

## DATA DICTIONARY: HUMAN ACTIVITY RECOGNITION USING SMARTPHONES

### DATASET

**Subject\_ID:** 1-30

The ID given to subjects in the test and train conditions

**Activities:** The type of activity the subject was involved in when the activity was measured

1. WALKING
2. WALKING\_UPSTAIRS
3. WALKING\_DOWNSTAIRS
4. SITTING
5. STANDING
6. LYING

All Values below were normalized using feature scaling and bounded into values between [-1,1.] -1 indicates the lowest value in the dataset for that feature and 1 indicates the highest value.

All measurements were captured at a constant rate of 50hz using Cartesian coordinates in the X, Y & Z directions. The acceleration signal was filtered into the body and gravity acceleration signals using a 3rd order low pass Butterworth filter with a corner frequency of 20 Hz. The acceleration signal was then separated into body and gravity acceleration signals using another low pass Butterworth filter with a corner frequency of 0.3 Hz.

**tBodyAcc**: : A body acceleration motion signal value captured using an accelerometer for each subject.

1. mean()-X: The mean value of the acceleration produced by the subject when moving horizontally from the origin point
2. mean()-Y: The mean value of the acceleration produced by the subject when moving vertically from the origin point
3. mean()-Z: The mean value of the acceleration produced by the subject when moving forward or backwards from the origin point
4. std()-X: The standard deviation of the acceleration produced by the subject when moving horizontally from the origin point
5. std()-Y: The standard deviation of the acceleration produced by the subject when moving vertically from the origin point

6. `std()-Z`: The standard deviation of the acceleration produced by the subject when moving vertically from the origin point
7. `mad()-X`: The median absolute deviation value of the acceleration produced by the subject when moving horizontally from the origin point
8. `mad()-Y`: The median absolute deviation of the acceleration produced by the subject when moving vertically from the origin point
9. `mad()-Z`: The median absolute deviation of the acceleration produced by the subject when moving vertically from the origin point
10. `max()-X`: maximum value of the acceleration produced by the subject when moving horizontally from the origin point compared to others in the dataset
11. `max()-Y`: The maximum value of the acceleration produced by the subject when moving vertically from the origin point compared to others in the dataset
12. `max()-Z`: The maximum value of the acceleration produced by the subject when moving forwards or backwards from the origin point compared to others in the dataset
13. `min()-X`: minimum value of the acceleration produced by the subject when moving horizontally from the origin point compared to others in the dataset
14. `min()-Y`: The minimum value of the acceleration produced by the subject when moving vertically from the origin point compared to others in the dataset
15. `min()-Z`: The minimum value of the acceleration produced by the subject when moving forwards or backwards from the origin point compared to others in the dataset
16. `sma()`: The signal magnitude area, which is the acceleration magnitude summed over three axes within each window normalized by the window length.

17. energy()-X: A measure of the energy produced by the subject produced by the subject when moving horizontally from the origin point when compared to others in the dataset.

This is derived from the sum of squared differences from the mean divided by the number of values

18. energy()-Y: A measure of the energy produced by the subject produced by the subject when moving vertically from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

19. energy()-Z: A measure of the energy produced by the subject produced by the subject when moving forwards and backwards from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

20. iqr()-X: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving horizontally from the origin point when compared to others in the dataset

21. iqr()-Y: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving vertically from the origin point when compared to others in the dataset

22. iqr()-Z: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving forwards and backwards from the origin point when compared to others in the dataset

23. entropy()-X: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving horizontally from the origin point

24. entropy()-Y: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving vertically from the origin point

25. `entropy()`-Z: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving forwards and backwards from the origin point

26. `arCoeff()`-X,1: The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point.

27. `arCoeff()`-X,2: The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point.

28. `arCoeff()`-X,3: The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point.

29. `arCoeff()`-X,4: The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point.

30. `arCoeff()`-Y,1: The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point.

31. `arCoeff()`-Y,2: The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point.

32. `arCoeff()`-Y,3: The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point.

33. `arCoeff()`-Y,4: The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point.

34. `arCoeff()`-Z,1: The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point.

35.  $\text{arCoeff}() - Z, 2$ : The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point.

36.  $\text{arCoeff}() - Z, 3$ : The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point.

37.  $\text{arCoeff}() - Z, 4$ : The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point.

38.  $\text{correlation}() - X, Y$ : The correlation between all coefficients of the subject moving horizontally and vertically for each subject.

39.  $\text{correlation}() - X, Z$ : The correlation between all coefficients of the subject moving horizontally and forwards & backwards for each subject.

40.  $\text{correlation}() - Y, Z$ : The correlation between all coefficients of the subject moving vertically and forwards & backwards for each subject.

**tGravityAcc**: A gravity acceleration motion signal value captured using an accelerometer for each subject. All of the values below are measures of acceleration.

41.  $\text{mean}() - X$ : The mean value of the acceleration produced by the subject when moving horizontally from the origin point

42.  $\text{mean}() - Y$ : The mean value of the acceleration produced by the subject when moving vertically from the origin point

43. mean()-Z: The mean value of the acceleration produced by the subject when moving forward or backwards from the origin point

44. std()-X: The standard deviation of the acceleration produced by the subject when moving horizontally from the origin point

45. std()-Y: The standard deviation of the acceleration produced by the subject when moving vertically from the origin point

46. std()-Z: The standard deviation of the acceleration produced by the subject when moving vertically from the origin point

47. mad()-X: The median absolute deviation value of the acceleration produced by the subject when moving horizontally from the origin point

48. mad()-Y: The median absolute deviation of the acceleration produced by the subject when moving vertically from the origin point

49. mad()-Z: The median absolute deviation of the acceleration produced by the subject when moving vertically from the origin point

50. max()-X: maximum value of the acceleration produced by the subject when moving horizontally from the origin point compared to others in the dataset

51. max()-Y: The maximum value of the acceleration produced by the subject when moving vertically from the origin point compared to others in the dataset

52. max()-Z: The maximum value of the acceleration produced by the subject when moving forwards or backwards from the origin point compared to others in the dataset

53. min()-X: minimum value of the acceleration produced by the subject when moving horizontally from the origin point compared to others in the dataset

54. min()-Y: The minimum value of the acceleration produced by the subject when moving vertically from the origin point compared to others in the dataset

55. min()-Z: The minimum value of the acceleration produced by the subject when moving forwards or backwards from the origin point compared to others in the dataset

56. sma(): The signal magnitude area, which is the acceleration magnitude summed over three axes within each window normalized by the window length.

57. energy()-X: A measure of the energy produced by the subject produced by the subject when moving horizontally from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

58. energy()-Y: A measure of the energy produced by the subject produced by the subject when moving vertically from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

59. energy()-Z: A measure of the energy produced by the subject produced by the subject when moving forwards and backwards from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

60. iqr()-X: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving horizontally from the origin point when compared to others in the dataset

61. iqr()-Y: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving vertically from the origin point when compared to others in the dataset

62. iqr()-Z: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving forwards and backwards from the origin point when compared to others in the dataset



63. `entropy()-X`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving horizontally from the origin point

64. `entropy()-Y`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving vertically from the origin point

65. `entropy()-Z`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving forwards and backwards from the origin point

66. `arCoeff()-X,1`: The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point.

67. `arCoeff()-X,2`: The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point.

68. `arCoeff()-X,3`: The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point.

69. `arCoeff()-X,4`: The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point.

70. `arCoeff()-Y,1`: The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point.

71. `arCoeff()-Y,2`: The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point.

72. `arCoeff()-Y,3`: The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point.

73. `arCoeff()-Y,4`: The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point.

74. `arCoeff()-Z,1`: The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point.

75. `arCoeff()-Z,2`: The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point.

76. `arCoeff()-Z,3`: The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point.

77. `arCoeff()-Z,4`: The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point.

78. `correlation()-X,Y`: The correlation between all coefficients of the subject moving horizontally and vertically for each subject.

79. `correlation()-X,Z`: The correlation between all coefficients of the subject moving horizontally and forwards & backwards for each subject.

80. `correlation()-Y,Z`: The correlation between all coefficients of the subject moving vertically and forwards & backwards for each subject.

**tBodyAccJerk**: : A signal value derived from the body linear acceleration and angle velocity derived in time captured using an accelerometer. From those values, a J=herk value was derived to create a measure of the rate of increase of the acceleration over time

81. mean()-X: The mean value of the jerk value produced by the subject when moving horizontally from the origin point

82. mean()-Y: The mean value of the jerk value produced by the subject when moving vertically from the origin point

83. mean()-Z: The mean value of the jerk value produced by the subject when moving forward or backwards from the origin point

84. std()-X: The standard deviation of the jerk value produced by the subject when moving horizontally from the origin point

85. std()-Y: The standard deviation of the jerk value produced by the subject when moving vertically from the origin point

86. std()-Z: The standard deviation of the jerk value produced by the subject when moving vertically from the origin point

87. mad()-X: The median absolute deviation value of the jerk value produced by the subject when moving horizontally from the origin point

88. mad()-Y: The median absolute deviation of the jerk value produced by the subject when moving vertically from the origin point

89. mad()-Z: The median absolute deviation of the jerk value produced by the subject when moving vertically from the origin point

90. max()-X: maximum value of the jerk value produced by the subject when moving horizontally from the origin point compared to others in the dataset

91. max()-Y: The maximum value of the jerk value produced by the subject when moving vertically from the origin point compared to others in the dataset

92. max()-Z: The maximum value of the jerk value produced by the subject when moving forwards or backwards from the origin point compared to others in the dataset

93. min()-X: minimum value of the jerk value produced by the subject when moving horizontally from the origin point compared to others in the dataset

94. min()-Y: The minimum value of the jerk value produced by the subject when moving vertically from the origin point compared to others in the dataset

95. min()-Z: The minimum value of the jerk value produced by the subject when moving forwards or backwards from the origin point compared to others in the dataset

96. sma(): The signal magnitude area, which is the jerk value magnitude summed over three axes within each window normalized by the window length.

97. energy()-X: A measure of the energy produced by the subject produced by the subject when moving horizontally from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values in the jerk signal data.

98. energy()-Y: A measure of the energy produced by the subject produced by the subject when moving vertically from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values in the jerk signal data.

99. energy()-Z: A measure of the energy produced by the subject produced by the subject when moving forwards and backwards from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values in the jerk signal data.

100. iqr()-X: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving horizontally from the origin point when compared to others in the dataset in the jerk signal data.

101.        `iqr()-Y`: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving vertically from the origin point when compared to others in the dataset in the jerk signal data.

102.        `iqr()-Z`: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving forwards and backwards from the origin point when compared to others in the dataset in the jerk signal data.

103.        `entropy()-X`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving horizontally from the origin point in the jerk signal data.

104.        `entropy()-Y`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving vertically from the origin point in the jerk signal data.

105.        `entropy()-Z`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving forwards and backwards from the origin point in the jerk signal data.

106.        `arCoeff()-X,1`: The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point in the jerk signal data.

107.        `arCoeff()-X,2`: The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point in the jerk signal data.

108.        `arCoeff()-X,3`: The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point in the jerk signal data.

109.         $\text{arCoeff}(-X,4)$ : The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point in the jerk signal data.

110.         $\text{arCoeff}(-Y,1)$ : The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point in the jerk signal data.

111.         $\text{arCoeff}(-Y,2)$ : The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point in the jerk signal data.

112.         $\text{arCoeff}(-Y,3)$ : The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point in the jerk signal data.

113.         $\text{arCoeff}(-Y,4)$ : The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point in the jerk signal data.

114.         $\text{arCoeff}(-Z,1)$ : The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point in the jerk signal data.

115.         $\text{arCoeff}(-Z,2)$ : The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point in the jerk signal data.

116.         $\text{arCoeff}(-Z,3)$ : The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point in the jerk signal data.

117.        arCoeff()-Z,4: The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point in the jerk signal data.

118.        correlation()-X,Y: The correlation between all coefficients of the subject moving horizontally and vertically for each subject in the jerk signal data.

119.        correlation()-X,Z: The correlation between all coefficients of the subject moving horizontally and forwards & backwards for each subject in the jerk signal data.

120.        correlation()-Y,Z: The correlation between all coefficients of the subject moving vertically and forwards & backwards for each subject in the jerk signal data.

**tBodyGyro**: : A body acceleration motion signal value captured using a gyrometer for each subject.

121.        mean()-X: The mean value of the acceleration produced by the subject when moving horizontally from the origin point

122.        mean()-Y: The mean value of the acceleration produced by the subject when moving vertically from the origin point

123.        mean()-Z: The mean value of the acceleration produced by the subject when moving forward or backwards from the origin point

124.        std()-X: The standard deviation of the acceleration produced by the subject when moving horizontally from the origin point

125.        std()-Y: The standard deviation of the acceleration produced by the subject when moving vertically from the origin point

126.        `std()-Z`: The standard deviation of the acceleration produced by the subject when moving vertically from the origin point
127.        `mad()-X`: The median absolute deviation value of the acceleration produced by the subject when moving horizontally from the origin point
128.        `mad()-Y`: The median absolute deviation of the acceleration produced by the subject when moving vertically from the origin point
129.        `mad()-Z`: The median absolute deviation of the acceleration produced by the subject when moving vertically from the origin point
130.        `max()-X`: maximum value of the acceleration produced by the subject when moving horizontally from the origin point compared to others in the dataset
131.        `max()-Y`: The maximum value of the acceleration produced by the subject when moving vertically from the origin point compared to others in the dataset
132.        `max()-Z`: The maximum value of the acceleration produced by the subject when moving forwards or backwards from the origin point compared to others in the dataset
133.        `min()-X`: minimum value of the acceleration produced by the subject when moving horizontally from the origin point compared to others in the dataset
134.        `min()-Y`: The minimum value of the acceleration produced by the subject when moving vertically from the origin point compared to others in the dataset
135.        `min()-Z`: The minimum value of the acceleration produced by the subject when moving forwards or backwards from the origin point compared to others in the dataset
136.        `sma()`: The signal magnitude area, which is the acceleration magnitude summed over three axes within each window normalized by the window length.



137.       energy()-X: A measure of the energy produced by the subject produced by the subject when moving horizontally from the origin point when compared to others in the dataset.

This is derived from the sum of squared differences from the mean divided by the number of values

138.       energy()-Y: A measure of the energy produced by the subject produced by the subject when moving vertically from the origin point when compared to others in the dataset.

This is derived from the sum of squared differences from the mean divided by the number of values

139.       energy()-Z: A measure of the energy produced by the subject produced by the subject when moving forwards and backwards from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

140.       iqr()-X: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving horizontally from the origin point when compared to others in the dataset

141.       iqr()-Y: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving vertically from the origin point when compared to others in the dataset

142.       iqr()-Z: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving forwards and backwards from the origin point when compared to others in the dataset

143.       entropy()-X: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving horizontally from the origin point

144.        entropy()-Y: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving vertically from the origin point

145.        entropy()-Z: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving forwards and backwards from the origin point

146.        arCoeff()-X,1: The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point.

147.        arCoeff()-X,2: The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point.

148.        arCoeff()-X,3: The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point.

149.        arCoeff()-X,4: The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point.

150.        arCoeff()-Y,1: The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point.

151.        arCoeff()-Y,2: The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point.

152.        arCoeff()-Y,3: The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point.

153.        arCoeff()-Y,4: The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point.

154.        arCoeff()-Z,1: The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point.

155.        arCoeff()-Z,2: The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point.

156.        arCoeff()-Z,3: The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point.

157.        arCoeff()-Z,4: The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point.

158.        correlation()-X,Y: The correlation between all coefficients of the subject moving horizontally and vertically for each subject.

159.        correlation()-X,Z: The correlation between all coefficients of the subject moving horizontally and forwards & backwards for each subject.

160.        correlation()-Y,Z: The correlation between all coefficients of the subject moving vertically and forwards & backwards for each subject.

**tBodyGyroJerk**: : A signal value derived from the body linear acceleration and angle velocity derived in time captured using a gyrometer. From those values, a Jerk signal was derived to create a measure of the rate of increase of the acceleration over time

161.        `mean()-X`: The mean value of the jerk value produced by the subject when moving horizontally from the origin point

162.        `mean()-Y`: The mean value of the jerk value produced by the subject when moving vertically from the origin point

163.        `mean()-Z`: The mean value of the jerk value produced by the subject when moving forward or backwards from the origin point

164.        `std()-X`: The standard deviation of the jerk value produced by the subject when moving horizontally from the origin point

165.        `std()-Y`: The standard deviation of the jerk value produced by the subject when moving vertically from the origin point

166.        `std()-Z`: The standard deviation of the jerk value produced by the subject when moving vertically from the origin point

167.        `mad()-X`: The median absolute deviation value of the jerk value produced by the subject when moving horizontally from the origin point

168.        `mad()-Y`: The median absolute deviation of the jerk value produced by the subject when moving vertically from the origin point

169.        `mad()-Z`: The median absolute deviation of the jerk value produced by the subject when moving vertically from the origin point

170.        `max()-X`: maximum value of the jerk value produced by the subject when moving horizontally from the origin point compared to others in the dataset

171.        `max()-Y`: The maximum value of the jerk value produced by the subject when moving vertically from the origin point compared to others in the dataset

172.        `max()-Z`: The maximum value of the jerk value produced by the subject when moving forwards or backwards from the origin point compared to others in the dataset

173.        `min()-X`: minimum value of the jerk value produced by the subject when moving horizontally from the origin point compared to others in the dataset

174.        `min()-Y`: The minimum value of the jerk value produced by the subject when moving vertically from the origin point compared to others in the dataset

175.        `min()-Z`: The minimum value of the jerk value produced by the subject when moving forwards or backwards from the origin point compared to others in the dataset

176.        `sma()`: The signal magnitude area, which is the jerk value magnitude summed over three axes within each window normalized by the window length.

177.        `energy()-X`: A measure of the energy produced by the subject produced by the subject when moving horizontally from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values in the jerk signal data.

178.        `energy()-Y`: A measure of the energy produced by the subject produced by the subject when moving vertically from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values in the jerk signal data.

179.        `energy()-Z`: A measure of the energy produced by the subject produced by the subject when moving forwards and backwards from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values in the jerk signal data.

180.        `iqr()-X`: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving horizontally from the origin point when compared to others in the dataset in the jerk signal data.

181.        `iqr()-Y`: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving vertically from the origin point when compared to others in the dataset in the jerk signal data.

182.        `iqr()-Z`: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving forwards and backwards from the origin point when compared to others in the dataset in the jerk signal data.

183.        `entropy()-X`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving horizontally from the origin point in the jerk signal data.

184.        `entropy()-Y`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving vertically from the origin point in the jerk signal data.

185.        `entropy()-Z`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving forwards and backwards from the origin point in the jerk signal data.

186.        `arCoeff()-X,1`: The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point in the jerk signal data.

187.        `arCoeff()-X,2`: The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point in the jerk signal data.

188.        `arCoeff()-X,3`: The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point in the jerk signal data.

189.         $\text{arCoeff}(-X,4)$ : The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving horizontally from the origin point in the jerk signal data.

190.         $\text{arCoeff}(-Y,1)$ : The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point in the jerk signal data.

191.         $\text{arCoeff}(-Y,2)$ : The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point in the jerk signal data.

192.         $\text{arCoeff}(-Y,3)$ : The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point in the jerk signal data.

193.         $\text{arCoeff}(-Y,4)$ : The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving vertically from the origin point in the jerk signal data.

194.         $\text{arCoeff}(-Z,1)$ : The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point in the jerk signal data.

195.         $\text{arCoeff}(-Z,2)$ : The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point in the jerk signal data.

196.         $\text{arCoeff}(-Z,3)$ : The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point in the jerk signal data.

197.        arCoeff()-Z,4: The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving forwards and backwards from the origin point in the jerk signal data.

198.        correlation()-X,Y: The correlation between all coefficients of the subject moving horizontally and vertically for each subject in the jerk signal data.

199.        correlation()-X,Z: The correlation between all coefficients of the subject moving horizontally and forwards & backwards for each subject in the jerk signal data.

200.        correlation()-Y,Z: The correlation between all coefficients of the subject moving vertically and forwards & backwards for each subject in the jerk signal data.

**tBodyAccMag** : A signal value derived from the body linear acceleration and angle velocity derived in time captured using an accelerometer. From those values, a magnitude value was derived using a Euclidean norm. These values are a composite of the magnitude of acceleration in all directions

201.        mean(): The mean value of the acceleration magnitude produced by the subject when moving from the origin point

202.        std(): The standard deviation of the acceleration magnitude produced by the subject when moving from the origin point

203.        mad(): The median absolute deviation value of the acceleration magnitude produced by the subject when moving from the origin point

204.        max(): The maximum value of the acceleration magnitude produced by the subject when moving from the origin point



205.        `min()`: The minimum value of the acceleration magnitude produced by the subject when moving from the origin point

206.        `sma()`: The signal magnitude area, which is the acceleration magnitude summed over three axes within each window normalized by the window length.

207.        `energy()`: A measure of the energy magnitudes produced by the subject produced by the subject when moving from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

208.        `iqr()`: A measure of the difference in interquartile ranges produced by the subject produced by the subject's acceleration magnitude when moving from the origin point when compared to others in the dataset

209.        `entropy()`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject based on the acceleration magnitude

210.        `arCoeff()1`: The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.

211.        `arCoeff()2`: The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.

212.        `arCoeff()3`: The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.

213.        `arCoeff()4`: The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.

**tGravityAccMag** : A signal value derived from the gravity linear acceleration and angle velocity derived in time captured using an accelerometer. From those values, a magnitude value was derived using a Euclidean norm. These values are a composite of the magnitude of acceleration in all directions

214.        `mean()`: The mean value of the acceleration magnitude produced by the subject when moving from the origin point

215.        `std()`: The standard deviation of the acceleration magnitude produced by the subject when moving from the origin point

216.        `mad()`: The median absolute deviation value of the acceleration magnitude produced by the subject when moving from the origin point

217.        `max()`: The maximum value of the acceleration magnitude produced by the subject when moving from the origin point

218.        `min()`: The minimum value of the acceleration magnitude produced by the subject when moving from the origin point

219.        `sma()`: The signal magnitude area, which is the acceleration magnitude summed over three axes within each window normalized by the window length.

220.        `energy()`: A measure of the energy magnitudes produced by the subject produced by the subject when moving from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

221.        `iqr()`: A measure of the difference in interquartile ranges produced by the subject produced by the subject's acceleration magnitude when moving from the origin point when compared to others in the dataset

222.        entropy(): A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject based on the acceleration magnitude

223.        arCoeff()1: The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.

224.        arCoeff()2: The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.

225.        arCoeff()3: The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.

226.        arCoeff()4: The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.

**tBodyAccJerkMag** : A signal value derived from the body linear acceleration and angle velocity derived in time captured using an accelerometer. From those values, a magnitude value was derived from the jerk values using a Euclidean norm. A jerk signal a measure in the change of acceleration over time. These values are a composite of the magnitude of acceleration in all directions.

227.        mean(): The mean value of the acceleration magnitude produced by the subject when moving from the origin point

228.        std(): The standard deviation of the acceleration magnitude produced by the subject when moving from the origin point

229.        mad(): The median absolute deviation value of the acceleration magnitude produced by the subject when moving from the origin point

230.        `max()`: The maximum value of the acceleration magnitude produced by the subject when moving from the origin point
231.        `min()`: The minimum value of the acceleration magnitude produced by the subject when moving from the origin point
232.        `sma()`: The signal magnitude area, which is the acceleration magnitude summed over three axes within each window normalized by the window length.
233.        `energy()`: A measure of the energy magnitudes produced by the subject produced by the subject when moving from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values
234.        `iqr()`: A measure of the difference in interquartile ranges produced by the subject produced by the subject's acceleration magnitude when moving from the origin point when compared to others in the dataset
235.        `entropy()`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject based on the acceleration magnitude
236.        `arCoeff()`1: The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.
237.        `arCoeff()`2: The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.
238.        `arCoeff()`3: The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.
239.        `arCoeff()`4: The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.

**tBodyGyroMag** : A signal value derived from the body linear acceleration and angle velocity derived in time captured using a gyrometer. From those values, a magnitude value was derived using a Euclidean norm. These values are a composite of the magnitude of acceleration in all directions

240.        `mean()`: The mean value of the acceleration magnitude produced by the subject when moving from the origin point

241.        `std()`: The standard deviation of the acceleration magnitude produced by the subject when moving from the origin point

242.        `mad()`: The median absolute deviation value of the acceleration magnitude produced by the subject when moving from the origin point

243.        `max()`: The maximum value of the acceleration magnitude produced by the subject when moving from the origin point

244.        `min()`: The minimum value of the acceleration magnitude produced by the subject when moving from the origin point

245.        `sma()`: The signal magnitude area, which is the acceleration magnitude summed over three axes within each window normalized by the window length.

246.        `energy()`: A measure of the energy magnitudes produced by the subject produced by the subject when moving from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

247.        `iqr()`: A measure of the difference in interquartile ranges produced by the subject produced by the subject's acceleration magnitude when moving from the origin point when compared to others in the dataset

248.        `entropy()`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject based on the acceleration magnitude

249.        `arCoeff()1`: The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.

250.        `arCoeff()2`: The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.

251.        `arCoeff()3`: The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.

252.        `arCoeff()4`: The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.

**tBodyGyroJerkMag** : A signal value derived from the body linear acceleration and angle velocity derived in time captured using a gyrometer. From those values, a magnitude value was derived from the jerk values using a Euclidean norm. A jerk value a measure in the change of acceleration over time. These values are a composite of the magnitude of acceleration in all directions.

253.        `mean()`: The mean value of the acceleration magnitude produced by the subject when moving from the origin point

254.        `std()`: The standard deviation of the acceleration magnitude produced by the subject when moving from the origin point

255.        `mad()`: The median absolute deviation value of the acceleration magnitude produced by the subject when moving from the origin point

256.        `max()`: The maximum value of the acceleration magnitude produced by the subject when moving from the origin point
257.        `min()`: The minimum value of the acceleration magnitude produced by the subject when moving from the origin point
258.        `sma()`: The signal magnitude area, which is the acceleration magnitude summed over three axes within each window normalized by the window length.
259.        `energy()`: A measure of the energy magnitudes produced by the subject produced by the subject when moving from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values
260.        `iqr()`: A measure of the difference in interquartile ranges produced by the subject produced by the subject's acceleration magnitude when moving from the origin point when compared to others in the dataset
261.        `entropy()`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject based on the acceleration magnitude
262.        `arCoeff()`1: The first autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.
263.        `arCoeff()`2: The second autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.
264.        `arCoeff()`3: The third autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.
265.        `arCoeff()`4: The fourth autoregression coefficient produced by an a time series regression with a Burg Value=4 the subject when moving from the origin point.

**fBodyAcc**: : A body acceleration motion signal value captured using an accelerometer for each subject. A Fast Fourier Transform was then applied to the signal, thus converting its time value into a frequency value.

266.        mean()-X: The mean value of the acceleration produced by the subject when moving horizontally from the origin point

267.        mean()-Y: The mean value of the acceleration produced by the subject when moving vertically from the origin point

268.        mean()-Z: The mean value of the acceleration produced by the subject when moving forward or backwards from the origin point

269.        std()-X: The standard deviation of the acceleration produced by the subject when moving horizontally from the origin point

270.        std()-Y: The standard deviation of the acceleration produced by the subject when moving vertically from the origin point

271.        std()-Z: The standard deviation of the acceleration produced by the subject when moving vertically from the origin point

272.        mad()-X: The median absolute deviation value of the acceleration produced by the subject when moving horizontally from the origin point

273.        mad()-Y: The median absolute deviation of the acceleration produced by the subject when moving vertically from the origin point

274.        mad()-Z: The median absolute deviation of the acceleration produced by the subject when moving vertically from the origin point

275.        max()-X: maximum value of the acceleration produced by the subject when moving horizontally from the origin point compared to others in the dataset



276.        `max()-Y`: The maximum value of the acceleration produced by the subject when moving vertically from the origin point compared to others in the dataset

277.        `max()-Z`: The maximum value of the acceleration produced by the subject when moving forwards or backwards from the origin point compared to others in the dataset

278.        `min()-X`: minimum value of the acceleration produced by the subject when moving horizontally from the origin point compared to others in the dataset

279.        `min()-Y`: The minimum value of the acceleration produced by the subject when moving vertically from the origin point compared to others in the dataset

280.        `min()-Z`: The minimum value of the acceleration produced by the subject when moving forwards or backwards from the origin point compared to others in the dataset

281.        `sma()`: The signal magnitude area, which is the acceleration magnitude summed over three axes within each window normalized by the window length.

282.        `energy()-X`: A measure of the energy produced by the subject produced by the subject when moving horizontally from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

283.        `energy()-Y`: A measure of the energy produced by the subject produced by the subject when moving vertically from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

284.        `energy()-Z`: A measure of the energy produced by the subject produced by the subject when moving forwards and backwards from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

285.        `iqr()-X`: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving horizontally from the origin point when compared to others in the dataset

286.        `iqr()-Y`: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving vertically from the origin point when compared to others in the dataset

287.        `iqr()-Z`: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving forwards and backwards from the origin point when compared to others in the dataset

288.        `entropy()-X`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving horizontally from the origin point

289.        `entropy()-Y`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving vertically from the origin point

290.        `entropy()-Z`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving forwards and backwards from the origin point

291.        `maxInds-X`: The frequency component with the largest magnitude produced by the subject when moving horizontally from the origin point

292.        `maxInds-Y`: The frequency component with the largest magnitude produced by the subject when moving vertically from the origin point

293.        `maxInds-Z`: The frequency component with the largest magnitude produced by the subject when moving forwards and backwards from the origin point

294.        meanFreq()-X: A mean frequency computed from the weighted average of the frequency components produced by the subject when moving horizontally from the origin point

295.        meanFreq()-Y: A mean frequency computed from the weighted average of the frequency components produced by the subject when moving vertically from the origin point

296.        meanFreq()-Z: A mean frequency computed from the weighted average of the frequency components produced by the subject when moving forwards and backwards from the origin point

297.        skewness()-X: The skewness of the frequency domain signal produced by the subject when moving horizontally from the origin point. Skewness is a measure of how far a distribution deviates from a normal distribution regarding the density of its tails.

298.        kurtosis()-X: The kurtosis of the frequency domain signal produced by the subject when moving horizontally from the origin point. Kurtosis is a measure of how far a distribution deviates from a normal distribution regarding the distribution of probability from the shoulders into the center and tails.

299.        skewness()-Y: The skewness of the frequency domain signal produced by the subject when moving vertically from the origin point. Skewness is a measure of how far a distribution deviates from a normal distribution regarding the density of its tails.

300.        kurtosis()-Y: The kurtosis of the frequency domain signal produced by the subject when moving vertically from the origin point. Kurtosis is a measure of how far a distribution deviates from a normal distribution regarding the distribution of probability from the shoulders into the center and tails.

301.        skewness()-Z: The skewness of the frequency domain signal produced by the subject when moving forwards and backwards from the origin point. Skewness is a measure of how far a distribution deviates from a normal distribution regarding the density of its tails.

302.        `kurtosis()`-Z :The kurtosis of the frequency domain signal produced by the subject when moving vertically from the origin point. Kurtosis is a measure of how far a distribution deviates from a normal distribution regarding the distribution of probability from the shoulders into the center and tails.

303.        `bandsEnergy()`-1,8-X: A measure of the energy from domains 1-8 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

304.        `bandsEnergy()`-9,16-X: A measure of the energy from domains 9-16 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

305.        `bandsEnergy()`-17,24-X: A measure of the energy from domains 17-24 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

306.        `bandsEnergy()`-25,32-X: A measure of the energy from domains 25-32 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

307.        `bandsEnergy()`-33,40-X: A measure of the energy from domains 33-40 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

308.        `bandsEnergy()`-41,48-X: A measure of the energy from domains 41-48 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

309.        `bandsEnergy()`-49,56-X: A measure of the energy from domains 49-56 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

310.        `bandsEnergy()-57,64-X`: A measure of the energy from domains 57-64 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

311.        `bandsEnergy()-1,16-X`: A measure of the energy from domains 1-16 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

312.        `bandsEnergy()-17,32-X`: A measure of the energy from domains 17-32 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

313.        `bandsEnergy()-33,48-X`: A measure of the energy from domains 33-48 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

314.        `bandsEnergy()-49,64-X`: A measure of the energy from domains 49-64 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

315.        `bandsEnergy()-1,24-X`: A measure of the energy from domains 1-24 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

316.        `bandsEnergy()-25,48-X`: A measure of the energy from domains 25-48 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

317.        `bandsEnergy()-1,8-Y`: A measure of the energy from domains 1-8 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

318.        `bandsEnergy()-9,16-Y`: A measure of the energy from domains 9-16 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

319.        `bandsEnergy()-17,24-Y`: A measure of the energy from domains 17-24 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
320.        `bandsEnergy()-25,32-Y`: A measure of the energy from domains 25-32 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
321.        `bandsEnergy()-33,40-Y`: A measure of the energy from domains 33-40 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
322.        `bandsEnergy()-41,48-Y`: A measure of the energy from domains 41-48 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
323.        `bandsEnergy()-49,56-Y`: A measure of the energy from domains 49-56 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
324.        `bandsEnergy()-57,64-Y`: A measure of the energy from domains 57-64 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
325.        `bandsEnergy()-1,16-Y`: A measure of the energy from domains 1-16 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
326.        `bandsEnergy()-17,32-Y`: A measure of the energy from domains 17-32 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
327.        `bandsEnergy()-33,48-Y`: A measure of the energy from domains 33-48 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
328.        `bandsEnergy()-49,64-Y`: A measure of the energy from domains 49-64 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
329.        `bandsEnergy()-1,24-Y`: A measure of the energy from domains 1-24 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
330.        `bandsEnergy()-25,48-Y`: A measure of the energy from domains 25-48 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

331.       bandsEnergy()-1,8-Z: A measure of the energy from domains 1-8 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

332.       bandsEnergy()-9,16-Z: A measure of the energy from domains 9-16 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

333.       bandsEnergy()-17,24-Z: A measure of the energy from domains 17-24 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

334.       bandsEnergy()-25,32-Z: A measure of the energy from domains 25-32 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

335.       bandsEnergy()-33,40- Z: A measure of the energy from domains 33-40 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

336.       bandsEnergy()-41,48- Z: A measure of the energy from domains 41-48 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

337.       bandsEnergy()-49,56- Z: A measure of the energy from domains 49-56 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

338.       bandsEnergy()-57,64-Z: A measure of the energy from domains 57-64 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

339.       bandsEnergy()-1,16-Z: A measure of the energy from domains 1-16 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

340.       bandsEnergy()-17,32-Z: A measure of the energy from domains 17-32 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

341.       bandsEnergy()-33,48-Z: A measure of the energy from domains 33-48 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

342.       bandsEnergy()-49,64-Z: A measure of the energy from domains 49-64 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

343.       bandsEnergy()-1,24-Z: A measure of the energy from domains 1-24 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

344.       bandsEnergy()-25,48-Z: A measure of the energy from domains 25-48 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

**fBodyAccJerk**: : A signal value derived from the body linear acceleration and angle velocity derived in time captured using an accelerometer. From those values, a jerk signal was derived to create a measure of the rate of increase of the acceleration over time. A Fast Fourier Transform was then applied to the signal, thus converting its time value into a frequency value.



345.        `mean()-X`: The mean value of the acceleration produced by the subject when moving horizontally from the origin point
346.        `mean()-Y`: The mean value of the acceleration produced by the subject when moving vertically from the origin point
347.        `mean()-Z`: The mean value of the acceleration produced by the subject when moving forward or backwards from the origin point
348.        `std()-X`: The standard deviation of the acceleration produced by the subject when moving horizontally from the origin point
349.        `std()-Y`: The standard deviation of the acceleration produced by the subject when moving vertically from the origin point
350.        `std()-Z`: The standard deviation of the acceleration produced by the subject when moving vertically from the origin point
351.        `mad()-X`: The median absolute deviation value of the acceleration produced by the subject when moving horizontally from the origin point
352.        `mad()-Y`: The median absolute deviation of the acceleration produced by the subject when moving vertically from the origin point
353.        `mad()-Z`: The median absolute deviation of the acceleration produced by the subject when moving vertically from the origin point
354.        `max()-X`: maximum value of the acceleration produced by the subject when moving horizontally from the origin point compared to others in the dataset
355.        `max()-Y`: The maximum value of the acceleration produced by the subject when moving vertically from the origin point compared to others in the dataset
356.        `max()-Z`: The maximum value of the acceleration produced by the subject when moving forwards or backwards from the origin point compared to others in the dataset

357. min()-X: minimum value of the acceleration produced by the subject when moving horizontally from the origin point compared to others in the dataset

358. min()-Y: The minimum value of the acceleration produced by the subject when moving vertically from the origin point compared to others in the dataset

359. min()-Z: The minimum value of the acceleration produced by the subject when moving forwards or backwards from the origin point compared to others in the dataset

360. sma(): The signal magnitude area, which is the acceleration magnitude summed over three axes within each window normalized by the window length.

361. energy()-X: A measure of the energy produced by the subject produced by the subject when moving horizontally from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

362. energy()-Y: A measure of the energy produced by the subject produced by the subject when moving vertically from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

363. energy()-Z: A measure of the energy produced by the subject produced by the subject when moving forwards and backwards from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

364. iqr()-X: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving horizontally from the origin point when compared to others in the dataset

365. iqr()-Y: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving vertically from the origin point when compared to others in the dataset

366.        iqr()-Z: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving forwards and backwards from the origin point when compared to others in the dataset

367.        entropy()-X: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving horizontally from the origin point

368.        entropy()-Y: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving vertically from the origin point

369.        entropy()-Z: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving forwards and backwards from the origin point

370.        maxInds-X: The frequency component with the largest magnitude produced by the subject when moving horizontally from the origin point

371.        maxInds-Y: The frequency component with the largest magnitude produced by the subject when moving vertically from the origin point

372.        maxInds-Z: The frequency component with the largest magnitude produced by the subject when moving forwards and backwards from the origin point

373.        meanFreq()-X: A mean frequency computed from the weighted average of the frequency components produced by the subject when moving horizontally from the origin point

374.        meanFreq()-Y: A mean frequency computed from the weighted average of the frequency components produced by the subject when moving vertically from the origin point

375.        meanFreq()-Z: A mean frequency computed from the weighted average of the frequency components produced by the subject when moving forwards and backwards from the origin point

376.        skewness()-X: The skewness of the frequency domain signal produced by the subject when moving horizontally from the origin point. Skewness is a measure of how far a distribution deviates from a normal distribution regarding the density of its tails.

377.        kurtosis()-X: The kurtosis of the frequency domain signal produced by the subject when moving horizontally from the origin point. Kurtosis is a measure of how far a distribution deviates from a normal distribution regarding the distribution of probability from the shoulders into the center and tails.

378.        skewness()-Y: The skewness of the frequency domain signal produced by the subject when moving vertically from the origin point. Skewness is a measure of how far a distribution deviates from a normal distribution regarding the density of its tails.

379.        kurtosis()-Y: The kurtosis of the frequency domain signal produced by the subject when moving vertically from the origin point. Kurtosis is a measure of how far a distribution deviates from a normal distribution regarding the distribution of probability from the shoulders into the center and tails.

380.        skewness()-Z: The skewness of the frequency domain signal produced by the subject when moving forwards and backwards from the origin point. Skewness is a measure of how far a distribution deviates from a normal distribution regarding the density of its tails.

381.        kurtosis()-Z :The kurtosis of the frequency domain signal produced by the subject when moving vertically from the origin point. Kurtosis is a measure of how far a distribution deviates from a normal distribution regarding the distribution of probability from the shoulders into the center and tails.

382.       bandsEnergy()-1,8-X: A measure of the energy from domains 1-8 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

383.       bandsEnergy()-9,16-X: A measure of the energy from domains 9-16 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

384.       bandsEnergy()-17,24-X: A measure of the energy from domains 17-24 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

385.       bandsEnergy()-25,32-X: A measure of the energy from domains 25-32 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

386.       bandsEnergy()-33,40-X: A measure of the energy from domains 33-40 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

387.       bandsEnergy()-41,48-X: A measure of the energy from domains 41-48 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

388.       bandsEnergy()-49,56-X: A measure of the energy from domains 49-56 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

389.       bandsEnergy()-57,64-X: A measure of the energy from domains 57-64 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

390.       bandsEnergy()-1,16-X: A measure of the energy from domains 1-16 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

391.        bandsEnergy()-17,32-X: A measure of the energy from domains 17-32 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

392.        bandsEnergy()-33,48-X: A measure of the energy from domains 33-48 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

393.        bandsEnergy()-49,64-X: A measure of the energy from domains 49-64 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

394.        bandsEnergy()-1,24-X: A measure of the energy from domains 1-24 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

395.        bandsEnergy()-25,48-X: A measure of the energy from domains 25-48 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

396.        bandsEnergy()-1,8-Y: A measure of the energy from domains 1-8 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

397.        bandsEnergy()-9,16-Y: A measure of the energy from domains 9-16 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

398.        bandsEnergy()-17,24-Y: A measure of the energy from domains 17-24 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

399.        bandsEnergy()-25,32-Y: A measure of the energy from domains 25-32 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

400.        bandsEnergy()-33,40- Y: A measure of the energy from domains 33-40 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

401.        `bandsEnergy()-41,48- Y`: A measure of the energy from domains 41-48 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
402.        `bandsEnergy()-49,56- Y`: A measure of the energy from domains 49-56 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
403.        `bandsEnergy()-57,64-Y`: A measure of the energy from domains 57-64 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
404.        `bandsEnergy()-1,16-Y`: A measure of the energy from domains 1-16 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
405.        `bandsEnergy()-17,32-Y`: A measure of the energy from domains 17-32 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
406.        `bandsEnergy()-33,48-Y`: A measure of the energy from domains 33-48 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
407.        `bandsEnergy()-49,64-Y`: A measure of the energy from domains 49-64 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
408.        `bandsEnergy()-1,24-Y`: A measure of the energy from domains 1-24 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
409.        `bandsEnergy()-25,48-Y`: A measure of the energy from domains 25-48 within the 64 bins of energy produced by the subject when moving vertically from the origin point.
410.        `bandsEnergy()-1,8-Z`: A measure of the energy from domains 1-8 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.
411.        `bandsEnergy()-9,16-Z`: A measure of the energy from domains 9-16 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

412.        bandsEnergy()-17,24-Z: A measure of the energy from domains 17-24 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

413.        bandsEnergy()-25,32-Z: A measure of the energy from domains 25-32 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

414.        bandsEnergy()-33,40- Z: A measure of the energy from domains 33-40 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

415.        bandsEnergy()-41,48- Z: A measure of the energy from domains 41-48 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

416.        bandsEnergy()-49,56- Z: A measure of the energy from domains 49-56 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

417.        bandsEnergy()-57,64-Z: A measure of the energy from domains 57-64 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

418.        bandsEnergy()-1,16-Z: A measure of the energy from domains 1-16 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

419.        bandsEnergy()-17,32-Z: A measure of the energy from domains 17-32 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.



420.        bandsEnergy()-33,48-Z: A measure of the energy from domains 33-48 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

421.        bandsEnergy()-49,64-Z: A measure of the energy from domains 49-64 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

422.        bandsEnergy()-1,24-Z: A measure of the energy from domains 1-24 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

423.        bandsEnergy()-25,48-Z: A measure of the energy from domains 25-48 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

**fBodyGyro**: : A body acceleration motion signal value captured using a gyrometer for each subject. A Fast Fourier Transform was then applied to the signal, thus converting its time value into a frequency value.

424.        mean()-X: The mean value of the acceleration produced by the subject when moving horizontally from the origin point

425.        mean()-Y: The mean value of the acceleration produced by the subject when moving vertically from the origin point

426.        mean()-Z: The mean value of the acceleration produced by the subject when moving forward or backwards from the origin point

427.        `std()-X`: The standard deviation of the acceleration produced by the subject when moving horizontally from the origin point
428.        `std()-Y`: The standard deviation of the acceleration produced by the subject when moving vertically from the origin point
429.        `std()-Z`: The standard deviation of the acceleration produced by the subject when moving vertically from the origin point
430.        `mad()-X`: The median absolute deviation value of the acceleration produced by the subject when moving horizontally from the origin point
431.        `mad()-Y`: The median absolute deviation of the acceleration produced by the subject when moving vertically from the origin point
432.        `mad()-Z`: The median absolute deviation of the acceleration produced by the subject when moving vertically from the origin point
433.        `max()-X`: maximum value of the acceleration produced by the subject when moving horizontally from the origin point compared to others in the dataset
434.        `max()-Y`: The maximum value of the acceleration produced by the subject when moving vertically from the origin point compared to others in the dataset
435.        `max()-Z`: The maximum value of the acceleration produced by the subject when moving forwards or backwards from the origin point compared to others in the dataset
436.        `min()-X`: minimum value of the acceleration produced by the subject when moving horizontally from the origin point compared to others in the dataset
437.        `min()-Y`: The minimum value of the acceleration produced by the subject when moving vertically from the origin point compared to others in the dataset
438.        `min()-Z`: The minimum value of the acceleration produced by the subject when moving forwards or backwards from the origin point compared to others in the dataset

439.        sma(): The signal magnitude area, which is the acceleration magnitude summed over three axes within each window normalized by the window length.

440.        energy()-X: A measure of the energy produced by the subject produced by the subject when moving horizontally from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

441.        energy()-Y: A measure of the energy produced by the subject produced by the subject when moving vertically from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

442.        energy()-Z: A measure of the energy produced by the subject produced by the subject when moving forwards and backwards from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

443.        iqr()-X: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving horizontally from the origin point when compared to others in the dataset

444.        iqr()-Y: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving vertically from the origin point when compared to others in the dataset

445.        iqr()-Z: A measure of the difference in interquartile ranges produced by the subject produced by the subject when moving forwards and backwards from the origin point when compared to others in the dataset

446.        entropy()-X: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving horizontally from the origin point

447.        entropy()-Y: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving vertically from the origin point

448.        entropy()-Z: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject when moving forwards and backwards from the origin point

449.        maxInds-X: The frequency component with the largest magnitude produced by the subject when moving horizontally from the origin point

450.        maxInds-Y: The frequency component with the largest magnitude produced by the subject when moving vertically from the origin point

451.        maxInds-Z: The frequency component with the largest magnitude produced by the subject when moving forwards and backwards from the origin point

452.        meanFreq()-X: A mean frequency computed from the weighted average of the frequency components produced by the subject when moving horizontally from the origin point

453.        meanFreq()-Y: A mean frequency computed from the weighted average of the frequency components produced by the subject when moving vertically from the origin point

454.        meanFreq()-Z: A mean frequency computed from the weighted average of the frequency components produced by the subject when moving forwards and backwards from the origin point

455.        skewness()-X: The skewness of the frequency domain signal produced by the subject when moving horizontally from the origin point. Skewness is a measure of how far a distribution deviates from a normal distribution regarding the density of its tails.

456.        kurtosis()-X: The kurtosis of the frequency domain signal produced by the subject when moving horizontally from the origin point. Kurtosis is a measure of how far a

distribution deviates from a normal distribution regarding the distribution of probability from the shoulders into the center and tails.

457.        `skewness()`-Y: The skewness of the frequency domain signal produced by the subject when moving vertically from the origin point. Skewness is a measure of how far a distribution deviates from a normal distribution regarding the density of its tails.

458.        `kurtosis()`-Y: The kurtosis of the frequency domain signal produced by the subject when moving vertically from the origin point. Kurtosis is a measure of how far a distribution deviates from a normal distribution regarding the distribution of probability from the shoulders into the center and tails.

459.        `skewness()`-Z: The skewness of the frequency domain signal produced by the subject when moving forwards and backwards from the origin point. Skewness is a measure of how far a distribution deviates from a normal distribution regarding the density of its tails.

460.        `kurtosis()`-Z :The kurtosis of the frequency domain signal produced by the subject when moving vertically from the origin point. Kurtosis is a measure of how far a distribution deviates from a normal distribution regarding the distribution of probability from the shoulders into the center and tails.

461.        `bandsEnergy()`-1,8-X: A measure of the energy from domains 1-8 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

462.        `bandsEnergy()`-9,16-X: A measure of the energy from domains 9-16 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

463.        `bandsEnergy()`-17,24-X: A measure of the energy from domains 17-24 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

464.        `bandsEnergy()`-25,32-X: A measure of the energy from domains 25-32 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

465.        `bandsEnergy()`-33,40-X: A measure of the energy from domains 33-40 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

466.        `bandsEnergy()`-41,48-X: A measure of the energy from domains 41-48 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

467.        `bandsEnergy()`-49,56-X: A measure of the energy from domains 49-56 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

468.        `bandsEnergy()`-57,64-X: A measure of the energy from domains 57-64 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

469.        `bandsEnergy()`-1,16-X: A measure of the energy from domains 1-16 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

470.        `bandsEnergy()`-17,32-X: A measure of the energy from domains 17-32 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

471.        `bandsEnergy()`-33,48-X: A measure of the energy from domains 33-48 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

472.        `bandsEnergy()`-49,64-X: A measure of the energy from domains 49-64 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

473.        `bandsEnergy()`-1,24-X: A measure of the energy from domains 1-24 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

474.        `bandsEnergy()`-25,48-X: A measure of the energy from domains 25-48 within the 64 bins of energy produced by the subject when moving horizontally from the origin point.

475.        `bandsEnergy()`-1,8-Y: A measure of the energy from domains 1-8 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

476.        `bandsEnergy()`-9,16-Y: A measure of the energy from domains 9-16 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

477.        `bandsEnergy()`-17,24-Y: A measure of the energy from domains 17-24 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

478.        `bandsEnergy()`-25,32-Y: A measure of the energy from domains 25-32 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

479.        `bandsEnergy()`-33,40- Y: A measure of the energy from domains 33-40 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

480.        `bandsEnergy()`-41,48- Y: A measure of the energy from domains 41-48 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

481.        `bandsEnergy()`-49,56- Y: A measure of the energy from domains 49-56 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

482.        `bandsEnergy()`-57,64-Y: A measure of the energy from domains 57-64 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

483.       bandsEnergy()-1,16-Y: A measure of the energy from domains 1-16 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

484.       bandsEnergy()-17,32-Y: A measure of the energy from domains 17-32 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

485.       bandsEnergy()-33,48-Y:A measure of the energy from domains 33-48 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

486.       bandsEnergy()-49,64-Y:A measure of the energy from domains 49-64 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

487.       bandsEnergy()-1,24-Y:A measure of the energy from domains 1-24 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

488.       bandsEnergy()-25,48-Y:A measure of the energy from domains 25-48 within the 64 bins of energy produced by the subject when moving vertically from the origin point.

489.       bandsEnergy()-1,8-Z: A measure of the energy from domains 1-8 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

490.       bandsEnergy()-9,16-Z: A measure of the energy from domains 9-16 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

491.       bandsEnergy()-17,24-Z: A measure of the energy from domains 17-24 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

492.       bandsEnergy()-25,32-Z: A measure of the energy from domains 25-32 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.



493.        `bandsEnergy()`-33,40- Z: A measure of the energy from domains 33-40 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

494.        `bandsEnergy()`-41,48- Z: A measure of the energy from domains 41-48 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

495.        `bandsEnergy()`-49,56- Z: A measure of the energy from domains 49-56 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

496.        `bandsEnergy()`-57,64-Z: A measure of the energy from domains 57-64 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

497.        `bandsEnergy()`-1,16-Z: A measure of the energy from domains 1-16 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

498.        `bandsEnergy()`-17,32-Z: A measure of the energy from domains 17-32 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

499.        `bandsEnergy()`-33,48-Z: A measure of the energy from domains 33-48 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

500.        `bandsEnergy()`-49,64-Z: A measure of the energy from domains 49-64 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

501.        `bandsEnergy()-1,24-Z`: A measure of the energy from domains 1-24 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

502.        `bandsEnergy()-25,48-Z`: A measure of the energy from domains 25-48 within the 64 bins of energy produced by the subject when moving forwards and backwards from the origin point.

**fBodyAccMag** : A signal value derived from the body linear acceleration and angle velocity derived in time captured using an accelerometer. From those values, a magnitude value was derived using a Euclidean norm. These values are a composite of the magnitude of acceleration in all directions. A Fast Fourier Transform was then applied to the signal, thus converting its time value into a frequency value.

503.        `mean()`: The mean value of the acceleration magnitude produced by the subject when moving from the origin point

504.        `std()`: The standard deviation of the acceleration magnitude produced by the subject when moving from the origin point

505.        `mad()`: The median absolute deviation value of the acceleration magnitude produced by the subject when moving from the origin point

506.        `max()`: The maximum value of the acceleration magnitude produced by the subject when moving from the origin point

507.        `min()`: The minimum value of the acceleration magnitude produced by the subject when moving from the origin point

508.        `sma()`: The signal magnitude area, which is the acceleration magnitude summed over three axes within each window normalized by the window length.

509.        `energy()`: A measure of the energy magnitudes produced by the subject produced by the subject when moving from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

510.        `iqr()`: A measure of the difference in interquartile ranges produced by the subject produced by the subject's acceleration magnitude when moving from the origin point when compared to others in the dataset

511.        `entropy()`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject based on the acceleration magnitude

512.        `maxInds()`: The frequency component with the largest magnitude produced by the subject when moving forwards and backwards from the origin point.

513.        `meanFreq()`: A mean frequency computed from the weighted average of the frequency components produced by the subject when moving forwards and backwards from the origin point

514.        `skewness()`: The skewness of the frequency domain signal produced by the subject when moving from the origin point. Skewness is a measure of how far a distribution deviates from a normal distribution regarding the density of its tails.

515.        `kurtosis()`: The kurtosis of the frequency domain signal produced by the subject when moving vertically from the origin point. Kurtosis is a measure of how far a distribution deviates from a normal distribution regarding the distribution of probability from the shoulders into the center and tails.

**fBodyBodyAccJerkMag** : A signal value derived from the body linear acceleration and angle velocity derived in time captured using an accelerometer. From those values, a magnitude value was derived from the jerk values using a Euclidean norm. A jerk value a measure in the change of acceleration over time. These values are a composite of the magnitude of acceleration in all directions. A Fast Fourier Transform was then applied to the jerk value, thus converting its time value into a frequency value.

516.        `mean()`: The mean value of the acceleration magnitude produced by the subject when moving from the origin point

517.        `std()`: The standard deviation of the acceleration magnitude produced by the subject when moving from the origin point

518.        `mad()`: The median absolute deviation value of the acceleration magnitude produced by the subject when moving from the origin point

519.        `max()`: The maximum value of the acceleration magnitude produced by the subject when moving from the origin point

520.        `min()`: The minimum value of the acceleration magnitude produced by the subject when moving from the origin point

521.        `sma()`: The signal magnitude area, which is the acceleration magnitude summed over three axes within each window normalized by the window length.

522.        `energy()`: A measure of the energy magnitudes produced by the subject produced by the subject when moving from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

523.        `iqr()`: A measure of the difference in interquartile ranges produced by the subject produced by the subject's acceleration magnitude when moving from the origin point when compared to others in the dataset

524.        `entropy()`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject based on the acceleration magnitude

525.        `maxInds()`: The frequency component with the largest magnitude produced by the subject when moving forwards and backwards from the origin point.

526.        `meanFreq()`: A mean frequency computed from the weighted average of the frequency components produced by the subject when moving forwards and backwards from the origin point

527.        `skewness()`: The skewness of the frequency domain signal produced by the subject when moving from the origin point. Skewness is a measure of how far a distribution deviates from a normal distribution regarding the density of its tails.

528.        `kurtosis()`: The kurtosis of the frequency domain signal produced by the subject when moving vertically from the origin point. Kurtosis is a measure of how far a distribution deviates from a normal distribution regarding the distribution of probability from the shoulders into the center and tails.

**fBodyBodyGyroMag** : A signal value derived from the body linear acceleration and angle velocity derived in time captured using a gyrometer. From those values, a magnitude value was derived using a Euclidean norm. These values are a composite of the magnitude of acceleration in all directions. A Fast Fourier Transform was then applied to the signal, thus converting its time value into a frequency value.

529.        `mean()`: The mean value of the acceleration magnitude produced by the subject when moving from the origin point
530.        `std()`: The standard deviation of the acceleration magnitude produced by the subject when moving from the origin point
531.        `mad()`: The median absolute deviation value of the acceleration magnitude produced by the subject when moving from the origin point
532.        `max()`: The maximum value of the acceleration magnitude produced by the subject when moving from the origin point
533.        `min()`: The minimum value of the acceleration magnitude produced by the subject when moving from the origin point
534.        `sma()`: The signal magnitude area, which is the acceleration magnitude summed over three axes within each window normalized by the window length.
535.        `energy()`: A measure of the energy magnitudes produced by the subject produced by the subject when moving from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values
536.        `iqr()`: A measure of the difference in interquartile ranges produced by the subject produced by the subject's acceleration magnitude when moving from the origin point when compared to others in the dataset
537.        `entropy()`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject based on the acceleration magnitude
538.        `maxInds()`: The frequency component with the largest magnitude produced by the subject when moving forwards and backwards from the origin point.

539.        `meanFreq()`: A mean frequency computed from the weighted average of the frequency components produced by the subject when moving forwards and backwards from the origin point

540.        `skewness()`: The skewness of the frequency domain signal produced by the subject when moving from the origin point. Skewness is a measure of how far a distribution deviates from a normal distribution regarding the density of its tails.

541.        `kurtosis()`: The kurtosis of the frequency domain signal produced by the subject when moving vertically from the origin point. Kurtosis is a measure of how far a distribution deviates from a normal distribution regarding the distribution of probability from the shoulders into the center and tails.

**fBodyBodyGyroJerkMag** : A signal value derived from the body linear acceleration and angle velocity derived in time captured using a gyrometer. From those values, a magnitude value was derived from the jerk values using a Euclidean norm. A jerk value a measure in the change of acceleration over time. These values are a composite of the magnitude of acceleration in all directions. A Fast Fourier Transform was then applied to the jerk value, thus converting its time value into a frequency value.

542.        `mean()`: The mean value of the acceleration magnitude produced by the subject when moving from the origin point

543.        `std()`: The standard deviation of the acceleration magnitude produced by the subject when moving from the origin point

544.        `mad()`: The median absolute deviation value of the acceleration magnitude produced by the subject when moving from the origin point

545.        `max()`: The maximum value of the acceleration magnitude produced by the subject when moving from the origin point

546.        `min()`: The minimum value of the acceleration magnitude produced by the subject when moving from the origin point

547.        `sma()`: The signal magnitude area, which is the acceleration magnitude summed over three axes within each window normalized by the window length.

548.        `energy()`: A measure of the energy magnitudes produced by the subject produced by the subject when moving from the origin point when compared to others in the dataset. This is derived from the sum of squared differences from the mean divided by the number of values

549.        `iqr()`: A measure of the difference in interquartile ranges produced by the subject produced by the subject's acceleration magnitude when moving from the origin point when compared to others in the dataset

550.        `entropy()`: A measure of signal entropy, which is a measure of the signals' degree of randomness, produced by the subject based on the acceleration magnitude

551.        `maxInds()`: The frequency component with the largest magnitude produced by the subject when moving forwards and backwards from the origin point.

552.        `meanFreq()`: A mean frequency computed from the weighted average of the frequency components produced by the subject when moving forwards and backwards from the origin point

553.        `skewness()`: The skewness of the frequency domain signal produced by the subject when moving from the origin point. Skewness is a measure of how far a distribution deviates from a normal distribution regarding the density of its tails.



554.           kurtosis(): The kurtosis of the frequency domain signal produced by the subject when moving vertically from the origin point. Kurtosis is a measure of how far a distribution deviates from a normal distribution regarding the distribution of probability from the shoulders into the center and tails.

**Angle: A measure of the angle between two vectors in the respective measurements**

555.           (tBodyAccMean,gravity): The angle between the gravity acceleration vector as measured by an accelerometer within a signal sample value and the mean of the body acceleration vector within a signal sample value for each subject.

556.           (tBodyAccJerkMean,gravityMean): The angle between the mean value of the acceleration jerk vector as measured by an accelerometer within a signal sample value and the mean of the gravity acceleration vector within a signal sample value for each subject..

557.           (tBodyGyroMean,gravityMean): The angle between the gravity acceleration vector as measured by a gyrometer within a signal sample value and the mean of the gravity acceleration vector within a signal sample value for each subject..

558.           (tBodyGyroJerkMean,gravityMean): The angle between the mean value of the acceleration jerk vector as measured by a gyrometer within a signal sample value and the mean of the gravity acceleration vector within a signal sample value for each subject..

559.           (X,gravityMean): The angle between the mean value of all horizontal acceleration and the mean of the gravity acceleration vector within a signal sample value for each subject.

560.           (Y,gravityMean): The angle between the mean value of all vertical acceleration and the mean of the gravity acceleration vector within a signal sample value for each subject.

561. (Z,gravityMean): The angle between the mean value of all forwards and backwards acceleration and the mean of the gravity acceleration vector within a signal sample value for each subject.

`angle(tBodyAccMean,gravity)`

`angle(tBodyAccJerkMean,gravityMean)`

`angle(tBodyGyroMean,gravityMean)`

`angle(tBodyGyroJerkMean,gravityMean)`

`angle(X,gravityMean)`

`angle(Y,gravityMean)`

`angle(Z,gravityMean)`