Reproducible Research: Peer Assessment 1

Loading and preprocessing the data

Unzip the folder and read in the data in the activity.csv file.

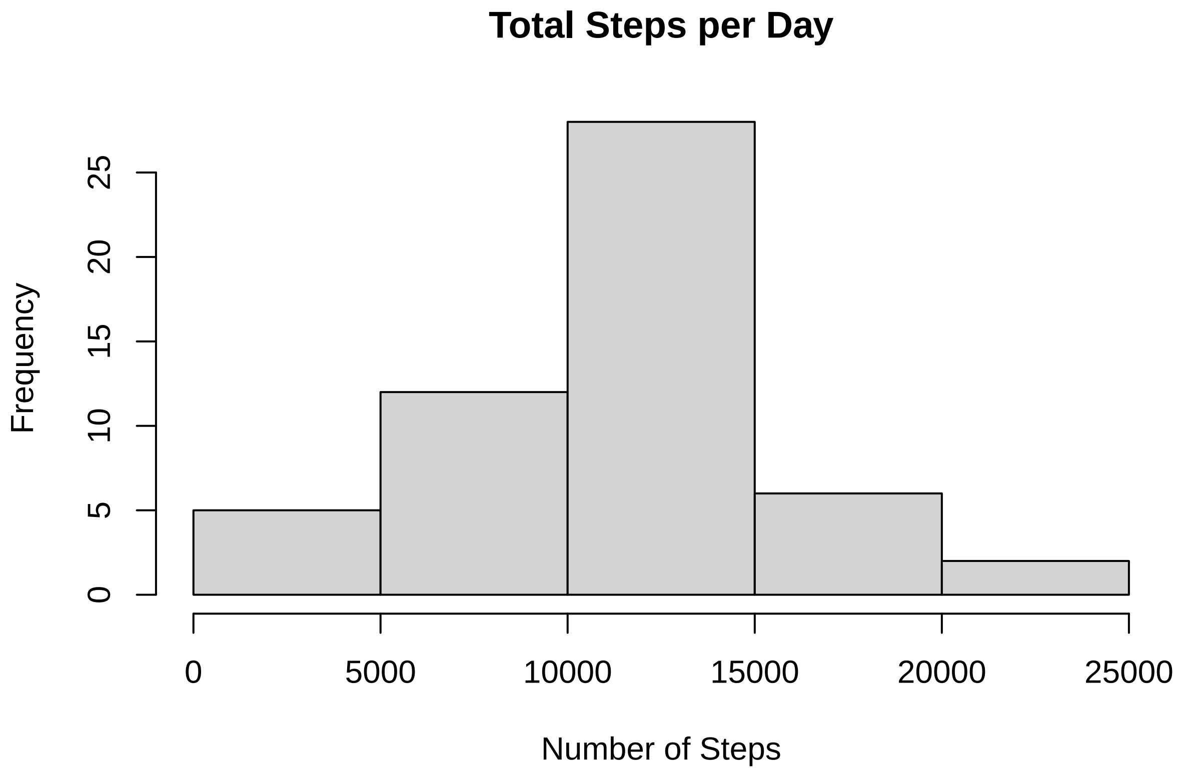
```r
if (!file.exists('activity.csv')) {
  unzip(zipfile = "activity.zip")
}

activityData <- read.csv(file="activity.csv", header=TRUE)
```

```r
## What is mean total number of steps taken per day?
```

```r
# Calculate the total steps taken per day
totalSteps <- aggregate(steps ~ date, activityData, FUN=sum)

# Make a histogram of the total number of steps taken per day
hist(totalSteps$steps,
     main = "Total Steps per Day",
     xlab = "Number of Steps")
```



```
# Calculate and report the mean and median of total steps taken per day
meanSteps <- mean(totalSteps$steps, na.rm = TRUE)
medSteps <- median(totalSteps$steps, na.rm = TRUE)

#The mean steps taken per day is :
  meanSteps
```

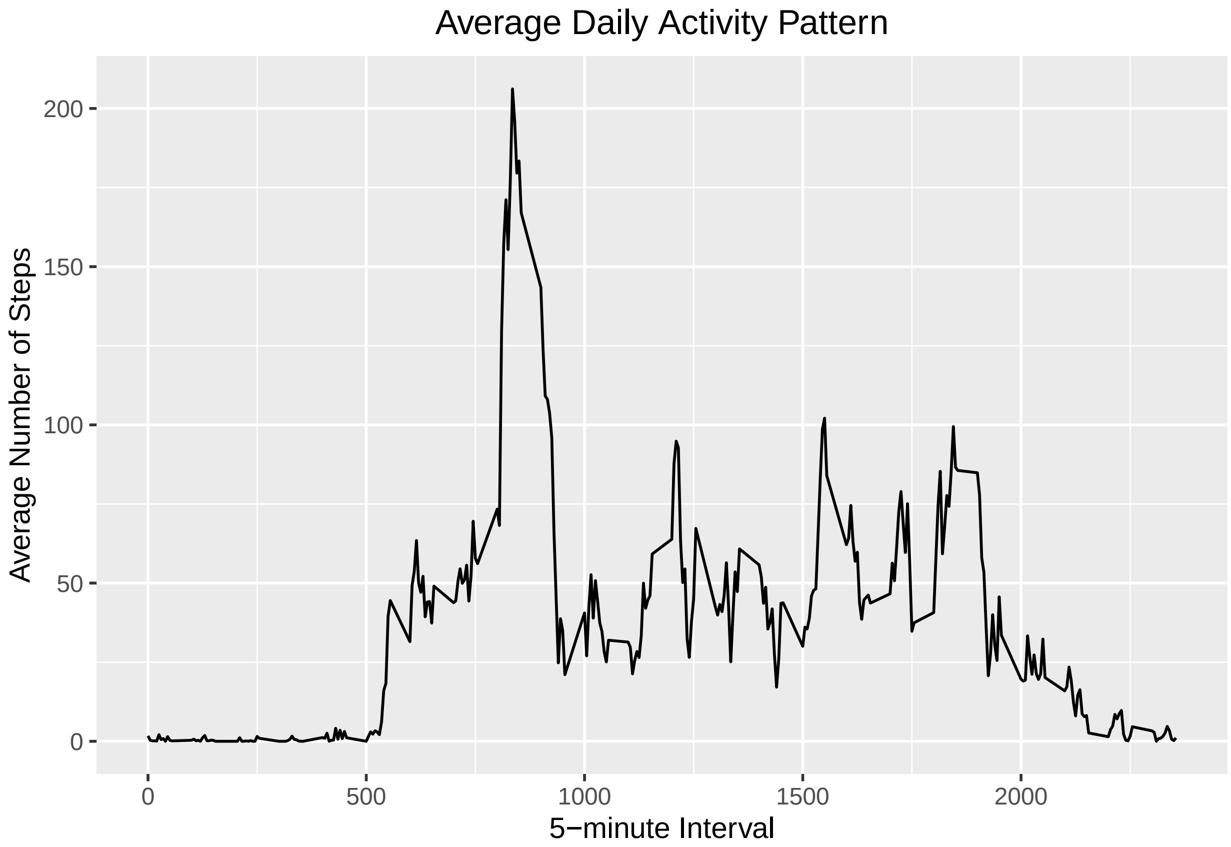
```
## [1] 10766.19
```

```
#Median Number of Steps Taken per Day is :
  medSteps
```

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

```
## What is the average daily activity pattern?
```

```
# Make a time-series plot of the 5-minute interval and the average number of
# steps taken, averaged acoss all days.
library(ggplot2)
meanStepsByInt <- aggregate(steps ~ interval, activityData, mean)
ggplot(data = meanStepsByInt, aes(x = interval, y = steps)) +
  geom_line() +
  ggtitle("Average Daily Activity Pattern") +
  xlab("5-minute Interval") +
  ylab("Average Number of Steps") +
  theme(plot.title = element_text(hjust = 0.5))
```



```
# Which 5-minute interval across all days contain the maximum number of steps
```

```
# Which 5-minute interval across all days contain the maximum number of steps
maxInt <- meanStepsByInt[which.max(meanStepsByInt$steps),]

maxInt
```

```
##     interval    steps
## 104      835 206.1698
```

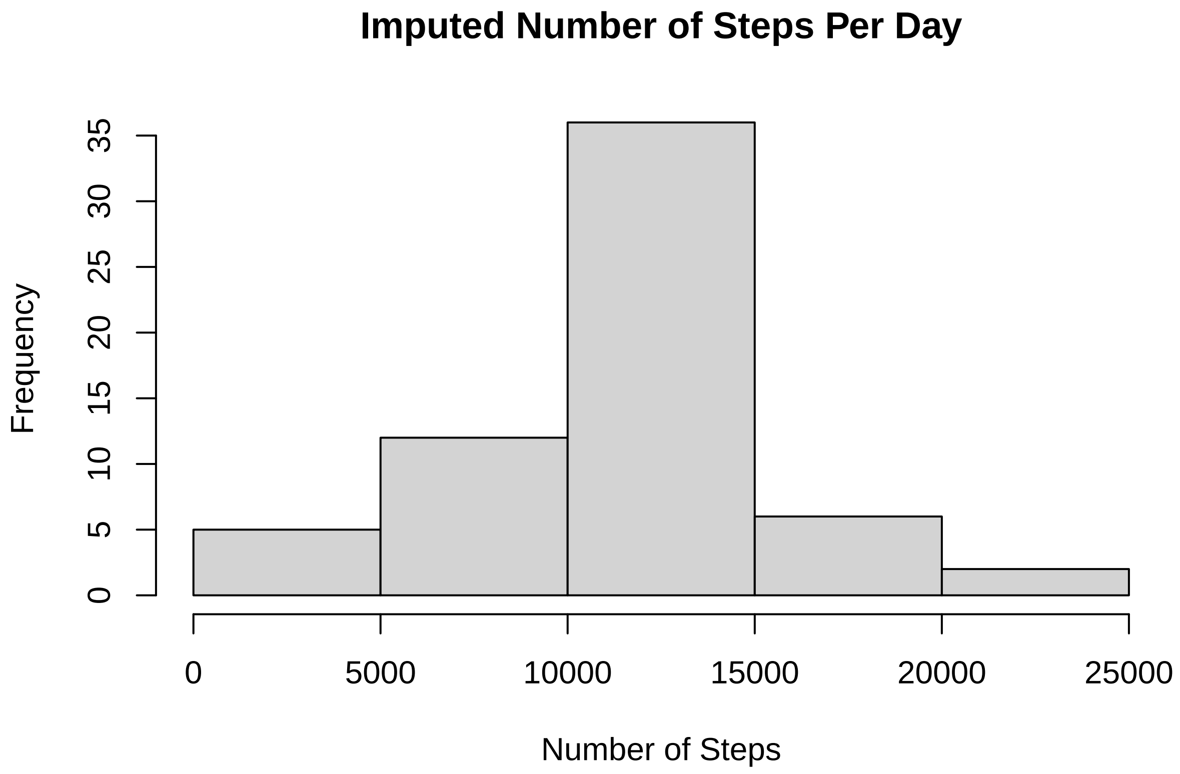
```
## Imputing missing values
#Calculate and report the total number of missing values in the dataset by using:
```

```
missingVals <- is.na(activityData$steps)
```

```
#We see that, there are 17568 missing values. We would substitute these missing values with the 5-day m
```

```
# Create a new dataset that is equal to the original dataset but with
# the missing data filled in.
imp_activityData <- transform(activityData,
                              steps = ifelse(is.na(activityData$steps),
                                             meanStepsByInt$steps[match(activityData$interval,
                                                                        meanStepsByInt$interval)],
                                             activityData$steps))

# Make a histogram of the total number of steps taken each day and
# and report the mean and median.
impStepsByInt <- aggregate(steps ~ date, imp_activityData, FUN=sum)
hist(impStepsByInt$steps,
     main = "Imputed Number of Steps Per Day",
     xlab = "Number of Steps")
```



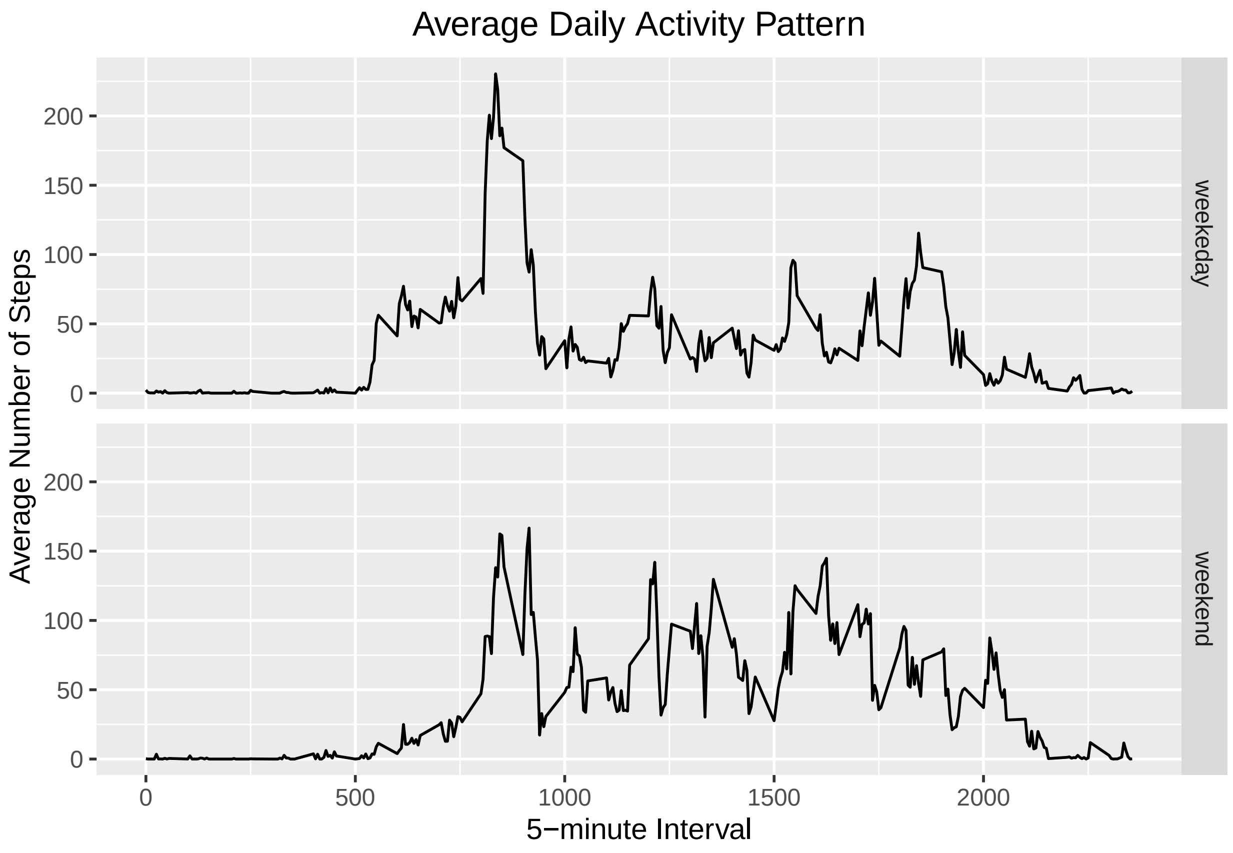
```
impMeanSteps <- mean(impStepsByInt$steps, na.rm = TRUE)
impMedSteps <- median(impStepsByInt$steps, na.rm = TRUE)
diffMean = impMeanSteps - meanSteps
diffMed = impMedSteps - medSteps
diffTotal = sum(impStepsByInt$steps) - sum(totalSteps$steps)
```

```
## Are there differences in activity patterns between weekdays and weekends?
#Create a new factor variable in the dataset with two levels - "weekend" and "weekday"
```

```
DayType <- function(date) {
  day <- weekdays(date)
  if (day %in% c('Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday'))
```

```
      return ("weekeday")
  else if (day %in% c('Saturday', 'Sunday'))
      return ("weekend")
  else
      stop ("Invalid Date Format.")
}
imp_activityData$date <- as.Date(imp_activityData$date)
imp_activityData$day <- sapply(imp_activityData$date, FUN = DayType)

# Make a panel plot containnig a time-series plot of the 5-minute interval
# and the average number of steps taken across all weekdays or weekends
meanStepsByDay <- aggregate(steps ~ interval + day, imp_activityData, mean)
ggplot(data = meanStepsByDay, aes(x = interval, y = steps)) +
  geom_line() +
  facet_grid(day ~ .) +
  ggtitle("Average Daily Activity Pattern") +
  xlab("5-minute Interval") +
  ylab("Average Number of Steps") +
  theme(plot.title = element_text(hjust = 0.5))
```



```
#Conclusion
#From the plot, we can conclude that there are differences in the number of steps taken during the week
```