Code Book for the Cleaned Data from Samsung Galaxy S II

The output file created by the run_analysis.R function will have the following columns:

Subject

This will be a subject id that refers to one of the 30 persons who were wearing Samsung Galaxy SII while the readings were collected. It will have a numeric value between 1 and 30.

Activity

This is the activity that the subject was performing while the readings were collected. It will have one of the following 6 values - WALKING, WALKING_UPSTAIRS, WALKING_DOWNSTAIRS, SITTING, STANDING, LAYING

Variable

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).

That gives us 17 variables

- tBodyAcc
- tGravityAcc
- tBodyAccJerk
- tBodyGyro
- tBodyGyroJerk
- tBodyAccMag
- tGravityAccMag
- tBodyAccJerkMag

- tBodyGyroMag
- tBodyGyroJerkMag
- fBodyAcc
- fBodyAccJerk
- fBodyGyro
- fBodyAccMag
- fBodyAccJerkMag
- fBodyGyroMag
- fBodyGyroJerkMag

XYZ_direction

Out of the 17 variables, the following 8 variables will have X or Y or Z to indicate the direction of the 3-axial signals

- tBodyAcc
- tGravityAcc
- tBodyAccJerk
- tBodyGyro
- tBodyGyroJerk
- fBodyAcc
- fBodyAccJerk
- fBodyGyro

mean

This will be the average of all the mean values captured in the original data. The units will be the same as it was in the original data

std

This will be the average of all the std values captured in the original data.