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# **Summary**

Code book contains input data columns, transformations used, final tidy data columns and type

# **Input Data**

### **Features:**

contains 561 columns

- 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
- 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
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- 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
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- 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
- 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
- 146 tBodyGyro-arCoeff()-X,1
- 147 tBodyGyro-arCoeff()-X,2
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- 158 tBodyGyro-correlation()-X,Y
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- 161 tBodyGyroJerk-mean()-X
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- 163 tBodyGyroJerk-mean()-Z
- 164 tBodyGyroJerk-std()-X
- 165 tBodyGyroJerk-std()-Y
- 166 tBodyGyroJerk-std()-Z
- 167 tBodyGyroJerk-mad()-X
- 168 tBodyGyroJerk-mad()-Y
- 169 tBodyGyroJerk-mad()-Z
- 170 tBodyGyroJerk-max()-X
- 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
- 180 tBodyGyroJerk-iqr()-X
- 181 tBodyGyroJerk-iqr()-Y
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- 183 tBodyGyroJerk-entropy()-X
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- 186 tBodyGyroJerk-arCoeff()-X,1
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- 189 tBodyGyroJerk-arCoeff()-X,4
- 190 tBodyGyroJerk-arCoeff()-Y,1
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- 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
- 198 tBodyGyroJerk-correlation()-X,Y
- 199 tBodyGyroJerk-correlation()-X,Z
- 200 tBodyGyroJerk-correlation()-Y,Z
- 201 tBodyAccMag-mean()
- 202 tBodyAccMag-std()
- 203 tBodyAccMag-mad()
- 204 tBodyAccMag-max()
- 205 tBodyAccMag-min()
- 206 tBodyAccMag-sma()
- 207 tBodyAccMag-energy()
- 208 tBodyAccMag-iqr()
- 209 tBodyAccMag-entropy()
- 210 tBodyAccMag-arCoeff()1
- 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()
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- 224 tGravityAccMag-arCoeff()2
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- 226 tGravityAccMag-arCoeff()4
- 227 tBodyAccJerkMag-mean()
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- 230 tBodyAccJerkMag-max()
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- 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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- 251 tBodyGyroMag-arCoeff()3
- 252 tBodyGyroMag-arCoeff()4
- 253 tBodyGyroJerkMag-mean()
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- 255 tBodyGyroJerkMag-mad()
- 256 tBodyGyroJerkMag-max()
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- 259 tBodyGyroJerkMag-energy()
- 260 tBodyGyroJerkMag-iqr()
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- 262 tBodyGyroJerkMag-arCoeff()1

- 263 tBodyGyroJerkMag-arCoeff()2
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- 265 tBodyGyroJerkMag-arCoeff()4
- 266 fBodyAcc-mean()-X
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- 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
- 276 fBodyAcc-max()-Y
- 277 fBodyAcc-max()-Z
- 278 fBodyAcc-min()-X
- 279 fBodyAcc-min()-Y
- 280 fBodyAcc-min()-Z
- 281 fBodyAcc-sma()
- 282 fBodyAcc-energy()-X
- 283 fBodyAcc-energy()-Y
- 284 fBodyAcc-energy()-Z
- 285 fBodyAcc-iqr()-X
- 286 fBodyAcc-iqr()-Y
- 287 fBodyAcc-iqr()-Z

- 288 fBodyAcc-entropy()-X
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- 290 fBodyAcc-entropy()-Z
- 291 fBodyAcc-maxInds-X
- 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
- 303 fBodyAcc-bandsEnergy()-1,8
- 304 fBodyAcc-bandsEnergy()-9,16
- 305 fBodyAcc-bandsEnergy()-17,24
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- 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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- 396 fBodyAccJerk-bandsEnergy()-1,8
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- 399 fBodyAccJerk-bandsEnergy()-25,32
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- 402 fBodyAccJerk-bandsEnergy()-49,56
- 403 fBodyAccJerk-bandsEnergy()-57,64
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- 406 fBodyAccJerk-bandsEnergy()-33,48
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- 410 fBodyAccJerk-bandsEnergy()-1,8
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- 413 fBodyAccJerk-bandsEnergy()-25,32
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- 423 fBodyAccJerk-bandsEnergy()-25,48
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- 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
- 446 fBodyGyro-entropy()-X
- 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
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- 460 fBodyGyro-kurtosis()-Z
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- 472 fBodyGyro-bandsEnergy()-49,64
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- 475 fBodyGyro-bandsEnergy()-1,8
- 476 fBodyGyro-bandsEnergy()-9,16
- 477 fBodyGyro-bandsEnergy()-17,24
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- 482 fBodyGyro-bandsEnergy()-57,64
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- 488 fBodyGyro-bandsEnergy()-25,48
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- 503 fBodyAccMag-mean()
- 504 fBodyAccMag-std()
- 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()
- 516 fBodyBodyAccJerkMag-mean()
- 517 fBodyBodyAccJerkMag-std()
- 518 fBodyBodyAccJerkMag-mad()
- 519 fBodyBodyAccJerkMag-max()
- 520 fBodyBodyAccJerkMag-min()
- 521 fBodyBodyAccJerkMag-sma()
- 522 fBodyBodyAccJerkMag-energy()
- 523 fBodyBodyAccJerkMag-iqr()
- 524 fBodyBodyAccJerkMag-entropy()
- 525 fBodyBodyAccJerkMag-maxInds
- 526 fBodyBodyAccJerkMag-meanFreq()
- 527 fBodyBodyAccJerkMag-skewness()
- 528 fBodyBodyAccJerkMag-kurtosis()
- 529 fBodyBodyGyroMag-mean()
- 530 fBodyBodyGyroMag-std()
- 531 fBodyBodyGyroMag-mad()
- 532 fBodyBodyGyroMag-max()
- 533 fBodyBodyGyroMag-min()
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- 535 fBodyBodyGyroMag-energy()
- 536 fBodyBodyGyroMag-iqr()
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- 538 fBodyBodyGyroMag-maxInds
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- 540 fBodyBodyGyroMag-skewness()
- 541 fBodyBodyGyroMag-kurtosis()
- 542 fBodyBodyGyroJerkMag-mean()
- 543 fBodyBodyGyroJerkMag-std()
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- 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)

#### **Activity Labels**

- 1 WALKING
- 2 WALKING\_UPSTAIRS
- 3 WALKING\_DOWNSTAIRS
- 4 SITTING
- **5 STANDING**
- 6 LAYING

## **Transformations used:**

8 data sets consisting 3 from test , 3 from training and 2 common were combined along with column names derived from features . Standard R functions used

Data for mean, std deviations columns along with subject and activity label extracted

Data is summarized using group of subject and activity label

# **Final Tidy data**

## Tidy data set

Field Name Type

Volunteer : int

Activity : chr

tBodyAcc-mean-X : num

tBodyAcc-mean-Y : num

tBodyAcc-mean-Z : num

tGravityAcc-mean-X : num

tGravityAcc-mean-Y : num

tGravityAcc-mean-Z : num

tBodyAccJerk-mean-X : num

tBodyAccJerk-mean-Y: num

tBodyAccJerk-mean-Z : num

tBodyGyro-mean-X : num

tBodyGyro-mean-Y: num

tBodyGyro-mean-Z : num

tBodyGyroJerk-mean-X: num

tBodyGyroJerk-mean-Y: num

tBodyGyroJerk-mean-Z: num

tBodyAccMag-mean : num

tGravityAccMag-mean : num

tBodyAccJerkMag-mean : num

tBodyGyroMag-mean : num

tBodyGyroJerkMag-mean: num

fBodyAcc-mean-X : num

fBodyAcc-mean-Y : num

fBodyAcc-mean-Z : num

fBodyAccJerk-mean-X: num

fBodyAccJerk-mean-Y: num

fBodyAccJerk-mean-Z: num

fBodyGyro-mean-X: num

fBodyGyro-mean-Y: num

fBodyGyro-mean-Z : num

fBodyAccMag-mean : num

fBodyBodyAccJerkMag-mean: num

fBodyBodyGyroMag-mean: num

fBodyBodyGyroJerkMag-mean: num

tBodyAcc-std-X : num

tBodyAcc-std-Y : num

tBodyAcc-std-Z : num

tGravityAcc-std-X : num

tGravityAcc-std-Y : num

tGravityAcc-std-Z : num

tBodyAccJerk-std-X : num

tBodyAccJerk-std-Y : num

tBodyAccJerk-std-Z : num

tBodyGyro-std-X : num

tBodyGyro-std-Y : num

tBodyGyro-std-Z : num

tBodyGyroJerk-std-X : num

tBodyGyroJerk-std-Y : num

tBodyGyroJerk-std-Z : num

tBodyAccMag-std : num

tGravityAccMag-std : num

tBodyAccJerkMag-std : num

tBodyGyroMag-std : num

tBodyGyroJerkMag-std : num

fBodyAcc-std-X : num

fBodyAcc-std-Y : num

fBodyAcc-std-Z : num

fBodyAccJerk-std-X : num

fBodyAccJerk-std-Y : num

fBodyAccJerk-std-Z : num

fBodyGyro-std-X : num

fBodyGyro-std-Y : num

fBodyGyro-std-Z : num

fBodyAccMag-std : num

fBodyBodyAccJerkMag-std: num

fBodyBodyGyroMag-std : num

f Body Body Gyro Jerk Mag-std: num