

model_evaluation_and_assessment_excercise.R

```
setwd("C:/Users/Shraddha/Desktop/sv R related/acadgild/assignments/session19  
As signment")  
WLE<- read.csv("WLE.csv",header=T, na.strings=c("", "NA"))  
data<-WLE  
View(data)  
training<-data[1:4010,]  
testing<-data[4011:4024,]  
names(training)
```

```
## [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_pitch_belt"  
## [13] "skewness_roll_belt" "skewness_roll_belt.1"  
## [15] "max_roll_belt" "max_pitch_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"

```

Logistic regression model:

```
fit <- glm(classe~.,data = training,family = binomial)
```

```
## Warning: glm.fit: algorithm did not converge
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```
summary(fit)
```

```
##
```

```
## Call:
```

```
## glm(formula = classe ~ ., family = binomial, data = training)
```

```
##
```

```
## Deviance Residuals:
```

```
##      Min       1Q   Median       3Q      Max  
## -1.477e-04 -2.100e-08  2.100e-08  2.100e-08  9.859e-05
```

```
##
```

```
## Coefficients: (18 not defined because of singularities)
```

```
##              Estimate Std. Error z value Pr(>|z|)  
## (Intercept)      3.202e+10  1.709e+13  0.002    0.999  
## user_namecarlitos      6.085e+06  3.247e+09  0.002    0.999  
## user_nameeurico      -8.308e+06  4.435e+09 -0.002    0.999  
## user_namejeremy      -3.867e+06  2.065e+09 -0.002    0.999  
## user_namepedro       6.342e+06  3.385e+09  0.002    0.999  
## raw_timestamp_part_1   -2.421e+01  1.292e+04 -0.002    0.999  
## raw_timestamp_part_2    1.411e-05  2.360e-02  0.001    1.000  
## cvtd_timestamp28/11/2011 14:15      NA         NA      NA      NA  
## cvtd_timestamp30/11/2011 17:12      NA         NA      NA      NA  
## cvtd_timestamp5/12/2011 11:23   -2.151e+03  1.117e+06 -0.002    0.998  
## cvtd_timestamp5/12/2011 11:25      NA         NA      NA      NA  
## cvtd_timestamp5/12/2011 14:22   -1.842e+01  8.271e+04  0.000    1.000  
## cvtd_timestamp5/12/2011 14:23      NA         NA      NA      NA  
## new_windowyes      -1.196e+04  9.115e+08  0.000    1.000  
## num_window         3.216e+01  1.436e+04  0.002    0.998  
## roll_belt          3.836e+00  8.842e+03  0.000    1.000  
## pitch_belt         3.331e+00  1.228e+04  0.000    1.000  
## yaw_belt           -1.298e-01  5.861e+02  0.000    1.000  
## total_accel_belt     -2.160e+00  1.120e+04  0.000    1.000  
## kurtosis_roll_belt    -2.413e+02  1.132e+07  0.000    1.000  
## kurtosis_picth_belt    2.133e+00  6.052e+04  0.000    1.000  
## skewness_roll_belt    1.471e+01  4.592e+05  0.000    1.000  
## skewness_roll_belt.1   -1.419e+01  1.658e+05  0.000    1.000  
## max_roll_belt        1.833e+02  2.214e+07  0.000    1.000  
## max_picth_belt        2.699e+01  2.798e+05  0.000    1.000  
## max_yaw_belt         2.329e+02  1.125e+07  0.000    1.000  
## min_roll_belt        -2.742e+02  2.014e+07  0.000    1.000  
## min_pitch_belt       -2.265e+01  1.450e+06  0.000    1.000  
## min_yaw_belt          NA         NA      NA      NA  
## amplitude_roll_belt   -2.385e+02  2.213e+07  0.000    1.000  
## amplitude_pitch_belt    NA         NA      NA      NA  
## amplitude_yaw_belt     NA         NA      NA      NA  
## var_total_accel_belt   -1.510e+01  4.775e+05  0.000    1.000  
## avg_roll_belt         2.785e+00  1.051e+05  0.000    1.000
```

| | | | | |
|-----------------------|------------|-----------|--------|-------|
| ## stddev_roll_belt | 1.753e+01 | 1.265e+06 | 0.000 | 1.000 |
| ## var_roll_belt | -3.117e+00 | 1.134e+05 | 0.000 | 1.000 |
| ## avg_pitch_belt | -6.328e+00 | 1.748e+05 | 0.000 | 1.000 |
| ## stddev_pitch_belt | -8.170e+01 | 1.457e+06 | 0.000 | 1.000 |
| ## var_pitch_belt | 1.734e+01 | 3.934e+05 | 0.000 | 1.000 |
| ## avg_yaw_belt | 8.784e+01 | 2.140e+06 | 0.000 | 1.000 |
| ## stddev_yaw_belt | 1.326e+00 | 4.623e+06 | 0.000 | 1.000 |
| ## var_yaw_belt | 1.552e-02 | 1.262e+04 | 0.000 | 1.000 |
| ## gyros_belt_x | 1.681e+01 | 1.064e+05 | 0.000 | 1.000 |
| ## gyros_belt_y | 1.424e+01 | 3.427e+05 | 0.000 | 1.000 |
| ## gyros_belt_z | -6.446e+00 | 1.389e+05 | 0.000 | 1.000 |
| ## accel_belt_x | -1.552e-01 | 1.451e+03 | 0.000 | 1.000 |
| ## accel_belt_y | 4.502e-02 | 1.660e+03 | 0.000 | 1.000 |
| ## accel_belt_z | 3.158e-01 | 1.794e+03 | 0.000 | 1.000 |
| ## magnet_belt_x | 2.267e-01 | 8.493e+02 | 0.000 | 1.000 |
| ## magnet_belt_y | 1.765e-01 | 8.810e+02 | 0.000 | 1.000 |
| ## magnet_belt_z | 1.660e-01 | 5.184e+02 | 0.000 | 1.000 |
| ## roll_arm | -5.731e-02 | 1.442e+02 | 0.000 | 1.000 |
| ## pitch_arm | -5.222e-01 | 6.479e+02 | -0.001 | 0.999 |
| ## yaw_arm | -1.016e-01 | 1.354e+02 | -0.001 | 0.999 |
| ## total_accel_arm | -5.238e-01 | 2.292e+03 | 0.000 | 1.000 |
| ## var_accel_arm | -4.505e-01 | 2.112e+04 | 0.000 | 1.000 |
| ## avg_roll_arm | -1.565e-01 | 1.405e+04 | 0.000 | 1.000 |
| ## stddev_roll_arm | 3.474e+00 | 1.064e+05 | 0.000 | 1.000 |
| ## var_roll_arm | -2.031e-02 | 3.502e+02 | 0.000 | 1.000 |
| ## avg_pitch_arm | 1.466e+00 | 1.531e+05 | 0.000 | 1.000 |
| ## stddev_pitch_arm | 1.567e+01 | 1.588e+05 | 0.000 | 1.000 |
| ## var_pitch_arm | 1.251e-02 | 3.281e+03 | 0.000 | 1.000 |
| ## avg_yaw_arm | 1.020e+00 | 1.778e+04 | 0.000 | 1.000 |
| ## stddev_yaw_arm | -6.699e+00 | 5.032e+04 | 0.000 | 1.000 |
| ## var_yaw_arm | 2.898e-02 | 4.722e+02 | 0.000 | 1.000 |
| ## gyros_arm_x | 1.337e+00 | 1.778e+04 | 0.000 | 1.000 |
| ## gyros_arm_y | 6.535e+00 | 4.083e+04 | 0.000 | 1.000 |
| ## gyros_arm_z | 4.908e+00 | 2.287e+04 | 0.000 | 1.000 |
| ## accel_arm_x | -1.632e-02 | 5.067e+02 | 0.000 | 1.000 |
| ## accel_arm_y | -3.202e-02 | 5.528e+02 | 0.000 | 1.000 |
| ## accel_arm_z | -1.523e-02 | 3.129e+02 | 0.000 | 1.000 |
| ## magnet_arm_x | 7.353e-03 | 1.451e+02 | 0.000 | 1.000 |
| ## magnet_arm_y | 1.141e-01 | 3.629e+02 | 0.000 | 1.000 |
| ## magnet_arm_z | -5.990e-02 | 2.168e+02 | 0.000 | 1.000 |
| ## kurtosis_roll_arm | -1.279e+00 | 1.372e+05 | 0.000 | 1.000 |
| ## kurtosis_pitch_arm | 2.095e+00 | 2.848e+05 | 0.000 | 1.000 |
| ## kurtosis_yaw_arm | -8.336e+00 | 1.133e+05 | 0.000 | 1.000 |
| ## skewness_roll_arm | 2.048e+01 | 1.972e+06 | 0.000 | 1.000 |
| ## skewness_pitch_arm | 3.350e+01 | 1.123e+06 | 0.000 | 1.000 |
| ## skewness_yaw_arm | -6.954e+00 | 2.958e+05 | 0.000 | 1.000 |
| ## max_roll_arm | -3.085e+01 | 1.179e+07 | 0.000 | 1.000 |
| ## max_pitch_arm | -1.668e+03 | 2.989e+07 | 0.000 | 1.000 |
| ## max_yaw_arm | 3.360e+00 | 2.645e+05 | 0.000 | 1.000 |
| ## min_roll_arm | 3.030e+01 | 1.186e+07 | 0.000 | 1.000 |

| | | | | |
|-----------------------------|------------|-----------|-------|-------|
| ## min_pitch_arm | 1.668e+03 | 2.988e+07 | 0.000 | 1.000 |
| ## min_yaw_arm | -5.460e+00 | 2.966e+05 | 0.000 | 1.000 |
| ## amplitude_roll_arm | 2.402e+01 | 1.174e+07 | 0.000 | 1.000 |
| ## amplitude_pitch_arm | 1.669e+03 | 2.985e+07 | 0.000 | 1.000 |
| ## amplitude_yaw_arm | NA | NA | NA | NA |
| ## roll_dumbbell | 1.295e-01 | 6.889e+02 | 0.000 | 1.000 |
| ## pitch_dumbbell | -3.122e-01 | 1.172e+03 | 0.000 | 1.000 |
| ## yaw_dumbbell | 1.662e-01 | 6.861e+02 | 0.000 | 1.000 |
| ## kurtosis_roll_dumbbell | 3.774e+02 | 1.605e+07 | 0.000 | 1.000 |
| ## kurtosis_pitch_dumbbell | -4.045e+00 | 4.009e+05 | 0.000 | 1.000 |
| ## skewness_roll_dumbbell | 4.256e+01 | 3.945e+05 | 0.000 | 1.000 |
| ## skewness_pitch_dumbbell | 2.731e+01 | 4.182e+05 | 0.000 | 1.000 |
| ## max_roll_dumbbell | 2.581e+02 | 1.216e+07 | 0.000 | 1.000 |
| ## max_pitch_dumbbell | 2.558e+02 | 1.105e+07 | 0.000 | 1.000 |
| ## max_yaw_dumbbell | -3.795e+02 | 1.572e+07 | 0.000 | 1.000 |
| ## min_roll_dumbbell | -2.594e+02 | 1.209e+07 | 0.000 | 1.000 |
| ## min_pitch_dumbbell | -2.567e+02 | 1.104e+07 | 0.000 | 1.000 |
| ## min_yaw_dumbbell | NA | NA | NA | NA |
| ## amplitude_roll_dumbbell | -2.599e+02 | 1.217e+07 | 0.000 | 1.000 |
| ## amplitude_pitch_dumbbell | -2.565e+02 | 1.105e+07 | 0.000 | 1.000 |
| ## amplitude_yaw_dumbbell | NA | NA | NA | NA |
| ## total_accel_dumbbell | 1.707e+00 | 5.707e+03 | 0.000 | 1.000 |
| ## var_accel_dumbbell | 7.186e-01 | 4.159e+04 | 0.000 | 1.000 |
| ## avg_roll_dumbbell | -4.136e-01 | 1.115e+04 | 0.000 | 1.000 |
| ## stddev_roll_dumbbell | 6.602e-02 | 9.903e+04 | 0.000 | 1.000 |
| ## var_roll_dumbbell | 1.127e-02 | 8.361e+02 | 0.000 | 1.000 |
| ## avg_pitch_dumbbell | 2.273e+00 | 6.363e+04 | 0.000 | 1.000 |
| ## stddev_pitch_dumbbell | -9.758e-01 | 5.308e+05 | 0.000 | 1.000 |
| ## var_pitch_dumbbell | 1.958e-02 | 4.552e+03 | 0.000 | 1.000 |
| ## avg_yaw_dumbbell | 9.768e-01 | 3.070e+04 | 0.000 | 1.000 |
| ## stddev_yaw_dumbbell | 3.835e+00 | 1.491e+05 | 0.000 | 1.000 |
| ## var_yaw_dumbbell | -2.194e-02 | 1.529e+03 | 0.000 | 1.000 |
| ## gyros_dumbbell_x | 1.089e+01 | 4.168e+04 | 0.000 | 1.000 |
| ## gyros_dumbbell_y | -5.854e-01 | 3.294e+04 | 0.000 | 1.000 |
| ## gyros_dumbbell_z | 5.848e+00 | 3.567e+04 | 0.000 | 1.000 |
| ## accel_dumbbell_x | 4.649e-01 | 1.511e+03 | 0.000 | 1.000 |
| ## accel_dumbbell_y | -1.996e-01 | 8.743e+02 | 0.000 | 1.000 |
| ## accel_dumbbell_z | -2.526e-01 | 1.095e+03 | 0.000 | 1.000 |
| ## magnet_dumbbell_x | -1.429e-01 | 4.937e+02 | 0.000 | 1.000 |
| ## magnet_dumbbell_y | 8.417e-02 | 6.860e+02 | 0.000 | 1.000 |
| ## magnet_dumbbell_z | 5.264e-02 | 3.787e+02 | 0.000 | 1.000 |
| ## roll_forearm | 9.560e-03 | 1.646e+02 | 0.000 | 1.000 |
| ## pitch_forearm | 1.215e-01 | 1.499e+03 | 0.000 | 1.000 |
| ## yaw_forearm | -5.853e-03 | 1.043e+02 | 0.000 | 1.000 |
| ## kurtosis_roll_forearm | 2.956e+01 | 9.889e+06 | 0.000 | 1.000 |
| ## kurtosis_pitch_forearm | 2.758e+00 | 1.556e+05 | 0.000 | 1.000 |
| ## skewness_roll_forearm | -2.087e+00 | 4.561e+05 | 0.000 | 1.000 |
| ## skewness_pitch_forearm | 2.092e+01 | 8.209e+05 | 0.000 | 1.000 |
| ## max_roll_forearm | -5.134e+02 | 8.853e+06 | 0.000 | 1.000 |
| ## max_pitch_forearm | -1.242e+00 | 2.123e+04 | 0.000 | 1.000 |

```

## max_yaw_forearm -3.206e+01 9.579e+06 0.000 1.000
## min_roll_forearm 5.123e+02 8.855e+06 0.000 1.000
## min_pitch_forearm 3.160e-02 2.930e+04 0.000 1.000
## min_yaw_forearm NA NA NA NA
## amplitude_roll_forearm 5.167e+02 8.817e+06 0.000 1.000
## amplitude_pitch_forearm NA NA NA NA
## amplitude_yaw_forearm NA NA NA NA
## total_accel_forearm 3.209e-01 2.326e+03 0.000 1.000
## var_accel_forearm -8.244e-01 1.426e+04 0.000 1.000
## avg_roll_forearm -3.349e-01 1.792e+04 0.000 1.000
## stddev_roll_forearm 3.649e-01 1.261e+05 0.000 1.000
## var_roll_forearm 1.848e-03 7.983e+02 0.000 1.000
## avg_pitch_forearm -5.398e-01 1.044e+05 0.000 1.000
## stddev_pitch_forearm -1.688e+01 6.420e+05 0.000 1.000
## var_pitch_forearm 2.086e-01 9.747e+03 0.000 1.000
## avg_yaw_forearm 1.224e+00 3.374e+04 0.000 1.000
## stddev_yaw_forearm 3.636e+00 1.006e+05 0.000 1.000
## var_yaw_forearm -1.549e-02 8.103e+02 0.000 1.000
## gyros_forearm_x 1.341e+01 2.526e+04 0.001 1.000
## gyros_forearm_y 2.150e-03 1.120e+04 0.000 1.000
## gyros_forearm_z -1.424e+00 2.607e+04 0.000 1.000
## accel_forearm_x -8.488e-02 2.285e+02 0.000 1.000
## accel_forearm_y -7.488e-02 2.917e+02 0.000 1.000
## accel_forearm_z -1.275e-01 4.796e+02 0.000 1.000
## magnet_forearm_x 4.579e-02 1.750e+02 0.000 1.000
## magnet_forearm_y -1.938e-02 1.765e+02 0.000 1.000
## magnet_forearm_z 1.386e-01 2.646e+02 0.001 1.000
## accel_forearm_y.1 NA NA NA NA
## accel_forearm_z.1 NA NA NA NA
## magnet_forearm_x.1 NA NA NA NA
## magnet_forearm_y.1 NA NA NA NA
## magnet_forearm_z.1 NA NA NA NA
##
## (Dispersion parameter for binomial family taken to be 1)
##
## Null deviance: 5.1432e+03 on 4009 degrees of freedom
## Residual deviance: 1.3222e-07 on 3862 degrees of freedom
## AIC: 296
##
## Number of Fisher Scoring iterations: 25

library(ResourceSelection)

## ResourceSelection 0.3-2 2017-02-28

hoslem.test(training$classe, fitted(fit))

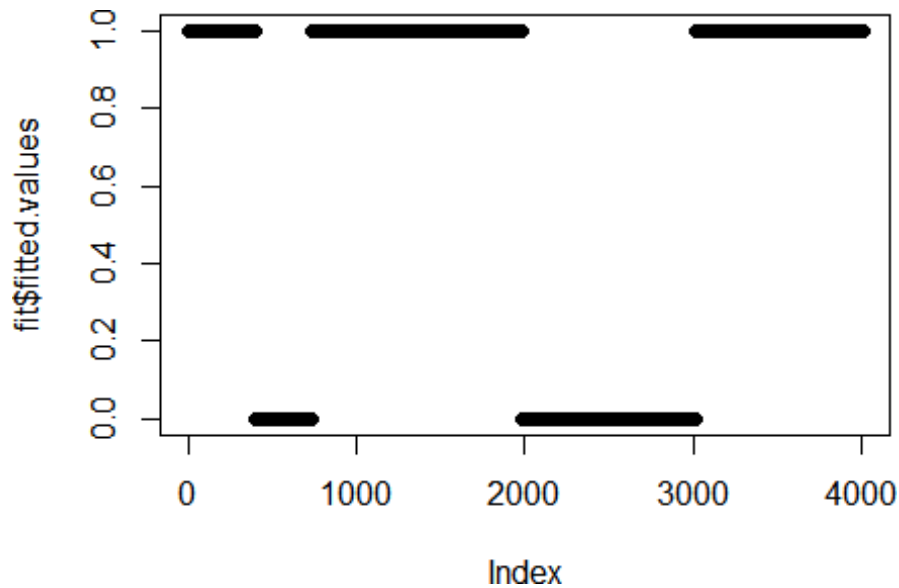
## Warning in Ops.factor(1, y): '-' not meaningful for factors

##
## Hosmer and Lemeshow goodness of fit (GOF) test

```

```
##
## data:  training$classe, fitted(fit)
## X-squared = 4010, df = 8, p-value < 2.2e-16

#plot the fitted model
plot(fit$fitted.values)
```



```
pred <- predict(fit,newdata = testing,type = 'response')

## Warning in predict.lm(object, newdata, se.fit, scale = 1, type =
## ifelse(type == : prediction from a rank-deficient fit may be misleading

library(caret)

## Loading required package: lattice
## Loading required package: ggplot2

#with default prob cut 0.50
testing$pred_classe <- ifelse(pred<0.7,'yes','no')

table(testing$pred_classe,testing$classe)

##
##      A  B  C  D  E
## no  0  0 14  0  0
```

```

#training split of churn classes
round(table(training$classe)/nrow(training),2)*100

##
##  A  B  C  D  E
## 34 22  2  7 34

# test split of churn classes
round(table(testing$classe)/nrow(testing),2)*100

##
##  A  B  C  D  E
##  0  0 100  0  0

#predicted split of churn classes
round(table(testing$pred_classe)/nrow(testing),2)*100

##
##  no
## 100

#create confusion matrix
confusionMatrix(testing$classe,testing$classe)

## Confusion Matrix and Statistics
##
##              Reference
## Prediction  A  B  C  D  E
##           A  0  0  0  0  0
##           B  0  0  0  0  0
##           C  0  0 14  0  0
##           D  0  0  0  0  0
##           E  0  0  0  0  0
##
## Overall Statistics
##
##              Accuracy : 1
##              95% CI : (0.7684, 1)
##      No Information Rate : 1
##      P-Value [Acc > NIR] : 1
##
##              Kappa : NaN
##  McNemar's Test P-Value : NA
##
## Statistics by Class:
##
##              Class: A Class: B Class: C Class: D Class: E
## Sensitivity              NA              NA              1              NA              NA
## Specificity              1              1              NA              1              1
## Pos Pred Value              NA              NA              NA              NA              NA
## Neg Pred Value              NA              NA              NA              NA              NA

```



```
## Prevalence          0          0          1          0          0
## Detection Rate      0          0          1          0          0
## Detection Prevalence 0          0          1          0          0
## Balanced Accuracy   NA          NA          NA          NA          NA

# Load Libraries
library(caret)
library(rpart)

# define training control
#train_control<- trainControl(method="cv", number=10)

# train the model
#model<- train(classe~.,data=training, trControl=train_control, method="glm")

# append predictions
pred<- cbind(testing,predictions)

# summarize results
confusion Matrix<- confusion Matrix(pred$predictions,pred$pred_classe)
```

Confusion Matrix and Statistics

| | Reference | |
|------------|-----------|------|
| Prediction | yes | no |
| yes | 54 | 48 |
| no | 170 | 1395 |

Accuracy : 0.8692
 95% CI : (0.8521, 0.8851)
 No Information Rate : 0.8656
 P-Value [Acc > NIR] : 0.3492

 Kappa : 0.2699
 McNemar's Test P-Value : 2.503e-16

 Sensitivity : 0.24107
 Specificity : 0.96674
 Pos Pred Value : 0.52941
 Neg Pred Value : 0.89137
 Prevalence : 0.13437
 Detection Rate : 0.03239
 Detection Prevalence : 0.06119
 Balanced Accuracy : 0.60390

 'Positive' Class : yes