Introduction
==========

One of the most exciting areas in all of data science right now is wearable computing - see for example this article . Companies like Fitbit, Nike, and Jawbone Up are racing to develop the most advanced algorithms to attract new users. The data linked to from the course website 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:
http://archive.ics.uci.edu/ml/datasets/Human+Activity+Recognition+Using+Smartphones

The raw data for this project come from:
https://d396qusza40orc.cloudfront.net/getdata%2Fprojectfiles%2FUCI%20HAR%20Dataset.zip

Feature Selection for TidyDataset.txt
==========

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).

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.

tBodyAcc-XYZ
tGravityAcc-XYZ
tBodyAccJerk-XYZ
tBodyGyro-XYZ
tBodyGyroJerk-XYZ
tBodyAccMag
tGravityAccMag
tBodyAccJerkMag
tBodyGyroMag
tBodyGyroJerkMag
fBodyAcc-XYZ
fBodyAccJerk-XYZ
fBodyGyro-XYZ
fBodyAccMag
fBodyAccJerkMag
fBodyGyroMag
fBodyGyroJerkMag

The set of variables that were estimated from these signals are:
mean(): Mean value
std(): Standard deviation

The complete list of variables of each feature vector is:
subjectid: factor indicating the subject ID of the measurement
activitylabel : factor indicating the activity of the subject id whose measurement are given
tBodyAcc-mean()-X : numeric, Cf. introduction on what it means
tBodyAcc-mean()-Y : numeric, Cf. introduction on what it means
tBodyAcc-mean()-Z : numeric, Cf. introduction on what it means
tBodyAcc-std()-X : numeric, Cf. introduction on what it means
tBodyAcc-std()-Y : numeric, Cf. introduction on what it means
tBodyAcc-std()-Z : numeric, Cf. introduction on what it means
tGravityAcc-mean()-X : numeric, Cf. introduction on what it means
tGravityAcc-mean()-Y : numeric, Cf. introduction on what it means
tGravityAcc-mean()-Z : numeric, Cf. introduction on what it means
tGravityAcc-std()-X : numeric, Cf. introduction on what it means
tGravityAcc-std()-Y : numeric, Cf. introduction on what it means
tGravityAcc-std()-Z : numeric, Cf. introduction on what it means
tBodyAccJerk-mean()-X : numeric, Cf. introduction on what it means
tBodyAccJerk-mean()-Y : numeric, Cf. introduction on what it means
tBodyAccJerk-mean()-Z : numeric, Cf. introduction on what it means
tBodyAccJerk-std()-X : numeric, Cf. introduction on what it means
tBodyAccJerk-std()-Y : numeric, Cf. introduction on what it means
tBodyAccJerk-std()-Z : numeric, Cf. introduction on what it means
tBodyGyro-mean()-X : numeric, Cf. introduction on what it means
tBodyGyro-mean()-Y : numeric, Cf. introduction on what it means
tBodyGyro-mean()-Z : numeric, Cf. introduction on what it means
tBodyGyro-std()-X : numeric, Cf. introduction on what it means
tBodyGyro-std()-Y : numeric, Cf. introduction on what it means
tBodyGyro-std()-Z : numeric, Cf. introduction on what it means
tBodyGyroJerk-mean()-X : numeric, Cf. introduction on what it means
tBodyGyroJerk-mean()-Y : numeric, Cf. introduction on what it means
tBodyGyroJerk-mean()-Z : numeric, Cf. introduction on what it means
tBodyGyroJerk-std()-X : numeric, Cf. introduction on what it means
tBodyGyroJerk-std()-Y : numeric, Cf. introduction on what it means
tBodyGyroJerk-std()-Z : numeric, Cf. introduction on what it means
tBodyAccMag-mean(): numeric, Cf. introduction on what it means
tBodyAccMag-std(): numeric, Cf. introduction on what it means
tGravityAccMag-mean(): numeric, Cf. introduction on what it means
tGravityAccMag-std(): numeric, Cf. introduction on what it means
tBodyAccJerkMag-mean(): numeric, Cf. introduction on what it means
tBodyAccJerkMag-std(): numeric, Cf. introduction on what it means
tBodyGyroMag-mean(): numeric, Cf. introduction on what it means
tBodyGyroMag-std(): numeric, Cf. introduction on what it means
tBodyGyroJerkMag-mean(): numeric, Cf. introduction on what it means
tBodyGyroJerkMag-std(): numeric, Cf. introduction on what it means
fBodyAcc-mean()-X : numeric, Cf. introduction on what it means
fBodyAcc-mean()-Y : numeric, Cf. introduction on what it means
fBodyAcc-mean()-Z : numeric, Cf. introduction on what it means
fBodyAcc-std()-X : numeric, Cf. introduction on what it means
fBodyAcc-std()-Y : numeric, Cf. introduction on what it means
fBodyAcc-std()-Z : numeric, Cf. introduction on what it means
fBodyAcc-meanFreq()-X : numeric, Cf. introduction on what it means
fBodyAcc-meanFreq()-Y : numeric, Cf. introduction on what it means
fBodyAcc-meanFreq()-Z : numeric, Cf. introduction on what it means
fBodyAccJerk-mean()-X : numeric, Cf. introduction on what it means
fBodyAccJerk-mean()-Y : numeric, Cf. introduction on what it means
fBodyAccJerk-mean()-Z : numeric, Cf. introduction on what it means

fBodyAccJerk-std()-X : numeric, Cf. introduction on what it means
fBodyAccJerk-std()-Y : numeric, Cf. introduction on what it means
fBodyAccJerk-std()-Z : numeric, Cf. introduction on what it means
fBodyAccJerk-meanFreq()-X : numeric, Cf. introduction on what it means
fBodyAccJerk-meanFreq()-Y : numeric, Cf. introduction on what it means
fBodyAccJerk-meanFreq()-Z : numeric, Cf. introduction on what it means
fBodyGyro-mean()-X : numeric, Cf. introduction on what it means
fBodyGyro-mean()-Y : numeric, Cf. introduction on what it means
fBodyGyro-mean()-Z : numeric, Cf. introduction on what it means
fBodyGyro-std()-X : numeric, Cf. introduction on what it means
fBodyGyro-std()-Y : numeric, Cf. introduction on what it means
fBodyGyro-std()-Z : numeric, Cf. introduction on what it means
fBodyGyro-meanFreq()-X : numeric, Cf. introduction on what it means
fBodyGyro-meanFreq()-Y : numeric, Cf. introduction on what it means
fBodyGyro-meanFreq()-Z : numeric, Cf. introduction on what it means
fBodyAccMag-mean(): numeric, Cf. introduction on what it means
fBodyAccMag-std(): numeric, Cf. introduction on what it means
fBodyAccMag-meanFreq(): numeric, Cf. introduction on what it means
fBodyBodyAccJerkMag-mean(): numeric, Cf. introduction on what it means
fBodyBodyAccJerkMag-std(): numeric, Cf. introduction on what it means
fBodyBodyAccJerkMag-meanFreq(): numeric, Cf. introduction on what it means
fBodyBodyGyroMag-mean(): numeric, Cf. introduction on what it means
fBodyBodyGyroMag-std(): numeric, Cf. introduction on what it means
fBodyBodyGyroMag-meanFreq(): numeric, Cf. introduction on what it means
fBodyBodyGyroJerkMag-mean(): numeric, Cf. introduction on what it means
fBodyBodyGyroJerkMag-std(): numeric, Cf. introduction on what it means
fBodyBodyGyroJerkMag-meanFreq(): numeric, Cf. introduction on what it means

Feature Selection for TidyAggregatedDataset.txt

Dataset with the with the average of each variable of the previously described dataset : TidyDataset.txt for each activity and each subject. Cf previous section for info about features info