Assignment Codebook

N

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Project Description

The purpose of this project is to demonstrate my ability to collect, work with, and clean a data set. The goal is to prepare tidy data that can be used for later analysis.

The data relate to accelerometer and gyroscope sensor signals collected from 30 participants in a study while carrying out 6 activities

{WALKING, WALKING_UPSTAIRS, WALKING_DOWNSTAIRS, SITTING, STANDING, LAYING}.

The final output is a tidy dataset with named columns and a summary of the mean and standard deviation statistics by Activity type and participant.

Study design and data processing

Collection of the raw data

The raw data were downloaded from the site below:

https://d396qusza40orc.cloudfront.net/getdata%2Fprojectfiles%2FUCI%20HAR%20Dataset.zip

There is a test and train sample with 3 files: - subject, containing the indicator of which of the 30 participants the dataline refers to - x, containing the sensor readings with a variety of metrics (mean, min, max, std, etc) for each of the available sensors - y, contianing the reference from 1-6 for which activity was being observed on the dataline.

Notes on the original (raw) data

Some additional notes (if avaialble, otherwise you can leave this section out).

http://archive.ics.uci.edu/ml/datasets/Human+Activity+Recognition+Using+Smartphones

The experiments have been carried out with a group of 30 volunteers within an age bracket of 19-48 years. Each person performed six activities (WALKING, WALKING_UPSTAIRS, WALKING_DOWNSTAIRS, SITTING, STANDING, LAYING) wearing a smartphone (Samsung Galaxy S II) on the waist. Using its embedded accelerometer and gyroscope, we captured 3-axial linear acceleration and 3-axial angular velocity at a constant rate of 50Hz. The experiments have been video-recorded to label the data manually. The obtained dataset has been randomly partitioned into two sets, where 70% of the volunteers was selected for generating the training data and 30% the test data.

The sensor signals (accelerometer and gyroscope) were pre-processed by applying noise filters and then sampled in fixed-width sliding windows of 2.56 sec and 50% overlap (128 readings/window). The sensor acceleration signal, which has gravitational and body motion components, was separated using a Butterworth low-pass filter into body acceleration and gravity. The gravitational force is assumed to have only low frequency components, therefore a filter with 0.3 Hz cutoff frequency was used. From each window, a vector of features was obtained by calculating variables from the time and frequency domain.

Check the README.txt file for further details about this dataset.

A video of the experiment including an example of the 6 recorded activities with one of the participants can be seen in the following link: http://www.youtube.com/watch?v=XOEN9W05_4A

Creating the tidy datafile

Guide to create the tidy data file

All the processing is included in the R script "Assignment.r" which is in the GitHub Repo. The steps are as follows:

1. The data was download and unzip the file
2. Import the 6 files from test and train
3. Merge the datasets to crease *subject, x, y*
4. Minimise the columns of dataset *x* to include only the mean and standard deviation measurements from the sensors to create the *x_clean* dataset.
5. Apply appropriate column names of all datasets *subject, y, x_clean* and merge them to create the *full* dataset
6. Summarise the *full* dataset by taking the mean of each of the sensor readings by subject and activity to create the *full_sum* dataset
7. Output the *full_sum* dataset to a *tidydata.csv* file

Description of the variables in the tiny_data.txt file

The general attributes of the data are below:

Data dimensions with 1 row for eachof the 6 activities by each of the 30 participants giving 180 rows. There are 81 variables including Subject and Activity leaving 79 mean sensor measurements:

```
dim(tidyT)
```

```
## [1] 180  81
```

The column names are as below

```
names(tidyT)
```

```
##  [1] "Subject"                       "Activity"
##  [3] "tBodyAcc.mean...X"             "tBodyAcc.mean...Y"
##  [5] "tBodyAcc.mean...Z"             "tBodyAcc.std...X"
##  [7] "tBodyAcc.std...Y"              "tBodyAcc.std...Z"
##  [9] "tGravityAcc.mean...X"          "tGravityAcc.mean...Y"
## [11] "tGravityAcc.mean...Z"          "tGravityAcc.std...X"
## [13] "tGravityAcc.std...Y"           "tGravityAcc.std...Z"
## [15] "tBodyAccJerk.mean...X"         "tBodyAccJerk.mean...Y"
## [17] "tBodyAccJerk.mean...Z"         "tBodyAccJerk.std...X"
## [19] "tBodyAccJerk.std...Y"          "tBodyAccJerk.std...Z"
## [21] "tBodyGyro.mean...X"            "tBodyGyro.mean...Y"
## [23] "tBodyGyro.mean...Z"            "tBodyGyro.std...X"
## [25] "tBodyGyro.std...Y"             "tBodyGyro.std...Z"
## [27] "tBodyGyroJerk.mean...X"        "tBodyGyroJerk.mean...Y"
## [29] "tBodyGyroJerk.mean...Z"        "tBodyGyroJerk.std...X"
## [31] "tBodyGyroJerk.std...Y"         "tBodyGyroJerk.std...Z"
## [33] "tBodyAccMag.mean.."            "tBodyAccMag.std.."
## [35] "tGravityAccMag.mean.."         "tGravityAccMag.std.."
## [37] "tBodyAccJerkMag.mean.."        "tBodyAccJerkMag.std.."
```

```
## [39] "tBodyGyroMag.mean.."             "tBodyGyroMag.std.."
## [41] "tBodyGyroJerkMag.mean.."         "tBodyGyroJerkMag.std.."
## [43] "fBodyAcc.mean...X"               "fBodyAcc.mean...Y"
## [45] "fBodyAcc.mean...Z"               "fBodyAcc.std...X"
## [47] "fBodyAcc.std...Y"                "fBodyAcc.std...Z"
## [49] "fBodyAcc.meanFreq...X"           "fBodyAcc.meanFreq...Y"
## [51] "fBodyAcc.meanFreq...Z"           "fBodyAccJerk.mean...X"
## [53] "fBodyAccJerk.mean...Y"           "fBodyAccJerk.mean...Z"
## [55] "fBodyAccJerk.std...X"            "fBodyAccJerk.std...Y"
## [57] "fBodyAccJerk.std...Z"            "fBodyAccJerk.meanFreq...X"
## [59] "fBodyAccJerk.meanFreq...Y"       "fBodyAccJerk.meanFreq...Z"
## [61] "fBodyGyro.mean...X"              "fBodyGyro.mean...Y"
## [63] "fBodyGyro.mean...Z"              "fBodyGyro.std...X"
## [65] "fBodyGyro.std...Y"               "fBodyGyro.std...Z"
## [67] "fBodyGyro.meanFreq...X"          "fBodyGyro.meanFreq...Y"
## [69] "fBodyGyro.meanFreq...Z"          "fBodyAccMag.mean.."
## [71] "fBodyAccMag.std.."               "fBodyAccMag.meanFreq.."
## [73] "fBodyBodyAccJerkMag.mean.."      "fBodyBodyAccJerkMag.std.."
## [75] "fBodyBodyAccJerkMag.meanFreq.."  "fBodyBodyGyroMag.mean.."
## [77] "fBodyBodyGyroMag.std.."          "fBodyBodyGyroMag.meanFreq.."
## [79] "fBodyBodyGyroJerkMag.mean.."     "fBodyBodyGyroJerkMag.std.."
## [81] "fBodyBodyGyroJerkMag.meanFreq.."
```

Variable 1: Subject

The variable indicates the subject that the sensor data refers to from the 1-30 participants involved

Data dimensions with 1 row for each 6

```
t<-as.data.frame(table(tidyT$Subject));
names(t)<-c("Participant","RowCount")
t
```

```
##    Participant RowCount
## 1            1        6
## 2            2        6
## 3            3        6
## 4            4        6
## 5            5        6
## 6            6        6
## 7            7        6
## 8            8        6
## 9            9        6
## 10          10        6
## 11          11        6
## 12          12        6
## 13          13        6
## 14          14        6
## 15          15        6
## 16          16        6
## 17          17        6
## 18          18        6
## 19          19        6
## 20          20        6
## 21          21        6
```

```
## 22          22        6
## 23          23        6
## 24          24        6
## 25          25        6
## 26          26        6
## 27          27        6
## 28          28        6
## 29          29        6
## 30          30        6
```

The data are numeric from 1-30 with 6 observations for each; one observation for each Activity measured. file)

Variable 2: Activity

The variable indicates the subject that the sensor data refers to from the 1-30 participants involved

Data dimensions with 1 row for each 6

```
q<-as.data.frame(table(tidyT$Activity));
names(t)<-c("Activity","RowCount")
q
```

```
##                 Var1 Freq
## 1             LAYING   30
## 2            SITTING   30
## 3           STANDING   30
## 4            WALKING   30
## 5 WALKING_DOWNSTAIRS   30
## 6   WALKING_UPSTAIRS   30
```

The data are text with 30 observations for each; one observation for each participant measured in the study.

Variable 3-81: Mean of Sensor Observations

A sample of the first 6 rows of the data from the 79 saensor factors is included below: these are all numeric in type.

```
head(tidyT[,3:81])
```

```
##   tBodyAcc.mean...X tBodyAcc.mean...Y tBodyAcc.mean...Z tBodyAcc.std...X
## 1         0.2773308      -0.017383819        -0.1111481      -0.28374026
## 2         0.2554617      -0.023953149        -0.0973020      -0.35470803
## 3         0.2891883      -0.009918505        -0.1075662       0.03003534
## 4         0.2612376      -0.001308288        -0.1045442      -0.97722901
## 5         0.2789176      -0.016137590        -0.1106018      -0.99575990
## 6         0.2215982      -0.040513953        -0.1132036      -0.92805647
##   tBodyAcc.std...Y tBodyAcc.std...Z tGravityAcc.mean...X
## 1      0.114461337      -0.26002790            0.9352232
## 2     -0.002320265      -0.01947924            0.8933511
## 3     -0.031935943      -0.23043421            0.9318744
## 4     -0.922618642      -0.93958629            0.8315099
## 5     -0.973190056      -0.97977588            0.9429520
## 6     -0.836827406      -0.82606140           -0.2488818
##   tGravityAcc.mean...Y tGravityAcc.mean...Z tGravityAcc.std...X
```

```
## 1           -0.2821650          -0.06810286          -0.9766096
## 2           -0.3621534          -0.07540294          -0.9563670
## 3           -0.2666103          -0.06211996          -0.9505598
## 4            0.2044116           0.33204370          -0.9684571
## 5           -0.2729838           0.01349058          -0.9937630
## 6            0.7055498           0.44581772          -0.8968300
##   tGravityAcc.std...Y tGravityAcc.std...Z tBodyAccJerk.mean...X
## 1          -0.9713060          -0.9477172            0.07404163
## 2          -0.9528492          -0.9123794            0.10137273
## 3          -0.9370187          -0.8959397            0.05415532
## 4          -0.9355171          -0.9490409            0.07748252
## 5          -0.9812260          -0.9763241            0.07537665
## 6          -0.9077200          -0.8523663            0.08108653
##   tBodyAccJerk.mean...Y tBodyAccJerk.mean...Z tBodyAccJerk.std...X
## 1          0.0282721096          -0.004168406          -0.11361560
## 2          0.0194863076          -0.045562545          -0.44684389
## 3          0.0296504490          -0.010971973          -0.01228386
## 4         -0.0006191028          -0.003367792          -0.98643071
## 5          0.0079757309          -0.003685250          -0.99460454
## 6          0.0038382040           0.010834236          -0.95848211
##   tBodyAccJerk.std...Y tBodyAccJerk.std...Z tBodyGyro.mean...X
## 1            0.0670025           -0.5026998        -0.04183096
## 2           -0.3782744           -0.7065935         0.05054938
## 3           -0.1016014           -0.3457350        -0.03507819
## 4           -0.9813720           -0.9879108        -0.04535006
## 5           -0.9856487           -0.9922512        -0.02398773
## 6           -0.9241493           -0.9548551        -0.01655309
##   tBodyGyro.mean...Y tBodyGyro.mean...Z tBodyGyro.std...X
## 1        -0.06953005         0.08494482        -0.4735355
## 2        -0.16617002         0.05835955        -0.5448711
## 3        -0.09093713         0.09008501        -0.4580305
## 4        -0.09192415         0.06293138        -0.9772113
## 5        -0.05939722         0.07480075        -0.9871919
## 6        -0.06448612         0.14868944        -0.8735439
##   tBodyGyro.std...Y tBodyGyro.std...Z tBodyGyroJerk.mean...X
## 1      -0.054607769        -0.3442666             -0.08999754
## 2       0.004105184        -0.5071687             -0.12223277
## 3      -0.126349195        -0.1247025             -0.07395920
## 4      -0.966473895        -0.9414259             -0.09367938
## 5      -0.987734440        -0.9806456             -0.09960921
## 6      -0.951090440        -0.9082847             -0.10727095
##   tBodyGyroJerk.mean...Y tBodyGyroJerk.mean...Z tBodyGyroJerk.std...X
## 1            -0.03984287            -0.04613093            -0.2074219
## 2            -0.04214859            -0.04071255            -0.6147865
## 3            -0.04399028            -0.02704611            -0.4870273
## 4            -0.04021181            -0.04670263            -0.9917316
## 5            -0.04406279            -0.04895055            -0.9929451
## 6            -0.04151729            -0.07405012            -0.9186085
##   tBodyGyroJerk.std...Y tBodyGyroJerk.std...Z tBodyAccMag.mean..
## 1            -0.3044685            -0.4042555        -0.13697118
## 2            -0.6016967            -0.6063320        -0.12992763
## 3            -0.2388248            -0.2687615         0.02718829
## 4            -0.9895181            -0.9879358        -0.94853679
## 5            -0.9951379            -0.9921085        -0.98427821
```

```
## 6            -0.9679072            -0.9577902        -0.84192915
##   tBodyAccMag.std.. tGravityAccMag.mean.. tGravityAccMag.std..
## 1       -0.21968865           -0.13697118          -0.21968865
## 2       -0.32497093           -0.12992763          -0.32497093
## 3        0.01988435            0.02718829           0.01988435
## 4       -0.92707842           -0.94853679          -0.92707842
## 5       -0.98194293           -0.98427821          -0.98194293
## 6       -0.79514486           -0.84192915          -0.79514486
##   tBodyAccJerkMag.mean.. tBodyAccJerkMag.std.. tBodyGyroMag.mean..
## 1            -0.14142881           -0.07447175         -0.16097955
## 2            -0.46650345           -0.47899162         -0.12673559
## 3            -0.08944748           -0.02578772         -0.07574125
## 4            -0.98736420           -0.98412002         -0.93089249
## 5            -0.99236779           -0.99309621         -0.97649379
## 6            -0.95439626           -0.92824563         -0.87475955
##   tBodyGyroMag.std.. tBodyGyroJerkMag.mean.. tBodyGyroJerkMag.std..
## 1         -0.1869784              -0.2987037             -0.3253249
## 2         -0.1486193              -0.5948829             -0.6485530
## 3         -0.2257244              -0.2954638             -0.3065106
## 4         -0.9345318              -0.9919763             -0.9883087
## 5         -0.9786900              -0.9949668             -0.9947332
## 6         -0.8190102              -0.9634610             -0.9358410
##   fBodyAcc.mean...X fBodyAcc.mean...Y fBodyAcc.mean...Z fBodyAcc.std...X
## 1       -0.20279431       0.089712726        -0.3315601      -0.31913472
## 2       -0.40432178      -0.190976721        -0.4333497      -0.33742819
## 3        0.03822918       0.001549908        -0.2255745       0.02433084
## 4       -0.97964124      -0.944084550        -0.9591849      -0.97641231
## 5       -0.99524993      -0.977070848        -0.9852971      -0.99602835
## 6       -0.93909905      -0.867065205        -0.8826669      -0.92443743
##   fBodyAcc.std...Y fBodyAcc.std...Z fBodyAcc.meanFreq...X
## 1       0.05604001      -0.27968675           -0.20754837
## 2       0.02176951       0.08595655           -0.41873500
## 3      -0.11296374      -0.29792789           -0.30739520
## 4      -0.91727501      -0.93446956           -0.04951360
## 5      -0.97229310      -0.97793726            0.08651536
## 6      -0.83362556      -0.81289156           -0.15879267
##   fBodyAcc.meanFreq...Y fBodyAcc.meanFreq...Z fBodyAccJerk.mean...X
## 1            0.11309365            0.04972652           -0.17054696
## 2           -0.16069721           -0.52011479           -0.47987525
## 3            0.06322008            0.29432270           -0.02766387
## 4            0.07594608            0.23882987           -0.98659702
## 5            0.11747895            0.24485859           -0.99463080
## 6            0.09753484            0.08943766           -0.95707388
##   fBodyAccJerk.mean...Y fBodyAccJerk.mean...Z fBodyAccJerk.std...X
## 1           -0.03522552            -0.4689992           -0.1335866
## 2           -0.41344459            -0.6854744           -0.4619070
## 3           -0.12866716            -0.2883347           -0.0863279
## 4           -0.98157947            -0.9860531           -0.9874930
## 5           -0.98541870            -0.9907522           -0.9950738
## 6           -0.92246261            -0.9480609           -0.9641607
##   fBodyAccJerk.std...Y fBodyAccJerk.std...Z fBodyAccJerk.meanFreq...X
## 1            0.1067399           -0.5347134                -0.2092620
## 2           -0.3817771           -0.7260402                -0.3770231
## 3           -0.1345800           -0.4017215                -0.2531643
```

```
## 4           -0.9825139           -0.9883392                 0.2566108
## 5           -0.9870182           -0.9923498                 0.3141829
## 6           -0.9322179           -0.9605870                 0.1324191
##   fBodyAccJerk.meanFreq...Y fBodyAccJerk.meanFreq...Z fBodyGyro.mean...X
## 1               -0.38623714              -0.185530281         -0.3390322
## 2               -0.50949553              -0.551104284         -0.4926117
## 3               -0.33758970               0.009372239         -0.3524496
## 4                0.04754378               0.092392003         -0.9761615
## 5                0.03916190               0.138581479         -0.9863868
## 6                0.02451362               0.024387945         -0.8502492
##   fBodyGyro.mean...Y fBodyGyro.mean...Z fBodyGyro.std...X
## 1        -0.10305942        -0.25594094        -0.5166919
## 2        -0.31947461        -0.45359721        -0.5658925
## 3        -0.05570225        -0.03186943        -0.4954225
## 4        -0.97583859        -0.95131554        -0.9779042
## 5        -0.98898446        -0.98077312        -0.9874971
## 6        -0.95219149        -0.90930272        -0.8822965
##   fBodyGyro.std...Y fBodyGyro.std...Z fBodyGyro.meanFreq...X
## 1       -0.03350816        -0.4365622            0.014784499
## 2        0.15153891        -0.5717078           -0.187450248
## 3       -0.18141473        -0.2384436           -0.100453729
## 4       -0.96234504        -0.9439178            0.189153021
## 5       -0.98710773        -0.9823453           -0.120293021
## 6       -0.95123205        -0.9165825           -0.003546796
##   fBodyGyro.meanFreq...Y fBodyGyro.meanFreq...Z fBodyAccMag.mean..
## 1            -0.06577462           0.0007733216        -0.12862345
## 2            -0.47357479          -0.1333739043        -0.35239594
## 3             0.08255115          -0.0756762068         0.09658453
## 4             0.06312707          -0.0297839207        -0.94778292
## 5            -0.04471920           0.1006076351        -0.98535636
## 6            -0.09152913           0.0104581257        -0.86176765
##   fBodyAccMag.std.. fBodyAccMag.meanFreq.. fBodyBodyAccJerkMag.mean..
## 1        -0.3980326             0.19064372                -0.05711940
## 2        -0.4162601            -0.09774335                -0.44265216
## 3        -0.1865303             0.11918714                 0.02621849
## 4        -0.9284448             0.23665501                -0.98526213
## 5        -0.9823138             0.28455529                -0.99254248
## 6        -0.7983009             0.08640856                -0.93330036
##   fBodyBodyAccJerkMag.std.. fBodyBodyAccJerkMag.meanFreq..
## 1                -0.1034924                     0.09382218
## 2                -0.5330599                     0.08535241
## 3                -0.1040523                     0.07649155
## 4                -0.9816062                     0.35185220
## 5                -0.9925360                     0.42222010
## 6                -0.9218040                     0.26639115
##   fBodyBodyGyroMag.mean.. fBodyBodyGyroMag.std..
## 1              -0.1992526             -0.3210180
## 2              -0.3259615             -0.1829855
## 3              -0.1857203             -0.3983504
## 4              -0.9584356             -0.9321984
## 5              -0.9846176             -0.9784661
## 6              -0.8621902             -0.8243194
##   fBodyBodyGyroMag.meanFreq.. fBodyBodyGyroJerkMag.mean..
## 1                0.2688443675                  -0.3193086
```

```
## 2               -0.2193033761                  -0.6346651
## 3                0.3496138955                  -0.2819634
## 4               -0.0002621867                  -0.9897975
## 5               -0.0286057725                  -0.9948154
## 6               -0.1397750127                  -0.9423669
##   fBodyBodyGyroJerkMag.std.. fBodyBodyGyroJerkMag.meanFreq..
## 1                 -0.3816019                        0.1906634
## 2                 -0.6939305                        0.1142773
## 3                 -0.3919199                        0.1900007
## 4                 -0.9870496                        0.1847759
## 5                 -0.9946711                        0.3344987
## 6                 -0.9326607                        0.1764859
```

Below, a summary of the min, max, median and quartiles of the sensor information. Note; the variables contain means of the mean and standard deviation by Activity and SUbject, so the summary KPIs themselves are a summary of those mean/standard deviation KPIs.

```
summary(tidyT[,3:81])
```

```
##  tBodyAcc.mean...X tBodyAcc.mean...Y   tBodyAcc.mean...Z
##  Min.   :0.2216    Min.   :-0.040514   Min.   :-0.15251
##  1st Qu.:0.2712    1st Qu.:-0.020022   1st Qu.:-0.11207
##  Median :0.2770    Median :-0.017262   Median :-0.10819
##  Mean   :0.2743    Mean   :-0.017876   Mean   :-0.10916
##  3rd Qu.:0.2800    3rd Qu.:-0.014936   3rd Qu.:-0.10443
##  Max.   :0.3015    Max.   :-0.001308   Max.   :-0.07538
##  tBodyAcc.std...X  tBodyAcc.std...Y   tBodyAcc.std...Z
##  Min.   :-0.9961   Min.   :-0.99024   Min.   :-0.9877
##  1st Qu.:-0.9799   1st Qu.:-0.94205   1st Qu.:-0.9498
##  Median :-0.7526   Median :-0.50897   Median :-0.6518
##  Mean   :-0.5577   Mean   :-0.46046   Mean   :-0.5756
##  3rd Qu.:-0.1984   3rd Qu.:-0.03077   3rd Qu.:-0.2306
##  Max.   : 0.6269   Max.   : 0.61694   Max.   : 0.6090
##  tGravityAcc.mean...X tGravityAcc.mean...Y tGravityAcc.mean...Z
##  Min.   :-0.6800      Min.   :-0.47989     Min.   :-0.49509
##  1st Qu.: 0.8376      1st Qu.:-0.23319     1st Qu.:-0.11726
##  Median : 0.9208      Median :-0.12782     Median : 0.02384
##  Mean   : 0.6975      Mean   :-0.01621     Mean   : 0.07413
##  3rd Qu.: 0.9425      3rd Qu.: 0.08773     3rd Qu.: 0.14946
##  Max.   : 0.9745      Max.   : 0.95659     Max.   : 0.95787
##  tGravityAcc.std...X tGravityAcc.std...Y tGravityAcc.std...Z
##  Min.   :-0.9968     Min.   :-0.9942     Min.   :-0.9910
##  1st Qu.:-0.9825     1st Qu.:-0.9711     1st Qu.:-0.9605
##  Median :-0.9695     Median :-0.9590     Median :-0.9450
##  Mean   :-0.9638     Mean   :-0.9524     Mean   :-0.9364
##  3rd Qu.:-0.9509     3rd Qu.:-0.9370     3rd Qu.:-0.9180
##  Max.   :-0.8296     Max.   :-0.6436     Max.   :-0.6102
##  tBodyAccJerk.mean...X tBodyAccJerk.mean...Y tBodyAccJerk.mean...Z
##  Min.   :0.04269       Min.   :-0.0386872    Min.   :-0.067458
##  1st Qu.:0.07396       1st Qu.: 0.0004664    1st Qu.:-0.010601
##  Median :0.07640       Median : 0.0094698    Median :-0.003861
##  Mean   :0.07947       Mean   : 0.0075652    Mean   :-0.004953
##  3rd Qu.:0.08330       3rd Qu.: 0.0134008    3rd Qu.: 0.001958
##  Max.   :0.13019       Max.   : 0.0568186    Max.   : 0.038053
##  tBodyAccJerk.std...X tBodyAccJerk.std...Y tBodyAccJerk.std...Z
```

```
##  Min.   :-0.9946      Min.   :-0.9895      Min.   :-0.99329
##  1st Qu.:-0.9832      1st Qu.:-0.9724      1st Qu.:-0.98266
##  Median :-0.8104      Median :-0.7756      Median :-0.88366
##  Mean   :-0.5949      Mean   :-0.5654      Mean   :-0.73596
##  3rd Qu.:-0.2233      3rd Qu.:-0.1483      3rd Qu.:-0.51212
##  Max.   : 0.5443      Max.   : 0.3553      Max.   : 0.03102
##  tBodyGyro.mean...X tBodyGyro.mean...Y tBodyGyro.mean...Z
##  Min.   :-0.20578   Min.   :-0.20421   Min.   :-0.07245
##  1st Qu.:-0.04712   1st Qu.:-0.08955   1st Qu.: 0.07475
##  Median :-0.02871   Median :-0.07318   Median : 0.08512
##  Mean   :-0.03244   Mean   :-0.07426   Mean   : 0.08744
##  3rd Qu.:-0.01676   3rd Qu.:-0.06113   3rd Qu.: 0.10177
##  Max.   : 0.19270   Max.   : 0.02747   Max.   : 0.17910
##  tBodyGyro.std...X tBodyGyro.std...Y tBodyGyro.std...Z
##  Min.   :-0.9943   Min.   :-0.9942   Min.   :-0.9855
##  1st Qu.:-0.9735   1st Qu.:-0.9629   1st Qu.:-0.9609
##  Median :-0.7890   Median :-0.8017   Median :-0.8010
##  Mean   :-0.6916   Mean   :-0.6533   Mean   :-0.6164
##  3rd Qu.:-0.4414   3rd Qu.:-0.4196   3rd Qu.:-0.3106
##  Max.   : 0.2677   Max.   : 0.4765   Max.   : 0.5649
##  tBodyGyroJerk.mean...X tBodyGyroJerk.mean...Y tBodyGyroJerk.mean...Z
##  Min.   :-0.15721       Min.   :-0.07681       Min.   :-0.092500
##  1st Qu.:-0.10322       1st Qu.:-0.04552       1st Qu.:-0.061725
##  Median :-0.09868       Median :-0.04112       Median :-0.053430
##  Mean   :-0.09606       Mean   :-0.04269       Mean   :-0.054802
##  3rd Qu.:-0.09110       3rd Qu.:-0.03842       3rd Qu.:-0.048985
##  Max.   :-0.02209       Max.   :-0.01320       Max.   :-0.006941
##  tBodyGyroJerk.std...X tBodyGyroJerk.std...Y tBodyGyroJerk.std...Z
##  Min.   :-0.9965       Min.   :-0.9971       Min.   :-0.9954
##  1st Qu.:-0.9800       1st Qu.:-0.9832       1st Qu.:-0.9848
##  Median :-0.8396       Median :-0.8942       Median :-0.8610
##  Mean   :-0.7036       Mean   :-0.7636       Mean   :-0.7096
##  3rd Qu.:-0.4629       3rd Qu.:-0.5861       3rd Qu.:-0.4741
##  Max.   : 0.1791       Max.   : 0.2959       Max.   : 0.1932
##  tBodyAccMag.mean.. tBodyAccMag.std.. tGravityAccMag.mean..
##  Min.   :-0.9865    Min.   :-0.9865   Min.   :-0.9865
##  1st Qu.:-0.9573    1st Qu.:-0.9430   1st Qu.:-0.9573
##  Median :-0.4829    Median :-0.6074   Median :-0.4829
##  Mean   :-0.4973    Mean   :-0.5439   Mean   :-0.4973
##  3rd Qu.:-0.0919    3rd Qu.:-0.2090   3rd Qu.:-0.0919
##  Max.   : 0.6446    Max.   : 0.4284   Max.   : 0.6446
##  tGravityAccMag.std.. tBodyAccJerkMag.mean.. tBodyAccJerkMag.std..
##  Min.   :-0.9865      Min.   :-0.9928        Min.   :-0.9946
##  1st Qu.:-0.9430      1st Qu.:-0.9807        1st Qu.:-0.9765
##  Median :-0.6074      Median :-0.8168        Median :-0.8014
##  Mean   :-0.5439      Mean   :-0.6079        Mean   :-0.5842
##  3rd Qu.:-0.2090      3rd Qu.:-0.2456        3rd Qu.:-0.2173
##  Max.   : 0.4284      Max.   : 0.4345        Max.   : 0.4506
##  tBodyGyroMag.mean.. tBodyGyroMag.std.. tBodyGyroJerkMag.mean..
##  Min.   :-0.9807     Min.   :-0.9814    Min.   :-0.99732
##  1st Qu.:-0.9461     1st Qu.:-0.9476    1st Qu.:-0.98515
##  Median :-0.6551     Median :-0.7420    Median :-0.86479
##  Mean   :-0.5652     Mean   :-0.6304    Mean   :-0.73637
##  3rd Qu.:-0.2159     3rd Qu.:-0.3602    3rd Qu.:-0.51186
```

```
##  Max.   : 0.4180     Max.   : 0.3000    Max.   : 0.08758
##  tBodyGyroJerkMag.std.. fBodyAcc.mean...X fBodyAcc.mean...Y
##  Min.   :-0.9977        Min.   :-0.9952   Min.   :-0.98903
##  1st Qu.:-0.9805        1st Qu.:-0.9787   1st Qu.:-0.95361
##  Median :-0.8809        Median :-0.7691   Median :-0.59498
##  Mean   :-0.7550        Mean   :-0.5758   Mean   :-0.48873
##  3rd Qu.:-0.5767        3rd Qu.:-0.2174   3rd Qu.:-0.06341
##  Max.   : 0.2502        Max.   : 0.5370   Max.   : 0.52419
##  fBodyAcc.mean...Z fBodyAcc.std...X  fBodyAcc.std...Y   fBodyAcc.std...Z
##  Min.   :-0.9895   Min.   :-0.9966   Min.   :-0.99068   Min.   :-0.9872
##  1st Qu.:-0.9619   1st Qu.:-0.9820   1st Qu.:-0.94042   1st Qu.:-0.9459
##  Median :-0.7236   Median :-0.7470   Median :-0.51338   Median :-0.6441
##  Mean   :-0.6297   Mean   :-0.5522   Mean   :-0.48148   Mean   :-0.5824
##  3rd Qu.:-0.3183   3rd Qu.:-0.1966   3rd Qu.:-0.07913   3rd Qu.:-0.2655
##  Max.   : 0.2807   Max.   : 0.6585   Max.   : 0.56019   Max.   : 0.6871
##  fBodyAcc.meanFreq...X fBodyAcc.meanFreq...Y fBodyAcc.meanFreq...Z
##  Min.   :-0.63591      Min.   :-0.379518     Min.   :-0.52011
##  1st Qu.:-0.39165      1st Qu.:-0.081314     1st Qu.:-0.03629
##  Median :-0.25731      Median : 0.007855     Median : 0.06582
##  Mean   :-0.23227      Mean   : 0.011529     Mean   : 0.04372
##  3rd Qu.:-0.06105      3rd Qu.: 0.086281     3rd Qu.: 0.17542
##  Max.   : 0.15912      Max.   : 0.466528     Max.   : 0.40253
##  fBodyAccJerk.mean...X fBodyAccJerk.mean...Y fBodyAccJerk.mean...Z
##  Min.   :-0.9946       Min.   :-0.9894       Min.   :-0.9920
##  1st Qu.:-0.9828       1st Qu.:-0.9725       1st Qu.:-0.9796
##  Median :-0.8126       Median :-0.7817       Median :-0.8707
##  Mean   :-0.6139       Mean   :-0.5882       Mean   :-0.7144
##  3rd Qu.:-0.2820       3rd Qu.:-0.1963       3rd Qu.:-0.4697
##  Max.   : 0.4743       Max.   : 0.2767       Max.   : 0.1578
##  fBodyAccJerk.std...X fBodyAccJerk.std...Y fBodyAccJerk.std...Z
##  Min.   :-0.9951      Min.   :-0.9905      Min.   :-0.993108
##  1st Qu.:-0.9847      1st Qu.:-0.9737      1st Qu.:-0.983747
##  Median :-0.8254      Median :-0.7852      Median :-0.895121
##  Mean   :-0.6121      Mean   :-0.5707      Mean   :-0.756489
##  3rd Qu.:-0.2475      3rd Qu.:-0.1685      3rd Qu.:-0.543787
##  Max.   : 0.4768      Max.   : 0.3498      Max.   :-0.006236
##  fBodyAccJerk.meanFreq...X fBodyAccJerk.meanFreq...Y
##  Min.   :-0.57604          Min.   :-0.60197
##  1st Qu.:-0.28966          1st Qu.:-0.39751
##  Median :-0.06091          Median :-0.23209
##  Mean   :-0.06910          Mean   :-0.22810
##  3rd Qu.: 0.17660          3rd Qu.:-0.04721
##  Max.   : 0.33145          Max.   : 0.19568
##  fBodyAccJerk.meanFreq...Z fBodyGyro.mean...X fBodyGyro.mean...Y
##  Min.   :-0.62756          Min.   :-0.9931    Min.   :-0.9940
##  1st Qu.:-0.30867          1st Qu.:-0.9697    1st Qu.:-0.9700
##  Median :-0.09187          Median :-0.7300    Median :-0.8141
##  Mean   :-0.13760          Mean   :-0.6367    Mean   :-0.6767
##  3rd Qu.: 0.03858          3rd Qu.:-0.3387    3rd Qu.:-0.4458
##  Max.   : 0.23011          Max.   : 0.4750    Max.   : 0.3288
##  fBodyGyro.mean...Z fBodyGyro.std...X fBodyGyro.std...Y fBodyGyro.std...Z
##  Min.   :-0.9860    Min.   :-0.9947   Min.   :-0.9944   Min.   :-0.9867
##  1st Qu.:-0.9624    1st Qu.:-0.9750   1st Qu.:-0.9602   1st Qu.:-0.9643
##  Median :-0.7909    Median :-0.8086   Median :-0.7964   Median :-0.8224
```

```
##  Mean   :-0.6044    Mean   :-0.7110   Mean   :-0.6454   Mean   :-0.6577
##  3rd Qu.:-0.2635    3rd Qu.:-0.4813   3rd Qu.:-0.4154   3rd Qu.:-0.3916
##  Max.   : 0.4924    Max.   : 0.1966   Max.   : 0.6462   Max.   : 0.5225
##  fBodyGyro.meanFreq...X fBodyGyro.meanFreq...Y fBodyGyro.meanFreq...Z
##  Min.   :-0.395770      Min.   :-0.66681       Min.   :-0.50749
##  1st Qu.:-0.213363      1st Qu.:-0.29433       1st Qu.:-0.15481
##  Median :-0.115527      Median :-0.15794       Median :-0.05081
##  Mean   :-0.104551      Mean   :-0.16741       Mean   :-0.05718
##  3rd Qu.: 0.002655      3rd Qu.:-0.04269       3rd Qu.: 0.04152
##  Max.   : 0.249209      Max.   : 0.27314       Max.   : 0.37707
##  fBodyAccMag.mean.. fBodyAccMag.std.. fBodyAccMag.meanFreq..
##  Min.   :-0.9868    Min.   :-0.9876   Min.   :-0.31234
##  1st Qu.:-0.9560    1st Qu.:-0.9452   1st Qu.:-0.01475
##  Median :-0.6703    Median :-0.6513   Median : 0.08132
##  Mean   :-0.5365    Mean   :-0.6210   Mean   : 0.07613
##  3rd Qu.:-0.1622    3rd Qu.:-0.3654   3rd Qu.: 0.17436
##  Max.   : 0.5866    Max.   : 0.1787   Max.   : 0.43585
##  fBodyBodyAccJerkMag.mean.. fBodyBodyAccJerkMag.std..
##  Min.   :-0.9940            Min.   :-0.9944
##  1st Qu.:-0.9770            1st Qu.:-0.9752
##  Median :-0.7940            Median :-0.8126
##  Mean   :-0.5756            Mean   :-0.5992
##  3rd Qu.:-0.1872            3rd Qu.:-0.2668
##  Max.   : 0.5384            Max.   : 0.3163
##  fBodyBodyAccJerkMag.meanFreq.. fBodyBodyGyroMag.mean..
##  Min.   :-0.12521               Min.   :-0.9865
##  1st Qu.: 0.04527               1st Qu.:-0.9616
##  Median : 0.17198               Median :-0.7657
##  Mean   : 0.16255               Mean   :-0.6671
##  3rd Qu.: 0.27593               3rd Qu.:-0.4087
##  Max.   : 0.48809               Max.   : 0.2040
##  fBodyBodyGyroMag.std.. fBodyBodyGyroMag.meanFreq..
##  Min.   :-0.9815        Min.   :-0.45664
##  1st Qu.:-0.9488        1st Qu.:-0.16951
##  Median :-0.7727        Median :-0.05352
##  Mean   :-0.6723        Mean   :-0.03603
##  3rd Qu.:-0.4277        3rd Qu.: 0.08228
##  Max.   : 0.2367        Max.   : 0.40952
##  fBodyBodyGyroJerkMag.mean.. fBodyBodyGyroJerkMag.std..
##  Min.   :-0.9976             Min.   :-0.9976
##  1st Qu.:-0.9813             1st Qu.:-0.9802
##  Median :-0.8779             Median :-0.8941
##  Mean   :-0.7564             Mean   :-0.7715
##  3rd Qu.:-0.5831             3rd Qu.:-0.6081
##  Max.   : 0.1466             Max.   : 0.2878
##  fBodyBodyGyroJerkMag.meanFreq..
##  Min.   :-0.18292
##  1st Qu.: 0.05423
##  Median : 0.11156
##  Mean   : 0.12592
##  3rd Qu.: 0.20805
##  Max.   : 0.42630
```

Annex

Code used to import the *tidydata.csv* into the *tidyT* dataframe which was used for computing the attributes in the description of the data/variables above

```
tidyT<-read.csv(file = "./UCI HAR Dataset/tidydata.csv",sep=" ")
```