

# Getting and Cleaning Data Course Project

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```
##
## 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
```

## Getting and Cleaning Data Course Project

```
filename <- "Final_Dataset.zip"

### Checking if archive already exists.
if (!file.exists(filename)){
  fileURL <- "https://d396qusza40orc.cloudfront.net/getdata%2Fprojectfiles%2FUCI%20HAR%20Dataset.zip"
  download.file(fileURL, filename, method="curl")
}

### Checking if folder exists
if (!file.exists("UCI HAR Dataset")) {
  unzip(filename)
}
```

## Assigning all the data frames

```
features <- read.table("UCI HAR Dataset/features.txt", col.names = c("n", "functions"))
activities <- read.table("UCI HAR Dataset/activity_labels.txt", col.names = c("code", "activity"))
subject_test <- read.table("UCI HAR Dataset/test/subject_test.txt", col.names = "subject")
x_test <- read.table("UCI HAR Dataset/test/X_test.txt", col.names = features$functions)
y_test <- read.table("UCI HAR Dataset/test/y_test.txt", col.names = "code")
subject_train <- read.table("UCI HAR Dataset/train/subject_train.txt", col.names = "subject")
x_train <- read.table("UCI HAR Dataset/train/X_train.txt", col.names = features$functions)
y_train <- read.table("UCI HAR Dataset/train/y_train.txt", col.names = "code")
```

**Q1: Merge Training and Test Dataset to create one common dataset**

```
X <- rbind(x_train, x_test)
Y <- rbind(y_train, y_test)
Subject <- rbind(subject_train, subject_test)
Merged_Data <- cbind(Subject, Y, X)
```

**Q2: Extract only the measurements on the mean and standard deviation for each measurement.**

```
TidyData <- Merged_Data %>% select(subject, code, contains("mean"), contains("std"))
```

**Q3: Uses descriptive activity names to name the activities in the data set.**

```
TidyData$code <- activities[TidyData$code, 2]
```

**Q4: Appropriately labels the data set with descriptive variable names.**

```
names(TidyData)[2] = "activity"
names(TidyData)<-gsub("Acc", "Accelerometer", names(TidyData))
names(TidyData)<-gsub("Gyro", "Gyroscope", names(TidyData))
names(TidyData)<-gsub("BodyBody", "Body", names(TidyData))
names(TidyData)<-gsub("Mag", "Magnitude", names(TidyData))
names(TidyData)<-gsub("^t", "Time", names(TidyData))
names(TidyData)<-gsub("^f", "Frequency", names(TidyData))
names(TidyData)<-gsub("tBody", "TimeBody", names(TidyData))
names(TidyData)<-gsub("-mean()", "Mean", names(TidyData), ignore.case = TRUE)
names(TidyData)<-gsub("-std()", "STD", names(TidyData), ignore.case = TRUE)
names(TidyData)<-gsub("-freq()", "Frequency", names(TidyData), ignore.case = TRUE)
names(TidyData)<-gsub("angle", "Angle", names(TidyData))
names(TidyData)<-gsub("gravity", "Gravity", names(TidyData))
```

**Q5: From the data set in Q4, creates a second, independent tidy data set with the average of each variable for each activity and each subject.**

```
FinalData <- TidyData %>%
  group_by(subject, activity) %>%
  summarise_all(funs(mean))
```

```
## Warning: 'funs()' was deprecated in dplyr 0.8.0.
## i Please use a list of either functions or lambdas:
##
## # Simple named list: list(mean = mean, median = median)
```

```
##
## # Auto named with 'tibble::lst()': tibble::lst(mean, median)
##
## # Using lambdas list(~ mean(., trim = .2), ~ median(., na.rm = TRUE))
## Call 'lifecycle::last_lifecycle_warnings()' to see where this warning was
## generated.
```

```
write.table(FinalData, "FinalData.txt", row.name=FALSE)
```

**Q5: From the data set in Q4, creates a second, independent tidy data set with the average of each variable for each activity and each subject.**

```
FinalData <- TidyData %>%
  group_by(subject, activity) %>%
  summarise_all(funs(mean))
```

```
## Warning: 'funs()' was deprecated in dplyr 0.8.0.
## i Please use a list of either functions or lambdas:
##
## # Simple named list: list(mean = mean, median = median)
##
## # Auto named with 'tibble::lst()': tibble::lst(mean, median)
##
## # Using lambdas list(~ mean(., trim = .2), ~ median(., na.rm = TRUE))
## Call 'lifecycle::last_lifecycle_warnings()' to see where this warning was
## generated.
```

```
write.table(FinalData, "FinalData.txt", row.name=FALSE)
```

## Checking final data

```
str(FinalData)
```

```
## gropd_df [180 x 88] (S3: grouped_df/tbl_df/tbl/data.frame)
## $ subject                : int [1:180] 1 1 1 1 1 1 2 2 2 2 ...
## $ activity                : chr [1:180] "LAYING" "SITTING" "STANDING" "WA
## $ TimeBodyAccelerometer.mean...X : num [1:180] 0.222 0.261 0.279 0.277 0.289 ...
## $ TimeBodyAccelerometer.mean...Y : num [1:180] -0.04051 -0.00131 -0.01614 -0.017
## $ TimeBodyAccelerometer.mean...Z : num [1:180] -0.113 -0.105 -0.111 -0.111 -0.10
## $ TimeGravityAccelerometer.mean...X : num [1:180] -0.249 0.832 0.943 0.935 0.932 ..
## $ TimeGravityAccelerometer.mean...Y : num [1:180] 0.706 0.204 -0.273 -0.282 -0.267
## $ TimeGravityAccelerometer.mean...Z : num [1:180] 0.4458 0.332 0.0135 -0.0681 -0.06
## $ TimeBodyAccelerometerJerk.mean...X : num [1:180] 0.0811 0.0775 0.0754 0.074 0.0542
## $ TimeBodyAccelerometerJerk.mean...Y : num [1:180] 0.003838 -0.000619 0.007976 0.028
## $ TimeBodyAccelerometerJerk.mean...Z : num [1:180] 0.01083 -0.00337 -0.00369 -0.0041
## $ TimeBodyGyroscope.mean...X : num [1:180] -0.0166 -0.0454 -0.024 -0.0418 -0
## $ TimeBodyGyroscope.mean...Y : num [1:180] -0.0645 -0.0919 -0.0594 -0.0695 -
## $ TimeBodyGyroscope.mean...Z : num [1:180] 0.1487 0.0629 0.0748 0.0849 0.090
```

```

## $ TimeBodyGyroscopeJerk.mean...X : num [1:180] -0.1073 -0.0937 -0.0996 -0.09 -0.09
## $ TimeBodyGyroscopeJerk.mean...Y : num [1:180] -0.0415 -0.0402 -0.0441 -0.0398 -0.0398
## $ TimeBodyGyroscopeJerk.mean...Z : num [1:180] -0.0741 -0.0467 -0.049 -0.0461 -0.0461
## $ TimeBodyAccelerometerMagnitude.mean.. : num [1:180] -0.8419 -0.9485 -0.9843 -0.137 0.137
## $ TimeGravityAccelerometerMagnitude.mean.. : num [1:180] -0.8419 -0.9485 -0.9843 -0.137 0.137
## $ TimeBodyAccelerometerJerkMagnitude.mean.. : num [1:180] -0.9544 -0.9874 -0.9924 -0.1414 -0.1414
## $ TimeBodyGyroscopeMagnitude.mean.. : num [1:180] -0.8748 -0.9309 -0.9765 -0.161 -0.161
## $ TimeBodyGyroscopeJerkMagnitude.mean.. : num [1:180] -0.963 -0.992 -0.995 -0.299 -0.299
## $ FrequencyBodyAccelerometer.mean...X : num [1:180] -0.9391 -0.9796 -0.9952 -0.2028 0.2028
## $ FrequencyBodyAccelerometer.mean...Y : num [1:180] -0.86707 -0.94408 -0.97707 0.0897 0.0897
## $ FrequencyBodyAccelerometer.mean...Z : num [1:180] -0.883 -0.959 -0.985 -0.332 -0.222
## $ FrequencyBodyAccelerometer.meanFreq...X : num [1:180] -0.1588 -0.0495 0.0865 -0.2075 -0.2075
## $ FrequencyBodyAccelerometer.meanFreq...Y : num [1:180] 0.0975 0.0759 0.1175 0.1131 0.0631
## $ FrequencyBodyAccelerometer.meanFreq...Z : num [1:180] 0.0894 0.2388 0.2449 0.0497 0.2941
## $ FrequencyBodyAccelerometerJerk.mean...X : num [1:180] -0.9571 -0.9866 -0.9946 -0.1705 -0.1705
## $ FrequencyBodyAccelerometerJerk.mean...Y : num [1:180] -0.9225 -0.9816 -0.9854 -0.0352 -0.0352
## $ FrequencyBodyAccelerometerJerk.mean...Z : num [1:180] -0.948 -0.986 -0.991 -0.469 -0.288
## $ FrequencyBodyAccelerometerJerk.meanFreq...X : num [1:180] 0.132 0.257 0.314 -0.209 -0.253
## $ FrequencyBodyAccelerometerJerk.meanFreq...Y : num [1:180] 0.0245 0.0475 0.0392 -0.3862 -0.3862
## $ FrequencyBodyAccelerometerJerk.meanFreq...Z : num [1:180] 0.02439 0.09239 0.13858 -0.18553 0.18553
## $ FrequencyBodyGyroscope.mean...X : num [1:180] -0.85 -0.976 -0.986 -0.339 -0.352
## $ FrequencyBodyGyroscope.mean...Y : num [1:180] -0.9522 -0.9758 -0.989 -0.1031 -0.1031
## $ FrequencyBodyGyroscope.mean...Z : num [1:180] -0.9093 -0.9513 -0.9808 -0.2559 -0.2559
## $ FrequencyBodyGyroscope.meanFreq...X : num [1:180] -0.00355 0.18915 -0.12029 0.01478 0.01478
## $ FrequencyBodyGyroscope.meanFreq...Y : num [1:180] -0.0915 0.0631 -0.0447 -0.0658 0.0658
## $ FrequencyBodyGyroscope.meanFreq...Z : num [1:180] 0.010458 -0.029784 0.100608 0.0007 0.0007
## $ FrequencyBodyAccelerometerMagnitude.mean.. : num [1:180] -0.8618 -0.9478 -0.9854 -0.1286 0.1286
## $ FrequencyBodyAccelerometerMagnitude.meanFreq.. : num [1:180] 0.0864 0.2367 0.2846 0.1906 0.1192
## $ FrequencyBodyAccelerometerJerkMagnitude.mean.. : num [1:180] -0.9333 -0.9853 -0.9925 -0.0571 0.0571
## $ FrequencyBodyAccelerometerJerkMagnitude.meanFreq.. : num [1:180] 0.2664 0.3519 0.4222 0.0938 0.0768
## $ FrequencyBodyGyroscopeMagnitude.mean.. : num [1:180] -0.862 -0.958 -0.985 -0.199 -0.188
## $ FrequencyBodyGyroscopeMagnitude.meanFreq.. : num [1:180] -0.139775 -0.000262 -0.028606 0.28606 0.28606
## $ FrequencyBodyGyroscopeJerkMagnitude.mean.. : num [1:180] -0.942 -0.99 -0.995 -0.319 -0.282
## $ FrequencyBodyGyroscopeJerkMagnitude.meanFreq.. : num [1:180] 0.176 0.185 0.334 0.191 0.19
## $ Angle.TimeBodyAccelerometerMean.Gravity. : num [1:180] 0.021366 0.027442 -0.000222 0.0604 0.0604
## $ Angle.TimeBodyAccelerometerJerkMean..GravityMean. : num [1:180] 0.00306 0.02971 0.02196 -0.00793 0.00793
## $ Angle.TimeBodyGyroscopeMean.GravityMean. : num [1:180] -0.00167 0.0677 -0.03379 0.01306 0.01306
## $ Angle.TimeBodyGyroscopeJerkMean.GravityMean. : num [1:180] 0.0844 -0.0649 -0.0279 -0.0187 -0.0187
## $ Angle.X.GravityMean. : num [1:180] 0.427 -0.591 -0.743 -0.729 -0.744
## $ Angle.Y.GravityMean. : num [1:180] -0.5203 -0.0605 0.2702 0.277 0.267
## $ Angle.Z.GravityMean. : num [1:180] -0.3524 -0.218 0.0123 0.0689 0.0689
## $ TimeBodyAccelerometer.std...X : num [1:180] -0.928 -0.977 -0.996 -0.284 0.03
## $ TimeBodyAccelerometer.std...Y : num [1:180] -0.8368 -0.9226 -0.9732 0.1145 -0.1145
## $ TimeBodyAccelerometer.std...Z : num [1:180] -0.826 -0.94 -0.98 -0.26 -0.23
## $ TimeGravityAccelerometer.std...X : num [1:180] -0.897 -0.968 -0.994 -0.977 -0.953
## $ TimeGravityAccelerometer.std...Y : num [1:180] -0.908 -0.936 -0.981 -0.971 -0.937
## $ TimeGravityAccelerometer.std...Z : num [1:180] -0.852 -0.949 -0.976 -0.948 -0.896
## $ TimeBodyAccelerometerJerk.std...X : num [1:180] -0.9585 -0.9864 -0.9946 -0.1136 -0.1136
## $ TimeBodyAccelerometerJerk.std...Y : num [1:180] -0.924 -0.981 -0.986 0.067 -0.102
## $ TimeBodyAccelerometerJerk.std...Z : num [1:180] -0.955 -0.988 -0.992 -0.503 -0.344
## $ TimeBodyGyroscope.std...X : num [1:180] -0.874 -0.977 -0.987 -0.474 -0.453
## $ TimeBodyGyroscope.std...Y : num [1:180] -0.9511 -0.9665 -0.9877 -0.0546 -0.0546
## $ TimeBodyGyroscope.std...Z : num [1:180] -0.908 -0.941 -0.981 -0.344 -0.123
## $ TimeBodyGyroscopeJerk.std...X : num [1:180] -0.919 -0.992 -0.993 -0.207 -0.487

```

```

## $ TimeBodyGyroscopeJerk.std...Y : num [1:180] -0.968 -0.99 -0.995 -0.304 -0.239
## $ TimeBodyGyroscopeJerk.std...Z : num [1:180] -0.958 -0.988 -0.992 -0.404 -0.26
## $ TimeBodyAccelerometerMagnitude.std.. : num [1:180] -0.7951 -0.9271 -0.9819 -0.2197 0
## $ TimeGravityAccelerometerMagnitude.std.. : num [1:180] -0.7951 -0.9271 -0.9819 -0.2197 0
## $ TimeBodyAccelerometerJerkMagnitude.std.. : num [1:180] -0.9282 -0.9841 -0.9931 -0.0745 -
## $ TimeBodyGyroscopeMagnitude.std.. : num [1:180] -0.819 -0.935 -0.979 -0.187 -0.22
## $ TimeBodyGyroscopeJerkMagnitude.std.. : num [1:180] -0.936 -0.988 -0.995 -0.325 -0.30
## $ FrequencyBodyAccelerometer.std...X : num [1:180] -0.9244 -0.9764 -0.996 -0.3191 0.
## $ FrequencyBodyAccelerometer.std...Y : num [1:180] -0.834 -0.917 -0.972 0.056 -0.113
## $ FrequencyBodyAccelerometer.std...Z : num [1:180] -0.813 -0.934 -0.978 -0.28 -0.298
## $ FrequencyBodyAccelerometerJerk.std...X : num [1:180] -0.9642 -0.9875 -0.9951 -0.1336 -
## $ FrequencyBodyAccelerometerJerk.std...Y : num [1:180] -0.932 -0.983 -0.987 0.107 -0.135
## $ FrequencyBodyAccelerometerJerk.std...Z : num [1:180] -0.961 -0.988 -0.992 -0.535 -0.40
## $ FrequencyBodyGyroscope.std...X : num [1:180] -0.882 -0.978 -0.987 -0.517 -0.49
## $ FrequencyBodyGyroscope.std...Y : num [1:180] -0.9512 -0.9623 -0.9871 -0.0335 -
## $ FrequencyBodyGyroscope.std...Z : num [1:180] -0.917 -0.944 -0.982 -0.437 -0.23
## $ FrequencyBodyAccelerometerMagnitude.std.. : num [1:180] -0.798 -0.928 -0.982 -0.398 -0.18
## $ FrequencyBodyAccelerometerJerkMagnitude.std.. : num [1:180] -0.922 -0.982 -0.993 -0.103 -0.10
## $ FrequencyBodyGyroscopeMagnitude.std.. : num [1:180] -0.824 -0.932 -0.978 -0.321 -0.39
## $ FrequencyBodyGyroscopeJerkMagnitude.std.. : num [1:180] -0.933 -0.987 -0.995 -0.382 -0.39
## - attr(*, "groups")= tibble [30 x 2] (S3: tbl_df/tbl/data.frame)
## ..$ subject: int [1:30] 1 2 3 4 5 6 7 8 9 10 ...
## ..$ .rows : list<int> [1:30]
## .. ..$ : int [1:6] 1 2 3 4 5 6
## .. ..$ : int [1:6] 7 8 9 10 11 12
## .. ..$ : int [1:6] 13 14 15 16 17 18
## .. ..$ : int [1:6] 19 20 21 22 23 24
## .. ..$ : int [1:6] 25 26 27 28 29 30
## .. ..$ : int [1:6] 31 32 33 34 35 36
## .. ..$ : int [1:6] 37 38 39 40 41 42
## .. ..$ : int [1:6] 43 44 45 46 47 48
## .. ..$ : int [1:6] 49 50 51 52 53 54
## .. ..$ : int [1:6] 55 56 57 58 59 60
## .. ..$ : int [1:6] 61 62 63 64 65 66
## .. ..$ : int [1:6] 67 68 69 70 71 72
## .. ..$ : int [1:6] 73 74 75 76 77 78
## .. ..$ : int [1:6] 79 80 81 82 83 84
## .. ..$ : int [1:6] 85 86 87 88 89 90
## .. ..$ : int [1:6] 91 92 93 94 95 96
## .. ..$ : int [1:6] 97 98 99 100 101 102
## .. ..$ : int [1:6] 103 104 105 106 107 108
## .. ..$ : int [1:6] 109 110 111 112 113 114
## .. ..$ : int [1:6] 115 116 117 118 119 120
## .. ..$ : int [1:6] 121 122 123 124 125 126
## .. ..$ : int [1:6] 127 128 129 130 131 132
## .. ..$ : int [1:6] 133 134 135 136 137 138
## .. ..$ : int [1:6] 139 140 141 142 143 144
## .. ..$ : int [1:6] 145 146 147 148 149 150
## .. ..$ : int [1:6] 151 152 153 154 155 156
## .. ..$ : int [1:6] 157 158 159 160 161 162
## .. ..$ : int [1:6] 163 164 165 166 167 168
## .. ..$ : int [1:6] 169 170 171 172 173 174
## .. ..$ : int [1:6] 175 176 177 178 179 180
## .. ..@ ptype: int(0)

```

```
##   ..- attr(*, ".drop")= logi TRUE
```

## Printing final data

FinalData

```
## # A tibble: 180 x 88
## # Groups:   subject [30]
##   subject activity TimeBodyAccelerometer.mea-1 TimeBodyAcceleromete-2
##   <int> <chr>          <dbl>          <dbl>
## 1      1 1 LAYING          0.222          -0.0405
## 2      1 1 SITTING        0.261          -0.00131
## 3      1 1 STANDING        0.279          -0.0161
## 4      1 1 WALKING          0.277          -0.0174
## 5      1 1 WALKING_DOWNSTAIRS 0.289          -0.00992
## 6      1 1 WALKING_UPSTAIRS    0.255          -0.0240
## 7      2 2 LAYING          0.281          -0.0182
## 8      2 2 SITTING        0.277          -0.0157
## 9      2 2 STANDING        0.278          -0.0184
## 10     2 2 WALKING          0.276          -0.0186
## # i 170 more rows
## # i abbreviated names: 1: TimeBodyAccelerometer.mean...X,
## #   2: TimeBodyAccelerometer.mean...Y
## # i 84 more variables: TimeBodyAccelerometer.mean...Z <dbl>,
## #   TimeGravityAccelerometer.mean...X <dbl>,
## #   TimeGravityAccelerometer.mean...Y <dbl>,
## #   TimeGravityAccelerometer.mean...Z <dbl>, ...
```