Week 2 Homework

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This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

Read in the dataset Activity monitoring data as a csv file.

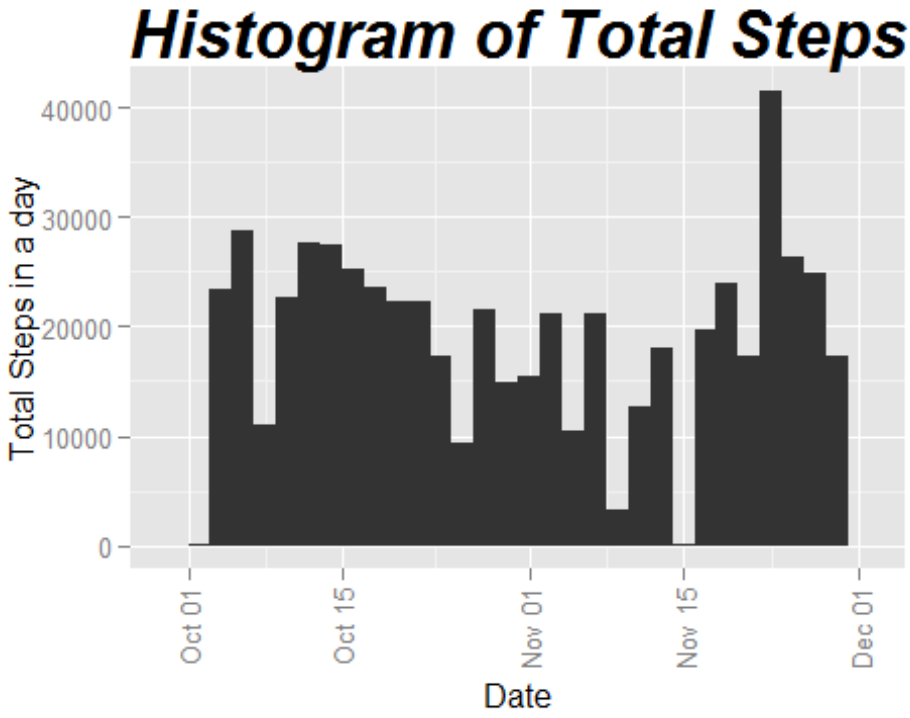
```
library(plyr)
library(ggplot2)
stepData <-
read.csv("C:/Users/1405249584A/Documents/R/CourseraData/activity.csv")
stepData$date <- as.Date(stepData$date,"%Y-%m-%d")
```

Find the mean and median:

```
mean(stepData$steps,na.rm=TRUE)

## [1] 37.3826

median(stepData$steps,na.rm=TRUE)

## [1] 0
```

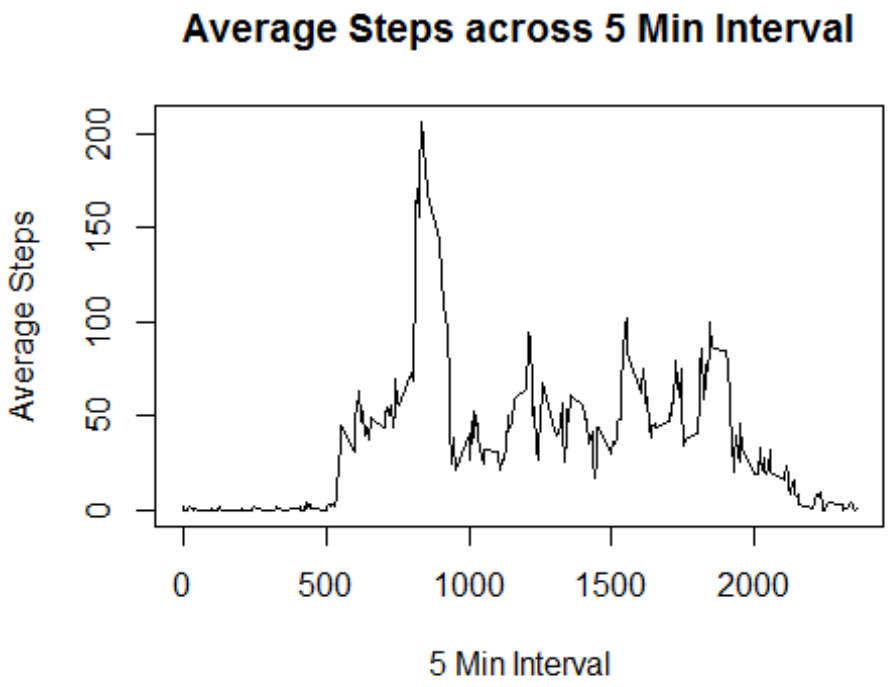
Plot a histogram of the total number of steps taken each day:

```
hist <- ggplot(stepData)+
  geom_histogram(aes(x=date,weight=steps))+
  ggtitle("Histogram of Total Steps")+
  ylab("Total Steps in a day")+
  xlab("Date")+
  theme(plot.title = element_text(color="black", size=25,
face="bold.italic"),
        axis.text.x=element_text(angle=90,vjust=.5,hjust=1))
hist
```



Time series plot of the average number of steps taken. The first graph is to verify the line (second) graph:

```
average <- ddply(stepData,~date,summarise,avg=mean(steps,na.rm=TRUE))
gplotT <- ggplot(average)+
  geom_histogram(aes(x=date,weight=avg))+
  ggtitle("Histogram of Average Steps Each Day")+
  ylab("Average Steps in a day")+
  xlab("Date")+
  theme(plot.title = element_text(color="black", size=25,
face="bold.italic"),
        axis.text.x=element_text(angle=90,vjust=.5,hjust=1))

intervals <- ddply(stepData,~interval,summarise,avg=mean(steps,na.rm=TRUE))
plot(intervals$interval,intervals$avg,type="l",
     main="Average Steps across 5 Min Interval", ylab="Average Steps",
xlab="5 Min Interval")
```



5-minute interval that, on average, contains the maximum number of steps:

```
intervals[intervals$avg==max(intervals$avg),]

##     interval      avg
## 104      835 206.1698
```

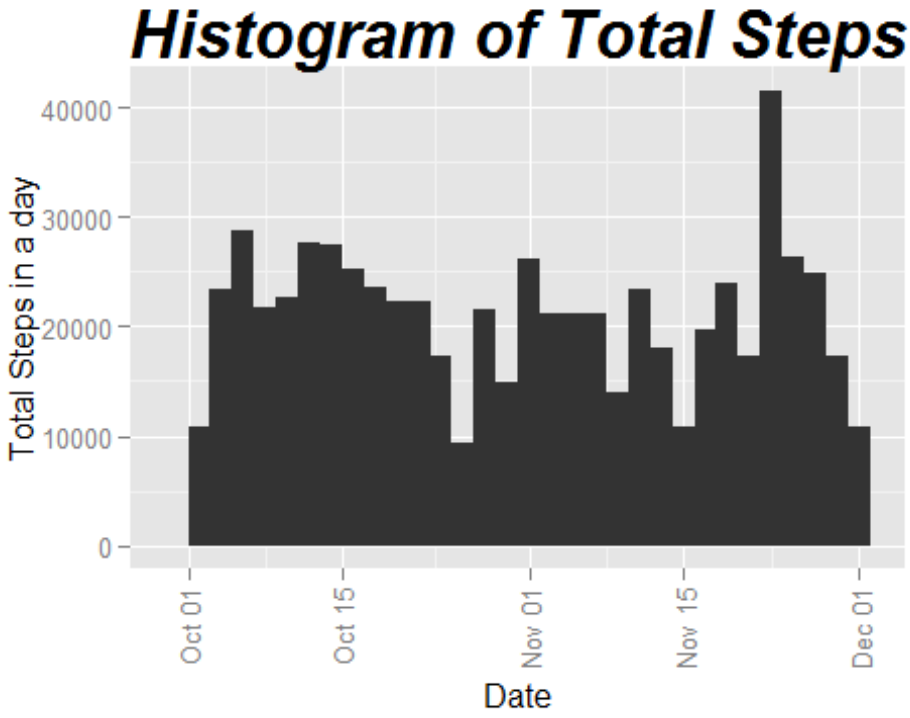
Code to describe and show a strategy for imputing missing data:

Keeping it simple and using the mean of the specific interval to impute the missing values.

```
avgDay <- ddply(stepData,~date+interval,avg=mean(steps,na.rm=TRUE))
dailyAvg <- aggregate(avgDay$steps,format(avgDay['date'],'%d'),mean)
stepData2 <- stepData
stepData2[is.na(stepData2$steps),'steps'] <- intervals$avg
```

Histogram of the new dataset. Also find the new mean and median:

```
hist2 <- ggplot(stepData2)+
  geom_histogram(aes(x=date,weight=steps))+
  ggtitle("Histogram of Total Steps")+
  ylab("Total Steps in a day")+
  xlab("Date")+
  theme(plot.title = element_text(color="black", size=25,
face="bold.italic"),
        axis.text.x=element_text(angle=90,vjust=.5,hjust=1))
hist2
```




```
mean(stepData2$steps)
```

```
## [1] 37.3826
```

```
median(stepData2$steps)
```

```
## [1] 0
```

Compare the old average steps with the new average steps with the imputed data.

```
avgDay2 <- ddply(stepData2,~date+interval,avg=mean(steps))
View(cbind(avgDay2,avgDay))
```

The median and mean from the old dataset and new dataset are the same.

```
mean(stepData2$steps)
```

```
## [1] 37.3826
```

```
median(stepData2$steps)
```

```
## [1] 0
```

```
mean(stepData$steps,na.rm=TRUE)
```

```
## [1] 37.3826
```

```
median(stepData$steps,na.rm=TRUE)
```

```
## [1] 0
```

Add new column indicating if a date is a weekday or weekend.

```
weekdays <- c("Monday","Tuesday","Wednesday","Thursday","Friday")
weekends <- c("Saturday","Sunday")
stepData2$day <- weekdays(stepData2$date)
stepData2[stepData2$day%in%weekdays,'day'] <- "weekday"
stepData2[stepData2$day%in%weekends,'day'] <- "weekend"
stepData2$day <- factor(stepData2$day)
```

Make a panel plot with a time series of average steps based on weekday or weekend.

```
avgDay3 <-
ddply(stepData2,~interval+day,summarise,steps=as.double(format(mean(steps),option=4)))
lineplot <- ggplot(avgDay3)+
  geom_line(aes(x=interval,y=steps,colour=day,group=day))+
  ggtitle("Line Plot of Average Steps for Each Interval")+
  facet_grid(day~.)
lineplot
```