########### QUANTILE 3

> hitungRandomForest(train\_dataset1\_normMDA, test\_dataset1\_normMDA);

+

pred 1 2 3 4 5

1 142 16 14 8 26

2 2 42 4 3 5

3 21 18 402 7 21

4 2 1 4 163 7

5 32 39 47 39 3614

Confusion Matrix and Statistics

Reference

Prediction 1 2 3 4 5

1 142 16 14 8 26

2 2 42 4 3 5

3 21 18 402 7 21

4 2 1 4 163 7

5 32 39 47 39 3614

Overall Statistics

Accuracy : 0.9325

95% CI : (0.9249, 0.9395)

No Information Rate : 0.785

P-Value [Acc > NIR] : < 2.2e-16

Kappa : 0.8088

Mcnemar's Test P-Value : 3.778e-14

Statistics by Class:

Class: 1 Class: 2 Class: 3 Class: 4 Class: 5

Sensitivity 0.71357 0.362069 0.85350 0.74091 0.9839

Specificity 0.98571 0.996932 0.98408 0.99686 0.8439

Pos Pred Value 0.68932 0.750000 0.85714 0.92090 0.9584

Neg Pred Value 0.98726 0.983993 0.98361 0.98734 0.9350

Prevalence 0.04253 0.024792 0.10066 0.04702 0.7850

Detection Rate 0.03035 0.008976 0.08592 0.03484 0.7724

Detection Prevalence 0.04403 0.011968 0.10024 0.03783 0.8059

Balanced Accuracy 0.84964 0.679500 0.91879 0.86888 0.9139

Call:

randomForest(formula = respon ~ ., data = train\_data, importance = TRUE)

Type of random forest: classification

Number of trees: 500

No. of variables tried at each split: 4

OOB estimate of error rate: 6.89%

Confusion matrix:

1 2 3 4 5 class.error

1 554 17 60 8 216 0.35204678

2 58 166 45 9 129 0.59213759

3 60 15 1573 24 218 0.16772487

4 36 7 36 740 175 0.25553320

5 71 16 65 22 14348 0.01198182

################ MEAN

> set.seed(12345);

+

+ modelRandomForest = hitungRandomForest(train\_dataset1\_normMDA, test\_dataset1\_normMDA);

+ hitungNaiveBayes(train\_dataset1\_normMDA, test\_dataset1\_normMDA);

+ hitungDecisionTree(train\_dataset1\_normMDA, test\_dataset1\_normMDA);

+

+ modelRandomForest = hitungRandomForest(train\_dataset1\_normMDG, test\_dataset1\_normMDG);

+ hitungNaiveBayes(train\_dataset1\_normMDG, test\_dataset1\_normMDG);

+ hitungDecisionTree(train\_dataset1\_normMDG, test\_dataset1\_normMDG);

+

+

pred 1 2 3 4 5

1 146 15 14 9 25

2 2 43 6 3 6

3 21 19 401 9 22

4 0 2 5 163 6

5 30 37 45 36 3614

Confusion Matrix and Statistics

Reference

Prediction 1 2 3 4 5

1 146 15 14 9 25

2 2 43 6 3 6

3 21 19 401 9 22

4 0 2 5 163 6

5 30 37 45 36 3614

Overall Statistics

Accuracy : 0.9333

95% CI : (0.9258, 0.9403)

No Information Rate : 0.785

P-Value [Acc > NIR] : < 2.2e-16

Kappa : 0.812

Mcnemar's Test P-Value : 3.879e-13

Statistics by Class:

Class: 1 Class: 2 Class: 3 Class: 4 Class: 5

Sensitivity 0.73367 0.37069 0.8514 0.74091 0.9839

Specificity 0.98594 0.99627 0.9831 0.99708 0.8529

Pos Pred Value 0.69856 0.71667 0.8496 0.92614 0.9607

Neg Pred Value 0.98814 0.98420 0.9834 0.98734 0.9357

Prevalence 0.04253 0.02479 0.1007 0.04702 0.7850

Detection Rate 0.03120 0.00919 0.0857 0.03484 0.7724

Detection Prevalence 0.04467 0.01282 0.1009 0.03761 0.8040

Balanced Accuracy 0.85980 0.68348 0.9173 0.86900 0.9184

pred 1 2 3 4 5

1 31 14 26 5 27

2 55 41 66 52 237

3 69 41 249 53 305

4 11 1 11 9 149

5 33 19 119 101 2955

Confusion Matrix and Statistics

Reference

Prediction 1 2 3 4 5

1 31 14 26 5 27

2 55 41 66 52 237

3 69 41 249 53 305

4 11 1 11 9 149

5 33 19 119 101 2955

Overall Statistics

Accuracy : 0.7021

95% CI : (0.6887, 0.7152)

No Information Rate : 0.785

P-Value [Acc > NIR] : 1

Kappa : 0.3199

Mcnemar's Test P-Value : <2e-16

Statistics by Class:

Class: 1 Class: 2 Class: 3 Class: 4 Class: 5

Sensitivity 0.155779 0.353448 0.52866 0.040909 0.8045

Specificity 0.983929 0.910147 0.88878 0.961426 0.7296

Pos Pred Value 0.300971 0.090909 0.34728 0.049724 0.9157

Neg Pred Value 0.963287 0.982261 0.94397 0.953090 0.5055

Prevalence 0.042530 0.024792 0.10066 0.047019 0.7850

Detection Rate 0.006625 0.008763 0.05322 0.001923 0.6315

Detection Prevalence 0.022013 0.096388 0.15324 0.038683 0.6897

Balanced Accuracy 0.569854 0.631798 0.70872 0.501168 0.7671

[1] "CHAID"

Confusion Matrix and Statistics

Reference

Prediction 1 2 3 4 5

1 106 23 28 18 56

2 10 14 0 1 12

3 21 23 288 29 26

4 2 9 8 59 11

5 60 47 147 113 3568

Overall Statistics

Accuracy : 0.8624

95% CI : (0.8522, 0.8721)

No Information Rate : 0.785

P-Value [Acc > NIR] : < 2.2e-16

Kappa : 0.5808

Mcnemar's Test P-Value : < 2.2e-16

Statistics by Class:

Class: 1 Class: 2 Class: 3 Class: 4 Class: 5

Sensitivity 0.53266 0.120690 0.61146 0.26818 0.9714

Specificity 0.97210 0.994959 0.97647 0.99327 0.6352

Pos Pred Value 0.45887 0.378378 0.74419 0.66292 0.9067

Neg Pred Value 0.97909 0.978027 0.95736 0.96492 0.8589

Prevalence 0.04253 0.024792 0.10066 0.04702 0.7850

Detection Rate 0.02265 0.002992 0.06155 0.01261 0.7626

Detection Prevalence 0.04937 0.007908 0.08271 0.01902 0.8410

Balanced Accuracy 0.75238 0.557825 0.79397 0.63073 0.8033

[1] "CART"

Confusion Matrix and Statistics

Reference

Prediction 1 2 3 4 5

1 16 0 5 3 0

2 0 0 0 0 0

3 79 46 262 42 113

4 0 0 0 0 0

5 104 70 204 175 3560

Overall Statistics

Accuracy : 0.8203

95% CI : (0.809, 0.8312)

No Information Rate : 0.785

P-Value [Acc > NIR] : 1.142e-09

Kappa : 0.397

Mcnemar's Test P-Value : NA

Statistics by Class:

Class: 1 Class: 2 Class: 3 Class: 4 Class: 5

Sensitivity 0.080402 0.00000 0.55626 0.00000 0.9692

Specificity 0.998214 1.00000 0.93346 1.00000 0.4503

Pos Pred Value 0.666667 NaN 0.48339 NaN 0.8655

Neg Pred Value 0.960687 0.97521 0.94948 0.95298 0.8004

Prevalence 0.042530 0.02479 0.10066 0.04702 0.7850

Detection Rate 0.003420 0.00000 0.05599 0.00000 0.7608

Detection Prevalence 0.005129 0.00000 0.11584 0.00000 0.8790

Balanced Accuracy 0.539308 0.50000 0.74486 0.50000 0.7098

[1] "C50"

Confusion Matrix and Statistics

Reference

Prediction 1 2 3 4 5

1 136 22 21 10 36

2 18 32 11 6 19

3 13 13 382 13 33

4 4 11 5 138 28

5 28 38 52 53 3557

Overall Statistics

Accuracy : 0.9072

95% CI : (0.8986, 0.9154)

No Information Rate : 0.785

P-Value [Acc > NIR] : < 2.2e-16

Kappa : 0.7426

Mcnemar's Test P-Value : 0.001096

Statistics by Class:

Class: 1 Class: 2 Class: 3 Class: 4 Class: 5

Sensitivity 0.68342 0.275862 0.81104 0.62727 0.9684

Specificity 0.98013 0.988166 0.98289 0.98924 0.8300

Pos Pred Value 0.60444 0.372093 0.84141 0.74194 0.9541

Neg Pred Value 0.98586 0.981711 0.97893 0.98175 0.8780

Prevalence 0.04253 0.024792 0.10066 0.04702 0.7850

Detection Rate 0.02907 0.006839 0.08164 0.02949 0.7602

Detection Prevalence 0.04809 0.018380 0.09703 0.03975 0.7968

Balanced Accuracy 0.83178 0.632014 0.89697 0.80825 0.8992

pred 1 2 3 4 5

1 147 16 11 9 25

2 3 43 6 3 7

3 20 18 402 9 21

4 2 2 5 162 8

5 27 37 47 37 3612

Confusion Matrix and Statistics

Reference

Prediction 1 2 3 4 5

1 147 16 11 9 25

2 3 43 6 3 7

3 20 18 402 9 21

4 2 2 5 162 8

5 27 37 47 37 3612

Overall Statistics

Accuracy : 0.9331

95% CI : (0.9256, 0.9401)

No Information Rate : 0.785

P-Value [Acc > NIR] : < 2.2e-16

Kappa : 0.8116

Mcnemar's Test P-Value : 1.478e-11

Statistics by Class:

Class: 1 Class: 2 Class: 3 Class: 4 Class: 5

Sensitivity 0.73869 0.37069 0.85350 0.73636 0.9834

Specificity 0.98638 0.99584 0.98384 0.99619 0.8529

Pos Pred Value 0.70673 0.69355 0.85532 0.90503 0.9606

Neg Pred Value 0.98837 0.98419 0.98361 0.98711 0.9336

Prevalence 0.04253 0.02479 0.10066 0.04702 0.7850

Detection Rate 0.03142 0.00919 0.08592 0.03462 0.7720

Detection Prevalence 0.04445 0.01325 0.10045 0.03826 0.8036

Balanced Accuracy 0.86254 0.68326 0.91867 0.86628 0.9181

pred 1 2 3 4 5

1 32 17 21 8 27

2 52 36 57 48 238

3 70 42 258 59 320

4 12 1 9 8 133

5 33 20 126 97 2955

Confusion Matrix and Statistics

Reference

Prediction 1 2 3 4 5

1 32 17 21 8 27

2 52 36 57 48 238

3 70 42 258 59 320

4 12 1 9 8 133

5 33 20 126 97 2955

Overall Statistics

Accuracy : 0.7029

95% CI : (0.6896, 0.716)

No Information Rate : 0.785

P-Value [Acc > NIR] : 1

Kappa : 0.3201

Mcnemar's Test P-Value : <2e-16

Statistics by Class:

Class: 1 Class: 2 Class: 3 Class: 4 Class: 5

Sensitivity 0.160804 0.310345 0.54777 0.03636 0.8045

Specificity 0.983705 0.913434 0.88332 0.96524 0.7256

Pos Pred Value 0.304762 0.083527 0.34446 0.04908 0.9146

Neg Pred Value 0.963489 0.981168 0.94580 0.95306 0.5041

Prevalence 0.042530 0.024792 0.10066 0.04702 0.7850

Detection Rate 0.006839 0.007694 0.05514 0.00171 0.6315

Detection Prevalence 0.022441 0.092114 0.16008 0.03484 0.6905

Balanced Accuracy 0.572255 0.611889 0.71554 0.50080 0.7651

[1] "CHAID"

Confusion Matrix and Statistics

Reference

Prediction 1 2 3 4 5

1 101 21 24 15 51

2 11 15 0 1 5

3 21 22 309 29 65

4 6 7 7 51 13

5 60 51 131 124 3539

Overall Statistics

Accuracy : 0.8581

95% CI : (0.8478, 0.868)

No Information Rate : 0.785

P-Value [Acc > NIR] : < 2.2e-16

Kappa : 0.573

Mcnemar's Test P-Value : < 2.2e-16

Statistics by Class:

Class: 1 Class: 2 Class: 3 Class: 4 Class: 5

Sensitivity 0.50754 0.129310 0.65605 0.23182 0.9635

Specificity 0.97522 0.996274 0.96744 0.99260 0.6362

Pos Pred Value 0.47642 0.468750 0.69283 0.60714 0.9063

Neg Pred Value 0.97806 0.978266 0.96173 0.96322 0.8269

Prevalence 0.04253 0.024792 0.10066 0.04702 0.7850

Detection Rate 0.02159 0.003206 0.06604 0.01090 0.7564

Detection Prevalence 0.04531 0.006839 0.09532 0.01795 0.8346

Balanced Accuracy 0.74138 0.562792 0.81175 0.61221 0.7999

[1] "CART"

Confusion Matrix and Statistics

Reference

Prediction 1 2 3 4 5

1 16 0 5 3 0

2 0 0 0 0 0

3 79 46 262 42 113

4 0 0 0 0 0

5 104 70 204 175 3560

Overall Statistics

Accuracy : 0.8203

95% CI : (0.809, 0.8312)

No Information Rate : 0.785

P-Value [Acc > NIR] : 1.142e-09

Kappa : 0.397

Mcnemar's Test P-Value : NA

Statistics by Class:

Class: 1 Class: 2 Class: 3 Class: 4 Class: 5

Sensitivity 0.080402 0.00000 0.55626 0.00000 0.9692

Specificity 0.998214 1.00000 0.93346 1.00000 0.4503

Pos Pred Value 0.666667 NaN 0.48339 NaN 0.8655

Neg Pred Value 0.960687 0.97521 0.94948 0.95298 0.8004

Prevalence 0.042530 0.02479 0.10066 0.04702 0.7850

Detection Rate 0.003420 0.00000 0.05599 0.00000 0.7608

Detection Prevalence 0.005129 0.00000 0.11584 0.00000 0.8790

Balanced Accuracy 0.539308 0.50000 0.74486 0.50000 0.7098

[1] "C50"

Confusion Matrix and Statistics

Reference

Prediction 1 2 3 4 5

1 139 20 14 9 32

2 14 35 9 4 8

3 17 15 377 16 38

4 4 9 3 140 30

5 25 37 68 51 3565

Overall Statistics

Accuracy : 0.9096

95% CI : (0.901, 0.9177)

No Information Rate : 0.785

P-Value [Acc > NIR] : < 2.2e-16

Kappa : 0.747

Mcnemar's Test P-Value : 3.949e-07

Statistics by Class:

Class: 1 Class: 2 Class: 3 Class: 4 Class: 5

Sensitivity 0.69849 0.30172 0.80042 0.63636 0.9706

Specificity 0.98326 0.99233 0.97956 0.98968 0.8201

Pos Pred Value 0.64953 0.50000 0.81425 0.75269 0.9517

Neg Pred Value 0.98656 0.98243 0.97770 0.98219 0.8842

Prevalence 0.04253 0.02479 0.10066 0.04702 0.7850

Detection Rate 0.02971 0.00748 0.08057 0.02992 0.7619

Detection Prevalence 0.04574 0.01496 0.09895 0.03975 0.8006

Balanced Accuracy 0.84088 0.64703 0.88999 0.81302 0.8953

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