

Data Transformation Document

DEFINITIONS, CROSSWALKS, AND PROCESS

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AN EXTENSION OF THE FOLLOWING WORK:

Davide Anguita, Alessandro Ghio, Luca Oneto, Xavier Parra and Jorge L. Reyes-Ortiz. Human Activity Recognition on Smartphones using a Multiclass Hardware-Friendly Support Vector Machine. International Workshop of Ambient Assisted Living (IWAAL 2012). Vitoria-Gasteiz, Spain. Dec 2012

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Davide Anguita, Alessandro Ghio, Luca Oneto, Xavier Parra and Jorge L. Reyes-Ortiz. Human Activity Recognition on Smartphones using a Multiclass Hardware-Friendly Support Vector Machine. International Workshop of Ambient Assisted Living (IWAAL 2012). Vitoria-Gasteiz, Spain. Dec 2012

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Jorge L. Reyes-Ortiz, Alessandro Ghio, Luca Oneto, Davide Anguita. November 2012.

SECTION 1: OVERVIEW

This manual explains the inputs, transformations, and outputs for a particular set of restructured data. The data records measurements taken from 30 participants aged 19 to 48 as they performed activities. The participants walked, walked up stairs, and walked down stairs, as well as sat, stood, or lay down. The participants wore a mobile phone attached to their waist as they did these activities. Each phone had software that used the phone's embedded accelerometer and gyroscope to record measurements. An accelerometer is a device that measures changes in speed. A gyroscope is a device that can measure changes in direction. The mobile phone was a Samsung Galaxy S II.

The raw data is in the folder of the same name. Eight files were loaded into a program and reorganized.

The program created 561 new files and placed them in the folder tidy_data. Each new file represents all measures of one measurement type, and each measure of that type is linked to one anonymous participant ID (e.g., 30) and one activity name (e.g., Walking Up Stairs). Each file has 10,300 records.

A sample record for example, from a file containing the name "BodyAcceleration" looks like the following:

| ID | Activity | Measurement Value |
|----|---------------------|-------------------|
| 30 | "Walking Up Stairs" | -0.61862762 |

As the program reorganized the data, no participant ids were changed. Further, activity names changed only slightly. See below.

| Old Activity Name | New Activity Name |
|--------------------|---------------------|
| WALKING | Walking |
| WALKING_UPSTAIRS | Walking Up Stairs |
| WALKING_DOWNSTAIRS | Walking Down Stairs |
| STANDING | Standing |
| SITTING | Sitting |
| LAYING | Lying |
| --End of List-- | --End of List-- |

Section 2 describes the raw data. Section 3 defines the new names for measurements. Section 4 shows each new measurement name for the old name. Section 5 provides the steps that the program followed. Section 6 is the actual program.

SECTION 2: RAW DATA DESCRIPTION

Special Note: The following is the documentation of the files in the raw_data folder. It was sole written by the author below.

```
=====
Human Activity Recognition Using Smartphones Dataset
Version 1.0
=====
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=====
```

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. See 'features_info.txt' for more details.

For each record it is provided:

=====

- Triaxial acceleration from the accelerometer (total acceleration) and the estimated body acceleration.
- Triaxial Angular velocity from the gyroscope.
- A 561-feature vector with time and frequency domain variables.
- Its activity label.
- An identifier of the subject who carried out the experiment.

The dataset includes the following files:

=====

- 'README.txt'
- 'features_info.txt': Shows information about the variables used on the feature vector.
- 'features.txt': List of all features.
- 'activity_labels.txt': Links the class labels with their activity name.
- 'train/X_train.txt': Training set.
- 'train/y_train.txt': Training labels.
- 'test/X_test.txt': Test set.
- 'test/y_test.txt': Test labels.

The following files are available for the train and test data. Their descriptions are equivalent.

- 'train/subject_train.txt': Each row identifies the subject who performed the activity for each window sample. Its range is from 1 to 30.
- 'train/Inertial Signals/total_acc_x_train.txt': The acceleration signal from the smartphone accelerometer X axis in standard gravity units 'g'. Every row shows a 128 element vector. The same description applies for the 'total_acc_x_train.txt' and 'total_acc_z_train.txt' files for the Y and Z axis.
- 'train/Inertial Signals/body_acc_x_train.txt': The body acceleration signal obtained by subtracting the gravity from the total acceleration.

- 'train/Inertial Signals/body_gyro_x_train.txt': The angular velocity vector measured by the gyroscope for each window sample. The units are radians/second.

Notes:

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- Features are normalized and bounded within $[-1,1]$.
- Each feature vector is a row on the text file.

For more information about this dataset contact:

activityrecognition@smartlab.ws

License:

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Use of this dataset in publications must be acknowledged by referencing the following publication [1]

[1] Davide Anguita, Alessandro Ghio, Luca Oneto, Xavier Parra and Jorge L. Reyes-Ortiz. Human Activity Recognition on Smartphones using a Multiclass Hardware-Friendly Support Vector Machine. International Workshop of Ambient Assisted Living (IWAAL 2012). Vitoria-Gasteiz, Spain. Dec 2012

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Jorge L. Reyes-Ortiz, Alessandro Ghio, Luca Oneto, Davide Anguita.
November 2012.

SECTION 3: DEFINITIONS OF NEW MEASUREMENT NAMES

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|----|-------------------------|---|
| 1 | BodyAccelerationMeanX | Average of the acceleration in standard acceleration units (g) on the X-axis |
| 2 | BodyAccelerationMeanY | Average of the acceleration in standard acceleration units (g) on the Y-axis |
| 3 | BodyAccelerationMeanZ | Average of the acceleration in standard acceleration units (g) on the Z-axis |
| 4 | BodyAccelerationStdDevX | Standard deviation of the acceleration in standard acceleration units (g) on the X-axis |
| 5 | BodyAccelerationStdDevY | Standard deviation of the acceleration in standard acceleration units (g) on the Y-axis |
| 6 | BodyAccelerationStdDevZ | Standard deviation of the acceleration in standard acceleration units (g) on the Z-axis |
| 7 | BodyAccelerationMedianX | Median of the acceleration in standard acceleration units (g) on the X-axis |
| 8 | BodyAccelerationMedianY | Median of the acceleration in standard acceleration units (g) on the Y-axis |
| 9 | BodyAccelerationMedianZ | Median of the acceleration in standard acceleration units (g) on the Z-axis |
| 10 | BodyAccelerationMaxX | Maximum acceleration in standard acceleration units (g) on the X-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|----|-------------------------------------|--|
| 11 | BodyAccelerationMaxY | Maximum acceleration in standard acceleration units (g) on the Y-axis |
| 12 | BodyAccelerationMaxZ | Maximum acceleration in standard acceleration units (g) on the Z-axis |
| 13 | BodyAccelerationMinX | Minimum acceleration in standard acceleration units (g) on the X-axis |
| 14 | BodyAccelerationMinY | Minimum acceleration in standard acceleration units (g) on the Y-axis |
| 15 | BodyAccelerationMinZ | Minimum acceleration in standard acceleration units (g) on the Z-axis |
| 16 | BodyAccelerationMagnitude | Magnitude of the acceleration in standard acceleration units (g) |
| 17 | BodyAccelerationEnergyX | Energy expended on acceleration in standard acceleration units (g) on the X-axis |
| 18 | BodyAccelerationEnergyY | Energy expended on acceleration in standard acceleration units (g) on the Y-axis |
| 19 | BodyAccelerationEnergyZ | Energy expended on acceleration in standard acceleration units (g) on the Z-axis |
| 20 | BodyAccelerationInterQuartileRangeX | 25th to 75th percentile of acceleration in standard acceleration units (g) on the X-axis |
| 21 | BodyAccelerationInterQuartileRangeY | 26th to 75th percentile of acceleration in standard acceleration units (g) on the Y-axis |
| 22 | BodyAccelerationInterQuartileRangeZ | 27th to 75th percentile of acceleration in standard acceleration units (g) on the Z-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|----|--------------------------|---|
| 23 | BodyAccelerationDeclineX | Reduction of energy spent on acceleration in standard acceleration units (g) on the X-axis |
| 24 | BodyAccelerationDeclineY | Reduction of energy spent on acceleration in standard acceleration units (g) on the Y-axis |
| 25 | BodyAccelerationDeclineZ | Reduction of energy spent on acceleration in standard acceleration units (g) on the Z-axis |
| 26 | BodyAccelerationCoeffX,1 | Regression coefficient estimating acceleration in standard acceleration units (g) on the X-axis |
| 27 | BodyAccelerationCoeffX,2 | Regression coefficient estimating acceleration in standard acceleration units (g) on the X-axis |
| 28 | BodyAccelerationCoeffX,3 | Regression coefficient estimating acceleration in standard acceleration units (g) on the X-axis |
| 29 | BodyAccelerationCoeffX,4 | Regression coefficient estimating acceleration in standard acceleration units (g) on the X-axis |
| 30 | BodyAccelerationCoeffY,1 | Regression coefficient estimating acceleration in standard acceleration units (g) on the Y-axis |
| 31 | BodyAccelerationCoeffY,2 | Regression coefficient estimating acceleration in standard acceleration units (g) on the Y-axis |
| 32 | BodyAccelerationCoeffY,3 | Regression coefficient estimating acceleration in standard acceleration units (g) on the Y-axis |
| 33 | BodyAccelerationCoeffY,4 | Regression coefficient estimating acceleration in standard acceleration units (g) on the Y-axis |
| 34 | BodyAccelerationCoeffZ,1 | Regression coefficient estimating acceleration in standard acceleration units (g) on the Z-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|----|--------------------------|---|
| 35 | BodyAccelerationCoeffZ,2 | Regression coefficient estimating acceleration in standard acceleration units (g) on the Z-axis |
| 36 | BodyAccelerationCoeffZ,3 | Regression coefficient estimating acceleration in standard acceleration units (g) on the Z-axis |
| 37 | BodyAccelerationCoeffZ,4 | Regression coefficient estimating acceleration in standard acceleration units (g) on the Z-axis |
| 38 | BodyAccelerationCorrX,Y | Correlation of the acceleration in standard acceleration units (g) on the X and Y axes |
| 39 | BodyAccelerationCorrX,Z | Correlation of the acceleration in standard acceleration units (g) on the X and Z axes |
| 40 | BodyAccelerationCorrY,Z | Correlation of the acceleration in standard acceleration units (g) on the Y and Z axes |
| 41 | GravitationalPullMeanX | Average of the gravitational pull on the X-axis |
| 42 | GravitationalPullMeanY | Average of the gravitational pull on the Y-axis |
| 43 | GravitationalPullMeanZ | Average of the gravitational pull on the Z-axis |
| 44 | GravitationalPullStdDevX | Standard deviation of the gravitational pull on the X-axis |
| 45 | GravitationalPullStdDevY | Standard deviation of the gravitational pull on the Y-axis |
| 46 | GravitationalPullStdDevZ | Standard deviation of the gravitational pull on the Z-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|----|----------------------------|---|
| 47 | GravitationalPullMedianX | Median of the gravitational pull on the X-axis |
| 48 | GravitationalPullMedianY | Median of the gravitational pull on the Y-axis |
| 49 | GravitationalPullMedianZ | Median of the gravitational pull on the Z-axis |
| 50 | GravitationalPullMaxX | Maximum gravitational pull on the X-axis |
| 51 | GravitationalPullMaxY | Maximum gravitational pull on the Y-axis |
| 52 | GravitationalPullMaxZ | Maximum gravitational pull on the Z-axis |
| 53 | GravitationalPullMinX | Minimum gravitational pull on the X-axis |
| 54 | GravitationalPullMinY | Minimum gravitational pull on the Y-axis |
| 55 | GravitationalPullMinZ | Minimum gravitational pull on the Z-axis |
| 56 | GravitationalPullMagnitude | Magnitude of the gravitational pull |
| 57 | GravitationalPullEnergyX | Energy expended on gravitational pull on the X-axis |
| 58 | GravitationalPullEnergyY | Energy expended on gravitational pull on the Y-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|----|--------------------------------------|--|
| 59 | GravitationalPullEnergyZ | Energy expended on gravitational pull on the Z-axis |
| 60 | GravitationalPullInterQuartileRangeX | 25th to 75th percentile of gravitational pull on the X-axis |
| 61 | GravitationalPullInterQuartileRangeY | 26th to 75th percentile of gravitational pull on the Y-axis |
| 62 | GravitationalPullInterQuartileRangeZ | 27th to 75th percentile of gravitational pull on the Z-axis |
| 63 | GravitationalPullDeclineX | Reduction of energy spent on gravitational pull on the X-axis |
| 64 | GravitationalPullDeclineY | Reduction of energy spent on gravitational pull on the Y-axis |
| 65 | GravitationalPullDeclineZ | Reduction of energy spent on gravitational pull on the Z-axis |
| 66 | GravitationalPullCoeffX,1 | Regression coefficient estimating gravitational pull on the X-axis |
| 67 | GravitationalPullCoeffX,2 | Regression coefficient estimating gravitational pull on the X-axis |
| 68 | GravitationalPullCoeffX,3 | Regression coefficient estimating gravitational pull on the X-axis |
| 69 | GravitationalPullCoeffX,4 | Regression coefficient estimating gravitational pull on the X-axis |
| 70 | GravitationalPullCoeffY,1 | Regression coefficient estimating gravitational pull on the Y-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|----|---------------------------|--|
| 71 | GravitationalPullCoeffY,2 | Regression coefficient estimating gravitational pull on the Y-axis |
| 72 | GravitationalPullCoeffY,3 | Regression coefficient estimating gravitational pull on the Y-axis |
| 73 | GravitationalPullCoeffY,4 | Regression coefficient estimating gravitational pull on the Y-axis |
| 74 | GravitationalPullCoeffZ,1 | Regression coefficient estimating gravitational pull on the Z-axis |
| 75 | GravitationalPullCoeffZ,2 | Regression coefficient estimating gravitational pull on the Z-axis |
| 76 | GravitationalPullCoeffZ,3 | Regression coefficient estimating gravitational pull on the Z-axis |
| 77 | GravitationalPullCoeffZ,4 | Regression coefficient estimating gravitational pull on the Z-axis |
| 78 | GravitationalPullCorrX,Y | Regression coefficient estimating gravitational pull on the X and Y axes |
| 79 | GravitationalPullCorrX,Z | Regression coefficient estimating gravitational pull on the X and Z axes |
| 80 | GravitationalPullCorrY,Z | Regression coefficient estimating gravitational pull on the Y and Z axes |
| 81 | BodyAccelerationJerkMeanX | Average of the acceleration in standard acceleration units (g) on the X-axis |
| 82 | BodyAccelerationJerkMeanY | Average of the acceleration in standard acceleration units (g) on the Y-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|----|-----------------------------|---|
| 83 | BodyAccelerationJerkMeanZ | Average of the acceleration in standard acceleration units (g) on the Z-axis |
| 84 | BodyAccelerationJerkStdDevX | Standard deviation of the acceleration in standard acceleration units (g) on the X-axis |
| 85 | BodyAccelerationJerkStdDevY | Standard deviation of the acceleration in standard acceleration units (g) on the Y-axis |
| 86 | BodyAccelerationJerkStdDevZ | Standard deviation of the acceleration in standard acceleration units (g) on the Z-axis |
| 87 | BodyAccelerationJerkMedianX | Median of the acceleration in standard acceleration units (g) on the X-axis |
| 88 | BodyAccelerationJerkMedianY | Median of the acceleration in standard acceleration units (g) on the Y-axis |
| 89 | BodyAccelerationJerkMedianZ | Median of the acceleration in standard acceleration units (g) on the Z-axis |
| 90 | BodyAccelerationJerkMaxX | Maximum acceleration in standard acceleration units (g) on the X-axis |
| 91 | BodyAccelerationJerkMaxY | Maximum acceleration in standard acceleration units (g) on the Y-axis |
| 92 | BodyAccelerationJerkMaxZ | Maximum acceleration in standard acceleration units (g) on the Z-axis |
| 93 | BodyAccelerationJerkMinX | Minimum acceleration in standard acceleration units (g) on the X-axis |
| 94 | BodyAccelerationJerkMinY | Minimum acceleration in standard acceleration units (g) on the Y-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|---|
| 95 | BodyAccelerationJerkMinZ | Minimum acceleration in standard acceleration units (g) on the Z-axis |
| 96 | BodyAccelerationJerkMagnitude | Magnitude of the acceleration in standard acceleration units (g) |
| 97 | BodyAccelerationJerkEnergyX | Energy expended on acceleration in standard acceleration units (g) on the X-axis |
| 98 | BodyAccelerationJerkEnergyY | Energy expended on acceleration in standard acceleration units (g) on the Y-axis |
| 99 | BodyAccelerationJerkEnergyZ | Energy expended on acceleration in standard acceleration units (g) on the Z-axis |
| 100 | BodyAccelerationJerkInterQuartileRangeX | 25th to 75th percentile of acceleration in standard acceleration units (g) on the X-axis |
| 101 | BodyAccelerationJerkInterQuartileRangeY | 26th to 75th percentile of acceleration in standard acceleration units (g) on the Y-axis |
| 102 | BodyAccelerationJerkInterQuartileRangeZ | 27th to 75th percentile of acceleration in standard acceleration units (g) on the Z-axis |
| 103 | BodyAccelerationJerkDeclineX | Reduction of energy spent on acceleration in standard acceleration units (g) on the X-axis |
| 104 | BodyAccelerationJerkDeclineY | Reduction of energy spent on acceleration in standard acceleration units (g) on the Y-axis |
| 105 | BodyAccelerationJerkDeclineZ | Reduction of energy spent on acceleration in standard acceleration units (g) on the Z-axis |
| 106 | BodyAccelerationJerkCoeffX,1 | Regression coefficient estimating acceleration in standard acceleration units (g) on the X-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|------------------------------|---|
| 107 | BodyAccelerationJerkCoeffX,2 | Regression coefficient estimating acceleration in standard acceleration units (g) on the X-axis |
| 108 | BodyAccelerationJerkCoeffX,3 | Regression coefficient estimating acceleration in standard acceleration units (g) on the X-axis |
| 109 | BodyAccelerationJerkCoeffX,4 | Regression coefficient estimating acceleration in standard acceleration units (g) on the X-axis |
| 110 | BodyAccelerationJerkCoeffY,1 | Regression coefficient estimating acceleration in standard acceleration units (g) on the Y-axis |
| 111 | BodyAccelerationJerkCoeffY,2 | Regression coefficient estimating acceleration in standard acceleration units (g) on the Y-axis |
| 112 | BodyAccelerationJerkCoeffY,3 | Regression coefficient estimating acceleration in standard acceleration units (g) on the Y-axis |
| 113 | BodyAccelerationJerkCoeffY,4 | Regression coefficient estimating acceleration in standard acceleration units (g) on the Y-axis |
| 114 | BodyAccelerationJerkCoeffZ,1 | Regression coefficient estimating acceleration in standard acceleration units (g) on the Z-axis |
| 115 | BodyAccelerationJerkCoeffZ,2 | Regression coefficient estimating acceleration in standard acceleration units (g) on the Z-axis |
| 116 | BodyAccelerationJerkCoeffZ,3 | Regression coefficient estimating acceleration in standard acceleration units (g) on the Z-axis |
| 117 | BodyAccelerationJerkCoeffZ,4 | Regression coefficient estimating acceleration in standard acceleration units (g) on the Z-axis |
| 118 | BodyAccelerationJerkCorrX,Y | Correlation of the acceleration in standard acceleration units (g) |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|-----------------------------|---|
| 119 | BodyAccelerationJerkCorrX,Z | Correlation of the acceleration in standard acceleration units (g) |
| 120 | BodyAccelerationJerkCorrY,Z | Correlation of the acceleration in standard acceleration units (g) |
| 121 | BodyRotationalMeanX | Average of the acceleration (in radians per second) as the participant turns on the X-axis |
| 122 | BodyRotationalMeanY | Average of the acceleration (in radians per second) as the participant turns on the Y-axis |
| 123 | BodyRotationalMeanZ | Average of the acceleration (in radians per second) as the participant turns on the Z-axis |
| 124 | BodyRotationalStdDevX | Standard deviation of the acceleration (in radians per second) as the participant turns on the X-axis |
| 125 | BodyRotationalStdDevY | Standard deviation of the acceleration (in radians per second) as the participant turns on the Y-axis |
| 126 | BodyRotationalStdDevZ | Standard deviation of the acceleration (in radians per second) as the participant turns on the Z-axis |
| 127 | BodyRotationalMedianX | Median of the acceleration (in radians per second) as the participant turns on the X-axis |
| 128 | BodyRotationalMedianY | Median of the acceleration (in radians per second) as the participant turns on the Y-axis |
| 129 | BodyRotationalMedianZ | Median of the acceleration (in radians per second) as the participant turns on the Z-axis |
| 130 | BodyRotationalMaxX | Maximum acceleration (in radians per second) as the participant turns on the X-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|-----------------------------------|--|
| 131 | BodyRotationalMaxY | Maximum acceleration (in radians per second) as the participant turns on the Y-axis |
| 132 | BodyRotationalMaxZ | Maximum acceleration (in radians per second) as the participant turns on the Z-axis |
| 133 | BodyRotationalMinX | Minimum acceleration (in radians per second) as the participant turns on the X-axis |
| 134 | BodyRotationalMinY | Minimum acceleration (in radians per second) as the participant turns on the Y-axis |
| 135 | BodyRotationalMinZ | Minimum acceleration (in radians per second) as the participant turns on the Z-axis |
| 136 | BodyRotationalMagnitude | Magnitude of the acceleration (in radians per second) as the participant turns |
| 137 | BodyRotationalEnergyX | Energy expended on acceleration (in radians per second) as the participant turns on the X-axis |
| 138 | BodyRotationalEnergyY | Energy expended on acceleration (in radians per second) as the participant turns on the Y-axis |
| 139 | BodyRotationalEnergyZ | Energy expended on acceleration (in radians per second) as the participant turns on the Z-axis |
| 140 | BodyRotationalInterQuartileRangeX | 25th to 75th percentile of acceleration (in radians per second) as the participant turns on the X-axis |
| 141 | BodyRotationalInterQuartileRangeY | 26th to 75th percentile of acceleration (in radians per second) as the participant turns on the Y-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|-----------------------------------|---|
| 142 | BodyRotationalInterQuartileRangeZ | 27th to 75th percentile of acceleration (in radians per second) as the participant turns on the Z-axis |
| 143 | BodyRotationalDeclineX | Reduction of energy spent on acceleration (in radians per second) as the participant turns on the X-axis |
| 144 | BodyRotationalDeclineY | Reduction of energy spent on acceleration (in radians per second) as the participant turns on the Y-axis |
| 145 | BodyRotationalDeclineZ | Reduction of energy spent on acceleration (in radians per second) as the participant turns on the Z-axis |
| 146 | BodyRotationalCoeffX,1 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the X-axis |
| 147 | BodyRotationalCoeffX,2 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the X-axis |
| 148 | BodyRotationalCoeffX,3 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the X-axis |
| 149 | BodyRotationalCoeffX,4 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the X-axis |
| 150 | BodyRotationalCoeffY,1 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the Y-axis |
| 151 | BodyRotationalCoeffY,2 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the Y-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|-------------------------|---|
| 152 | BodyRotationalCoeffY,3 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the Y-axis |
| 153 | BodyRotationalCoeffY,4 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the Y-axis |
| 154 | BodyRotationalCoeffZ,1 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the Z-axis |
| 155 | BodyRotationalCoeffZ,2 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the Z-axis |
| 156 | BodyRotationalCoeffZ,3 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the Z-axis |
| 157 | BodyRotationalCoeffZ,4 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the Z-axis |
| 158 | BodyRotationalCorrX,Y | Correlation of the acceleration (in radians per second) as the participant turns on the X-axis |
| 159 | BodyRotationalCorrX,Z | Correlation of the acceleration (in radians per second) as the participant turns on the Y-axis |
| 160 | BodyRotationalCorrY,Z | Correlation of the acceleration (in radians per second) as the participant turns on the Z-axis |
| 161 | BodyRotationalJerkMeanX | Average of the acceleration (in radians per second) as the participant turns on the X-axis |
| 162 | BodyRotationalJerkMeanY | Average of the acceleration (in radians per second) as the participant turns on the Y-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---------------------------|---|
| 163 | BodyRotationalJerkMeanZ | Average of the acceleration (in radians per second) as the participant turns on the Z-axis |
| 164 | BodyRotationalJerkStdDevX | Standard deviation of the acceleration (in radians per second) as the participant turns on the X-axis |
| 165 | BodyRotationalJerkStdDevY | Standard deviation of the acceleration (in radians per second) as the participant turns on the Y-axis |
| 166 | BodyRotationalJerkStdDevZ | Standard deviation of the acceleration (in radians per second) as the participant turns on the Z-axis |
| 167 | BodyRotationalJerkMedianX | Median of the acceleration (in radians per second) as the participant turns on the X-axis |
| 168 | BodyRotationalJerkMedianY | Median of the acceleration (in radians per second) as the participant turns on the Y-axis |
| 169 | BodyRotationalJerkMedianZ | Median of the acceleration (in radians per second) as the participant turns on the Z-axis |
| 170 | BodyRotationalJerkMaxX | Maximum acceleration (in radians per second) as the participant turns on the X-axis |
| 171 | BodyRotationalJerkMaxY | Maximum acceleration (in radians per second) as the participant turns on the Y-axis |
| 172 | BodyRotationalJerkMaxZ | Maximum acceleration (in radians per second) as the participant turns on the Z-axis |
| 173 | BodyRotationalJerkMinX | Minimum acceleration (in radians per second) as the participant turns on the X-axis |
| 174 | BodyRotationalJerkMinY | Minimum acceleration (in radians per second) as the participant turns on the Y-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---------------------------------------|--|
| 175 | BodyRotationalJerkMinZ | Minimum acceleration (in radians per second) as the participant turns on the Z-axis |
| 176 | BodyRotationalJerkMagnitude | Magnitude of the acceleration (in radians per second) as the participant turns |
| 177 | BodyRotationalJerkEnergyX | Energy expended on acceleration (in radians per second) as the participant turns on the X-axis |
| 178 | BodyRotationalJerkEnergyY | Energy expended on acceleration (in radians per second) as the participant turns on the Y-axis |
| 179 | BodyRotationalJerkEnergyZ | Energy expended on acceleration (in radians per second) as the participant turns on the Z-axis |
| 180 | BodyRotationalJerkInterQuartileRangeX | 25th to 75th percentile of acceleration (in radians per second) as the participant turns on the X-axis |
| 181 | BodyRotationalJerkInterQuartileRangeY | 26th to 75th percentile of acceleration (in radians per second) as the participant turns on the Y-axis |
| 182 | BodyRotationalJerkInterQuartileRangeZ | 27th to 75th percentile of acceleration (in radians per second) as the participant turns on the Z-axis |
| 183 | BodyRotationalJerkDeclineX | Reduction of energy spent on acceleration (in radians per second) as the participant turns on the X-axis |
| 184 | BodyRotationalJerkDeclineY | Reduction of energy spent on acceleration (in radians per second) as the participant turns on the Y-axis |
| 185 | BodyRotationalJerkDeclineZ | Reduction of energy spent on acceleration (in radians per second) as the participant turns on the Z-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|----------------------------|---|
| 186 | BodyRotationalJerkCoeffX,1 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the X-axis |
| 187 | BodyRotationalJerkCoeffX,2 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the X-axis |
| 188 | BodyRotationalJerkCoeffX,3 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the X-axis |
| 189 | BodyRotationalJerkCoeffX,4 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the X-axis |
| 190 | BodyRotationalJerkCoeffY,1 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the Y-axis |
| 191 | BodyRotationalJerkCoeffY,2 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the Y-axis |
| 192 | BodyRotationalJerkCoeffY,3 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the Y-axis |
| 193 | BodyRotationalJerkCoeffY,4 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the Y-axis |
| 194 | BodyRotationalJerkCoeffZ,1 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the Z-axis |
| 195 | BodyRotationalJerkCoeffZ,2 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the Z-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|------------------------------------|---|
| 196 | BodyRotationalJerkCoeffZ,3 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the Z-axis |
| 197 | BodyRotationalJerkCoeffZ,4 | Regression coefficient estimating acceleration (in radians per second) as the participant turns on the Z-axis |
| 198 | BodyRotationalJerkCorrX,Y | Correlation of the acceleration (in radians per second) as the participant turns on the X-axis |
| 199 | BodyRotationalJerkCorrX,Z | Correlation of the acceleration (in radians per second) as the participant turns on the Y-axis |
| 200 | BodyRotationalJerkCorrY,Z | Correlation of the acceleration (in radians per second) as the participant turns on the Z-axis |
| 201 | BodyAccelerationMagnitudeMean | Mean Magnitude of the acceleration in standard acceleration units (g) |
| 202 | BodyAccelerationMagnitudeStdDev | Standard deviation of the magnitude of the acceleration in standard acceleration units (g) |
| 203 | BodyAccelerationMagnitudeMedian | Median of the magnitude of the acceleration in standard acceleration units (g) |
| 204 | BodyAccelerationMagnitudeMax | Maximum magnitude of the acceleration in standard acceleration units (g) |
| 205 | BodyAccelerationMagnitudeMin | Minimum magnitude of the acceleration in standard acceleration units (g) |
| 206 | BodyAccelerationMagnitudeMagnitude | Magnitude of the acceleration in standard acceleration units (g) |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|--|
| 207 | BodyAccelerationMagnitudeEnergy | Energy spent on the magnitude of the acceleration in standard acceleration units (g) |
| 208 | BodyAccelerationMagnitudeInterQuartileRange | 27th to 75th percentile of the acceleration in standard acceleration units (g) |
| 209 | BodyAccelerationMagnitudeDecline | Reduction of energy spent on acceleration in standard acceleration units (g) |
| 210 | BodyAccelerationMagnitudeCoeff1 | Regression coefficient estimating acceleration in standard acceleration units (g) |
| 211 | BodyAccelerationMagnitudeCoeff2 | Regression coefficient estimating acceleration in standard acceleration units (g) |
| 212 | BodyAccelerationMagnitudeCoeff3 | Regression coefficient estimating acceleration in standard acceleration units (g) |
| 213 | BodyAccelerationMagnitudeCoeff4 | Regression coefficient estimating acceleration in standard acceleration units (g) |
| 214 | GravitationalPullMagnitudeMean | Mean magnitude of the gravitational pull |
| 215 | GravitationalPullMagnitudeStdDev | Standard deviation of the gravitational pull |
| 216 | GravitationalPullMagnitudeMedian | Median magnitude of the gravitational pull |
| 217 | GravitationalPullMagnitudeMax | Maximum magnitude of the gravitational pull |
| 218 | GravitationalPullMagnitudeMin | Minimum magnitude of the gravitational pull |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|--|---|
| 219 | GravitationalPullMagnitudeMagnitude | Magnitude of the gravitational pull |
| 220 | GravitationalPullMagnitudeEnergy | Energy spent on the magnitude of the gravitational pull |
| 221 | GravitationalPullMagnitudeInterQuartileRange | 25th to 75th percentile of the gravitational pull |
| 222 | GravitationalPullMagnitudeDecline | Reduction of energy spent on gravitational pull |
| 223 | GravitationalPullMagnitudeCoeff1 | Regression coefficient estimating gravitational pull |
| 224 | GravitationalPullMagnitudeCoeff2 | Regression coefficient estimating gravitational pull |
| 225 | GravitationalPullMagnitudeCoeff3 | Regression coefficient estimating gravitational pull |
| 226 | GravitationalPullMagnitudeCoeff4 | Regression coefficient estimating gravitational pull |
| 227 | BodyAccelerationJerkMagnitudeMean | Mean magnitude of the acceleration in standard acceleration units (g) |
| 228 | BodyAccelerationJerkMagnitudeStdDev | Standard deviation of the acceleration in standard acceleration units (g) |
| 229 | BodyAccelerationJerkMagnitudeMedian | Median magnitude of the acceleration in standard acceleration units (g) |
| 230 | BodyAccelerationJerkMagnitudeMax | Maximum magnitude of the acceleration in standard acceleration units (g) |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|---|
| 231 | BodyAccelerationJerkMagnitudeMin | Minimum magnitude of the acceleration in standard acceleration units (g) |
| 232 | BodyAccelerationJerkMagnitudeMagnitude | Magnitude of the acceleration in standard acceleration units (g) |
| 233 | BodyAccelerationJerkMagnitudeEnergy | Energy spent on the magnitude of the acceleration in standard acceleration units (g) |
| 234 | BodyAccelerationJerkMagnitudeInterQuartileRange | 25th to 75th percentile of the acceleration in standard acceleration units (g) |
| 235 | BodyAccelerationJerkMagnitudeDecline | Reduction of energy spent on acceleration in standard acceleration units (g) |
| 236 | BodyAccelerationJerkMagnitudeCoeff1 | Regression coefficient estimating acceleration in standard acceleration units (g) |
| 237 | BodyAccelerationJerkMagnitudeCoeff2 | Regression coefficient estimating acceleration in standard acceleration units (g) |
| 238 | BodyAccelerationJerkMagnitudeCoeff3 | Regression coefficient estimating acceleration in standard acceleration units (g) |
| 239 | BodyAccelerationJerkMagnitudeCoeff4 | Regression coefficient estimating acceleration in standard acceleration units (g) |
| 240 | BodyRotationalMagnitudeMean | Mean magnitude of the acceleration (in radians per second) as the participant turns |
| 241 | BodyRotationalMagnitudeStdDev | Standard deviation of the acceleration (in radians per second) as the participant turns |
| 242 | BodyRotationalMagnitudeMedian | Median magnitude of the acceleration (in radians per second) as the participant turns |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|--|
| 243 | BodyRotationalMagnitudeMax | Maximum magnitude of the acceleration (in radians per second) as the participant turns |
| 244 | BodyRotationalMagnitudeMin | Minimum magnitude of the acceleration (in radians per second) as the participant turns |
| 245 | BodyRotationalMagnitudeMagnitude | Magnitude of the acceleration (in radians per second) as the participant turns |
| 246 | BodyRotationalMagnitudeEnergy | Energy spent on the magnitude of the acceleration (in radians per second) as the participant turns |
| 247 | BodyRotationalMagnitudeInterQuartileRange | 25th to 75th percentile of the acceleration (in radians per second) as the participant turns |
| 248 | BodyRotationalMagnitudeDecline | Reduction of energy spent on acceleration (in radians per second) as the participant turns |
| 249 | BodyRotationalMagnitudeCoeff1 | Regression coefficient estimating acceleration (in radians per second) as the participant turns |
| 250 | BodyRotationalMagnitudeCoeff2 | Regression coefficient estimating acceleration (in radians per second) as the participant turns |
| 251 | BodyRotationalMagnitudeCoeff3 | Regression coefficient estimating acceleration (in radians per second) as the participant turns |
| 252 | BodyRotationalMagnitudeCoeff4 | Regression coefficient estimating acceleration (in radians per second) as the participant turns |
| 253 | BodyRotationalJerkMagnitudeMean | Mean magnitude of the acceleration (in radians per second) as the participant turns |
| 254 | BodyRotationalJerkMagnitudeStdDev | Standard deviation of the acceleration (in radians per second) as the participant turns |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|--|--|
| 255 | BodyRotationalJerkMagnitudeMedian | Median magnitude of the acceleration (in radians per second) as the participant turns |
| 256 | BodyRotationalJerkMagnitudeMax | Maximum magnitude of the acceleration (in radians per second) as the participant turns |
| 257 | BodyRotationalJerkMagnitudeMin | Minimum magnitude of the acceleration (in radians per second) as the participant turns |
| 258 | BodyRotationalJerkMagnitudeMagnitude | Magnitude of the acceleration (in radians per second) as the participant turns |
| 259 | BodyRotationalJerkMagnitudeEnergy | Energy spent on the magnitude of the acceleration (in radians per second) as the participant turns |
| 260 | BodyRotationalJerkMagnitudeInterQuartile Range | 25th to 75th percentile of the acceleration (in radians per second) as the participant turns |
| 261 | BodyRotationalJerkMagnitudeDecline | Reduction of energy spent on acceleration (in radians per second) as the participant turns |
| 262 | BodyRotationalJerkMagnitudeCoeff1 | Regression coefficient estimating acceleration (in radians per second) as the participant turns |
| 263 | BodyRotationalJerkMagnitudeCoeff2 | Regression coefficient estimating acceleration (in radians per second) as the participant turns |
| 264 | BodyRotationalJerkMagnitudeCoeff3 | Regression coefficient estimating acceleration (in radians per second) as the participant turns |
| 265 | BodyRotationalJerkMagnitudeCoeff4 | Regression coefficient estimating acceleration (in radians per second) as the participant turns |
| 266 | BodyAccelerationMeanX | Average of the acceleration in standard acceleration units (g) on the X-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|-------------------------|---|
| 267 | BodyAccelerationMeanY | Average of the acceleration in standard acceleration units (g) on the Y-axis |
| 268 | BodyAccelerationMeanZ | Average of the acceleration in standard acceleration units (g) on the Z-axis |
| 269 | BodyAccelerationStdDevX | Standard deviation of the acceleration in standard acceleration units (g) on the X-axis |
| 270 | BodyAccelerationStdDevY | Standard deviation of the acceleration in standard acceleration units (g) on the Y-axis |
| 271 | BodyAccelerationStdDevZ | Standard deviation of the acceleration in standard acceleration units (g) on the Z-axis |
| 272 | BodyAccelerationMedianX | Median of the acceleration in standard acceleration units (g) on the X-axis |
| 273 | BodyAccelerationMedianY | Median of the acceleration in standard acceleration units (g) on the Y-axis |
| 274 | BodyAccelerationMedianZ | Median of the acceleration in standard acceleration units (g) on the Z-axis |
| 275 | BodyAccelerationMaxX | Maximum acceleration in standard acceleration units (g) on the X-axis |
| 276 | BodyAccelerationMaxY | Maximum acceleration in standard acceleration units (g) on the Y-axis |
| 277 | BodyAccelerationMaxZ | Maximum acceleration in standard acceleration units (g) on the Z-axis |
| 278 | BodyAccelerationMinX | Minimum acceleration in standard acceleration units (g) on the X-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|-------------------------------------|--|
| 279 | BodyAccelerationMinY | Minimum acceleration in standard acceleration units (g) on the Y-axis |
| 280 | BodyAccelerationMinZ | Minimum acceleration in standard acceleration units (g) on the Z-axis |
| 281 | BodyAccelerationMagnitude | Magnitude of the acceleration in standard acceleration units (g) |
| 282 | BodyAccelerationEnergyX | Energy expended on acceleration in standard acceleration units (g) on the X-axis |
| 283 | BodyAccelerationEnergyY | Energy expended on acceleration in standard acceleration units (g) on the Y-axis |
| 284 | BodyAccelerationEnergyZ | Energy expended on acceleration in standard acceleration units (g) on the Z-axis |
| 285 | BodyAccelerationInterQuartileRangeX | 25th to 75th percentile of acceleration in standard acceleration units (g) on the X-axis |
| 286 | BodyAccelerationInterQuartileRangeY | 26th to 75th percentile of acceleration in standard acceleration units (g) on the Y-axis |
| 287 | BodyAccelerationInterQuartileRangeZ | 27th to 75th percentile of acceleration in standard acceleration units (g) on the Z-axis |
| 288 | BodyAccelerationDeclineX | Reduction of energy spent on acceleration in standard acceleration units (g) on the X-axis |
| 289 | BodyAccelerationDeclineY | Reduction of energy spent on acceleration in standard acceleration units (g) on the Y-axis |
| 290 | BodyAccelerationDeclineZ | Reduction of energy spent on acceleration in standard acceleration units (g) on the Z-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|-------------------------------|---|
| 291 | BodyAccelerationMaxMagnitudeX | Maximum magnitude of the acceleration in standard acceleration units (g) on the X-axis |
| 292 | BodyAccelerationMaxMagnitudeY | Maximum magnitude of the acceleration in standard acceleration units (g) on the Y-axis |
| 293 | BodyAccelerationMaxMagnitudeZ | Maximum magnitude of the acceleration in standard acceleration units (g) on the Z-axis |
| 294 | BodyAccelerationMeanFreqX | Mean Frequency of the acceleration in standard acceleration units (g) on the X-axis |
| 295 | BodyAccelerationMeanFreqY | Mean Frequency of the acceleration in standard acceleration units (g) on the Y-axis |
| 296 | BodyAccelerationMeanFreqZ | Mean Frequency of the acceleration in standard acceleration units (g) on the Z-axis |
| 297 | BodyAccelerationskewnessX | Degree of skewness in the distribution of the acceleration in standard acceleration units (g) on the X-axis |
| 298 | BodyAccelerationkurtosisX | Degree of kurtosis in the distribution of the acceleration in standard acceleration units (g) on the X-axis |
| 298 | BodyAccelerationkurtosisX | Degree of kurtosis in the distribution of the acceleration in standard acceleration units (g) on the X-axis |
| 299 | BodyAccelerationskewnessY | Degree of skewness in the distribution of the acceleration in standard acceleration units (g) on the Y-axis |
| 300 | BodyAccelerationkurtosisY | Degree of kurtosis in the distribution of the acceleration in standard acceleration units (g) on the Y-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|------------------------------------|--|
| 301 | BodyAccelerationSkewnessZ | Degree of skewness in the distribution of the acceleration in standard acceleration units (g) on the Z-axis |
| 302 | BodyAccelerationKurtosisZ | Degree of kurtosis in the distribution of the acceleration in standard acceleration units (g) on the Z-axis |
| 303 | BodyAccelerationEnergyInRange1,8 | Energy expended on acceleration in standard acceleration units (g) in the range of 1 to 8 standard units (g) |
| 304 | BodyAccelerationEnergyInRange9,16 | Energy expended on acceleration in standard acceleration units (g) in the range of 9 to 16 standard units (g) |
| 305 | BodyAccelerationEnergyInRange17,24 | Energy expended on acceleration in standard acceleration units (g) in the range of 17 to 24 standard units (g) |
| 306 | BodyAccelerationEnergyInRange25,32 | Energy expended on acceleration in standard acceleration units (g) in the range of 25 to 32 standard units (g) |
| 307 | BodyAccelerationEnergyInRange33,40 | Energy expended on acceleration in standard acceleration units (g) in the range of 33 to 40 standard units (g) |
| 308 | BodyAccelerationEnergyInRange41,48 | Energy expended on acceleration in standard acceleration units (g) in the range of 41 to 48 standard units (g) |
| 309 | BodyAccelerationEnergyInRange49,56 | Energy expended on acceleration in standard acceleration units (g) in the range of 49 to 56 standard units (g) |
| 310 | BodyAccelerationEnergyInRange57,64 | Energy expended on acceleration in standard acceleration units (g) in the range of 57 to 64 standard units (g) |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|--|
| 311 | BodyAccelerationEnergyInRange1,16 | Energy expended on acceleration in standard acceleration units (g) in the range of 1 to 16 standard units (g) |
| 312 | BodyAccelerationEnergyInRange17,32 | Energy expended on acceleration in standard acceleration units (g) in the range of 17 to 32 standard units (g) |
| 313 | BodyAccelerationEnergyInRange33,48 | Energy expended on acceleration in standard acceleration units (g) in the range of 33 to 48 standard units (g) |
| 314 | BodyAccelerationEnergyInRange49,64 | Energy expended on acceleration in standard acceleration units (g) in the range of 49 to 64 standard units (g) |
| 315 | BodyAccelerationEnergyInRange1,24 | Energy expended on acceleration in standard acceleration units (g) in the range of 1 to 24 standard units (g) |
| 316 | BodyAccelerationEnergyInRange25,48 | Energy expended on acceleration in standard acceleration units (g) in the range of 25 to 48 standard units (g) |
| 317 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 318 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 319 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 320 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 321 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|--|
| 322 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 323 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 324 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 325 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 326 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 327 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 328 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 329 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 330 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 331 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 332 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 333 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|--|
| 334 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 335 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 336 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 337 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 338 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 339 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 340 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 341 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 342 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 343 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 344 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 345 | BodyAccelerationJerkMeanX | Average of the acceleration in standard acceleration units (g) on the X-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|-----------------------------|---|
| 346 | BodyAccelerationJerkMeanY | Average of the acceleration in standard acceleration units (g) on the Y-axis |
| 347 | BodyAccelerationJerkMeanZ | Average of the acceleration in standard acceleration units (g) on the Z-axis |
| 348 | BodyAccelerationJerkStdDevX | Standard deviation of the acceleration in standard acceleration units (g) on the X-axis |
| 349 | BodyAccelerationJerkStdDevY | Standard deviation of the acceleration in standard acceleration units (g) on the Y-axis |
| 350 | BodyAccelerationJerkStdDevZ | Standard deviation of the acceleration in standard acceleration units (g) on the Z-axis |
| 351 | BodyAccelerationJerkMedianX | Median of the acceleration in standard acceleration units (g) on the X-axis |
| 352 | BodyAccelerationJerkMedianY | Median of the acceleration in standard acceleration units (g) on the Y-axis |
| 353 | BodyAccelerationJerkMedianZ | Median of the acceleration in standard acceleration units (g) on the Z-axis |
| 354 | BodyAccelerationJerkMaxX | Maximum acceleration in standard acceleration units (g) on the X-axis |
| 355 | BodyAccelerationJerkMaxY | Maximum acceleration in standard acceleration units (g) on the Y-axis |
| 356 | BodyAccelerationJerkMaxZ | Maximum acceleration in standard acceleration units (g) on the Z-axis |
| 357 | BodyAccelerationJerkMinX | Minimum acceleration in standard acceleration units (g) on the X-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|--|
| 358 | BodyAccelerationJerkMinY | Minimum acceleration in standard acceleration units (g) on the Y-axis |
| 359 | BodyAccelerationJerkMinZ | Minimum acceleration in standard acceleration units (g) on the Z-axis |
| 360 | BodyAccelerationJerkMagnitude | Magnitude of the acceleration in standard acceleration units (g) |
| 361 | BodyAccelerationJerkEnergyX | Energy expended on acceleration in standard acceleration units (g) on the X-axis |
| 362 | BodyAccelerationJerkEnergyY | Energy expended on acceleration in standard acceleration units (g) on the Y-axis |
| 363 | BodyAccelerationJerkEnergyZ | Energy expended on acceleration in standard acceleration units (g) on the Z-axis |
| 364 | BodyAccelerationJerkInterQuartileRangeX | 25th to 75th percentile of acceleration in standard acceleration units (g) on the X-axis |
| 365 | BodyAccelerationJerkInterQuartileRangeY | 26th to 75th percentile of acceleration in standard acceleration units (g) on the Y-axis |
| 366 | BodyAccelerationJerkInterQuartileRangeZ | 27th to 75th percentile of acceleration in standard acceleration units (g) on the Z-axis |
| 367 | BodyAccelerationJerkDeclineX | Reduction of energy spent on acceleration in standard acceleration units (g) on the X-axis |
| 368 | BodyAccelerationJerkDeclineY | Reduction of energy spent on acceleration in standard acceleration units (g) on the Y-axis |
| 369 | BodyAccelerationJerkDeclineZ | Reduction of energy spent on acceleration in standard acceleration units (g) on the Z-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|-----------------------------------|---|
| 370 | BodyAccelerationJerkMaxMagnitudeX | Magnitude of the directional acceleration in standard acceleration units (g) on the X-axis |
| 371 | BodyAccelerationJerkMaxMagnitudeY | Magnitude of the directional acceleration in standard acceleration units (g) on the Y-axis |
| 372 | BodyAccelerationJerkMaxMagnitudeZ | Magnitude of the directional acceleration in standard acceleration units (g) on the Z-axis |
| 373 | BodyAccelerationJerkMeanFreqX | Mean Frequency of the acceleration in standard acceleration units (g) on the X-axis |
| 374 | BodyAccelerationJerkMeanFreqY | Mean Frequency of the acceleration in standard acceleration units (g) on the Y-axis |
| 375 | BodyAccelerationJerkMeanFreqZ | Mean Frequency of the acceleration in standard acceleration units (g) on the Z-axis |
| 376 | BodyAccelerationJerkskewnessX | Degree of skewness in the distribution of the acceleration in standard acceleration units (g) on the X-axis |
| 377 | BodyAccelerationJerkkurtosisX | Degree of kurtosis in the distribution of the acceleration in standard acceleration units (g) on the X-axis |
| 378 | BodyAccelerationJerkskewnessY | Degree of skewness in the distribution of the acceleration in standard acceleration units (g) on the Y-axis |
| 379 | BodyAccelerationJerkkurtosisY | Degree of kurtosis in the distribution of the acceleration in standard acceleration units (g) on the Y-axis |
| 380 | BodyAccelerationJerkskewnessZ | Degree of skewness in the distribution of the acceleration in standard acceleration units (g) on the Z-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|--|---|
| 381 | BodyAccelerationJerkkurtosisZ | Degree of kurtosis in the distribution of the acceleration in standard acceleration units (g) on the Z-axis |
| 382 | BodyAccelerationJerkEnergyInRange1,8 | Energy expended on acceleration in standard acceleration units (g) in the range of 1 to 8 standard units |
| 383 | BodyAccelerationJerkEnergyInRange9,16 | Energy expended on acceleration in standard acceleration units (g) in the range of 9 to 16 standard units |
| 384 | BodyAccelerationJerkEnergyInRange17,24 | Energy expended on acceleration in standard acceleration units (g) in the range of 17 to 24 standard units |
| 385 | BodyAccelerationJerkEnergyInRange25,32 | Energy expended on acceleration in standard acceleration units (g) in the range of 25 to 32 standard units |
| 386 | BodyAccelerationJerkEnergyInRange33,40 | Energy expended on acceleration in standard acceleration units (g) in the range of 33 to 40 standard units |
| 387 | BodyAccelerationJerkEnergyInRange41,48 | Energy expended on acceleration in standard acceleration units (g) in the range of 41 to 48 standard units |
| 388 | BodyAccelerationJerkEnergyInRange49,56 | Energy expended on acceleration in standard acceleration units (g) in the range of 49 to 56 standard units |
| 389 | BodyAccelerationJerkEnergyInRange57,64 | Energy expended on acceleration in standard acceleration units (g) in the range of 57 to 64 standard units |
| 390 | BodyAccelerationJerkEnergyInRange1,16 | Energy expended on acceleration in standard acceleration units (g) in the range of 1 to 16 standard units |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|--|
| 391 | BodyAccelerationJerkEnergyInRange17,32 | Energy expended on acceleration in standard acceleration units (g) in the range of 17 to 32 standard units |
| 392 | BodyAccelerationJerkEnergyInRange33,48 | Energy expended on acceleration in standard acceleration units (g) in the range of 33 to 48 standard units |
| 393 | BodyAccelerationJerkEnergyInRange49,64 | Energy expended on acceleration in standard acceleration units (g) in the range of 49 to 64 standard units |
| 394 | BodyAccelerationJerkEnergyInRange1,24 | Energy expended on acceleration in standard acceleration units (g) in the range of 1 to 24 standard units (g) |
| 395 | BodyAccelerationJerkEnergyInRange25,48 | Energy expended on acceleration in standard acceleration units (g) in the range of 25 to 48 standard units (g) |
| 396 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 397 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 398 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 399 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 400 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 401 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|--|
| 402 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 403 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 404 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 405 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 406 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 407 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 408 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 409 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 410 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 411 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 412 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 413 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|--|
| 414 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 415 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 416 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 417 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 418 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 419 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 420 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 421 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 422 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 423 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 424 | BodyRotationalMeanX | Average of the acceleration in radians per second as the participant turns on the X-axis |
| 425 | BodyRotationalMeanY | Average of the acceleration in radians per second as the participant turns on the Y-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|-----------------------|---|
| 426 | BodyRotationalMeanZ | Average of the acceleration in radians per second as the participant turns on the Z-axis |
| 427 | BodyRotationalStdDevX | Standard deviation of the acceleration in radians per second as the participant turns on the X-axis |
| 428 | BodyRotationalStdDevY | Standard deviation of the acceleration in radians per second as the participant turns on the Y-axis |
| 429 | BodyRotationalStdDevZ | Standard deviation of the acceleration in radians per second as the participant turns on the Z-axis |
| 430 | BodyRotationalMedianX | Median of the acceleration in radians per second as the participant turns on the X-axis |
| 431 | BodyRotationalMedianY | Median of the acceleration in radians per second as the participant turns on the Y-axis |
| 432 | BodyRotationalMedianZ | Median of the acceleration in radians per second as the participant turns on the Z-axis |
| 433 | BodyRotationalMaxX | Maximum acceleration in radians per second as the participant turns on the X-axis |
| 434 | BodyRotationalMaxY | Maximum acceleration in radians per second as the participant turns on the Y-axis |
| 435 | BodyRotationalMaxZ | Maximum acceleration in radians per second as the participant turns on the Z-axis |
| 436 | BodyRotationalMinX | Minimum acceleration in radians per second as the participant turns on the X-axis |
| 437 | BodyRotationalMinY | Minimum acceleration in radians per second as the participant turns on the Y-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|-----------------------------------|--|
| 438 | BodyRotationalMinZ | Minimum acceleration in radians per second as the participant turns on the Z-axis |
| 439 | BodyRotationalMagnitude | Magnitude of the acceleration in radians per second as the participant turns |
| 440 | BodyRotationalEnergyX | Energy expended on acceleration in radians per second as the participant turns on the X-axis |
| 441 | BodyRotationalEnergyY | Energy expended on acceleration in radians per second as the participant turns on the Y-axis |
| 442 | BodyRotationalEnergyZ | Energy expended on acceleration in radians per second as the participant turns on the Z-axis |
| 443 | BodyRotationalInterQuartileRangeX | 25th to 75th percentile of acceleration in radians per second as the participant turns on the X-axis |
| 444 | BodyRotationalInterQuartileRangeY | 25th to 75th percentile of acceleration in radians per second as the participant turns on the Y-axis |
| 445 | BodyRotationalInterQuartileRangeZ | 25th to 75th percentile of acceleration in radians per second as the participant turns on the Z-axis |
| 446 | BodyRotationalDeclineX | Reduction of energy spent on acceleration in radians per second as the participant turns on the X-axis |
| 447 | BodyRotationalDeclineY | Reduction of energy spent on acceleration in radians per second as the participant turns on the Y-axis |
| 448 | BodyRotationalDeclineZ | Reduction of energy spent on acceleration in radians per second as the participant turns on the Z-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|-----------------------------|---|
| 449 | BodyRotationalMaxMagnitudeX | Maximum magnitude of the acceleration in radians per second as the participant turns on the X-axis |
| 450 | BodyRotationalMaxMagnitudeY | Maximum magnitude of the acceleration in radians per second as the participant turns on the Y-axis |
| 451 | BodyRotationalMaxMagnitudeZ | Maximum magnitude of the acceleration in radians per second as the participant turns on the Z-axis |
| 452 | BodyRotationalMeanFreqX | Mean Frequency of the acceleration in radians per second as the participant turns on the X-axis |
| 453 | BodyRotationalMeanFreqY | Mean Frequency of the acceleration in radians per second as the participant turns on the Y-axis |
| 454 | BodyRotationalMeanFreqZ | Mean Frequency of the acceleration in radians per second as the participant turns on the Z-axis |
| 455 | BodyRotationalskewnessX | Degree of skewness in the distribution of the acceleration in radians per second as the participant turns on the X-axis |
| 456 | BodyRotationalkurtosisX | Degree of kurtosis in the distribution of the acceleration in radians per second as the participant turns on the X-axis |
| 457 | BodyRotationalskewnessY | Degree of skewness in the distribution of the acceleration in radians per second as the participant turns on the Y-axis |
| 458 | BodyRotationalkurtosisY | Degree of kurtosis in the distribution of the acceleration in radians per second as the participant turns on the Y-axis |
| 459 | BodyRotationalskewnessZ | Degree of skewness in the distribution of the acceleration in radians per second as the participant turns on the Z-axis |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|----------------------------------|---|
| 460 | BodyRotationalkurtosisZ | Degree of kurtosis in the distribution of the acceleration in radians per second as the participant turns on the Z-axis |
| 461 | BodyRotationalEnergyInRange1,8 | Acceleration in radians per second as the participant turns |
| 462 | BodyRotationalEnergyInRange9,16 | Acceleration in radians per second as the participant turns |
| 463 | BodyRotationalEnergyInRange17,24 | Acceleration in radians per second as the participant turns |
| 464 | BodyRotationalEnergyInRange25,32 | Acceleration in radians per second as the participant turns |
| 465 | BodyRotationalEnergyInRange33,40 | Acceleration in radians per second as the participant turns |
| 466 | BodyRotationalEnergyInRange41,48 | Acceleration in radians per second as the participant turns |
| 467 | BodyRotationalEnergyInRange49,56 | Acceleration in radians per second as the participant turns |
| 468 | BodyRotationalEnergyInRange57,64 | Acceleration in radians per second as the participant turns |
| 469 | BodyRotationalEnergyInRange1,16 | Acceleration in radians per second as the participant turns |
| 470 | BodyRotationalEnergyInRange17,32 | Acceleration in radians per second as the participant turns |
| 471 | BodyRotationalEnergyInRange33,48 | Acceleration in radians per second as the participant turns |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|--|
| 472 | BodyRotationalEnergyInRange49,64 | Acceleration in radians per second as the participant turns |
| 473 | BodyRotationalEnergyInRange1,24 | Acceleration in radians per second as the participant turns |
| 474 | BodyRotationalEnergyInRange25,48 | Acceleration in radians per second as the participant turns |
| 475 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 476 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 477 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 478 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 479 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 480 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 481 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 482 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 483 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|--|
| 484 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 485 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 486 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 487 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 488 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 489 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 490 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 491 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 492 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 493 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 494 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 495 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|--|
| 496 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 497 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 498 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 499 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 500 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 501 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 502 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 503 | BodyAccelerationMagnitudeMean | Mean Magnitude of the acceleration in standard acceleration units (g) |
| 504 | BodyAccelerationMagnitudeStdDev | Standard deviation of the magnitude of the acceleration in standard acceleration units (g) |
| 505 | BodyAccelerationMagnitudeMedian | Median of the magnitude of the acceleration in standard acceleration units (g) |
| 506 | BodyAccelerationMagnitudeMax | Maximum magnitude of the acceleration in standard acceleration units (g) |
| 507 | BodyAccelerationMagnitudeMin | Minimum magnitude of the acceleration in standard acceleration units (g) |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|--|
| 508 | BodyAccelerationMagnitudeMagnitude | Magnitude of the acceleration in standard acceleration units (g) |
| 509 | BodyAccelerationMagnitudeEnergy | Energy spent on the magnitude of the acceleration in standard acceleration units (g) |
| 510 | BodyAccelerationMagnitudeInterQuartileRange | 25th to 75th percentile of the acceleration in standard acceleration units (g) |
| 511 | BodyAccelerationMagnitudeDecline | Reduction of energy spent on acceleration in standard acceleration units (g) |
| 512 | BodyAccelerationMagnitudeMaxMagnitude | Maximum magnitude of the acceleration in standard acceleration units (g) |
| 513 | BodyAccelerationMagnitudeMeanFreq | Mean Magnitude of the frequency-oriented acceleration in standard acceleration units (g) |
| 514 | BodyAccelerationMagnitudeskewness | Magnitude of the skewness of the distribution of the acceleration in standard acceleration units (g) |
| 515 | BodyAccelerationMagnitudekurtosis | Magnitude of the kurtosis of the distribution of the acceleration in standard acceleration units (g) |
| 516 | BodyBodyAccelerationJerkMagnitudeMean | Mean Magnitude of the acceleration in standard acceleration units (g) |
| 517 | BodyBodyAccelerationJerkMagnitudeStdDev | Standard deviation of the magnitude of the acceleration in standard acceleration units (g) |
| 518 | BodyBodyAccelerationJerkMagnitudeMedian | Median of the magnitude of the acceleration in standard acceleration units (g) |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|--|
| 519 | BodyBodyAccelerationJerkMagnitudeMax | Maximum magnitude of the acceleration in standard acceleration units (g) |
| 520 | BodyBodyAccelerationJerkMagnitudeMin | Minimum magnitude of the acceleration in standard acceleration units (g) |
| 521 | BodyBodyAccelerationJerkMagnitudeMagnitude | Magnitude of the acceleration in standard acceleration units (g) |
| 522 | BodyBodyAccelerationJerkMagnitudeEnergy | Energy spent on the magnitude of the acceleration in standard acceleration units (g) |
| 523 | BodyBodyAccelerationJerkMagnitudeInterQuartileRange | 25th to 75th percentile of the acceleration in standard acceleration units (g) |
| 524 | BodyBodyAccelerationJerkMagnitudeDecline | Reduction of energy spent on acceleration in standard acceleration units (g) |
| 525 | BodyBodyAccelerationJerkMagnitudeMaximumMagnitude | Maximum magnitude of the acceleration in standard acceleration units (g) |
| 526 | BodyBodyAccelerationJerkMagnitudeMeanFrequency | Mean Magnitude of the frequency-oriented acceleration in standard acceleration units (g) |
| 527 | BodyBodyAccelerationJerkMagnitudeSkewness | Magnitude of the skewness of the distribution of the acceleration in standard acceleration units (g) |
| 528 | BodyBodyAccelerationJerkMagnitudeKurtosis | Magnitude of the kurtosis of the distribution of the acceleration in standard acceleration units (g) |
| 529 | BodyBodyRotationalMagnitudeMean | Mean Magnitude of the change in direction relative to gravitational pull in radians per second |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|--|---|
| 530 | BodyBodyRotationalMagnitudeStdDev | Standard deviation of the magnitude of the change in direction relative to gravitational pull in radians per second |
| 531 | BodyBodyRotationalMagnitudeMedian | Median of the magnitude of the change in direction relative to gravitational pull in radians per second |
| 532 | BodyBodyRotationalMagnitudeMax | Maximum magnitude of the change in direction relative to gravitational pull in radians per second |
| 533 | BodyBodyRotationalMagnitudeMin | Minimum magnitude of the change in direction relative to gravitational pull in radians per second |
| 534 | BodyBodyRotationalMagnitudeMagnitude | Magnitude of the change in direction relative to gravitational pull in radians per second |
| 535 | BodyBodyRotationalMagnitudeEnergy | Energy spent on the magnitude of the change in direction relative to gravitational pull in radians per second |
| 536 | BodyBodyRotationalMagnitudeInterQuartile Range | 25th to 75th percentile of the change in direction relative to gravitational pull in radians per second |
| 537 | BodyBodyRotationalMagnitudeDecline | Reduction of energy spent on change in direction relative to gravitational pull in radians per second |
| 538 | BodyBodyRotationalMagnitudeMaxMagnitude | Maximum magnitude of the change in direction relative to gravitational pull in radians per second |
| 539 | BodyBodyRotationalMagnitudeMeanFreq | Mean Magnitude of the frequency-oriented change in direction relative to gravitational pull in radians per second |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|---|
| 540 | BodyBodyRotationalMagnitudeskewness | Magnitude of the skewness of the distribution of the change in direction relative to gravitational pull in radians per second |
| 541 | BodyBodyRotationalMagnitudekurtosis | Magnitude of the kurtosis of the distribution of the change in direction relative to gravitational pull in radians per second |
| 542 | BodyBodyRotationalJerkMagnitudeMean | Mean Magnitude of the change in direction relative to gravitational pull in radians per second |
| 543 | BodyBodyRotationalJerkMagnitudeStdDev | Standard deviation of the magnitude of the change in direction relative to gravitational pull in radians per second |
| 544 | BodyBodyRotationalJerkMagnitudeMedian | Median of the magnitude of the change in direction relative to gravitational pull in radians per second |
| 545 | BodyBodyRotationalJerkMagnitudeMax | Maximum magnitude of the change in direction relative to gravitational pull in radians per second |
| 546 | BodyBodyRotationalJerkMagnitudeMin | Minimum magnitude of the change in direction relative to gravitational pull in radians per second |
| 547 | BodyBodyRotationalJerkMagnitudeMagnitude | Magnitude of the change in direction relative to gravitational pull in radians per second |
| 548 | BodyBodyRotationalJerkMagnitudeEnergy | Energy spent on the magnitude of the change in direction relative to gravitational pull in radians per second |
| 549 | BodyBodyRotationalJerkMagnitudeInterQuartileRange | 25th to 75th percentile of the change in direction relative to gravitational pull in radians per second |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|--|---|
| 550 | BodyBodyRotationalJerkMagnitudeDecline | Reduction of energy spent on change in direction relative to gravitational pull in radians per second |
| 551 | BodyBodyRotationalJerkMagnitudeMaxMagnitude | Maximum magnitude of the change in direction relative to gravitational pull in radians per second |
| 552 | BodyBodyRotationalJerkMagnitudeMeanFreq | Mean Magnitude of the frequency-oriented change in direction relative to gravitational pull in radians per second |
| 553 | BodyBodyRotationalJerkMagnitudeskewness | Magnitude of the skewness of the distribution of the change in direction relative to gravitational pull in radians per second |
| 554 | BodyBodyRotationalJerkMagnitudekurtosis | Magnitude of the kurtosis of the distribution of the change in direction relative to gravitational pull in radians per second |
| 555 | DirectionalChangeBodyAccelerationMeanRelativeToGravity | Change in direction relative to gravitational pull in radians per second |
| 556 | DirectionalChangeBodyAccelerationJerkMeanRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 557 | DirectionalChangeBodyRotationalMeanRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 558 | DirectionalChangeBodyRotationalJerkMeanRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 559 | DirectionalChangeXRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| 560 | DirectionalChangeYRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |

| ID | MEASUREMENT NAME | MEASUREMENT DESCRIPTION |
|-----|---|--|
| 561 | DirectionalChangeZRelativeToGravityMean | Change in direction relative to gravitational pull in radians per second |
| | --End of List-- | --End of List-- |

SECTION 4: CROSSWALK BETWEEN OLD AND NEW MEASUREMENT NAMES

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|----|----------------------|-------------------------|
| 1 | tBodyAcc-mean()-X | BodyAccelerationMeanX |
| 2 | tBodyAcc-mean()-Y | BodyAccelerationMeanY |
| 3 | tBodyAcc-mean()-Z | BodyAccelerationMeanZ |
| 4 | tBodyAcc-std()-X | BodyAccelerationStdDevX |
| 5 | tBodyAcc-std()-Y | BodyAccelerationStdDevY |
| 6 | tBodyAcc-std()-Z | BodyAccelerationStdDevZ |
| 7 | tBodyAcc-mad()-X | BodyAccelerationMedianX |
| 8 | tBodyAcc-mad()-Y | BodyAccelerationMedianY |
| 9 | tBodyAcc-mad()-Z | BodyAccelerationMedianZ |
| 10 | tBodyAcc-max()-X | BodyAccelerationMaxX |
| 11 | tBodyAcc-max()-Y | BodyAccelerationMaxY |
| 12 | tBodyAcc-max()-Z | BodyAccelerationMaxZ |
| 13 | tBodyAcc-min()-X | BodyAccelerationMinX |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|----|------------------------|-------------------------------------|
| 14 | tBodyAcc-min()-Y | BodyAccelerationMinY |
| 15 | tBodyAcc-min()-Z | BodyAccelerationMinZ |
| 16 | tBodyAcc-sma() | BodyAccelerationMagnitude |
| 17 | tBodyAcc-energy()-X | BodyAccelerationEnergyX |
| 18 | tBodyAcc-energy()-Y | BodyAccelerationEnergyY |
| 19 | tBodyAcc-energy()-Z | BodyAccelerationEnergyZ |
| 20 | tBodyAcc-iqr()-X | BodyAccelerationInterQuartileRangeX |
| 21 | tBodyAcc-iqr()-Y | BodyAccelerationInterQuartileRangeY |
| 22 | tBodyAcc-iqr()-Z | BodyAccelerationInterQuartileRangeZ |
| 23 | tBodyAcc-entropy()-X | BodyAccelerationDeclineX |
| 24 | tBodyAcc-entropy()-Y | BodyAccelerationDeclineY |
| 25 | tBodyAcc-entropy()-Z | BodyAccelerationDeclineZ |
| 26 | tBodyAcc-arCoeff()-X,1 | BodyAccelerationCoeffX,1 |
| 27 | tBodyAcc-arCoeff()-X,2 | BodyAccelerationCoeffX,2 |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|----|----------------------------|--------------------------|
| 28 | tBodyAcc-arCoeff()-X,3 | BodyAccelerationCoeffX,3 |
| 29 | tBodyAcc-arCoeff()-X,4 | BodyAccelerationCoeffX,4 |
| 30 | tBodyAcc-arCoeff()-Y,1 | BodyAccelerationCoeffY,1 |
| 31 | tBodyAcc-arCoeff()-Y,2 | BodyAccelerationCoeffY,2 |
| 32 | tBodyAcc-arCoeff()-Y,3 | BodyAccelerationCoeffY,3 |
| 33 | tBodyAcc-arCoeff()-Y,4 | BodyAccelerationCoeffY,4 |
| 34 | tBodyAcc-arCoeff()-Z,1 | BodyAccelerationCoeffZ,1 |
| 35 | tBodyAcc-arCoeff()-Z,2 | BodyAccelerationCoeffZ,2 |
| 36 | tBodyAcc-arCoeff()-Z,3 | BodyAccelerationCoeffZ,3 |
| 37 | tBodyAcc-arCoeff()-Z,4 | BodyAccelerationCoeffZ,4 |
| 38 | tBodyAcc-correlation()-X,Y | BodyAccelerationCorrX,Y |
| 39 | tBodyAcc-correlation()-X,Z | BodyAccelerationCorrX,Z |
| 40 | tBodyAcc-correlation()-Y,Z | BodyAccelerationCorrY,Z |
| 41 | tGravityAcc-mean()-X | GravitationalPullMeanX |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|----|----------------------|--------------------------|
| 42 | tGravityAcc-mean()-Y | GravitationalPullMeanY |
| 43 | tGravityAcc-mean()-Z | GravitationalPullMeanZ |
| 44 | tGravityAcc-std()-X | GravitationalPullStdDevX |
| 45 | tGravityAcc-std()-Y | GravitationalPullStdDevY |
| 46 | tGravityAcc-std()-Z | GravitationalPullStdDevZ |
| 47 | tGravityAcc-mad()-X | GravitationalPullMedianX |
| 48 | tGravityAcc-mad()-Y | GravitationalPullMedianY |
| 49 | tGravityAcc-mad()-Z | GravitationalPullMedianZ |
| 50 | tGravityAcc-max()-X | GravitationalPullMaxX |
| 51 | tGravityAcc-max()-Y | GravitationalPullMaxY |
| 52 | tGravityAcc-max()-Z | GravitationalPullMaxZ |
| 53 | tGravityAcc-min()-X | GravitationalPullMinX |
| 54 | tGravityAcc-min()-Y | GravitationalPullMinY |
| 55 | tGravityAcc-min()-Z | GravitationalPullMinZ |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|----|---------------------------|--------------------------------------|
| 56 | tGravityAcc-sma() | GravitationalPullMagnitude |
| 57 | tGravityAcc-energy()-X | GravitationalPullEnergyX |
| 58 | tGravityAcc-energy()-Y | GravitationalPullEnergyY |
| 59 | tGravityAcc-energy()-Z | GravitationalPullEnergyZ |
| 60 | tGravityAcc-iqr()-X | GravitationalPullInterQuartileRangeX |
| 61 | tGravityAcc-iqr()-Y | GravitationalPullInterQuartileRangeY |
| 62 | tGravityAcc-iqr()-Z | GravitationalPullInterQuartileRangeZ |
| 63 | tGravityAcc-entropy()-X | GravitationalPullDeclineX |
| 64 | tGravityAcc-entropy()-Y | GravitationalPullDeclineY |
| 65 | tGravityAcc-entropy()-Z | GravitationalPullDeclineZ |
| 66 | tGravityAcc-arCoeff()-X,1 | GravitationalPullCoeffX,1 |
| 67 | tGravityAcc-arCoeff()-X,2 | GravitationalPullCoeffX,2 |
| 68 | tGravityAcc-arCoeff()-X,3 | GravitationalPullCoeffX,3 |
| 69 | tGravityAcc-arCoeff()-X,4 | GravitationalPullCoeffX,4 |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|----|-------------------------------|---------------------------|
| 70 | tGravityAcc-arCoeff()-Y,1 | GravitationalPullCoeffY,1 |
| 71 | tGravityAcc-arCoeff()-Y,2 | GravitationalPullCoeffY,2 |
| 72 | tGravityAcc-arCoeff()-Y,3 | GravitationalPullCoeffY,3 |
| 73 | tGravityAcc-arCoeff()-Y,4 | GravitationalPullCoeffY,4 |
| 74 | tGravityAcc-arCoeff()-Z,1 | GravitationalPullCoeffZ,1 |
| 75 | tGravityAcc-arCoeff()-Z,2 | GravitationalPullCoeffZ,2 |
| 76 | tGravityAcc-arCoeff()-Z,3 | GravitationalPullCoeffZ,3 |
| 77 | tGravityAcc-arCoeff()-Z,4 | GravitationalPullCoeffZ,4 |
| 78 | tGravityAcc-correlation()-X,Y | GravitationalPullCorrX,Y |
| 79 | tGravityAcc-correlation()-X,Z | GravitationalPullCorrX,Z |
| 80 | tGravityAcc-correlation()-Y,Z | GravitationalPullCorrY,Z |
| 81 | tBodyAccJerk-mean()-X | BodyAccelerationJerkMeanX |
| 82 | tBodyAccJerk-mean()-Y | BodyAccelerationJerkMeanY |
| 83 | tBodyAccJerk-mean()-Z | BodyAccelerationJerkMeanZ |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|----|-------------------------|-------------------------------|
| 84 | tBodyAccJerk-std()-X | BodyAccelerationJerkStdDevX |
| 85 | tBodyAccJerk-std()-Y | BodyAccelerationJerkStdDevY |
| 86 | tBodyAccJerk-std()-Z | BodyAccelerationJerkStdDevZ |
| 87 | tBodyAccJerk-mad()-X | BodyAccelerationJerkMedianX |
| 88 | tBodyAccJerk-mad()-Y | BodyAccelerationJerkMedianY |
| 89 | tBodyAccJerk-mad()-Z | BodyAccelerationJerkMedianZ |
| 90 | tBodyAccJerk-max()-X | BodyAccelerationJerkMaxX |
| 91 | tBodyAccJerk-max()-Y | BodyAccelerationJerkMaxY |
| 92 | tBodyAccJerk-max()-Z | BodyAccelerationJerkMaxZ |
| 93 | tBodyAccJerk-min()-X | BodyAccelerationJerkMinX |
| 94 | tBodyAccJerk-min()-Y | BodyAccelerationJerkMinY |
| 95 | tBodyAccJerk-min()-Z | BodyAccelerationJerkMinZ |
| 96 | tBodyAccJerk-sma() | BodyAccelerationJerkMagnitude |
| 97 | tBodyAccJerk-energy()-X | BodyAccelerationJerkEnergyX |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|----------------------------|---|
| 98 | tBodyAccJerk-energy()-Y | BodyAccelerationJerkEnergyY |
| 99 | tBodyAccJerk-energy()-Z | BodyAccelerationJerkEnergyZ |
| 100 | tBodyAccJerk-iqr()-X | BodyAccelerationJerkInterQuartileRangeX |
| 101 | tBodyAccJerk-iqr()-Y | BodyAccelerationJerkInterQuartileRangeY |
| 102 | tBodyAccJerk-iqr()-Z | BodyAccelerationJerkInterQuartileRangeZ |
| 103 | tBodyAccJerk-entropy()-X | BodyAccelerationJerkDeclineX |
| 104 | tBodyAccJerk-entropy()-Y | BodyAccelerationJerkDeclineY |
| 105 | tBodyAccJerk-entropy()-Z | BodyAccelerationJerkDeclineZ |
| 106 | tBodyAccJerk-arCoeff()-X,1 | BodyAccelerationJerkCoeffX,1 |
| 107 | tBodyAccJerk-arCoeff()-X,2 | BodyAccelerationJerkCoeffX,2 |
| 108 | tBodyAccJerk-arCoeff()-X,3 | BodyAccelerationJerkCoeffX,3 |
| 109 | tBodyAccJerk-arCoeff()-X,4 | BodyAccelerationJerkCoeffX,4 |
| 110 | tBodyAccJerk-arCoeff()-Y,1 | BodyAccelerationJerkCoeffY,1 |
| 111 | tBodyAccJerk-arCoeff()-Y,2 | BodyAccelerationJerkCoeffY,2 |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|--------------------------------|------------------------------|
| 112 | tBodyAccJerk-arCoeff()-Y,3 | BodyAccelerationJerkCoeffY,3 |
| 113 | tBodyAccJerk-arCoeff()-Y,4 | BodyAccelerationJerkCoeffY,4 |
| 114 | tBodyAccJerk-arCoeff()-Z,1 | BodyAccelerationJerkCoeffZ,1 |
| 115 | tBodyAccJerk-arCoeff()-Z,2 | BodyAccelerationJerkCoeffZ,2 |
| 116 | tBodyAccJerk-arCoeff()-Z,3 | BodyAccelerationJerkCoeffZ,3 |
| 117 | tBodyAccJerk-arCoeff()-Z,4 | BodyAccelerationJerkCoeffZ,4 |
| 118 | tBodyAccJerk-correlation()-X,Y | BodyAccelerationJerkCorrX,Y |
| 119 | tBodyAccJerk-correlation()-X,Z | BodyAccelerationJerkCorrX,Z |
| 120 | tBodyAccJerk-correlation()-Y,Z | BodyAccelerationJerkCorrY,Z |
| 121 | tBodyGyro-mean()-X | BodyRotationalMeanX |
| 122 | tBodyGyro-mean()-Y | BodyRotationalMeanY |
| 123 | tBodyGyro-mean()-Z | BodyRotationalMeanZ |
| 124 | tBodyGyro-std()-X | BodyRotationalStdDevX |
| 125 | tBodyGyro-std()-Y | BodyRotationalStdDevY |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|----------------------|-------------------------|
| 126 | tBodyGyro-std()-Z | BodyRotationalStdDevZ |
| 127 | tBodyGyro-mad()-X | BodyRotationalMedianX |
| 128 | tBodyGyro-mad()-Y | BodyRotationalMedianY |
| 129 | tBodyGyro-mad()-Z | BodyRotationalMedianZ |
| 130 | tBodyGyro-max()-X | BodyRotationalMaxX |
| 131 | tBodyGyro-max()-Y | BodyRotationalMaxY |
| 132 | tBodyGyro-max()-Z | BodyRotationalMaxZ |
| 133 | tBodyGyro-min()-X | BodyRotationalMinX |
| 134 | tBodyGyro-min()-Y | BodyRotationalMinY |
| 135 | tBodyGyro-min()-Z | BodyRotationalMinZ |
| 136 | tBodyGyro-sma() | BodyRotationalMagnitude |
| 137 | tBodyGyro-energy()-X | BodyRotationalEnergyX |
| 138 | tBodyGyro-energy()-Y | BodyRotationalEnergyY |
| 139 | tBodyGyro-energy()-Z | BodyRotationalEnergyZ |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|-------------------------|-----------------------------------|
| 140 | tBodyGyro-iqr()-X | BodyRotationalInterQuartileRangeX |
| 141 | tBodyGyro-iqr()-Y | BodyRotationalInterQuartileRangeY |
| 142 | tBodyGyro-iqr()-Z | BodyRotationalInterQuartileRangeZ |
| 143 | tBodyGyro-entropy()-X | BodyRotationalDeclineX |
| 144 | tBodyGyro-entropy()-Y | BodyRotationalDeclineY |
| 145 | tBodyGyro-entropy()-Z | BodyRotationalDeclineZ |
| 146 | tBodyGyro-arCoeff()-X,1 | BodyRotationalCoeffX,1 |
| 147 | tBodyGyro-arCoeff()-X,2 | BodyRotationalCoeffX,2 |
| 148 | tBodyGyro-arCoeff()-X,3 | BodyRotationalCoeffX,3 |
| 149 | tBodyGyro-arCoeff()-X,4 | BodyRotationalCoeffX,4 |
| 150 | tBodyGyro-arCoeff()-Y,1 | BodyRotationalCoeffY,1 |
| 151 | tBodyGyro-arCoeff()-Y,2 | BodyRotationalCoeffY,2 |
| 152 | tBodyGyro-arCoeff()-Y,3 | BodyRotationalCoeffY,3 |
| 153 | tBodyGyro-arCoeff()-Y,4 | BodyRotationalCoeffY,4 |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|-----------------------------|---------------------------|
| 154 | tBodyGyro-arCoeff()-Z,1 | BodyRotationalCoeffZ,1 |
| 155 | tBodyGyro-arCoeff()-Z,2 | BodyRotationalCoeffZ,2 |
| 156 | tBodyGyro-arCoeff()-Z,3 | BodyRotationalCoeffZ,3 |
| 157 | tBodyGyro-arCoeff()-Z,4 | BodyRotationalCoeffZ,4 |
| 158 | tBodyGyro-correlation()-X,Y | BodyRotationalCorrX,Y |
| 159 | tBodyGyro-correlation()-X,Z | BodyRotationalCorrX,Z |
| 160 | tBodyGyro-correlation()-Y,Z | BodyRotationalCorrY,Z |
| 161 | tBodyGyroJerk-mean()-X | BodyRotationalJerkMeanX |
| 162 | tBodyGyroJerk-mean()-Y | BodyRotationalJerkMeanY |
| 163 | tBodyGyroJerk-mean()-Z | BodyRotationalJerkMeanZ |
| 164 | tBodyGyroJerk-std()-X | BodyRotationalJerkStdDevX |
| 165 | tBodyGyroJerk-std()-Y | BodyRotationalJerkStdDevY |
| 166 | tBodyGyroJerk-std()-Z | BodyRotationalJerkStdDevZ |
| 167 | tBodyGyroJerk-mad()-X | BodyRotationalJerkMedianX |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|--------------------------|---------------------------------------|
| 168 | tBodyGyroJerk-mad()-Y | BodyRotationalJerkMedianY |
| 169 | tBodyGyroJerk-mad()-Z | BodyRotationalJerkMedianZ |
| 170 | tBodyGyroJerk-max()-X | BodyRotationalJerkMaxX |
| 171 | tBodyGyroJerk-max()-Y | BodyRotationalJerkMaxY |
| 172 | tBodyGyroJerk-max()-Z | BodyRotationalJerkMaxZ |
| 173 | tBodyGyroJerk-min()-X | BodyRotationalJerkMinX |
| 174 | tBodyGyroJerk-min()-Y | BodyRotationalJerkMinY |
| 175 | tBodyGyroJerk-min()-Z | BodyRotationalJerkMinZ |
| 176 | tBodyGyroJerk-sma() | BodyRotationalJerkMagnitude |
| 177 | tBodyGyroJerk-energy()-X | BodyRotationalJerkEnergyX |
| 178 | tBodyGyroJerk-energy()-Y | BodyRotationalJerkEnergyY |
| 179 | tBodyGyroJerk-energy()-Z | BodyRotationalJerkEnergyZ |
| 180 | tBodyGyroJerk-iqr()-X | BodyRotationalJerkInterQuartileRangeX |
| 181 | tBodyGyroJerk-iqr()-Y | BodyRotationalJerkInterQuartileRangeY |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|-----------------------------|---------------------------------------|
| 182 | tBodyGyroJerk-iqr()-Z | BodyRotationalJerkInterQuartileRangeZ |
| 183 | tBodyGyroJerk-entropy()-X | BodyRotationalJerkDeclineX |
| 184 | tBodyGyroJerk-entropy()-Y | BodyRotationalJerkDeclineY |
| 185 | tBodyGyroJerk-entropy()-Z | BodyRotationalJerkDeclineZ |
| 186 | tBodyGyroJerk-arCoeff()-X,1 | BodyRotationalJerkCoeffX,1 |
| 187 | tBodyGyroJerk-arCoeff()-X,2 | BodyRotationalJerkCoeffX,2 |
| 188 | tBodyGyroJerk-arCoeff()-X,3 | BodyRotationalJerkCoeffX,3 |
| 189 | tBodyGyroJerk-arCoeff()-X,4 | BodyRotationalJerkCoeffX,4 |
| 190 | tBodyGyroJerk-arCoeff()-Y,1 | BodyRotationalJerkCoeffY,1 |
| 191 | tBodyGyroJerk-arCoeff()-Y,2 | BodyRotationalJerkCoeffY,2 |
| 192 | tBodyGyroJerk-arCoeff()-Y,3 | BodyRotationalJerkCoeffY,3 |
| 193 | tBodyGyroJerk-arCoeff()-Y,4 | BodyRotationalJerkCoeffY,4 |
| 194 | tBodyGyroJerk-arCoeff()-Z,1 | BodyRotationalJerkCoeffZ,1 |
| 195 | tBodyGyroJerk-arCoeff()-Z,2 | BodyRotationalJerkCoeffZ,2 |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|---------------------------------|---|
| 196 | tBodyGyroJerk-arCoeff()-Z,3 | BodyRotationalJerkCoeffZ,3 |
| 197 | tBodyGyroJerk-arCoeff()-Z,4 | BodyRotationalJerkCoeffZ,4 |
| 198 | tBodyGyroJerk-correlation()-X,Y | BodyRotationalJerkCorrX,Y |
| 199 | tBodyGyroJerk-correlation()-X,Z | BodyRotationalJerkCorrX,Z |
| 200 | tBodyGyroJerk-correlation()-Y,Z | BodyRotationalJerkCorrY,Z |
| 201 | tBodyAccMag-mean() | BodyAccelerationMagnitudeMean |
| 202 | tBodyAccMag-std() | BodyAccelerationMagnitudeStdDev |
| 203 | tBodyAccMag-mad() | BodyAccelerationMagnitudeMedian |
| 204 | tBodyAccMag-max() | BodyAccelerationMagnitudeMax |
| 205 | tBodyAccMag-min() | BodyAccelerationMagnitudeMin |
| 206 | tBodyAccMag-sma() | BodyAccelerationMagnitudeMagnitude |
| 207 | tBodyAccMag-energy() | BodyAccelerationMagnitudeEnergy |
| 208 | tBodyAccMag-iqr() | BodyAccelerationMagnitudeInterQuartileRange |
| 209 | tBodyAccMag-entropy() | BodyAccelerationMagnitudeDecline |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|---------------------------|--|
| 210 | tBodyAccMag-arCoeff()1 | BodyAccelerationMagnitudeCoeff1 |
| 211 | tBodyAccMag-arCoeff()2 | BodyAccelerationMagnitudeCoeff2 |
| 212 | tBodyAccMag-arCoeff()3 | BodyAccelerationMagnitudeCoeff3 |
| 213 | tBodyAccMag-arCoeff()4 | BodyAccelerationMagnitudeCoeff4 |
| 214 | tGravityAccMag-mean() | GravitationalPullMagnitudeMean |
| 215 | tGravityAccMag-std() | GravitationalPullMagnitudeStdDev |
| 216 | tGravityAccMag-mad() | GravitationalPullMagnitudeMedian |
| 217 | tGravityAccMag-max() | GravitationalPullMagnitudeMax |
| 218 | tGravityAccMag-min() | GravitationalPullMagnitudeMin |
| 219 | tGravityAccMag-sma() | GravitationalPullMagnitudeMagnitude |
| 220 | tGravityAccMag-energy() | GravitationalPullMagnitudeEnergy |
| 221 | tGravityAccMag-iqr() | GravitationalPullMagnitudeInterQuartileRange |
| 222 | tGravityAccMag-entropy() | GravitationalPullMagnitudeDecline |
| 223 | tGravityAccMag-arCoeff()1 | GravitationalPullMagnitudeCoeff1 |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|----------------------------|---|
| 224 | tGravityAccMag-arCoeff()2 | GravitationalPullMagnitudeCoeff2 |
| 225 | tGravityAccMag-arCoeff()3 | GravitationalPullMagnitudeCoeff3 |
| 226 | tGravityAccMag-arCoeff()4 | GravitationalPullMagnitudeCoeff4 |
| 227 | tBodyAccJerkMag-mean() | BodyAccelerationJerkMagnitudeMean |
| 228 | tBodyAccJerkMag-std() | BodyAccelerationJerkMagnitudeStdDev |
| 229 | tBodyAccJerkMag-mad() | BodyAccelerationJerkMagnitudeMedian |
| 230 | tBodyAccJerkMag-max() | BodyAccelerationJerkMagnitudeMax |
| 231 | tBodyAccJerkMag-min() | BodyAccelerationJerkMagnitudeMin |
| 232 | tBodyAccJerkMag-sma() | BodyAccelerationJerkMagnitudeMagnitude |
| 233 | tBodyAccJerkMag-energy() | BodyAccelerationJerkMagnitudeEnergy |
| 234 | tBodyAccJerkMag-iqr() | BodyAccelerationJerkMagnitudeInterQuartileRange |
| 235 | tBodyAccJerkMag-entropy() | BodyAccelerationJerkMagnitudeDecline |
| 236 | tBodyAccJerkMag-arCoeff()1 | BodyAccelerationJerkMagnitudeCoeff1 |
| 237 | tBodyAccJerkMag-arCoeff()2 | BodyAccelerationJerkMagnitudeCoeff2 |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|----------------------------|---|
| 238 | tBodyAccJerkMag-arCoeff()3 | BodyAccelerationJerkMagnitudeCoeff3 |
| 239 | tBodyAccJerkMag-arCoeff()4 | BodyAccelerationJerkMagnitudeCoeff4 |
| 240 | tBodyGyroMag-mean() | BodyRotationalMagnitudeMean |
| 241 | tBodyGyroMag-std() | BodyRotationalMagnitudeStdDev |
| 242 | tBodyGyroMag-mad() | BodyRotationalMagnitudeMedian |
| 243 | tBodyGyroMag-max() | BodyRotationalMagnitudeMax |
| 244 | tBodyGyroMag-min() | BodyRotationalMagnitudeMin |
| 245 | tBodyGyroMag-sma() | BodyRotationalMagnitudeMagnitude |
| 246 | tBodyGyroMag-energy() | BodyRotationalMagnitudeEnergy |
| 247 | tBodyGyroMag-iqr() | BodyRotationalMagnitudeInterQuartileRange |
| 248 | tBodyGyroMag-entropy() | BodyRotationalMagnitudeDecline |
| 249 | tBodyGyroMag-arCoeff()1 | BodyRotationalMagnitudeCoeff1 |
| 250 | tBodyGyroMag-arCoeff()2 | BodyRotationalMagnitudeCoeff2 |
| 251 | tBodyGyroMag-arCoeff()3 | BodyRotationalMagnitudeCoeff3 |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|-----------------------------|---|
| 252 | tBodyGyroMag-arCoeff()4 | BodyRotationalMagnitudeCoeff4 |
| 253 | tBodyGyroJerkMag-mean() | BodyRotationalJerkMagnitudeMean |
| 254 | tBodyGyroJerkMag-std() | BodyRotationalJerkMagnitudeStdDev |
| 255 | tBodyGyroJerkMag-mad() | BodyRotationalJerkMagnitudeMedian |
| 256 | tBodyGyroJerkMag-max() | BodyRotationalJerkMagnitudeMax |
| 257 | tBodyGyroJerkMag-min() | BodyRotationalJerkMagnitudeMin |
| 258 | tBodyGyroJerkMag-sma() | BodyRotationalJerkMagnitudeMagnitude |
| 259 | tBodyGyroJerkMag-energy() | BodyRotationalJerkMagnitudeEnergy |
| 260 | tBodyGyroJerkMag-iqr() | BodyRotationalJerkMagnitudeInterQuartileRange |
| 261 | tBodyGyroJerkMag-entropy() | BodyRotationalJerkMagnitudeDecline |
| 262 | tBodyGyroJerkMag-arCoeff()1 | BodyRotationalJerkMagnitudeCoeff1 |
| 263 | tBodyGyroJerkMag-arCoeff()2 | BodyRotationalJerkMagnitudeCoeff2 |
| 264 | tBodyGyroJerkMag-arCoeff()3 | BodyRotationalJerkMagnitudeCoeff3 |
| 265 | tBodyGyroJerkMag-arCoeff()4 | BodyRotationalJerkMagnitudeCoeff4 |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|----------------------|-------------------------|
| 266 | fBodyAcc-mean()-X | BodyAccelerationMeanX |
| 267 | fBodyAcc-mean()-Y | BodyAccelerationMeanY |
| 268 | fBodyAcc-mean()-Z | BodyAccelerationMeanZ |
| 269 | fBodyAcc-std()-X | BodyAccelerationStdDevX |
| 270 | fBodyAcc-std()-Y | BodyAccelerationStdDevY |
| 271 | fBodyAcc-std()-Z | BodyAccelerationStdDevZ |
| 272 | fBodyAcc-mad()-X | BodyAccelerationMedianX |
| 273 | fBodyAcc-mad()-Y | BodyAccelerationMedianY |
| 274 | fBodyAcc-mad()-Z | BodyAccelerationMedianZ |
| 275 | fBodyAcc-max()-X | BodyAccelerationMaxX |
| 276 | fBodyAcc-max()-Y | BodyAccelerationMaxY |
| 277 | fBodyAcc-max()-Z | BodyAccelerationMaxZ |
| 278 | fBodyAcc-min()-X | BodyAccelerationMinX |
| 279 | fBodyAcc-min()-Y | BodyAccelerationMinY |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|----------------------|-------------------------------------|
| 280 | fBodyAcc-min()-Z | BodyAccelerationMinZ |
| 281 | fBodyAcc-sma() | BodyAccelerationMagnitude |
| 282 | fBodyAcc-energy()-X | BodyAccelerationEnergyX |
| 283 | fBodyAcc-energy()-Y | BodyAccelerationEnergyY |
| 284 | fBodyAcc-energy()-Z | BodyAccelerationEnergyZ |
| 285 | fBodyAcc-iqr()-X | BodyAccelerationInterQuartileRangeX |
| 286 | fBodyAcc-iqr()-Y | BodyAccelerationInterQuartileRangeY |
| 287 | fBodyAcc-iqr()-Z | BodyAccelerationInterQuartileRangeZ |
| 288 | fBodyAcc-entropy()-X | BodyAccelerationDeclineX |
| 289 | fBodyAcc-entropy()-Y | BodyAccelerationDeclineY |
| 290 | fBodyAcc-entropy()-Z | BodyAccelerationDeclineZ |
| 291 | fBodyAcc-maxInds-X | BodyAccelerationMaxMagnitudeX |
| 292 | fBodyAcc-maxInds-Y | BodyAccelerationMaxMagnitudeY |
| 293 | fBodyAcc-maxInds-Z | BodyAccelerationMaxMagnitudeZ |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|------------------------------|------------------------------------|
| 294 | fBodyAcc-meanFreq()-X | BodyAccelerationMeanFreqX |
| 295 | fBodyAcc-meanFreq()-Y | BodyAccelerationMeanFreqY |
| 296 | fBodyAcc-meanFreq()-Z | BodyAccelerationMeanFreqZ |
| 297 | fBodyAcc-skewness()-X | BodyAccelerationskewnessX |
| 298 | fBodyAcc-kurtosis()-X | BodyAccelerationkurtosisX |
| 299 | fBodyAcc-skewness()-Y | BodyAccelerationskewnessY |
| 300 | fBodyAcc-kurtosis()-Y | BodyAccelerationkurtosisY |
| 301 | fBodyAcc-skewness()-Z | BodyAccelerationskewnessZ |
| 302 | fBodyAcc-kurtosis()-Z | BodyAccelerationkurtosisZ |
| 303 | fBodyAcc-bandsEnergy()-1,8 | BodyAccelerationEnergyInRange1,8 |
| 304 | fBodyAcc-bandsEnergy()-9,16 | BodyAccelerationEnergyInRange9,16 |
| 305 | fBodyAcc-bandsEnergy()-17,24 | BodyAccelerationEnergyInRange17,24 |
| 306 | fBodyAcc-bandsEnergy()-25,32 | BodyAccelerationEnergyInRange25,32 |
| 307 | fBodyAcc-bandsEnergy()-33,40 | BodyAccelerationEnergyInRange33,40 |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|------------------------------|---|
| 308 | fBodyAcc-bandsEnergy()-41,48 | BodyAccelerationEnergyInRange41,48 |
| 309 | fBodyAcc-bandsEnergy()-49,56 | BodyAccelerationEnergyInRange49,56 |
| 310 | fBodyAcc-bandsEnergy()-57,64 | BodyAccelerationEnergyInRange57,64 |
| 311 | fBodyAcc-bandsEnergy()-1,16 | BodyAccelerationEnergyInRange1,16 |
| 312 | fBodyAcc-bandsEnergy()-17,32 | BodyAccelerationEnergyInRange17,32 |
| 313 | fBodyAcc-bandsEnergy()-33,48 | BodyAccelerationEnergyInRange33,48 |
| 314 | fBodyAcc-bandsEnergy()-49,64 | BodyAccelerationEnergyInRange49,64 |
| 315 | fBodyAcc-bandsEnergy()-1,24 | BodyAccelerationEnergyInRange1,24 |
| 316 | fBodyAcc-bandsEnergy()-25,48 | BodyAccelerationEnergyInRange25,48 |
| 317 | fBodyAcc-bandsEnergy()-1,8 | DirectionalChangeZRelativeToGravityMean |
| 318 | fBodyAcc-bandsEnergy()-9,16 | DirectionalChangeZRelativeToGravityMean |
| 319 | fBodyAcc-bandsEnergy()-17,24 | DirectionalChangeZRelativeToGravityMean |
| 320 | fBodyAcc-bandsEnergy()-25,32 | DirectionalChangeZRelativeToGravityMean |
| 321 | fBodyAcc-bandsEnergy()-33,40 | DirectionalChangeZRelativeToGravityMean |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|------------------------------|---|
| 322 | fBodyAcc-bandsEnergy()-41,48 | DirectionalChangeZRelativeToGravityMean |
| 323 | fBodyAcc-bandsEnergy()-49,56 | DirectionalChangeZRelativeToGravityMean |
| 324 | fBodyAcc-bandsEnergy()-57,64 | DirectionalChangeZRelativeToGravityMean |
| 325 | fBodyAcc-bandsEnergy()-1,16 | DirectionalChangeZRelativeToGravityMean |
| 326 | fBodyAcc-bandsEnergy()-17,32 | DirectionalChangeZRelativeToGravityMean |
| 327 | fBodyAcc-bandsEnergy()-33,48 | DirectionalChangeZRelativeToGravityMean |
| 328 | fBodyAcc-bandsEnergy()-49,64 | DirectionalChangeZRelativeToGravityMean |
| 329 | fBodyAcc-bandsEnergy()-1,24 | DirectionalChangeZRelativeToGravityMean |
| 330 | fBodyAcc-bandsEnergy()-25,48 | DirectionalChangeZRelativeToGravityMean |
| 331 | fBodyAcc-bandsEnergy()-1,8 | DirectionalChangeZRelativeToGravityMean |
| 332 | fBodyAcc-bandsEnergy()-9,16 | DirectionalChangeZRelativeToGravityMean |
| 333 | fBodyAcc-bandsEnergy()-17,24 | DirectionalChangeZRelativeToGravityMean |
| 334 | fBodyAcc-bandsEnergy()-25,32 | DirectionalChangeZRelativeToGravityMean |
| 335 | fBodyAcc-bandsEnergy()-33,40 | DirectionalChangeZRelativeToGravityMean |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|------------------------------|---|
| 336 | fBodyAcc-bandsEnergy()-41,48 | DirectionalChangeZRelativeToGravityMean |
| 337 | fBodyAcc-bandsEnergy()-49,56 | DirectionalChangeZRelativeToGravityMean |
| 338 | fBodyAcc-bandsEnergy()-57,64 | DirectionalChangeZRelativeToGravityMean |
| 339 | fBodyAcc-bandsEnergy()-1,16 | DirectionalChangeZRelativeToGravityMean |
| 340 | fBodyAcc-bandsEnergy()-17,32 | DirectionalChangeZRelativeToGravityMean |
| 341 | fBodyAcc-bandsEnergy()-33,48 | DirectionalChangeZRelativeToGravityMean |
| 342 | fBodyAcc-bandsEnergy()-49,64 | DirectionalChangeZRelativeToGravityMean |
| 343 | fBodyAcc-bandsEnergy()-1,24 | DirectionalChangeZRelativeToGravityMean |
| 344 | fBodyAcc-bandsEnergy()-25,48 | DirectionalChangeZRelativeToGravityMean |
| 345 | fBodyAccJerk-mean()-X | BodyAccelerationJerkMeanX |
| 346 | fBodyAccJerk-mean()-Y | BodyAccelerationJerkMeanY |
| 347 | fBodyAccJerk-mean()-Z | BodyAccelerationJerkMeanZ |
| 348 | fBodyAccJerk-std()-X | BodyAccelerationJerkStdDevX |
| 349 | fBodyAccJerk-std()-Y | BodyAccelerationJerkStdDevY |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|-------------------------|-------------------------------|
| 350 | fBodyAccJerk-std()-Z | BodyAccelerationJerkStdDevZ |
| 351 | fBodyAccJerk-mad()-X | BodyAccelerationJerkMedianX |
| 352 | fBodyAccJerk-mad()-Y | BodyAccelerationJerkMedianY |
| 353 | fBodyAccJerk-mad()-Z | BodyAccelerationJerkMedianZ |
| 354 | fBodyAccJerk-max()-X | BodyAccelerationJerkMaxX |
| 355 | fBodyAccJerk-max()-Y | BodyAccelerationJerkMaxY |
| 356 | fBodyAccJerk-max()-Z | BodyAccelerationJerkMaxZ |
| 357 | fBodyAccJerk-min()-X | BodyAccelerationJerkMinX |
| 358 | fBodyAccJerk-min()-Y | BodyAccelerationJerkMinY |
| 359 | fBodyAccJerk-min()-Z | BodyAccelerationJerkMinZ |
| 360 | fBodyAccJerk-sma() | BodyAccelerationJerkMagnitude |
| 361 | fBodyAccJerk-energy()-X | BodyAccelerationJerkEnergyX |
| 362 | fBodyAccJerk-energy()-Y | BodyAccelerationJerkEnergyY |
| 363 | fBodyAccJerk-energy()-Z | BodyAccelerationJerkEnergyZ |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|---------------------------|---|
| 364 | fBodyAccJerk-iqr()-X | BodyAccelerationJerkInterQuartileRangeX |
| 365 | fBodyAccJerk-iqr()-Y | BodyAccelerationJerkInterQuartileRangeY |
| 366 | fBodyAccJerk-iqr()-Z | BodyAccelerationJerkInterQuartileRangeZ |
| 367 | fBodyAccJerk-entropy()-X | BodyAccelerationJerkDeclineX |
| 368 | fBodyAccJerk-entropy()-Y | BodyAccelerationJerkDeclineY |
| 369 | fBodyAccJerk-entropy()-Z | BodyAccelerationJerkDeclineZ |
| 370 | fBodyAccJerk-maxInds-X | BodyAccelerationJerkMaxMagnitudeX |
| 371 | fBodyAccJerk-maxInds-Y | BodyAccelerationJerkMaxMagnitudeY |
| 372 | fBodyAccJerk-maxInds-Z | BodyAccelerationJerkMaxMagnitudeZ |
| 373 | fBodyAccJerk-meanFreq()-X | BodyAccelerationJerkMeanFreqX |
| 374 | fBodyAccJerk-meanFreq()-Y | BodyAccelerationJerkMeanFreqY |
| 375 | fBodyAccJerk-meanFreq()-Z | BodyAccelerationJerkMeanFreqZ |
| 376 | fBodyAccJerk-skewness()-X | BodyAccelerationJerkskewnessX |
| 377 | fBodyAccJerk-kurtosis()-X | BodyAccelerationJerkkurtosisX |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|----------------------------------|--|
| 378 | fBodyAccJerk-skewness()-Y | BodyAccelerationJerkskewnessY |
| 379 | fBodyAccJerk-kurtosis()-Y | BodyAccelerationJerkkurtosisY |
| 380 | fBodyAccJerk-skewness()-Z | BodyAccelerationJerkskewnessZ |
| 381 | fBodyAccJerk-kurtosis()-Z | BodyAccelerationJerkkurtosisZ |
| 382 | fBodyAccJerk-bandsEnergy()-1,8 | BodyAccelerationJerkEnergyInRange1,8 |
| 383 | fBodyAccJerk-bandsEnergy()-9,16 | BodyAccelerationJerkEnergyInRange9,16 |
| 384 | fBodyAccJerk-bandsEnergy()-17,24 | BodyAccelerationJerkEnergyInRange17,24 |
| 385 | fBodyAccJerk-bandsEnergy()-25,32 | BodyAccelerationJerkEnergyInRange25,32 |
| 386 | fBodyAccJerk-bandsEnergy()-33,40 | BodyAccelerationJerkEnergyInRange33,40 |
| 387 | fBodyAccJerk-bandsEnergy()-41,48 | BodyAccelerationJerkEnergyInRange41,48 |
| 388 | fBodyAccJerk-bandsEnergy()-49,56 | BodyAccelerationJerkEnergyInRange49,56 |
| 389 | fBodyAccJerk-bandsEnergy()-57,64 | BodyAccelerationJerkEnergyInRange57,64 |
| 390 | fBodyAccJerk-bandsEnergy()-1,16 | BodyAccelerationJerkEnergyInRange1,16 |
| 391 | fBodyAccJerk-bandsEnergy()-17,32 | BodyAccelerationJerkEnergyInRange17,32 |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|----------------------------------|---|
| 392 | fBodyAccJerk-bandsEnergy()-33,48 | BodyAccelerationJerkEnergyInRange33,48 |
| 393 | fBodyAccJerk-bandsEnergy()-49,64 | BodyAccelerationJerkEnergyInRange49,64 |
| 394 | fBodyAccJerk-bandsEnergy()-1,24 | BodyAccelerationJerkEnergyInRange1,24 |
| 395 | fBodyAccJerk-bandsEnergy()-25,48 | BodyAccelerationJerkEnergyInRange25,48 |
| 396 | fBodyAccJerk-bandsEnergy()-1,8 | DirectionalChangeZRelativeToGravityMean |
| 397 | fBodyAccJerk-bandsEnergy()-9,16 | DirectionalChangeZRelativeToGravityMean |
| 398 | fBodyAccJerk-bandsEnergy()-17,24 | DirectionalChangeZRelativeToGravityMean |
| 399 | fBodyAccJerk-bandsEnergy()-25,32 | DirectionalChangeZRelativeToGravityMean |
| 400 | fBodyAccJerk-bandsEnergy()-33,40 | DirectionalChangeZRelativeToGravityMean |
| 401 | fBodyAccJerk-bandsEnergy()-41,48 | DirectionalChangeZRelativeToGravityMean |
| 402 | fBodyAccJerk-bandsEnergy()-49,56 | DirectionalChangeZRelativeToGravityMean |
| 403 | fBodyAccJerk-bandsEnergy()-57,64 | DirectionalChangeZRelativeToGravityMean |
| 404 | fBodyAccJerk-bandsEnergy()-1,16 | DirectionalChangeZRelativeToGravityMean |
| 405 | fBodyAccJerk-bandsEnergy()-17,32 | DirectionalChangeZRelativeToGravityMean |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|----------------------------------|---|
| 406 | fBodyAccJerk-bandsEnergy()-33,48 | DirectionalChangeZRelativeToGravityMean |
| 407 | fBodyAccJerk-bandsEnergy()-49,64 | DirectionalChangeZRelativeToGravityMean |
| 408 | fBodyAccJerk-bandsEnergy()-1,24 | DirectionalChangeZRelativeToGravityMean |
| 409 | fBodyAccJerk-bandsEnergy()-25,48 | DirectionalChangeZRelativeToGravityMean |
| 410 | fBodyAccJerk-bandsEnergy()-1,8 | DirectionalChangeZRelativeToGravityMean |
| 411 | fBodyAccJerk-bandsEnergy()-9,16 | DirectionalChangeZRelativeToGravityMean |
| 412 | fBodyAccJerk-bandsEnergy()-17,24 | DirectionalChangeZRelativeToGravityMean |
| 413 | fBodyAccJerk-bandsEnergy()-25,32 | DirectionalChangeZRelativeToGravityMean |
| 414 | fBodyAccJerk-bandsEnergy()-33,40 | DirectionalChangeZRelativeToGravityMean |
| 415 | fBodyAccJerk-bandsEnergy()-41,48 | DirectionalChangeZRelativeToGravityMean |
| 416 | fBodyAccJerk-bandsEnergy()-49,56 | DirectionalChangeZRelativeToGravityMean |
| 417 | fBodyAccJerk-bandsEnergy()-57,64 | DirectionalChangeZRelativeToGravityMean |
| 418 | fBodyAccJerk-bandsEnergy()-1,16 | DirectionalChangeZRelativeToGravityMean |
| 419 | fBodyAccJerk-bandsEnergy()-17,32 | DirectionalChangeZRelativeToGravityMean |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|----------------------------------|---|
| 420 | fBodyAccJerk-bandsEnergy()-33,48 | DirectionalChangeZRelativeToGravityMean |
| 421 | fBodyAccJerk-bandsEnergy()-49,64 | DirectionalChangeZRelativeToGravityMean |
| 422 | fBodyAccJerk-bandsEnergy()-1,24 | DirectionalChangeZRelativeToGravityMean |
| 423 | fBodyAccJerk-bandsEnergy()-25,48 | DirectionalChangeZRelativeToGravityMean |
| 424 | fBodyGyro-mean()-X | BodyRotationalMeanX |
| 425 | fBodyGyro-mean()-Y | BodyRotationalMeanY |
| 426 | fBodyGyro-mean()-Z | BodyRotationalMeanZ |
| 427 | fBodyGyro-std()-X | BodyRotationalStdDevX |
| 428 | fBodyGyro-std()-Y | BodyRotationalStdDevY |
| 429 | fBodyGyro-std()-Z | BodyRotationalStdDevZ |
| 430 | fBodyGyro-mad()-X | BodyRotationalMedianX |
| 431 | fBodyGyro-mad()-Y | BodyRotationalMedianY |
| 432 | fBodyGyro-mad()-Z | BodyRotationalMedianZ |
| 433 | fBodyGyro-max()-X | BodyRotationalMaxX |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|-----------------------|-----------------------------------|
| 434 | fBodyGyro-max()-Y | BodyRotationalMaxY |
| 435 | fBodyGyro-max()-Z | BodyRotationalMaxZ |
| 436 | fBodyGyro-min()-X | BodyRotationalMinX |
| 437 | fBodyGyro-min()-Y | BodyRotationalMinY |
| 438 | fBodyGyro-min()-Z | BodyRotationalMinZ |
| 439 | fBodyGyro-sma() | BodyRotationalMagnitude |
| 440 | fBodyGyro-energy()-X | BodyRotationalEnergyX |
| 441 | fBodyGyro-energy()-Y | BodyRotationalEnergyY |
| 442 | fBodyGyro-energy()-Z | BodyRotationalEnergyZ |
| 443 | fBodyGyro-iqr()-X | BodyRotationalInterQuartileRangeX |
| 444 | fBodyGyro-iqr()-Y | BodyRotationalInterQuartileRangeY |
| 445 | fBodyGyro-iqr()-Z | BodyRotationalInterQuartileRangeZ |
| 446 | fBodyGyro-entropy()-X | BodyRotationalDeclineX |
| 447 | fBodyGyro-entropy()-Y | BodyRotationalDeclineY |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|-----------------------------|--------------------------------|
| 448 | fBodyGyro-entropy()-Z | BodyRotationalDeclineZ |
| 449 | fBodyGyro-maxInds-X | BodyRotationalMaxMagnitudeX |
| 450 | fBodyGyro-maxInds-Y | BodyRotationalMaxMagnitudeY |
| 451 | fBodyGyro-maxInds-Z | BodyRotationalMaxMagnitudeZ |
| 452 | fBodyGyro-meanFreq()-X | BodyRotationalMeanFreqX |
| 453 | fBodyGyro-meanFreq()-Y | BodyRotationalMeanFreqY |
| 454 | fBodyGyro-meanFreq()-Z | BodyRotationalMeanFreqZ |
| 455 | fBodyGyro-skewness()-X | BodyRotationalskewnessX |
| 456 | fBodyGyro-kurtosis()-X | BodyRotationalkurtosisX |
| 457 | fBodyGyro-skewness()-Y | BodyRotationalskewnessY |
| 458 | fBodyGyro-kurtosis()-Y | BodyRotationalkurtosisY |
| 459 | fBodyGyro-skewness()-Z | BodyRotationalskewnessZ |
| 460 | fBodyGyro-kurtosis()-Z | BodyRotationalkurtosisZ |
| 461 | fBodyGyro-bandsEnergy()-1,8 | BodyRotationalEnergyInRange1,8 |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|-------------------------------|---|
| 462 | fBodyGyro-bandsEnergy()-9,16 | BodyRotationalEnergyInRange9,16 |
| 463 | fBodyGyro-bandsEnergy()-17,24 | BodyRotationalEnergyInRange17,24 |
| 464 | fBodyGyro-bandsEnergy()-25,32 | BodyRotationalEnergyInRange25,32 |
| 465 | fBodyGyro-bandsEnergy()-33,40 | BodyRotationalEnergyInRange33,40 |
| 466 | fBodyGyro-bandsEnergy()-41,48 | BodyRotationalEnergyInRange41,48 |
| 467 | fBodyGyro-bandsEnergy()-49,56 | BodyRotationalEnergyInRange49,56 |
| 468 | fBodyGyro-bandsEnergy()-57,64 | BodyRotationalEnergyInRange57,64 |
| 469 | fBodyGyro-bandsEnergy()-1,16 | BodyRotationalEnergyInRange1,16 |
| 470 | fBodyGyro-bandsEnergy()-17,32 | BodyRotationalEnergyInRange17,32 |
| 471 | fBodyGyro-bandsEnergy()-33,48 | BodyRotationalEnergyInRange33,48 |
| 472 | fBodyGyro-bandsEnergy()-49,64 | BodyRotationalEnergyInRange49,64 |
| 473 | fBodyGyro-bandsEnergy()-1,24 | BodyRotationalEnergyInRange1,24 |
| 474 | fBodyGyro-bandsEnergy()-25,48 | BodyRotationalEnergyInRange25,48 |
| 475 | fBodyGyro-bandsEnergy()-1,8 | DirectionalChangeZRelativeToGravityMean |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|-------------------------------|---|
| 476 | fBodyGyro-bandsEnergy()-9,16 | DirectionalChangeZRelativeToGravityMean |
| 477 | fBodyGyro-bandsEnergy()-17,24 | DirectionalChangeZRelativeToGravityMean |
| 478 | fBodyGyro-bandsEnergy()-25,32 | DirectionalChangeZRelativeToGravityMean |
| 479 | fBodyGyro-bandsEnergy()-33,40 | DirectionalChangeZRelativeToGravityMean |
| 480 | fBodyGyro-bandsEnergy()-41,48 | DirectionalChangeZRelativeToGravityMean |
| 481 | fBodyGyro-bandsEnergy()-49,56 | DirectionalChangeZRelativeToGravityMean |
| 482 | fBodyGyro-bandsEnergy()-57,64 | DirectionalChangeZRelativeToGravityMean |
| 483 | fBodyGyro-bandsEnergy()-1,16 | DirectionalChangeZRelativeToGravityMean |
| 484 | fBodyGyro-bandsEnergy()-17,32 | DirectionalChangeZRelativeToGravityMean |
| 485 | fBodyGyro-bandsEnergy()-33,48 | DirectionalChangeZRelativeToGravityMean |
| 486 | fBodyGyro-bandsEnergy()-49,64 | DirectionalChangeZRelativeToGravityMean |
| 487 | fBodyGyro-bandsEnergy()-1,24 | DirectionalChangeZRelativeToGravityMean |
| 488 | fBodyGyro-bandsEnergy()-25,48 | DirectionalChangeZRelativeToGravityMean |
| 489 | fBodyGyro-bandsEnergy()-1,8 | DirectionalChangeZRelativeToGravityMean |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|-------------------------------|---|
| 490 | fBodyGyro-bandsEnergy()-9,16 | DirectionalChangeZRelativeToGravityMean |
| 491 | fBodyGyro-bandsEnergy()-17,24 | DirectionalChangeZRelativeToGravityMean |
| 492 | fBodyGyro-bandsEnergy()-25,32 | DirectionalChangeZRelativeToGravityMean |
| 493 | fBodyGyro-bandsEnergy()-33,40 | DirectionalChangeZRelativeToGravityMean |
| 494 | fBodyGyro-bandsEnergy()-41,48 | DirectionalChangeZRelativeToGravityMean |
| 495 | fBodyGyro-bandsEnergy()-49,56 | DirectionalChangeZRelativeToGravityMean |
| 496 | fBodyGyro-bandsEnergy()-57,64 | DirectionalChangeZRelativeToGravityMean |
| 497 | fBodyGyro-bandsEnergy()-1,16 | DirectionalChangeZRelativeToGravityMean |
| 498 | fBodyGyro-bandsEnergy()-17,32 | DirectionalChangeZRelativeToGravityMean |
| 499 | fBodyGyro-bandsEnergy()-33,48 | DirectionalChangeZRelativeToGravityMean |
| 500 | fBodyGyro-bandsEnergy()-49,64 | DirectionalChangeZRelativeToGravityMean |
| 501 | fBodyGyro-bandsEnergy()-1,24 | DirectionalChangeZRelativeToGravityMean |
| 502 | fBodyGyro-bandsEnergy()-25,48 | DirectionalChangeZRelativeToGravityMean |
| 503 | fBodyAccMag-mean() | BodyAccelerationMagnitudeMean |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|----------------------------|---|
| 504 | fBodyAccMag-std() | BodyAccelerationMagnitudeStdDev |
| 505 | fBodyAccMag-mad() | BodyAccelerationMagnitudeMedian |
| 506 | fBodyAccMag-max() | BodyAccelerationMagnitudeMax |
| 507 | fBodyAccMag-min() | BodyAccelerationMagnitudeMin |
| 508 | fBodyAccMag-sma() | BodyAccelerationMagnitudeMagnitude |
| 509 | fBodyAccMag-energy() | BodyAccelerationMagnitudeEnergy |
| 510 | fBodyAccMag-iqr() | BodyAccelerationMagnitudeInterQuartileRange |
| 511 | fBodyAccMag-entropy() | BodyAccelerationMagnitudeDecline |
| 512 | fBodyAccMag-maxInds | BodyAccelerationMagnitudeMaxMagnitude |
| 513 | fBodyAccMag-meanFreq() | BodyAccelerationMagnitudeMeanFreq |
| 514 | fBodyAccMag-skewness() | BodyAccelerationMagnitudeskewness |
| 515 | fBodyAccMag-kurtosis() | BodyAccelerationMagnitudekurtosis |
| 516 | fBodyBodyAccJerkMag-mean() | BodyBodyAccelerationJerkMagnitudeMean |
| 517 | fBodyBodyAccJerkMag-std() | BodyBodyAccelerationJerkMagnitudeStdDev |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|--------------------------------|---|
| 518 | fBodyBodyAccJerkMag-mad() | BodyBodyAccelerationJerkMagnitudeMedian |
| 519 | fBodyBodyAccJerkMag-max() | BodyBodyAccelerationJerkMagnitudeMax |
| 520 | fBodyBodyAccJerkMag-min() | BodyBodyAccelerationJerkMagnitudeMin |
| 521 | fBodyBodyAccJerkMag-sma() | BodyBodyAccelerationJerkMagnitudeMagnitude |
| 522 | fBodyBodyAccJerkMag-energy() | BodyBodyAccelerationJerkMagnitudeEnergy |
| 523 | fBodyBodyAccJerkMag-iqr() | BodyBodyAccelerationJerkMagnitudeInterQuartileRange |
| 524 | fBodyBodyAccJerkMag-entropy() | BodyBodyAccelerationJerkMagnitudeDecline |
| 525 | fBodyBodyAccJerkMag-maxInds | BodyBodyAccelerationJerkMagnitudeMaxMagnitude |
| 526 | fBodyBodyAccJerkMag-meanFreq() | BodyBodyAccelerationJerkMagnitudeMeanFreq |
| 527 | fBodyBodyAccJerkMag-skewness() | BodyBodyAccelerationJerkMagnitudeskewness |
| 528 | fBodyBodyAccJerkMag-kurtosis() | BodyBodyAccelerationJerkMagnitudekurtosis |
| 529 | fBodyBodyGyroMag-mean() | BodyBodyRotationalMagnitudeMean |
| 530 | fBodyBodyGyroMag-std() | BodyBodyRotationalMagnitudeStdDev |
| 531 | fBodyBodyGyroMag-mad() | BodyBodyRotationalMagnitudeMedian |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|-----------------------------|---|
| 532 | fBodyBodyGyroMag-max() | BodyBodyRotationalMagnitudeMax |
| 533 | fBodyBodyGyroMag-min() | BodyBodyRotationalMagnitudeMin |
| 534 | fBodyBodyGyroMag-sma() | BodyBodyRotationalMagnitudeMagnitude |
| 535 | fBodyBodyGyroMag-energy() | BodyBodyRotationalMagnitudeEnergy |
| 536 | fBodyBodyGyroMag-iqr() | BodyBodyRotationalMagnitudeInterQuartileRange |
| 537 | fBodyBodyGyroMag-entropy() | BodyBodyRotationalMagnitudeDecline |
| 538 | fBodyBodyGyroMag-maxInds | BodyBodyRotationalMagnitudeMaxMagnitude |
| 539 | fBodyBodyGyroMag-meanFreq() | BodyBodyRotationalMagnitudeMeanFreq |
| 540 | fBodyBodyGyroMag-skewness() | BodyBodyRotationalMagnitudeSkewness |
| 541 | fBodyBodyGyroMag-kurtosis() | BodyBodyRotationalMagnitudeKurtosis |
| 542 | fBodyBodyGyroJerkMag-mean() | BodyBodyRotationalJerkMagnitudeMean |
| 543 | fBodyBodyGyroJerkMag-std() | BodyBodyRotationalJerkMagnitudeStdDev |
| 544 | fBodyBodyGyroJerkMag-mad() | BodyBodyRotationalJerkMagnitudeMedian |
| 545 | fBodyBodyGyroJerkMag-max() | BodyBodyRotationalJerkMagnitudeMax |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|--------------------------------------|---|
| 546 | fBodyBodyGyroJerkMag-min() | BodyBodyRotationalJerkMagnitudeMin |
| 547 | fBodyBodyGyroJerkMag-sma() | BodyBodyRotationalJerkMagnitudeMagnitude |
| 548 | fBodyBodyGyroJerkMag-energy() | BodyBodyRotationalJerkMagnitudeEnergy |
| 549 | fBodyBodyGyroJerkMag-iqr() | BodyBodyRotationalJerkMagnitudeInterQuartileRange |
| 550 | fBodyBodyGyroJerkMag-entropy() | BodyBodyRotationalJerkMagnitudeDecline |
| 551 | fBodyBodyGyroJerkMag-maxInds | BodyBodyRotationalJerkMagnitudeMaxMagnitude |
| 552 | fBodyBodyGyroJerkMag-meanFreq() | BodyBodyRotationalJerkMagnitudeMeanFreq |
| 553 | fBodyBodyGyroJerkMag-skewness() | BodyBodyRotationalJerkMagnitudeskewness |
| 554 | fBodyBodyGyroJerkMag-kurtosis() | BodyBodyRotationalJerkMagnitudekurtosis |
| 555 | angle(tBodyAccMean,gravity) | DirectionalChangetBodyAccelerationMeanRelativeToGravity |
| 556 | angle(tBodyAccJerkMean),gravityMean) | DirectionalChangetBodyAccelerationJerkMeanRelativeToGravityMean |
| 557 | angle(tBodyGyroMean,gravityMean) | DirectionalChangetBodyRotationalMeanRelativeToGravityMean |
| 558 | angle(tBodyGyroJerkMean,gravityMean) | DirectionalChangetBodyRotationalJerkMeanRelativeToGravityMean |
| 559 | angle(X,gravityMean) | DirectionalChangeXRelativeToGravityMean |

| ID | OLD MEASUREMENT NAME | NEW MEASUREMENT NAME |
|-----|----------------------|---|
| 560 | angle(Y,gravityMean) | DirectionalChangeYRelativeToGravityMean |
| 561 | angle(Z,gravityMean) | DirectionalChangeZRelativeToGravityMean |
| | --End of List-- | --End of List-- |

SECTION 5: STEPS THE PROGRAM `run_analysis.R` PERFORMED

The file `run_analysis.R` reorganized data from the following files.

- `features.txt`
- `activity_labels`
- `subject_train.txt`
- `x_train.txt`
- `y_train.txt`
- `subject_test.txt`
- `x_test.txt`
- `y_test.txt`

The program created 561 new files and placed them in the folder `tidy_data`. Each new file represents all measures of one measurement type, and each measure of that type is linked to one anonymous participant ID (e.g., 30) and one activity name (e.g., Walking Up Stairs). Each file has 10,300 records.

The steps performed in the program file `run_analysis.R` are below.

1. Merged the two observation files "`X_train.txt`" and "`X_test.txt`". This led to an observations file that contained 561 columns and 10,299 observations. Each file was in its own directory, namely, `train`, and `test`.
2. Changed column/feature names from 1 through 6 to Walking, Walking Up Stairs, Walking Down Stairs, Standing, Sitting, and Laying.
3. Defined a function that reads data about observations, subjects attached to observations, activities attached to observations, activities performed by subjects, and variables captured or already created.
4. Defined a function that creates variable names that are more readable by a analyst.
5. Executed the `getData` function and pass it the appropriate files related to training a statistical model based upon the data.

6. Passed the observations, subjects by observation, and acts by observation data from a temporary variable to the appropriate data frames, which were data containers in R where R can perform actions on the data.
7. Executed the function to alter variable (measurement) names and pass it the current names.
8. Merged the two files that indicated the subject id affiliated with each of the 10,299 observations named "y_train.txt" and "y_test.txt." Each file was in its own directory, namely, train, and test.
9. Merged the two files (subject_train.txt, subject_test.txt) that indicated the activity id affiliated with each of the 10,299 observations.
10. Decoded the activity ids by using the activity_labels.txt file.
11. Transformed the cryptic feature (measurement) names to more understandable variable names.
12. Attached a column to the beginning of the observations file to indicate an activity for each observation.
13. Attached a column to the beginning of the observations file to indicate a subject for each observation.
14. Sliced the new observations file into 561 files, one for each variable, and place these into the tidy_data folder.

SECTION 6: THE PROGRAM `run_analysis.R`

This file (`run_analysis.R`) reorganized data from the following files.

- `features.txt`
- `activity_labels`
- `subject_train.txt`
- `x_train.txt`
- `y_train.txt`
- `subject_test.txt`
- `x_test.txt`
- `y_test.txt`

The program created 561 new files and placed them in the folder `tidy_data`. Each new file represents all measures of one measurement type, and each measure of that type is linked to one anonymous participant ID (e.g., 30) and one activity name (e.g., Walking Up Stairs). Each file has 10,300 records.

---program begins---

```
install.packages("doBy")
require("doBy")

#Define a function that renames activities
setActivityNamesByObs<-function(actsByObs){
  for(i in seq_along(actsByObs[,1])){
    actsByObs[i,1]<-gsub("1", "Walking", actsByObs[i,1])
    actsByObs[i,1]<-gsub("2", "Walking Up Stairs", actsByObs[i,1])
    actsByObs[i,1]<-gsub("3", "Walking Down Stairs", actsByObs[i,1])
    actsByObs[i,1]<-gsub("4", "Standing", actsByObs[i,1])
    actsByObs[i,1]<-gsub("5", "Sitting", actsByObs[i,1])
    actsByObs[i,1]<-gsub("6", "Lying", actsByObs[i,1])
  }
  assign("actsByObs",actsByObs,.GlobalEnv)
}
```

#Define a function that reads data about observations, subjects attached to observations, activities attached to observations, activities performed by subjects, and variables (also known as features or measurements) captured or already created.

```
getData <- function(observationsFile, variablesFile, SubjectsByObjsFile, ActivitiesByObjsFile,
activitiesFile){
```

```
  tempObservations<-read.table(observationsFile,sep="",header=FALSE)
  assign("tempObservations",tempObservations,.GlobalEnv)
```

```
  variables<-read.table(variablesFile, sep="", header=FALSE)
```

```
  variableNames<-character(0)
```

```
  variableNames<-as.character(variables[,2])
  assign("variableNames",variableNames,.GlobalEnv)
```

```
  tempSubjsByObs<-read.table(SubjectsByObjsFile,sep="", header=FALSE)
  assign("tempSubjsByObs",tempSubjsByObs,.GlobalEnv)
```

```
  tempActsByObs<-read.table(ActivitiesByObjsFile,sep="", header=FALSE)
  assign("tempActsByObs",tempActsByObs,.GlobalEnv)
```



```

activityNames<-read.table(activitiesFile, sep="", header=FALSE)
assign("activityNames",activityNames,.GlobalEnv)

colnames(activityNames)<-c("Number","Name")

}

#Define a function that creates variable (i.e., measurement) names that are more readable by a
analyst.

clarifyVariableNames <- function (variableNames){
  tempVariableNames<-variableNames

  for(i in 1:length(tempVariableNames)){

    if(grep1("[b][a][n][d][s][E][n][e][r][g][y]",variableNames[i])){

      x<-variableNames[i]
      assign("x",x,.GlobalEnv)

      variableNames[i]<-paste(variableNames[i],"A", sep="")
      assign("variableNames",variableNames,.GlobalEnv)
    }
  }
}

```

```

for(j in 1:length(tempVariableNames)){

  if(variableNames[j]==x){

    y<-variableNames[j]
    assign("y",y,.GlobalEnv)
    variableNames[j]<-paste(variableNames[j],"B", sep="")

    if(variableNames[j+14]==x){
      variableNames[j+14]<-paste(variableNames[j+14],"C", sep="")

      assign("variableNames",variableNames,.GlobalEnv)

      for(k in 1:length(tempVariableNames)){

        if(variableNames[k]==variableNames[j]){

          z<-variableNames[k]
          assign("z",z,.GlobalEnv)
          variableNames[k]<-paste(variableNames[k],"C", sep="")
          assign("variableNames",variableNames,.GlobalEnv)
        }
      }
    }
  }
}

```

```

    }
  }
}
}
}
}

```

```

for(l in 1:length(tempVariableNames)){

  if(grep1("[C][B][A]",variableNames[l])==TRUE){
    variableNames[l]<-gsub("CBA","C", variableNames[l])
    assign("variableNames",variableNames,.GlobalEnv)

  }

}

```

```

for(m in 1:length(tempVariableNames)){

  if(grep1("[B][A]",variableNames[m])==TRUE){
    variableNames[m]<-gsub("BA","B", variableNames[m])
    assign("variableNames",variableNames,.GlobalEnv)

  }
}

```

```

}
for(n in 1:length(tempVariableNames)){
  if(grep1("[C][A]",variableNames[n])==TRUE){
    variableNames[n]<-gsub("CA","C", variableNames[n])
    assign("variableNames",variableNames,.GlobalEnv)
  }
}

for(i in 1:length(tempVariableNames)){

  if(!grep1("[b][a][n][d][s][E][n][e][r][g][y]",variableNames[i])){
    if(grep1("[A][c][c]",variableNames[i])){

      x<-variableNames[i]
      assign("x",x,.GlobalEnv)

      variableNames[i]<-paste(variableNames[i],"A", sep="")
      assign("variableNames",variableNames,.GlobalEnv)

      for(j in 1:length(tempVariableNames)){

        if(identical(variableNames[j],x)){

```

```

y<-variableNames[j]
assign("y",y,.GlobalEnv)
variableNames[j]<-paste(variableNames[j],"B", sep="")
assign("variableNames",variableNames,.GlobalEnv)

for(k in 1:length(tempVariableNames)){

  if(isTRUE(all.equal(variableNames[k],variableNames[j]))){

    z<-variableNames[k]
    assign("z",z,.GlobalEnv)
    variableNames[k]<-paste(variableNames[k],"C", sep="")
    assign("variableNames",variableNames,.GlobalEnv)
  }
}

}

}

}

}

}

}

for(l in 1:length(tempVariableNames)){

```

```

if(grepl("[C][B][A]",variableNames[1])==TRUE){
  variableNames[1]<-gsub("CBA","C", variableNames[1])
  assign("variableNames",variableNames,.GlobalEnv)

}
}

for(m in 1:length(tempVariableNames)){

  if(grepl("[B][A]",variableNames[m])==TRUE){
    variableNames[m]<-gsub("BA","B", variableNames[m])
    assign("variableNames",variableNames,.GlobalEnv)

  }
}

for(n in 1:length(tempVariableNames)){

  if(grepl("[C][A]",variableNames[n])==TRUE){
    variableNames[n]<-gsub("CA","C", variableNames[m])
    assign("variableNames",variableNames,.GlobalEnv)
  }
}

```

```

    )
  }

for(n in 1:length(tempVariableNames)){

  if(grep1("[A][A]",variableNames[n])==TRUE){
    variableNames[n]<-gsub("AA","A", variableNames[m])
    assign("variableNames",variableNames,.GlobalEnv)

  }
}

for(i in 1:length(tempVariableNames)){

  if(!grep1("[b][a][n][d][s][E][n][e][r][g][y]",variableNames[i])){

    if(grep1("[G][y][r][o]",variableNames[i])){

      x<-variableNames[i]
      assign("x",x,.GlobalEnv)

      variableNames[i]<-paste(variableNames[i],"A", sep="")
    }
  }
}

```

```

assign("variableNames",variableNames,.GlobalEnv)

for(j in 1:length(tempVariableNames)){

  if(identical(variableNames[j],x)){

    y<-variableNames[j]
    assign("y",y,.GlobalEnv)
    variableNames[j]<-paste(variableNames[j],"B", sep="")
    assign("variableNames",variableNames,.GlobalEnv)

    for(k in 1:length(tempVariableNames)){

      if(isTRUE(all.equal(variableNames[k],variableNames[j]))){

        z<-variableNames[k]
        assign("z",z,.GlobalEnv)
        variableNames[k]<-paste(variableNames[k],"C", sep="")
        assign("variableNames",variableNames,.GlobalEnv)

      }
    }
  }
}

```



```

    }
  }
}
}

```

```

for(l in 1:length(tempVariableNames)){

  if(grep1("[C][B][A]",variableNames[l])==TRUE){
    variableNames[l]<-gsub("CBA","C", variableNames[l])
    assign("variableNames",variableNames,.GlobalEnv)

  }
}

```

```

for(m in 1:length(tempVariableNames)){

  if(grep1("[B][A]",variableNames[m])==TRUE){
    variableNames[m]<-gsub("BA","B", variableNames[m])
    assign("variableNames",variableNames,.GlobalEnv)
  }
}

```

```

    }
}

for(n in 1:length(tempVariableNames)){

    if(grepl("[C][A]",variableNames[n])==TRUE){
        variableNames[n]<-gsub("CA","C", variableNames[m])
        assign("variableNames",variableNames,.GlobalEnv)

    }
}

for(n in 1:length(variableNames)){

    if(grepl("[A][A]",variableNames[n])==TRUE){
        variableNames[n]<-gsub("AA","A", variableNames[m])
        assign("variableNames",variableNames,.GlobalEnv)
    }
}

for(i in 1:length(variableNames)){

```

```

variableNames[i]<-gsub("entropy","Decline", variableNames[i])
variableNames[i]<-gsub("arCoeff","Coeff", variableNames[i])
variableNames[i]<-gsub("^f","", variableNames[i])
variableNames[i]<-gsub("^t","", variableNames[i])
variableNames[i]<-gsub("Acc","Acceleration", variableNames[i])
variableNames[i]<-gsub("GravityAcceleration","GravitationalPull",variableNames[i])
variableNames[i]<-gsub("GravityAcceleration","GravitationalPull",variableNames[i])
variableNames[i]<-gsub("GyroThrust","RotationalVelocity",variableNames[i])
variableNames[i]<-gsub("Gyro","Rotational",variableNames[i])
variableNames[i]<-gsub("mean","Mean", variableNames[i])
variableNames[i]<-gsub("correlation","Corr", variableNames[i])
variableNames[i]<-gsub("Mag","Magnitude", variableNames[i])
variableNames[i]<-gsub("mad","Median", variableNames[i])
variableNames[i]<-gsub("bandsEnergy","EnergyInRange", variableNames[i])
variableNames[i]<-gsub("angle","AngleBetweenVectors", variableNames[i])
variableNames[i]<-gsub("sma","Magnitude", variableNames[i])
variableNames[i]<-gsub("maxInds","MaxMagnitude", variableNames[i])
variableNames[i]<-gsub("iqr","InterQuartileRange", variableNames[i])
variableNames[i]<-gsub("AngleBetweenVectors","DirectionalChange", variableNames[i])
variableNames[i]<-gsub("AccelerationThrust","Acceleration", variableNames[i])
variableNames[i]<-gsub("std","StdDev", variableNames[i])
variableNames[i]<-gsub("energy","Energy", variableNames[i])
variableNames[i]<-gsub("max","Max", variableNames[i])

```

```

variableNames[i]<-gsub("min","Min", variableNames[i])
variableNames[i]<-gsub("-", "", variableNames[i])
variableNames[i]<-gsub("[(]", "", variableNames[i])
variableNames[i]<-gsub("[]]", "", variableNames[i])
variableNames[i]<-gsub("WalkingUpWalkingUp", "WalkingUp", variableNames[i])
variableNames[i]<-
gsub("DirectionalChanggetAccelerationMean,gravityMean", "DirectionalChangeInThrustRelativeToGravityMe
an", variableNames[i])
variableNames[i]<-
gsub("DirectionalChanggetRotationalVelocityMean,gravityMean", "DirectionalChangeThrustRotationalVeloc
ityMeanRelativeToGravity", variableNames[i])
variableNames[i]<-gsub(",gravity", "RelativeToGravity", variableNames[i])
variableNames[i]<-
gsub("DirectionalChangeRotationalMeanRelativeToGravityMean", "DirectionalChanggetRotationalRelativeTo
GravityMean", variableNames[i])
assign("variableNames", variableNames, .GlobalEnv)

}
}

#Execute the getData function and pass it the appropriate files related to training.
getData("train/X_train.txt", "features.txt", "train/subject_train.txt", "train/y_train.txt",
"activity_labels.txt")

```

```
setActivityNamesByObs(tempActsByObs)
```

```
assign("tempActsByObs",tempActsByObs,.GlobalEnv)
```

```
#Pass the observations, subjects by observation, and acts by observation data from temp to the  
appropriate data frames.
```

```
observations<-tempObservations
```

```
subjsByObs<-tempSubjsByObs
```

```
actsByObs<-tempActsByObs
```

```
getData("test/X_test.txt","features.txt","test/subject_test.txt", "test/y_test.txt",  
"activity_labels.txt")
```

```
observations<-rbind(observations, tempObservations)
```

```
subjsByObs<-rbind(subjsByObs, tempSubjsByObs)
```

```
actsByObs<-rbind(actsByObs, tempActsByObs)
```

```
setActivityNamesByObs(actsByObs)
```

```
actsByObs<-data.frame(actsByObs)
```

```
#Execute the function which alters the variable names and pass it the current names.
```

```

clarifyVariableNames(variableNames)

combineObsVarsSubjsActs<-function(observations, variableNames, subjsByObs, actsByObs){

  colnames(observations)<-variableNames

  assign("observations",observations,.GlobalEnv)
  colnames(subjsByObs)[1]<-"subjsByObs"

  subjsByObsIds<-as.character(subjsByObs$subjsByObs)
  assign("subjsByObsIds",subjsByObsIds,.GlobalEnv)

  colnames(actsByObs)[1]<-"actsByObs"

  actsByObs<-as.character(actsByObs$actsByObs)
  assign("actsByObs",actsByObs,.GlobalEnv)

}

combineObsVarsSubjsActs(observations, variableNames, subjsByObs, actsByObs)

actsByObs<-data.frame(actsByObs)
subjsByObsIds<-data.frame(subjsByObsIds)

```

```

observations<-cbind(actsByObs,observations)
observations<-cbind(subjsByObsIds,observations)
colnames(observations)<-c("subjsIds", "activities", variableNames)

summaryFunction <- function(x) c(means = mean(x))

for (i in 1:length(variableNames)){

  index<-i+2

  if(!file.exists("./tidyMerged")){dir.create("./tidyMerged")}

  measureToAggregate<-data.frame(observations[,c(1,2,index)])
  colnames(measureToAggregate)<-c("subjsByObsIds", "actsByObs", "measure")
  measureToAggregate$subjsByObsIds<-as.numeric(as.character(measureToAggregate$subjsByObsIds))
  measureToAggregate <- measureToAggregate[order(measureToAggregate$subjsByObsIds,
measureToAggregate$actsByObs) , ]
  write.table(measureToAggregate,paste("./tidyMerged/",
variableNames[i], ".txt", sep=""), row.names=FALSE)

  if(grep1("([M][e][a][n] | [S][t][d][D][e][v])", colnames(observations)[index])==TRUE){
    if(!file.exists("./tidyExtracted")){dir.create("./tidyExtracted")}

```

```

    extractionMeanStdDev<-data.frame(observations[,c(1,2,index)])
    colnames(extractionMeanStdDev)<-c("subjsByObsIds", "actsByObs", "measure")
    extractionMeanStdDev$subjsByObsIds<-
as.numeric(as.character(extractionMeanStdDev$subjsByObsIds))
    extractionMeanStdDev <- extractionMeanStdDev[order(extractionMeanStdDev$subjsByObsIds,
extractionMeanStdDev$actsByObs) , ]
    write.table(extractionMeanStdDev,paste("./tidyExtracted/",
variableNames[i],".txt",sep=""),row.names=FALSE)

}

if(!file.exists("./tidyAveraged")){dir.create("./tidyAveraged")}

aggregatedMeasure<-summaryBy(measure ~ subjsByObsIds + actsByObs, data=measureToAggregate,
FUN=summaryFunction)

colnames(aggregatedMeasure)<-c("subjIds", "activities", "means")
names(aggregatedMeasure)
aggregatedMeasure$subjIds<-as.numeric(as.character(aggregatedMeasure$subjIds))
aggregatedMeasure <- aggregatedMeasure[order(aggregatedMeasure$subjIds,
aggregatedMeasure$activities ) , ]

```



```
write.table(aggregatedMeasure,paste("./tidyAveraged/",  
variableNames[i],".txt",sep=""),row.names=FALSE)
```

```
}
```

```
write.table(variableNames,"tidyVariableNames.txt", sep=" ", quote=FALSE)
```

```
---program ends---
```