Codebook for the aggregated version of the "Human Activity Recognition Using Smartphones Data Set"

The following steps have been performed on the original date set to extract a subset of grouped means (see also run_analysis.R and ReadMe.md for more information).

The script will perform the following steps:

1. Loads in the main file for "train" (X_train.txt) and corresponding y_train.txt (key for type of activity) and subject_train.txt (key of number of test person). Each of them has 7352 rows.
2. Merges those 3 files together with cbind()
3. Does the same for the 3 "test" files
4. Merges the 2 tables for "train" and "test" to one large table with rbind()
5. Renames the first 2 columns to "Person" and "Activity". The next 561 columns are named with the value names from features.txt (see Code Book for further information)
6. Uses grepl() to find all columns that contain "mean" or "std". I decided to not only include names that have "mean"/"std" at the end (like tBodyAcc-mean()-X), but also those that have "mean"/"std" somewhere in the middle (like fBodyAcc-meanFreq()-X)
7. Uses a boolean vector to subset those columns
8. Replaces the activity numbers with the descriptive labels from activity_labels.txt
9. Uses the function aggreate() to calculate the mean for each variable, grouped by Person and Activity
10. Writes the resulting table into a new file named aggregatedData.txt

Many of the following variables come in sets of three, because most values have been measured for each of the three directions in space separately (X, Y, and Z).

Col. No.	Variable name	Meaning	Values
1	**"Person"**	No. of test person	1-30
2	**"Activity"**	Type of activity	WALKING WALKING_UPSTAIRS WALDING_DOWNSTAIRS SITTING STANDING LAYING
The following time domain signals (prefix "t") were captured at a constant rate of 50 Hz. Then they were filtered (see features_info.txt for more information):			
3	**"tBodyAcc-mean()-X"**	body acceleration mean along X	
4	**"tBodyAcc-mean()-Y"**	body acceleration mean along Y	
5	**"tBodyAcc-mean()-Z"**	body acceleration mean along Z	
6	**"tBodyAcc-std()-X"**	body acceleration standard deviation along X	
7	**"tBodyAcc-std()-Y"**	body acceleration standard deviation along Y	
8	**"tBodyAcc-std()-Z"**	body acceleration standard deviation along Z	
9	**"tGravityAcc-mean()-X"**	gravity acceleration mean along X	
10	**"tGravityAcc-mean()-Y"**	gravity acceleration mean along Y	
11	**"tGravityAcc-mean()-Z"**	gravity acceleration mean along Z	
12	**"tGravityAcc-std()-X"**	gravity acceleration standard deviation along X	
13	**"tGravityAcc-std()-Y"**	gravity acceleration standard deviation along Y	
14	**"tGravityAcc-std()-Z"**	gravity acceleration standard deviation along Z	
15	**"tBodyAccJerk-mean()-X"**	body jerk mean along X	
16	**"tBodyAccJerk-mean()-Y"**	body jerk mean along Y	
17	**"tBodyAccJerk-mean()-Z"**	body jerk mean along Z	
18	**"tBodyAccJerk-std()-X"**	body jerk standard deviation along X	
19	**"tBodyAccJerk-std()-Y"**	body jerk standard deviation along Y	
20	**"tBodyAccJerk-std()-Z"**	body jerk standard deviation along Z	
21	**"tBodyGyro-mean()-X"**	gyroscope mean along X	
22	**"tBodyGyro-mean()-Y"**	gyroscope mean along Y	
23	**"tBodyGyro-mean()-Z"**	gyroscope mean along Z	

24	**"tBodyGyro-std()-X"**	gyroscope standard deviation along X	
25	**"tBodyGyro-std()-Y"**	gyroscope standard deviation along Y	
26	**"tBodyGyro-std()-Z"**	gyroscope standard deviation along Z	
27	**"tBodyGyroJerk-mean()-X"**	gyroscope jerk mean along X	
28	**"tBodyGyroJerk-mean()-Y"**	gyroscope jerk mean along Y	
29	**"tBodyGyroJerk-mean()-Z"**	gyroscope jerk mean along Z	
30	**"tBodyGyroJerk-std()-X"**	gyroscope jerk standard deviation along X	
31	**"tBodyGyroJerk-std()-Y"**	gyroscope jerk standard deviation along Y	
32	**"tBodyGyroJerk-std()-Z"**	gyroscope jerk standard deviation along Z	
33	**"tBodyAccMag-mean()"**	body acceleration magnitude mean	
34	**"tBodyAccMag-std()"**	body acceleration magnitude standard deviation	
35	**"tGravityAccMag-mean()"**	gravity acceleration magnitude mean	
36	**"tGravityAccMag-std()"**	gravity acceleration magnitude standard deviation	
37	**"tBodyAccJerkMag-mean()"**	body jerk magnitude mean	
38	**"tBodyAccJerkMag-std()"**	body jerk magnitude standard deviation	
39	**"tBodyGyroMag-mean()"**	gyroscope magnitude mean	
40	**"tBodyGyroMag-std()"**	gyroscope magnitude standard deviation	
41	**"tBodyGyroJerkMag-mean()"**	gyroscope jerk magnitude mean	
42	**"tBodyGyroJerkMag-std()"**	gyroscope jerk magnitude standard deviation	
A Fast Fourier Transformation (FFT) was applied to the following variables (see features_info.txt for further information):			
43	**"fBodyAcc-mean()-X"**	body acceleration mean along X	
44	**"fBodyAcc-mean()-Y"**	body acceleration mean along Y	
45	**"fBodyAcc-mean()-Z"**	body acceleration mean along Z	
46	**"fBodyAcc-std()-X"**	body acceleration standard deviation along X	
47	**"fBodyAcc-std()-Y"**	body acceleration standard deviation along Y	
48	**"fBodyAcc-std()-Z"**	body acceleration standard deviation along Z	
49	**"fBodyAcc-meanFreq()-X"**	body acceleration mean frequency along X	
50	**"fBodyAcc-meanFreq()-Y"**	body acceleration mean frequency along Y	
51	**"fBodyAcc-meanFreq()-Z"**	body acceleration mean frequency along Z	
52	**"fBodyAccJerk-mean()-X"**	body acceleration jerk mean along X	
53	**"fBodyAccJerk-mean()-Y"**	body acceleration jerk mean along Y	
54	**"fBodyAccJerk-mean()-Z"**	body acceleration jerk mean along Z	
55	**"fBodyAccJerk-std()-X"**	body acceleration jerk standard deviation along X	
56	**"fBodyAccJerk-std()-Y"**	body acceleration jerk standard deviation along Y	
57	**"fBodyAccJerk-std()-Z"**	body acceleration jerk standard deviation along Z	
58	**"fBodyAccJerk-meanFreq()-X"**	body acceleration jerk mean frequency along X	
59	**"fBodyAccJerk-meanFreq()-Y"**	body acceleration jerk mean frequency along Y	
60	**"fBodyAccJerk-meanFreq()-Z"**	body acceleration jerk mean frequency along Z	
61	**"fBodyGyro-mean()-X"**	gyroscope mean along X	
62	**"fBodyGyro-mean()-Y"**	gyroscope mean along Y	
63	**"fBodyGyro-mean()-Z"**	gyroscope mean along Z	
64	**"fBodyGyro-std()-X"**	gyroscope standard deviation along X	
65	**"fBodyGyro-std()-Y"**	gyroscope standard deviation along Y	
66	**"fBodyGyro-std()-Z"**	gyroscope standard deviation along Z	
67	**"fBodyGyro-meanFreq()-X"**	gyroscope mean frequency along X	
68	**"fBodyGyro-meanFreq()-Y"**	gyroscope mean frequency along Y	
69	**"fBodyGyro-meanFreq()-Z"**	gyroscope mean frequency along Z	
70	**"fBodyAccMag-mean()"**	body acceleration magnitude mean	
71	**"fBodyAccMag-std()"**	body acceleration magnitude standard deviation	
72	**"fBodyAccMag-meanFreq()"**	body acceleration magnitude mean frequency	
73	**"fBodyBodyAccJerkMag-mean()"**	body acceleration jerk magnitude mean	
74	**"fBodyBodyAccJerkMag-std()"**	body acceleration jerk magnitude standard deviation	
75	**"fBodyBodyAccJerkMag-meanFreq()"**	body acceleration jerk magnitude mean frequency	
76	**"fBodyBodyGyroMag-mean()"**	body gyroscope magnitude mean	
77	**"fBodyBodyGyroMag-std()"**	body gyroscope magnitude standard deviation	
78	**"fBodyBodyGyroMag-meanFreq()"**	body gyroscope magnitude mean frequency	
79	**"fBodyBodyGyroJerkMag-mean()"**	body gyroscope jerk magnitude mean	
80	**"fBodyBodyGyroJerkMag-std()"**	body gyroscope jerk magnitude standard deviation	
81	**"fBodyBodyGyroJerkMag-meanFreq()"**	body gyroscope jerk magnitude mean frequency	