Getting and Cleaning Data Course Project

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Contents

Load Packages and get the Data

```
packages <- c("data.table", "reshape2")
sapply(packages, require, character.only = TRUE, quietly = TRUE)
```

```
## Warning: package 'reshape2' was built under R version 4.1.2
```

```
##
## Attaching package: 'reshape2'
```

```
## The following objects are masked from 'package:data.table':
##
##     dcast, melt
```

```
## data.table   reshape2
##       TRUE       TRUE
```

```
path <- getwd()
url <- "https://d396qusza40orc.cloudfront.net/getdata%2Fprojectfiles%2FUCI%20HAR%20Dataset.zip"
download.file(url, file.path(path, "dataFiles.zip"))
unzip(zipfile = "dataFiles.zip")
```

Load activity labels + features

```
activityLabels <- fread(file.path(path, "UCI HAR Dataset/activity_labels.txt")
                        , col.names = c("classLabels", "activityName"))
activityLabels
```

```
##    classLabels       activityName
## 1:           1            WALKING
## 2:           2   WALKING_UPSTAIRS
## 3:           3 WALKING_DOWNSTAIRS
## 4:           4            SITTING
## 5:           5           STANDING
## 6:           6             LAYING
```

```
features <- fread(file.path(path, "UCI HAR Dataset/features.txt")
                  , col.names = c("index", "featureNames"))
features
```

```
##      index                        featureNames
##   1:     1                   tBodyAcc-mean()-X
##   2:     2                   tBodyAcc-mean()-Y
##   3:     3                   tBodyAcc-mean()-Z
##   4:     4                    tBodyAcc-std()-X
##   5:     5                    tBodyAcc-std()-Y
##  ---
## 557:   557     angle(tBodyGyroMean,gravityMean)
## 558:   558 angle(tBodyGyroJerkMean,gravityMean)
## 559:   559                 angle(X,gravityMean)
## 560:   560                 angle(Y,gravityMean)
## 561:   561                 angle(Z,gravityMean)
```

```
featuresWanted <- grep("(mean|std)\\(\\)", features[, featureNames])
featuresWanted
```

```
##  [1]   1   2   3   4   5   6  41  42  43  44  45  46  81  82  83  84  85  86 121
## [20] 122 123 124 125 126 161 162 163 164 165 166 201 202 214 215 227 228 240 241
## [39] 253 254 266 267 268 269 270 271 345 346 347 348 349 350 424 425 426 427 428
## [58] 429 503 504 516 517 529 530 542 543
```

```
measurements <- features[featuresWanted, featureNames]
measurements <- gsub('[()]', '', measurements)
measurements
```

```
##  [1] "tBodyAcc-mean-X"          "tBodyAcc-mean-Y"
##  [3] "tBodyAcc-mean-Z"          "tBodyAcc-std-X"
##  [5] "tBodyAcc-std-Y"           "tBodyAcc-std-Z"
##  [7] "tGravityAcc-mean-X"       "tGravityAcc-mean-Y"
##  [9] "tGravityAcc-mean-Z"       "tGravityAcc-std-X"
## [11] "tGravityAcc-std-Y"        "tGravityAcc-std-Z"
## [13] "tBodyAccJerk-mean-X"      "tBodyAccJerk-mean-Y"
```

```
## [15] "tBodyAccJerk-mean-Z"       "tBodyAccJerk-std-X"
## [17] "tBodyAccJerk-std-Y"        "tBodyAccJerk-std-Z"
## [19] "tBodyGyro-mean-X"          "tBodyGyro-mean-Y"
## [21] "tBodyGyro-mean-Z"          "tBodyGyro-std-X"
## [23] "tBodyGyro-std-Y"           "tBodyGyro-std-Z"
## [25] "tBodyGyroJerk-mean-X"      "tBodyGyroJerk-mean-Y"
## [27] "tBodyGyroJerk-mean-Z"      "tBodyGyroJerk-std-X"
## [29] "tBodyGyroJerk-std-Y"       "tBodyGyroJerk-std-Z"
## [31] "tBodyAccMag-mean"          "tBodyAccMag-std"
## [33] "tGravityAccMag-mean"       "tGravityAccMag-std"
## [35] "tBodyAccJerkMag-mean"      "tBodyAccJerkMag-std"
## [37] "tBodyGyroMag-mean"         "tBodyGyroMag-std"
## [39] "tBodyGyroJerkMag-mean"     "tBodyGyroJerkMag-std"
## [41] "fBodyAcc-mean-X"           "fBodyAcc-mean-Y"
## [43] "fBodyAcc-mean-Z"           "fBodyAcc-std-X"
## [45] "fBodyAcc-std-Y"            "fBodyAcc-std-Z"
## [47] "fBodyAccJerk-mean-X"       "fBodyAccJerk-mean-Y"
## [49] "fBodyAccJerk-mean-Z"       "fBodyAccJerk-std-X"
## [51] "fBodyAccJerk-std-Y"        "fBodyAccJerk-std-Z"
## [53] "fBodyGyro-mean-X"          "fBodyGyro-mean-Y"
## [55] "fBodyGyro-mean-Z"          "fBodyGyro-std-X"
## [57] "fBodyGyro-std-Y"           "fBodyGyro-std-Z"
## [59] "fBodyAccMag-mean"          "fBodyAccMag-std"
## [61] "fBodyBodyAccJerkMag-mean"  "fBodyBodyAccJerkMag-std"
## [63] "fBodyBodyGyroMag-mean"     "fBodyBodyGyroMag-std"
## [65] "fBodyBodyGyroJerkMag-mean" "fBodyBodyGyroJerkMag-std"
```

Load train datasets

```
train <- fread(file.path(path, "UCI HAR Dataset/train/X_train.txt"))[, featuresWanted, with = FALSE]
train
```

```
##              V1           V2          V3         V4          V5          V6
##    1: 0.2885845 -0.020294171 -0.13290514 -0.9952786 -0.98311061 -0.91352645
##    2: 0.2784188 -0.016410568 -0.12352019 -0.9982453 -0.97530022 -0.96032199
##    3: 0.2796531 -0.019467156 -0.11346169 -0.9953796 -0.96718701 -0.97894396
##    4: 0.2791739 -0.026200646 -0.12328257 -0.9960915 -0.98340270 -0.99067510
##    5: 0.2766288 -0.016569655 -0.11536185 -0.9981386 -0.98081727 -0.99048163
##   ---
## 7348: 0.2996653 -0.057193414 -0.18123302 -0.1953865  0.03990485  0.07707808
## 7349: 0.2738527 -0.007749326 -0.14746837 -0.2353085  0.00481628  0.05927999
## 7350: 0.2733874 -0.017010616 -0.04502183 -0.2182182 -0.10382198  0.27453270
## 7351: 0.2896542 -0.018843044 -0.15828059 -0.2191394 -0.11141169  0.26889320
## 7352: 0.3515035 -0.012423118 -0.20386717 -0.2692704 -0.08721154  0.17740393
##             V41        V42          V43        V44        V45        V46
##    1: 0.9633961 -0.1408397  0.115374940 -0.9852497 -0.9817084 -0.8776250
##    2: 0.9665611 -0.1415513  0.109378810 -0.9974113 -0.9894474 -0.9316387
##    3: 0.9668781 -0.1420098  0.101883920 -0.9995740 -0.9928658 -0.9929172
##    4: 0.9676152 -0.1439765  0.099850143 -0.9966456 -0.9813928 -0.9784764
##    5: 0.9682244 -0.1487502  0.094485896 -0.9984293 -0.9880982 -0.9787449
##   ---
```

```
## 7348: 0.9231481 -0.2220041 -0.039491660 -0.9444382 -0.8575407 -0.8674138
## 7349: 0.9183433 -0.2420535 -0.039862500 -0.9535979 -0.9291713 -0.8694935
## 7350: 0.9198095 -0.2369499 -0.026805129 -0.9784452 -0.9806060 -0.7641497
## 7351: 0.9223230 -0.2332303 -0.004983703 -0.9741122 -0.9723907 -0.8536165
## 7352: 0.9187067 -0.2332916 -0.020953992 -0.9524154 -0.9678496 -0.8984653
##              V81          V82          V83        V84        V85        V86
##    1:  0.07799634  0.005000803 -0.067830808 -0.9935191 -0.9883600 -0.9935750
##    2:  0.07400671  0.005771104  0.029376633 -0.9955481 -0.9810636 -0.9918457
##    3:  0.07363596  0.003104037 -0.009045631 -0.9907428 -0.9809556 -0.9896866
##    4:  0.07732061  0.020057642 -0.009864772 -0.9926974 -0.9875527 -0.9934976
##    5:  0.07344436  0.019121574  0.016779979 -0.9964202 -0.9883587 -0.9924549
##   ---
## 7348: -0.31922709  0.111397090 -0.169427540 -0.2995271 -0.3564275 -0.6506243
## 7349: -0.42260512  0.357862360  0.051456001 -0.3509320 -0.3862116 -0.6417727
## 7350:  0.09654146 -0.135002530 -0.029136106 -0.3454551 -0.3781767 -0.6430245
## 7351: -0.02584867 -0.025821570 -0.032682186 -0.3871069 -0.4060632 -0.6678806
## 7352:  0.07505177  0.011401085 -0.285681110 -0.3205442 -0.4693679 -0.7126710
##              V121        V122       V123       V124        V125       V126
##    1: -0.006100849 -0.03136479 0.10772540 -0.9853103 -0.97662344 -0.9922053
##    2: -0.016111620 -0.08389378 0.10058429 -0.9831200 -0.98904580 -0.9891212
##    3: -0.031698294 -0.10233542 0.09612688 -0.9762921 -0.99355182 -0.9863787
##    4: -0.043409983 -0.09138618 0.08553770 -0.9913848 -0.99240732 -0.9875542
##    5: -0.033960416 -0.07470803 0.07739203 -0.9851836 -0.99237812 -0.9874019
##   ---
## 7348: -0.035023660 -0.09301128 0.12441230 -0.3973339  0.08487785 -0.1657174
## 7349:  0.118695630 -0.09574625 0.03327696 -0.4784581  0.09824861 -0.1884673
## 7350: -0.213192440  0.03932063 0.19798185 -0.3782516  0.18590206 -0.2699790
## 7351: -0.406204760  0.06879686 0.17746651 -0.5292325  0.19036009 -0.2879251
## 7352: -0.041810187 -0.32250584 0.03825155 -0.4512327  0.02221634 -0.2201066
##              V161        V162        V163       V164       V165       V166
##    1: -0.09916740 -0.05551737 -0.06198580 -0.9921107 -0.9925193 -0.9920553
##    2: -0.11050283 -0.04481873 -0.05924282 -0.9898726 -0.9972926 -0.9938510
##    3: -0.10848567 -0.04241031 -0.05582883 -0.9884618 -0.9956321 -0.9915318
##    4: -0.09116989 -0.03633262 -0.06046466 -0.9911194 -0.9966410 -0.9933289
##    5: -0.09077010 -0.03763253 -0.05828932 -0.9913545 -0.9964730 -0.9945110
##   ---
## 7348:  0.04090584  0.07815953 -0.11083806 -0.5930287 -0.6292927 -0.5840011
## 7349: -0.14406697  0.02744048 -0.14013456 -0.6320755 -0.6293634 -0.6260069
## 7350: -0.23152944 -0.07171316 -0.08098272 -0.6611103 -0.6327624 -0.5980500
## 7351: -0.07991862 -0.05814916 -0.07121785 -0.6576469 -0.6596746 -0.6020059
## 7352:  0.26304757  0.09566641 -0.21579029 -0.6954549 -0.6923486 -0.6119226
##              V201        V202         V214        V215       V227       V228
##    1: -0.959433880 -0.95055150 -0.959433880 -0.95055150 -0.9933059 -0.9943364
##    2: -0.979289150 -0.97605707 -0.979289150 -0.97605707 -0.9912535 -0.9916944
##    3: -0.983703130 -0.98801962 -0.983703130 -0.98801962 -0.9885313 -0.9903969
##    4: -0.986541760 -0.98642135 -0.986541760 -0.98642135 -0.9930780 -0.9933808
##    5: -0.992827150 -0.99127536 -0.992827150 -0.99127536 -0.9934800 -0.9958537
##   ---
## 7348: -0.031718539 -0.09368804 -0.031718539 -0.09368804 -0.4139201 -0.2769031
## 7349: -0.065256168 -0.14853924 -0.065256168 -0.14853924 -0.4340713 -0.3380341
## 7350: -0.003935800 -0.15870137 -0.003935800 -0.15870137 -0.4110720 -0.3780005
## 7351: -0.002445041 -0.18571989 -0.002445041 -0.18571989 -0.4448779 -0.4188038
## 7352: -0.049089815 -0.22915736 -0.049089815 -0.22915736 -0.4757782 -0.3132720
##              V240        V241       V253       V254       V266        V267
```

```
##    1: -0.96895908 -0.96433518 -0.9942478 -0.9913676 -0.9947832 -0.98298410
##    2: -0.98068314 -0.98375419 -0.9951232 -0.9961016 -0.9974507 -0.97685173
##    3: -0.97631707 -0.98605146 -0.9934032 -0.9950910 -0.9935941 -0.97251146
##    4: -0.98205988 -0.98735112 -0.9955022 -0.9952666 -0.9954906 -0.98356972
##    5: -0.98520373 -0.98906257 -0.9958076 -0.9952580 -0.9972859 -0.98230099
##   ---
## 7348: -0.02043340 -0.11389440 -0.5938237 -0.6898059 -0.1313659 -0.08907401
## 7349: -0.02724640 -0.16531358 -0.6061105 -0.7095336 -0.1590770 -0.07905949
## 7350:  0.04288741 -0.04783646 -0.6170732 -0.6944434 -0.3457673 -0.24613490
## 7351:  0.02874038 -0.01231364 -0.6418402 -0.6927134 -0.4003685 -0.30687189
## 7352: -0.10037282 -0.09570471 -0.6716245 -0.7198713 -0.2652620 -0.22038885
##             V268       V269        V270       V271       V345       V346
##    1: -0.9392687 -0.9954217 -0.98313297 -0.9061650 -0.9923325 -0.9871699
##    2: -0.9735227 -0.9986803 -0.97492981 -0.9554381 -0.9950322 -0.9813115
##    3: -0.9833040 -0.9963128 -0.96550593 -0.9770493 -0.9909937 -0.9816423
##    4: -0.9910798 -0.9963121 -0.98324437 -0.9902291 -0.9944466 -0.9887272
##    5: -0.9883694 -0.9986065 -0.98012947 -0.9919150 -0.9962920 -0.9887900
##   ---
## 7348: -0.2567707 -0.2219892  0.03782007  0.1524447 -0.2776079 -0.3403910
## 7349: -0.2750528 -0.2674305 -0.01595056  0.1356481 -0.3526293 -0.3471167
## 7350: -0.2872700 -0.1732116 -0.09185909  0.4185680 -0.3959014 -0.3679453
## 7351: -0.3537963 -0.1581917 -0.07760596  0.4298757 -0.4701400 -0.4583053
## 7352: -0.2728009 -0.2707942 -0.08010541  0.2894096 -0.3567680 -0.4827390
##             V347       V348       V349       V350       V424       V425
##    1: -0.9896961 -0.9958207 -0.9909363 -0.9970517 -0.9865744 -0.9817615
##    2: -0.9897398 -0.9966523 -0.9820839 -0.9926268 -0.9773867 -0.9925300
##    3: -0.9875663 -0.9912488 -0.9814148 -0.9904159 -0.9754332 -0.9937147
##    4: -0.9913542 -0.9913783 -0.9869269 -0.9943908 -0.9871096 -0.9936015
##    5: -0.9906244 -0.9969025 -0.9886067 -0.9929065 -0.9824465 -0.9929838
##   ---
## 7348: -0.6054851 -0.3909422 -0.4247760 -0.6952235 -0.3342158 -0.2033015
## 7349: -0.6041097 -0.4085466 -0.4859153 -0.6778388 -0.4299594 -0.2874398
## 7350: -0.6208069 -0.3505566 -0.4370713 -0.6627493 -0.4341224 -0.3064590
## 7351: -0.6709690 -0.3579492 -0.3878953 -0.6636156 -0.5620693 -0.3752905
## 7352: -0.6849379 -0.3424707 -0.4912107 -0.7385850 -0.3472197 -0.2875120
##             V426       V427       V428       V429        V503       V504
##    1: -0.9895148 -0.9850326 -0.9738861 -0.9940349 -0.95215466 -0.9561340
##    2: -0.9896058 -0.9849043 -0.9871681 -0.9897847 -0.98085662 -0.9758658
##    3: -0.9867557 -0.9766422 -0.9933990 -0.9873282 -0.98779477 -0.9890155
##    4: -0.9871913 -0.9928104 -0.9916460 -0.9886776 -0.98751866 -0.9867420
##    5: -0.9886664 -0.9859818 -0.9919558 -0.9879443 -0.99359085 -0.9900635
##   ---
## 7348: -0.3030927 -0.4201429  0.2221261 -0.2015845 -0.09710645 -0.2325997
## 7349: -0.3096755 -0.4965887  0.2721709 -0.2266229 -0.15816072 -0.2753727
## 7350: -0.3570412 -0.3734644  0.3983264 -0.3102584 -0.29865396 -0.2202881
## 7351: -0.4111765 -0.5275530  0.4241280 -0.3169318 -0.34679483 -0.2345385
## 7352: -0.3088774 -0.4847770  0.1663831 -0.2643296 -0.24003809 -0.3426704
##             V516       V517       V529        V530       V542       V543
##    1: -0.9937257 -0.9937550 -0.9801349 -0.96130944 -0.9919904 -0.9906975
##    2: -0.9903355 -0.9919603 -0.9882956 -0.98332192 -0.9958539 -0.9963995
##    3: -0.9892801 -0.9908667 -0.9892548 -0.98602772 -0.9950305 -0.9951274
##    4: -0.9927689 -0.9916998 -0.9894128 -0.98783575 -0.9952207 -0.9952369
##    5: -0.9955228 -0.9943890 -0.9914330 -0.98905935 -0.9950928 -0.9954648
##   ---
```

```
## 7348: -0.2715138 -0.2875532 -0.3327526 -0.12972709 -0.6810966 -0.7239514
## 7349: -0.3530367 -0.3233721 -0.3579925 -0.18711416 -0.6827557 -0.7711831
## 7350: -0.4249092 -0.3263019 -0.3519481 -0.03229018 -0.6858515 -0.7263718
## 7351: -0.4551831 -0.3780772 -0.4150037  0.03919899 -0.7121307 -0.6894209
## 7352: -0.3379895 -0.2872274 -0.3307803 -0.10600212 -0.7155882 -0.7451204
```

```
data.table::setnames(train, colnames(train), measurements)
trainActivities <- fread(file.path(path, "UCI HAR Dataset/train/Y_train.txt")
                         , col.names = c("Activity"))
trainSubjects <- fread(file.path(path, "UCI HAR Dataset/train/subject_train.txt")
                         , col.names = c("SubjectNum"))
train <- cbind(trainSubjects, trainActivities, train)
train
```

```
##       SubjectNum Activity tBodyAcc-mean-X tBodyAcc-mean-Y tBodyAcc-mean-Z
##    1:          1        5       0.2885845    -0.020294171     -0.13290514
##    2:          1        5       0.2784188    -0.016410568     -0.12352019
##    3:          1        5       0.2796531    -0.019467156     -0.11346169
##    4:          1        5       0.2791739    -0.026200646     -0.12328257
##    5:          1        5       0.2766288    -0.016569655     -0.11536185
##   ---
## 7348:         30        2       0.2996653    -0.057193414     -0.18123302
## 7349:         30        2       0.2738527    -0.007749326     -0.14746837
## 7350:         30        2       0.2733874    -0.017010616     -0.04502183
## 7351:         30        2       0.2896542    -0.018843044     -0.15828059
## 7352:         30        2       0.3515035    -0.012423118     -0.20386717
##       tBodyAcc-std-X tBodyAcc-std-Y tBodyAcc-std-Z tGravityAcc-mean-X
##    1:     -0.9952786    -0.98311061    -0.91352645          0.9633961
##    2:     -0.9982453    -0.97530022    -0.96032199          0.9665611
##    3:     -0.9953796    -0.96718701    -0.97894396          0.9668781
##    4:     -0.9960915    -0.98340270    -0.99067510          0.9676152
##    5:     -0.9981386    -0.98081727    -0.99048163          0.9682244
##   ---
## 7348:     -0.1953865     0.03990485     0.07707808          0.9231481
## 7349:     -0.2353085     0.00481628     0.05927999          0.9183433
## 7350:     -0.2182182    -0.10382198     0.27453270          0.9198095
## 7351:     -0.2191394    -0.11141169     0.26889320          0.9223230
## 7352:     -0.2692704    -0.08721154     0.17740393          0.9187067
##       tGravityAcc-mean-Y tGravityAcc-mean-Z tGravityAcc-std-X tGravityAcc-std-Y
##    1:         -0.1408397        0.115374940        -0.9852497        -0.9817084
##    2:         -0.1415513        0.109378810        -0.9974113        -0.9894474
##    3:         -0.1420098        0.101883920        -0.9995740        -0.9928658
##    4:         -0.1439765        0.099850143        -0.9966456        -0.9813928
##    5:         -0.1487502        0.094485896        -0.9984293        -0.9880982
##   ---
## 7348:         -0.2220041       -0.039491660        -0.9444382        -0.8575407
## 7349:         -0.2420535       -0.039862500        -0.9535979        -0.9291713
## 7350:         -0.2369499       -0.026805129        -0.9784452        -0.9806060
## 7351:         -0.2332303       -0.004983703        -0.9741122        -0.9723907
## 7352:         -0.2332916       -0.020953992        -0.9524154        -0.9678496
##       tGravityAcc-std-Z tBodyAccJerk-mean-X tBodyAccJerk-mean-Y
##    1:        -0.8776250          0.07799634         0.005000803
##    2:        -0.9316387          0.07400671         0.005771104
##    3:        -0.9929172          0.07363596         0.003104037
```

```
##    4:        -0.9784764          0.07732061         0.020057642
##    5:        -0.9787449          0.07344436         0.019121574
##   ---
## 7348:        -0.8674138         -0.31922709         0.111397090
## 7349:        -0.8694935         -0.42260512         0.357862360
## 7350:        -0.7641497          0.09654146        -0.135002530
## 7351:        -0.8536165         -0.02584867        -0.025821570
## 7352:        -0.8984653          0.07505177         0.011401085
##       tBodyAccJerk-mean-Z tBodyAccJerk-std-X tBodyAccJerk-std-Y
##    1:        -0.067830808         -0.9935191         -0.9883600
##    2:         0.029376633         -0.9955481         -0.9810636
##    3:        -0.009045631         -0.9907428         -0.9809556
##    4:        -0.009864772         -0.9926974         -0.9875527
##    5:         0.016779979         -0.9964202         -0.9883587
##   ---
## 7348:        -0.169427540         -0.2995271         -0.3564275
## 7349:         0.051456001         -0.3509320         -0.3862116
## 7350:        -0.029136106         -0.3454551         -0.3781767
## 7351:        -0.032682186         -0.3871069         -0.4060632
## 7352:        -0.285681110         -0.3205442         -0.4693679
##       tBodyAccJerk-std-Z tBodyGyro-mean-X tBodyGyro-mean-Y tBodyGyro-mean-Z
##    1:         -0.9935750     -0.006100849      -0.03136479       0.10772540
##    2:         -0.9918457     -0.016111620      -0.08389378       0.10058429
##    3:         -0.9896866     -0.031698294      -0.10233542       0.09612688
##    4:         -0.9934976     -0.043409983      -0.09138618       0.08553770
##    5:         -0.9924549     -0.033960416      -0.07470803       0.07739203
##   ---
## 7348:         -0.6506243     -0.035023660      -0.09301128       0.12441230
## 7349:         -0.6417727      0.118695630      -0.09574625       0.03327696
## 7350:         -0.6430245     -0.213192440       0.03932063       0.19798185
## 7351:         -0.6678806     -0.406204760       0.06879686       0.17746651
## 7352:         -0.7126710     -0.041810187      -0.32250584       0.03825155
##       tBodyGyro-std-X tBodyGyro-std-Y tBodyGyro-std-Z tBodyGyroJerk-mean-X
##    1:      -0.9853103     -0.97662344      -0.9922053          -0.09916740
##    2:      -0.9831200     -0.98904580      -0.9891212          -0.11050283
##    3:      -0.9762921     -0.99355182      -0.9863787          -0.10848567
##    4:      -0.9913848     -0.99240732      -0.9875542          -0.09116989
##    5:      -0.9851836     -0.99237812      -0.9874019          -0.09077010
##   ---
## 7348:      -0.3973339      0.08487785      -0.1657174           0.04090584
## 7349:      -0.4784581      0.09824861      -0.1884673          -0.14406697
## 7350:      -0.3782516      0.18590206      -0.2699790          -0.23152944
## 7351:      -0.5292325      0.19036009      -0.2879251          -0.07991862
## 7352:      -0.4512327      0.02221634      -0.2201066           0.26304757
##       tBodyGyroJerk-mean-Y tBodyGyroJerk-mean-Z tBodyGyroJerk-std-X
##    1:          -0.05551737          -0.06198580          -0.9921107
##    2:          -0.04481873          -0.05924282          -0.9898726
##    3:          -0.04241031          -0.05582883          -0.9884618
##    4:          -0.03633262          -0.06046466          -0.9911194
##    5:          -0.03763253          -0.05828932          -0.9913545
##   ---
## 7348:           0.07815953          -0.11083806          -0.5930287
## 7349:           0.02744048          -0.14013456          -0.6320755
## 7350:          -0.07171316          -0.08098272          -0.6611103
```

```
## 7351:          -0.05814916          -0.07121785          -0.6576469
## 7352:           0.09566641          -0.21579029          -0.6954549
##       tBodyGyroJerk-std-Y tBodyGyroJerk-std-Z tBodyAccMag-mean tBodyAccMag-std
##    1:          -0.9925193          -0.9920553     -0.959433880     -0.95055150
##    2:          -0.9972926          -0.9938510     -0.979289150     -0.97605707
##    3:          -0.9956321          -0.9915318     -0.983703130     -0.98801962
##    4:          -0.9966410          -0.9933289     -0.986541760     -0.98642135
##    5:          -0.9964730          -0.9945110     -0.992827150     -0.99127536
##   ---
## 7348:          -0.6292927          -0.5840011     -0.031718539     -0.09368804
## 7349:          -0.6293634          -0.6260069     -0.065256168     -0.14853924
## 7350:          -0.6327624          -0.5980500     -0.003935800     -0.15870137
## 7351:          -0.6596746          -0.6020059     -0.002445041     -0.18571989
## 7352:          -0.6923486          -0.6119226     -0.049089815     -0.22915736
##       tGravityAccMag-mean tGravityAccMag-std tBodyAccJerkMag-mean
##    1:        -0.959433880        -0.95055150           -0.9933059
##    2:        -0.979289150        -0.97605707           -0.9912535
##    3:        -0.983703130        -0.98801962           -0.9885313
##    4:        -0.986541760        -0.98642135           -0.9930780
##    5:        -0.992827150        -0.99127536           -0.9934800
##   ---
## 7348:        -0.031718539        -0.09368804           -0.4139201
## 7349:        -0.065256168        -0.14853924           -0.4340713
## 7350:        -0.003935800        -0.15870137           -0.4110720
## 7351:        -0.002445041        -0.18571989           -0.4448779
## 7352:        -0.049089815        -0.22915736           -0.4757782
##       tBodyAccJerkMag-std tBodyGyroMag-mean tBodyGyroMag-std
##    1:          -0.9943364       -0.96895908      -0.96433518
##    2:          -0.9916944       -0.98068314      -0.98375419
##    3:          -0.9903969       -0.97631707      -0.98605146
##    4:          -0.9933808       -0.98205988      -0.98735112
##    5:          -0.9958537       -0.98520373      -0.98906257
##   ---
## 7348:          -0.2769031       -0.02043340      -0.11389440
## 7349:          -0.3380341       -0.02724640      -0.16531358
## 7350:          -0.3780005        0.04288741      -0.04783646
## 7351:          -0.4188038        0.02874038      -0.01231364
## 7352:          -0.3132720       -0.10037282      -0.09570471
##       tBodyGyroJerkMag-mean tBodyGyroJerkMag-std fBodyAcc-mean-X
##    1:            -0.9942478           -0.9913676      -0.9947832
##    2:            -0.9951232           -0.9961016      -0.9974507
##    3:            -0.9934032           -0.9950910      -0.9935941
##    4:            -0.9955022           -0.9952666      -0.9954906
##    5:            -0.9958076           -0.9952580      -0.9972859
##   ---
## 7348:            -0.5938237           -0.6898059      -0.1313659
## 7349:            -0.6061105           -0.7095336      -0.1590770
## 7350:            -0.6170732           -0.6944434      -0.3457673
## 7351:            -0.6418402           -0.6927134      -0.4003685
## 7352:            -0.6716245           -0.7198713      -0.2652620
##       fBodyAcc-mean-Y fBodyAcc-mean-Z fBodyAcc-std-X fBodyAcc-std-Y
##    1:     -0.98298410      -0.9392687     -0.9954217    -0.98313297
##    2:     -0.97685173      -0.9735227     -0.9986803    -0.97492981
##    3:     -0.97251146      -0.9833040     -0.9963128    -0.96550593
```

```
##    4:     -0.98356972      -0.9910798     -0.9963121    -0.98324437
##    5:     -0.98230099      -0.9883694     -0.9986065    -0.98012947
##   ---
## 7348:     -0.08907401      -0.2567707     -0.2219892     0.03782007
## 7349:     -0.07905949      -0.2750528     -0.2674305    -0.01595056
## 7350:     -0.24613490      -0.2872700     -0.1732116    -0.09185909
## 7351:     -0.30687189      -0.3537963     -0.1581917    -0.07760596
## 7352:     -0.22038885      -0.2728009     -0.2707942    -0.08010541
##       fBodyAcc-std-Z fBodyAccJerk-mean-X fBodyAccJerk-mean-Y
##    1:     -0.9061650          -0.9923325          -0.9871699
##    2:     -0.9554381          -0.9950322          -0.9813115
##    3:     -0.9770493          -0.9909937          -0.9816423
##    4:     -0.9902291          -0.9944466          -0.9887272
##    5:     -0.9919150          -0.9962920          -0.9887900
##   ---
## 7348:      0.1524447          -0.2776079          -0.3403910
## 7349:      0.1356481          -0.3526293          -0.3471167
## 7350:      0.4185680          -0.3959014          -0.3679453
## 7351:      0.4298757          -0.4701400          -0.4583053
## 7352:      0.2894096          -0.3567680          -0.4827390
##       fBodyAccJerk-mean-Z fBodyAccJerk-std-X fBodyAccJerk-std-Y
##    1:          -0.9896961         -0.9958207         -0.9909363
##    2:          -0.9897398         -0.9966523         -0.9820839
##    3:          -0.9875663         -0.9912488         -0.9814148
##    4:          -0.9913542         -0.9913783         -0.9869269
##    5:          -0.9906244         -0.9969025         -0.9886067
##   ---
## 7348:          -0.6054851         -0.3909422         -0.4247760
## 7349:          -0.6041097         -0.4085466         -0.4859153
## 7350:          -0.6208069         -0.3505566         -0.4370713
## 7351:          -0.6709690         -0.3579492         -0.3878953
## 7352:          -0.6849379         -0.3424707         -0.4912107
##       fBodyAccJerk-std-Z fBodyGyro-mean-X fBodyGyro-mean-Y fBodyGyro-mean-Z
##    1:         -0.9970517       -0.9865744       -0.9817615       -0.9895148
##    2:         -0.9926268       -0.9773867       -0.9925300       -0.9896058
##    3:         -0.9904159       -0.9754332       -0.9937147       -0.9867557
##    4:         -0.9943908       -0.9871096       -0.9936015       -0.9871913
##    5:         -0.9929065       -0.9824465       -0.9929838       -0.9886664
##   ---
## 7348:         -0.6952235       -0.3342158       -0.2033015       -0.3030927
## 7349:         -0.6778388       -0.4299594       -0.2874398       -0.3096755
## 7350:         -0.6627493       -0.4341224       -0.3064590       -0.3570412
## 7351:         -0.6636156       -0.5620693       -0.3752905       -0.4111765
## 7352:         -0.7385850       -0.3472197       -0.2875120       -0.3088774
##       fBodyGyro-std-X fBodyGyro-std-Y fBodyGyro-std-Z fBodyAccMag-mean
##    1:      -0.9850326      -0.9738861      -0.9940349      -0.95215466
##    2:      -0.9849043      -0.9871681      -0.9897847      -0.98085662
##    3:      -0.9766422      -0.9933990      -0.9873282      -0.98779477
##    4:      -0.9928104      -0.9916460      -0.9886776      -0.98751866
##    5:      -0.9859818      -0.9919558      -0.9879443      -0.99359085
##   ---
## 7348:      -0.4201429       0.2221261      -0.2015845      -0.09710645
## 7349:      -0.4965887       0.2721709      -0.2266229      -0.15816072
## 7350:      -0.3734644       0.3983264      -0.3102584      -0.29865396
```

```
## 7351:      -0.5275530       0.4241280      -0.3169318      -0.34679483
## 7352:      -0.4847770       0.1663831      -0.2643296      -0.24003809
##       fBodyAccMag-std fBodyBodyAccJerkMag-mean fBodyBodyAccJerkMag-std
##    1:      -0.9561340               -0.9937257              -0.9937550
##    2:      -0.9758658               -0.9903355              -0.9919603
##    3:      -0.9890155               -0.9892801              -0.9908667
##    4:      -0.9867420               -0.9927689              -0.9916998
##    5:      -0.9900635               -0.9955228              -0.9943890
##   ---
## 7348:      -0.2325997               -0.2715138              -0.2875532
## 7349:      -0.2753727               -0.3530367              -0.3233721
## 7350:      -0.2202881               -0.4249092              -0.3263019
## 7351:      -0.2345385               -0.4551831              -0.3780772
## 7352:      -0.3426704               -0.3379895              -0.2872274
##       fBodyBodyGyroMag-mean fBodyBodyGyroMag-std fBodyBodyGyroJerkMag-mean
##    1:            -0.9801349          -0.96130944                -0.9919904
##    2:            -0.9882956          -0.98332192                -0.9958539
##    3:            -0.9892548          -0.98602772                -0.9950305
##    4:            -0.9894128          -0.98783575                -0.9952207
##    5:            -0.9914330          -0.98905935                -0.9950928
##   ---
## 7348:            -0.3327526          -0.12972709                -0.6810966
## 7349:            -0.3579925          -0.18711416                -0.6827557
## 7350:            -0.3519481          -0.03229018                -0.6858515
## 7351:            -0.4150037           0.03919899                -0.7121307
## 7352:            -0.3307803          -0.10600212                -0.7155882
##       fBodyBodyGyroJerkMag-std
##    1:               -0.9906975
##    2:               -0.9963995
##    3:               -0.9951274
##    4:               -0.9952369
##    5:               -0.9954648
##   ---
## 7348:               -0.7239514
## 7349:               -0.7711831
## 7350:               -0.7263718
## 7351:               -0.6894209
## 7352:               -0.7451204
```

Load test datasets

```
test <- fread(file.path(path, "UCI HAR Dataset/test/X_test.txt"))[, featuresWanted, with = FALSE]
test
```

```
##              V1          V2          V3         V4          V5         V6
##    1: 0.2571778 -0.02328523 -0.01465376 -0.9384040 -0.92009078 -0.6676833
##    2: 0.2860267 -0.01316336 -0.11908252 -0.9754147 -0.96745790 -0.9449582
##    3: 0.2754848 -0.02605042 -0.11815167 -0.9938190 -0.96992551 -0.9627480
##    4: 0.2702982 -0.03261387 -0.11752018 -0.9947428 -0.97326761 -0.9670907
##    5: 0.2748330 -0.02784779 -0.12952716 -0.9938525 -0.96744548 -0.9782950
##   ---
```

```
## 2943: 0.3101546 -0.05339125 -0.09910872 -0.2878663 -0.14058918 -0.2150877
## 2944: 0.3633846 -0.03921402 -0.10591509 -0.3053880  0.02814774 -0.1963729
## 2945: 0.3499661  0.03007744 -0.11578796 -0.3296381 -0.04214289 -0.2501807
## 2946: 0.2375938  0.01846687 -0.09649893 -0.3231143 -0.22977539 -0.2075736
## 2947: 0.1536272 -0.01843651 -0.13701846 -0.3300460 -0.19525335 -0.1643388
##             V41        V42        V43        V44        V45        V46
##    1: 0.9364893 -0.2827192  0.1152882 -0.9254273 -0.9370141 -0.5642884
##    2: 0.9274036 -0.2892151  0.1525683 -0.9890571 -0.9838872 -0.9647811
##    3: 0.9299150 -0.2875128  0.1460856 -0.9959365 -0.9882505 -0.9815796
##    4: 0.9288814 -0.2933958  0.1429259 -0.9931392 -0.9704192 -0.9915917
##    5: 0.9265997 -0.3029609  0.1383067 -0.9955746 -0.9709604 -0.9680853
##   ---
## 2943: 0.8909677 -0.2767180 -0.2315935 -0.9807982 -0.9203893 -0.9494664
## 2944: 0.8912809 -0.2749762 -0.2280502 -0.9817830 -0.9295222 -0.9346775
## 2945: 0.8908972 -0.2761645 -0.2262558 -0.9828841 -0.9333010 -0.9400140
## 2946: 0.8927357 -0.2623564 -0.2351080 -0.9859829 -0.9621989 -0.9489939
## 2947: 0.8943309 -0.2614073 -0.2361121 -0.9847364 -0.9645770 -0.9623691
##              V81          V82          V83        V84        V85        V86
##    1:  0.07204601  0.045754401 -0.106042660 -0.9066828 -0.9380164 -0.9359358
##    2:  0.07018069 -0.017876016 -0.001720629 -0.9492040 -0.9726989 -0.9777267
##    3:  0.06936778 -0.004908146 -0.013672983 -0.9910699 -0.9714041 -0.9728674
##    4:  0.07485289  0.032274322  0.012141275 -0.9908016 -0.9728957 -0.9759253
##    5:  0.07837679  0.022276764  0.002748499 -0.9920724 -0.9786700 -0.9866120
##   ---
## 2943: -0.08800546 -0.231491610  0.036014732 -0.4167254 -0.5212051 -0.5431463
## 2944:  0.14876453 -0.344464440 -0.131282100 -0.3620992 -0.4023177 -0.5291683
## 2945:  0.04632680 -0.174973600  0.200841960 -0.3893490 -0.4320439 -0.5453444
## 2946:  0.33455894 -0.059122249  0.020024236 -0.4418078 -0.5788833 -0.4903575
## 2947:  0.22380428  0.256686870  0.012817095 -0.4790768 -0.5687591 -0.4170744
##              V121        V122       V123       V124       V125       V126
##    1:  0.119976160 -0.09179234 0.18962854 -0.8830891 -0.8161636 -0.9408812
##    2: -0.001552463 -0.18729119 0.18070522 -0.9255665 -0.9295992 -0.9675810
##    3: -0.048212671 -0.16627974 0.15417437 -0.9729882 -0.9785106 -0.9756483
##    4: -0.056641577 -0.12601846 0.11833718 -0.9677905 -0.9751338 -0.9632327
##    5: -0.059992128 -0.08472343 0.07865926 -0.9746560 -0.9779511 -0.9676287
##   ---
## 2943: -0.142472810  0.02544275 0.20286208 -0.5627386 -0.5268550 -0.2567564
## 2944:  0.062107316 -0.04315641 0.11359406 -0.4640369 -0.5181490 -0.1396287
## 2945: -0.123715000  0.08631957 0.26142304 -0.4219774 -0.5570594 -0.1975039
## 2946: -0.335912030  0.09934677 0.35505812 -0.6678579 -0.5551660 -0.3426199
## 2947: -0.208229480 -0.03865400 0.24610106 -0.6166534 -0.5085570 -0.3138543
##              V161         V162         V163       V164       V165       V166
##    1: -0.20489621 -0.174487710 -0.093389340 -0.9012242 -0.9108601 -0.9392504
##    2: -0.13866849 -0.025802071 -0.071418405 -0.9623042 -0.9562894 -0.9813408
##    3: -0.09780967 -0.034213274 -0.060028399 -0.9841669 -0.9879399 -0.9761876
##    4: -0.10223178 -0.044713461 -0.053436499 -0.9841709 -0.9895542 -0.9807240
##    5: -0.09184994 -0.029005022 -0.061235354 -0.9884738 -0.9918773 -0.9819836
##   ---
## 2943:  0.13828793 -0.005041591 -0.279400710 -0.6646345 -0.6049332 -0.6670702
## 2944: -0.20074200  0.069037389 -0.259789700 -0.5984058 -0.5946965 -0.6417382
## 2945: -0.36210021 -0.303347310  0.172746460 -0.6124836 -0.6281620 -0.6161555
## 2946: -0.05582278 -0.103685680  0.314818590 -0.7150106 -0.6623249 -0.7009483
## 2947: -0.02814551  0.173651560  0.001372617 -0.6857578 -0.6194253 -0.6872994
##             V201       V202       V214       V215       V227       V228
```

```
##    1: -0.8669294 -0.7051911 -0.8669294 -0.7051911 -0.9297665 -0.8959942
##    2: -0.9689614 -0.9539024 -0.9689614 -0.9539024 -0.9737168 -0.9410078
##    3: -0.9762282 -0.9790834 -0.9762282 -0.9790834 -0.9816177 -0.9713710
##    4: -0.9743245 -0.9770159 -0.9743245 -0.9770159 -0.9827121 -0.9748075
##    5: -0.9758356 -0.9768934 -0.9758356 -0.9768934 -0.9869079 -0.9888539
##   ---
## 2943: -0.2008855 -0.2343877 -0.2008855 -0.2343877 -0.4559232 -0.4126706
## 2944: -0.1705631 -0.1986268 -0.1705631 -0.1986268 -0.4257498 -0.2880653
## 2945: -0.2076032 -0.2523881 -0.2076032 -0.2523881 -0.4632321 -0.2923697
## 2946: -0.2338657 -0.2927046 -0.2338657 -0.2927046 -0.4864946 -0.3621037
## 2947: -0.2243090 -0.2624866 -0.2243090 -0.2624866 -0.4624043 -0.3710656
##            V240       V241       V253       V254       V266        V267
##    1: -0.7955439 -0.7620732 -0.9251949 -0.8943436 -0.9185097 -0.91821319
##    2: -0.8984331 -0.9108583 -0.9733934 -0.9440900 -0.9609030 -0.96443332
##    3: -0.9391936 -0.9717763 -0.9867480 -0.9844015 -0.9919063 -0.96503362
##    4: -0.9471844 -0.9703682 -0.9888204 -0.9855681 -0.9930298 -0.96828390
##    5: -0.9574192 -0.9694995 -0.9900621 -0.9904189 -0.9924042 -0.96920715
##   ---
## 2943: -0.3937639 -0.4789186 -0.6494828 -0.5967016 -0.3355388 -0.23387059
## 2944: -0.3031531 -0.4765808 -0.6322312 -0.5643632 -0.2504241 -0.06012332
## 2945: -0.2886459 -0.5303024 -0.6497476 -0.5915989 -0.3626403 -0.18680220
## 2946: -0.3789522 -0.5472317 -0.6966865 -0.6583167 -0.3783654 -0.40006993
## 2947: -0.4085228 -0.4939524 -0.6682140 -0.6083416 -0.4012226 -0.31841507
##            V268       V269         V270       V271       V345       V346
##    1: -0.7890915 -0.9482903 -0.925136870 -0.6363167 -0.8996332 -0.9374850
##    2: -0.9566748 -0.9843500 -0.970174760 -0.9418619 -0.9435190 -0.9691623
##    3: -0.9668996 -0.9947537 -0.973695850 -0.9622866 -0.9910295 -0.9733689
##    4: -0.9669116 -0.9955936 -0.976917560 -0.9689579 -0.9905362 -0.9724525
##    5: -0.9796527 -0.9945037 -0.967468110 -0.9782399 -0.9914800 -0.9798346
##   ---
## 2943: -0.3286207 -0.2698271 -0.148105510 -0.2157249 -0.4508228 -0.5439906
## 2944: -0.2756377 -0.3282253  0.008056758 -0.2160092 -0.3177561 -0.4116971
## 2945: -0.2711378 -0.3169726 -0.032618899 -0.2982284 -0.3899408 -0.4348765
## 2946: -0.2823201 -0.3024231 -0.199957890 -0.2287489 -0.4261218 -0.5838392
## 2947: -0.2221230 -0.3038541 -0.186334520 -0.1982265 -0.5238330 -0.5971720
##            V347       V348       V349       V350       V424       V425
##    1: -0.9235514 -0.9244291 -0.9432104 -0.9478915 -0.8235579 -0.8079160
##    2: -0.9734489 -0.9616312 -0.9800263 -0.9807873 -0.9225130 -0.9264957
##    3: -0.9717030 -0.9919122 -0.9709857 -0.9723222 -0.9728456 -0.9808333
##    4: -0.9703374 -0.9919600 -0.9754341 -0.9806211 -0.9715016 -0.9813450
##    5: -0.9834930 -0.9935709 -0.9786966 -0.9885033 -0.9764045 -0.9804043
##   ---
## 2943: -0.4988520 -0.4323739 -0.5280954 -0.5854999 -0.4763887 -0.5218199
## 2944: -0.4947402 -0.4780054 -0.4339487 -0.5609813 -0.4319631 -0.4920759
## 2945: -0.4448655 -0.4448027 -0.4698176 -0.6572389 -0.2914094 -0.5179180
## 2946: -0.4391983 -0.5122416 -0.6030957 -0.5396678 -0.6278853 -0.5434641
## 2947: -0.3568914 -0.4784920 -0.5659273 -0.4752730 -0.5689044 -0.5114901
##            V426       V427       V428       V429       V503       V504
##    1: -0.9179126 -0.9032627 -0.8226770 -0.9561651 -0.7909464 -0.7110740
##    2: -0.9682295 -0.9270506 -0.9320107 -0.9701434 -0.9541266 -0.9597458
##    3: -0.9720602 -0.9731979 -0.9771945 -0.9790953 -0.9756497 -0.9837843
##    4: -0.9667055 -0.9671856 -0.9719094 -0.9652755 -0.9733931 -0.9821196
##    5: -0.9687820 -0.9743979 -0.9765654 -0.9700165 -0.9777390 -0.9788381
##   ---
```

```
## 2943: -0.3426978 -0.5904839 -0.5333008 -0.2985052 -0.2731909 -0.3321409
## 2944: -0.3281087 -0.4781497 -0.5383805 -0.1648946 -0.2094867 -0.3169538
## 2945: -0.3063887 -0.4635660 -0.5861540 -0.2381669 -0.2366061 -0.3772403
## 2946: -0.3680427 -0.6817483 -0.5656499 -0.3944327 -0.3147630 -0.3902011
## 2947: -0.4532693 -0.6331353 -0.5101592 -0.3365837 -0.2884126 -0.3625984
##             V516       V517       V529       V530       V542       V543
##    1: -0.8950612 -0.8963596 -0.7706100 -0.7971128 -0.8901655 -0.9073076
##    2: -0.9454372 -0.9341520 -0.9244608 -0.9167741 -0.9519774 -0.9382124
##    3: -0.9710690 -0.9703078 -0.9752095 -0.9739984 -0.9856888 -0.9832727
##    4: -0.9716545 -0.9784844 -0.9762973 -0.9712482 -0.9855619 -0.9858429
##    5: -0.9874888 -0.9897160 -0.9770070 -0.9696193 -0.9904980 -0.9905719
##   ---
## 2943: -0.4221715 -0.4034507 -0.4778440 -0.5712343 -0.6014236 -0.6188288
## 2944: -0.2652178 -0.3222741 -0.4918547 -0.5565773 -0.5663438 -0.5925070
## 2945: -0.2474406 -0.3589800 -0.6012827 -0.5633274 -0.5923314 -0.6179484
## 2946: -0.3486653 -0.3832820 -0.6385545 -0.5659171 -0.6797106 -0.6549599
## 2947: -0.3651578 -0.3823873 -0.5186400 -0.5639466 -0.6159911 -0.6252073
```

```
data.table::setnames(test, colnames(test), measurements)
testActivities <- fread(file.path(path, "UCI HAR Dataset/test/Y_test.txt")
                        , col.names = c("Activity"))
testSubjects <- fread(file.path(path, "UCI HAR Dataset/test/subject_test.txt")
                      , col.names = c("SubjectNum"))
test <- cbind(testSubjects, testActivities, test)
test
```

```
##       SubjectNum Activity tBodyAcc-mean-X tBodyAcc-mean-Y tBodyAcc-mean-Z
##    1:          2        5       0.2571778     -0.02328523     -0.01465376
##    2:          2        5       0.2860267     -0.01316336     -0.11908252
##    3:          2        5       0.2754848     -0.02605042     -0.11815167
##    4:          2        5       0.2702982     -0.03261387     -0.11752018
##    5:          2        5       0.2748330     -0.02784779     -0.12952716
##   ---
## 2943:         24        2       0.3101546     -0.05339125     -0.09910872
## 2944:         24        2       0.3633846     -0.03921402     -0.10591509
## 2945:         24        2       0.3499661      0.03007744     -0.11578796
## 2946:         24        2       0.2375938      0.01846687     -0.09649893
## 2947:         24        2       0.1536272     -0.01843651     -0.13701846
##       tBodyAcc-std-X tBodyAcc-std-Y tBodyAcc-std-Z tGravityAcc-mean-X
##    1:     -0.9384040    -0.92009078     -0.6676833          0.9364893
##    2:     -0.9754147    -0.96745790     -0.9449582          0.9274036
##    3:     -0.9938190    -0.96992551     -0.9627480          0.9299150
##    4:     -0.9947428    -0.97326761     -0.9670907          0.9288814
##    5:     -0.9938525    -0.96744548     -0.9782950          0.9265997
##   ---
## 2943:     -0.2878663    -0.14058918     -0.2150877          0.8909677
## 2944:     -0.3053880     0.02814774     -0.1963729          0.8912809
## 2945:     -0.3296381    -0.04214289     -0.2501807          0.8908972
## 2946:     -0.3231143    -0.22977539     -0.2075736          0.8927357
## 2947:     -0.3300460    -0.19525335     -0.1643388          0.8943309
##       tGravityAcc-mean-Y tGravityAcc-mean-Z tGravityAcc-std-X tGravityAcc-std-Y
##    1:         -0.2827192          0.1152882        -0.9254273        -0.9370141
##    2:         -0.2892151          0.1525683        -0.9890571        -0.9838872
##    3:         -0.2875128          0.1460856        -0.9959365        -0.9882505
```

```
##    4:         -0.2933958          0.1429259        -0.9931392        -0.9704192
##    5:         -0.3029609          0.1383067        -0.9955746        -0.9709604
##   ---
## 2943:         -0.2767180         -0.2315935        -0.9807982        -0.9203893
## 2944:         -0.2749762         -0.2280502        -0.9817830        -0.9295222
## 2945:         -0.2761645         -0.2262558        -0.9828841        -0.9333010
## 2946:         -0.2623564         -0.2351080        -0.9859829        -0.9621989
## 2947:         -0.2614073         -0.2361121        -0.9847364        -0.9645770
##       tGravityAcc-std-Z tBodyAccJerk-mean-X tBodyAccJerk-mean-Y
##    1:        -0.5642884          0.07204601         0.045754401
##    2:        -0.9647811          0.07018069        -0.017876016
##    3:        -0.9815796          0.06936778        -0.004908146
##    4:        -0.9915917          0.07485289         0.032274322
##    5:        -0.9680853          0.07837679         0.022276764
##   ---
## 2943:        -0.9494664         -0.08800546        -0.231491610
## 2944:        -0.9346775          0.14876453        -0.344464440
## 2945:        -0.9400140          0.04632680        -0.174973600
## 2946:        -0.9489939          0.33455894        -0.059122249
## 2947:        -0.9623691          0.22380428         0.256686870
##       tBodyAccJerk-mean-Z tBodyAccJerk-std-X tBodyAccJerk-std-Y
##    1:        -0.106042660         -0.9066828         -0.9380164
##    2:        -0.001720629         -0.9492040         -0.9726989
##    3:        -0.013672983         -0.9910699         -0.9714041
##    4:         0.012141275         -0.9908016         -0.9728957
##    5:         0.002748499         -0.9920724         -0.9786700
##   ---
## 2943:         0.036014732         -0.4167254         -0.5212051
## 2944:        -0.131282100         -0.3620992         -0.4023177
## 2945:         0.200841960         -0.3893490         -0.4320439
## 2946:         0.020024236         -0.4418078         -0.5788833
## 2947:         0.012817095         -0.4790768         -0.5687591
##       tBodyAccJerk-std-Z tBodyGyro-mean-X tBodyGyro-mean-Y tBodyGyro-mean-Z
##    1:         -0.9359358      0.119976160      -0.09179234       0.18962854
##    2:         -0.9777267     -0.001552463      -0.18729119       0.18070522
##    3:         -0.9728674     -0.048212671      -0.16627974       0.15417437
##    4:         -0.9759253     -0.056641577      -0.12601846       0.11833718
##    5:         -0.9866120     -0.059992128      -0.08472343       0.07865926
##   ---
## 2943:         -0.5431463     -0.142472810       0.02544275       0.20286208
## 2944:         -0.5291683      0.062107316      -0.04315641       0.11359406
## 2945:         -0.5453444     -0.123715000       0.08631957       0.26142304
## 2946:         -0.4903575     -0.335912030       0.09934677       0.35505812
## 2947:         -0.4170744     -0.208229480      -0.03865400       0.24610106
##       tBodyGyro-std-X tBodyGyro-std-Y tBodyGyro-std-Z tBodyGyroJerk-mean-X
##    1:      -0.8830891      -0.8161636      -0.9408812          -0.20489621
##    2:      -0.9255665      -0.9295992      -0.9675810          -0.13866849
##    3:      -0.9729882      -0.9785106      -0.9756483          -0.09780967
##    4:      -0.9677905      -0.9751338      -0.9632327          -0.10223178
##    5:      -0.9746560      -0.9779511      -0.9676287          -0.09184994
##   ---
## 2943:      -0.5627386      -0.5268550      -0.2567564           0.13828793
## 2944:      -0.4640369      -0.5181490      -0.1396287          -0.20074200
## 2945:      -0.4219774      -0.5570594      -0.1975039          -0.36210021
```

```
## 2946:      -0.6678579      -0.5551660      -0.3426199          -0.05582278
## 2947:      -0.6166534      -0.5085570      -0.3138543          -0.02814551
##       tBodyGyroJerk-mean-Y tBodyGyroJerk-mean-Z tBodyGyroJerk-std-X
##    1:         -0.174487710         -0.093389340          -0.9012242
##    2:         -0.025802071         -0.071418405          -0.9623042
##    3:         -0.034213274         -0.060028399          -0.9841669
##    4:         -0.044713461         -0.053436499          -0.9841709
##    5:         -0.029005022         -0.061235354          -0.9884738
##   ---
## 2943:         -0.005041591         -0.279400710          -0.6646345
## 2944:          0.069037389         -0.259789700          -0.5984058
## 2945:         -0.303347310          0.172746460          -0.6124836
## 2946:         -0.103685680          0.314818590          -0.7150106
## 2947:          0.173651560          0.001372617          -0.6857578
##       tBodyGyroJerk-std-Y tBodyGyroJerk-std-Z tBodyAccMag-mean tBodyAccMag-std
##    1:          -0.9108601          -0.9392504       -0.8669294      -0.7051911
##    2:          -0.9562894          -0.9813408       -0.9689614      -0.9539024
##    3:          -0.9879399          -0.9761876       -0.9762282      -0.9790834
##    4:          -0.9895542          -0.9807240       -0.9743245      -0.9770159
##    5:          -0.9918773          -0.9819836       -0.9758356      -0.9768934
##   ---
## 2943:          -0.6049332          -0.6670702       -0.2008855      -0.2343877
## 2944:          -0.5946965          -0.6417382       -0.1705631      -0.1986268
## 2945:          -0.6281620          -0.6161555       -0.2076032      -0.2523881
## 2946:          -0.6623249          -0.7009483       -0.2338657      -0.2927046
## 2947:          -0.6194253          -0.6872994       -0.2243090      -0.2624866
##       tGravityAccMag-mean tGravityAccMag-std tBodyAccJerkMag-mean
##    1:          -0.8669294         -0.7051911           -0.9297665
##    2:          -0.9689614         -0.9539024           -0.9737168
##    3:          -0.9762282         -0.9790834           -0.9816177
##    4:          -0.9743245         -0.9770159           -0.9827121
##    5:          -0.9758356         -0.9768934           -0.9869079
##   ---
## 2943:          -0.2008855         -0.2343877           -0.4559232
## 2944:          -0.1705631         -0.1986268           -0.4257498
## 2945:          -0.2076032         -0.2523881           -0.4632321
## 2946:          -0.2338657         -0.2927046           -0.4864946
## 2947:          -0.2243090         -0.2624866           -0.4624043
##       tBodyAccJerkMag-std tBodyGyroMag-mean tBodyGyroMag-std
##    1:          -0.8959942        -0.7955439       -0.7620732
##    2:          -0.9410078        -0.8984331       -0.9108583
##    3:          -0.9713710        -0.9391936       -0.9717763
##    4:          -0.9748075        -0.9471844       -0.9703682
##    5:          -0.9888539        -0.9574192       -0.9694995
##   ---
## 2943:          -0.4126706        -0.3937639       -0.4789186
## 2944:          -0.2880653        -0.3031531       -0.4765808
## 2945:          -0.2923697        -0.2886459       -0.5303024
## 2946:          -0.3621037        -0.3789522       -0.5472317
## 2947:          -0.3710656        -0.4085228       -0.4939524
##       tBodyGyroJerkMag-mean tBodyGyroJerkMag-std fBodyAcc-mean-X
##    1:            -0.9251949           -0.8943436      -0.9185097
##    2:            -0.9733934           -0.9440900      -0.9609030
##    3:            -0.9867480           -0.9844015      -0.9919063
```

```
##    4:            -0.9888204           -0.9855681      -0.9930298
##    5:            -0.9900621           -0.9904189      -0.9924042
##   ---
## 2943:            -0.6494828           -0.5967016      -0.3355388
## 2944:            -0.6322312           -0.5643632      -0.2504241
## 2945:            -0.6497476           -0.5915989      -0.3626403
## 2946:            -0.6966865           -0.6583167      -0.3783654
## 2947:            -0.6682140           -0.6083416      -0.4012226
##       fBodyAcc-mean-Y fBodyAcc-mean-Z fBodyAcc-std-X fBodyAcc-std-Y
##    1:     -0.91821319      -0.7890915     -0.9482903   -0.925136870
##    2:     -0.96443332      -0.9566748     -0.9843500   -0.970174760
##    3:     -0.96503362      -0.9668996     -0.9947537   -0.973695850
##    4:     -0.96828390      -0.9669116     -0.9955936   -0.976917560
##    5:     -0.96920715      -0.9796527     -0.9945037   -0.967468110
##   ---
## 2943:     -0.23387059      -0.3286207     -0.2698271   -0.148105510
## 2944:     -0.06012332      -0.2756377     -0.3282253    0.008056758
## 2945:     -0.18680220      -0.2711378     -0.3169726   -0.032618899
## 2946:     -0.40006993      -0.2823201     -0.3024231   -0.199957890
## 2947:     -0.31841507      -0.2221230     -0.3038541   -0.186334520
##       fBodyAcc-std-Z fBodyAccJerk-mean-X fBodyAccJerk-mean-Y
##    1:     -0.6363167          -0.8996332          -0.9374850
##    2:     -0.9418619          -0.9435190          -0.9691623
##    3:     -0.9622866          -0.9910295          -0.9733689
##    4:     -0.9689579          -0.9905362          -0.9724525
##    5:     -0.9782399          -0.9914800          -0.9798346
##   ---
## 2943:     -0.2157249          -0.4508228          -0.5439906
## 2944:     -0.2160092          -0.3177561          -0.4116971
## 2945:     -0.2982284          -0.3899408          -0.4348765
## 2946:     -0.2287489          -0.4261218          -0.5838392
## 2947:     -0.1982265          -0.5238330          -0.5971720
##       fBodyAccJerk-mean-Z fBodyAccJerk-std-X fBodyAccJerk-std-Y
##    1:          -0.9235514         -0.9244291         -0.9432104
##    2:          -0.9734489         -0.9616312         -0.9800263
##    3:          -0.9717030         -0.9919122         -0.9709857
##    4:          -0.9703374         -0.9919600         -0.9754341
##    5:          -0.9834930         -0.9935709         -0.9786966
##   ---
## 2943:          -0.4988520         -0.4323739         -0.5280954
## 2944:          -0.4947402         -0.4780054         -0.4339487
## 2945:          -0.4448655         -0.4448027         -0.4698176
## 2946:          -0.4391983         -0.5122416         -0.6030957
## 2947:          -0.3568914         -0.4784920         -0.5659273
##       fBodyAccJerk-std-Z fBodyGyro-mean-X fBodyGyro-mean-Y fBodyGyro-mean-Z
##    1:         -0.9478915       -0.8235579       -0.8079160       -0.9179126
##    2:         -0.9807873       -0.9225130       -0.9264957       -0.9682295
##    3:         -0.9723222       -0.9728456       -0.9808333       -0.9720602
##    4:         -0.9806211       -0.9715016       -0.9813450       -0.9667055
##    5:         -0.9885033       -0.9764045       -0.9804043       -0.9687820
##   ---
## 2943:         -0.5854999       -0.4763887       -0.5218199       -0.3426978
## 2944:         -0.5609813       -0.4319631       -0.4920759       -0.3281087
## 2945:         -0.6572389       -0.2914094       -0.5179180       -0.3063887
```

```
## 2946:         -0.5396678       -0.6278853       -0.5434641       -0.3680427
## 2947:         -0.4752730       -0.5689044       -0.5114901       -0.4532693
##       fBodyGyro-std-X fBodyGyro-std-Y fBodyGyro-std-Z fBodyAccMag-mean
##    1:      -0.9032627      -0.8226770      -0.9561651       -0.7909464
##    2:      -0.9270506      -0.9320107      -0.9701434       -0.9541266
##    3:      -0.9731979      -0.9771945      -0.9790953       -0.9756497
##    4:      -0.9671856      -0.9719094      -0.9652755       -0.9733931
##    5:      -0.9743979      -0.9765654      -0.9700165       -0.9777390
##   ---
## 2943:      -0.5904839      -0.5333008      -0.2985052       -0.2731909
## 2944:      -0.4781497      -0.5383805      -0.1648946       -0.2094867
## 2945:      -0.4635660      -0.5861540      -0.2381669       -0.2366061
## 2946:      -0.6817483      -0.5656499      -0.3944327       -0.3147630
## 2947:      -0.6331353      -0.5101592      -0.3365837       -0.2884126
##       fBodyAccMag-std fBodyBodyAccJerkMag-mean fBodyBodyAccJerkMag-std
##    1:      -0.7110740               -0.8950612               -0.8963596
##    2:      -0.9597458               -0.9454372               -0.9341520
##    3:      -0.9837843               -0.9710690               -0.9703078
##    4:      -0.9821196               -0.9716545               -0.9784844
##    5:      -0.9788381               -0.9874888               -0.9897160
##   ---
## 2943:      -0.3321409               -0.4221715               -0.4034507
## 2944:      -0.3169538               -0.2652178               -0.3222741
## 2945:      -0.3772403               -0.2474406               -0.3589800
## 2946:      -0.3902011               -0.3486653               -0.3832820
## 2947:      -0.3625984               -0.3651578               -0.3823873
##       fBodyBodyGyroMag-mean fBodyBodyGyroMag-std fBodyBodyGyroJerkMag-mean
##    1:            -0.7706100           -0.7971128                -0.8901655
##    2:            -0.9244608           -0.9167741                -0.9519774
##    3:            -0.9752095           -0.9739984                -0.9856888
##    4:            -0.9762973           -0.9712482                -0.9855619
##    5:            -0.9770070           -0.9696193                -0.9904980
##   ---
## 2943:            -0.4778440           -0.5712343                -0.6014236
## 2944:            -0.4918547           -0.5565773                -0.5663438
## 2945:            -0.6012827           -0.5633274                -0.5923314
## 2946:            -0.6385545           -0.5659171                -0.6797106
## 2947:            -0.5186400           -0.5639466                -0.6159911
##       fBodyBodyGyroJerkMag-std
##    1:               -0.9073076
##    2:               -0.9382124
##    3:               -0.9832727
##    4:               -0.9858429
##    5:               -0.9905719
##   ---
## 2943:               -0.6188288
## 2944:               -0.5925070
## 2945:               -0.6179484
## 2946:               -0.6549599
## 2947:               -0.6252073
```

Merge Datasets

```
# merge datasets
combined <- rbind(train, test)

# Convert classLabels to activityName basically. More explicit.
combined[["Activity"]] <- factor(combined[, Activity]
                                 , levels = activityLabels[["classLabels"]]
                                 , labels = activityLabels[["activityName"]])

combined[["SubjectNum"]] <- as.factor(combined[, SubjectNum])
combined <- reshape2::melt(data = combined, id = c("SubjectNum", "Activity"))
combined <- reshape2::dcast(data = combined, SubjectNum + Activity ~ variable, fun.aggregate = mean)

data.table::fwrite(x = combined, file = "tidyData.txt", quote = FALSE)
```