HAR_tidy_data

Is a data set in which the mean of each of the variables [3] to [81] listed below are calculated for each Activity/Subject ID combination.

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).

Units:
Acceleration (total and body) are 'g's (gravity of earth -> 9.80665 m/sec2).
Gyroscope measurement units are rad/sec.

Below is an overview description of the different parts of the variable names for variables 3 to 81 labeled below.

The measurements are defined as follows:

Denotes 3-axial signals in the X, Y and Z directions
-X
-Y
-Z

tAcc – raw accelerometer signal at 50 Hz
tGyro – raw gyroscope signal at 50Hz
tBodyAcc – Body component of acceleration signal
tGravityAcc – Gravity component of acceleration signal
tBodyGyro – gyroscope signal at 50 Hz

tBodyAccJerk–Jerk signal, derivative of body linear acceleration
tBodyGyroJerk-Jerk signal, derivative of angular velocity

Using Euclidean norm:
tBodyAccMag – magnitude of body component of acceleration
tGravityAccMag – magnitude of gravity component of acceleration
tBodyAccJerkMag – magnitude of body AccJerk
tBodyGyroMag – magnitude of body Gyrocopic measurement
tBodyGyroJerkMag – magnitude of body GyroJerk

Fast Fourier Transform applied to signals to convert the measurements to the Frequency domain:
fBodyAcc
fBodyAccJerk
fBodyGyro
fBodyAccJerkMag
fBodyGyroMag
fBodyGyroJerkMag

mean(): Mean value
std(): Standard deviation
meanFreq(): Weighted average of the frequency components to obtain a mean frequency

The data set of 81 variables contains 180 records

[1] ActivityName : Factor
Activity subject is performing during measurement
ActName corresponds to ActID

WALKING	1
WALKING_UPSTAIRS	2
WALKING_DOWNSTAIRS	3
SITTING	4
STANDING	5
LAYING	6

[2] SubjectID: Integer
Identification number of subject
Range: 1 to 30

Values of the measurements below, 3 to 81, are Numeric.

The values are the means of the measurements taken summarized by Activity and Subject. To make the listing more readable, I provided the key above to describe the variable names below.

tBodyAcc – Body component of acceleration signal means and standard deviations in the X, Y, and Z directions, units, g's.

[3] tBodyAcc-mean()-X
[4] tBodyAcc-mean()-Y
[5] tBodyAcc-mean()-Z
[6] tBodyAcc-std()-X
[7] tBodyAcc-std()-Y
[8] tBodyAcc-std()-Z

tGravityAcc – Gravity component of acceleration signal means and standard deviations in the X, Y, and Z directions, units, g's

[9] tGravityAcc-mean()-X
[10] tGravityAcc-mean()-Y
[11] tGravityAcc-mean()-Z
[12] tGravityAcc-std()-X
[13] tGravityAcc-std()-Y
[14] tGravityAcc-std()-Z

tBodyAccJerk–Jerk signal, derivative of body linear acceleration means and standard deviations in the X, Y, and Z directions, units, m/s.

[15] tBodyAccJerk-mean()-X
[16] tBodyAccJerk-mean()-Y
[17] tBodyAccJerk-mean()-Z
[18] tBodyAccJerk-std()-X
[19] tBodyAccJerk-std()-Y
[20] tBodyAccJerk-std()-Z

tBodyGyro – gyroscope signal at 50 Hz, means and standard deviations in the X, Y, and Z directions, units, rad/sec.

[21] tBodyGyro-mean()-X
[22] tBodyGyro-mean()-Y
[23] tBodyGyro-mean()-Z
[24] tBodyGyro-std()-X
[25] tBodyGyro-std()-Y
[26] tBodyGyro-std()-Z

tBodyGyroJerk-Jerk signal, derivative of angular velocity means and standard deviations in the X, Y, and Z directions, units, rads.

[27] tBodyGyroJerk-mean()-X
[28] tBodyGyroJerk-mean()-Y
[29] tBodyGyroJerk-mean()-Z
[30] tBodyGyroJerk-std()-X
[31] tBodyGyroJerk-std()-Y
[32] tBodyGyroJerk-std()-Z

tBodyAccMag - magnitude of body component of acceleration mean and standard deviation, units, m/sec2.

[33] tBodyAccMag-mean()
[34] tBodyAccMag-std()

tGravityAccMag - magnitude of gravity component of acceleration mean and standard deviation, units, m/sec2.

[35] tGravityAccMag-mean()
[36] tGravityAccMag-std()

tBodyAccJerkMag - magnitude of body AccJerk, units, m/s.

[37] tBodyAccJerkMag-mean()
[38] tBodyAccJerkMag-std()

tBodyGyroMag - magnitude of body Gyroscopic measurement, rad/sec.

[39] tBodyGyroMag-mean()
[40] tBodyGyroMag-std()

tBodyGyroJerkMag - magnitude of body GyroJerk, units, rads.

[41] tBodyGyroJerkMag-mean()
[42] tBodyGyroJerkMag-std()

Fast Fourier Transform, frequency domain variables of the variables above.

BodyAcc – Body component of acceleration signal means and standard deviations in the X, Y, and Z directions, m/sec2

[43] fBodyAcc-mean()-X
[44] fBodyAcc-mean()-Y
[45] fBodyAcc-mean()-Z
[46] fBodyAcc-std()-X
[47] fBodyAcc-std()-Y
[48] fBodyAcc-std()-Z
[49] fBodyAcc-meanFreq()-X
[50] fBodyAcc-meanFreq()-Y
[51] fBodyAcc-meanFreq()-Z

BodyAccJerk–Jerk signal, derivative of body linear acceleration means and standard deviations in the X, Y, and Z directions, units, m/sec2.

[52] fBodyAccJerk-mean()-X
[53] fBodyAccJerk-mean()-Y
[54] fBodyAccJerk-mean()-Z
[55] fBodyAccJerk-std()-X
[56] fBodyAccJerk-std()-Y
[57] fBodyAccJerk-std()-Z
[58] fBodyAccJerk-meanFreq()-X
[59] fBodyAccJerk-meanFreq()-Y
[60] fBodyAccJerk-meanFreq()-Z

BodyGyro – gyroscope signal at 50 Hz, means and standard deviations in the X, Y, and Z directions, units, rad/sec.

[61] fBodyGyro-mean()-X
[62] fBodyGyro-mean()-Y
[63] fBodyGyro-mean()-Z
[64] fBodyGyro-std()-X
[65] fBodyGyro-std()-Y
[66] fBodyGyro-std()-Z
[67] fBodyGyro-meanFreq()-X
[68] fBodyGyro-meanFreq()-Y
[69] fBodyGyro-meanFreq()-Z

BodyAccMag – magnitude of body component of acceleration mean and standard deviation, units, m/sec2.

[70] fBodyAccMag-mean()
[71] fBodyAccMag-std()
[72] fBodyAccMag-meanFreq()

BodyAccJerkMag - magnitude of body AccJerk, units, m/s.
Note: It appears that the variable was mistakenly labeled with Body twice.
I left the variable name unchanged.

[73] fBodyBodyAccJerkMag-mean()
[74] fBodyBodyAccJerkMag-std()
[75] fBodyBodyAccJerkMag-meanFreq()

BodyGyroMag - magnitude of body Gyrocopic measurement, rad/sec.
Note: It appears that the variable was mistakenly labeled with Body twice.
I left the variable name unchanged.

[76] fBodyBodyGyroMag-mean()
[77] fBodyBodyGyroMag-std()
[78] fBodyBodyGyroMag-meanFreq()

BodyGyroJerkMag - magnitude of body GyroJerk, units, rads.

[79] fBodyBodyGyroJerkMag-mean()
[80] fBodyBodyGyroJerkMag-std()
[81] fBodyBodyGyroJerkMag-meanFreq()

Raw Data Code Book information

Subject Files

Subject Identification number range: 1 to 30

Activity Labels File used to apply Activity Names corresponding to Activity identification numbers.

Act

	ActID	ActName
1	1	WALKING
2	2	WALKING_UPSTAIRS
3	3	WALKING_DOWNSTAIRS
4	4	SITTING
5	5	STANDING
6	6	LAYING

Raw Data Feature Selection

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The features selected for this database come from the accelerometer and gyroscope 3-axial raw signals tAcc-XYZ and tGyro-XYZ. These time domain signals (prefix 't' to denote time) were captured at a constant rate of 50 Hz. Then they were filtered using a median filter and a 3rd order low pass Butterworth filter with a corner frequency of 20 Hz to remove noise. Similarly, the acceleration signal was then separated into body and gravity acceleration signals (tBodyAcc-XYZ and tGravityAcc-XYZ) using another low pass Butterworth filter with a corner frequency of 0.3 Hz.

Subsequently, the body linear acceleration and angular velocity were derived in time to obtain Jerk signals (tBodyAccJerk-XYZ and tBodyGyroJerk-XYZ). Also the magnitude of these three-dimensional signals were calculated using the Euclidean norm (tBodyAccMag, tGravityAccMag, tBodyAccJerkMag, tBodyGyroMag, tBodyGyroJerkMag).

Finally a Fast Fourier Transform (FFT) was applied to some of these signals producing fBodyAcc-XYZ, fBodyAccJerk-XYZ, fBodyGyro-XYZ, fBodyAccJerkMag, fBodyGyroMag, fBodyGyroJerkMag. (Note the 'f' to indicate frequency domain signals).

These signals were used to estimate variables of the feature vector for each pattern:

'-XYZ' is used to denote 3-axial signals in the X, Y and Z directions.

tBodyAcc-XYZ
tGravityAcc-XYZ
tBodyAccJerk-XYZ
tBodyGyro-XYZ
tBodyGyroJerk-XYZ
tBodyAccMag
tGravityAccMag

tBodyAccJerkMag
tBodyGyroMag
tBodyGyroJerkMag
fBodyAcc-XYZ
fBodyAccJerk-XYZ
fBodyGyro-XYZ
fBodyAccMag
fBodyAccJerkMag
fBodyGyroMag
fBodyGyroJerkMag

The set of variables that were estimated from these signals are:

mean(): Mean value
std(): Standard deviation
mad(): Median absolute deviation
max(): Largest value in array
min(): Smallest value in array
sma(): Signal magnitude area
energy(): Energy measure. Sum of the squares divided by the number of values.
iqr(): Interquartile range
entropy(): Signal entropy
arCoeff(): Autorregresion coefficients with Burg order equal to 4
correlation(): correlation coefficient between two signals
maxInds(): index of the frequency component with largest magnitude
meanFreq(): Weighted average of the frequency components to obtain a mean frequency
skewness(): skewness of the frequency domain signal
kurtosis(): kurtosis of the frequency domain signal
bandsEnergy(): Energy of a frequency interval within the 64 bins of the FFT of each window.
angle(): Angle between to vectors.

Additional vectors obtained by averaging the signals in a signal window sample. These are used on the angle() variable:

gravityMean
tBodyAccMean
tBodyAccJerkMean
tBodyGyroMean
tBodyGyroJerkMean

Original Features 561 Variables in the raw data set, features.txt

1 1 tBodyAcc-mean()-X
2 2 tBodyAcc-mean()-Y
3 3 tBodyAcc-mean()-Z
4 4 tBodyAcc-std()-X
5 5 tBodyAcc-std()-Y
6 6 tBodyAcc-std()-Z
7 7 tBodyAcc-mad()-X
8 8 tBodyAcc-mad()-Y
9 9 tBodyAcc-mad()-Z
10 10 tBodyAcc-max()-X
11 11 tBodyAcc-max()-Y
12 12 tBodyAcc-max()-Z
13 13 tBodyAcc-min()-X
14 14 tBodyAcc-min()-Y
15 15 tBodyAcc-min()-Z
16 16 tBodyAcc-sma()
17 17 tBodyAcc-energy()-X
18 18 tBodyAcc-energy()-Y
19 19 tBodyAcc-energy()-Z
20 20 tBodyAcc-iqr()-X
21 21 tBodyAcc-iqr()-Y
22 22 tBodyAcc-iqr()-Z
23 23 tBodyAcc-entropy()-X
24 24 tBodyAcc-entropy()-Y
25 25 tBodyAcc-entropy()-Z
26 26 tBodyAcc-arCoeff()-X,1
27 27 tBodyAcc-arCoeff()-X,2
28 28 tBodyAcc-arCoeff()-X,3
29 29 tBodyAcc-arCoeff()-X,4
30 30 tBodyAcc-arCoeff()-Y,1
31 31 tBodyAcc-arCoeff()-Y,2
32 32 tBodyAcc-arCoeff()-Y,3
33 33 tBodyAcc-arCoeff()-Y,4
34 34 tBodyAcc-arCoeff()-Z,1
35 35 tBodyAcc-arCoeff()-Z,2
36 36 tBodyAcc-arCoeff()-Z,3
37 37 tBodyAcc-arCoeff()-Z,4
38 38 tBodyAcc-correlation()-X,Y
39 39 tBodyAcc-correlation()-X,Z
40 40 tBodyAcc-correlation()-Y,Z
41 41 tGravityAcc-mean()-X
42 42 tGravityAcc-mean()-Y
43 43 tGravityAcc-mean()-Z
44 44 tGravityAcc-std()-X
45 45 tGravityAcc-std()-Y
46 46 tGravityAcc-std()-Z
47 47 tGravityAcc-mad()-X
48 48 tGravityAcc-mad()-Y
49 49 tGravityAcc-mad()-Z
50 50 tGravityAcc-max()-X
51 51 tGravityAcc-max()-Y
52 52 tGravityAcc-max()-Z
53 53 tGravityAcc-min()-X
54 54 tGravityAcc-min()-Y
55 55 tGravityAcc-min()-Z

56 56 tGravityAcc-sma()
57 57 tGravityAcc-energy()-X
58 58 tGravityAcc-energy()-Y
59 59 tGravityAcc-energy()-Z
60 60 tGravityAcc-iqr()-X
61 61 tGravityAcc-iqr()-Y
62 62 tGravityAcc-iqr()-Z
63 63 tGravityAcc-entropy()-X
64 64 tGravityAcc-entropy()-Y
65 65 tGravityAcc-entropy()-Z
66 66 tGravityAcc-arCoeff()-X,1
67 67 tGravityAcc-arCoeff()-X,2
68 68 tGravityAcc-arCoeff()-X,3
69 69 tGravityAcc-arCoeff()-X,4
70 70 tGravityAcc-arCoeff()-Y,1
71 71 tGravityAcc-arCoeff()-Y,2
72 72 tGravityAcc-arCoeff()-Y,3
73 73 tGravityAcc-arCoeff()-Y,4
74 74 tGravityAcc-arCoeff()-Z,1
75 75 tGravityAcc-arCoeff()-Z,2
76 76 tGravityAcc-arCoeff()-Z,3
77 77 tGravityAcc-arCoeff()-Z,4
78 78 tGravityAcc-correlation()-X,Y
79 79 tGravityAcc-correlation()-X,Z
80 80 tGravityAcc-correlation()-Y,Z
81 81 tBodyAccJerk-mean()-X
82 82 tBodyAccJerk-mean()-Y
83 83 tBodyAccJerk-mean()-Z
84 84 tBodyAccJerk-std()-X
85 85 tBodyAccJerk-std()-Y
86 86 tBodyAccJerk-std()-Z
87 87 tBodyAccJerk-mad()-X
88 88 tBodyAccJerk-mad()-Y
89 89 tBodyAccJerk-mad()-Z
90 90 tBodyAccJerk-max()-X
91 91 tBodyAccJerk-max()-Y
92 92 tBodyAccJerk-max()-Z
93 93 tBodyAccJerk-min()-X
94 94 tBodyAccJerk-min()-Y
95 95 tBodyAccJerk-min()-Z
96 96 tBodyAccJerk-sma()
97 97 tBodyAccJerk-energy()-X
98 98 tBodyAccJerk-energy()-Y
99 99 tBodyAccJerk-energy()-Z
100 100 tBodyAccJerk-iqr()-X
101 101 tBodyAccJerk-iqr()-Y
102 102 tBodyAccJerk-iqr()-Z
103 103 tBodyAccJerk-entropy()-X
104 104 tBodyAccJerk-entropy()-Y
105 105 tBodyAccJerk-entropy()-Z
106 106 tBodyAccJerk-arCoeff()-X,1
107 107 tBodyAccJerk-arCoeff()-X,2
108 108 tBodyAccJerk-arCoeff()-X,3
109 109 tBodyAccJerk-arCoeff()-X,4
110 110 tBodyAccJerk-arCoeff()-Y,1
111 111 tBodyAccJerk-arCoeff()-Y,2
112 112 tBodyAccJerk-arCoeff()-Y,3

113 113 tBodyAccJerk-arCoeff()-Y,4
114 114 tBodyAccJerk-arCoeff()-Z,1
115 115 tBodyAccJerk-arCoeff()-Z,2
116 116 tBodyAccJerk-arCoeff()-Z,3
117 117 tBodyAccJerk-arCoeff()-Z,4
118 118 tBodyAccJerk-correlation()-X,Y
119 119 tBodyAccJerk-correlation()-X,Z
120 120 tBodyAccJerk-correlation()-Y,Z
121 121 tBodyGyro-mean()-X
122 122 tBodyGyro-mean()-Y
123 123 tBodyGyro-mean()-Z
124 124 tBodyGyro-std()-X
125 125 tBodyGyro-std()-Y
126 126 tBodyGyro-std()-Z
127 127 tBodyGyro-mad()-X
128 128 tBodyGyro-mad()-Y
129 129 tBodyGyro-mad()-Z
130 130 tBodyGyro-max()-X
131 131 tBodyGyro-max()-Y
132 132 tBodyGyro-max()-Z
133 133 tBodyGyro-min()-X
134 134 tBodyGyro-min()-Y
135 135 tBodyGyro-min()-Z
136 136 tBodyGyro-sma()
137 137 tBodyGyro-energy()-X
138 138 tBodyGyro-energy()-Y
139 139 tBodyGyro-energy()-Z
140 140 tBodyGyro-iqr()-X
141 141 tBodyGyro-iqr()-Y
142 142 tBodyGyro-iqr()-Z
143 143 tBodyGyro-entropy()-X
144 144 tBodyGyro-entropy()-Y
145 145 tBodyGyro-entropy()-Z
146 146 tBodyGyro-arCoeff()-X,1
147 147 tBodyGyro-arCoeff()-X,2
148 148 tBodyGyro-arCoeff()-X,3
149 149 tBodyGyro-arCoeff()-X,4
150 150 tBodyGyro-arCoeff()-Y,1
151 151 tBodyGyro-arCoeff()-Y,2
152 152 tBodyGyro-arCoeff()-Y,3
153 153 tBodyGyro-arCoeff()-Y,4
154 154 tBodyGyro-arCoeff()-Z,1
155 155 tBodyGyro-arCoeff()-Z,2
156 156 tBodyGyro-arCoeff()-Z,3
157 157 tBodyGyro-arCoeff()-Z,4
158 158 tBodyGyro-correlation()-X,Y
159 159 tBodyGyro-correlation()-X,Z
160 160 tBodyGyro-correlation()-Y,Z
161 161 tBodyGyroJerk-mean()-X
162 162 tBodyGyroJerk-mean()-Y
163 163 tBodyGyroJerk-mean()-Z
164 164 tBodyGyroJerk-std()-X
165 165 tBodyGyroJerk-std()-Y
166 166 tBodyGyroJerk-std()-Z
167 167 tBodyGyroJerk-mad()-X
168 168 tBodyGyroJerk-mad()-Y
169 169 tBodyGyroJerk-mad()-Z

170 170 tBodyGyroJerk-max()-X
171 171 tBodyGyroJerk-max()-Y
172 172 tBodyGyroJerk-max()-Z
173 173 tBodyGyroJerk-min()-X
174 174 tBodyGyroJerk-min()-Y
175 175 tBodyGyroJerk-min()-Z
176 176 tBodyGyroJerk-sma()
177 177 tBodyGyroJerk-energy()-X
178 178 tBodyGyroJerk-energy()-Y
179 179 tBodyGyroJerk-energy()-Z
180 180 tBodyGyroJerk-iqr()-X
181 181 tBodyGyroJerk-iqr()-Y
182 182 tBodyGyroJerk-iqr()-Z
183 183 tBodyGyroJerk-entropy()-X
184 184 tBodyGyroJerk-entropy()-Y
185 185 tBodyGyroJerk-entropy()-Z
186 186 tBodyGyroJerk-arCoeff()-X,1
187 187 tBodyGyroJerk-arCoeff()-X,2
188 188 tBodyGyroJerk-arCoeff()-X,3
189 189 tBodyGyroJerk-arCoeff()-X,4
190 190 tBodyGyroJerk-arCoeff()-Y,1
191 191 tBodyGyroJerk-arCoeff()-Y,2
192 192 tBodyGyroJerk-arCoeff()-Y,3
193 193 tBodyGyroJerk-arCoeff()-Y,4
194 194 tBodyGyroJerk-arCoeff()-Z,1
195 195 tBodyGyroJerk-arCoeff()-Z,2
196 196 tBodyGyroJerk-arCoeff()-Z,3
197 197 tBodyGyroJerk-arCoeff()-Z,4
198 198 tBodyGyroJerk-correlation()-X,Y
199 199 tBodyGyroJerk-correlation()-X,Z
200 200 tBodyGyroJerk-correlation()-Y,Z
201 201 tBodyAccMag-mean()
202 202 tBodyAccMag-std()
203 203 tBodyAccMag-mad()
204 204 tBodyAccMag-max()
205 205 tBodyAccMag-min()
206 206 tBodyAccMag-sma()
207 207 tBodyAccMag-energy()
208 208 tBodyAccMag-iqr()
209 209 tBodyAccMag-entropy()
210 210 tBodyAccMag-arCoeff()1
211 211 tBodyAccMag-arCoeff()2
212 212 tBodyAccMag-arCoeff()3
213 213 tBodyAccMag-arCoeff()4
214 214 tGravityAccMag-mean()
215 215 tGravityAccMag-std()
216 216 tGravityAccMag-mad()
217 217 tGravityAccMag-max()
218 218 tGravityAccMag-min()
219 219 tGravityAccMag-sma()
220 220 tGravityAccMag-energy()
221 221 tGravityAccMag-iqr()
222 222 tGravityAccMag-entropy()
223 223 tGravityAccMag-arCoeff()1
224 224 tGravityAccMag-arCoeff()2
225 225 tGravityAccMag-arCoeff()3
226 226 tGravityAccMag-arCoeff()4

227 227 tBodyAccJerkMag-mean()
228 228 tBodyAccJerkMag-std()
229 229 tBodyAccJerkMag-mad()
230 230 tBodyAccJerkMag-max()
231 231 tBodyAccJerkMag-min()
232 232 tBodyAccJerkMag-sma()
233 233 tBodyAccJerkMag-energy()
234 234 tBodyAccJerkMag-iqr()
235 235 tBodyAccJerkMag-entropy()
236 236 tBodyAccJerkMag-arCoeff()1
237 237 tBodyAccJerkMag-arCoeff()2
238 238 tBodyAccJerkMag-arCoeff()3
239 239 tBodyAccJerkMag-arCoeff()4
240 240 tBodyGyroMag-mean()
241 241 tBodyGyroMag-std()
242 242 tBodyGyroMag-mad()
243 243 tBodyGyroMag-max()
244 244 tBodyGyroMag-min()
245 245 tBodyGyroMag-sma()
246 246 tBodyGyroMag-energy()
247 247 tBodyGyroMag-iqr()
248 248 tBodyGyroMag-entropy()
249 249 tBodyGyroMag-arCoeff()1
250 250 tBodyGyroMag-arCoeff()2
251 251 tBodyGyroMag-arCoeff()3
252 252 tBodyGyroMag-arCoeff()4
253 253 tBodyGyroJerkMag-mean()
254 254 tBodyGyroJerkMag-std()
255 255 tBodyGyroJerkMag-mad()
256 256 tBodyGyroJerkMag-max()
257 257 tBodyGyroJerkMag-min()
258 258 tBodyGyroJerkMag-sma()
259 259 tBodyGyroJerkMag-energy()
260 260 tBodyGyroJerkMag-iqr()
261 261 tBodyGyroJerkMag-entropy()
262 262 tBodyGyroJerkMag-arCoeff()1
263 263 tBodyGyroJerkMag-arCoeff()2
264 264 tBodyGyroJerkMag-arCoeff()3
265 265 tBodyGyroJerkMag-arCoeff()4
266 266 fBodyAcc-mean()-X
267 267 fBodyAcc-mean()-Y
268 268 fBodyAcc-mean()-Z
269 269 fBodyAcc-std()-X
270 270 fBodyAcc-std()-Y
271 271 fBodyAcc-std()-Z
272 272 fBodyAcc-mad()-X
273 273 fBodyAcc-mad()-Y
274 274 fBodyAcc-mad()-Z
275 275 fBodyAcc-max()-X
276 276 fBodyAcc-max()-Y
277 277 fBodyAcc-max()-Z
278 278 fBodyAcc-min()-X
279 279 fBodyAcc-min()-Y
280 280 fBodyAcc-min()-Z
281 281 fBodyAcc-sma()
282 282 fBodyAcc-energy()-X
283 283 fBodyAcc-energy()-Y

284 284 fBodyAcc-energy()-Z
285 285 fBodyAcc-iqr()-X
286 286 fBodyAcc-iqr()-Y
287 287 fBodyAcc-iqr()-Z
288 288 fBodyAcc-entropy()-X
289 289 fBodyAcc-entropy()-Y
290 290 fBodyAcc-entropy()-Z
291 291 fBodyAcc-maxInds-X
292 292 fBodyAcc-maxInds-Y
293 293 fBodyAcc-maxInds-Z
294 294 fBodyAcc-meanFreq()-X
295 295 fBodyAcc-meanFreq()-Y
296 296 fBodyAcc-meanFreq()-Z
297 297 fBodyAcc-skewness()-X
298 298 fBodyAcc-kurtosis()-X
299 299 fBodyAcc-skewness()-Y
300 300 fBodyAcc-kurtosis()-Y
301 301 fBodyAcc-skewness()-Z
302 302 fBodyAcc-kurtosis()-Z
303 303 fBodyAcc-bandsEnergy()-1,8
304 304 fBodyAcc-bandsEnergy()-9,16
305 305 fBodyAcc-bandsEnergy()-17,24
306 306 fBodyAcc-bandsEnergy()-25,32
307 307 fBodyAcc-bandsEnergy()-33,40
308 308 fBodyAcc-bandsEnergy()-41,48
309 309 fBodyAcc-bandsEnergy()-49,56
310 310 fBodyAcc-bandsEnergy()-57,64
311 311 fBodyAcc-bandsEnergy()-1,16
312 312 fBodyAcc-bandsEnergy()-17,32
313 313 fBodyAcc-bandsEnergy()-33,48
314 314 fBodyAcc-bandsEnergy()-49,64
315 315 fBodyAcc-bandsEnergy()-1,24
316 316 fBodyAcc-bandsEnergy()-25,48
317 317 fBodyAcc-bandsEnergy()-1,8
318 318 fBodyAcc-bandsEnergy()-9,16
319 319 fBodyAcc-bandsEnergy()-17,24
320 320 fBodyAcc-bandsEnergy()-25,32
321 321 fBodyAcc-bandsEnergy()-33,40
322 322 fBodyAcc-bandsEnergy()-41,48
323 323 fBodyAcc-bandsEnergy()-49,56
324 324 fBodyAcc-bandsEnergy()-57,64
325 325 fBodyAcc-bandsEnergy()-1,16
326 326 fBodyAcc-bandsEnergy()-17,32
327 327 fBodyAcc-bandsEnergy()-33,48
328 328 fBodyAcc-bandsEnergy()-49,64
329 329 fBodyAcc-bandsEnergy()-1,24
330 330 fBodyAcc-bandsEnergy()-25,48
331 331 fBodyAcc-bandsEnergy()-1,8
332 332 fBodyAcc-bandsEnergy()-9,16
333 333 fBodyAcc-bandsEnergy()-17,24
334 334 fBodyAcc-bandsEnergy()-25,32
335 335 fBodyAcc-bandsEnergy()-33,40
336 336 fBodyAcc-bandsEnergy()-41,48
337 337 fBodyAcc-bandsEnergy()-49,56
338 338 fBodyAcc-bandsEnergy()-57,64
339 339 fBodyAcc-bandsEnergy()-1,16
340 340 fBodyAcc-bandsEnergy()-17,32

341 341 fBodyAcc-bandsEnergy()-33,48
342 342 fBodyAcc-bandsEnergy()-49,64
343 343 fBodyAcc-bandsEnergy()-1,24
344 344 fBodyAcc-bandsEnergy()-25,48
345 345 fBodyAccJerk-mean()-X
346 346 fBodyAccJerk-mean()-Y
347 347 fBodyAccJerk-mean()-Z
348 348 fBodyAccJerk-std()-X
349 349 fBodyAccJerk-std()-Y
350 350 fBodyAccJerk-std()-Z
351 351 fBodyAccJerk-mad()-X
352 352 fBodyAccJerk-mad()-Y
353 353 fBodyAccJerk-mad()-Z
354 354 fBodyAccJerk-max()-X
355 355 fBodyAccJerk-max()-Y
356 356 fBodyAccJerk-max()-Z
357 357 fBodyAccJerk-min()-X
358 358 fBodyAccJerk-min()-Y
359 359 fBodyAccJerk-min()-Z
360 360 fBodyAccJerk-sma()
361 361 fBodyAccJerk-energy()-X
362 362 fBodyAccJerk-energy()-Y
363 363 fBodyAccJerk-energy()-Z
364 364 fBodyAccJerk-iqr()-X
365 365 fBodyAccJerk-iqr()-Y
366 366 fBodyAccJerk-iqr()-Z
367 367 fBodyAccJerk-entropy()-X
368 368 fBodyAccJerk-entropy()-Y
369 369 fBodyAccJerk-entropy()-Z
370 370 fBodyAccJerk-maxInds-X
371 371 fBodyAccJerk-maxInds-Y
372 372 fBodyAccJerk-maxInds-Z
373 373 fBodyAccJerk-meanFreq()-X
374 374 fBodyAccJerk-meanFreq()-Y
375 375 fBodyAccJerk-meanFreq()-Z
376 376 fBodyAccJerk-skewness()-X
377 377 fBodyAccJerk-kurtosis()-X
378 378 fBodyAccJerk-skewness()-Y
379 379 fBodyAccJerk-kurtosis()-Y
380 380 fBodyAccJerk-skewness()-Z
381 381 fBodyAccJerk-kurtosis()-Z
382 382 fBodyAccJerk-bandsEnergy()-1,8
383 383 fBodyAccJerk-bandsEnergy()-9,16
384 384 fBodyAccJerk-bandsEnergy()-17,24
385 385 fBodyAccJerk-bandsEnergy()-25,32
386 386 fBodyAccJerk-bandsEnergy()-33,40
387 387 fBodyAccJerk-bandsEnergy()-41,48
388 388 fBodyAccJerk-bandsEnergy()-49,56
389 389 fBodyAccJerk-bandsEnergy()-57,64
390 390 fBodyAccJerk-bandsEnergy()-1,16
391 391 fBodyAccJerk-bandsEnergy()-17,32
392 392 fBodyAccJerk-bandsEnergy()-33,48
393 393 fBodyAccJerk-bandsEnergy()-49,64
394 394 fBodyAccJerk-bandsEnergy()-1,24
395 395 fBodyAccJerk-bandsEnergy()-25,48
396 396 fBodyAccJerk-bandsEnergy()-1,8
397 397 fBodyAccJerk-bandsEnergy()-9,16

398 398 fBodyAccJerk-bandsEnergy()-17,24
399 399 fBodyAccJerk-bandsEnergy()-25,32
400 400 fBodyAccJerk-bandsEnergy()-33,40
401 401 fBodyAccJerk-bandsEnergy()-41,48
402 402 fBodyAccJerk-bandsEnergy()-49,56
403 403 fBodyAccJerk-bandsEnergy()-57,64
404 404 fBodyAccJerk-bandsEnergy()-1,16
405 405 fBodyAccJerk-bandsEnergy()-17,32
406 406 fBodyAccJerk-bandsEnergy()-33,48
407 407 fBodyAccJerk-bandsEnergy()-49,64
408 408 fBodyAccJerk-bandsEnergy()-1,24
409 409 fBodyAccJerk-bandsEnergy()-25,48
410 410 fBodyAccJerk-bandsEnergy()-1,8
411 411 fBodyAccJerk-bandsEnergy()-9,16
412 412 fBodyAccJerk-bandsEnergy()-17,24
413 413 fBodyAccJerk-bandsEnergy()-25,32
414 414 fBodyAccJerk-bandsEnergy()-33,40
415 415 fBodyAccJerk-bandsEnergy()-41,48
416 416 fBodyAccJerk-bandsEnergy()-49,56
417 417 fBodyAccJerk-bandsEnergy()-57,64
418 418 fBodyAccJerk-bandsEnergy()-1,16
419 419 fBodyAccJerk-bandsEnergy()-17,32
420 420 fBodyAccJerk-bandsEnergy()-33,48
421 421 fBodyAccJerk-bandsEnergy()-49,64
422 422 fBodyAccJerk-bandsEnergy()-1,24
423 423 fBodyAccJerk-bandsEnergy()-25,48
424 424 fBodyGyro-mean()-X
425 425 fBodyGyro-mean()-Y
426 426 fBodyGyro-mean()-Z
427 427 fBodyGyro-std()-X
428 428 fBodyGyro-std()-Y
429 429 fBodyGyro-std()-Z
430 430 fBodyGyro-mad()-X
431 431 fBodyGyro-mad()-Y
432 432 fBodyGyro-mad()-Z
433 433 fBodyGyro-max()-X
434 434 fBodyGyro-max()-Y
435 435 fBodyGyro-max()-Z
436 436 fBodyGyro-min()-X
437 437 fBodyGyro-min()-Y
438 438 fBodyGyro-min()-Z
439 439 fBodyGyro-sma()
440 440 fBodyGyro-energy()-X
441 441 fBodyGyro-energy()-Y
442 442 fBodyGyro-energy()-Z
443 443 fBodyGyro-iqr()-X
444 444 fBodyGyro-iqr()-Y
445 445 fBodyGyro-iqr()-Z
446 446 fBodyGyro-entropy()-X
447 447 fBodyGyro-entropy()-Y
448 448 fBodyGyro-entropy()-Z
449 449 fBodyGyro-maxInds-X
450 450 fBodyGyro-maxInds-Y
451 451 fBodyGyro-maxInds-Z
452 452 fBodyGyro-meanFreq()-X
453 453 fBodyGyro-meanFreq()-Y
454 454 fBodyGyro-meanFreq()-Z

455 455 fBodyGyro-skewness()-X
456 456 fBodyGyro-kurtosis()-X
457 457 fBodyGyro-skewness()-Y
458 458 fBodyGyro-kurtosis()-Y
459 459 fBodyGyro-skewness()-Z
460 460 fBodyGyro-kurtosis()-Z
461 461 fBodyGyro-bandsEnergy()-1,8
462 462 fBodyGyro-bandsEnergy()-9,16
463 463 fBodyGyro-bandsEnergy()-17,24
464 464 fBodyGyro-bandsEnergy()-25,32
465 465 fBodyGyro-bandsEnergy()-33,40
466 466 fBodyGyro-bandsEnergy()-41,48
467 467 fBodyGyro-bandsEnergy()-49,56
468 468 fBodyGyro-bandsEnergy()-57,64
469 469 fBodyGyro-bandsEnergy()-1,16
470 470 fBodyGyro-bandsEnergy()-17,32
471 471 fBodyGyro-bandsEnergy()-33,48
472 472 fBodyGyro-bandsEnergy()-49,64
473 473 fBodyGyro-bandsEnergy()-1,24
474 474 fBodyGyro-bandsEnergy()-25,48
475 475 fBodyGyro-bandsEnergy()-1,8
476 476 fBodyGyro-bandsEnergy()-9,16
477 477 fBodyGyro-bandsEnergy()-17,24
478 478 fBodyGyro-bandsEnergy()-25,32
479 479 fBodyGyro-bandsEnergy()-33,40
480 480 fBodyGyro-bandsEnergy()-41,48
481 481 fBodyGyro-bandsEnergy()-49,56
482 482 fBodyGyro-bandsEnergy()-57,64
483 483 fBodyGyro-bandsEnergy()-1,16
484 484 fBodyGyro-bandsEnergy()-17,32
485 485 fBodyGyro-bandsEnergy()-33,48
486 486 fBodyGyro-bandsEnergy()-49,64
487 487 fBodyGyro-bandsEnergy()-1,24
488 488 fBodyGyro-bandsEnergy()-25,48
489 489 fBodyGyro-bandsEnergy()-1,8
490 490 fBodyGyro-bandsEnergy()-9,16
491 491 fBodyGyro-bandsEnergy()-17,24
492 492 fBodyGyro-bandsEnergy()-25,32
493 493 fBodyGyro-bandsEnergy()-33,40
494 494 fBodyGyro-bandsEnergy()-41,48
495 495 fBodyGyro-bandsEnergy()-49,56
496 496 fBodyGyro-bandsEnergy()-57,64
497 497 fBodyGyro-bandsEnergy()-1,16
498 498 fBodyGyro-bandsEnergy()-17,32
499 499 fBodyGyro-bandsEnergy()-33,48
500 500 fBodyGyro-bandsEnergy()-49,64
501 501 fBodyGyro-bandsEnergy()-1,24
502 502 fBodyGyro-bandsEnergy()-25,48
503 503 fBodyAccMag-mean()
504 504 fBodyAccMag-std()
505 505 fBodyAccMag-mad()
506 506 fBodyAccMag-max()
507 507 fBodyAccMag-min()
508 508 fBodyAccMag-sma()
509 509 fBodyAccMag-energy()
510 510 fBodyAccMag-iqr()
511 511 fBodyAccMag-entropy()

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512                 512 fBodyAccMag-maxInds
513              513 fBodyAccMag-meanFreq()
514              514 fBodyAccMag-skewness()
515              515 fBodyAccMag-kurtosis()
516           516 fBodyBodyAccJerkMag-mean()
517            517 fBodyBodyAccJerkMag-std()
518            518 fBodyBodyAccJerkMag-mad()
519            519 fBodyBodyAccJerkMag-max()
520            520 fBodyBodyAccJerkMag-min()
521            521 fBodyBodyAccJerkMag-sma()
522         522 fBodyBodyAccJerkMag-energy()
523            523 fBodyBodyAccJerkMag-iqr()
524        524 fBodyBodyAccJerkMag-entropy()
525          525 fBodyBodyAccJerkMag-maxInds
526       526 fBodyBodyAccJerkMag-meanFreq()
527       527 fBodyBodyAccJerkMag-skewness()
528       528 fBodyBodyAccJerkMag-kurtosis()
529              529 fBodyBodyGyroMag-mean()
530               530 fBodyBodyGyroMag-std()
531               531 fBodyBodyGyroMag-mad()
532               532 fBodyBodyGyroMag-max()
533               533 fBodyBodyGyroMag-min()
534               534 fBodyBodyGyroMag-sma()
535            535 fBodyBodyGyroMag-energy()
536               536 fBodyBodyGyroMag-iqr()
537           537 fBodyBodyGyroMag-entropy()
538             538 fBodyBodyGyroMag-maxInds
539          539 fBodyBodyGyroMag-meanFreq()
540          540 fBodyBodyGyroMag-skewness()
541          541 fBodyBodyGyroMag-kurtosis()
542          542 fBodyBodyGyroJerkMag-mean()
543           543 fBodyBodyGyroJerkMag-std()
544           544 fBodyBodyGyroJerkMag-mad()
545           545 fBodyBodyGyroJerkMag-max()
546           546 fBodyBodyGyroJerkMag-min()
547           547 fBodyBodyGyroJerkMag-sma()
548        548 fBodyBodyGyroJerkMag-energy()
549           549 fBodyBodyGyroJerkMag-iqr()
550       550 fBodyBodyGyroJerkMag-entropy()
551         551 fBodyBodyGyroJerkMag-maxInds
552      552 fBodyBodyGyroJerkMag-meanFreq()
553      553 fBodyBodyGyroJerkMag-skewness()
554      554 fBodyBodyGyroJerkMag-kurtosis()
555          555 angle(tBodyAccMean,gravity)
556 556 angle(tBodyAccJerkMean),gravityMean)
557     557 angle(tBodyGyroMean,gravityMean)
558 558 angle(tBodyGyroJerkMean,gravityMean)
559                 559 angle(X,gravityMean)
560                 560 angle(Y,gravityMean)
561                 561 angle(Z,gravityMean)
```