Code Book

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Introduction

This code book was created as part of the *Coursera/ Johns Hopkins University "Getting and Cleaning Data" Course Project*.

The purpose of the project is to demonstrate ability to collect, work with, and clean a data set.

The project consists on preparing a tidy data set for the **"Human Activity Recognition Using Smartphones Data Set"**, generating a second tidy data set with variables means and providing this code book.

The *run_analysis.R* script available in my GitHub repository (where you found this code book) performs the data preparation.

Raw data

The "Human Activity Recognition Using Smartphones Data Set" presents data collected from features of Samsung Galaxy S smartphones in an experiment carried out with a group of 30 volunteers.

A broader description is available at: RawDataSetInformation (http://archive.ics.uci.edu/ml/datasets/Human+Activity+Recognition+Using+Smartphones)

The raw data used in the course project can be downloaded here: RawData (https://d396qusza40orc.cloudfront.net/getdata%2Fprojectfiles%2FUCI%20HAR%20Dataset.zip)

Actions performed to prepare the final tidy data set

Given the course project instructions, the *run_analysis.R* script performs the following steps:
1. Downloads the raw data set
2. Loads the data into R
3. Merges the training and the test sets
4. Extracts a subset containing only the measurements on the mean and standard deviation for each feature variable
5. Uses descriptive activity names to name the activities in the merged data set
6. Labels the data set with descriptive variable names
- *Uses capital letter at the beginning of words present in the names*
- *Replaces less intuitive abbreviations by extended words*
- *Deletes special characters*
- *Reorders parts of the names*
7. Creates a second, independent, tidy data set with the average of each (feature measurement) variable within each pair of subject and activity

Note: The *run_analysis.R* script includes various comments explaining the commands used.

Tidy data

The final tidy data set is available in my GitHub repository as a text file *(FinalData.txt)*. To read it in R, after downloading it and properly addressing its path, run: read.table("path/FinalData.txt", header = TRUE).

Dimensions (wide form): 180 rows, 88 columns.

Variables description: All variables in the list below, except Subject and Activity, refer to group means, i.e. they are feature measurement averages within the pair of Subject and Activity.

List of Variables

Column	Name	Class	Description
1	Subject	integer	identifier of the subject who performed the activity; ranges from 1 to 30
2	Activity	factor	activities; factor variable with 6 levels: laying, sitting, standing, walking, walking_downstairs, walking_upstairs
3	TimeBodyAccXMean	numeric	time domain body accelerometer X-axis mean
4	TimeBodyAccYMean	numeric	time domain body accelerometer Y-axis mean
5	TimeBodyAccZMean	numeric	time domain body accelerometer Z-axis mean
6	TimeGravityAccXMean	numeric	time domain gravity accelerometer X-axis mean
7	TimeGravityAccYMean	numeric	time domain gravity accelerometer Y-axis mean
8	TimeGravityAccZMean	numeric	time domain gravity accelerometer Z-axis mean
9	TimeBodyAccJerkXMean	numeric	time domain body accelerometer jerk X-axis mean
10	TimeBodyAccJerkYMean	numeric	time domain body accelerometer jerk Y-axis mean
11	TimeBodyAccJerkZMean	numeric	time domain body accelerometer jerk Z-axis mean
12	TimeBodyGyroXMean	numeric	time domain body gyroscope X-axis mean
13	TimeBodyGyroYMean	numeric	time domain body gyroscope Y-axis mean
14	TimeBodyGyroZMean	numeric	time domain body gyroscope Z-axis mean
15	TimeBodyGyroJerkXMean	numeric	time domain body gyroscope jerk X-axis mean
16	TimeBodyGyroJerkYMean	numeric	time domain body gyroscope jerk Y-axis mean
17	TimeBodyGyroJerkZMean	numeric	time domain body gyroscope jerk Z-axis mean
18	TimeBodyAccMagMean	numeric	time domain body accelerometer magnitude mean
19	TimeGravityAccMagMean	numeric	time domain gravity accelerometer magnitude mean
20	TimeBodyAccJerkMagMean	numeric	time domain body accelerometer jerk magnitude mean
21	TimeBodyGyroMagMean	numeric	time domain body gyroscope magnitude mean
22	TimeBodyGyroJerkMagMean	numeric	time domain body gyroscope jerk magnitude mean
23	FreqBodyAccXMean	numeric	frequency domain body accelerometer X-axis mean
24	FreqBodyAccYMean	numeric	frequency domain body accelerometer Y-axis mean
25	FreqBodyAccZMean	numeric	frequency domain body accelerometer Z-axis mean
26	FreqBodyAccXMeanFreq	numeric	frequency domain body accelerometer X-axis mean frequency
27	FreqBodyAccYMeanFreq	numeric	frequency domain body accelerometer Y-axis mean frequency

Note:
All variables, except Subject and Activity, refer to group means, i.e. they are feature measurement averages within the pair of Subject and Activity.

Column	Name	Class	Description
28	FreqBodyAccZMeanFreq	numeric	frequency domain body accelerometer Z-axis mean frequency
29	FreqBodyAccJerkXMean	numeric	frequency domain body accelerometer jerk X-axis mean
30	FreqBodyAccJerkYMean	numeric	frequency domain body accelerometer jerk Y-axis mean
31	FreqBodyAccJerkZMean	numeric	frequency domain body accelerometer jerk Z-axis mean
32	FreqBodyAccJerkXMeanFreq	numeric	frequency domain body accelerometer jerk X-axis mean frequency
33	FreqBodyAccJerkYMeanFreq	numeric	frequency domain body accelerometer jerk Y-axis mean frequency
34	FreqBodyAccJerkZMeanFreq	numeric	frequency domain body accelerometer jerk Z-axis mean frequency
35	FreqBodyGyroXMean	numeric	frequency domain body gyroscope X-axis mean
36	FreqBodyGyroYMean	numeric	frequency domain body gyroscope Y-axis mean
37	FreqBodyGyroZMean	numeric	frequency domain body gyroscope Z-axis mean
38	FreqBodyGyroXMeanFreq	numeric	frequency domain body gyroscope X-axis mean frequency
39	FreqBodyGyroYMeanFreq	numeric	frequency domain body gyroscope Y-axis mean frequency
40	FreqBodyGyroZMeanFreq	numeric	frequency domain body gyroscope Z-axis mean frequency
41	FreqBodyAccMagMean	numeric	frequency domain body accelerometer magnitude mean
42	FreqBodyAccMagMeanFreq	numeric	frequency domain body accelerometer magnitude mean frequency
43	FreqBodyAccJerkMagMean	numeric	frequency domain body accelerometer jerk magnitude mean
44	FreqBodyAccJerkMagMeanFreq	numeric	frequency domain body accelerometer jerk magnitude mean frequency
45	FreqBodyGyroMagMean	numeric	frequency domain body gyroscope magnitude mean
46	FreqBodyGyroMagMeanFreq	numeric	frequency domain body gyroscope magnitude mean frequency
47	FreqBodyGyroJerkMagMean	numeric	frequency domain body gyroscope jerk magnitude mean
48	FreqBodyGyroJerkMagMeanFreq	numeric	frequency domain body gyroscope jerk magnitude mean frequency
49	AngleTimeBodyAccMeanGravity	numeric	angle time domain body accelerometer mean gravity
50	AngleTimeBodyAccJerkMeanGravityMean	numeric	angle time domain body accelerometer jerk mean gravity mean
51	AngleTimeBodyGyroMeanGravityMean	numeric	angle time domain body gyroscope mean gravity mean
52	AngleTimeBodyGyroJerkMeanGravityMean	numeric	angle time domain body gyroscope jerk mean gravity mean
53	AngleXGravityMean	numeric	angle X-axis gravity mean
54	AngleYGravityMean	numeric	angle Y-axis gravity mean
55	AngleZGravityMean	numeric	angle Z-axis gravity mean
56	TimeBodyAccXSd	numeric	time domain body accelerometer X-axis standard deviation
57	TimeBodyAccYSd	numeric	time domain body accelerometer Y-axis standard deviation

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Column	Name	Class	Description
58	TimeBodyAccZSd	numeric	time domain body accelerometer Z-axis standard deviation
59	TimeGravityAccXSd	numeric	time domain gravity accelerometer X-axis standard deviation
60	TimeGravityAccYSd	numeric	time domain gravity accelerometer Y-axis standard deviation
61	TimeGravityAccZSd	numeric	time domain gravity accelerometer Z-axis standard deviation
62	TimeBodyAccJerkXSd	numeric	time domain body accelerometer jerk X-axis standard deviation
63	TimeBodyAccJerkYSd	numeric	time domain body accelerometer jerk Y-axis standard deviation
64	TimeBodyAccJerkZSd	numeric	time domain body accelerometer jerk Z-axis standard deviation
65	TimeBodyGyroXSd	numeric	time domain body gyroscope X-axis standard deviation
66	TimeBodyGyroYSd	numeric	time domain body gyroscope Y-axis standard deviation
67	TimeBodyGyroZSd	numeric	time domain body gyroscope Z-axis standard deviation
68	TimeBodyGyroJerkXSd	numeric	time domain body gyroscope jerk X-axis standard deviation
69	TimeBodyGyroJerkYSd	numeric	time domain body gyroscope jerk Y-axis standard deviation
70	TimeBodyGyroJerkZSd	numeric	time domain body gyroscope jerk Z-axis standard deviation
71	TimeBodyAccMagSd	numeric	time domain body accelerometer magnitude standard deviation
72	TimeGravityAccMagSd	numeric	time domain gravity accelerometer magnitude standard deviation
73	TimeBodyAccJerkMagSd	numeric	time domain body accelerometer jerk magnitude standard deviation
74	TimeBodyGyroMagSd	numeric	time domain body gyroscope magnitude standard deviation
75	TimeBodyGyroJerkMagSd	numeric	time domain body gyroscope jerk magnitude standard deviation
76	FreqBodyAccXSd	numeric	frequency domain body accelerometer X-axis standard deviation
77	FreqBodyAccYSd	numeric	frequency domain body accelerometer Y-axis standard deviation
78	FreqBodyAccZSd	numeric	frequency domain body accelerometer Z-axis standard deviation
79	FreqBodyAccJerkXSd	numeric	frequency domain body accelerometer jerk X-axis standard deviation
80	FreqBodyAccJerkYSd	numeric	frequency domain body accelerometer jerk Y-axis standard deviation
81	FreqBodyAccJerkZSd	numeric	frequency domain body accelerometer jerk Z-axis standard deviation
82	FreqBodyGyroXSd	numeric	frequency domain body gyroscope X-axis standard deviation
83	FreqBodyGyroYSd	numeric	frequency domain body gyroscope Y-axis standard deviation
84	FreqBodyGyroZSd	numeric	frequency domain body gyroscope Z-axis standard deviation
85	FreqBodyAccMagSd	numeric	frequency domain body accelerometer magnitude standard deviation

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Column	Name	Class	Description
86	FreqBodyAccJerkMagSd	numeric	frequency domain body accelerometer jerk magnitude standard deviation
87	FreqBodyGyroMagSd	numeric	frequency domain body gyroscope magnitude standard deviation
88	FreqBodyGyroJerkMagSd	numeric	frequency domain body gyroscope jerk magnitude standard deviation

Note:
All variables, except Subject and Activity, refer to group means, i.e. they are feature measurement averages within the pair of Subject and Activity.