**Introduction:**

This dataset was generated from detail datasets [Human Activity Recognition Using SmartPhones Data Set](https://d396qusza40orc.cloudfront.net/getdata%2Fprojectfiles%2FUCI%20HAR%20Dataset.zip) downloaded from the UCI – Machine Learning Repository. The original datasets represent data collected from the accelerometers from the Samsung Galaxy S smartphone. A full description is available at the site where the data was obtained. To produce the final dataset for this course assignment, only the measurements on the mean and standard deviation for each measurement were included. Final results were generated by taking the average of each selected measurement for each activity.

**Original dataset background provided by the “feature\_info” file included in the download:**

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

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

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

**Data Dictionary for the tidy dataset:**

**ActName**

Name of the activity performed by each participant/subject

Domain Values:

1 = WALKING

2 = WALKING\_UPSTAIRS

3 = WALKING\_DOWNSTAIRS

4 = ITTING

5 = STANDING

6 = LAYING

**tBodyAcc.mean.X**

The average of the means for the time domain of body acceleration signals of X axial for a given activity.

**tBodyAcc.mean.Y**

The average of the means for the time domain of body acceleration signals of Y axial for a given activity.

**tBodyAcc.mean.Z**

The average of the means for the time domain of body acceleration signals of Z axial for a given activity.

**tBodyAcc.std.X**

The average of the standard deviation for the time domain of body acceleration signals of X axial for a given activity.

**tBodyAcc.std.Y**

The average of the standard deviation for the time domain of body acceleration signals of Y axial for a given activity.

**tBodyAcc.std.Z**

The average of the standard deviation for the time domain of body acceleration signals of Z axial for a given activity.

**tGravityAcc.mean.X**

The average of the means for the time domain of gravity acceleration signals of X axial for a given activity.

**tGravityAcc.mean.Y**

The average of the means for the time domain of gravity acceleration signals of Y axial for a given activity.

**tGravityAcc.mean.Z**

The average of the means for the time domain of gravity acceleration signals of Z axial for a given activity.

**tGravityAcc.std.X**

The average of the standard deviation for the time domain of gravity acceleration signals of X axial for a given activity.

**tGravityAcc.std.Y**

The average of the standard deviation for the time domain of gravity acceleration signals of Y axial for a given activity.

**tGravityAcc.std.Z**

The average of the standard deviation for the time domain of gravity acceleration signals of X axial for a given activity.

**tBodyAccJerk.mean.X**

The average of the means for the time domain of body acceleration Jerk signal of X axial for a given activity.

**tBodyAccJerk.mean.Y**

The average of the means for the time domain of body acceleration Jerk signal of Y axial for a given activity.

**tBodyAccJerk.mean.Z**

The average of the means for the time domain of body acceleration Jerk signal of Z axial for a given activity.

**tBodyAccJerk.std.X**

The average of the standard deviation for the time domain of body acceleration Jerk signal of X axial for a given activity.

**tBodyAccJerk.std.Y**

The average of the standard deviation for the time domain of body acceleration Jerk signal of Y axial for a given activity.

**tBodyAccJerk.std.Z**

The average of the standard deviation for the time domain of body acceleration Jerk signal of Z axial for a given activity.

**tBodyGyro.mean.X**

The average of the means for the time domain of body’s angular velocity from the gyroscope of X axial for a given activity.

**tBodyGyro.mean.Y**

The average of the means for the time domain of body’s angular velocity from the gyroscope of Y axial for a given activity.

**tBodyGyro.mean.Z**

The average of the means for the time domain of body’s angular velocity from the gyroscope of Z axial for a given activity.

**tBodyGyro.std.X**

The average of the standard deviation for the time domain of body’s angular velocity from the gyroscope of X axial for a given activity.

**tBodyGyro.std.Y**

The average of the standard deviation for the time domain of body’s angular velocity from the gyroscope of Y axial for a given activity.

**tBodyGyro.std.Z**

The average of the standard deviation for the time domain of body’s angular velocity from the gyroscope of Z axial for a given activity.

**tBodyGyroJerk.mean.X**

The average of the means for the time domain of body’s angular velocity Jerk signal from the gyroscope of X axial for a given activity.

**tBodyGyroJerk.mean.Y**

The average of the means for the time domain of body’s angular velocity Jerk signal from the gyroscope of Y axial for a given activity.

**tBodyGyroJerk.mean.Z**

The average of the means for the time domain of body’s angular velocity Jerk signal from the gyroscope of Z axial for a given activity.

**tBodyGyroJerk.std.X**

The average of the standard deviation for the time domain of body’s angular velocity Jerk signal from the gyroscope of X axial for a given activity.

**tBodyGyroJerk.std.Y**

The average of the standard deviation for the time domain of body’s angular velocity Jerk signal from the gyroscope of Y axial for a given activity.

**tBodyGyroJerk.std.Z**

The average of the standard deviation for the time domain of body’s angular velocity Jerk signal from the gyroscope of Z axial for a given activity.

**tBodyAccMag.mean**

The average of the mean measurements of the time domain for magnitude of these three-dimensional acceleration signals calculated using the Euclidean norm for a given activity.

**tBodyAccMag.std**

The average of the standard deviation measurements of the time domain for magnitude of these three-dimensional acceleration signals calculated using the Euclidean norm for a given activity.

**tGravityAccMag.mean**

The average of the mean measurements of the time domain for magnitude of these three-dimensional gravitational signals calculated using the Euclidean norm for a given activity.

**tGravityAccMag.std**

The average of the standard deviation measurements of the time domain for magnitude of these three-dimensional gravitational signals calculated using the Euclidean norm for a given activity.

**tBodyAccJerkMag.mean**

The average of the mean measurements of the time domain for magnitude of these three-dimensional acceleration Jerk signals calculated using the Euclidean norm for a given activity.

**tBodyAccJerkMag.std**

The average of the standard deviation measurements of the time domain for magnitude of these three-dimensional acceleration Jerk signals calculated using the Euclidean norm for a given activity.

**tBodyGyroMag.mean**

The average of the mean measurements of the time domain for magnitude of these three-dimensional angular velocity signals calculated using the Euclidean norm for a given activity.

**tBodyGyroMag.std**

The average of the standard deviation measurements of the time domain for magnitude of these three-dimensional angular velocity signals calculated using the Euclidean norm for a given activity.

**tBodyGyroJerkMag.mean**

The average of the mean measurements of the time domain for magnitude of these three-dimensional angular velocity Jerk signals calculated using the Euclidean norm for a given activity.

**tBodyGyroJerkMag.std**

The average of the standard deviation measurements of the time domain for magnitude of these three-dimensional angular velocity Jerk signals calculated using the Euclidean norm for a given activity.

**fBodyAcc.mean.X**

The average of the means for the frequency domain signal of body acceleration signals of X axial for a given activity.

**fBodyAcc.mean.Y**

The average of the means for the frequency domain signal of body acceleration signals of Y axial for a given activity.

**fBodyAcc.mean.Z**

The average of the means for the frequency domain signal of body acceleration signals of Z axial for a given activity.

**fBodyAcc.std.X**

The average of the standard deviation for the frequency domain signal of body acceleration signals of X axial for a given activity.

**fBodyAcc.std.Y**

The average of the standard deviation for the frequency domain signal of body acceleration signals of Y axial for a given activity.

**fBodyAcc.std.Z**

The average of the standard deviation for the frequency domain signal of body acceleration signals of Z axial for a given activity.

**fBodyAcc.meanFreq.X**

The average of the mean frequency for the frequency domain signal of body acceleration signals of X axial for a given activity.

**fBodyAcc.meanFreq.Y**

The average of the mean frequency for the frequency domain signal of body acceleration signals of Y axial for a given activity.

**fBodyAcc.meanFreq.Z**

The average of the mean frequency for the frequency domain signal of body acceleration signals of Z axial for a given activity.

**fBodyAccJerk.mean.X**

The average of the means for the frequency domain signal of body acceleration Jerk signals of X axial for a given activity.

**fBodyAccJerk.mean.Y**

The average of the means for the frequency domain signal of body acceleration Jerk signals of Y axial for a given activity.

**fBodyAccJerk.mean.Z**

The average of the means for the frequency domain signal of body acceleration Jerk signals of Z axial for a given activity.

**fBodyAccJerk.std.X**

The average of the standard deviation for the frequency domain signal of body acceleration Jerk signals of X axial for a given activity.

**fBodyAccJerk.std.Y**

The average of the standard deviation for the frequency domain signal of body acceleration Jerk signals of Y axial for a given activity.

**fBodyAccJerk.std.Z**

The average of the standard deviation for the frequency domain signal of body acceleration Jerk signals of Z axial for a given activity.

**fBodyAccJerk.meanFreq.X**

The average of the mean frequency for the frequency domain signal of body acceleration Jerk signals of Z axial for a given activity.

**fBodyAccJerk.meanFreq.Y**

The average of the mean frequency for the frequency domain signal of body acceleration Jerk signals of Y axial for a given activity.

**fBodyAccJerk.meanFreq.Z**

The average of the mean frequency for the frequency domain signal of body acceleration Jerk signals of Z axial for a given activity.

**fBodyGyro.mean.X**

The average of the means for the frequency domain signal of body angular velocity signals of X axial for a given activity.

**fBodyGyro.mean.Y**

The average of the means for the frequency domain signal of body angular velocity signals of Y axial for a given activity.

**fBodyGyro.mean.Z**

The average of the means for the frequency domain signal of body angular velocity signals of Z axial for a given activity.

**fBodyGyro.std.X**

The average of the standard deviation for the frequency domain signal of body angular velocity signals of X axial for a given activity.

**fBodyGyro.std.Y**

The average of the standard deviation for the frequency domain signal of body angular velocity signals of Y axial for a given activity.

**fBodyGyro.std.Z**

The average of the standard deviation for the frequency domain signal of body angular velocity signals of Z axial for a given activity.

**fBodyGyro.meanFreq.X**

The average of the mean frequency for the frequency domain signal of body angular velocity signals of X axial for a given activity.

**fBodyGyro.meanFreq.Y**

The average of the mean frequency for the frequency domain signal of body angular velocity signals of Y axial for a given activity.

**fBodyGyro.meanFreq.Z**

The average of the means for the frequency domain signal of body angular velocity signals of Z axial for a given activity.

**fBodyAccMag.mean**

The average of the mean measurements of the frequency domain for magnitude of these three-dimensional acceleration signals calculated using the Euclidean norm for a given activity.

**fBodyAccMag.std**

The average of the standard deviation measurements of the frequency domain for magnitude of these three-dimensional acceleration signals calculated using the Euclidean norm for a given activity.

**fBodyAccMag.meanFreq**

The average of the mean frequency of the frequency domain for magnitude of these three-dimensional acceleration signals calculated using the Euclidean norm for a given activity.

**fBodyBodyAccJerkMag.mean**

The average of the mean measurement of the frequency domain for magnitude of these three-dimensional acceleration Jerk signals calculated using the Euclidean norm for a given activity.

**fBodyBodyAccJerkMag.std**

The average of the standard deviation of the frequency domain for magnitude of these three-dimensional acceleration Jerk signals calculated using the Euclidean norm for a given activity.

**fBodyBodyAccJerkMag.meanFreq**

The average of the mean frequency of the frequency domain for magnitude of these three-dimensional acceleration Jerk signals calculated using the Euclidean norm for a given activity.

**fBodyBodyGyroMag.mean**

The average of the mean measurements of the frequency domain for magnitude of these three-dimensional angular velocity signals calculated using the Euclidean norm for a given activity.

**fBodyBodyGyroMag.std**

The average of the standard deviation of the frequency domain for magnitude of these three-dimensional angular velocity signals calculated using the Euclidean norm for a given activity.

**fBodyBodyGyroMag.meanFreq**

The average of the mean frequency of the frequency domain for magnitude of these three-dimensional angular velocity signals calculated using the Euclidean norm for a given activity.

**fBodyBodyGyroJerkMag.mean**

The average of the mean measurements of the frequency domain for magnitude of these three-dimensional angular velocity Jerk signals calculated using the Euclidean norm for a given activity.

**fBodyBodyGyroJerkMag.std**

The average of the standard deviation of the frequency domain for magnitude of these three-dimensional angular velocity signals calculated using the Euclidean norm for a given activity.

**fBodyBodyGyroJerkMag.meanFreq**

The average of the mean frequency of the frequency domain for magnitude of these three-dimensional angular velocity Jerk signals calculated using the Euclidean norm for a given activity.

**angletBodyAccMean.gravity**

Vector obtained by averaging the body acceleration mean signals of time domain.

**sampleangletBodyAccJerkMean.gravityMean**

Vector obtained by random sampling of the body acceleration mean signals of time domain.

**angletBodyGyroMean.gravityMean**

Vector obtained by averaging the body angular velocity mean signals of time domain.

**angletBodyGyroJerkMean.gravityMean**

Vector obtained by averaging the body angular velocity mean Jerk signals of time domain.

**angleX.gravityMean**

Vector obtain by averaging the gravitational mean measurements for the X axial.

**angleY.gravityMean**

Vector obtain by averaging the gravitational mean measurements for the X axial.

**angleZ.gravityMean**

Vector obtain by averaging the gravitational mean measurements for the Y axial.