Getting and Cleaning Data

Week 4 Assigment

Code book for tidydata uploaded as part 1

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Tidy data created using Human Activity Recognition Using Smartphones Dataset

Version 1.0

Tidy data : Data set with the average of each **Variable** for each **activity** and each **subject**.

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The data set include following attributes/fields

**Subject**: An identifier of the subject/person, who carried out the experiment. 30 volunteers(persons) within an age bracket of 19-48 years, identified as number 1 to 30.

**Activity** : Each person performed six activities wearing a smartphone (Samsung Galaxy S II) on the waist. The activity labels are : WALKING, WALKING\_UPSTAIRS, WALKING\_DOWNSTAIRS, SITTING, STANDING, LAYING)

**Variables** : 81 variables representing, Average of mean and standard deviation of Triaxial acceleration from the accelerometer (total acceleration) and the estimated body acceleration and Triaxial Angular velocity from the gyroscope . This was captured using accelerometer and gyroscope embedded in the device (wearing a smartphone (Samsung Galaxy S II) on the waist), grouped by activity and subject

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**Names of each column in tidy data frame**

Column 3 to 81 includes average ofaccelerometer and gyroscope 3-axial raw signals (demoted by X, Y and Z in names) , prefix 't' to denote time domain signals and the 'f' to indicate frequency domain signals.

**More explanation can be found in features\_info.txt**

[1] "subject" "activity"

[3] "tBodyAccmeanX" "tBodyAccmeanY"

[5] "tBodyAccmeanZ" "tBodyAccstdX"

[7] "tBodyAccstdY" "tBodyAccstdZ"

[9] "tGravityAccmeanX" "tGravityAccmeanY"

[11] "tGravityAccmeanZ" "tGravityAccstdX"

[13] "tGravityAccstdY" "tGravityAccstdZ"

[15] "tBodyAccJerkmeanX" "tBodyAccJerkmeanY"

[17] "tBodyAccJerkmeanZ" "tBodyAccJerkstdX"

[19] "tBodyAccJerkstdY" "tBodyAccJerkstdZ"

[21] "tBodyGyromeanX" "tBodyGyromeanY"

[23] "tBodyGyromeanZ" "tBodyGyrostdX"

[25] "tBodyGyrostdY" "tBodyGyrostdZ"

[27] "tBodyGyroJerkmeanX" "tBodyGyroJerkmeanY"

[29] "tBodyGyroJerkmeanZ" "tBodyGyroJerkstdX"

[31] "tBodyGyroJerkstdY" "tBodyGyroJerkstdZ"

[33] "tBodyAccMagmean" "tBodyAccMagstd"

[35] "tGravityAccMagmean" "tGravityAccMagstd"

[37] "tBodyAccJerkMagmean" "tBodyAccJerkMagstd"

[39] "tBodyGyroMagmean" "tBodyGyroMagstd"

[41] "tBodyGyroJerkMagmean" "tBodyGyroJerkMagstd"

[43] "fBodyAccmeanX" "fBodyAccmeanY"

[45] "fBodyAccmeanZ" "fBodyAccstdX"

[47] "fBodyAccstdY" "fBodyAccstdZ"

[49] "fBodyAccmeanFreqX" "fBodyAccmeanFreqY"

[51] "fBodyAccmeanFreqZ" "fBodyAccJerkmeanX"

[53] "fBodyAccJerkmeanY" "fBodyAccJerkmeanZ"

[55] "fBodyAccJerkstdX" "fBodyAccJerkstdY"

[57] "fBodyAccJerkstdZ" "fBodyAccJerkmeanFreqX"

[59] "fBodyAccJerkmeanFreqY" "fBodyAccJerkmeanFreqZ"

[61] "fBodyGyromeanX" "fBodyGyromeanY"

[63] "fBodyGyromeanZ" "fBodyGyrostdX"

[65] "fBodyGyrostdY" "fBodyGyrostdZ"

[67] "fBodyGyromeanFreqX" "fBodyGyromeanFreqY"

[69] "fBodyGyromeanFreqZ" "fBodyAccMagmean"

[71] "fBodyAccMagstd" "fBodyAccMagmeanFreq"

[73] "fBodyBodyAccJerkMagmean" "fBodyBodyAccJerkMagstd"

[75] "fBodyBodyAccJerkMagmeanFreq" "fBodyBodyGyroMagmean"

[77] "fBodyBodyGyroMagstd" "fBodyBodyGyroMagmeanFreq"

[79] "fBodyBodyGyroJerkMagmean" "fBodyBodyGyroJerkMagstd"

[81] "fBodyBodyGyroJerkMagmeanFreq"

**Following is the details of Dataset used to create the Tidydata**

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. A full description is available at the site where the data was obtained:

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