WLE_SVM_classification.R

```r
setwd("C:/Users/Shraddha/Desktop/sv R
related/acadgild/assignments/session17")
library(readr)
WLE<- read.csv("WLE.csv",header=T, na.strings=c("","NA"))
View(WLE)
dim(WLE)

## [1] 4024  158

library(kernlab)
WLE_train<-WLE[1:3950,]
WLE_test<-WLE[3951:4024,]
names(WLE)
```

```
##   [1] "user_name"              "raw_timestamp_part_1"
##   [3] "raw_timestamp_part_2"   "cvtd_timestamp"
##   [5] "new_window"             "num_window"
##   [7] "roll_belt"              "pitch_belt"
##   [9] "yaw_belt"               "total_accel_belt"
##  [11] "kurtosis_roll_belt"     "kurtosis_picth_belt"
##  [13] "skewness_roll_belt"     "skewness_roll_belt.1"
##  [15] "max_roll_belt"          "max_picth_belt"
##  [17] "max_yaw_belt"           "min_roll_belt"
##  [19] "min_pitch_belt"         "min_yaw_belt"
##  [21] "amplitude_roll_belt"    "amplitude_pitch_belt"
##  [23] "amplitude_yaw_belt"     "var_total_accel_belt"
##  [25] "avg_roll_belt"          "stddev_roll_belt"
##  [27] "var_roll_belt"          "avg_pitch_belt"
##  [29] "stddev_pitch_belt"      "var_pitch_belt"
##  [31] "avg_yaw_belt"           "stddev_yaw_belt"
##  [33] "var_yaw_belt"           "gyros_belt_x"
##  [35] "gyros_belt_y"           "gyros_belt_z"
##  [37] "accel_belt_x"           "accel_belt_y"
##  [39] "accel_belt_z"           "magnet_belt_x"
##  [41] "magnet_belt_y"          "magnet_belt_z"
##  [43] "roll_arm"               "pitch_arm"
##  [45] "yaw_arm"                "total_accel_arm"
##  [47] "var_accel_arm"          "avg_roll_arm"
##  [49] "stddev_roll_arm"        "var_roll_arm"
##  [51] "avg_pitch_arm"          "stddev_pitch_arm"
##  [53] "var_pitch_arm"          "avg_yaw_arm"
##  [55] "stddev_yaw_arm"         "var_yaw_arm"
##  [57] "gyros_arm_x"            "gyros_arm_y"
```

```
##  [59] "gyros_arm_z"              "accel_arm_x"
##  [61] "accel_arm_y"              "accel_arm_z"
##  [63] "magnet_arm_x"             "magnet_arm_y"
##  [65] "magnet_arm_z"             "kurtosis_roll_arm"
##  [67] "kurtosis_picth_arm"       "kurtosis_yaw_arm"
##  [69] "skewness_roll_arm"        "skewness_pitch_arm"
##  [71] "skewness_yaw_arm"         "max_roll_arm"
##  [73] "max_picth_arm"            "max_yaw_arm"
##  [75] "min_roll_arm"             "min_pitch_arm"
##  [77] "min_yaw_arm"              "amplitude_roll_arm"
##  [79] "amplitude_pitch_arm"      "amplitude_yaw_arm"
##  [81] "roll_dumbbell"            "pitch_dumbbell"
##  [83] "yaw_dumbbell"             "kurtosis_roll_dumbbell"
##  [85] "kurtosis_picth_dumbbell"  "skewness_roll_dumbbell"
##  [87] "skewness_pitch_dumbbell"  "max_roll_dumbbell"
##  [89] "max_picth_dumbbell"       "max_yaw_dumbbell"
##  [91] "min_roll_dumbbell"        "min_pitch_dumbbell"
##  [93] "min_yaw_dumbbell"         "amplitude_roll_dumbbell"
##  [95] "amplitude_pitch_dumbbell" "amplitude_yaw_dumbbell"
##  [97] "total_accel_dumbbell"     "var_accel_dumbbell"
##  [99] "avg_roll_dumbbell"        "stddev_roll_dumbbell"
## [101] "var_roll_dumbbell"        "avg_pitch_dumbbell"
## [103] "stddev_pitch_dumbbell"    "var_pitch_dumbbell"
## [105] "avg_yaw_dumbbell"         "stddev_yaw_dumbbell"
## [107] "var_yaw_dumbbell"         "gyros_dumbbell_x"
## [109] "gyros_dumbbell_y"         "gyros_dumbbell_z"
## [111] "accel_dumbbell_x"         "accel_dumbbell_y"
## [113] "accel_dumbbell_z"         "magnet_dumbbell_x"
## [115] "magnet_dumbbell_y"        "magnet_dumbbell_z"
## [117] "roll_forearm"             "pitch_forearm"
## [119] "yaw_forearm"              "kurtosis_roll_forearm"
## [121] "kurtosis_picth_forearm"   "skewness_roll_forearm"
## [123] "skewness_pitch_forearm"   "max_roll_forearm"
## [125] "max_picth_forearm"        "max_yaw_forearm"
## [127] "min_roll_forearm"         "min_pitch_forearm"
## [129] "min_yaw_forearm"          "amplitude_roll_forearm"
## [131] "amplitude_pitch_forearm"  "amplitude_yaw_forearm"
## [133] "total_accel_forearm"      "var_accel_forearm"
## [135] "avg_roll_forearm"         "stddev_roll_forearm"
## [137] "var_roll_forearm"         "avg_pitch_forearm"
## [139] "stddev_pitch_forearm"     "var_pitch_forearm"
## [141] "avg_yaw_forearm"          "stddev_yaw_forearm"
## [143] "var_yaw_forearm"          "gyros_forearm_x"
## [145] "gyros_forearm_y"          "gyros_forearm_z"
## [147] "accel_forearm_x"          "accel_forearm_y"
## [149] "accel_forearm_z"          "magnet_forearm_x"
## [151] "magnet_forearm_y"         "magnet_forearm_z"
## [153] "accel_forearm_y.1"        "accel_forearm_z.1"
## [155] "magnet_forearm_x.1"       "magnet_forearm_y.1"
## [157] "magnet_forearm_z.1"       "classe"
```

```
WLE_classifier<-ksvm(classe~.,data=WLE_train, kernel="vanilladot")

##  Setting default kernel parameters

## Warning in .local(x, ...): Variable(s) `' constant. Cannot scale data.

WLE_classifier

## Support Vector Machine object of class "ksvm"
##
## SV type: C-svc  (classification)
##  parameter : cost C = 1
##
## Linear (vanilla) kernel function.
##
## Number of Support Vectors : 3316
##
## Objective Function Value : -8.018326e+15 -6.023753e+13 -1.55818e+15 -6.339
44e+15 -4.264044e+13 -8.099278e+14 -4.066632e+15 -3.432538e+13 -3.432538e+13
-1.199172e+15
## Training error : 0.552405

WLE_prediction<-predict(WLE_classifier,WLE_test)
head(WLE_prediction)

## [1] A A A A A A
## Levels: A B C D E

table(WLE_prediction,WLE_test$classe)

##
## WLE_prediction  A  B  C  D  E
##              A  0  0 74  0  0
##              B  0  0  0  0  0
##              C  0  0  0  0  0
##              D  0  0  0  0  0
##              E  0  0  0  0  0

WLE_prediction

## [1] A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A
## [36] A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A
## [71] A A A A
## Levels: A B C D E

Agreement<-WLE_prediction ==WLE_test$classe
prop.table(table(Agreement))

## Agreement
## FALSE
##     1
```

```
set.seed(12345)
WLE_classifier_rbf<-ksvm(classe~.,data=WLE_train, kernel ="rbfdot")

## Warning in .local(x, ...): Variable(s) `' constant. Cannot scale data.

WLE_prediction_rbf<-predict(WLE_classifier_rbf,WLE_test)
Agreement_rbf<-WLE_prediction_rbf==WLE_test$classe
table(Agreement_rbf)

## Agreement_rbf
## FALSE
##     74

prop.table(table(Agreement_rbf))

## Agreement_rbf
## FALSE
##      1
```