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. For the Acceleration signals, the units will be in g and for the velocity signals, the units will be in radians/sec.

std

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