DATA DICTIONARY

(For the data set tidy_data_means.txt)

There are 30 subjects (with representing codes 1 through 30), with 6 rows per subject (corresponding to each of 6 activities). Thus the data has $30 \cdot 6 = 180$ rows. Including the subject code and activity, this data set has 79 features (columns). ***Each feature (excepting Subject and Activity) is the mean of all the measurements for a particular subject doing a particular activity***.

The features selected for this database come from the accelerometer and gyroscope 3-axial raw signals Time.Acc-XYZ and Time.Gyro-XYZ. These time domain signals were captured at a constant rate of 50 Hz. Then they were filtered using a median filter and a 3rd order low pass Butterworth filter with a corner frequency of 20 Hz to remove noise. Similarly, the acceleration signal was then separated into body and gravity acceleration signals (Time.BodyAcc-XYZ and Time.GravityAcc-XYZ) using another low pass Butterworth filter with a corner frequency of 0.3 Hz.

Subsequently, the body linear acceleration and angular velocity were derived in time to obtain Jerk signals (Time.BodyAccJerk-XYZ and Time.BodyGyroJerk-XYZ). Also the magnitude of these three-dimensional signals were calculated using the Euclidean norm (Time.BodyAccMag, Time.GravityAccMag, Time.BodyAccJerkMag, Time.BodyGyroMag, Time.BodyGyroJerkMag).

Finally a Fast Fourier Transform (FFT) was applied to some of these signals producing Freq.BodyAcc-XYZ, Freq.BodyAccJerk-XYZ, Freq.BodyGyro-XYZ, Freq.BodyAccJerkMag, Freq.BodyGyroMag, Freq.BodyGyroJerkMag. (Note the 'Freq.' to indicate frequency domain signals).

These signals were used to estimate variables of the feature vector for each pattern:
'-XYZ' is used to denote 3-axial signals in the X, Y and Z directions.

Features (columns):

1. Subject (subject code)
2. Time.BodyAcc.mean.X
3. Time.BodyAcc.mean.Y
4. Time.BodyAcc.mean.Z
5. Time.BodyAcc.std.X
6. Time.BodyAcc.std.Y
7. Time.BodyAcc.std.Z
8. Time.GravityAcc.mean.X
9. Time.GravityAcc.mean.Y
10. Time.GravityAcc.mean.Z
11. Time.GravityAcc.std.X
12. Time.GravityAcc.std.Y
13. Time.GravityAcc.std.Z
14. Time.BodyAccJerk.mean.X
15. Time.BodyAccJerk.mean.Y
16. Time.BodyAccJerk.mean.Z
17. Time.BodyAccJerk.std.X
18. Time.BodyAccJerk.std.Y

19. Time.BodyAccJerk.std.Z
20. Time.BodyGyro.mean.X
21. Time.BodyGyro.mean.Y
22. Time.BodyGyro.mean.Z
23. Time.BodyGyro.std.X
24. Time.BodyGyro.std.Y
25. Time.BodyGyro.std.Z
26. Time.BodyGyroJerk.mean.X
27. Time.BodyGyroJerk.mean.Y
28. Time.BodyGyroJerk.mean.Z
29. Time.BodyGyroJerk.std.X
30. Time.BodyGyroJerk.std.Y
31. Time.BodyGyroJerk.std.Z
32. Time.GravityAccMag.mean
33. Time.GravityAccMag.std
34. Time.BodyAccJerkMag.mean
35. Time.BodyAccJerkMag.std
36. Time.BodyGyroMag.mean
37. Time.BodyGyroMag.std
38. Time.BodyGyroJerkMag.mean
39. Time.BodyGyroJerkMag.std
40. Freq.BodyAcc.mean.X
41. Freq.BodyAcc.mean.Y
42. Freq.BodyAcc.mean.Z
43. Freq.BodyAcc.std.X
44. Freq.BodyAcc.std.Y
45. Freq.BodyAcc.std.Z
46. Freq.BodyAcc.meanFreq.X
47. Freq.BodyAcc.meanFreq.Y
48. Freq.BodyAcc.meanFreq.Z
49. Freq.BodyAccJerk.mean.X
50. Freq.BodyAccJerk.mean.Y
51. Freq.BodyAccJerk.mean.Z
52. Freq.BodyAccJerk.std.X
53. Freq.BodyAccJerk.std.Y
54. Freq.BodyAccJerk.std.Z
55. Freq.BodyAccJerk.meanFreq.X
56. Freq.BodyAccJerk.meanFreq.Y
57. Freq.BodyAccJerk.meanFreq.Z
58. Freq.BodyGyro.mean.X
59. Freq.BodyGyro.mean.Y
60. Freq.BodyGyro.mean.Z
61. Freq.BodyGyro.std.X
62. Freq.BodyGyro.std.Y
63. Freq.BodyGyro.std.Z
64. Freq.BodyGyro.meanFreq.X
65. Freq.BodyGyro.meanFreq.Y
66. Freq.BodyGyro.meanFreq.Z
67. Freq.BodyAccMag.mean

68. Freq.BodyAccMag.std
69. Freq.BodyAccMag.meanFreq
70. Freq.BodyBodyAccJerkMag.mean
71. Freq.BodyBodyAccJerkMag.std
72. Freq.BodyBodyAccJerkMag.meanFreq
73. Freq.BodyBodyGyroMag.mean
74. Freq.BodyBodyGyroMag.std
75. Freq.BodyBodyGyroMag.meanFreq
76. Freq.BodyBodyGyroJerkMag.mean
77. Freq.BodyBodyGyroJerkMag.std
78. Freq.BodyBodyGyroJerkMag.meanFreq
79. Activity (there are 6 possible activities)

More detailed information about these features can be found where the original data was found:

http://archive.ics.uci.edu/ml/datasets/Human+Activity+Recognition+Using+Smartphones

In the original data from the UCI repository, replace “Time.” by “t”, and “Freq.” by “f”.