Assignment 1

Jason

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Loading and preprocessing the data

```
library(knitr)
opts_chunk$set(echo =TRUE)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(lubridate)
```

```
##
## Attaching package: 'lubridate'

## The following objects are masked from 'package:dplyr':
##
##     intersect, setdiff, union

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

```
library(ggplot2)
setwd("~/R/Reproducibel_Research")

data <- read.csv("activity.csv", header = TRUE, sep = ',', colClasses = c("numeric", "character",
                                                                          "integer"))
data$date <- ymd(data$date)
```

What is mean total number of steps taken per day?

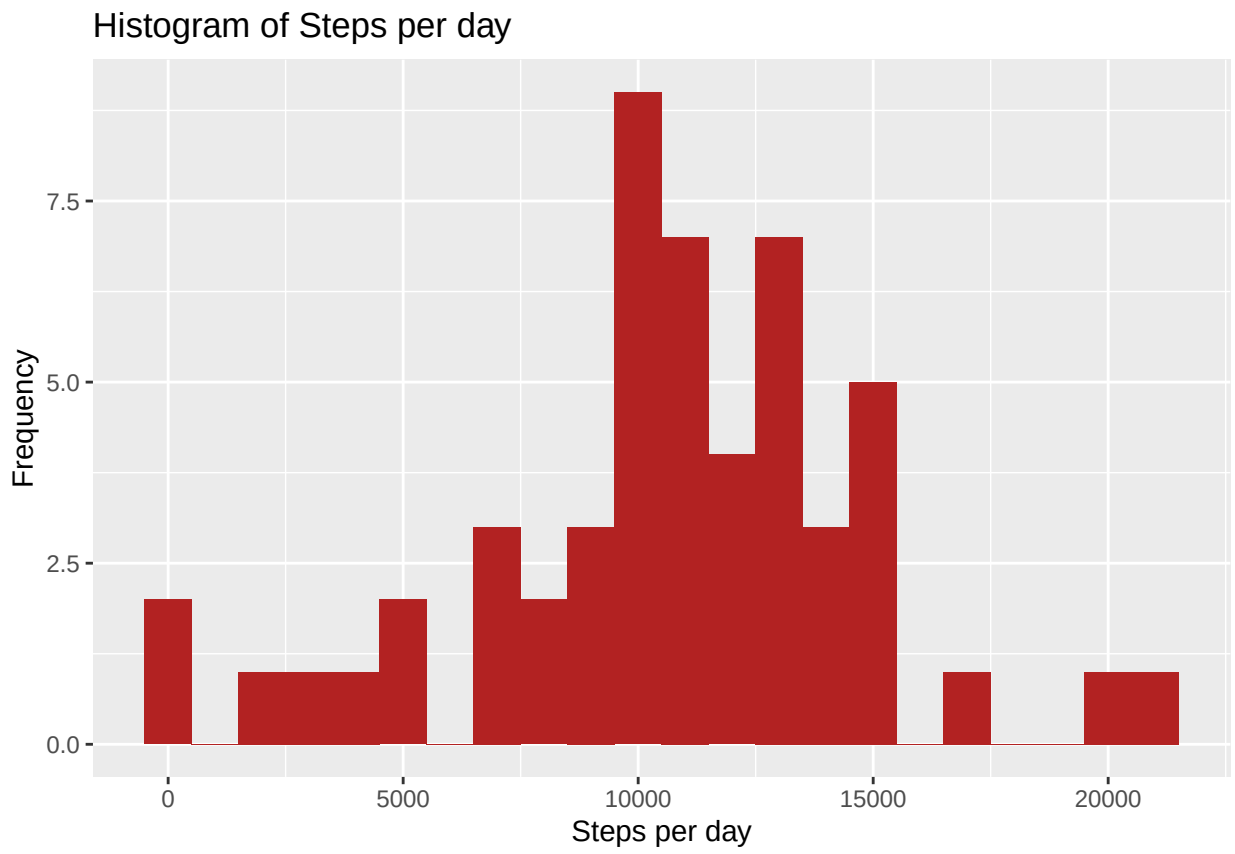
1. Calculating the steps taken

```
steps <- data %>%
  filter(!is.na(steps)) %>%
  group_by(date) %>%
  summarize(steps = sum(steps)) %>%
  print
```

```
## # A tibble: 53 x 2
##    date       steps
##    <date>     <dbl>
##  1 2012-10-02   126
##  2 2012-10-03 11352
##  3 2012-10-04 12116
##  4 2012-10-05 13294
##  5 2012-10-06 15420
##  6 2012-10-07 11015
##  7 2012-10-09 12811
##  8 2012-10-10  9900
##  9 2012-10-11 10304
## 10 2012-10-12 17382
## # ... with 43 more rows
```

2. Constructing the plot using ggplot

```
ggplot(steps, aes(x = steps)) +
  geom_histogram(fill = "firebrick", binwidth = 1000) +
  labs(title = "Histogram of Steps per day", x = "Steps per day", y = "Frequency")
```



3. Calculating the mean and the median

```
mean_steps <- mean(steps$steps, na.rm = TRUE)
median_steps <- median(steps$steps, na.rm = TRUE)
mean_steps
```

```
## [1] 10766.19
```

```
median_steps
```

```
## [1] 10765
```

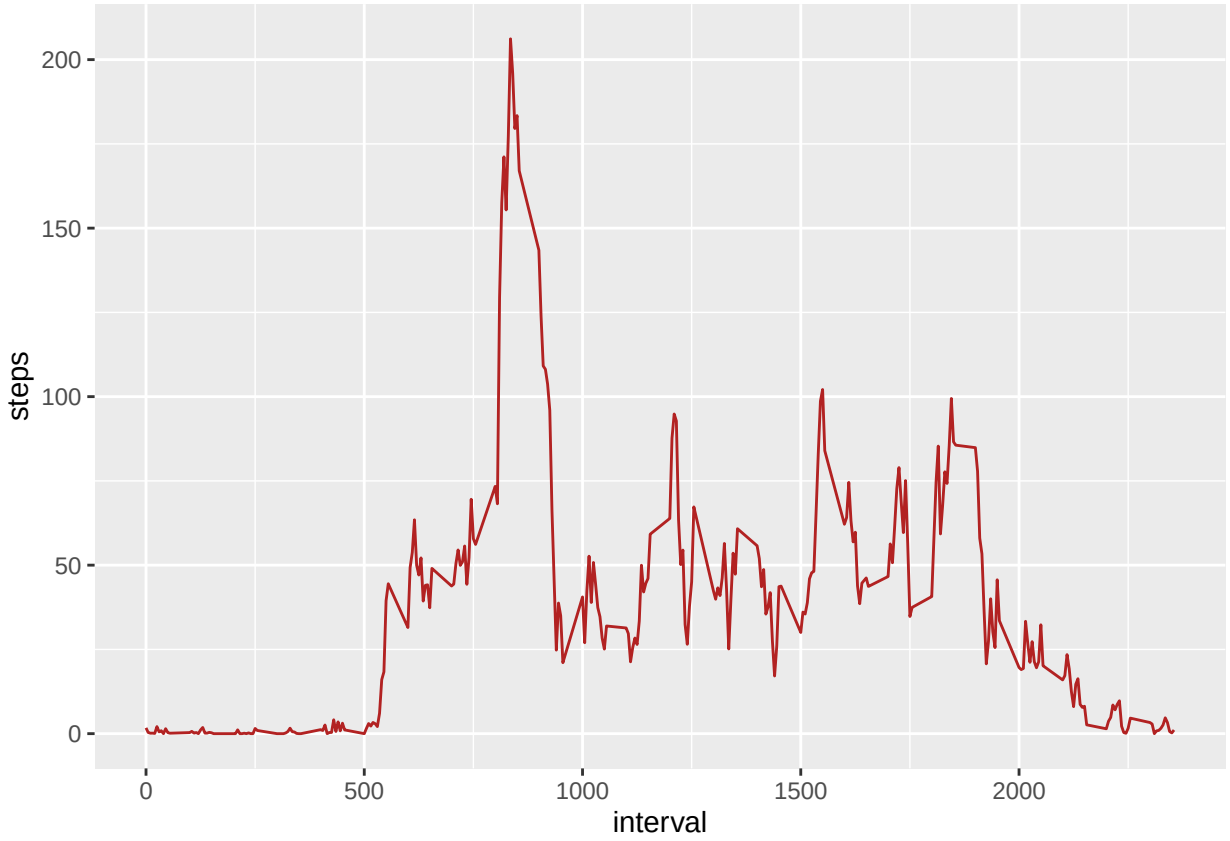
What is the average daily activity pattern?

1. Calcualting the acerage steps

```
interval <- data %>%
  filter(!is.na(steps)) %>%
  group_by(interval) %>%
  summarize(steps = mean(steps))
```

2. Plotting the graph

```
ggplot(interval, aes(x=interval, y=steps)) +
  geom_line(color = "firebrick")
```



3. Finding the max steps

```
interval[which.max(interval$steps),]
```

```
## # A tibble: 1 x 2
##   interval steps
##      <int> <dbl>
## 1      835  206.
```

Imputing missing values

1. Filling in the missing values

```
data_full <- data
nas <- is.na(data_full$steps)
avg_interval <- tapply(data_full$steps, data_full$interval, mean, na.rm=TRUE, simplify=TRUE)
data_full$steps[nas] <- avg_interval[as.character(data_full$interval[nas])]
```

2. Calculating the steps

```r
steps_full <- data_full %>%
  filter(!is.na(steps)) %>%
  group_by(date) %>%
  summarize(steps = sum(steps)) %>%
  print
```

```
## # A tibble: 61 x 2
##    date        steps
##    <date>      <dbl>
##  1 2012-10-01 10766.
##  2 2012-10-02   126
##  3 2012-10-03 11352
##  4 2012-10-04 12116
##  5 2012-10-05 13294
##  6 2012-10-06 15420
##  7 2012-10-07 11015
##  8 2012-10-08 10766.
##  9 2012-10-09 12811
## 10 2012-10-10  9900
## # ... with 51 more rows
```

3. Plotting the graph

```r
ggplot(steps_full, aes(x = steps)) +
  geom_histogram(fill = "firebrick", binwidth = 1000) +
  labs(title = "Histogram of Steps per day, including missing values", x = "Steps per day", y = "Freque
```

4. Calculating the median and the mean

```
mean_steps_full <- mean(steps_full$steps, na.rm = TRUE)
median_steps_full <- median(steps_full$steps, na.rm = TRUE)
mean_steps_full
```

```
## [1] 10766.19
```

```
median_steps_full
```

```
## [1] 10766.19
```

Are there differences in activity patterns between weekdays and weekends?

1. Whether weekday or weekend:

```
data_full <- mutate(data_full, weektype = ifelse(weekdays(data_full$date) == "Saturday" | weekdays(data_
data_full$weektype <- as.factor(data_full$weektype)
head(data_full)
```

```
##       steps       date interval weektype
## 1 1.7169811 2012-10-01        0  weekday
```

```
## 2 0.3396226 2012-10-01        5  weekday
## 3 0.1320755 2012-10-01       10  weekday
## 4 0.1509434 2012-10-01       15  weekday
## 5 0.0754717 2012-10-01       20  weekday
## 6 2.0943396 2012-10-01       25  weekday
```

2. average steps in 5 min intervals

```
interval_full <- data_full %>%
  group_by(interval, weektype) %>%
  summarise(steps = mean(steps))
```

3. Graph

```
s <- ggplot(interval_full, aes(x=interval, y=steps, color = weektype)) +
  geom_line() +
  facet_wrap(~weektype, ncol = 1, nrow=2)
print(s)
```