3rd Qu.: 8.020      3rd Qu.:0.0000      3rd Qu.: 2.37
## Max.    :17.540      Max.    :4.0817      Max.    :12.54
## ModeratelyActiveDistance LightActiveDistance SedentaryActiveDistance
## Min.      :0.0000      Min.      :0.010      Min.      :0.0000000
## 1st Qu.:0.0000      1st Qu.:2.540      1st Qu.:0.0000000
## Median :0.4200      Median :3.680      Median :0.0000000
## Mean    :0.7502      Mean    :3.807      Mean    :0.0009201
## 3rd Qu.:1.0400      3rd Qu.:4.930      3rd Qu.:0.0000000
## Max.    :6.4800      Max.    :9.480      Max.    :0.1100000
## VeryActiveMinutes FairlyActiveMinutes LightlyActiveMinutes SedentaryMinutes
## Min.      : 0.00      Min.      : 0.00      Min.      : 2.0      Min.      : 0.0
## 1st Qu.: 0.00      1st Qu.: 0.00      1st Qu.:158.0      1st Qu.: 631.0
## Median : 9.00      Median : 11.00      Median :208.0      Median : 717.0
## Mean    : 25.19      Mean    : 18.04      Mean    :216.9      Mean    : 712.2
## 3rd Qu.: 38.00      3rd Qu.: 27.00      3rd Qu.:263.0      3rd Qu.: 783.0
## Max.    :210.00      Max.    :143.00      Max.    :518.0      Max.    :1265.0
## Calories
## Min.      : 257
## 1st Qu.:1850
## Median :2220
## Mean    :2398
## 3rd Qu.:2926
## Max.    :4900

```

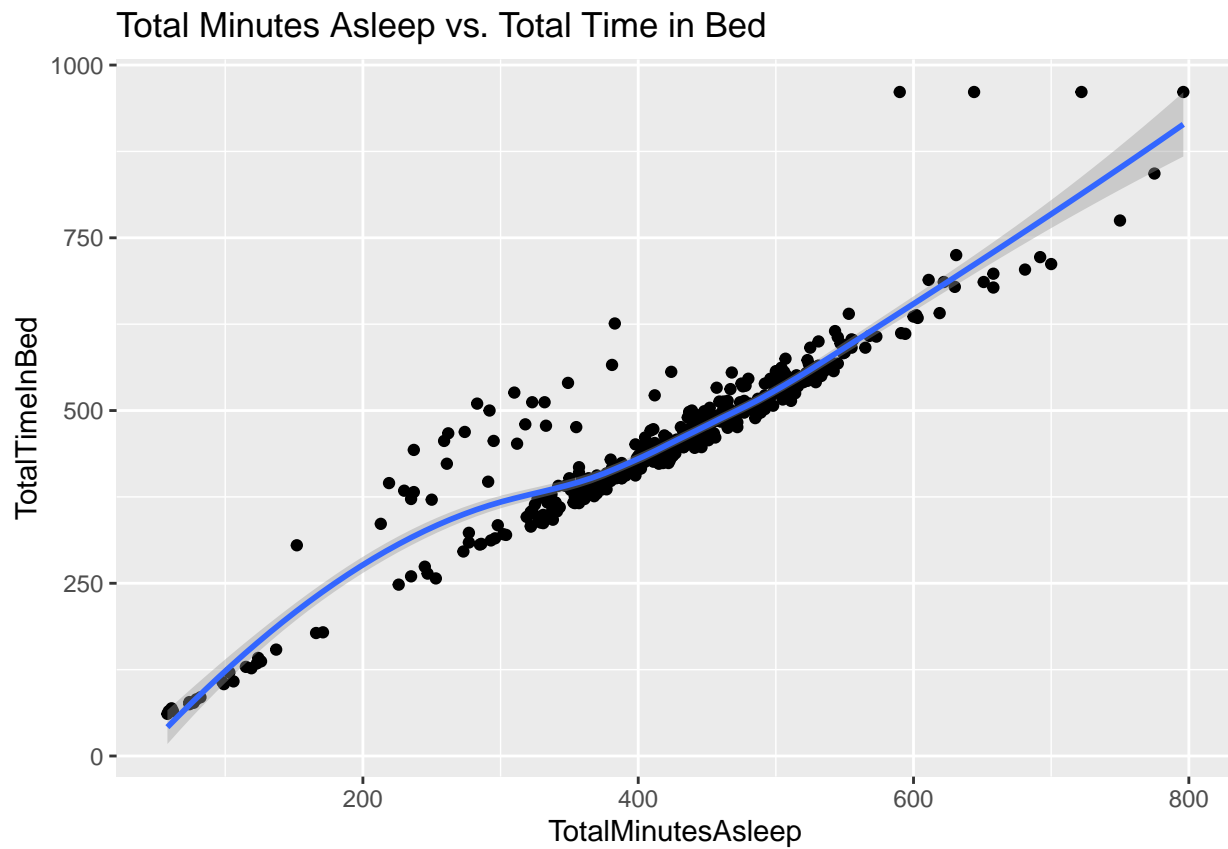
```
ggplot(data=daily_activity, aes(x=TotalSteps, y=SedentaryMinutes)) + geom_point() + geom_smooth() + lab
```

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

Total Steps vs. Sedentary Minutes



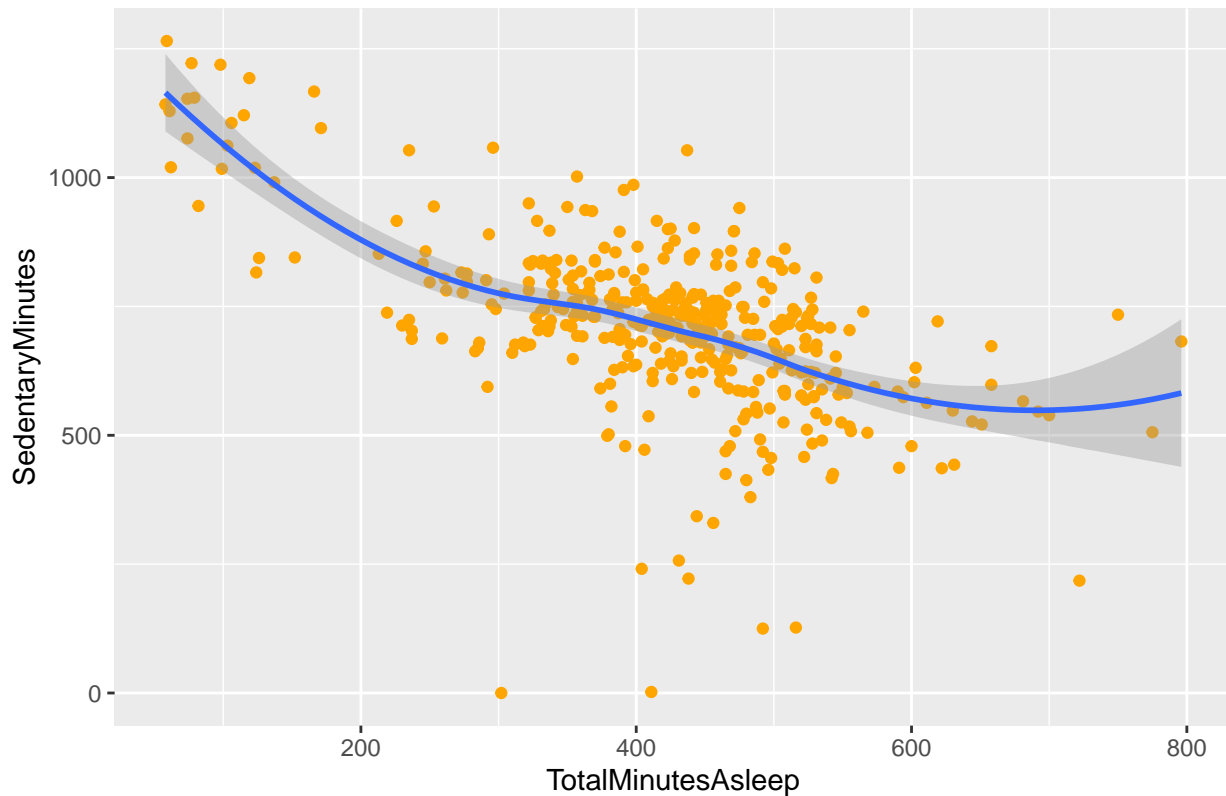
```
ggplot(data=sleep, aes(x=TotalMinutesAsleep, y=TotalTimeInBed)) + geom_point() + geom_smooth() + labs(t  
## `geom_smooth()` using method = 'loess' and formula 'y ~ x'
```



```
ggplot(data=merged_data, aes(x=TotalMinutesAsleep, y=SedentaryMinutes)) +  
  geom_point(color='orange') + geom_smooth() +  
  labs(title="Minutes Asleep vs. Sedentary Minutes")
```

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

Minutes Asleep vs. Sedentary Minutes



Summary

1. Most consumers live a sedentary lifestyle
2. Most people are not getting enough steps which is impacting them negatively
3. There is a negative correlation between minutes asleep and sedentary minutes
4. Recommendation for app: create reminders that tell consumers how many steps they've taken and how many they need to reach their daily goal. Remind consumers throughout the day to take a break and move around.
5. To make it more interesting, create little competitions that consumers can participate in to motivate them and help them reach their health goals.