Codebook

Data Set Information:

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.

Check the README.txt file for further details about this dataset.

A video of the experiment including an example of the 6 recorded activities with one of the participants can be seen in the following link: [Web Link]

An updated version of this dataset can be found at [Web Link]. It includes labels of postural transitions between activities and also the full raw inertial signals instead of the ones pre-processed into windows.

Attribute Information:

For each record in the dataset 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.

Variables

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

68 tGravityAcc-arCoeff()-X,3
69 tGravityAcc-arCoeff()-X,4
70 tGravityAcc-arCoeff()-Y,1
71 tGravityAcc-arCoeff()-Y,2
72 tGravityAcc-arCoeff()-Y,3
73 tGravityAcc-arCoeff()-Y,4
74 tGravityAcc-arCoeff()-Z,1
75 tGravityAcc-arCoeff()-Z,2
76 tGravityAcc-arCoeff()-Z,3
77 tGravityAcc-arCoeff()-Z,4
78 tGravityAcc-correlation()-X,Y
79 tGravityAcc-correlation()-X,Z
80 tGravityAcc-correlation()-Y,Z
81 tBodyAccJerk-mean()-X
82 tBodyAccJerk-mean()-Y
83 tBodyAccJerk-mean()-Z
84 tBodyAccJerk-std()-X
85 tBodyAccJerk-std()-Y
86 tBodyAccJerk-std()-Z
87 tBodyAccJerk-mad()-X
88 tBodyAccJerk-mad()-Y
89 tBodyAccJerk-mad()-Z
90 tBodyAccJerk-max()-X
91 tBodyAccJerk-max()-Y
92 tBodyAccJerk-max()-Z
93 tBodyAccJerk-min()-X
94 tBodyAccJerk-min()-Y
95 tBodyAccJerk-min()-Z
96 tBodyAccJerk-sma()
97 tBodyAccJerk-energy()-X
98 tBodyAccJerk-energy()-Y
99 tBodyAccJerk-energy()-Z
100 tBodyAccJerk-iqr()-X
101 tBodyAccJerk-iqr()-Y
102 tBodyAccJerk-iqr()-Z
103 tBodyAccJerk-entropy()-X
104 tBodyAccJerk-entropy()-Y
105 tBodyAccJerk-entropy()-Z
106 tBodyAccJerk-arCoeff()-X,1
107 tBodyAccJerk-arCoeff()-X,2
108 tBodyAccJerk-arCoeff()-X,3
109 tBodyAccJerk-arCoeff()-X,4
110 tBodyAccJerk-arCoeff()-Y,1
111 tBodyAccJerk-arCoeff()-Y,2
112 tBodyAccJerk-arCoeff()-Y,3
113 tBodyAccJerk-arCoeff()-Y,4
114 tBodyAccJerk-arCoeff()-Z,1
115 tBodyAccJerk-arCoeff()-Z,2
116 tBodyAccJerk-arCoeff()-Z,3
117 tBodyAccJerk-arCoeff()-Z,4
118 tBodyAccJerk-correlation()-X,Y
119 tBodyAccJerk-correlation()-X,Z
120 tBodyAccJerk-correlation()-Y,Z
121 tBodyGyro-mean()-X
122 tBodyGyro-mean()-Y
123 tBodyGyro-mean()-Z

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124 tBodyGyro-std()-X
125 tBodyGyro-std()-Y
126 tBodyGyro-std()-Z
127 tBodyGyro-mad()-X
128 tBodyGyro-mad()-Y
129 tBodyGyro-mad()-Z
130 tBodyGyro-max()-X
131 tBodyGyro-max()-Y
132 tBodyGyro-max()-Z
133 tBodyGyro-min()-X
134 tBodyGyro-min()-Y
135 tBodyGyro-min()-Z
136 tBodyGyro-sma()
137 tBodyGyro-energy()-X
138 tBodyGyro-energy()-Y
139 tBodyGyro-energy()-Z
140 tBodyGyro-iqr()-X
141 tBodyGyro-iqr()-Y
142 tBodyGyro-iqr()-Z
143 tBodyGyro-entropy()-X
144 tBodyGyro-entropy()-Y
145 tBodyGyro-entropy()-Z
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147 tBodyGyro-arCoeff()-X,2
148 tBodyGyro-arCoeff()-X,3
149 tBodyGyro-arCoeff()-X,4
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151 tBodyGyro-arCoeff()-Y,2
152 tBodyGyro-arCoeff()-Y,3
153 tBodyGyro-arCoeff()-Y,4
154 tBodyGyro-arCoeff()-Z,1
155 tBodyGyro-arCoeff()-Z,2
156 tBodyGyro-arCoeff()-Z,3
157 tBodyGyro-arCoeff()-Z,4
158 tBodyGyro-correlation()-X,Y
159 tBodyGyro-correlation()-X,Z
160 tBodyGyro-correlation()-Y,Z
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162 tBodyGyroJerk-mean()-Y
163 tBodyGyroJerk-mean()-Z
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165 tBodyGyroJerk-std()-Y
166 tBodyGyroJerk-std()-Z
167 tBodyGyroJerk-mad()-X
168 tBodyGyroJerk-mad()-Y
169 tBodyGyroJerk-mad()-Z
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171 tBodyGyroJerk-max()-Y
172 tBodyGyroJerk-max()-Z
173 tBodyGyroJerk-min()-X
174 tBodyGyroJerk-min()-Y
175 tBodyGyroJerk-min()-Z
176 tBodyGyroJerk-sma()
177 tBodyGyroJerk-energy()-X
178 tBodyGyroJerk-energy()-Y
179 tBodyGyroJerk-energy()-Z
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181 tBodyGyroJerk-iqr()-Y
182 tBodyGyroJerk-iqr()-Z
183 tBodyGyroJerk-entropy()-X
184 tBodyGyroJerk-entropy()-Y
185 tBodyGyroJerk-entropy()-Z
186 tBodyGyroJerk-arCoeff()-X,1
187 tBodyGyroJerk-arCoeff()-X,2
188 tBodyGyroJerk-arCoeff()-X,3
189 tBodyGyroJerk-arCoeff()-X,4
190 tBodyGyroJerk-arCoeff()-Y,1
191 tBodyGyroJerk-arCoeff()-Y,2
192 tBodyGyroJerk-arCoeff()-Y,3
193 tBodyGyroJerk-arCoeff()-Y,4
194 tBodyGyroJerk-arCoeff()-Z,1
195 tBodyGyroJerk-arCoeff()-Z,2
196 tBodyGyroJerk-arCoeff()-Z,3
197 tBodyGyroJerk-arCoeff()-Z,4
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199 tBodyGyroJerk-correlation()-X,Z
200 tBodyGyroJerk-correlation()-Y,Z
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203 tBodyAccMag-mad()
204 tBodyAccMag-max()
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211 tBodyAccMag-arCoeff()2
212 tBodyAccMag-arCoeff()3
213 tBodyAccMag-arCoeff()4
214 tGravityAccMag-mean()
215 tGravityAccMag-std()
216 tGravityAccMag-mad()
217 tGravityAccMag-max()
218 tGravityAccMag-min()
219 tGravityAccMag-sma()
220 tGravityAccMag-energy()
221 tGravityAccMag-iqr()
222 tGravityAccMag-entropy()
223 tGravityAccMag-arCoeff()1
224 tGravityAccMag-arCoeff()2
225 tGravityAccMag-arCoeff()3
226 tGravityAccMag-arCoeff()4
227 tBodyAccJerkMag-mean()
228 tBodyAccJerkMag-std()
229 tBodyAccJerkMag-mad()
230 tBodyAccJerkMag-max()
231 tBodyAccJerkMag-min()
232 tBodyAccJerkMag-sma()
233 tBodyAccJerkMag-energy()
234 tBodyAccJerkMag-iqr()
235 tBodyAccJerkMag-entropy()
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236 tBodyAccJerkMag-arCoeff()1
237 tBodyAccJerkMag-arCoeff()2
238 tBodyAccJerkMag-arCoeff()3
239 tBodyAccJerkMag-arCoeff()4
240 tBodyGyroMag-mean()
241 tBodyGyroMag-std()
242 tBodyGyroMag-mad()
243 tBodyGyroMag-max()
244 tBodyGyroMag-min()
245 tBodyGyroMag-sma()
246 tBodyGyroMag-energy()
247 tBodyGyroMag-iqr()
248 tBodyGyroMag-entropy()
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250 tBodyGyroMag-arCoeff()2
251 tBodyGyroMag-arCoeff()3
252 tBodyGyroMag-arCoeff()4
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255 tBodyGyroJerkMag-mad()
256 tBodyGyroJerkMag-max()
257 tBodyGyroJerkMag-min()
258 tBodyGyroJerkMag-sma()
259 tBodyGyroJerkMag-energy()
260 tBodyGyroJerkMag-iqr()
261 tBodyGyroJerkMag-entropy()
262 tBodyGyroJerkMag-arCoeff()1
263 tBodyGyroJerkMag-arCoeff()2
264 tBodyGyroJerkMag-arCoeff()3
265 tBodyGyroJerkMag-arCoeff()4
266 fBodyAcc-mean()-X
267 fBodyAcc-mean()-Y
268 fBodyAcc-mean()-Z
269 fBodyAcc-std()-X
270 fBodyAcc-std()-Y
271 fBodyAcc-std()-Z
272 fBodyAcc-mad()-X
273 fBodyAcc-mad()-Y
274 fBodyAcc-mad()-Z
275 fBodyAcc-max()-X
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279 fBodyAcc-min()-Y
280 fBodyAcc-min()-Z
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284 fBodyAcc-energy()-Z
285 fBodyAcc-iqr()-X
286 fBodyAcc-iqr()-Y
287 fBodyAcc-iqr()-Z
288 fBodyAcc-entropy()-X
289 fBodyAcc-entropy()-Y
290 fBodyAcc-entropy()-Z
291 fBodyAcc-maxInds-X
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292 fBodyAcc-maxInds-Y
293 fBodyAcc-maxInds-Z
294 fBodyAcc-meanFreq()-X
295 fBodyAcc-meanFreq()-Y
296 fBodyAcc-meanFreq()-Z
297 fBodyAcc-skewness()-X
298 fBodyAcc-kurtosis()-X
299 fBodyAcc-skewness()-Y
300 fBodyAcc-kurtosis()-Y
301 fBodyAcc-skewness()-Z
302 fBodyAcc-kurtosis()-Z
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307 fBodyAcc-bandsEnergy()-33,40
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329 fBodyAcc-bandsEnergy()-1,24
330 fBodyAcc-bandsEnergy()-25,48
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343 fBodyAcc-bandsEnergy()-1,24
344 fBodyAcc-bandsEnergy()-25,48
345 fBodyAccJerk-mean()-X
346 fBodyAccJerk-mean()-Y
347 fBodyAccJerk-mean()-Z

348 fBodyAccJerk-std()-X
349 fBodyAccJerk-std()-Y
350 fBodyAccJerk-std()-Z
351 fBodyAccJerk-mad()-X
352 fBodyAccJerk-mad()-Y
353 fBodyAccJerk-mad()-Z
354 fBodyAccJerk-max()-X
355 fBodyAccJerk-max()-Y
356 fBodyAccJerk-max()-Z
357 fBodyAccJerk-min()-X
358 fBodyAccJerk-min()-Y
359 fBodyAccJerk-min()-Z
360 fBodyAccJerk-sma()
361 fBodyAccJerk-energy()-X
362 fBodyAccJerk-energy()-Y
363 fBodyAccJerk-energy()-Z
364 fBodyAccJerk-iqr()-X
365 fBodyAccJerk-iqr()-Y
366 fBodyAccJerk-iqr()-Z
367 fBodyAccJerk-entropy()-X
368 fBodyAccJerk-entropy()-Y
369 fBodyAccJerk-entropy()-Z
370 fBodyAccJerk-maxInds-X
371 fBodyAccJerk-maxInds-Y
372 fBodyAccJerk-maxInds-Z
373 fBodyAccJerk-meanFreq()-X
374 fBodyAccJerk-meanFreq()-Y
375 fBodyAccJerk-meanFreq()-Z
376 fBodyAccJerk-skewness()-X
377 fBodyAccJerk-kurtosis()-X
378 fBodyAccJerk-skewness()-Y
379 fBodyAccJerk-kurtosis()-Y
380 fBodyAccJerk-skewness()-Z
381 fBodyAccJerk-kurtosis()-Z
382 fBodyAccJerk-bandsEnergy()-1,8
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384 fBodyAccJerk-bandsEnergy()-17,24
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392 fBodyAccJerk-bandsEnergy()-33,48
393 fBodyAccJerk-bandsEnergy()-49,64
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395 fBodyAccJerk-bandsEnergy()-25,48
396 fBodyAccJerk-bandsEnergy()-1,8
397 fBodyAccJerk-bandsEnergy()-9,16
398 fBodyAccJerk-bandsEnergy()-17,24
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400 fBodyAccJerk-bandsEnergy()-33,40
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403 fBodyAccJerk-bandsEnergy()-57,64

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409 fBodyAccJerk-bandsEnergy()-25,48
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420 fBodyAccJerk-bandsEnergy()-33,48
421 fBodyAccJerk-bandsEnergy()-49,64
422 fBodyAccJerk-bandsEnergy()-1,24
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424 fBodyGyro-mean()-X
425 fBodyGyro-mean()-Y
426 fBodyGyro-mean()-Z
427 fBodyGyro-std()-X
428 fBodyGyro-std()-Y
429 fBodyGyro-std()-Z
430 fBodyGyro-mad()-X
431 fBodyGyro-mad()-Y
432 fBodyGyro-mad()-Z
433 fBodyGyro-max()-X
434 fBodyGyro-max()-Y
435 fBodyGyro-max()-Z
436 fBodyGyro-min()-X
437 fBodyGyro-min()-Y
438 fBodyGyro-min()-Z
439 fBodyGyro-sma()
440 fBodyGyro-energy()-X
441 fBodyGyro-energy()-Y
442 fBodyGyro-energy()-Z
443 fBodyGyro-iqr()-X
444 fBodyGyro-iqr()-Y
445 fBodyGyro-iqr()-Z
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447 fBodyGyro-entropy()-Y
448 fBodyGyro-entropy()-Z
449 fBodyGyro-maxInds-X
450 fBodyGyro-maxInds-Y
451 fBodyGyro-maxInds-Z
452 fBodyGyro-meanFreq()-X
453 fBodyGyro-meanFreq()-Y
454 fBodyGyro-meanFreq()-Z
455 fBodyGyro-skewness()-X
456 fBodyGyro-kurtosis()-X
457 fBodyGyro-skewness()-Y
458 fBodyGyro-kurtosis()-Y
459 fBodyGyro-skewness()-Z

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460 fBodyGyro-kurtosis()-Z
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463 fBodyGyro-bandsEnergy()-17,24
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465 fBodyGyro-bandsEnergy()-33,40
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470 fBodyGyro-bandsEnergy()-17,32
471 fBodyGyro-bandsEnergy()-33,48
472 fBodyGyro-bandsEnergy()-49,64
473 fBodyGyro-bandsEnergy()-1,24
474 fBodyGyro-bandsEnergy()-25,48
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486 fBodyGyro-bandsEnergy()-49,64
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505 fBodyAccMag-mad()
506 fBodyAccMag-max()
507 fBodyAccMag-min()
508 fBodyAccMag-sma()
509 fBodyAccMag-energy()
510 fBodyAccMag-iqr()
511 fBodyAccMag-entropy()
512 fBodyAccMag-maxInds
513 fBodyAccMag-meanFreq()
514 fBodyAccMag-skewness()
515 fBodyAccMag-kurtosis()
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517 fBodyBodyAccJerkMag-std()
518 fBodyBodyAccJerkMag-mad()
519 fBodyBodyAccJerkMag-max()
520 fBodyBodyAccJerkMag-min()
521 fBodyBodyAccJerkMag-sma()
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523 fBodyBodyAccJerkMag-iqr()
524 fBodyBodyAccJerkMag-entropy()
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526 fBodyBodyAccJerkMag-meanFreq()
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530 fBodyBodyGyroMag-std()
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534 fBodyBodyGyroMag-sma()
535 fBodyBodyGyroMag-energy()
536 fBodyBodyGyroMag-iqr()
537 fBodyBodyGyroMag-entropy()
538 fBodyBodyGyroMag-maxInds
539 fBodyBodyGyroMag-meanFreq()
540 fBodyBodyGyroMag-skewness()
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544 fBodyBodyGyroJerkMag-mad()
545 fBodyBodyGyroJerkMag-max()
546 fBodyBodyGyroJerkMag-min()
547 fBodyBodyGyroJerkMag-sma()
548 fBodyBodyGyroJerkMag-energy()
549 fBodyBodyGyroJerkMag-iqr()
550 fBodyBodyGyroJerkMag-entropy()
551 fBodyBodyGyroJerkMag-maxInds
552 fBodyBodyGyroJerkMag-meanFreq()
553 fBodyBodyGyroJerkMag-skewness()
554 fBodyBodyGyroJerkMag-kurtosis()
555 angle(tBodyAccMean,gravity)
556 angle(tBodyAccJerkMean),gravityMean)
557 angle(tBodyGyroMean,gravityMean)
558 angle(tBodyGyroJerkMean,gravityMean)
559 angle(X,gravityMean)
560 angle(Y,gravityMean)
561 angle(Z,gravityMean)
```