CodeBook

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CodeBook for tidy.txt

This codebook accompanies "tidy.txt" which is produced from the original dataset taken from http://archive.ics.uci.edu/ml/datasets/Human+Activity+Recognition+Using+Smartphones.

The following enumerate the datasets included.

ID

- Subject - each subject has a unique integer ID
- Activity - the following are the codes for each activity

```
##   V1                 V2
## 1  1            WALKING
## 2  2   WALKING_UPSTAIRS
## 3  3 WALKING_DOWNSTAIRS
## 4  4            SITTING
## 5  5           STANDING
## 6  6             LAYING
```

FEATURES

The following description was taken from the ***features_info.txt*** *from the original dataset*

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.

For the purpose of this exercise, only the *mean* and *standard deviation* statistics were used.

The final list of features used are enumerated below.

```
##  [1] "tBodyAcc-mean()-X"
##  [2] "tBodyAcc-mean()-Y"
##  [3] "tBodyAcc-mean()-Z"
```

```
##  [4] "tBodyAcc-std()-X"
##  [5] "tBodyAcc-std()-Y"
##  [6] "tBodyAcc-std()-Z"
##  [7] "tGravityAcc-mean()-X"
##  [8] "tGravityAcc-mean()-Y"
##  [9] "tGravityAcc-mean()-Z"
## [10] "tGravityAcc-std()-X"
## [11] "tGravityAcc-std()-Y"
## [12] "tGravityAcc-std()-Z"
## [13] "tBodyAccJerk-mean()-X"
## [14] "tBodyAccJerk-mean()-Y"
## [15] "tBodyAccJerk-mean()-Z"
## [16] "tBodyAccJerk-std()-X"
## [17] "tBodyAccJerk-std()-Y"
## [18] "tBodyAccJerk-std()-Z"
## [19] "tBodyGyro-mean()-X"
## [20] "tBodyGyro-mean()-Y"
## [21] "tBodyGyro-mean()-Z"
## [22] "tBodyGyro-std()-X"
## [23] "tBodyGyro-std()-Y"
## [24] "tBodyGyro-std()-Z"
## [25] "tBodyGyroJerk-mean()-X"
## [26] "tBodyGyroJerk-mean()-Y"
## [27] "tBodyGyroJerk-mean()-Z"
## [28] "tBodyGyroJerk-std()-X"
## [29] "tBodyGyroJerk-std()-Y"
## [30] "tBodyGyroJerk-std()-Z"
## [31] "tBodyAccMag-mean()"
## [32] "tBodyAccMag-std()"
## [33] "tGravityAccMag-mean()"
## [34] "tGravityAccMag-std()"
## [35] "tBodyAccJerkMag-mean()"
## [36] "tBodyAccJerkMag-std()"
## [37] "tBodyGyroMag-mean()"
## [38] "tBodyGyroMag-std()"
## [39] "tBodyGyroJerkMag-mean()"
## [40] "tBodyGyroJerkMag-std()"
## [41] "fBodyAcc-mean()-X"
## [42] "fBodyAcc-mean()-Y"
## [43] "fBodyAcc-mean()-Z"
## [44] "fBodyAcc-std()-X"
## [45] "fBodyAcc-std()-Y"
## [46] "fBodyAcc-std()-Z"
## [47] "fBodyAcc-meanFreq()-X"
## [48] "fBodyAcc-meanFreq()-Y"
## [49] "fBodyAcc-meanFreq()-Z"
## [50] "fBodyAccJerk-mean()-X"
## [51] "fBodyAccJerk-mean()-Y"
## [52] "fBodyAccJerk-mean()-Z"
## [53] "fBodyAccJerk-std()-X"
## [54] "fBodyAccJerk-std()-Y"
## [55] "fBodyAccJerk-std()-Z"
## [56] "fBodyAccJerk-meanFreq()-X"
## [57] "fBodyAccJerk-meanFreq()-Y"
```

```
## [58] "fBodyAccJerk-meanFreq()-Z"
## [59] "fBodyGyro-mean()-X"
## [60] "fBodyGyro-mean()-Y"
## [61] "fBodyGyro-mean()-Z"
## [62] "fBodyGyro-std()-X"
## [63] "fBodyGyro-std()-Y"
## [64] "fBodyGyro-std()-Z"
## [65] "fBodyGyro-meanFreq()-X"
## [66] "fBodyGyro-meanFreq()-Y"
## [67] "fBodyGyro-meanFreq()-Z"
## [68] "fBodyAccMag-mean()"
## [69] "fBodyAccMag-std()"
## [70] "fBodyAccMag-meanFreq()"
## [71] "fBodyBodyAccJerkMag-mean()"
## [72] "fBodyBodyAccJerkMag-std()"
## [73] "fBodyBodyAccJerkMag-meanFreq()"
## [74] "fBodyBodyGyroMag-mean()"
## [75] "fBodyBodyGyroMag-std()"
## [76] "fBodyBodyGyroMag-meanFreq()"
## [77] "fBodyBodyGyroJerkMag-mean()"
## [78] "fBodyBodyGyroJerkMag-std()"
## [79] "fBodyBodyGyroJerkMag-meanFreq()"
## [80] "angle(tBodyAccMean,gravity)"
## [81] "angle(tBodyAccJerkMean),gravityMean)"
## [82] "angle(tBodyGyroMean,gravityMean)"
## [83] "angle(tBodyGyroJerkMean,gravityMean)"
## [84] "angle(X,gravityMean)"
## [85] "angle(Y,gravityMean)"
## [86] "angle(Z,gravityMean)"
```