

Codebook for 'Means Dataset.txt'

The dataset presents summarized results of an experiment on Human Activity Recognition Using Smartphones. 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 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.

The dataset presents the averages of 86 separate variables describing the means and standard deviations of the variables measured during the experiment. Each of the averages is provided for each subject in the experiment (a total of 30) and for each activity (a total of six), resulting in 180 observations. Activity type and subject ID are included in the dataset as columns 1 and 2. The dataset was generated using the R script run_analysis and the process is described in detail in the accompanying ReadMe file.

The variable names described below are spelled out, describing the origin of the measurement (accelerometer and gyroscope) and further specifications (time or frequency measurement, axis, angle). Standard Deviation is abbreviated as std.

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'data.frame': 180 obs. of 88 variables:

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activity

Storage mode: integer
Factor with 6 levels

	Values and labels	N	Percent
1	'laying'	30	16.7
2	'sitting'	30	16.7
3	'standing'	30	16.7
4	'walking'	30	16.7
5	'walking downstairs'	30	16.7
6	'walking upstairs'	30	16.7

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subjectID

Storage mode: integer (1:30)

Min.: 1.000
1st Qu.: 8.000
Median: 15.500
Mean: 15.500
3rd Qu.: 23.000
Max.: 30.000

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timeBodyAccelerometer-mean-X

Storage mode: double

Min.: 0.222
1st Qu.: 0.271
Median: 0.277
Mean: 0.274
3rd Qu.: 0.280
Max.: 0.301

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timeBodyAccelerometer-mean-Y

Storage mode: double

Min.: -0.041
1st Qu.: -0.020
Median: -0.017
Mean: -0.018
3rd Qu.: -0.015
Max.: -0.001

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timeBodyAccelerometer-mean-Z

Storage mode: double

Min.: -0.152

1st Qu.: -0.112
Median: -0.108
Mean: -0.109
3rd Qu.: -0.104
Max.: -0.075

=====

timeBodyAccelerometer-std-X

Storage mode: double

Min.: -0.996
1st Qu.: -0.980
Median: -0.753
Mean: -0.558
3rd Qu.: -0.198
Max.: 0.627

=====

timeBodyAccelerometer-std-Y

Storage mode: double

Min.: -0.990
1st Qu.: -0.942
Median: -0.509
Mean: -0.461
3rd Qu.: -0.031
Max.: 0.617

=====

timeBodyAccelerometer-std-Z

Storage mode: double

Min.: -0.988
1st Qu.: -0.950
Median: -0.652
Mean: -0.576
3rd Qu.: -0.231
Max.: 0.609

=====

timeGravityAccelerometer-mean-X

Storage mode: double

Min.:	-0.680
1st Qu.:	0.838
Median:	0.921
Mean:	0.698
3rd Qu.:	0.942
Max.:	0.975

=====

timeGravityAccelerometer-mean-Y

Storage mode: double

Min.:	-0.480
1st Qu.:	-0.233
Median:	-0.128
Mean:	-0.016
3rd Qu.:	0.088
Max.:	0.957

=====

timeGravityAccelerometer-mean-Z

Storage mode: double

Min.:	-0.495
1st Qu.:	-0.117
Median:	0.024
Mean:	0.074
3rd Qu.:	0.149
Max.:	0.958

=====

timeGravityAccelerometer-std-X

Storage mode: double

Min.: -0.997
1st Qu.: -0.983
Median: -0.970
Mean: -0.964
3rd Qu.: -0.951
Max.: -0.830

=====

timeGravityAccelerometer-std-Y

Storage mode: double

Min.: -0.994
1st Qu.: -0.971
Median: -0.959
Mean: -0.952
3rd Qu.: -0.937
Max.: -0.644

=====

timeGravityAccelerometer-std-Z

Storage mode: double

Min.: -0.991
1st Qu.: -0.961
Median: -0.945
Mean: -0.936
3rd Qu.: -0.918
Max.: -0.610

=====

timeBodyAccelerometerJerk-mean-X

Storage mode: double

Min.: 0.043
1st Qu.: 0.074
Median: 0.076
Mean: 0.079

3rd Qu.: 0.083
Max.: 0.130

=====

timeBodyAccelerometerJerk-mean-Y

Storage mode: double

Min.: -0.039
1st Qu.: 0.000
Median: 0.009
Mean: 0.008
3rd Qu.: 0.013
Max.: 0.057

=====

timeBodyAccelerometerJerk-mean-Z

Storage mode: double

Min.: -0.067
1st Qu.: -0.011
Median: -0.004
Mean: -0.005
3rd Qu.: 0.002
Max.: 0.038

=====

timeBodyAccelerometerJerk-std-X

Storage mode: double

Min.: -0.995
1st Qu.: -0.983
Median: -0.810
Mean: -0.595
3rd Qu.: -0.223
Max.: 0.544

=====

timeBodyAccelerometerJerk-std-Y

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-----  
-----  
  
Storage mode: double  
  
    Min.: -0.990  
    1st Qu.: -0.972  
    Median: -0.776  
    Mean: -0.565  
    3rd Qu.: -0.148  
    Max.:  0.355  
  
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```

timeBodyAccelerometerJerk-std-Z

```
-----  
-----  
  
Storage mode: double  
  
    Min.: -0.993  
    1st Qu.: -0.983  
    Median: -0.884  
    Mean: -0.736  
    3rd Qu.: -0.512  
    Max.:  0.031  
  
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timeBodyGyroscope-mean-X

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-----  
-----  
  
Storage mode: double  
  
    Min.: -0.206  
    1st Qu.: -0.047  
    Median: -0.029  
    Mean: -0.032  
    3rd Qu.: -0.017  
    Max.:  0.193  
  
=====
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timeBodyGyroscope-mean-Y

```
-----  
-----  
  
Storage mode: double  
  
    Min.: -0.204
```

1st Qu.: -0.090
Median: -0.073
Mean: -0.074
3rd Qu.: -0.061
Max.: 0.027

=====

timeBodyGyroscope-mean-Z

Storage mode: double

Min.: -0.072
1st Qu.: 0.075
Median: 0.085
Mean: 0.087
3rd Qu.: 0.102
Max.: 0.179

=====

timeBodyGyroscope-std-X

Storage mode: double

Min.: -0.994
1st Qu.: -0.974
Median: -0.789
Mean: -0.692
3rd Qu.: -0.441
Max.: 0.268

=====

timeBodyGyroscope-std-Y

Storage mode: double

Min.: -0.994
1st Qu.: -0.963
Median: -0.802
Mean: -0.653
3rd Qu.: -0.420
Max.: 0.476

=====

timeBodyGyroscope-std-Z

Storage mode: double

Min.: -0.986
1st Qu.: -0.961
Median: -0.801
Mean: -0.616
3rd Qu.: -0.311
Max.: 0.565

=====

timeBodyGyroscopeJerk-mean-X

Storage mode: double

Min.: -0.157
1st Qu.: -0.103
Median: -0.099
Mean: -0.096
3rd Qu.: -0.091
Max.: -0.022

=====

timeBodyGyroscopeJerk-mean-Y

Storage mode: double

Min.: -0.077
1st Qu.: -0.046
Median: -0.041
Mean: -0.043
3rd Qu.: -0.038
Max.: -0.013

=====

timeBodyGyroscopeJerk-mean-Z

Storage mode: double

Min.: -0.092
1st Qu.: -0.062
Median: -0.053
Mean: -0.055
3rd Qu.: -0.049
Max.: -0.007

=====

timeBodyGyroscopeJerk-std-X

Storage mode: double

Min.: -0.997
1st Qu.: -0.980
Median: -0.840
Mean: -0.704
3rd Qu.: -0.463
Max.: 0.179

=====

timeBodyGyroscopeJerk-std-Y

Storage mode: double

Min.: -0.997
1st Qu.: -0.983
Median: -0.894
Mean: -0.764
3rd Qu.: -0.586
Max.: 0.296

=====

timeBodyGyroscopeJerk-std-Z

Storage mode: double

Min.: -0.995
1st Qu.: -0.985
Median: -0.861
Mean: -0.710

3rd Qu.: -0.474
Max.: 0.193

=====

timeBodyAccelerometerMagnitude-mean

Storage mode: double

Min.: -0.987
1st Qu.: -0.957
Median: -0.483
Mean: -0.497
3rd Qu.: -0.092
Max.: 0.645

=====

timeBodyAccelerometerMagnitude-std

Storage mode: double

Min.: -0.987
1st Qu.: -0.943
Median: -0.607
Mean: -0.544
3rd Qu.: -0.209
Max.: 0.428

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timeGravityAccelerometerMagnitude-mean

Storage mode: double

Min.: -0.987
1st Qu.: -0.957
Median: -0.483
Mean: -0.497
3rd Qu.: -0.092
Max.: 0.645

=====

timeGravityAccelerometerMagnitude-std

Storage mode: double

Min.: -0.987
1st Qu.: -0.943
Median: -0.607
Mean: -0.544
3rd Qu.: -0.209
Max.: 0.428

=====
=====

timeBodyAccelerometerJerkMagnitude-mean

Storage mode: double

Min.: -0.993
1st Qu.: -0.981
Median: -0.817
Mean: -0.608
3rd Qu.: -0.246
Max.: 0.434

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timeBodyAccelerometerJerkMagnitude-std

Storage mode: double

Min.: -0.995
1st Qu.: -0.977
Median: -0.801
Mean: -0.584
3rd Qu.: -0.217
Max.: 0.451

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=====

timeBodyGyroscopeMagnitude-mean

Storage mode: double

Min.: -0.981

1st Qu.: -0.946
Median: -0.655
Mean: -0.565
3rd Qu.: -0.216
Max.: 0.418

=====

timeBodyGyroscopeMagnitude-std

Storage mode: double

Min.: -0.981
1st Qu.: -0.948
Median: -0.742
Mean: -0.630
3rd Qu.: -0.360
Max.: 0.300

=====

timeBodyGyroscopeJerkMagnitude-mean

Storage mode: double

Min.: -0.997
1st Qu.: -0.985
Median: -0.865
Mean: -0.736
3rd Qu.: -0.512
Max.: 0.088

=====

timeBodyGyroscopeJerkMagnitude-std

Storage mode: double

Min.: -0.998
1st Qu.: -0.981
Median: -0.881
Mean: -0.755
3rd Qu.: -0.577
Max.: 0.250

=====

frequencyBodyAccelerometer-mean-X

Storage mode: double

Min.: -0.995
1st Qu.: -0.979
Median: -0.769
Mean: -0.576
3rd Qu.: -0.217
Max.: 0.537

=====

frequencyBodyAccelerometer-mean-Y

Storage mode: double

Min.: -0.989
1st Qu.: -0.954
Median: -0.595
Mean: -0.489
3rd Qu.: -0.063
Max.: 0.524

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frequencyBodyAccelerometer-mean-Z

Storage mode: double

Min.: -0.990
1st Qu.: -0.962
Median: -0.724
Mean: -0.630
3rd Qu.: -0.318
Max.: 0.281

=====

frequencyBodyAccelerometer-std-X

Storage mode: double

Min.: -0.997
1st Qu.: -0.982
Median: -0.747
Mean: -0.552
3rd Qu.: -0.197
Max.: 0.658

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frequencyBodyAccelerometer-std-Y

Storage mode: double

Min.: -0.991
1st Qu.: -0.940
Median: -0.513
Mean: -0.481
3rd Qu.: -0.079
Max.: 0.560

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frequencyBodyAccelerometer-std-Z

Storage mode: double

Min.: -0.987
1st Qu.: -0.946
Median: -0.644
Mean: -0.582
3rd Qu.: -0.266
Max.: 0.687

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=====

frequencyBodyAccelerometer-meanFrequency-X

Storage mode: double

Min.: -0.636
1st Qu.: -0.392
Median: -0.257
Mean: -0.232

3rd Qu.: -0.061
Max.: 0.159

=====

frequencyBodyAccelerometer-meanFrequency-Y

Storage mode: double

Min.: -0.380
1st Qu.: -0.081
Median: 0.008
Mean: 0.012
3rd Qu.: 0.086
Max.: 0.467

=====

frequencyBodyAccelerometer-meanFrequency-Z

Storage mode: double

Min.: -0.520
1st Qu.: -0.036
Median: 0.066
Mean: 0.044
3rd Qu.: 0.175
Max.: 0.403

=====

frequencyBodyAccelerometerJerk-mean-X

Storage mode: double

Min.: -0.995
1st Qu.: -0.983
Median: -0.813
Mean: -0.614
3rd Qu.: -0.282
Max.: 0.474

=====

frequencyBodyAccelerometerJerk-mean-Y


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-----  
-----  
  
Storage mode: double  
  
      Min.:  -0.989  
1st Qu.:  -0.973  
Median:   -0.782  
Mean:    -0.588  
3rd Qu.:  -0.196  
Max.:     0.277  
  
=====
```

```
=====
```

frequencyBodyAccelerometerJerk-mean-Z

```
-----  
-----  
  
Storage mode: double  
  
      Min.:  -0.992  
1st Qu.:  -0.980  
Median:   -0.871  
Mean:    -0.714  
3rd Qu.:  -0.470  
Max.:     0.158  
  
=====
```

```
=====
```

frequencyBodyAccelerometerJerk-std-X

```
-----  
-----  
  
Storage mode: double  
  
      Min.:  -0.995  
1st Qu.:  -0.985  
Median:   -0.825  
Mean:    -0.612  
3rd Qu.:  -0.247  
Max.:     0.477  
  
=====
```

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```

frequencyBodyAccelerometerJerk-std-Y

```
-----  
-----  
  
Storage mode: double  
  
      Min.:  -0.991
```

1st Qu.: -0.974
Median: -0.785
Mean: -0.571
3rd Qu.: -0.169
Max.: 0.350

=====
=====

frequencyBodyAccelerometerJerk-std-Z

Storage mode: double

Min.: -0.993
1st Qu.: -0.984
Median: -0.895
Mean: -0.756
3rd Qu.: -0.544
Max.: -0.006

=====
=====

frequencyBodyAccelerometerJerk-meanFrequency-X

Storage mode: double

Min.: -0.576
1st Qu.: -0.290
Median: -0.061
Mean: -0.069
3rd Qu.: 0.177
Max.: 0.331

=====
=====

frequencyBodyAccelerometerJerk-meanFrequency-Y

Storage mode: double

Min.: -0.602
1st Qu.: -0.398
Median: -0.232
Mean: -0.228
3rd Qu.: -0.047
Max.: 0.196

=====

frequencyBodyAccelerometerJerk-meanFrequency-Z

Storage mode: double

Min.: -0.628
1st Qu.: -0.309
Median: -0.092
Mean: -0.138
3rd Qu.: 0.039
Max.: 0.230

=====

frequencyBodyGyroscope-mean-X

Storage mode: double

Min.: -0.993
1st Qu.: -0.970
Median: -0.730
Mean: -0.637
3rd Qu.: -0.339
Max.: 0.475

=====

frequencyBodyGyroscope-mean-Y

Storage mode: double

Min.: -0.994
1st Qu.: -0.970
Median: -0.814
Mean: -0.677
3rd Qu.: -0.446
Max.: 0.329

=====

frequencyBodyGyroscope-mean-Z

Storage mode: double

Min.: -0.986
1st Qu.: -0.962
Median: -0.791
Mean: -0.604
3rd Qu.: -0.264
Max.: 0.492

=====

frequencyBodyGyroscope-std-X

Storage mode: double

Min.: -0.995
1st Qu.: -0.975
Median: -0.809
Mean: -0.711
3rd Qu.: -0.481
Max.: 0.197

=====

frequencyBodyGyroscope-std-Y

Storage mode: double

Min.: -0.994
1st Qu.: -0.960
Median: -0.796
Mean: -0.645
3rd Qu.: -0.415
Max.: 0.646

=====

frequencyBodyGyroscope-std-Z

Storage mode: double

Min.: -0.987
1st Qu.: -0.964
Median: -0.822
Mean: -0.658

3rd Qu.: -0.392
Max.: 0.522

=====

frequencyBodyGyroscope-meanFrequency-X

Storage mode: double

Min.: -0.396
1st Qu.: -0.213
Median: -0.116
Mean: -0.105
3rd Qu.: 0.003
Max.: 0.249

=====

frequencyBodyGyroscope-meanFrequency-Y

Storage mode: double

Min.: -0.667
1st Qu.: -0.294
Median: -0.158
Mean: -0.167
3rd Qu.: -0.043
Max.: 0.273

=====

frequencyBodyGyroscope-meanFrequency-Z

Storage mode: double

Min.: -0.507
1st Qu.: -0.155
Median: -0.051
Mean: -0.057
3rd Qu.: 0.042
Max.: 0.377

=====

frequencyBodyAccelerometerMagnitude-mean

```
-----  
-----  
  
Storage mode: double  
  
      Min.: -0.987  
1st Qu.: -0.956  
Median: -0.670  
Mean: -0.536  
3rd Qu.: -0.162  
Max.: 0.587  
  
=====
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frequencyBodyAccelerometerMagnitude-std

```
-----  
-----  
  
Storage mode: double  
  
      Min.: -0.988  
1st Qu.: -0.945  
Median: -0.651  
Mean: -0.621  
3rd Qu.: -0.365  
Max.: 0.179  
  
=====
```

```
=====
```

frequencyBodyAccelerometerMagnitude-meanFrequency

```
-----  
-----  
  
Storage mode: double  
  
      Min.: -0.312  
1st Qu.: -0.015  
Median: 0.081  
Mean: 0.076  
3rd Qu.: 0.174  
Max.: 0.436  
  
=====
```

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```

frequencyBodyAccelerometerJerkMagnitude-mean

```
-----  
-----  
  
Storage mode: double  
  
      Min.: -0.994
```

1st Qu.: -0.977
Median: -0.794
Mean: -0.576
3rd Qu.: -0.187
Max.: 0.538

=====

frequencyBodyAccelerometerJerkMagnitude-std

Storage mode: double

Min.: -0.994
1st Qu.: -0.975
Median: -0.813
Mean: -0.599
3rd Qu.: -0.267
Max.: 0.316

=====

frequencyBodyAccelerometerJerkMagnitude-meanFrequency

Storage mode: double

Min.: -0.125
1st Qu.: 0.045
Median: 0.172
Mean: 0.163
3rd Qu.: 0.276
Max.: 0.488

=====

frequencyBodyGyroscopeMagnitude-mean

Storage mode: double

Min.: -0.987
1st Qu.: -0.962
Median: -0.766
Mean: -0.667
3rd Qu.: -0.409
Max.: 0.204

=====

frequencyBodyGyroscopeMagnitude-std

Storage mode: double

Min.: -0.982
1st Qu.: -0.949
Median: -0.773
Mean: -0.672
3rd Qu.: -0.428
Max.: 0.237

=====

frequencyBodyGyroscopeMagnitude-meanFrequency

Storage mode: double

Min.: -0.457
1st Qu.: -0.170
Median: -0.054
Mean: -0.036
3rd Qu.: 0.082
Max.: 0.409

=====

frequencyBodyGyroscopeJerkMagnitude-mean

Storage mode: double

Min.: -0.998
1st Qu.: -0.981
Median: -0.878
Mean: -0.756
3rd Qu.: -0.583
Max.: 0.147

=====

frequencyBodyGyroscopeJerkMagnitude-std

Storage mode: double

Min.: -0.998
1st Qu.: -0.980
Median: -0.894
Mean: -0.771
3rd Qu.: -0.608
Max.: 0.288

=====

frequencyBodyGyroscopeJerkMagnitude-meanFrequency

Storage mode: double

Min.: -0.183
1st Qu.: 0.054
Median: 0.112
Mean: 0.126
3rd Qu.: 0.208
Max.: 0.426

=====

angle-timeBodyAccelerometer-meanGravity

Storage mode: double

Min.: -0.163
1st Qu.: -0.011
Median: 0.008
Mean: 0.007
3rd Qu.: 0.024
Max.: 0.129

=====

angle-timeBodyAccelerometerJerk-meanGravityMean

Storage mode: double

Min.: -0.121
1st Qu.: -0.021
Median: 0.003
Mean: 0.001

3rd Qu.: 0.022
Max.: 0.203

=====

angle-timeBodyGyroscope-meanGravityMean

Storage mode: double

Min.: -0.389
1st Qu.: -0.020
Median: 0.021
Mean: 0.022
3rd Qu.: 0.065
Max.: 0.444

=====

angle-timeBodyGyroscopeJerk-meanGravityMean

Storage mode: double

Min.: -0.224
1st Qu.: -0.056
Median: -0.016
Mean: -0.011
3rd Qu.: 0.032
Max.: 0.182

=====

angle-XGravity-mean

Storage mode: double

Min.: -0.947
1st Qu.: -0.791
Median: -0.738
Mean: -0.524
3rd Qu.: -0.582
Max.: 0.738

=====

angle-YGravity-mean

Storage mode: double

Min.: -0.875
1st Qu.: 0.022
Median: 0.171
Mean: 0.079
3rd Qu.: 0.243
Max.: 0.425

=====
=====

angle-ZGravity-mean

Storage mode: double

Min.: -0.874
1st Qu.: -0.084
Median: 0.005
Mean: -0.040
3rd Qu.: 0.106
Max.: 0.390