DATA DICTIONARY

The tidy data set finalData.txt contains **81** variables. Each of them is described below. Each [[*]] denotes a new variable where * is the column number for that variable.

Please note: Features in columns 3 through 81 have been normalized and bounded within [-1,1], so there are no units.

[[1]]

[1] "Group.1"- this column contains the SubjectID. Subject corresponds to a person who participated in the study.

[[2]]

[1] "Group.2": this column contains the activity labels. The different labels may be

WALKING, WALKING_UPSTAIRS, WALKING_DOWNSTAIRS, SITTING, STANDING, LAYING

The features selected for this database come from the accelerometer and gyroscope 3-axial raw signals tAcc-XYZ and tGyro-XYZ. These time domain signals (prefix 't' to denote time) were captured at a constant rate of 50 Hz. Then they were filtered using a median filter and a 3rd order low pass Butterworth filter with a corner frequency of 20 Hz to remove noise. Similarly, the acceleration signal was then separated into body and gravity acceleration signals (tBodyAcc-XYZ and tGravityAcc-XYZ) using another low pass Butterworth filter with a corner frequency of 0.3 Hz.

Subsequently, the body linear acceleration and angular velocity were derived in time to obtain Jerk signals (tBodyAccJerk-XYZ and tBodyGyroJerk-XYZ). Also the magnitude of these three-dimensional signals were calculated using the Euclidean norm (tBodyAccMag, tGravityAccMag, tBodyAccJerkMag, tBodyGyroMag, tBodyGyroJerkMag).

Finally a Fast Fourier Transform (FFT) was applied to some of these signals producing fBodyAcc-XYZ, fBodyAccJerk-XYZ, fBodyGyro-XYZ, fBodyAccJerkMag, fBodyGyroMag, fBodyGyroJerkMag. (Note the 'f' to indicate frequency domain signals).

These signals were used to estimate variables of the feature vector for each pattern:

'-XYZ' is used to denote 3-axial signals in the X, Y and Z directions.

tBodyAcc-XYZ

tGravityAcc-XYZ

tBodyAccJerk-XYZ

tBodyGyro-XYZ

tBodyGyroJerk-XYZ

tBodyAccMag

tGravityAccMag

tBodyAccJerkMag

tBodyGyroMag

tBodyGyroJerkMag

fBodyAcc-XYZ

fBodyAccJerk-XYZ

fBodyGyro-XYZ

fBodyAccMag

fBodyAccJerkMag

fBodyGyroMag

fBodyGyroJerkMag

The set of variables that were estimated from these signals are:

mean(): Mean value

std(): Standard deviation

mad(): Median absolute deviation

max(): Largest value in array

min(): Smallest value in array

sma(): Signal magnitude area

energy(): Energy measure. Sum of the squares divided by the number of values.

iqr(): Interquartile range

entropy(): Signal entropy

arCoeff(): Autorregresion coefficients with Burg order equal to 4

correlation(): correlation coefficient between two signals

maxInds(): index of the frequency component with largest magnitude

meanFreq(): Weighted average of the frequency components to obtain a mean frequency

skewness(): skewness of the frequency domain signal

kurtosis(): kurtosis of the frequency domain signal

bandsEnergy(): Energy of a frequency interval within the 64 bins of the FFT of each window.

angle(): Angle between to vectors.

Additional vectors obtained by averaging the signals in a signal window sample. These are used on the angle() variable:

gravityMean

tBodyAccMean

tBodyAccJerkMean

tBodyGyroMean

tBodyGyroJerkMean

The additional columns mentioned below are just an iteration of the above mentioned variables.

[[3]]

[1] "tBodyAcc.mean...X"

[[4]]

[1] "tBodyAcc.mean...Y"

[[5]]

[1] "tBodyAcc.mean...Z"

[[6]]

[1] "tGravityAcc.mean...X"

[[7]]

[1] "tGravityAcc.mean...Y"

[[8]]

[1] "tGravityAcc.mean...Z"

[[9]]

[1] "tBodyAccJerk.mean...X"

[[10]]

[1] "tBodyAccJerk.mean...Y"

[[11]]

[1] "tBodyAccJerk.mean...Z"

[[12]]

[1] "tBodyGyro.mean...X"

[[13]]

[1] "tBodyGyro.mean...Y"

[[14]]

[1] "tBodyGyro.mean...Z"

[[15]]

[1] "tBodyGyroJerk.mean...X"

[[16]]

[1] "tBodyGyroJerk.mean...Y"

[[17]]

[1] "tBodyGyroJerk.mean...Z"

[[18]]

[1] "tBodyAccMag.mean.."

[[19]]

[1] "tGravityAccMag.mean.."

[[20]]

[1] "tBodyAccJerkMag.mean.."

[[21]]

[1] "tBodyGyroMag.mean.."

[[22]]

[1] "tBodyGyroJerkMag.mean.."

[[23]]

[1] "fBodyAcc.mean...X"

[[24]]

[1] "fBodyAcc.mean...Y"

[[25]]

[1] "fBodyAcc.mean...Z"

[[26]]

[1] "fBodyAcc.meanFreq...X"

[[27]]

[1] "fBodyAcc.meanFreq...Y"

[[28]]

[1] "fBodyAcc.meanFreq...Z"

[[29]]

[1] "fBodyAccJerk.mean...X"

[[30]]

[1] "fBodyAccJerk.mean...Y"

[[31]]

[1] "fBodyAccJerk.mean...Z"

[[32]]

[1] "fBodyAccJerk.meanFreq...X"

[[33]]

[1] "fBodyAccJerk.meanFreq...Y"

[[34]]

[1] "fBodyAccJerk.meanFreq...Z"

[[35]]

[1] "fBodyGyro.mean...X"

[[36]]

[1] "fBodyGyro.mean...Y"

[[37]]

[1] "fBodyGyro.mean...Z"

[[38]]

[1] "fBodyGyro.meanFreq...X"

[[39]]

[1] "fBodyGyro.meanFreq...Y"

[[40]]

[1] "fBodyGyro.meanFreq...Z"

[[41]]

[1] "fBodyAccMag.mean.."

[[42]]

[1] "fBodyAccMag.meanFreq.."

[[43]]

[1] "fBodyBodyAccJerkMag.mean.."

[[44]]

[1] "fBodyBodyAccJerkMag.meanFreq.."

[[45]]

[1] "fBodyBodyGyroMag.mean.."

[[46]]

[1] "fBodyBodyGyroMag.meanFreq.."

[[47]]

[1] "fBodyBodyGyroJerkMag.mean.."

[[48]]

[1] "fBodyBodyGyroJerkMag.meanFreq.."

[[49]]

[1] "tBodyAcc.std...X"

[[50]]

[1] "tBodyAcc.std...Y"

[[51]]

[1] "tBodyAcc.std...Z"

[[52]]

[1] "tGravityAcc.std...X"

[[53]]

[1] "tGravityAcc.std...Y"

[[54]]

[1] "tGravityAcc.std...Z"

[[55]]

[1] "tBodyAccJerk.std...X"

[[56]]

[1] "tBodyAccJerk.std...Y"

[[57]]

[1] "tBodyAccJerk.std...Z"

[[58]]

[1] "tBodyGyro.std...X"

[[59]]

[1] "tBodyGyro.std...Y"

[[60]]

[1] "tBodyGyro.std...Z"

[[61]]

[1] "tBodyGyroJerk.std...X"

[[62]]

[1] "tBodyGyroJerk.std...Y"

[[63]]

[1] "tBodyGyroJerk.std...Z"

[[64]]

[1] "tBodyAccMag.std.."

[[65]]

[1] "tGravityAccMag.std.."

[[66]]

[1] "tBodyAccJerkMag.std.."

[[67]]

[1] "tBodyGyroMag.std.."

[[68]]

[1] "tBodyGyroJerkMag.std.."

[[69]]

[1] "fBodyAcc.std...X"

[[70]]

[1] "fBodyAcc.std...Y"

[[71]]

[1] "fBodyAcc.std...Z"

[[72]]

[1] "fBodyAccJerk.std...X"

[[73]]

[1] "fBodyAccJerk.std...Y"

[[74]]

[1] "fBodyAccJerk.std...Z"

[[75]]

[1] "fBodyGyro.std...X"

[[76]]

[1] "fBodyGyro.std...Y"

[[77]]

[1] "fBodyGyro.std...Z"

[[78]]

[1] "fBodyAccMag.std.."

[[79]]

[1] "fBodyBodyAccJerkMag.std.."

[[80]]

[1] "fBodyBodyGyroMag.std.."

[[81]]

[1] "fBodyBodyGyroJerkMag.std.."