Reproducible Research Peer 1

Setting working directory

```
setwd("C:/Users/ddddd/Reproducible peer 1")
```

Loading the activity dataset “activity.csv” using “read.csv”

```
dataset<-read.csv("activity.csv", header = T, sep = ",", stringsAsFactors = F)
```

Get a summary of number of steps, date and interval

```
dataset$date <- as.Date(dataset$date, "%Y-%m-%d")
summary(dataset)
```

```
##      steps             date              interval     
##  Min.   :  0.00   Min.   :2012-10-01   Min.   :   0.0  
##  1st Qu.:  0.00   1st Qu.:2012-10-16   1st Qu.: 588.8  
##  Median :  0.00   Median :2012-10-31   Median :1177.5  
##  Mean   : 37.38   Mean   :2012-10-31   Mean   :1177.5  
##  3rd Qu.: 12.00   3rd Qu.:2012-11-15   3rd Qu.:1766.2  
##  Max.   :806.00   Max.   :2012-11-30   Max.   :2355.0  
##  NA's   :2304
```

Checking for the dimensions of the activity dataset

```
dim(dataset)
```

```
## [1] 17568     3
```

Install the required packages

install.packages(“dplyr”)

install.packages(“ggplot2”)

Loading the library library(dplyr)

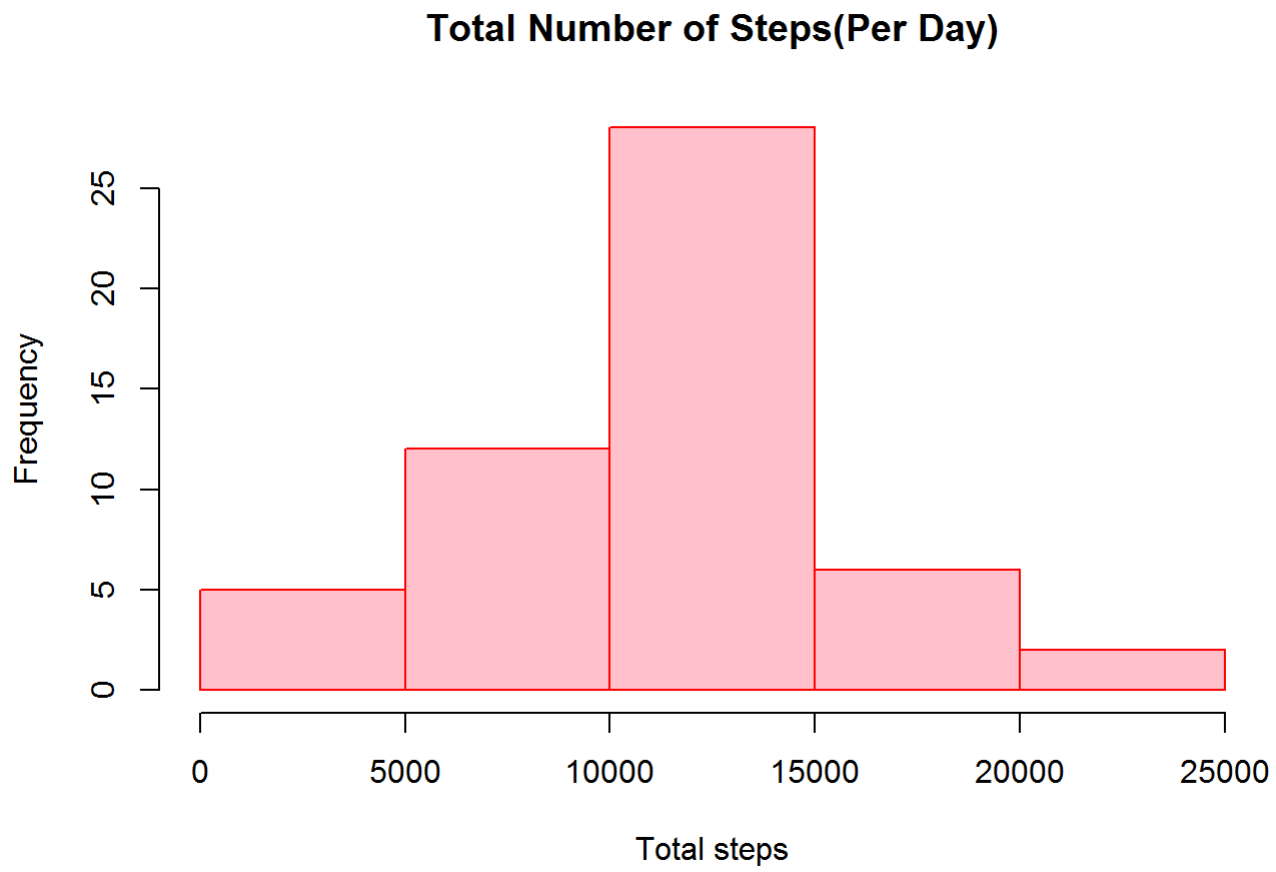
library(ggplot2)

Now, start calculating the required results as gven in this assignment

Que 1 What is the mean total number of steps taken per day?

Part 1.Calculating the total number of steps taken per day Here, the missing values are not included

```
totalstep <- aggregate(steps ~ date, dataset, sum)
hist(totalstep$steps, main = paste("Total Number of Steps(Per Day)"), col="pink",border="red",xlab="Total steps")
```



part 2 Calculating the mean and median of the total number of steps taken per day

1.Calculating mean

```
totalstepmean <- mean(totalstep$steps)
totalstepmean
```

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

2.Calculating median

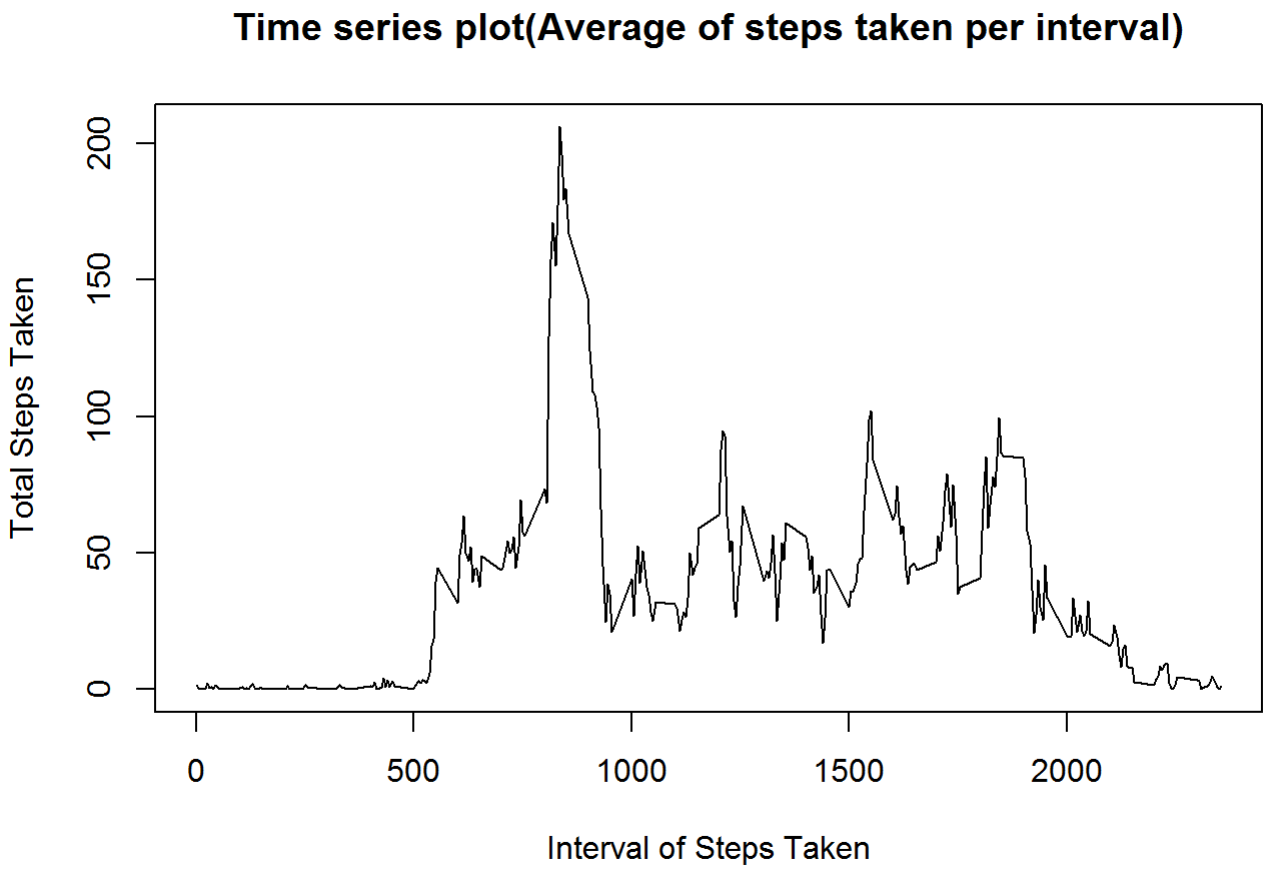
```
totalstepmedian <- median(totalstep$steps)
totalstepmedian
```

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

Que 2. What is the average daily activity ?

Part 1.Making the time series plot

```
totalstepint <- aggregate(steps ~ interval, dataset, mean)
plot(totalstepint$interval,totalstepint$steps, type="l", xlab="Interval of Steps Taken", ylab="Total Steps Taken",main="Time
 series plot(Average of steps taken per interval)")
```



Part 2. Determining the interval, having the maximum number of steps

```
Maximumstepsint <- totalstepint[which.max(totalstepint$steps),1]
Maximumstepsint
```

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

Que 3. Impute of fill the missing values(NAs)

Part 1.Calculating the sum of total missing values(NAs)

```
Sum_Missing_Values <- sum(!complete.cases(dataset))
Sum_Missing_Values
```

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

Part 2. Fill in the missing values(NAs) in the dataset

```
avgstepformissing <- aggregate(steps ~ interval, data = dataset, FUN = mean)
missingvaluefilling <- numeric()
```

Now,apply looping and fill the missing values (NAs)

```
for (i in 1:nrow(dataset)) {
  vari1 <- dataset[i, ]
    if (is.na(vari1$steps)) {
        steps <- subset(avgstepformissing, interval == vari1$interval)$steps
    } else {
        steps <- vari1$steps
    }

   missingvaluefilling <- c(missingvaluefilling, steps)
}
```

Table of data after filling missing values(NAs)

```
table(missingvaluefilling)
```

```
## missingvaluefilling
##                  0 0.0754716981132075  0.113207547169811
##              11166                 16                  8
##  0.132075471698113  0.150943396226415  0.169811320754717
##                 24                 16                 16
##  0.207547169811321  0.226415094339623  0.264150943396226
##                  8                 16                  8
##   0.30188679245283  0.320754716981132  0.339622641509434
##                  8                 16                 24
##  0.358490566037736  0.377358490566038  0.490566037735849
##                  8                  8                  8
##  0.528301886792453  0.584905660377358  0.622641509433962
##                  8                  8                  8
##  0.641509433962264  0.660377358490566  0.679245283018868
##                  8                  8                  8
##  0.830188679245283  0.867924528301887  0.943396226415094
##                 16                  8                 16
##  0.962264150943396                  1   1.07547169811321
##                  8                  7                  8
##   1.11320754716981   1.13207547169811   1.18867924528302
##                 16                  8                  8
##   1.45283018867925   1.47169811320755   1.54716981132075
##                  8                  8                  8
##   1.56603773584906   1.58490566037736   1.60377358490566
##                  8                  8                  8
##   1.62264150943396   1.71698113207547   1.83018867924528
##                  8                  8                  8
##                  2   2.09433962264151   2.20754716981132
##                  8                 16                  8
##   2.24528301886792   2.56603773584906   2.60377358490566
##                  8                  8                  8
##   2.62264150943396   2.84905660377358    2.9622641509434
##                  8                  8                  8
##                  3   3.11320754716981   3.30188679245283
##                 11                  8                 16
##   3.32075471698113   3.49056603773585   3.67924528301887
##                  8                  8                  8
##                  4   4.11320754716981   4.60377358490566
##                 25                  8                  8
##   4.69811320754717   4.81132075471698                  5
```

```
##                 8                 8                17
##                 6  6.05660377358491                 7
##                33                 8                87
##  7.07547169811321  7.79245283018868                 8
##                 8                 8                83
##   8.0188679245283  8.13207547169811  8.50943396226415
##                 8                 8                 8
##  8.67924528301887  8.69811320754717                 9
##                 8                 8                61
##  9.75471698113208                10                11
##                 8                46                43
##                12  12.4528301886792                13
##                43                 8                42
##                14  14.6603773584906                15
##                30                 8                68
##  15.9433962264151                16  16.0188679245283
##                 8                65                 8
##  16.3018867924528                17  17.1132075471698
##                 8                61                 8
##  17.2264150943396                18  18.3396226415094
##                 8                50                 8
##                19  19.0188679245283  19.2452830188679
##                51                 8                 8
##  19.3396226415094  19.5471698113208   19.622641509434
##                 8                 8                 8
##                20  20.1509433962264  20.7169811320755
##                53                 8                 8
##                21  21.0566037735849  21.1698113207547
##                38                 8                 8
##  21.3207547169811  21.3396226415094                22
##                16                 8                46
##                23  23.4528301886792                24
##                40                 8                42
##  24.7924528301887                25  25.0943396226415
##                 8                40                 8
##  25.1320754716981  25.5471698113208                26
##                 8                16                34
##  26.0754716981132  26.4716981132075  26.5283018867925
##                 8                 8                 8
##   26.811320754717  26.9811320754717                27
##                 8                 8                45
```

```
##   27.3018867924528   27.3962264150943   27.5094339622642
##                  8                  8                  8
##                 28   28.3396226415094    28.377358490566
##                 42                  8                  8
##                 29   29.6792452830189                 30
##                 36                  8                 37
##   30.0188679245283   30.2075471698113                 31
##                  8                  8                 41
##   31.3584905660377   31.4905660377358   31.9433962264151
##                  8                  8                  8
##                 32   32.3018867924528   32.4150943396226
##                 44                  8                  8
##                 33   33.3396226415094   33.4339622641509
##                 48                  8                  8
##   33.5283018867925                 34   34.6981132075472
##                  8                 35                  8
##   34.7735849056604   34.9811320754717                 35
##                  8                  8                 46
##   35.4716981132075   35.4905660377358                 36
##                  8                  8                 37
##   36.0754716981132   36.3207547169811                 37
##                  8                  8                 33
##   37.3584905660377   37.4150943396226   37.4528301886792
##                  8                  8                  8
##   37.5471698113208   37.7358490566038                 38
##                  8                  8                 45
##   38.5660377358491   38.7547169811321   38.8490566037736
##                  8                  8                  8
##   38.9245283018868                 39   39.3396226415094
##                  8                 44                  8
##   39.4528301886792   39.8867924528302   39.9622641509434
##                  8                  8                  8
##                 40   40.0188679245283   40.5660377358491
##                 39                  8                  8
##   40.6792452830189   40.9811320754717                 41
##                  8                  8                 24
##   41.8490566037736                 42   42.0377358490566
##                  8                 31                  8
##   42.3396226415094   42.4150943396226   42.7547169811321
##                  8                  8                  8
##                 43   43.2641509433962   43.5849056603774
```

```
##                37                 8                 8
##    43.622641509434   43.6792452830189   43.7735849056604
##                 8                 8                 8
##    43.811320754717   43.8679245283019                44
##                 8                 8                31
##   44.0188679245283   44.1698113207547   44.2830188679245
##                 8                 8                 8
##   44.3207547169811    44.377358490566   44.4905660377358
##                 8                 8                 8
##   44.6037735849057   44.6603773584906                45
##                 8                 8                22
##   45.0566037735849   45.2264150943396   45.4528301886792
##                 8                 8                 8
##   45.6603773584906   45.9622641509434                46
##                 8                 8                38
##   46.0377358490566   46.2075471698113   46.2452830188679
##                 8                 8                 8
##    46.622641509434                47   47.0754716981132
##                 8                24                 8
##   47.3207547169811   47.7547169811321                48
##                 8                 8                24
##   48.1320754716981   48.6981132075472                49
##                 8                 8                30
##   49.0377358490566   49.2641509433962   49.9245283018868
##                 8                 8                 8
##   49.9622641509434   49.9811320754717                50
##                 8                 8                29
##   50.1698113207547   50.5094339622642   50.7169811320755
##                 8                 8                 8
##   50.7924528301887   50.9811320754717                51
##                 8                 8                27
##   51.9622641509434                52   52.1509433962264
##                 8                32                 8
##   52.2641509433962   52.6603773584906                53
##                 8                 8                23
##   53.3584905660377   53.5471698113208   53.7735849056604
##                 8                 8                 8
##                54   54.4716981132075   54.5094339622642
##                18                 8                 8
##                55   55.6792452830189   55.7547169811321
##                33                 8                 8
```

```
##                56   56.1509433962264   56.3018867924528
##                25                  8                  8
##   56.4339622641509   56.5094339622642   56.9056603773585
##                 8                  8                  8
##                57   57.8490566037736                 58
##                28                  8                 28
##   58.0188679245283   58.0377358490566                 59
##                 8                  8                 24
##    59.188679245283   59.2641509433962   59.6603773584906
##                 8                  8                  8
##   59.7735849056604                 60    60.811320754717
##                 8                 30                  8
##                61   61.2264150943396                 62
##                21                  8                 31
##   62.1320754716981                 63   63.1698113207547
##                 8                 24                  8
##   63.3962264150943   63.4528301886792   63.8679245283019
##                 8                  8                  8
##                64   64.1320754716981                 65
##                27                  8                 22
##   65.3207547169811                 66   66.2075471698113
##                 8                 22                  8
##                67   67.2830188679245   67.7735849056604
##                17                  8                  8
##                68   68.2075471698113   68.9433962264151
##                24                  8                  8
##                69   69.5471698113208                 70
##                18                  8                 20
##                71                 72   72.7169811320755
##                26                 16                  8
##                73    73.377358490566                 74
##                13                  8                 25
##   74.2452830188679   74.5471698113208   74.6981132075472
##                 8                  8                  8
##                75   75.0943396226415                 76
##                18                  8                 18
##                77   77.6981132075472   77.8301886792453
##                15                  8                  8
##                78   78.9433962264151                 79
##                18                  8                 18
##                80                 81                 82
```

```
##                19                13                17
##  82.9056603773585                83  83.9622641509434
##                 8                10                 8
##                84  84.8679245283019                85
##                10                 8                14
##  85.3207547169811  85.3396226415094  85.6037735849057
##                 8                 8                 8
##                86  86.5849056603774                87
##                14                 8                 6
##  87.6981132075472                88                89
##                 8                14                 9
##                90                91                92
##                12                 7                14
##  92.7735849056604                93                94
##                 8                 6                12
##  94.8490566037736                95  95.9622641509434
##                 8                13                 8
##                96                97                98
##                 7                10                 8
##  98.6603773584906                99  99.4528301886792
##                 8                 9                 8
##               100               101               102
##                 8                12                 7
##   102.11320754717               103  103.716981132075
##                 8                10                 8
##               104               105               106
##                 8                 9                 9
##               107               108   108.11320754717
##                 8                 7                 8
##               109   109.11320754717               110
##                 8                 8                 7
##               111               112               113
##                11                10                 6
##               114               115               116
##                10                 6                 5
##               117               118               119
##                10                 4                13
##               120               121               122
##                 8                 6                 7
##               123               124  124.037735849057
##                 7                 8                 8
```

```
##                125                126                127
##                  1                  3                  6
##                128                129   129.433962264151
##                 10                  7                  8
##                130                131                132
##                  3                  6                  2
##                133                134                135
##                  3                  2                 10
##                136                137                138
##                  6                  9                  7
##                139                140                141
##                  7                  2                  3
##                142                143   143.452830188679
##                  6                 10                  8
##                144                145                146
##                  5                  3                  9
##                147                148                149
##                  1                  7                  6
##                150                151                152
##                  2                  2                  6
##                153                154                155
##                  8                  8                  2
##   155.396226415094                156                157
##                  8                  6                  4
##   157.528301886792                158                159
##                  8                  5                  6
##                160                161                162
##                  4                  5                  1
##                163                164                165
##                  5                  3                  2
##                166                167   167.018867924528
##                  4                  4                  8
##                168                170                171
##                  8                  8                  6
##   171.150943396226                172                173
##                  8                  7                  6
##                174                175                176
##                  7                  3                  6
##                177   177.301886792453                178
##                  1                  8                  4
##                179   179.566037735849                180
```

```
##                 6                 8                 4
##               181               182               183
##                 3                 3                 3
##   183.396226415094               184               185
##                 8                 3                 3
##               186               187               188
##                 4                 2                 4
##               189               190               191
##                 3                 7                 1
##               192               193               194
##                 2                 5                 3
##               195   195.924528301887               196
##                 1                 8                 1
##               197               198               199
##                 5                 4                 3
##               200               201               202
##                 2                 3                 2
##               203               204               205
##                 6                 3                 3
##               206   206.169811320755               207
##                 1                 8                 3
##               208               209               210
##                 2                 1                 1
##               211               212               213
##                 3                 1                 1
##               214               216               219
##                 1                 2                 2
##               221               223               224
##                 2                 4                 1
##               225               229               230
##                 2                 1                 2
##               231               232               235
##                 2                 3                 1
##               236               237               238
##                 1                 2                 2
##               240               241               242
##                 1                 2                 2
##               243               244               245
##                 3                 1                 3
##               247               248               249
##                 3                 1                 1
```

```
##  250  251  252
##    2    1    2
##  253  254  255
##    1    1    1
##  256  257  258
##    1    3    1
##  259  260  261
##    1    7    1
##  262  263  264
##    2    2    3
##  265  266  267
##    1    4    2
##  269  270  271
##    2    1    1
##  272  274  275
##    3    2    3
##  276  277  279
##    2    4    3
##  280  281  282
##    2    5    2
##  283  284  285
##    2    2    3
##  286  287  289
##    5    1    1
##  290  291  292
##    2    2    2
##  293  294  295
##    2    2    1
##  297  298  299
##    1    5    1
##  301  302  303
##    2    1    1
##  304  305  306
##    1    1    3
##  307  308  309
##    1    2    1
##  310  311  312
##    4    3    2
##  313  314  315
##    1    2    1
##  316  317  318
```

```
##   2   2   1
##  319  320  321
##   4   1   3
##  322  323  324
##   2   2   2
##  325  326  327
##   2   2   1
##  328  330  331
##   2   2   1
##  332  333  334
##   3   1   4
##  335  336  339
##   3   1   1
##  340  341  343
##   2   1   2
##  344  345  346
##   1   3   1
##  347  349  350
##   1   4   1
##  351  353  354
##   4   1   1
##  355  356  357
##   1   2   1
##  358  359  360
##   3   1   1
##  361  362  363
##   2   2   1
##  364  365  366
##   4   1   3
##  368  370  371
##   1   1   3
##  372  373  374
##   1   1   2
##  375  376  377
##   1   1   4
##  378  380  384
##   1   2   1
##  385  387  388
##   1   2   1
##  389  391  392
##   3   2   2
```

```
##  393  394  395
##    5    1    3
##  396  397  399
##    2    2    2
##  400  401  402
##    4    2    2
##  403  404  405
##    3    3    1
##  406  408  410
##    2    2    1
##  411  412  413
##    4    2    5
##  414  415  416
##    2    3    3
##  417  418  419
##    1    3    1
##  421  422  423
##    1    1    1
##  424  425  426
##    1    3    1
##  427  428  429
##    1    1    2
##  431  432  433
##    1    4    3
##  434  435  436
##    1    2    1
##  437  439  440
##    2    4    4
##  441  442  443
##    2    1    4
##  444  446  449
##    4    4    1
##  450  451  453
##    2    3    3
##  454  456  457
##    2    1    2
##  458  459  461
##    1    1    1
##  462  463  464
##    2    4    1
##  465  466  467
```

```
##   4   2   1
## 468 469 470
##   5   2   1
## 471 472 473
##   1   2   4
## 474 475 476
##   1   4   4
## 477 478 479
##   1   1   2
## 480 481 482
##   1   1   3
## 483 484 485
##   4   1   4
## 486 487 488
##   2   2   3
## 489 490 491
##   6   1   2
## 492 493 494
##   1   2   3
## 495 496 497
##   4   3   2
## 498 499 500
##   2   4   3
## 501 503 504
##   3   2   6
## 505 506 507
##   3   3   4
## 508 509 510
##   4   3   2
## 511 512 513
##   6   3   4
## 514 515 516
##   1   4   2
## 517 518 519
##   3   2   6
## 520 521 522
##   2   1   5
## 523 524 526
##   4   2   5
## 527 528 529
##   4   3   5
```

```
##         530         531         532
##           2           1           3
##         533         534         535
##           8           3           1
##         536         537         539
##           2           1           1
##         540         541         542
##           5           2           2
##         544         545         546
##           2           1           4
##         547         548         549
##           1           1           2
##         551         553         555
##           1           1           2
##         556         559         562
##           1           1           1
##         567         568         569
##           1           2           1
##         571         573         574
##           1           1           1
##         577         581         584
##           1           1           1
##         591         592         594
##           1           1           1
##         597         600         602
##           1           1           1
##         606         608         611
##           1           1           1
##         612         613         614
##           1           3           1
##         618         619         625
##           1           2           1
##         628         630         634
##           1           1           1
##         635         637         638
##           1           1           1
##         639         643         652
##           1           1           3
##         655         659         662
##           1           2           1
##         665         667         668
```

```
##   1   1   1
## 679 680 681
##   1   2   1
## 682 686 687
##   1   1   1
## 690 693 697
##   1   1   1
## 698 701 706
##   1   1   2
## 708 709 710
##   1   1   1
## 713 714 715
##   2   1   2
## 717 718 720
##   1   1   1
## 721 725 726
##   4   1   2
## 727 729 730
##   1   1   1
## 731 732 733
##   3   2   4
## 734 735 736
##   1   2   1
## 737 738 739
##   2   1   2
## 741 742 743
##   1   3   3
## 744 745 746
##   2   1   2
## 747 748 749
##   4   4   2
## 750 751 752
##   3   1   1
## 753 754 755
##   2   2   3
## 756 757 758
##   2   4   5
## 759 760 765
##   2   2   1
## 766 767 768
##   1   1   1
```

```
##               769               770               777
##                 1                 3                 1
##               781               783               785
##                 1                 1                 3
##               786               789               794
##                 1                 1                 1
##               802               806
##                 1                 1
```

First value

```
head(missingvaluefilling)
```

```
## [1] 1.7169811 0.3396226 0.1320755 0.1509434 0.0754717 2.0943396
```

Last value

```
tail(missingvaluefilling)
```

```
## [1] 2.6037736 4.6981132 3.3018868 0.6415094 0.2264151 1.0754717
```

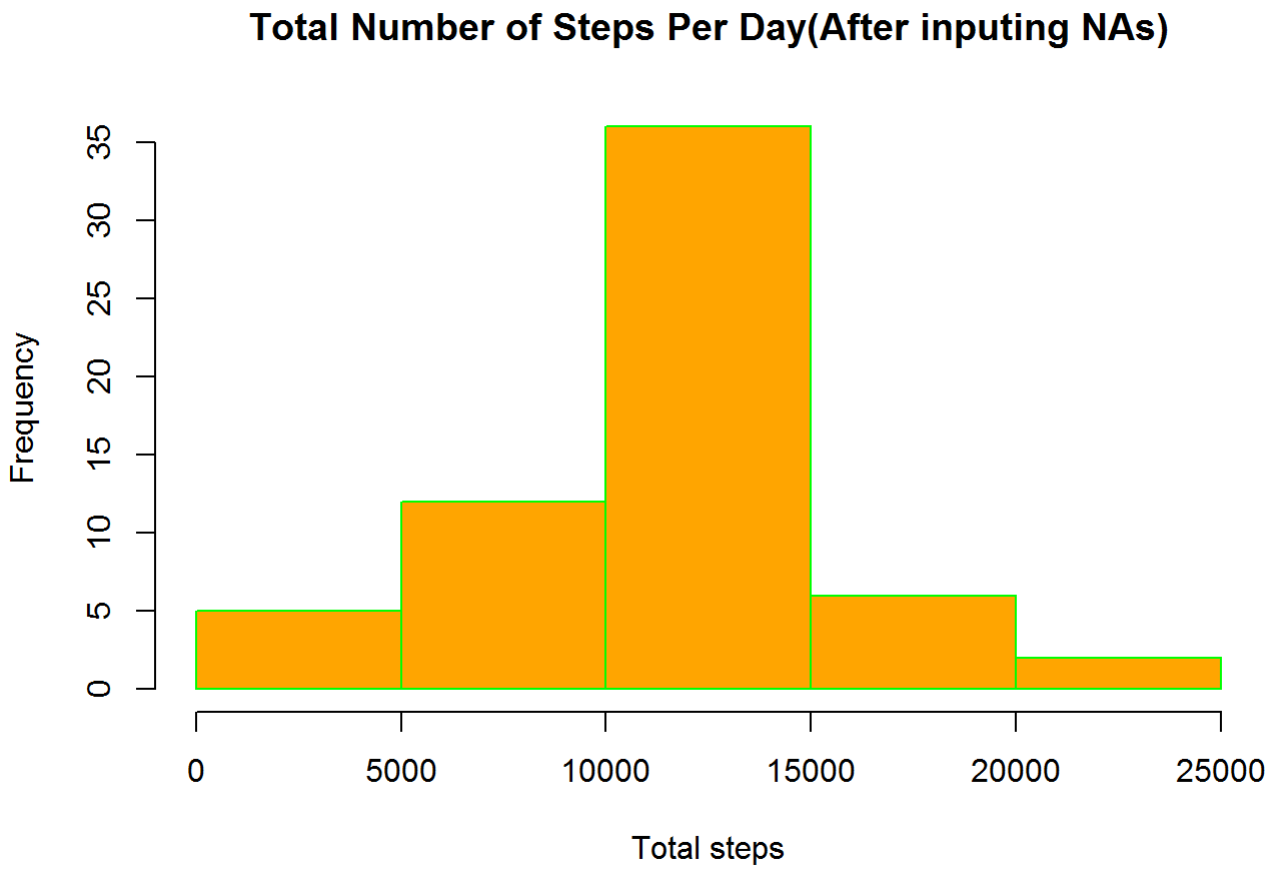
Part 3.Making a new dataset(dataset1) which also includes all the missing values(NAs) along with original data

```
dataset1 <- dataset
dataset1$steps <- missingvaluefilling
```

Part 4.Making a histogram of total steps taken per day including the missing values(NAs)

```
totalstepwithNA <- aggregate(steps ~ date, data = dataset1, sum, na.rm = TRUE)
```

```
#Plotting the histogram
hist(totalstepwithNA$steps, main = paste("Total Number of Steps Per Day(After inputing NAs)"), col="orange",border="green",
xlab="Total steps")
```



Part 5.calculating the mean and median total number of steps taken per day

1.calculating mean

```
totalstepwithNA_mean <- mean(totalstepwithNA$steps)
totalstepwithNA_mean
```

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

2.calculating median

```
totalstepwithNA_median <- median(totalstepwithNA$steps)
totalstepwithNA_median
```

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

Part 6. Comparing the mean and median of both the plots above in which one doesn't have missing values while the another one includes all the missing values

1.Diffrence of mean in both plots

```
Diffrence_mean <- totalstepwithNA_mean - totalstepmean
Diffrence_mean
```

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

2.Diffrence of median in both plots

```
Diffrence_median <- totalstepwithNA_median - totalstepmedian
Diffrence_median
```

```
## [1] 1.188679
```

Que 4.what are the differences in activity between weekdays and weekends?

Loading the library lattice for using the lattice graph or xyplot. This plot helps to display bivariate plot and here the plot shows the #number of steps taken in weekdays and weekends together in one plot.

```
library(lattice)
```

Part 1. As given on courera assignment , this step includes creating a new factor

```
Totalweekdays <- c("Monday", "Tuesday", "Wednesday", "Thursday",
              "Friday")
dataset1$dow = as.factor(ifelse(is.element(weekdays(as.Date(dataset1$date)),Totalweekdays), "weekdays", "weekends"))
totalstepwithNA <- aggregate(steps ~ interval + dow, dataset1, mean)
```

Part2.Ploting the result which shows the average number of steps taken per interval both in the weekends and the weekdays

```
xyplot(totalstepwithNA$steps ~ totalstepwithNA$interval|totalstepwithNA$dow, main="Average number of steps taken(Per interva
l)",xlab="Total intervals given", ylab="Total number of steps taken",layout=c(1,2), type="l")
```