run\_analysis.R

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Sun Sep 21 16:09:59 2014

# Analyze the test and train data that have been processed previouly.  
  
# To be consistent, manually set the workspace  
# to the 'project' directory  
  
# Load workspace  
load("run\_analysis.RData")  
  
library(dplyr)

##   
## Attaching package: 'dplyr'  
##   
## The following objects are masked from 'package:stats':  
##   
## filter, lag  
##   
## The following objects are masked from 'package:base':  
##   
## intersect, setdiff, setequal, union

library(stringr)  
library(xlsx)

## Warning: package 'xlsx' was built under R version 3.1.1

## Loading required package: rJava  
## Loading required package: xlsxjars

## Warning: package 'xlsxjars' was built under R version 3.1.1

# Combine xData\_test and xData\_train into xData  
xData <- rbind(xData\_test,xData\_train)  
  
# Check to make sure xData looks good  
tail(xData, n=1)

## subjectid subjecttype activity tBodyAccmeanX tBodyAccmeanY  
## 10299 30 train WALKING\_UPSTAIRS 0.3515 -0.01242  
## tBodyAccmeanZ tBodyAccstdX tBodyAccstdY tBodyAccstdZ tBodyAccmadX  
## 10299 -0.2039 -0.2693 -0.08721 0.1774 -0.3774  
## tBodyAccmadY tBodyAccmadZ tBodyAccmaxX tBodyAccmaxY tBodyAccmaxZ  
## 10299 -0.03868 0.2294 0.269 -0.147 -0.1337  
## tBodyAccminX tBodyAccminY tBodyAccminZ tBodyAccsma tBodyAccenergyX  
## 10299 0.2348 0.2378 0.3016 -0.02796 -0.7306  
## tBodyAccenergyY tBodyAccenergyZ tBodyAcciqrX tBodyAcciqrY  
## 10299 -0.8385 -0.3683 -0.6271 -0.1123  
## tBodyAcciqrZ tBodyAccentropyX tBodyAccentropyY tBodyAccentropyZ  
## 10299 0.2625 0.3122 0.3335 -0.0991  
## tBodyAccarCoeffX\_1 tBodyAccarCoeffX\_2 tBodyAccarCoeffX\_3  
## 10299 -0.4429 0.3865 -0.2306  
## tBodyAccarCoeffX\_4 tBodyAccarCoeffY\_1 tBodyAccarCoeffY\_2  
## 10299 0.1393 -0.4464 0.3916  
## tBodyAccarCoeffY\_3 tBodyAccarCoeffY\_4 tBodyAccarCoeffZ\_1  
## 10299 -0.1564 0.09787 -0.4057  
## tBodyAccarCoeffZ\_2 tBodyAccarCoeffZ\_3 tBodyAccarCoeffZ\_4  
## 10299 0.1833 -0.05656 0.05437  
## tBodyAcccorrelationX\_Y tBodyAcccorrelationX\_Z tBodyAcccorrelationY\_Z  
## 10299 -0.2664 -0.2911 -0.2003  
## tGravityAccmeanX tGravityAccmeanY tGravityAccmeanZ tGravityAccstdX  
## 10299 0.9187 -0.2333 -0.02095 -0.9524  
## tGravityAccstdY tGravityAccstdZ tGravityAccmadX tGravityAccmadY  
## 10299 -0.9678 -0.8985 -0.9558 -0.9698  
## tGravityAccmadZ tGravityAccmaxX tGravityAccmaxY tGravityAccmaxZ  
## 10299 -0.9033 0.856 -0.241 0.003031  
## tGravityAccminX tGravityAccminY tGravityAccminZ tGravityAccsma  
## 10299 0.9167 -0.2121 -0.04749 -0.432  
## tGravityAccenergyX tGravityAccenergyY tGravityAccenergyZ  
## 10299 0.7833 -0.9106 -0.9981  
## tGravityAcciqrX tGravityAcciqrY tGravityAcciqrZ tGravityAccentropyX  
## 10299 -0.9641 -0.9705 -0.92 -0.233  
## tGravityAccentropyY tGravityAccentropyZ tGravityAccarCoeffX\_1  
## 10299 -1 -0.944 -0.613  
## tGravityAccarCoeffX\_2 tGravityAccarCoeffX\_3 tGravityAccarCoeffX\_4  
## 10299 0.6525 -0.691 0.7285  
## tGravityAccarCoeffY\_1 tGravityAccarCoeffY\_2 tGravityAccarCoeffY\_3  
## 10299 -0.4997 0.4817 -0.4963  
## tGravityAccarCoeffY\_4 tGravityAccarCoeffZ\_1 tGravityAccarCoeffZ\_2  
## 10299 0.524 -0.842 0.8615  
## tGravityAccarCoeffZ\_3 tGravityAccarCoeffZ\_4  
## 10299 -0.8805 0.8956  
## tGravityAcccorrelationX\_Y tGravityAcccorrelationX\_Z  
## 10299 0.2528 -0.1231  
## tGravityAcccorrelationY\_Z tBodyAccJerkmeanX tBodyAccJerkmeanY  
## 10299 0.2952 0.07505 0.0114  
## tBodyAccJerkmeanZ tBodyAccJerkstdX tBodyAccJerkstdY tBodyAccJerkstdZ  
## 10299 -0.2857 -0.3205 -0.4694 -0.7127  
## tBodyAccJerkmadX tBodyAccJerkmadY tBodyAccJerkmadZ tBodyAccJerkmaxX  
## 10299 -0.4135 -0.4477 -0.6804 -0.1284  
## tBodyAccJerkmaxY tBodyAccJerkmaxZ tBodyAccJerkminX tBodyAccJerkminY  
## 10299 -0.5993 -0.7689 0.02911 0.4625  
## tBodyAccJerkminZ tBodyAccJerksma tBodyAccJerkenergyX  
## 10299 0.7275 -0.4845 -0.7665  
## tBodyAccJerkenergyY tBodyAccJerkenergyZ tBodyAccJerkiqrX  
## 10299 -0.8555 -0.955 -0.4606  
## tBodyAccJerkiqrY tBodyAccJerkiqrZ tBodyAccJerkentropyX  
## 10299 -0.539 -0.6152 0.5245  
## tBodyAccJerkentropyY tBodyAccJerkentropyZ tBodyAccJerkarCoeffX\_1  
## 10299 0.5054 0.3223 -0.3937  
## tBodyAccJerkarCoeffX\_2 tBodyAccJerkarCoeffX\_3 tBodyAccJerkarCoeffX\_4  
## 10299 0.2954 -0.04137 -0.003617  
## tBodyAccJerkarCoeffY\_1 tBodyAccJerkarCoeffY\_2 tBodyAccJerkarCoeffY\_3  
## 10299 -0.4721 0.3221 -0.07749  
## tBodyAccJerkarCoeffY\_4 tBodyAccJerkarCoeffZ\_1 tBodyAccJerkarCoeffZ\_2  
## 10299 0.1565 -0.3426 -0.1123  
## tBodyAccJerkarCoeffZ\_3 tBodyAccJerkarCoeffZ\_4  
## 10299 -0.05067 -0.3487  
## tBodyAccJerkcorrelationX\_Y tBodyAccJerkcorrelationX\_Z  
## 10299 -0.4205 -0.1663  
## tBodyAccJerkcorrelationY\_Z tBodyGyromeanX tBodyGyromeanY  
## 10299 0.1664 -0.04181 -0.3225  
## tBodyGyromeanZ tBodyGyrostdX tBodyGyrostdY tBodyGyrostdZ  
## 10299 0.03825 -0.4512 0.02222 -0.2201  
## tBodyGyromadX tBodyGyromadY tBodyGyromadZ tBodyGyromaxX  
## 10299 -0.4828 -0.07368 -0.2361 -0.4136  
## tBodyGyromaxY tBodyGyromaxZ tBodyGyrominX tBodyGyrominY  
## 10299 -0.2211 -0.2623 0.3904 0.4526  
## tBodyGyrominZ tBodyGyrosma tBodyGyroenergyX tBodyGyroenergyY  
## 10299 0.2774 -0.08496 -0.8623 -0.4743  
## tBodyGyroenergyZ tBodyGyroiqrX tBodyGyroiqrY tBodyGyroiqrZ  
## 10299 -0.7172 -0.5153 -0.371 -0.3479  
## tBodyGyroentropyX tBodyGyroentropyY tBodyGyroentropyZ  
## 10299 0.08656 -0.4272 0.3879  
## tBodyGyroarCoeffX\_1 tBodyGyroarCoeffX\_2 tBodyGyroarCoeffX\_3  
## 10299 -0.3117 0.1157 0.2851  
## tBodyGyroarCoeffX\_4 tBodyGyroarCoeffY\_1 tBodyGyroarCoeffY\_2  
## 10299 -0.2462 -0.715 0.6726  
## tBodyGyroarCoeffY\_3 tBodyGyroarCoeffY\_4 tBodyGyroarCoeffZ\_1  
## 10299 -0.6948 0.5627 -0.7209  
## tBodyGyroarCoeffZ\_2 tBodyGyroarCoeffZ\_3 tBodyGyroarCoeffZ\_4  
## 10299 0.6442 -0.497 0.4129  
## tBodyGyrocorrelationX\_Y tBodyGyrocorrelationX\_Z  
## 10299 -0.3479 -0.3251  
## tBodyGyrocorrelationY\_Z tBodyGyroJerkmeanX tBodyGyroJerkmeanY  
## 10299 0.1889 0.263 0.09567  
## tBodyGyroJerkmeanZ tBodyGyroJerkstdX tBodyGyroJerkstdY  
## 10299 -0.2158 -0.6955 -0.6923  
## tBodyGyroJerkstdZ tBodyGyroJerkmadX tBodyGyroJerkmadY  
## 10299 -0.6119 -0.6888 -0.7028  
## tBodyGyroJerkmadZ tBodyGyroJerkmaxX tBodyGyroJerkmaxY  
## 10299 -0.5983 -0.7503 -0.7785  
## tBodyGyroJerkmaxZ tBodyGyroJerkminX tBodyGyroJerkminY  
## 10299 -0.6978 0.8006 0.7808  
## tBodyGyroJerkminZ tBodyGyroJerksma tBodyGyroJerkenergyX  
## 10299 0.6917 -0.6744 -0.9519  
## tBodyGyroJerkenergyY tBodyGyroJerkenergyZ tBodyGyroJerkiqrX  
## 10299 -0.952 -0.9228 -0.6699  
## tBodyGyroJerkiqrY tBodyGyroJerkiqrZ tBodyGyroJerkentropyX  
## 10299 -0.7117 -0.6169 0.6605  
## tBodyGyroJerkentropyY tBodyGyroJerkentropyZ tBodyGyroJerkarCoeffX\_1  
## 10299 0.4499 0.6338 -0.1052  
## tBodyGyroJerkarCoeffX\_2 tBodyGyroJerkarCoeffX\_3  
## 10299 -0.09082 0.2369  
## tBodyGyroJerkarCoeffX\_4 tBodyGyroJerkarCoeffY\_1  
## 10299 0.08944 -0.627  
## tBodyGyroJerkarCoeffY\_2 tBodyGyroJerkarCoeffY\_3  
## 10299 0.4426 -0.1922  
## tBodyGyroJerkarCoeffY\_4 tBodyGyroJerkarCoeffZ\_1  
## 10299 -0.3503 -0.726  
## tBodyGyroJerkarCoeffZ\_2 tBodyGyroJerkarCoeffZ\_3  
## 10299 0.4463 -0.2916  
## tBodyGyroJerkarCoeffZ\_4 tBodyGyroJerkcorrelationX\_Y  
## 10299 -0.07467 0.05288  
## tBodyGyroJerkcorrelationX\_Z tBodyGyroJerkcorrelationY\_Z  
## 10299 -0.2307 -0.226  
## tBodyAccMagmean tBodyAccMagstd tBodyAccMagmad tBodyAccMagmax  
## 10299 -0.04909 -0.2292 -0.3457 -0.05191  
## tBodyAccMagmin tBodyAccMagsma tBodyAccMagenergy tBodyAccMagiqr  
## 10299 -0.6255 -0.04909 -0.5429 -0.5177  
## tBodyAccMagentropy tBodyAccMagarCoeff1 tBodyAccMagarCoeff2  
## 10299 0.7535 -0.3929 0.3898  
## tBodyAccMagarCoeff3 tBodyAccMagarCoeff4 tGravityAccMagmean  
## 10299 -0.5743 0.4996 -0.04909  
## tGravityAccMagstd tGravityAccMagmad tGravityAccMagmax  
## 10299 -0.2292 -0.3457 -0.05191  
## tGravityAccMagmin tGravityAccMagsma tGravityAccMagenergy  
## 10299 -0.6255 -0.04909 -0.5429  
## tGravityAccMagiqr tGravityAccMagentropy tGravityAccMagarCoeff1  
## 10299 -0.5177 0.7535 -0.3929  
## tGravityAccMagarCoeff2 tGravityAccMagarCoeff3 tGravityAccMagarCoeff4  
## 10299 0.3898 -0.5743 0.4996  
## tBodyAccJerkMagmean tBodyAccJerkMagstd tBodyAccJerkMagmad  
## 10299 -0.4758 -0.3133 -0.4376  
## tBodyAccJerkMagmax tBodyAccJerkMagmin tBodyAccJerkMagsma  
## 10299 -0.2761 -0.6516 -0.4758  
## tBodyAccJerkMagenergy tBodyAccJerkMagiqr tBodyAccJerkMagentropy  
## 10299 -0.8256 -0.6018 0.5895  
## tBodyAccJerkMagarCoeff1 tBodyAccJerkMagarCoeff2  
## 10299 -0.448 0.4821  
## tBodyAccJerkMagarCoeff3 tBodyAccJerkMagarCoeff4 tBodyGyroMagmean  
## 10299 -0.4014 0.3781 -0.1004  
## tBodyGyroMagstd tBodyGyroMagmad tBodyGyroMagmax tBodyGyroMagmin  
## 10299 -0.0957 -0.02375 -0.1868 -0.7206  
## tBodyGyroMagsma tBodyGyroMagenergy tBodyGyroMagiqr  
## 10299 -0.1004 -0.5496 -0.1049  
## tBodyGyroMagentropy tBodyGyroMagarCoeff1 tBodyGyroMagarCoeff2  
## 10299 0.4484 -0.7045 0.7368  
## tBodyGyroMagarCoeff3 tBodyGyroMagarCoeff4 tBodyGyroJerkMagmean  
## 10299 -0.7386 0.5414 -0.6716  
## tBodyGyroJerkMagstd tBodyGyroJerkMagmad tBodyGyroJerkMagmax  
## 10299 -0.7199 -0.74 -0.7652  
## tBodyGyroJerkMagmin tBodyGyroJerkMagsma tBodyGyroJerkMagenergy  
## 10299 -0.7048 -0.6716 -0.9479  
## tBodyGyroJerkMagiqr tBodyGyroJerkMagentropy tBodyGyroJerkMagarCoeff1  
## 10299 -0.7864 0.7563 0.03531  
## tBodyGyroJerkMagarCoeff2 tBodyGyroJerkMagarCoeff3  
## 10299 -0.02188 -0.0244  
## tBodyGyroJerkMagarCoeff4 fBodyAccmeanX fBodyAccmeanY fBodyAccmeanZ  
## 10299 -0.1754 -0.2653 -0.2204 -0.2728  
## fBodyAccstdX fBodyAccstdY fBodyAccstdZ fBodyAccmadX fBodyAccmadY  
## 10299 -0.2708 -0.08011 0.2894 -0.1145 -0.08815  
## fBodyAccmadZ fBodyAccmaxX fBodyAccmaxY fBodyAccmaxZ fBodyAccminX  
## 10299 -0.01519 -0.4176 -0.2762 0.4497 -0.9168  
## fBodyAccminY fBodyAccminZ fBodyAccsma fBodyAccenergyX  
## 10299 -0.9718 -0.8364 -0.1426 -0.731  
## fBodyAccenergyY fBodyAccenergyZ fBodyAcciqrX fBodyAcciqrY  
## 10299 -0.5784 -0.2988 -0.2515 -0.4097  
## fBodyAcciqrZ fBodyAccentropyX fBodyAccentropyY fBodyAccentropyZ  
## 10299 -0.7117 0.5889 0.4531 0.2277  
## fBodyAccmaxIndsX fBodyAccmaxIndsY fBodyAccmaxIndsZ fBodyAccmeanFreqX  
## 10299 -0.8065 -0.9333 -0.9231 -0.5661  
## fBodyAccmeanFreqY fBodyAccmeanFreqZ fBodyAccskewnessX  
## 10299 -0.4224 -0.5864 -0.2436  
## fBodyAcckurtosisX fBodyAccskewnessY fBodyAcckurtosisY  
## 10299 -0.633 -0.2469 -0.6064  
## fBodyAccskewnessZ fBodyAcckurtosisZ fBodyAccbandsEnergy1\_8  
## 10299 0.2283 -0.04095 -0.7095  
## fBodyAccbandsEnergy9\_16 fBodyAccbandsEnergy17\_24  
## 10299 -0.8657 -0.7133  
## fBodyAccbandsEnergy25\_32 fBodyAccbandsEnergy33\_40  
## 10299 -0.8296 -0.9129  
## fBodyAccbandsEnergy41\_48 fBodyAccbandsEnergy49\_56  
## 10299 -0.9052 -0.9685  
## fBodyAccbandsEnergy57\_64 fBodyAccbandsEnergy1\_16  
## 10299 -0.999 -0.7285  
## fBodyAccbandsEnergy17\_32 fBodyAccbandsEnergy33\_48  
## 10299 -0.7032 -0.91  
## fBodyAccbandsEnergy49\_64 fBodyAccbandsEnergy1\_24  
## 10299 -0.9787 -0.7274  
## fBodyAccbandsEnergy25\_48 fBodyAccbandsEnergy1\_8.1  
## 10299 -0.8351 -0.4738  
## fBodyAccbandsEnergy9\_16.1 fBodyAccbandsEnergy17\_24.1  
## 10299 -0.9111 -0.9142  
## fBodyAccbandsEnergy25\_32.1 fBodyAccbandsEnergy33\_40.1  
## 10299 -0.9178 -0.9198  
## fBodyAccbandsEnergy41\_48.1 fBodyAccbandsEnergy49\_56.1  
## 10299 -0.9623 -0.9621  
## fBodyAccbandsEnergy57\_64.1 fBodyAccbandsEnergy1\_16.1  
## 10299 -0.9997 -0.5511  
## fBodyAccbandsEnergy17\_32.1 fBodyAccbandsEnergy33\_48.1  
## 10299 -0.8934 -0.927  
## fBodyAccbandsEnergy49\_64.1 fBodyAccbandsEnergy1\_24.1  
## 10299 -0.9767 -0.5746  
## fBodyAccbandsEnergy25\_48.1 fBodyAccbandsEnergy1\_8.2  
## 10299 -0.9165 -0.1068  
## fBodyAccbandsEnergy9\_16.2 fBodyAccbandsEnergy17\_24.2  
## 10299 -0.9397 -0.9743  
## fBodyAccbandsEnergy25\_32.2 fBodyAccbandsEnergy33\_40.2  
## 10299 -0.9792 -0.9934  
## fBodyAccbandsEnergy41\_48.2 fBodyAccbandsEnergy49\_56.2  
## 10299 -0.9451 -0.9053  
## fBodyAccbandsEnergy57\_64.2 fBodyAccbandsEnergy1\_16.2  
## 10299 -0.8637 -0.2665  
## fBodyAccbandsEnergy17\_32.2 fBodyAccbandsEnergy33\_48.2  
## 10299 -0.9761 -0.9804  
## fBodyAccbandsEnergy49\_64.2 fBodyAccbandsEnergy1\_24.2  
## 10299 -0.892 -0.2874  
## fBodyAccbandsEnergy25\_48.2 fBodyAccJerkmeanX fBodyAccJerkmeanY  
## 10299 -0.9795 -0.3568 -0.4827  
## fBodyAccJerkmeanZ fBodyAccJerkstdX fBodyAccJerkstdY fBodyAccJerkstdZ  
## 10299 -0.6849 -0.3425 -0.4912 -0.7386  
## fBodyAccJerkmadX fBodyAccJerkmadY fBodyAccJerkmadZ fBodyAccJerkmaxX  
## 10299 -0.1848 -0.4609 -0.7194 -0.4781  
## fBodyAccJerkmaxY fBodyAccJerkmaxZ fBodyAccJerkminX fBodyAccJerkminY  
## 10299 -0.6406 -0.7719 -0.8064 -0.91  
## fBodyAccJerkminZ fBodyAccJerksma fBodyAccJerkenergyX  
## 10299 -0.9416 -0.4091 -0.7661  
## fBodyAccJerkenergyY fBodyAccJerkenergyZ fBodyAccJerkiqrX  
## 10299 -0.8555 -0.9551 -0.235  
## fBodyAccJerkiqrY fBodyAccJerkiqrZ fBodyAccJerkentropyX  
## 10299 -0.5187 -0.7402 0.5518  
## fBodyAccJerkentropyY fBodyAccJerkentropyZ fBodyAccJerkmaxIndsX  
## 10299 0.3409 0.07531 -0.32  
## fBodyAccJerkmaxIndsY fBodyAccJerkmaxIndsZ fBodyAccJerkmeanFreqX  
## 10299 -0.4 -0.96 -0.3156  
## fBodyAccJerkmeanFreqY fBodyAccJerkmeanFreqZ fBodyAccJerkskewnessX  
## 10299 -0.6338 -0.6638 -0.2761  
## fBodyAccJerkkurtosisX fBodyAccJerkskewnessY fBodyAccJerkkurtosisY  
## 10299 -0.7396 -0.5093 -0.9135  
## fBodyAccJerkskewnessZ fBodyAccJerkkurtosisZ  
## 10299 -0.4381 -0.8037  
## fBodyAccJerkbandsEnergy1\_8 fBodyAccJerkbandsEnergy9\_16  
## 10299 -0.8342 -0.8439  
## fBodyAccJerkbandsEnergy17\_24 fBodyAccJerkbandsEnergy25\_32  
## 10299 -0.7356 -0.8155  
## fBodyAccJerkbandsEnergy33\_40 fBodyAccJerkbandsEnergy41\_48  
## 10299 -0.8999 -0.8638  
## fBodyAccJerkbandsEnergy49\_56 fBodyAccJerkbandsEnergy57\_64  
## 10299 -0.945 -0.9946  
## fBodyAccJerkbandsEnergy1\_16 fBodyAccJerkbandsEnergy17\_32  
## 10299 -0.8258 -0.709  
## fBodyAccJerkbandsEnergy33\_48 fBodyAccJerkbandsEnergy49\_64  
## 10299 -0.8767 -0.9449  
## fBodyAccJerkbandsEnergy1\_24 fBodyAccJerkbandsEnergy25\_48  
## 10299 -0.7591 -0.7809  
## fBodyAccJerkbandsEnergy1\_8.1 fBodyAccJerkbandsEnergy9\_16.1  
## 10299 -0.7008 -0.9059  
## fBodyAccJerkbandsEnergy17\_24.1 fBodyAccJerkbandsEnergy25\_32.1  
## 10299 -0.8975 -0.915  
## fBodyAccJerkbandsEnergy33\_40.1 fBodyAccJerkbandsEnergy41\_48.1  
## 10299 -0.9239 -0.951  
## fBodyAccJerkbandsEnergy49\_56.1 fBodyAccJerkbandsEnergy57\_64.1  
## 10299 -0.9554 -0.998  
## fBodyAccJerkbandsEnergy1\_16.1 fBodyAccJerkbandsEnergy17\_32.1  
## 10299 -0.8442 -0.8852  
## fBodyAccJerkbandsEnergy33\_48.1 fBodyAccJerkbandsEnergy49\_64.1  
## 10299 -0.9172 -0.9607  
## fBodyAccJerkbandsEnergy1\_24.1 fBodyAccJerkbandsEnergy25\_48.1  
## 10299 -0.8416 -0.9147  
## fBodyAccJerkbandsEnergy1\_8.2 fBodyAccJerkbandsEnergy9\_16.2  
## 10299 -0.7726 -0.9496  
## fBodyAccJerkbandsEnergy17\_24.2 fBodyAccJerkbandsEnergy25\_32.2  
## 10299 -0.976 -0.9789  
## fBodyAccJerkbandsEnergy33\_40.2 fBodyAccJerkbandsEnergy41\_48.2  
## 10299 -0.9935 -0.9526  
## fBodyAccJerkbandsEnergy49\_56.2 fBodyAccJerkbandsEnergy57\_64.2  
## 10299 -0.9726 -0.9982  
## fBodyAccJerkbandsEnergy1\_16.2 fBodyAccJerkbandsEnergy17\_32.2  
## 10299 -0.8762 -0.9775  
## fBodyAccJerkbandsEnergy33\_48.2 fBodyAccJerkbandsEnergy49\_64.2  
## 10299 -0.9807 -0.9738  
## fBodyAccJerkbandsEnergy1\_24.2 fBodyAccJerkbandsEnergy25\_48.2  
## 10299 -0.9287 -0.9796  
## fBodyGyromeanX fBodyGyromeanY fBodyGyromeanZ fBodyGyrostdX  
## 10299 -0.3472 -0.2875 -0.3089 -0.4848  
## fBodyGyrostdY fBodyGyrostdZ fBodyGyromadX fBodyGyromadY  
## 10299 0.1664 -0.2643 -0.4257 -0.1202  
## fBodyGyromadZ fBodyGyromaxX fBodyGyromaxY fBodyGyromaxZ  
## 10299 -0.2125 -0.3991 0.07596 -0.458  
## fBodyGyrominX fBodyGyrominY fBodyGyrominZ fBodyGyrosma  
## 10299 -0.8929 -0.6474 -0.8421 -0.2682  
## fBodyGyroenergyX fBodyGyroenergyY fBodyGyroenergyZ fBodyGyroiqrX  
## 10299 -0.8486 -0.4762 -0.6937 -0.7046  
## fBodyGyroiqrY fBodyGyroiqrZ fBodyGyroentropyX fBodyGyroentropyY  
## 10299 -0.63 -0.5991 0.4788 0.4667  
## fBodyGyroentropyZ fBodyGyromaxIndsX fBodyGyromaxIndsY  
## 10299 0.3583 -1 -0.9355  
## fBodyGyromaxIndsZ fBodyGyromeanFreqX fBodyGyromeanFreqY  
## 10299 -0.7931 0.002108 -0.7381  
## fBodyGyromeanFreqZ fBodyGyroskewnessX fBodyGyrokurtosisX  
## 10299 -0.3472 0.1025 -0.2024  
## fBodyGyroskewnessY fBodyGyrokurtosisY fBodyGyroskewnessZ  
## 10299 0.03746 -0.3716 -0.06954  
## fBodyGyrokurtosisZ fBodyGyrobandsEnergy1\_8 fBodyGyrobandsEnergy9\_16  
## 10299 -0.4833 -0.8568 -0.92  
## fBodyGyrobandsEnergy17\_24 fBodyGyrobandsEnergy25\_32  
## 10299 -0.9205 -0.9543  
## fBodyGyrobandsEnergy33\_40 fBodyGyrobandsEnergy41\_48  
## 10299 -0.8698 -0.862  
## fBodyGyrobandsEnergy49\_56 fBodyGyrobandsEnergy57\_64  
## 10299 -0.8137 -0.7902  
## fBodyGyrobandsEnergy1\_16 fBodyGyrobandsEnergy17\_32  
## 10299 -0.8535 -0.9174  
## fBodyGyrobandsEnergy33\_48 fBodyGyrobandsEnergy49\_64  
## 10299 -0.8535 -0.8033  
## fBodyGyrobandsEnergy1\_24 fBodyGyrobandsEnergy25\_48  
## 10299 -0.8517 -0.9247  
## fBodyGyrobandsEnergy1\_8.1 fBodyGyrobandsEnergy9\_16.1  
## 10299 -0.1293 -0.9554  
## fBodyGyrobandsEnergy17\_24.1 fBodyGyrobandsEnergy25\_32.1  
## 10299 -0.9789 -0.9802  
## fBodyGyrobandsEnergy33\_40.1 fBodyGyrobandsEnergy41\_48.1  
## 10299 -0.989 -0.9825  
## fBodyGyrobandsEnergy49\_56.1 fBodyGyrobandsEnergy57\_64.1  
## 10299 -0.9715 -0.976  
## fBodyGyrobandsEnergy1\_16.1 fBodyGyrobandsEnergy17\_32.1  
## 10299 -0.3847 -0.9743  
## fBodyGyrobandsEnergy33\_48.1 fBodyGyrobandsEnergy49\_64.1  
## 10299 -0.9875 -0.9696  
## fBodyGyrobandsEnergy1\_24.1 fBodyGyrobandsEnergy25\_48.1  
## 10299 -0.4187 -0.981  
## fBodyGyrobandsEnergy1\_8.2 fBodyGyrobandsEnergy9\_16.2  
## 10299 -0.7099 -0.9314  
## fBodyGyrobandsEnergy17\_24.2 fBodyGyrobandsEnergy25\_32.2  
## 10299 -0.9538 -0.9757  
## fBodyGyrobandsEnergy33\_40.2 fBodyGyrobandsEnergy41\_48.2  
## 10299 -0.9769 -0.9586  
## fBodyGyrobandsEnergy49\_56.2 fBodyGyrobandsEnergy57\_64.2  
## 10299 -0.937 -0.9371  
## fBodyGyrobandsEnergy1\_16.2 fBodyGyrobandsEnergy17\_32.2  
## 10299 -0.701 -0.9442  
## fBodyGyrobandsEnergy33\_48.2 fBodyGyrobandsEnergy49\_64.2  
## 10299 -0.9719 -0.937  
## fBodyGyrobandsEnergy1\_24.2 fBodyGyrobandsEnergy25\_48.2  
## 10299 -0.6962 -0.9745  
## fBodyAccMagmean fBodyAccMagstd fBodyAccMagmad fBodyAccMagmax  
## 10299 -0.24 -0.3427 -0.1466 -0.62  
## fBodyAccMagmin fBodyAccMagsma fBodyAccMagenergy fBodyAccMagiqr  
## 10299 -0.9286 -0.24 -0.6981 -0.216  
## fBodyAccMagentropy fBodyAccMagmaxInds fBodyAccMagmeanFreq  
## 10299 0.5741 -0.931 -0.215  
## fBodyAccMagskewness fBodyAccMagkurtosis fBodyBodyAccJerkMagmean  
## 10299 -0.5728 -0.8616 -0.338  
## fBodyBodyAccJerkMagstd fBodyBodyAccJerkMagmad fBodyBodyAccJerkMagmax  
## 10299 -0.2872 -0.1911 -0.5499  
## fBodyBodyAccJerkMagmin fBodyBodyAccJerkMagsma  
## 10299 -0.8377 -0.338  
## fBodyBodyAccJerkMagenergy fBodyBodyAccJerkMagiqr  
## 10299 -0.7591 -0.4347  
## fBodyBodyAccJerkMagentropy fBodyBodyAccJerkMagmaxInds  
## 10299 0.2987 -0.9048  
## fBodyBodyAccJerkMagmeanFreq fBodyBodyAccJerkMagskewness  
## 10299 -0.2424 -0.3219  
## fBodyBodyAccJerkMagkurtosis fBodyBodyGyroMagmean fBodyBodyGyroMagstd  
## 10299 -0.7685 -0.3308 -0.106  
## fBodyBodyGyroMagmad fBodyBodyGyroMagmax fBodyBodyGyroMagmin  
## 10299 -0.1065 -0.09054 -0.7792  
## fBodyBodyGyroMagsma fBodyBodyGyroMagenergy fBodyBodyGyroMagiqr  
## 10299 -0.3308 -0.5894 -0.2906  
## fBodyBodyGyroMagentropy fBodyBodyGyroMagmaxInds  
## 10299 0.4365 -0.8462  
## fBodyBodyGyroMagmeanFreq fBodyBodyGyroMagskewness  
## 10299 -0.3891 -0.05758  
## fBodyBodyGyroMagkurtosis fBodyBodyGyroJerkMagmean  
## 10299 -0.388 -0.7156  
## fBodyBodyGyroJerkMagstd fBodyBodyGyroJerkMagmad  
## 10299 -0.7451 -0.6974  
## fBodyBodyGyroJerkMagmax fBodyBodyGyroJerkMagmin  
## 10299 -0.7836 -0.7587  
## fBodyBodyGyroJerkMagsma fBodyBodyGyroJerkMagenergy  
## 10299 -0.7156 -0.96  
## fBodyBodyGyroJerkMagiqr fBodyBodyGyroJerkMagentropy  
## 10299 -0.6772 0.202  
## fBodyBodyGyroJerkMagmaxInds fBodyBodyGyroJerkMagmeanFreq  
## 10299 -0.9048 -0.0584  
## fBodyBodyGyroJerkMagskewness fBodyBodyGyroJerkMagkurtosis  
## 10299 -0.3871 -0.7407  
## angletBodyAccMean\_gravity angletBodyAccJerkMean\_gravityMean  
## 10299 -0.2801 -0.007739  
## angletBodyGyroMean\_gravityMean angletBodyGyroJerkMean\_gravityMean  
## 10299 -0.05609 -0.617  
## angleX\_gravityMean angleY\_gravityMean angleZ\_gravityMean  
## 10299 -0.7833 0.2468 0.03669

# Create new dataframe df by trimming xData to columns to:  
# - 1. subjectid  
# - 2. subjecttype  
# - 3. activity  
# - 4... columns with 'mean' or 'std' in the column name  
data0 <- select(xData,  
 subjectid,  
 activity,   
 contains("mean", ignore.case=TRUE),   
 contains("std", ignore.case=TRUE))  
  
# Confirm new dataframe's column names  
print(names(data0))

## [1] "subjectid"   
## [2] "activity"   
## [3] "tBodyAccmeanX"   
## [4] "tBodyAccmeanY"   
## [5] "tBodyAccmeanZ"   
## [6] "tGravityAccmeanX"   
## [7] "tGravityAccmeanY"   
## [8] "tGravityAccmeanZ"   
## [9] "tBodyAccJerkmeanX"   
## [10] "tBodyAccJerkmeanY"   
## [11] "tBodyAccJerkmeanZ"   
## [12] "tBodyGyromeanX"   
## [13] "tBodyGyromeanY"   
## [14] "tBodyGyromeanZ"   
## [15] "tBodyGyroJerkmeanX"   
## [16] "tBodyGyroJerkmeanY"   
## [17] "tBodyGyroJerkmeanZ"   
## [18] "tBodyAccMagmean"   
## [19] "tGravityAccMagmean"   
## [20] "tBodyAccJerkMagmean"   
## [21] "tBodyGyroMagmean"   
## [22] "tBodyGyroJerkMagmean"   
## [23] "fBodyAccmeanX"   
## [24] "fBodyAccmeanY"   
## [25] "fBodyAccmeanZ"   
## [26] "fBodyAccmeanFreqX"   
## [27] "fBodyAccmeanFreqY"   
## [28] "fBodyAccmeanFreqZ"   
## [29] "fBodyAccJerkmeanX"   
## [30] "fBodyAccJerkmeanY"   
## [31] "fBodyAccJerkmeanZ"   
## [32] "fBodyAccJerkmeanFreqX"   
## [33] "fBodyAccJerkmeanFreqY"   
## [34] "fBodyAccJerkmeanFreqZ"   
## [35] "fBodyGyromeanX"   
## [36] "fBodyGyromeanY"   
## [37] "fBodyGyromeanZ"   
## [38] "fBodyGyromeanFreqX"   
## [39] "fBodyGyromeanFreqY"   
## [40] "fBodyGyromeanFreqZ"   
## [41] "fBodyAccMagmean"   
## [42] "fBodyAccMagmeanFreq"   
## [43] "fBodyBodyAccJerkMagmean"   
## [44] "fBodyBodyAccJerkMagmeanFreq"   
## [45] "fBodyBodyGyroMagmean"   
## [46] "fBodyBodyGyroMagmeanFreq"   
## [47] "fBodyBodyGyroJerkMagmean"   
## [48] "fBodyBodyGyroJerkMagmeanFreq"   
## [49] "angletBodyAccMean\_gravity"   
## [50] "angletBodyAccJerkMean\_gravityMean"   
## [51] "angletBodyGyroMean\_gravityMean"   
## [52] "angletBodyGyroJerkMean\_gravityMean"  
## [53] "angleX\_gravityMean"   
## [54] "angleY\_gravityMean"   
## [55] "angleZ\_gravityMean"   
## [56] "tBodyAccstdX"   
## [57] "tBodyAccstdY"   
## [58] "tBodyAccstdZ"   
## [59] "tGravityAccstdX"   
## [60] "tGravityAccstdY"   
## [61] "tGravityAccstdZ"   
## [62] "tBodyAccJerkstdX"   
## [63] "tBodyAccJerkstdY"   
## [64] "tBodyAccJerkstdZ"   
## [65] "tBodyGyrostdX"   
## [66] "tBodyGyrostdY"   
## [67] "tBodyGyrostdZ"   
## [68] "tBodyGyroJerkstdX"   
## [69] "tBodyGyroJerkstdY"   
## [70] "tBodyGyroJerkstdZ"   
## [71] "tBodyAccMagstd"   
## [72] "tGravityAccMagstd"   
## [73] "tBodyAccJerkMagstd"   
## [74] "tBodyGyroMagstd"   
## [75] "tBodyGyroJerkMagstd"   
## [76] "fBodyAccstdX"   
## [77] "fBodyAccstdY"   
## [78] "fBodyAccstdZ"   
## [79] "fBodyAccJerkstdX"   
## [80] "fBodyAccJerkstdY"   
## [81] "fBodyAccJerkstdZ"   
## [82] "fBodyGyrostdX"   
## [83] "fBodyGyrostdY"   
## [84] "fBodyGyrostdZ"   
## [85] "fBodyAccMagstd"   
## [86] "fBodyBodyAccJerkMagstd"   
## [87] "fBodyBodyGyroMagstd"   
## [88] "fBodyBodyGyroJerkMagstd"

# Confirm the data has not bee changed -  
# I know the 4th variable has "mean" in the column name  
print(identical(xData[,4],data0[,3]))

## [1] TRUE

# Create a small subset of data0 sorted by   
# subject and activity, with only a few measurement  
# columns, then write out so I can check them.  
  
tmpdf = data0 %>%  
 arrange(subjectid, activity) %>%  
 select(subjectid,  
 activity,  
 tBodyAccmeanX,  
 tBodyAccmeanY,  
 tBodyAccmeanZ)  
  
write.xlsx(tmpdf, file="subjectSortedData.xlsx")  
  
# Calculate mean of selected measurement columns in data0  
# grouped by subjectid and activity  
byIdAndActivity <- data0 %>%   
 group\_by(subjectid, activity) %>%  
 summarise\_each(funs(mean))  
  
# Output file of resultant table so I can check  
# the results in Excel against a subset of grouped data0  
# records I have generated earlier, where I had  
# manually calculated the grouped means for  
# a few columns.  
# I want to verify these mean values agree.  
write.xlsx(byIdAndActivity, file="MeansByIdAndActivity.xlsx")  
write.table(byIdAndActivity,  
 file="MeansByIdAndActivity.txt",  
 sep=" ",  
 row.names=FALSE,  
 col.names=TRUE)  
  
# Save current workspace  
print("Saving current workspace in 'run\_analysis.RData'")

## [1] "Saving current workspace in 'run\_analysis.RData'"

save(list = ls(all = TRUE), file = "run\_analysis.RData")