CODE BOOK

Code Book for the tidy_data file corresponding to the project to be completed during the Getting And Cleaning Data Coursera MOOC.

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.

Here, the mean value (mean()) and the standard deviation (std()) are given for each of the following measures:

"tBodyAcc-mean()-X"
"tBodyAcc-mean()-Y"
"tBodyAcc-mean()-Z"
"tBodyAcc-std()-X"
"tBodyAcc-std()-Y"
"tBodyAcc-std()-Z"
"tGravityAcc-mean()-X"
"tGravityAcc-mean()-Y"
"tGravityAcc-mean()-Z"
"tGravityAcc-std()-X"
"tGravityAcc-std()-Y"
"tGravityAcc-std()-Z"
"tBodyAccJerk-mean()-X"
"tBodyAccJerk-mean()-Y"
"tBodyAccJerk-mean()-Z"
"tBodyAccJerk-std()-X"
"tBodyAccJerk-std()-Y"
"tBodyAccJerk-std()-Z"
"tBodyGyro-mean()-X"
"tBodyGyro-mean()-Y"

"tBodyGyro-mean()-Z"
"tBodyGyro-std()-X"
"tBodyGyro-std()-Y"
"tBodyGyro-std()-Z"
"tBodyGyroJerk-mean()-X"
"tBodyGyroJerk-mean()-Y"
"tBodyGyroJerk-mean()-Z"
"tBodyGyroJerk-std()-X"
"tBodyGyroJerk-std()-Y"
"tBodyGyroJerk-std()-Z"
"tBodyAccMag-mean()"
"tBodyAccMag-std()"
"tGravityAccMag-mean()"
"tGravityAccMag-std()"
"tBodyAccJerkMag-mean()"
"tBodyAccJerkMag-std()"
"tBodyGyroMag-mean()"
"tBodyGyroMag-std()"
"tBodyGyroJerkMag-mean()"
"tBodyGyroJerkMag-std()"
"fBodyAcc-mean()-X"
"fBodyAcc-mean()-Y"
"fBodyAcc-mean()-Z"
"fBodyAcc-std()-X"
"fBodyAcc-std()-Y"
"fBodyAcc-std()-Z"
"tBodyGyroMag-sma()"
"tBodyGyroMag-energy()"
"tBodyGyroMag-iqr()"
"tBodyGyroMag-entropy()"
"tBodyGyroMag-arCoeff()1"
"tBodyGyroMag-arCoeff()2"
"fBodyGyro-mean()-X"
"fBodyGyro-mean()-Y"
"fBodyGyro-mean()-Z"
"fBodyGyro-std()-X"
"fBodyGyro-std()-Y"
"fBodyGyro-std()-Z"
"fBodyAccMag-mean()"
"fBodyAccMag-std()"
"fBodyBodyAccJerkMag-mean()"
"fBodyBodyAccJerkMag-std()"
"fBodyBodyGyroMag-mean()"
"fBodyBodyGyroMag-std()"
"fBodyBodyGyroJerkMag-mean()"
"fBodyBodyGyroJerkMag-std()"