Reproducible Research Project 1

Julie Steury

Friday, May 15, 2015

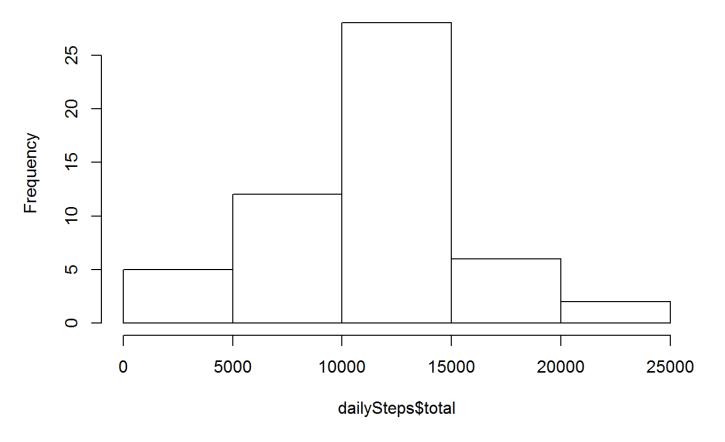
intersect, setdiff, setequal, union

##

```
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':
##
```

```
par(mfrow=c(1,1)) #initalize graphics device
#Read in data
aData<-read.csv(fname, stringsAsFactors=FALSE)
# Convert dates from character to POSIXct class
dates<- ymd(aData$date)</pre>
aData$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))</pre>
dailySteps <- summarize(aDataTbl,total=sum(steps))</pre>
dailyMean <- summarize(aDataTbl,avgDayStep=mean(steps))</pre>
allMean <- mean(dailyMean$avgDayStep)</pre>
periodMean=mean(dailySteps$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)

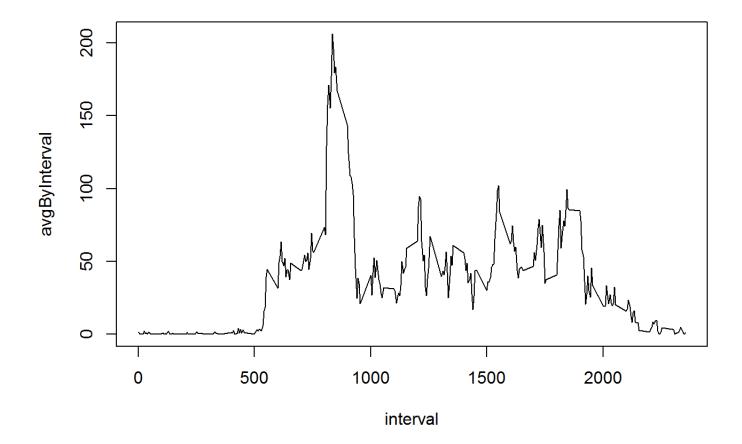
Which 5-minute interval, on average across all the days in the dataset, contains the maximum number of steps?

```
#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
```

```
##
                               NA
                                                                          NA
       [1]
             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
                 NΑ
                           NΑ
                               NA
                                    NA
                                         NA
                                              NA
                                                  NΑ
                                                       NA
                                                            NA
                                                                 NA
                                                                          NΑ
                                                                               NA
                                                                                    NA
##
      [52]
             NA
                 NA
                      NΑ
                           NΑ
                               NA
                                    NA
                                         NA
                                              NA
                                                   NA
                                                       NA
                                                            NA
                                                                 NA
                                                                      NA
                                                                          NA
                                                                               NA
                                                                                    NA
                                                                                         NΑ
##
      [69]
             NA
                 NA
                      NΑ
                           NΑ
                               NA
                                    NA
                                         NA
                                              NA
                                                  NA
                                                       NA
                                                            NA
                                                                 NA
                                                                      NA
                                                                          NA
                                                                               NA
                                                                                    NA
                                                                                         NΑ
##
      [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
##
                 NΑ
                                         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
                                                       NΑ
                                                            NA
                                                                 NA
                                                                      NA
                                                                          NA
                                                                               NA
                                                                                         NΑ
             NA
                 NΑ
                                              NA
                                                  NA
                                                                                    NA
##
    [239]
             NA
                 NA
                      NA
                           NA
                               NA
                                    NA
                                         NA
                                              NA
                                                  NA
                                                       NΑ
                                                            NA
                                                                 NA
                                                                      NA
                                                                          NA
                                                                               NA
                                                                                    NA
                                                                                         NΑ
##
    [256]
                 NΑ
                      NΑ
                           NΑ
                                NA
                                    NA
                                         NΑ
                                                   NΑ
                                                            NA
                                                                 NA
                                                                      NA
                                                                          NA
                                                                                    NA
                                                                                         NA
             NΑ
                                              NA
                                                       NA
                                                                               NA
##
    [273]
            NA
                                                                                    NA
                                                                                          0
                 NΑ
                      NΑ
                           NΑ
                               NA
                                    NΑ
                                         NΑ
                                              NΑ
                                                   NA
                                                       NΑ
                                                            NΑ
                                                                 NΑ
                                                                      NΑ
                                                                          NΑ
                                                                               NA
```

#	#	[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] [647]	90	36	0	0	0 519	9 529	0 613	0	0	0	0	0	0	0	25	0	0
#	#																		
#	#												323	600	533 a	251	56 57	161	32 10
#		[664]	80	10	9	145	46	0	44	126	42	138	53	0	0	22	57	161	19
#	#	[664] [681]	80 15	10 0	9 16	145 0	46 0	0 8	44 0	126 51	42 516	138 245	53 0	0 161	0 7	22 0	57 0	161 0	19 0
#	#	[664] [681] [698]	80	10 0 0	9 16 0	145 0 0	46	0 8 0	44	126 51 0	42	138	53	0	0 7 0	22 0 0	57 0 0	161 0 0	19 0 0
#	# # #	[664] [681] [698] [715]	80 15 0	10 0 0 72	9 16 0 73	145 0	46 0 0	0 8	44 0 0 97	126 51	42 516 0	138 245 0	53 0 0 0	0 161 0	0 7	22 0	57 0 0 0	161 0	19 0 0
# #	# # #	[664] [681] [698] [715] [732]	80 15 0 0	10 0 0	9 16 0	145 0 0 0	46 0 0	0 8 0 116	44 0 0	126 51 0 0	42 516 0 0	138 245 0 0	53 0 0	0 161 0 0	0 7 0 15	22 0 0 0	57 0 0	161 0 0	19 0 0
# # #	# # # #	[664] [681] [698] [715]	80 15 0 0 0 7	10 0 0 72 80	9 16 0 73 69	145 0 0 0	46 0 0 0	0 8 0 116 0	44 0 0 97 0	126 51 0 0	42 516 0 0	138 245 0 0	53 0 0 0 99	0 161 0 0 100	0 7 0 15 0	22 0 0 0	57 0 0 0 33	161 0 0 0	19 0 0 0
# # # #	# # # # #	[664] [681] [698] [715] [732] [749]	80 15 0 0 7 88	10 0 0 72 80 0	9 16 0 73 69 0	145 0 0 0 0	46 0 0 0 0	0 8 0 116 0	44 0 97 0 0	126 51 0 0 0	42 516 0 0 0	138 245 0 0 0	53 0 0 0 99	0 161 0 0 100	0 7 0 15 0	22 0 0 0 0	57 0 0 0 33 0	161 0 0 0 0	19 0 0 0 0
# # # #	# # # # # #	[664] [681] [698] [715] [732] [749] [766]	80 15 0 0 7 88	10 0 72 80 0 154	9 16 0 73 69 0	145 0 0 0 0 0 20	46 0 0 0 0	0 8 0 116 0 0	44 0 97 0 0	126 51 0 0 0 0	42 516 0 0 0 0	138 245 0 0 0 0	53 0 0 9 9 0	0 161 0 0 100 0	0 7 0 15 0 0	22 0 0 0 0 0	57 0 0 0 33 0	161 0 0 0 0 0	19 0 0 0 0 0
# # # #	# # # # # # #	[664] [681] [698] [715] [732] [749] [766] [783]	80 15 0 0 7 88 198	10 0 72 80 0 154 61	9 16 0 73 69 0 0 75	145 0 0 0 0 0 20	46 0 0 0 0 0	0 8 0 116 0 0 0 193	44 0 97 0 0 0 298	126 51 0 0 0 0	42 516 0 0 0 0 0	138 245 0 0 0 0 21	53 0 0 99 0	0 161 0 0 100 0 0	0 7 0 15 0 0 0	22 0 0 0 0 0 0	57 0 0 0 33 0 51	161 0 0 0 0 0 0 0 36	19 0 0 0 0 0
# # # # # #	# # # # # # # #	[664] [681] [698] [715] [732] [749] [766] [783] [800]	80 15 0 0 7 88 198 26	10 0 72 80 0 154 61 22 0	9 16 0 73 69 0 75 0	145 0 0 0 0 0 20 0 39	46 0 0 0 0 0 0 0 52	0 8 0 116 0 0 193 15	44 0 97 0 0 0 298 41	126 51 0 0 0 0 0	42 516 0 0 0 0 0 15 42	138 245 0 0 0 0 21 0	53 0 0 99 0 0 0	0 161 0 0 100 0 0 0 159	0 7 0 15 0 0 0 0 32	22 0 0 0 0 0 0 0	57 0 0 33 0 0 51	161 0 0 0 0 0 0 36 0	19 0 0 0 0 0 0
# # # # # #	# # # # # # # #	[664] [681] [698] [715] [732] [749] [766] [783] [800] [817]	80 15 0 0 7 88 198 26 34	10 0 72 80 0 154 61 22 0	9 16 0 73 69 0 75 0	145 0 0 0 0 20 0 39 0	46 0 0 0 0 0 52 0	0 8 0 116 0 0 193 15 36	44 0 97 0 0 298 41 73	126 51 0 0 0 0 0 0	42 516 0 0 0 0 15 42 0	138 245 0 0 0 0 21 0	53 0 0 99 0 0 0	0 161 0 0 100 0 0 0 159 0	0 7 0 15 0 0 0 32	22 0 0 0 0 0 0 0	57 0 0 33 0 51 0	161 0 0 0 0 0 36 0	19 0 0 0 0 0 0
#######################################	# # # # # # # # #	[664] [681] [698] [715] [732] [749] [766] [783] [800] [817] [834]	80 15 0 0 7 88 198 26 34 0	10 0 72 80 0 154 61 22 0	9 16 0 73 69 0 75 0 128	145 0 0 0 0 20 0 39 0 46	46 0 0 0 0 0 0 52 0	0 8 0 116 0 0 193 15 36 0	44 0 97 0 0 298 41 73 0	126 51 0 0 0 0 0 0 0	42 516 0 0 0 0 15 42 0	138 245 0 0 0 0 21 0	53 0 0 99 0 0 0	0 161 0 0 100 0 0 159 0	0 7 0 15 0 0 0 32 0	22 0 0 0 0 0 0 0 0	57 0 0 33 0 51 0	161 0 0 0 0 0 36 0	19 0 0 0 0 0 0 0
# # # # # # # # #	############	[664] [681] [698] [715] [732] [749] [766] [783] [800] [817] [834] [851]	80 15 0 0 7 88 198 26 34 0	10 0 72 80 0 154 61 22 0 90	9 16 0 73 69 0 75 0 0 128	145 0 0 0 0 20 0 39 0 46 0	46 0 0 0 0 0 0 52 0 0	0 8 0 116 0 0 193 15 36 0	44 0 97 0 0 298 41 73 0 0	126 51 0 0 0 0 0 0 9 0 9	42 516 0 0 0 0 15 42 0 0	138 245 0 0 0 0 21 0 0	53 0 0 99 0 0 0 0	0 161 0 100 0 0 159 0 8	0 7 0 15 0 0 0 32 0	22 0 0 0 0 0 0 0 0 0	57 0 0 33 0 51 0 0 47	161 0 0 0 0 36 0 0 0	19 0 0 0 0 0 0 0 0
#######################################	# # # # # # # # # # #	[664] [681] [698] [715] [732] [749] [766] [783] [800] [817] [834] [851] [868]	80 15 0 0 7 88 198 26 34 0 0	10 0 72 80 0 154 61 22 0 90 0	9 16 0 73 69 0 75 0 128 0	145 0 0 0 20 0 39 0 46 0	46 0 0 0 0 0 52 0 0 0	0 8 0 116 0 0 193 15 36 0	44 0 97 0 0 298 41 73 0 0	126 51 0 0 0 0 0 0 9 0	42 516 0 0 0 0 15 42 0 0	138 245 0 0 0 0 21 0 0	53 0 0 99 0 0 0 0	0 161 0 0 100 0 0 159 0 8	0 7 0 15 0 0 0 32 0 0	22 0 0 0 0 0 0 0 0 0 0 0 0 0	57 0 0 33 0 51 0 0 47 0	161 0 0 0 0 36 0 0 0	19 0 0 0 0 0 0 0 0 0
# # # # # # # # # # #	# # # # # # # # # # # #	[664] [681] [698] [715] [732] [749] [766] [783] [800] [817] [834] [851] [868] [885]	80 15 0 0 7 88 198 26 34 0 0	10 0 72 80 0 154 61 22 0 90 0	9 16 0 73 69 0 75 0 128 0 0	145 0 0 0 20 39 0 46 0 0 0	46 0 0 0 0 0 52 0 0 0 0	0 8 0 116 0 0 193 15 36 0 0 0	444 0 97 0 0 298 41 73 0 0 0 0 0	126 51 0 0 0 0 0 0 9 0 0	42 516 0 0 0 15 42 0 0 0 0 7	138 245 0 0 0 0 21 0 0 0	53 0 0 99 0 0 0 0 0 0 57	0 161 0 0 0 0 0 159 0 8 0 0 0 40	0 7 0 15 0 0 32 0 0 0 0	22 0 0 0 0 0 0 0 0 0 0 0	57 0 0 33 0 0 51 0 47 0 0	161 0 0 0 0 36 0 0 0 0	19 0 0 0 0 0 0 0 0 0 0
#######################################	# # # # # # # # # # # # #	[664] [681] [698] [715] [732] [749] [766] [783] [800] [817] [851] [851] [868] [885] [902] [919]	80 15 0 0 7 88 198 26 34 0 0 0 0	10 0 72 80 0 154 61 22 0 90 0 0 0	9 16 0 73 69 0 75 0 128 0 0 0 0	145 0 0 0 20 0 39 0 46 0 0 0 20	46 0 0 0 0 0 52 0 0 0 0 0 40	0 8 0 116 0 0 193 15 36 0 0 0 0 0 36	444 0 97 0 0 298 41 73 0 0 0 0 17	126 51 0 0 0 0 0 9 0 0 0 0 0 0 0 0 0 0 0 0 0	42 516 0 0 0 15 42 0 0 0 0 7 86	138 245 0 0 0 21 0 0 0 0 18 49	53 0 9 9 0 0 0 0 0 57 0	0 161 0 0 0 0 159 0 8 0 0 40 29	0 7 0 15 0 0 32 0 0 0 0 0 59	22 0 0 0 0 0 0 0 0 0 0 0 0 0	57 0 0 33 0 51 0 0 47 0 0 0 25	161 0 0 0 0 36 0 0 0 0 0 0 30	19 0 0 0 0 0 0 0 0 0 16 31
################	#################	[664] [681] [698] [715] [732] [749] [766] [783] [800] [817] [834] [851] [868] [885] [902] [919] [919] [936]	80 15 0 0 7 88 198 26 34 0 0 0 0 0 1 7	10 0 72 80 0 154 61 22 0 90 0 0 0 0	9 16 0 73 69 0 75 0 128 0 0 0 18 113	145 0 0 0 20 0 39 0 46 0 0 0 20 181	46 0 0 0 0 0 52 0 0 0 0 0 40 87	0 8 0 116 0 0 193 15 36 0 0 0 0 36 0	44 0 97 0 0 298 41 73 0 0 0 0 17 0	126 51 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	42 516 0 0 0 15 42 0 0 0 7 86	138 245 0 0 0 0 21 0 0 0 0 0 18 49	53 0 0 99 0 0 0 0 0 57 0 507	0 161 0 0 0 0 159 0 8 0 0 40 29	0 7 0 15 0 0 32 0 0 0 0 0 59 510	22 0 0 0 0 0 0 0 0 0 0 7 519	57 0 0 33 0 51 0 47 0 0 0 25 508	161 0 0 0 0 36 0 0 0 0 0 30 423	19 0 0 0 0 0 0 0 0 0 16 31 499
#################	#################	[664] [681] [698] [715] [732] [749] [766] [783] [800] [817] [851] [851] [868] [885] [902] [919]	80 15 0 0 7 88 198 26 34 0 0 0 0 1 7 259	10 0 72 80 0 154 61 22 0 90 0 0 0	9 16 0 73 69 0 75 0 128 0 0 0 0	145 0 0 0 20 0 39 0 46 0 0 0 20	46 0 0 0 0 0 52 0 0 0 0 0 40	0 8 0 116 0 0 193 15 36 0 0 0 0 0 36	444 0 97 0 0 298 41 73 0 0 0 0 17	126 51 0 0 0 0 0 9 0 0 0 0 0 0 0 0 0 0 0 0 0	42 516 0 0 0 15 42 0 0 0 0 7 86	138 245 0 0 0 0 21 0 0 0 0 0 18 49	53 0 9 9 0 0 0 0 0 57 0	0 161 0 0 0 0 159 0 8 0 0 40 29	0 7 0 15 0 0 32 0 0 0 0 0 59 510	22 0 0 0 0 0 0 0 0 0 0 7 519	57 0 0 33 0 51 0 0 47 0 0 0 25	161 0 0 0 0 36 0 0 0 0 0 0 30	19 0 0 0 0 0 0 0 0 0 16 31

##	[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	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
                                                                                      47
##
               0
                    0
                         0
                              0
                                         0
                                              0
                                                   0
                                                        0
                                                              0
                                                                   0
                                                                        8
                                                                             0
                                                                                   0
                                                                                             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
                                                        7
     [919]
               0
                    0
                         0
                               0
                                    0
                                         0
                                              0
                                                   0
                                                            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
                                                       57
                                                            99 507 522 510 519
                                                                                     508 423 499
##
     [970] 259
                   31
                        17
                                    0
                                         0
                                              0
                                                       17
                                                              0 145
                                                                     453 229
                                                                                144
                                                                                             0
                                                                                                  0
##
                                                   0
                                    0
##
     [987]
             82
                    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
             2.0943396
                          0.5283019
                                       0.8679245
                                                    0.0000000
                                                                 1.4716981
##
      [6]
##
     [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
                                                                 0.1320755
##
     [26]
             0.0000000
                          1.1320755
                                       0.0000000
                                                    0.0000000
             0.0000000
                                       0.0000000
                                                                 1.5471698
##
     [31]
                          0.2264151
                                                    0.0000000
     [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
##
                                       0.3396226
                                                    0.3584906
                                                                 4.1132075
##
     [51]
             2.5660377
                          0.0000000
##
     [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
##
            39.4528302
                         44.4905660
                                      31.4905660
                                                   49.2641509
                                                                53.7735849
##
     [71]
##
     [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
##
                                     68.2075472 129.4339623 157.5283019
     [96]
           56.1509434
                        73.3773585
    [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
##
                        24.7924528
                                     38.7547170
                                                  34.9811321
                                                               21.0566038
##
    [116]
           45.2264151
##
    [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
##
           42.0377358
                        44.6037736
                                     46.0377358
                                                  59.1886792
                                                               63.8679245
##
    [141]
##
    [146]
           87.6981132
                        94.8490566
                                     92.7735849
                                                  63.3962264
                                                               50.1698113
           54.4716981
##
                        32.4150943
                                     26.5283019
                                                  37.7358491
                                                               45.0566038
    [151]
           67.2830189
##
    [156]
                        42.3396226
                                     39.8867925
                                                  43.2641509
                                                               40.9811321
           46.2452830
                        56.4339623
                                     42.7547170
                                                  25.1320755
                                                               39.9622642
##
    [161]
##
           53.5471698
                        47.3207547
                                     60.8113208
                                                  55.7547170
                                                               51.9622642
    [166]
##
           43.5849057
                        48.6981132
                                     35.4716981
                                                  37.5471698
                                                               41.8490566
    [171]
                                     26.0754717
                                                               43.7735849
##
    [176]
           27.5094340
                        17.1132075
                                                  43.6226415
##
    [181]
           30.0188679
                        36.0754717
                                     35.4905660
                                                  38.8490566
                                                               45.9622642
##
           47.7547170
                                     65.3207547
                                                  82.9056604
                                                               98.6603774
    [186]
                        48.1320755
##
    [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
##
           68.9433962
                        59.6603774
                                     75.0943396
                                                  56.5094340
                                                               34.7735849
##
    [211]
##
    [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
           58.0377358
                        53.3584906
                                     36.3207547
                                                  20.7169811
                                                               27.3962264
##
    [231]
           40.0188679
                        30.2075472
                                     25.5471698
                                                  45.6603774
                                                               33.5283019
##
    [236]
##
    [241]
           19.6226415
                        19.0188679
                                     19.3396226
                                                  33.3396226
                                                               26.8113208
           21.1698113
                        27.3018868
                                     21.3396226
                                                  19.5471698
                                                               21.3207547
##
    [246]
                        20.1509434
                                     15.9433962
                                                               23.4528302
##
    [251]
           32.3018868
                                                  17.2264151
##
    [256]
           19.2452830
                        12.4528302
                                      8.0188679
                                                  14.6603774
                                                               16.3018868
                                      8.1320755
##
    [261]
            8.6792453
                         7.7924528
                                                   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
                                      0.0000000
                                                   0.0000000
##
    [306]
            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
            0.0000000
                         0.0000000
                                      0.0000000
                                                   0.0000000
                                                                0.0000000
##
    [321]
```

##	[326]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[331]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[336]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[341]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[346]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[351]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[356]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[361]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[366]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[371]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[376]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[381]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[386]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[391]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	_	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
	[396]					
##	[401]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[406]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[411]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[416]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[421]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[426]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[431]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[436]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[441]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[446]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[451]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[456]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[461]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[466]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[471]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[476]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[481]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[486]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[491]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[496]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[501]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[506]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[511]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[516]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[521]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[526]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[531]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[536]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[541]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[546]	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
##	[551]	0.0000000	0.0000000	0.0000000	0.0000000	117.0000000
##	[556]	9.0000000	0.0000000	0.0000000	0.0000000	0.0000000

```
##
    [561]
             0.0000000
                          0.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
             0.0000000
                                                    0.0000000
                                                                 0.0000000
##
    [566]
                          0.0000000
                                       9.9999999
    [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
##
             0.0000000
                          0.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
##
    [586]
##
    [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
##
            36.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
    [631]
                          0.0000000
##
    [636]
             0.0000000
                          0.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
##
    [641]
             0.0000000
                          0.0000000
                                       0.0000000
                                                   25.0000000
                                                                 0.0000000
             0.0000000
                         90.0000000 411.0000000 413.0000000 415.0000000
##
    [646]
    [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
##
             8.0000000
                          0.0000000
                                      51.0000000 516.0000000 245.0000000
##
    [686]
##
    [691]
             0.0000000 161.0000000
                                       7.0000000
                                                    0.0000000
                                                                 0.0000000
                          0.0000000
##
    [696]
             0.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
             0.0000000
                          0.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
##
    [701]
    [706]
             0.0000000
                          0.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
##
##
    [711]
             0.0000000
                          0.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
            72.0000000
                         73.0000000
                                       0.0000000
                                                    0.0000000 116.0000000
##
    [716]
    [721]
            97.0000000
                          0.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
##
##
    [726]
             0.0000000
                         15.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
                          0.0000000
##
    [731]
             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
##
                          0.0000000
##
    [761]
             0.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
##
    [766]
            88.0000000 154.0000000
                                       0.0000000
                                                   20.0000000
                                                                 0.0000000
             0.0000000
                          0.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
##
    [771]
    [776]
             0.0000000
                          0.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
##
                          0.0000000 198.0000000
##
    [781]
             0.0000000
                                                   61.0000000
                                                                75.0000000
                          0.0000000 193.0000000 298.0000000
##
    [786]
             0.0000000
                                                                 0.0000000
##
            15.0000000
                         21.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
    [791]
```

```
##
    [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
                                       0.0000000
                                                    0.0000000
                                                                47.0000000
##
    [861]
             0.0000000
                          8.0000000
##
    [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
             0.0000000
                          0.0000000
                                       0.0000000
                                                    0.0000000
                                                                16.0000000
##
    [931]
    [936]
             1.0000000
                          0.0000000
                                      18.0000000
                                                   20.0000000
                                                                40.0000000
##
            36.0000000
    [941]
                         17.0000000
                                      49.0000000
                                                   86.0000000
                                                                49.0000000
##
##
    [946]
             0.0000000
                         29.0000000
                                      59.0000000
                                                    7.0000000
                                                                25.0000000
           30.0000000
                                       7.0000000
                                                   18.0000000 113.0000000
    [951]
                         31.0000000
##
    [956] 181.0000000
                         87.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
##
           57.0000000
                         99.0000000 507.0000000 522.0000000 510.0000000
##
    [961]
    [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 145.0000000
##
                          0.0000000
                                      17.0000000
##
    [981] 453.0000000 229.0000000 144.0000000
                                                    0.0000000
                                                                 0.0000000
    [986]
             0.0000000
                         82.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
##
             0.0000000
                          0.0000000
                                       0.0000000
                                                    0.0000000
##
    [991]
                                                                 0.0000000
             0.0000000
                          0.0000000
                                       0.0000000
                                                    0.0000000
                                                                 0.0000000
##
    [996]
```

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

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
```

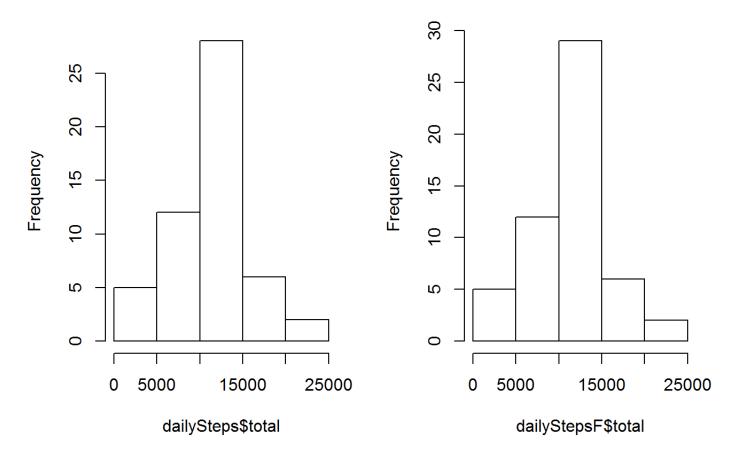
periodMeanF

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

```
# make a new histogrm 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