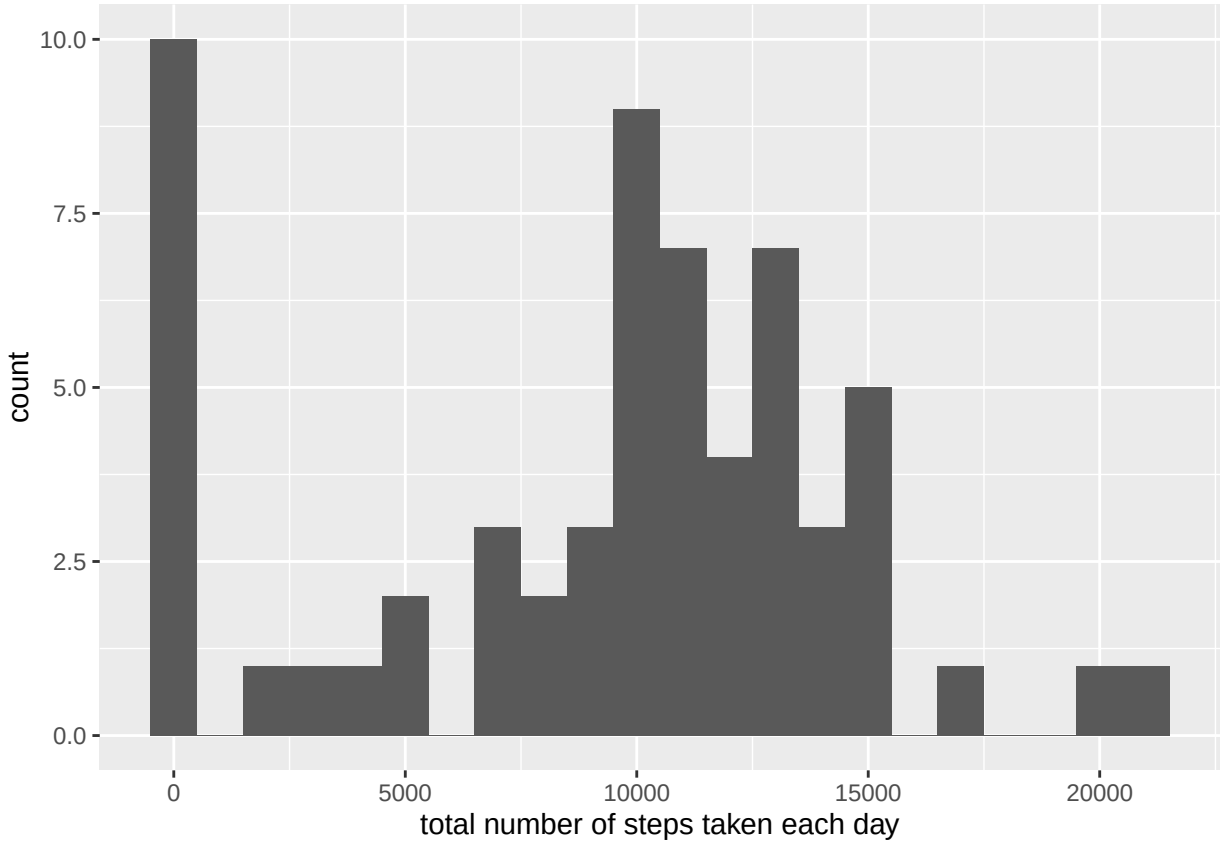
# Reproducible Research: Peer Assessment 1

## Loading and preprocessing the data

```
unzip(zipfile="activity.zip")
data <- read.csv("activity.csv")
```

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

```
library(ggplot2)
total.steps <- tapply(data$steps, data$date, FUN=sum, na.rm=TRUE)
qplot(total.steps, binwidth=1000, xlab="total number of steps taken each day")
```




```
mean(total.steps, na.rm=TRUE)
```

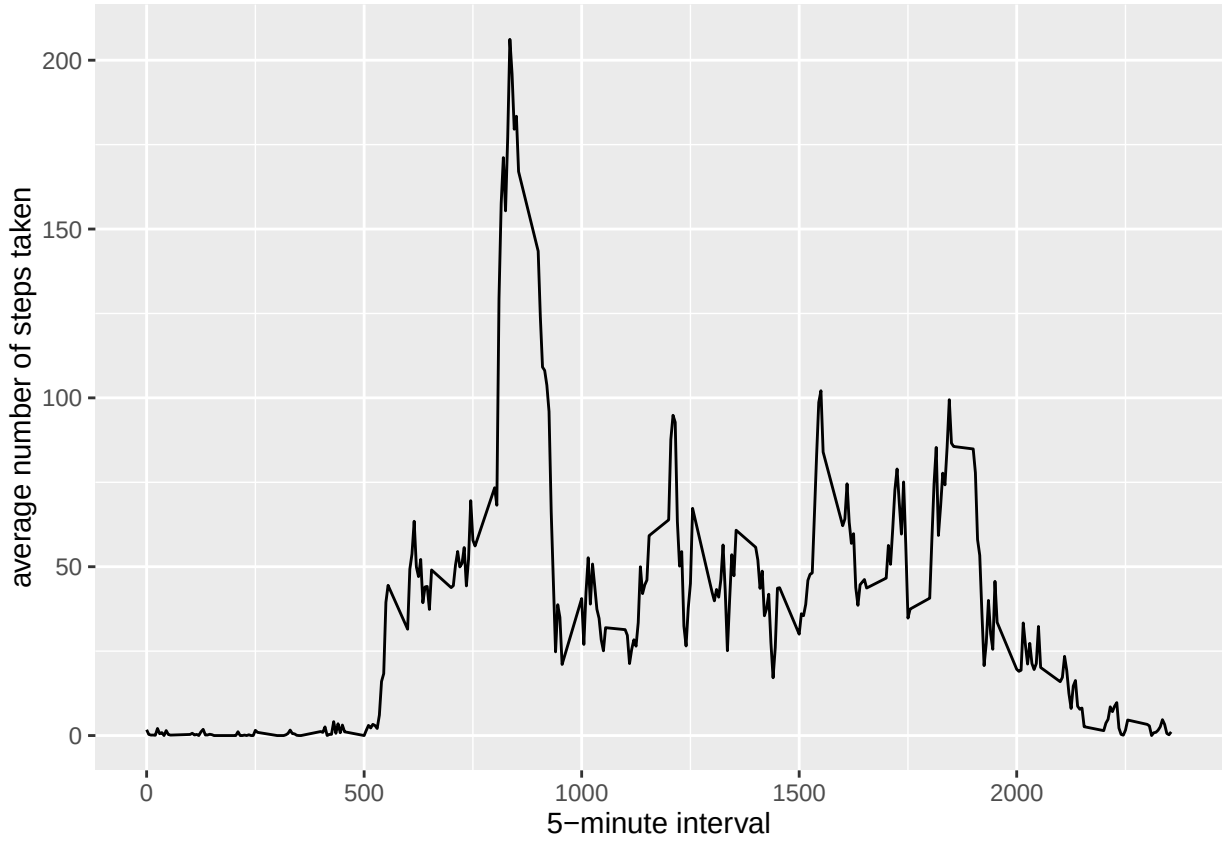
```
## [1] 9354.23
```

```
median(total.steps, na.rm=TRUE)
```

```
## [1] 10395
```

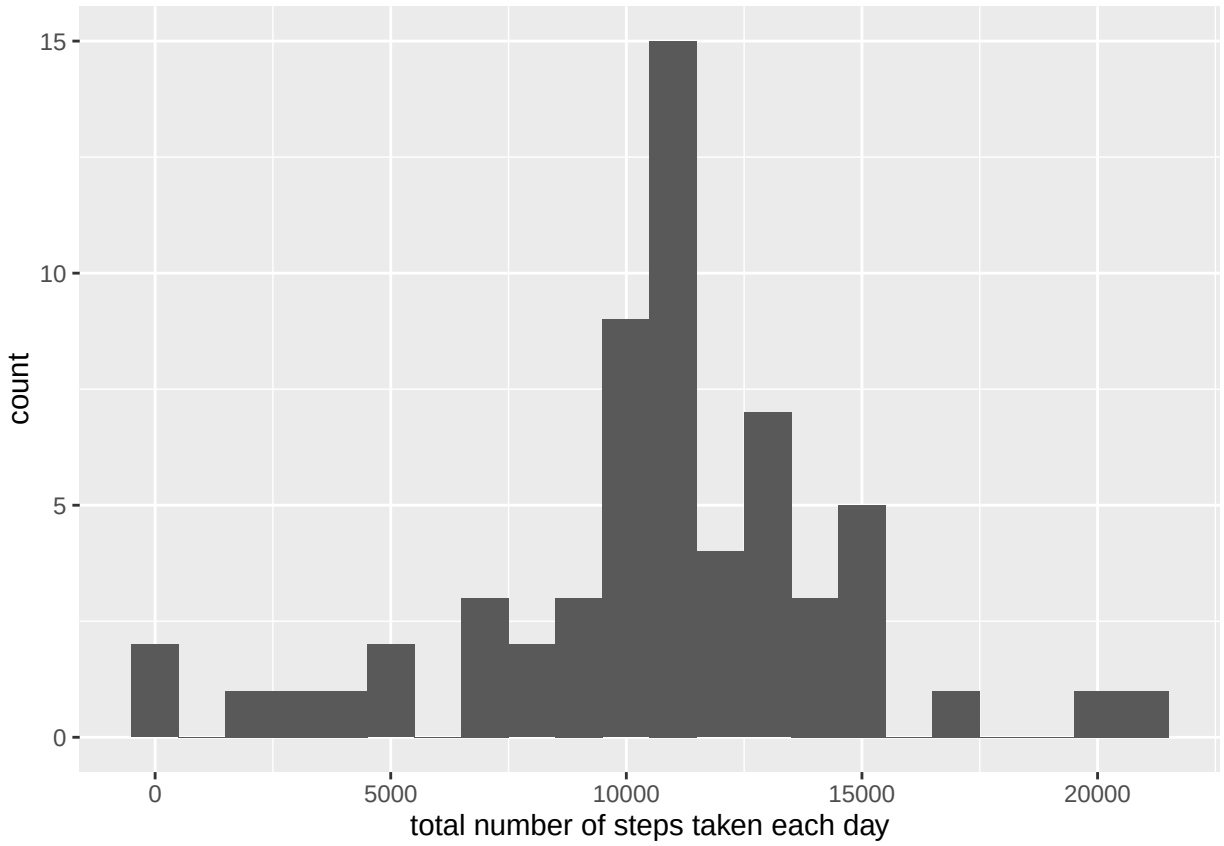
### What is the average daily activity pattern?

```
library(ggplot2)
averages <- aggregate(x=list(steps=data$steps), by=list(interval=data$interval),
                      FUN=mean, na.rm=TRUE)
ggplot(data=averages, aes(x=interval, y=steps)) +
    geom_line() +
    xlab("5-minute interval") +
    ylab("average number of steps taken")
```




## Imputing missing values missing <- is.na(data$steps) # How many missing table(missing) # Replace each missing value with the mean value of its 5-minute interval

```
fill.value <- function(steps, interval) {
    filled <- NA
    if (!is.na(steps))
        filled <- c(steps)
    else
        filled <- (averages[averages$interval==interval, "steps"])
    return(filled)
}
filled.data <- data
filled.data$steps <- mapply(fill.value, filled.data$steps, filled.data$interval)
total.steps <- tapply(filled.data$steps, filled.data$date, FUN=sum)
qplot(total.steps, binwidth=1000, xlab="total number of steps taken each day")
```




```
mean(total.steps)
```

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

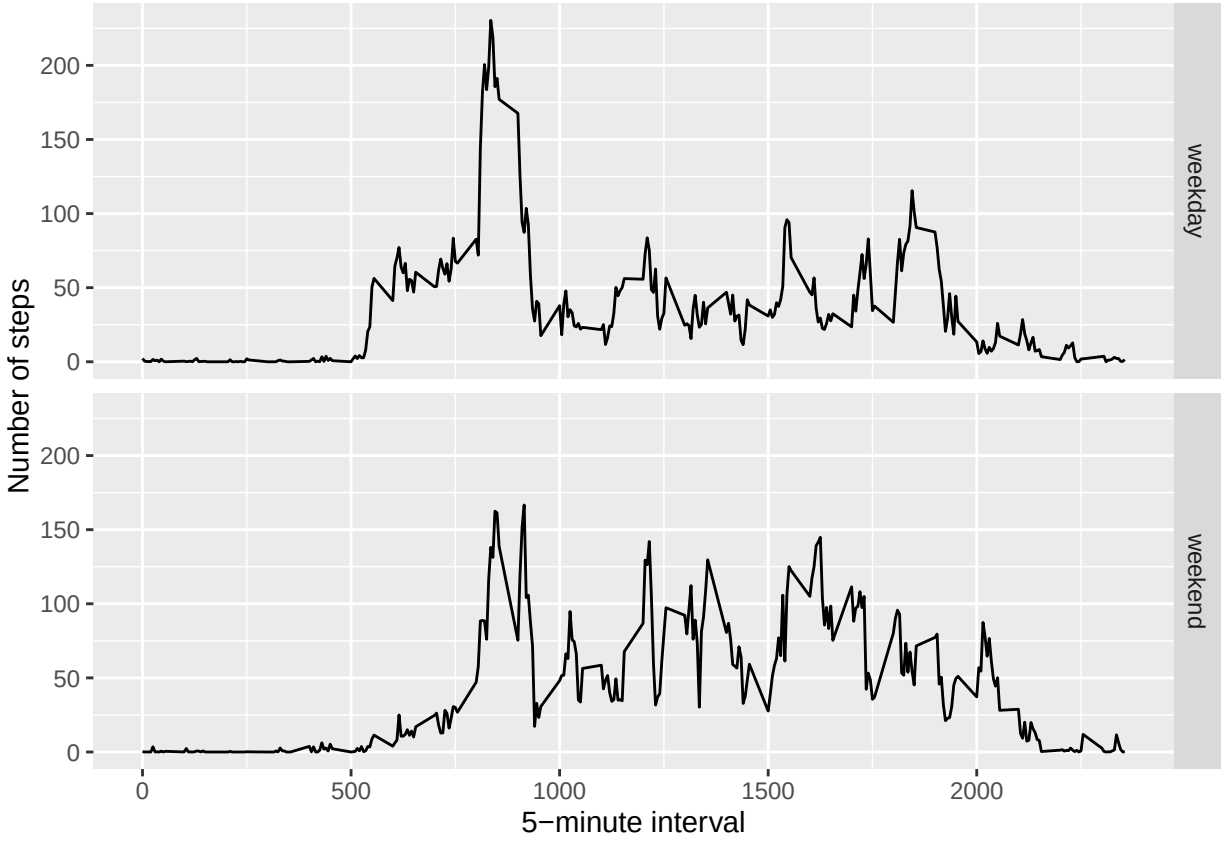
```
median(total.steps)
```

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

### Are there differences in activity patterns between weekdays and weekends?

```
weekday.or.weekend <- function(date) {
    day <- weekdays(date)
    if (day %in% c("Monday", "Tuesday", "Wednesday", "Thursday", "Friday"))
        return("weekday")
    else if (day %in% c("Saturday", "Sunday"))
        return("weekend")
    else
        stop("invalid date")
}
filled.data$date <- as.Date(filled.data$date)
filled.data$day <- sapply(filled.data$date, FUN=weekday.or.weekend)

averages <- aggregate(steps ~ interval + day, data=filled.data, mean)
ggplot(averages, aes(interval, steps)) + geom_line() + facet_grid(day ~ .) +xlab("5-minute interval") +
```


Number of steps
200
150
100
50
0
weekday
weekend
0
500
1000
1500
2000
5−minute interval