

Reproducible Research Project 1

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```
fname="./activity/activity.csv" #set filename for knitr
# fname="activity.csv" #set filename
```

```
# Load libraries
library(lubridate)
```

```
## Warning: package 'lubridate' was built under R version 3.1.3
```

```
library(dplyr)
```

```
## Warning: package 'dplyr' was built under R version 3.1.3
```

```
##
## Attaching package: 'dplyr'
##
## The following objects are masked from 'package:lubridate':
##
##   intersect, setdiff, union
##
## The following object is masked from 'package:stats':
##
##   filter
##
## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union
```

```
par(mfrow=c(1,1)) #italize graphics device

#Read in data
aData<-read.csv(fname,stringsAsFactors=FALSE)

# Convert dates from character to POSIXct class
dates<- ymd(aData$date)
aData$date <- dates

#head(aData); str(aData);tail(aData)

aDataTbl = group_by(tbl_df(aData),date)

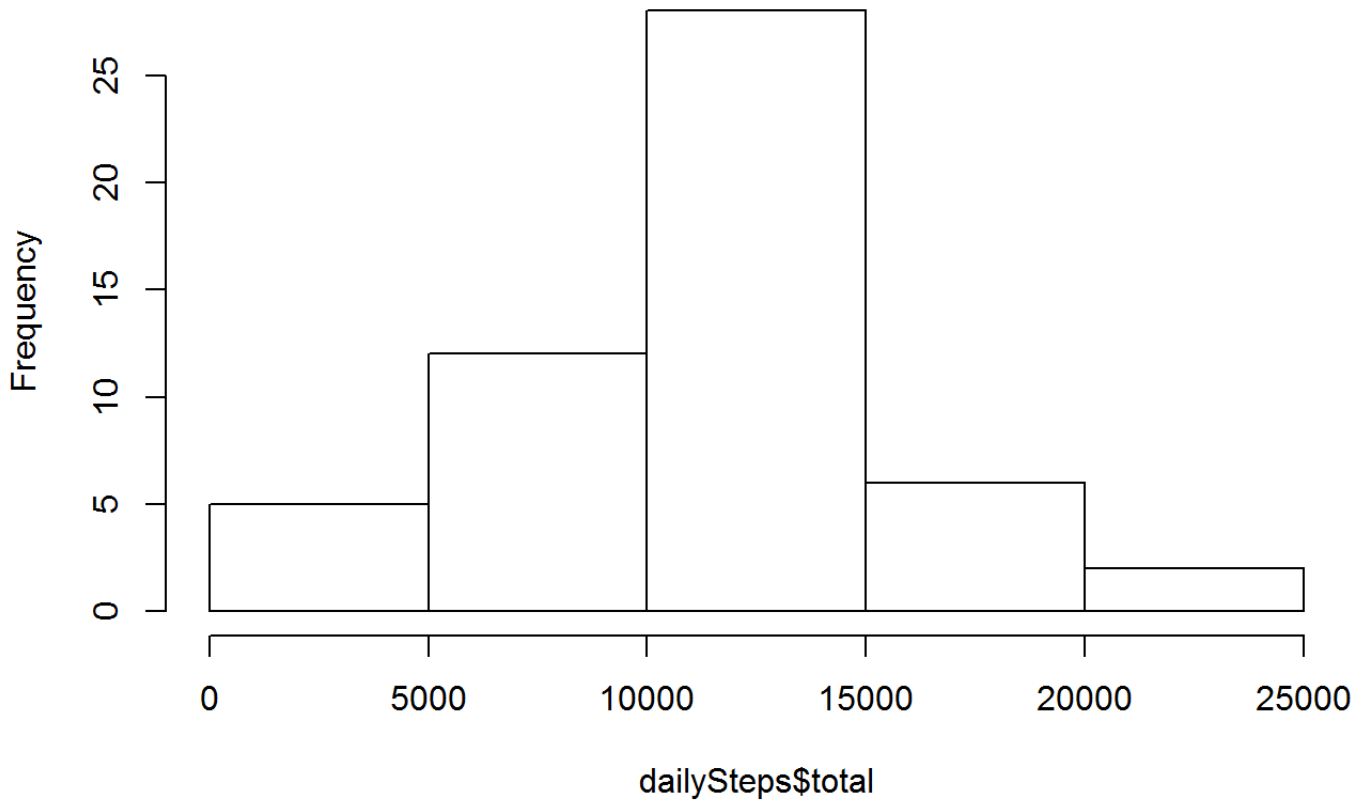
## What is mean total number of steps taken per day?

save <- summarize(aDataTbl,total=sum(steps))
dailySteps <- summarize(aDataTbl,total=sum(steps))
dailyMean <- summarize(aDataTbl,avgDayStep=mean(steps))

allMean <- mean(dailyMean$avgDayStep)
periodMean=mean(dailySteps$total,na.rm=TRUE)
dailyMedian = median(dailySteps$total,na.rm=TRUE)

# make a histogrm of daily steps
hist(dailySteps$total)
```

Histogram of dailySteps\$total



What is the average daily activity pattern?

Make a time series plot (i.e. type = "l") of the 5-minute interval (x-axis) and the average number of steps taken, averaged across all days (y-axis)

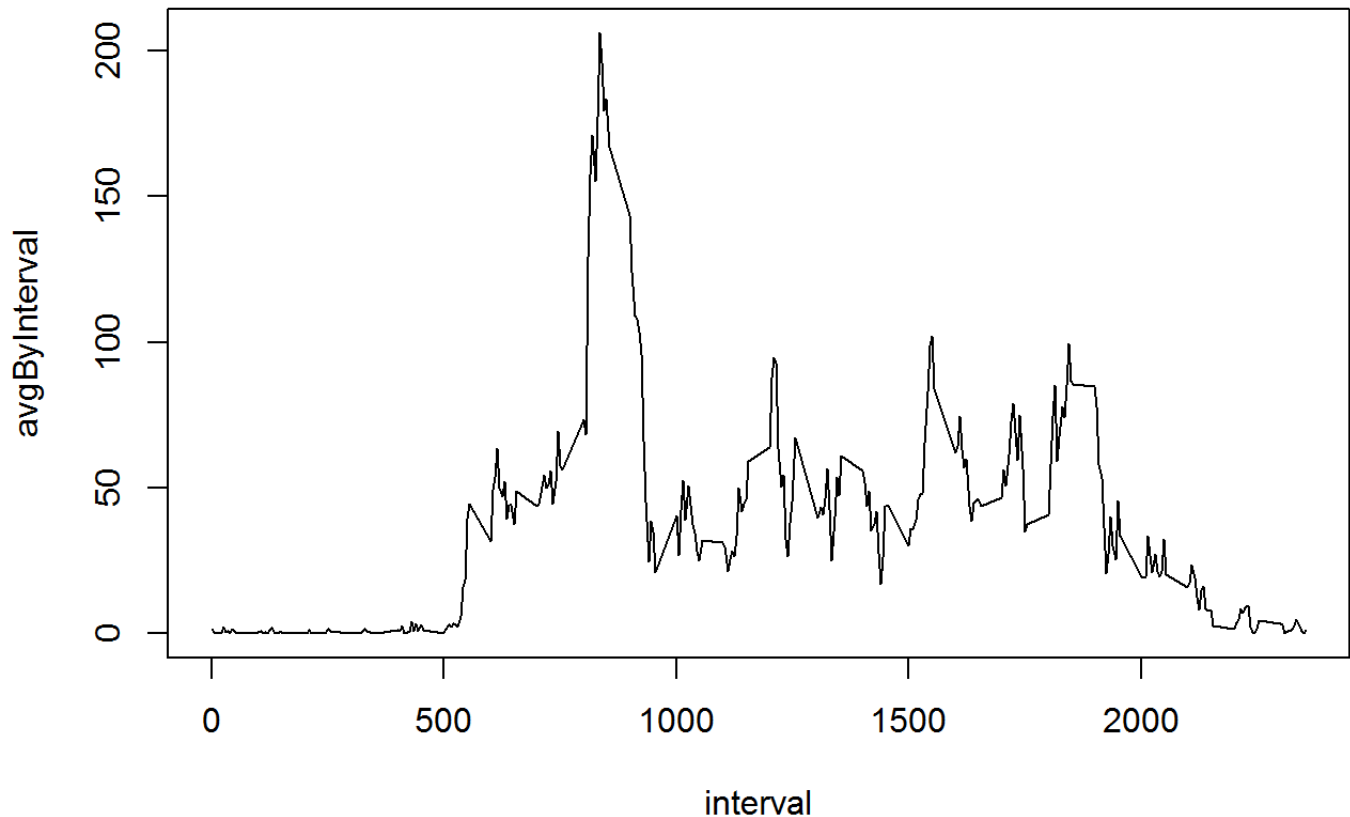
Which 5-minute interval, on average across all the days in the dataset, contains the maximum number of steps?

```
#Clean up missing data
aDataInt = group_by(tbl_df(aData),interval)

idx=!is.na(aDataInt$steps)
aDataInt=aDataInt[idx,]

intervalMean = summarize(aDataInt,avgByInterval=mean(steps))
```

Create the plot - time interval vs. average by interval



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.

Find the interval with the maximum average steps.

```
max=max(intervalMean[[2]])
y=intervalMean[which(intervalMean$avgByInterval==max),]
intervalMax=y[[1]]
intervalMax
```

```
## [1] 835
```

Imputing missing values

Note that there are a number of days/intervals where there are missing values (coded as NA). The presence of missing days may introduce bias into some calculations or summaries of the data.

Calculate and report the total number of missing values in the dataset (i.e. the total number of rows with NAs)

```
colSums(is.na(aData))
```

```
##      steps      date interval
##      2304         0         0
```

```
sum(is.na(aData$steps))
```

```
## [1] 2304
```

Devise a strategy for filling in all of the missing values in the dataset. The strategy does not need to be sophisticated. For example, you could use the mean/median for that day, or the mean for that 5-minute interval, etc.

Create a new dataset that is equal to the original dataset but with the missing data filled in.

```
idx=which(is.na(aData$steps)) #find the indexes for the na values

aDataF <- aData

for(i in seq_along(idx)) {
  intrv = aDataF[idx,]$interval
  #debug print statements
  #   print("idx,intrv"); print(idx[1:5]);print(intrv[1:5])

  x=which(intervalMean$interval==intrv)
  #   print("1. aDataF");print(aDataF[idx,]$steps[1:5])
  aDataF[idx,]$steps = intervalMean[x,]$avgByInterval
  #   print("aDataF");print(aDataF[idx,]$steps[1:5])
  #   aDataF[idx,]$steps = 1000
  #print("aDataF");print(aDataF[idx,]$steps[1:5])
}

aData[1:1000,]$steps
```

```
## [1] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
## [18] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
## [35] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
## [52] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
## [69] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
## [86] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
## [103] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
## [120] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
## [137] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
## [154] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
## [171] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
## [188] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
## [205] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
## [222] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
## [239] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
## [256] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA
## [273] NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA 0
```

```
## [290] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [307] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [324] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [341] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [358] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [375] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [392] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [409] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [426] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [443] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [460] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [477] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [494] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [511] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [528] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [545] 0 0 0 0 0 0 0 0 0 0 117 9 0 0 0 0 0
## [562] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [579] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [596] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [613] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 4 0 0
## [630] 0 36 0 0 0 0 0 0 0 0 0 0 0 0 25 0 0
## [647] 90 411 413 415 519 529 613 562 612 534 323 600 533 251 56 0 32
## [664] 80 10 9 145 46 0 44 126 42 138 53 0 0 22 57 161 19
## [681] 15 0 16 0 0 8 0 51 516 245 0 161 7 0 0 0 0
## [698] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [715] 0 72 73 0 0 116 97 0 0 0 0 0 15 0 0 0 0
## [732] 0 80 69 0 0 0 0 0 0 0 99 100 0 0 33 0 0
## [749] 7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [766] 88 154 0 20 0 0 0 0 0 0 0 0 0 0 0 0 0
## [783] 198 61 75 0 0 193 298 0 15 21 0 0 0 0 51 36 0
## [800] 26 22 0 39 52 15 41 0 42 0 0 159 32 0 0 0 0
## [817] 34 0 0 0 0 36 73 9 0 0 0 0 0 0 0 0 0
## [834] 0 90 128 46 0 0 0 0 0 0 0 0 0 0 0 0 0
## [851] 0 0 0 0 0 0 0 0 0 0 0 8 0 0 47 0 0
## [868] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [885] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [902] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [919] 0 0 0 0 0 0 0 0 7 18 57 40 0 0 0 0 16
## [936] 1 0 18 20 40 36 17 49 86 49 0 29 59 7 25 30 31
## [953] 7 18 113 181 87 0 0 0 57 99 507 522 510 519 508 423 499
## [970] 259 31 17 0 0 0 0 0 17 0 145 453 229 144 0 0 0
## [987] 82 0 0 0 0 0 0 0 0 0 0 0 0 0
```

```
mean(aData[1:1000,]$steps)
```

```
## [1] NA
```

aDataTbl[1:1000,]\$steps

##	[1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
##	[18]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
##	[35]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
##	[52]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
##	[69]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
##	[86]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
##	[103]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
##	[120]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
##	[137]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
##	[154]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
##	[171]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
##	[188]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
##	[205]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
##	[222]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
##	[239]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
##	[256]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
##	[273]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
##	[290]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[307]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[324]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[341]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[358]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[375]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[392]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[409]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[426]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[443]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[460]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[477]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[494]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[511]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[528]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[545]	0	0	0	0	0	0	0	0	0	117	9	0	0	0	0	0	0
##	[562]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[579]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[596]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[613]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0
##	[630]	0	36	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0
##	[647]	90	411	413	415	519	529	613	562	612	534	323	600	533	251	56	0	32
##	[664]	80	10	9	145	46	0	44	126	42	138	53	0	0	22	57	161	19
##	[681]	15	0	16	0	0	8	0	51	516	245	0	161	7	0	0	0	0
##	[698]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	[715]	0	72	73	0	0	116	97	0	0	0	0	0	15	0	0	0	0
##	[732]	0	80	69	0	0	0	0	0	0	0	99	100	0	0	33	0	0

```
## [749] 7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [766] 88 154 0 20 0 0 0 0 0 0 0 0 0 0 0 0 0
## [783] 198 61 75 0 0 193 298 0 15 21 0 0 0 0 51 36 0
## [800] 26 22 0 39 52 15 41 0 42 0 0 159 32 0 0 0 0
## [817] 34 0 0 0 0 36 73 9 0 0 0 0 0 0 0 0 0
## [834] 0 90 128 46 0 0 0 0 0 0 0 0 0 0 0 0 0
## [851] 0 0 0 0 0 0 0 0 0 0 0 8 0 0 47 0 0
## [868] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [885] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [902] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [919] 0 0 0 0 0 0 0 0 0 7 18 57 40 0 0 0 0 16
## [936] 1 0 18 20 40 36 17 49 86 49 0 29 59 7 25 30 31
## [953] 7 18 113 181 87 0 0 0 57 99 507 522 510 519 508 423 499
## [970] 259 31 17 0 0 0 0 0 17 0 145 453 229 144 0 0 0
## [987] 82 0 0 0 0 0 0 0 0 0 0 0 0 0 0
```

```
mean(aDataTbl[1:1000,]$steps)
```

```
## [1] NA
```

```
mean(aDataInt[1:1000,]$steps)
```

```
## [1] 30.153
```

```
aDataF[1:1000,]$steps
```

```
## [1] 1.7169811 0.3396226 0.1320755 0.1509434 0.0754717
## [6] 2.0943396 0.5283019 0.8679245 0.0000000 1.4716981
## [11] 0.3018868 0.1320755 0.3207547 0.6792453 0.1509434
## [16] 0.3396226 0.0000000 1.1132075 1.8301887 0.1698113
## [21] 0.1698113 0.3773585 0.2641509 0.0000000 0.0000000
## [26] 0.0000000 1.1320755 0.0000000 0.0000000 0.1320755
## [31] 0.0000000 0.2264151 0.0000000 0.0000000 1.5471698
## [36] 0.9433962 0.0000000 0.0000000 0.0000000 0.0000000
## [41] 0.2075472 0.6226415 1.6226415 0.5849057 0.4905660
## [46] 0.0754717 0.0000000 0.0000000 1.1886792 0.9433962
## [51] 2.5660377 0.0000000 0.3396226 0.3584906 4.1132075
## [56] 0.6603774 3.4905660 0.8301887 3.1132075 1.1132075
## [61] 0.0000000 1.5660377 3.0000000 2.2452830 3.3207547
## [66] 2.9622642 2.0943396 6.0566038 16.0188679 18.3396226
## [71] 39.4528302 44.4905660 31.4905660 49.2641509 53.7735849
## [76] 63.4528302 49.9622642 47.0754717 52.1509434 39.3396226
## [81] 44.0188679 44.1698113 37.3584906 49.0377358 43.8113208
## [86] 44.3773585 50.5094340 54.5094340 49.9245283 50.9811321
```


##	[91]	55.6792453	44.3207547	52.2641509	69.5471698	57.8490566
##	[96]	56.1509434	73.3773585	68.2075472	129.4339623	157.5283019
##	[101]	171.1509434	155.3962264	177.3018868	206.1698113	195.9245283
##	[106]	179.5660377	183.3962264	167.0188679	143.4528302	124.0377358
##	[111]	109.1132075	108.1132075	103.7169811	95.9622642	66.2075472
##	[116]	45.2264151	24.7924528	38.7547170	34.9811321	21.0566038
##	[121]	40.5660377	26.9811321	42.4150943	52.6603774	38.9245283
##	[126]	50.7924528	44.2830189	37.4150943	34.6981132	28.3396226
##	[131]	25.0943396	31.9433962	31.3584906	29.6792453	21.3207547
##	[136]	25.5471698	28.3773585	26.4716981	33.4339623	49.9811321
##	[141]	42.0377358	44.6037736	46.0377358	59.1886792	63.8679245
##	[146]	87.6981132	94.8490566	92.7735849	63.3962264	50.1698113
##	[151]	54.4716981	32.4150943	26.5283019	37.7358491	45.0566038
##	[156]	67.2830189	42.3396226	39.8867925	43.2641509	40.9811321
##	[161]	46.2452830	56.4339623	42.7547170	25.1320755	39.9622642
##	[166]	53.5471698	47.3207547	60.8113208	55.7547170	51.9622642
##	[171]	43.5849057	48.6981132	35.4716981	37.5471698	41.8490566
##	[176]	27.5094340	17.1132075	26.0754717	43.6226415	43.7735849
##	[181]	30.0188679	36.0754717	35.4905660	38.8490566	45.9622642
##	[186]	47.7547170	48.1320755	65.3207547	82.9056604	98.6603774
##	[191]	102.1132075	83.9622642	62.1320755	64.1320755	74.5471698
##	[196]	63.1698113	56.9056604	59.7735849	43.8679245	38.5660377
##	[201]	44.6603774	45.4528302	46.2075472	43.6792453	46.6226415
##	[206]	56.3018868	50.7169811	61.2264151	72.7169811	78.9433962
##	[211]	68.9433962	59.6603774	75.0943396	56.5094340	34.7735849
##	[216]	37.4528302	40.6792453	58.0188679	74.6981132	85.3207547
##	[221]	59.2641509	67.7735849	77.6981132	74.2452830	85.3396226
##	[226]	99.4528302	86.5849057	85.6037736	84.8679245	77.8301887
##	[231]	58.0377358	53.3584906	36.3207547	20.7169811	27.3962264
##	[236]	40.0188679	30.2075472	25.5471698	45.6603774	33.5283019
##	[241]	19.6226415	19.0188679	19.3396226	33.3396226	26.8113208
##	[246]	21.1698113	27.3018868	21.3396226	19.5471698	21.3207547
##	[251]	32.3018868	20.1509434	15.9433962	17.2264151	23.4528302
##	[256]	19.2452830	12.4528302	8.0188679	14.6603774	16.3018868
##	[261]	8.6792453	7.7924528	8.1320755	2.6226415	1.4528302
##	[266]	3.6792453	4.8113208	8.5094340	7.0754717	8.6981132
##	[271]	9.7547170	2.2075472	0.3207547	0.1132075	1.6037736
##	[276]	4.6037736	3.3018868	2.8490566	0.0000000	0.8301887
##	[281]	0.9622642	1.5849057	2.6037736	4.6981132	3.3018868
##	[286]	0.6415094	0.2264151	1.0754717	0.0000000	0.0000000
##	[291]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[296]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[301]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[306]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[311]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[316]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[321]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

[illegible]

##	[561]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[566]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[571]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[576]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[581]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[586]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[591]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[596]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[601]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[606]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[611]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[616]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[621]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[626]	0.0000000	4.0000000	0.0000000	0.0000000	0.0000000
##	[631]	36.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[636]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[641]	0.0000000	0.0000000	0.0000000	25.0000000	0.0000000
##	[646]	0.0000000	90.0000000	411.0000000	413.0000000	415.0000000
##	[651]	519.0000000	529.0000000	613.0000000	562.0000000	612.0000000
##	[656]	534.0000000	323.0000000	600.0000000	533.0000000	251.0000000
##	[661]	56.0000000	0.0000000	32.0000000	80.0000000	10.0000000
##	[666]	9.0000000	145.0000000	46.0000000	0.0000000	44.0000000
##	[671]	126.0000000	42.0000000	138.0000000	53.0000000	0.0000000
##	[676]	0.0000000	22.0000000	57.0000000	161.0000000	19.0000000
##	[681]	15.0000000	0.0000000	16.0000000	0.0000000	0.0000000
##	[686]	8.0000000	0.0000000	51.0000000	516.0000000	245.0000000
##	[691]	0.0000000	161.0000000	7.0000000	0.0000000	0.0000000
##	[696]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[701]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[706]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[711]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[716]	72.0000000	73.0000000	0.0000000	0.0000000	116.0000000
##	[721]	97.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[726]	0.0000000	15.0000000	0.0000000	0.0000000	0.0000000
##	[731]	0.0000000	0.0000000	80.0000000	69.0000000	0.0000000
##	[736]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[741]	0.0000000	99.0000000	100.0000000	0.0000000	0.0000000
##	[746]	33.0000000	0.0000000	0.0000000	7.0000000	0.0000000
##	[751]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[756]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[761]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[766]	88.0000000	154.0000000	0.0000000	20.0000000	0.0000000
##	[771]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[776]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[781]	0.0000000	0.0000000	198.0000000	61.0000000	75.0000000
##	[786]	0.0000000	0.0000000	193.0000000	298.0000000	0.0000000
##	[791]	15.0000000	21.0000000	0.0000000	0.0000000	0.0000000

```
## [796] 0.0000000 51.0000000 36.0000000 0.0000000 26.0000000
## [801] 22.0000000 0.0000000 39.0000000 52.0000000 15.0000000
## [806] 41.0000000 0.0000000 42.0000000 0.0000000 0.0000000
## [811] 159.0000000 32.0000000 0.0000000 0.0000000 0.0000000
## [816] 0.0000000 34.0000000 0.0000000 0.0000000 0.0000000
## [821] 0.0000000 36.0000000 73.0000000 9.0000000 0.0000000
## [826] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [831] 0.0000000 0.0000000 0.0000000 0.0000000 90.0000000
## [836] 128.0000000 46.0000000 0.0000000 0.0000000 0.0000000
## [841] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [846] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [851] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [856] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [861] 0.0000000 8.0000000 0.0000000 0.0000000 47.0000000
## [866] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [871] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [876] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [881] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [886] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [891] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [896] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [901] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [906] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [911] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [916] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [921] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [926] 0.0000000 7.0000000 18.0000000 57.0000000 40.0000000
## [931] 0.0000000 0.0000000 0.0000000 0.0000000 16.0000000
## [936] 1.0000000 0.0000000 18.0000000 20.0000000 40.0000000
## [941] 36.0000000 17.0000000 49.0000000 86.0000000 49.0000000
## [946] 0.0000000 29.0000000 59.0000000 7.0000000 25.0000000
## [951] 30.0000000 31.0000000 7.0000000 18.0000000 113.0000000
## [956] 181.0000000 87.0000000 0.0000000 0.0000000 0.0000000
## [961] 57.0000000 99.0000000 507.0000000 522.0000000 510.0000000
## [966] 519.0000000 508.0000000 423.0000000 499.0000000 259.0000000
## [971] 31.0000000 17.0000000 0.0000000 0.0000000 0.0000000
## [976] 0.0000000 0.0000000 17.0000000 0.0000000 145.0000000
## [981] 453.0000000 229.0000000 144.0000000 0.0000000 0.0000000
## [986] 0.0000000 82.0000000 0.0000000 0.0000000 0.0000000
## [991] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [996] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
```

```
mean(aDataF[1:1000,]$steps)
```

```
## [1] 28.35319
```

Make a histogram of the total number of steps taken each day and Calculate and report the mean and median total number of steps taken per day. Do these values differ from the estimates from the first part of the assignment? What is the impact of imputing missing data on the estimates of the total daily number of steps?

```
aDataFTbl = group_by(tbl_df(aDataF),date)
dailyStepsF <- summarize(aDataFTbl,total=sum(steps))
dailyMeanF <- summarize(aDataFTbl,avgDayStep=mean(steps))
periodMeanF <- mean(dailyStepsF$total,na.rm=TRUE)
dailyMedianF <- median(dailyStepsF$total,na.rm=TRUE)
periodMean <- mean(dailySteps$total,na.rm=TRUE)

periodMean
```

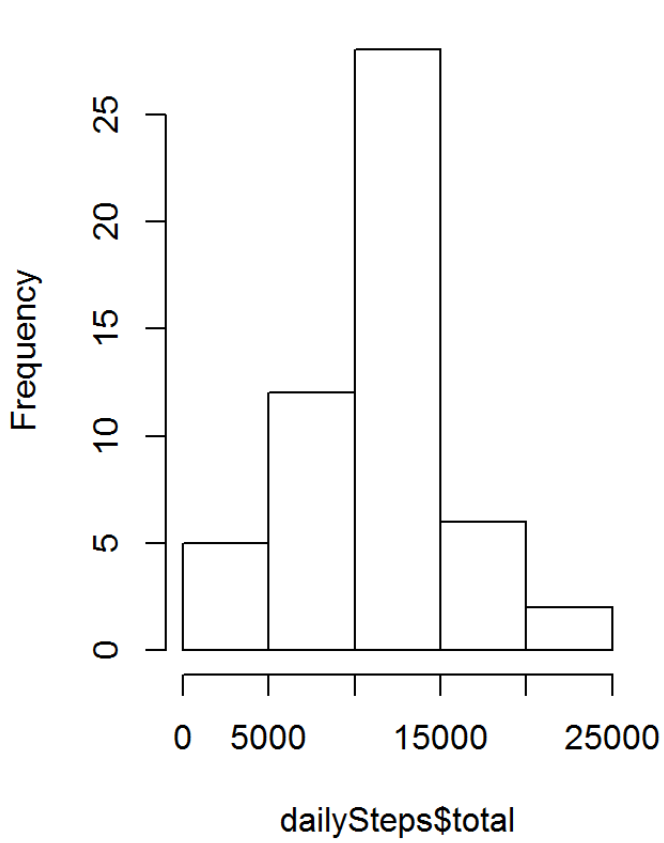
```
## [1] 10766.19
```

```
periodMeanF
```

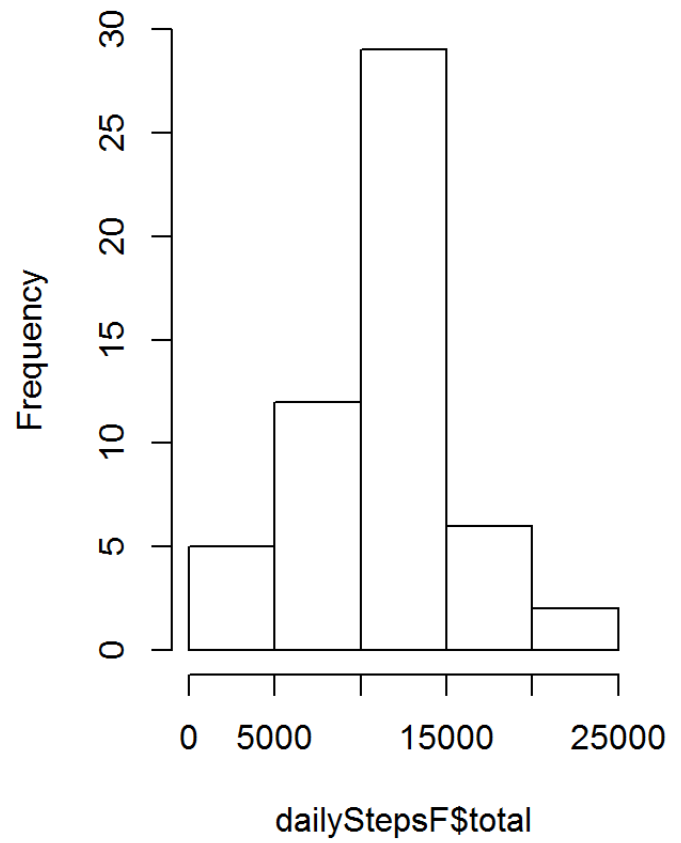
```
## [1] 10766.19
```

```
# make a new histogram of daily steps with missing data "filled"; compare to original
par(mfrow=c(1,2))
hist(dailySteps$total)
hist(dailyStepsF$total)
```

Histogram of dailySteps\$total



Histogram of dailyStepsF\$total



```
#debugging code
```