Background

This codebook identifies the variables in a tidy data set produced for the project in Coursera's "Getting and Cleaning Data". A full description of the raw data ("HAR Dataset") is available at the site where the data was obtained:

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

Data for this project was obtained from files in:
https://d396qusza40orc.cloudfront.net/getdata%2Fprojectfiles%2FUCI%20HAR%20Dataset.zip

See also: https://github.com/nxd1/UCI-HAR-data-analysis/blob/master/README.pdf - this contains additional information on the processing steps performed to convert the data.

Study Design

The tidy data consists of variables from the HAR Dataset which are either a mean or standard deviation measurement. Only those variables containing "mean()" or "std()" in the original name were selected. These variables reflect 2 of 17 different variables estimated in the data set. Refer to the HAR Dataset README.txt and feature_info.txt files for additional background on measures and features.

Based on the data set description and column names, there are 66 total variables that contain mean and standard deviation values, as follows:

Triaxial Variables	Single Variables
1. tBodyAcc-XYZ	1. tBodyAccMag
2. tGravityAcc-XYZ	2. tGravityAccMag
3. tBodyAccJerk-XYZ	3. tBodyAccJerkMag
4. tBodyGyro-XYZ	4. tBodyGyroMag
5. tBodyGyroJerk-XYZ	5. tBodyGyroJerkMag
6. fBodyAcc-XYZ	6. fBodyAccMag
7. fBodyAccJerk-XYZ	7. fBodyAccJerkMag
8. fBodyGyro-XYZ	8. fBodyGyroMag
	9. fBodyGyroJerkMag
24 total variables (8*3)	**9 total variables**
Total selected for the two measurements: 66 ((24 + 9) * 2)	

Specifically excluded from processing are a number of variables that include 'mean' in the name. The excluded measurements reflect either weighted average calculations (e.g., meanFreq()) or calculations of the angle between certain vectors (e.g., angle(tBodyAccMean, gravity)). These were not deemed necessary for this project.

Code book

The tidy data is contained in the text file "UCI_HAR_tidy_data.txt", delimited by whitespace, with a header for each data column: *subject*, *activity, measure, mean*. A description of each column/field is shown below.

Field Number	Name	Description
1	subject	Identifier for subject/volunteer in the experiment (1 – 30)
2	activity	Name of activity performed by subject - a total of 6 different activities (see below)
3	measure	Name of original measure selected for analysis – a total of 66 different measures (see below)
4	mean	The computed average for the measure identified. Measures starting with 't' are for time (secs) and those starting with 'f' are frequency (Hz) values.

The mean value corresponds to the calculated average of specific measures derived for each combination of subject and activity performed. There are a total of 11,880 records/rows in this file consisting of 30 subjects, 6 activities each and 66 measures for each activity/subject combination.

Values in this file can be read using the R command:

```
tidy <- read.table(file = "UCI_HAR_tidy_data.txt", header = TRUE)
```

Activity Descriptions: WALKING, WALKING_UPSTAIRS, WALKING_DOWNSTAIRS, SITTING, STANDING, LAYING

Measures averaged
(Refer to HAR Dataset documentation for a description of each data set measurement)

Item	Feature Index	Dataset Measurement	Tidy Data Measurement
1.	1	tBodyAcc-mean()-X	v001.tbodyacc.mean.x
2.	2	tBodyAcc-mean()-Y	v002.tbodyacc.mean.y
3.	3	tBodyAcc-mean()-Z	v003.tbodyacc.mean.z
4.	4	tBodyAcc-std()-X	v004.tbodyacc.std.x
5.	5	tBodyAcc-std()-Y	v005.tbodyacc.std.y
6.	6	tBodyAcc-std()-Z	v006.tbodyacc.std.z
7.	41	tGravityAcc-mean()-X	v041.tgravityacc.mean.x
8.	42	tGravityAcc-mean()-Y	v042.tgravityacc.mean.y
9.	43	tGravityAcc-mean()-Z	v043.tgravityacc.mean.z
10.	44	tGravityAcc-std()-X	v044.tgravityacc.std.x
11.	45	tGravityAcc-std()-Y	v045.tgravityacc.std.y
12.	46	tGravityAcc-std()-Z	v046.tgravityacc.std.z
13.	81	tBodyAccJerk-mean()-X	v081.tbodyaccjerk.mean.x
14.	82	tBodyAccJerk-mean()-Y	v082.tbodyaccjerk.mean.y
15.	83	tBodyAccJerk-mean()-Z	v083.tbodyaccjerk.mean.z
16.	84	tBodyAccJerk-std()-X	v084.tbodyaccjerk.std.x
17.	85	tBodyAccJerk-std()-Y	v085.tbodyaccjerk.std.y
18.	86	tBodyAccJerk-std()-Z	v086.tbodyaccjerk.std.z

19.	121	tBodyGyro-mean()-X	v121.tbodygyro.mean.x
20.	122	tBodyGyro-mean()-Y	v122.tbodygyro.mean.y
21.	123	tBodyGyro-mean()-Z	v123.tbodygyro.mean.z
22.	124	tBodyGyro-std()-X	v124.tbodygyro.std.x
23.	125	tBodyGyro-std()-Y	v125.tbodygyro.std.y
24.	126	tBodyGyro-std()-Z	v126.tbodygyro.std.z
25.	161	tBodyGyroJerk-mean()-X	v161.tbodygyrojerk.mean.x
26.	162	tBodyGyroJerk-mean()-Y	v162.tbodygyrojerk.mean.y
27.	163	tBodyGyroJerk-mean()-Z	v163.tbodygyrojerk.mean.z
28.	164	tBodyGyroJerk-std()-X	v164.tbodygyrojerk.std.x
29.	165	tBodyGyroJerk-std()-Y	v165.tbodygyrojerk.std.y
30.	166	tBodyGyroJerk-std()-Z	v166.tbodygyrojerk.std.z
31.	201	tBodyAccMag-mean()	v201.tbodyaccmag.mean
32.	202	tBodyAccMag-std()	v202.tbodyaccmag.std
33.	214	tGravityAccMag-mean()	v214.tgravityaccmag.mean
34.	215	tGravityAccMag-std()	v215.tgravityaccmag.std
35.	227	tBodyAccJerkMag-mean()	v227.tbodyaccjerkmag.mean
36.	228	tBodyAccJerkMag-std()	v228.tbodyaccjerkmag.std
37.	240	tBodyGyroMag-mean()	v240.tbodygyromag.mean
38.	241	tBodyGyroMag-std()	v241.tbodygyromag.std
39.	253	tBodyGyroJerkMag-mean()	v253.tbodygyrojerkmag.mean
40.	254	tBodyGyroJerkMag-std()	v254.tbodygyrojerkmag.std
41.	266	fBodyAcc-mean()-X	v266.fbodyacc.mean.x
42.	267	fBodyAcc-mean()-Y	v267.fbodyacc.mean.y
43.	268	fBodyAcc-mean()-Z	v268.fbodyacc.mean.z
44.	269	fBodyAcc-std()-X	v269.fbodyacc.std.x
45.	270	fBodyAcc-std()-Y	v270.fbodyacc.std.y
46.	271	fBodyAcc-std()-Z	v271.fbodyacc.std.z
47.	345	fBodyAccJerk-mean()-X	v345.fbodyaccjerk.mean.x
48.	346	fBodyAccJerk-mean()-Y	v346.fbodyaccjerk.mean.y
49.	347	fBodyAccJerk-mean()-Z	v347.fbodyaccjerk.mean.z
50.	348	fBodyAccJerk-std()-X	v348.fbodyaccjerk.std.x
51.	349	fBodyAccJerk-std()-Y	v349.fbodyaccjerk.std.y
52.	350	fBodyAccJerk-std()-Z	v350.fbodyaccjerk.std.z
53.	424	fBodyGyro-mean()-X	v424.fbodygyro.mean.x
54.	425	fBodyGyro-mean()-Y	v425.fbodygyro.mean.y
55.	426	fBodyGyro-mean()-Z	v426.fbodygyro.mean.z
56.	427	fBodyGyro-std()-X	v427.fbodygyro.std.x
57.	428	fBodyGyro-std()-Y	v428.fbodygyro.std.y

58.	429	fBodyGyro-std()-Z	v429.fbodygyro.std.z
59.	503	fBodyAccMag-mean()	v503.fbodyaccmag.mean
60.	504	fBodyAccMag-std()	v504.fbodyaccmag.std
61.	516	fBodyBodyAccJerkMag-mean()	v516.fbodybodyaccjerkmag.mean
62.	517	fBodyBodyAccJerkMag-std()	v517.fbodybodyaccjerkmag.std
63.	529	fBodyBodyGyroMag-mean()	v529.fbodybodygyromag.mean
64.	530	fBodyBodyGyroMag-std()	v530.fbodybodygyromag.std
65.	542	fBodyBodyGyroJerkMag-mean()	v542.fbodybodygyrojerkmag.mean
66.	543	fBodyBodyGyroJerkMag-std()	v543.fbodybodygyrojerkmag.std