#Summary of Performance Statistics from confusion matrix

# RF

#Accuracy Kappa

# 0.713690352 0.713115634

#knn

# Accuracy Kappa

# 0.469472807 0.468443225

#C5.0

# Accuracy Kappa

# 0.760575120 0.760124186

###################################################################

# Make a note of the dataset that the performance metrics belong to.

# Note performance metrics. Add the summary output as a comment.

#

# # Note: Want highest Kappa and Accuracy

# #

# Call:

# summary.resamples(object = ModelFitResults)

#

# Models: rf, knn, c50

# Number of resamples: 10

#

# Accuracy

# Min. 1st Qu. Median Mean 3rd Qu. Max. NA's

# rf 0.5629820 0.5693431 0.5835351 0.5895261 0.6019656 0.6408978 1

# knn 0.4393838 0.4414393 0.4460836 0.4492757 0.4503600 0.4743421 0

# c50 0.7389558 0.7425527 0.7500657 0.7500051 0.7544644 0.7645140 0

#

# Kappa

# Min. 1st Qu. Median Mean 3rd Qu. Max. NA's

# rf 0.5618586 0.5683567 0.5825218 0.5885449 0.6010432 0.6400045 1

# knn 0.4383265 0.4403812 0.4450335 0.4482233 0.4493047 0.4733213 0

# c50 0.7384593 0.7420736 0.7495894 0.7495327 0.7539961 0.7640689 0 0

#

Results of Model Training

**Confusion Matrix for RF**

Random Forest

4067 samples

520 predictor

735 classes: '0\_0\_102', '0\_0\_106', '0\_0\_107', '0\_0\_110', '0\_0\_111', '0\_0\_112', '0\_0\_113', '0\_0\_114', '0\_0\_115', '0\_0\_116', '0\_0\_117', '0\_0\_118', '0\_0\_119', '0\_0\_120', '0\_0\_121', '0\_0\_122', '0\_0\_123', '0\_0\_125', '0\_0\_126', '0\_0\_127', '0\_0\_128', '0\_0\_129', '0\_0\_130', '0\_0\_131', '0\_0\_132', '0\_0\_133', '0\_0\_134', '0\_0\_201', '0\_0\_202', '0\_0\_208', '0\_0\_209', '0\_0\_211', '0\_0\_212', '0\_0\_213', '0\_0\_214', '0\_0\_215', '0\_0\_216', '0\_0\_218', '0\_0\_219', '0\_0\_220', '0\_0\_222', '0\_0\_224', '0\_0\_225', '0\_0\_226', '0\_0\_227', '0\_0\_229', '0\_0\_230', '0\_0\_231', '0\_0\_232', '0\_0\_233', '0\_0\_234', '0\_0\_235', '0\_0\_236', '0\_0\_237', '0\_1\_1', '0\_1\_10', '0\_1\_107', '0\_1\_108', '0\_1\_110', '0\_1\_111', '0\_1\_112', '0\_1\_113', '0\_1\_114', '0\_1\_115', '0\_1\_116', '0\_1\_117', '0\_1\_118', '0\_1\_119', '0\_1\_121', '0\_1\_122', '0\_1\_15', '0\_1\_16', '0\_1\_202', '0\_1\_203', '0\_1\_213', '0\_1\_216', 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No pre-processing

Resampling: Cross-Validated (10 fold, repeated 1 times)

Summary of sample sizes: 3666, 3656, 3654, 3659, 3660, 3664, ...

Resampling results across tuning parameters:

mtry Accuracy Kappa

2 0.03242397 0.02601806

32 0.58952607 0.58854487

520 0.58072616 0.57975285

Accuracy was used to select the optimal model using the largest value.

The final value used for the model was mtry = 32.

**Confusion Matrix for KNN**

k-Nearest Neighbors

15138 samples

521 predictor

735 classes: '0\_0\_102', '0\_0\_106', '0\_0\_107', '0\_0\_110', '0\_0\_111', '0\_0\_112', '0\_0\_113', '0\_0\_114', '0\_0\_115', '0\_0\_116', '0\_0\_117', '0\_0\_118', '0\_0\_119', '0\_0\_120', '0\_0\_121', '0\_0\_122', '0\_0\_123', '0\_0\_125', '0\_0\_126', '0\_0\_127', '0\_0\_128', '0\_0\_129', '0\_0\_130', '0\_0\_131', '0\_0\_132', '0\_0\_133', '0\_0\_134', '0\_0\_201', '0\_0\_202', '0\_0\_208', '0\_0\_209', '0\_0\_211', '0\_0\_212', '0\_0\_213', '0\_0\_214', '0\_0\_215', '0\_0\_216', '0\_0\_218', '0\_0\_219', '0\_0\_220', '0\_0\_222', '0\_0\_224', '0\_0\_225', '0\_0\_226', '0\_0\_227', '0\_0\_229', '0\_0\_230', '0\_0\_231', '0\_0\_232', '0\_0\_233', '0\_0\_234', '0\_0\_235', '0\_0\_236', '0\_0\_237', '0\_1\_1', '0\_1\_10', '0\_1\_107', '0\_1\_108', '0\_1\_110', '0\_1\_111', '0\_1\_112', '0\_1\_113', '0\_1\_114', '0\_1\_115', '0\_1\_116', '0\_1\_117', '0\_1\_118', '0\_1\_119', '0\_1\_121', '0\_1\_122', '0\_1\_15', '0\_1\_16', '0\_1\_202', '0\_1\_203', '0\_1\_213', '0\_1\_216', 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No pre-processing

Resampling: Cross-Validated (10 fold, repeated 1 times)

Summary of sample sizes: 13618, 13613, 13641, 13618, 13605, 13644, ...

Resampling results across tuning parameters:

k Accuracy Kappa

5 0.4492757 0.4482233

7 0.4241116 0.4229892

9 0.4041633 0.4029901

Accuracy was used to select the optimal model using the largest value.

The final value used for the model was k = 5.

**Confusion Matrix for C5.0**

C5.0

15138 samples

521 predictor

735 classes: '0\_0\_102', '0\_0\_106', '0\_0\_107', '0\_0\_110', '0\_0\_111', '0\_0\_112', '0\_0\_113', '0\_0\_114', '0\_0\_115', '0\_0\_116', '0\_0\_117', '0\_0\_118', '0\_0\_119', '0\_0\_120', '0\_0\_121', '0\_0\_122', '0\_0\_123', '0\_0\_125', '0\_0\_126', '0\_0\_127', '0\_0\_128', '0\_0\_129', '0\_0\_130', '0\_0\_131', '0\_0\_132', '0\_0\_133', '0\_0\_134', '0\_0\_201', '0\_0\_202', '0\_0\_208', '0\_0\_209', '0\_0\_211', '0\_0\_212', '0\_0\_213', '0\_0\_214', '0\_0\_215', '0\_0\_216', '0\_0\_218', '0\_0\_219', '0\_0\_220', '0\_0\_222', '0\_0\_224', '0\_0\_225', '0\_0\_226', '0\_0\_227', '0\_0\_229', '0\_0\_230', '0\_0\_231', '0\_0\_232', '0\_0\_233', '0\_0\_234', '0\_0\_235', '0\_0\_236', '0\_0\_237', '0\_1\_1', '0\_1\_10', '0\_1\_107', '0\_1\_108', '0\_1\_110', '0\_1\_111', '0\_1\_112', '0\_1\_113', '0\_1\_114', '0\_1\_115', '0\_1\_116', '0\_1\_117', '0\_1\_118', '0\_1\_119', '0\_1\_121', '0\_1\_122', '0\_1\_15', '0\_1\_16', '0\_1\_202', '0\_1\_203', '0\_1\_213', '0\_1\_216', 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No pre-processing

Resampling: Cross-Validated (10 fold, repeated 1 times)

Summary of sample sizes: 13618, 13613, 13641, 13618, 13605, 13644, ...

Resampling results across tuning parameters:

model winnow trials Accuracy Kappa

rules FALSE 1 0.6126807 0.6119448

rules FALSE 10 0.7337124 0.7332095

rules FALSE 20 0.7500051 0.7495327

rules TRUE 1 0.6172710 0.6165434

rules TRUE 10 0.7317551 0.7312471

rules TRUE 20 0.7478405 0.7473636

tree FALSE 1 0.6169605 0.6162426

tree FALSE 10 0.7324531 0.7319452

tree FALSE 20 0.7474268 0.7469460

tree TRUE 1 0.6204031 0.6196906

tree TRUE 10 0.7278169 0.7273000

tree TRUE 20 0.7432983 0.7428096

Accuracy was used to select the optimal model using the largest value.

The final values used for the model were trials = 20, model = rules

and winnow = FALSE.

Results of Model Predict