######### Model: rfe #########

accuracy in Train: 1.00

confusion matrix

[[359 0 0 0 0 0 0 0 0 0]

[ 0 367 0 0 0 0 0 0 0 0]

[ 0 0 370 0 0 0 0 0 0 0]

[ 0 0 0 381 0 0 0 0 0 0]

[ 0 0 0 0 365 0 0 0 0 0]

[ 0 0 0 0 0 362 0 0 0 0]

[ 0 0 0 0 0 0 381 0 0 0]

[ 0 0 0 0 0 0 0 386 0 0]

[ 0 0 0 0 0 0 0 0 395 0]

[ 0 0 0 0 0 0 0 0 0 384]]

precision in Train: 1.00

recall in Train: 1.00

f1-score in Train: 1.00

cohen's kappa in Train: 1.00

accuracy in Validation: 0.14

confusion matrix

[[ 0 8 14 10 0 38 4 17 18 4]

[ 5 26 21 3 0 45 2 20 10 1]

[ 0 19 17 11 2 8 22 36 19 2]

[ 6 37 6 11 4 10 20 29 8 2]

[ 5 28 15 14 4 7 19 29 4 1]

[ 1 15 11 11 5 20 8 21 24 4]

[ 1 34 13 10 0 8 19 24 22 1]

[ 7 18 9 6 1 4 7 54 7 1]

[ 1 9 19 18 4 11 10 23 19 2]

[ 1 20 7 11 0 12 26 35 14 1]]

precision in Validation: 0.12

recall in Validation: 0.14

f1-score in Validation: 0.11

cohen's kappa in Validation: 0.04

accuracy in Test: 0.72

confusion matrix

[[87 3 5 0 0 1 2 0 0 2]

[ 4 80 3 2 0 1 2 0 7 1]

[ 3 7 64 5 2 9 4 0 4 2]

[ 0 0 2 59 22 3 3 3 4 4]

[ 0 2 4 13 66 3 6 1 3 2]

[ 4 2 8 3 3 73 1 0 5 1]

[ 1 1 3 5 4 0 72 10 3 1]

[ 2 3 5 2 6 1 10 64 6 1]

[ 0 2 2 4 1 8 5 3 75 0]

[ 2 0 5 5 0 7 1 1 1 78]]

precision in Test: 0.72

recall in Test: 0.72

f1-score in Test: 0.72

cohen's kappa in Test: 0.69

######## Model: xgbc #########

accuracy in Train: 1.00

confusion matrix

[[359 0 0 0 0 0 0 0 0 0]

[ 0 367 0 0 0 0 0 0 0 0]

[ 0 0 370 0 0 0 0 0 0 0]

[ 0 0 0 381 0 0 0 0 0 0]

[ 0 0 0 0 365 0 0 0 0 0]

[ 0 0 0 0 0 362 0 0 0 0]

[ 0 0 0 0 0 0 381 0 0 0]

[ 0 0 0 0 0 0 0 386 0 0]

[ 0 0 0 0 0 0 0 0 395 0]

[ 0 0 0 0 0 0 0 0 0 384]]

precision in Train: 1.00

recall in Train: 1.00

f1-score in Train: 1.00

cohen's kappa in Train: 1.00

accuracy in Validation: 0.12

confusion matrix

[[ 7 12 4 8 10 26 6 4 35 1]

[ 9 12 10 8 21 36 3 6 23 5]

[ 6 21 8 10 29 13 9 14 23 3]

[ 8 15 1 19 35 7 21 9 14 4]

[ 2 17 3 21 32 10 19 13 4 5]

[ 7 22 3 7 28 18 1 6 25 3]

[ 2 28 3 10 8 13 20 16 28 4]

[ 6 18 1 17 8 7 19 19 13 6]

[ 2 16 3 14 41 9 4 11 13 3]

[ 6 8 8 17 16 17 29 12 14 0]]

precision in Validation: 0.12

recall in Validation: 0.12

f1-score in Validation: 0.11

cohen's kappa in Validation: 0.02

accuracy in Test: 0.71

confusion matrix

[[89 2 6 0 0 0 2 1 0 0]

[ 3 85 2 1 0 3 1 0 4 1]

[ 7 5 62 1 3 7 4 1 5 5]

[ 0 1 5 59 12 5 5 4 4 5]

[ 0 4 3 18 59 3 5 4 4 0]

[ 4 2 8 0 6 69 0 1 5 5]

[ 1 3 3 3 5 0 71 11 2 1]

[ 1 1 6 2 3 1 13 61 9 3]

[ 0 2 2 2 1 3 5 7 76 2]

[ 3 0 3 4 0 6 2 1 2 79]]

precision in Test: 0.71

recall in Test: 0.71

f1-score in Test: 0.71

cohen's kappa in Test: 0.68

######### Model: adb #########

accuracy in Train: 0.93

confusion matrix

[[355 1 1 0 0 0 0 0 0 2]

[ 17 347 1 0 0 2 0 0 0 0]

[ 0 6 351 1 8 2 0 0 0 2]

[ 0 0 2 350 26 0 0 2 1 0]

[ 0 0 2 72 289 0 0 1 1 0]

[ 2 0 16 0 0 338 0 0 3 3]

[ 1 0 4 0 2 0 354 14 5 1]

[ 4 0 0 3 4 0 5 359 10 1]

[ 0 0 3 2 5 0 2 0 383 0]

[ 2 0 2 2 0 0 3 0 1 374]]

precision in Train: 0.94

recall in Train: 0.93

f1-score in Train: 0.93

cohen's kappa in Train: 0.93

accuracy in Validation: 0.13

confusion matrix

[[13 21 17 3 2 35 2 9 10 1]

[ 9 17 22 5 4 30 5 15 17 9]

[ 7 8 24 19 18 17 7 22 9 5]

[17 25 10 11 6 13 15 27 4 5]

[11 20 16 8 8 15 17 26 4 1]

[18 4 14 5 19 10 2 23 21 4]

[ 5 23 21 11 4 16 20 16 15 1]

[ 6 14 12 6 6 5 15 45 5 0]

[ 2 12 22 15 17 9 5 24 10 0]

[ 9 15 23 3 19 6 20 28 3 1]]

precision in Validation: 0.12

recall in Validation: 0.13

f1-score in Validation: 0.12

cohen's kappa in Validation: 0.03

accuracy in Test: 0.64

confusion matrix

[[81 3 6 1 0 1 1 1 0 6]

[10 70 8 1 2 1 2 2 4 0]

[ 4 3 66 4 11 3 1 1 4 3]

[ 0 0 8 56 23 2 3 4 0 4]

[ 0 0 5 35 50 2 4 1 3 0]

[ 2 0 24 2 9 53 1 2 4 3]

[ 1 2 8 4 9 0 56 14 5 1]

[ 2 0 8 1 6 0 14 54 13 2]

[ 0 1 9 5 4 0 5 3 72 1]

[ 2 0 8 5 1 4 0 2 1 77]]

precision in Test: 0.66

recall in Test: 0.64

f1-score in Test: 0.64

cohen's kappa in Test: 0.59

######### Model: gbc #########

accuracy in Train: 1.00

confusion matrix

[[359 0 0 0 0 0 0 0 0 0]

[ 0 367 0 0 0 0 0 0 0 0]

[ 0 0 370 0 0 0 0 0 0 0]

[ 0 0 0 381 0 0 0 0 0 0]

[ 0 0 0 0 365 0 0 0 0 0]

[ 0 0 0 0 0 362 0 0 0 0]

[ 0 0 0 0 0 0 381 0 0 0]

[ 0 0 0 0 0 0 0 386 0 0]

[ 0 0 0 0 0 0 0 0 395 0]

[ 0 0 0 0 0 0 0 0 0 384]]

precision in Train: 1.00

recall in Train: 1.00

f1-score in Train: 1.00

cohen's kappa in Train: 1.00

accuracy in Validation: 0.14

confusion matrix

[[16 3 6 16 3 33 3 12 17 4]

[ 7 8 28 13 25 25 6 4 9 8]

[ 8 11 16 14 31 8 8 17 19 4]

[10 5 6 23 34 7 24 14 7 3]

[ 8 11 3 16 38 11 19 8 6 6]

[13 5 8 14 31 18 6 11 12 2]

[ 6 15 18 9 13 16 17 17 17 4]

[18 5 11 12 12 4 15 24 6 7]

[11 3 2 8 38 16 15 9 10 4]

[10 1 12 26 14 10 22 20 12 0]]

precision in Validation: 0.12

recall in Validation: 0.14

f1-score in Validation: 0.13

cohen's kappa in Validation: 0.04

accuracy in Test: 0.70

confusion matrix

[[87 2 5 1 1 0 3 1 0 0]

[ 4 84 3 1 0 3 1 0 4 0]

[ 7 5 66 3 0 5 3 1 5 5]

[ 0 1 8 59 18 4 1 5 1 3]

[ 0 4 3 19 55 5 5 3 5 1]

[ 4 1 9 1 7 68 1 1 3 5]

[ 0 0 3 5 7 0 68 10 6 1]

[ 2 0 5 6 5 1 16 55 8 2]

[ 0 2 3 5 1 4 5 6 72 2]

[ 0 0 6 5 0 4 0 1 2 82]]

precision in Test: 0.70

recall in Test: 0.70

f1-score in Test: 0.70

cohen's kappa in Test: 0.66

######### Model: lr ##########

accuracy in Train: 1.00

confusion matrix

[[359 0 0 0 0 0 0 0 0 0]

[ 0 367 0 0 0 0 0 0 0 0]

[ 0 0 370 0 0 0 0 0 0 0]

[ 0 0 0 381 0 0 0 0 0 0]

[ 0 0 0 0 365 0 0 0 0 0]

[ 0 0 0 0 0 362 0 0 0 0]

[ 0 0 0 0 0 0 381 0 0 0]

[ 0 0 0 0 0 0 0 386 0 0]

[ 0 0 0 0 0 0 0 0 395 0]

[ 0 0 0 0 0 0 0 0 0 384]]

precision in Train: 1.00

recall in Train: 1.00

f1-score in Train: 1.00

cohen's kappa in Train: 1.00

accuracy in Validation: 0.13

confusion matrix

[[14 22 1 22 32 1 5 7 5 4]

[13 34 3 17 25 2 5 16 3 15]

[ 3 17 3 9 59 1 3 35 1 5]

[ 7 16 1 10 57 0 1 37 0 4]

[ 3 20 0 11 49 0 5 33 0 5]

[ 2 10 0 15 70 0 1 22 0 0]

[ 4 36 0 2 28 1 2 54 3 2]

[10 14 1 2 26 0 3 54 0 4]

[ 0 5 1 9 59 0 0 35 2 5]

[10 24 2 6 44 0 5 35 1 0]]

precision in Validation: 0.12

recall in Validation: 0.14

f1-score in Validation: 0.10

cohen's kappa in Validation: 0.04

accuracy in Test: 0.73

confusion matrix

[[87 1 5 0 1 1 1 2 0 2]

[ 3 87 1 1 0 1 2 2 2 1]

[ 5 6 63 5 5 4 4 1 4 3]

[ 0 0 5 55 22 4 1 4 4 5]

[ 0 2 2 13 64 4 8 4 2 1]

[ 2 0 8 1 6 75 1 0 3 4]

[ 2 0 4 6 4 0 73 8 2 1]

[ 2 2 3 3 3 1 11 70 3 2]

[ 0 2 2 2 1 6 7 4 74 2]

[ 2 0 3 2 1 4 3 2 2 81]]

precision in Test: 0.73

recall in Test: 0.73

f1-score in Test: 0.73

cohen's kappa in Test: 0.70

######### Model: dtc #########

Problem with input shape

######### Model: svm #########

accuracy in Train: 1.00

confusion matrix

[[359 0 0 0 0 0 0 0 0 0]

[ 0 367 0 0 0 0 0 0 0 0]

[ 0 0 370 0 0 0 0 0 0 0]

[ 0 0 0 381 0 0 0 0 0 0]

[ 0 0 0 0 365 0 0 0 0 0]

[ 0 0 0 0 0 362 0 0 0 0]

[ 0 0 0 0 0 0 381 0 0 0]

[ 0 0 0 0 0 0 0 386 0 0]

[ 0 0 0 0 0 0 0 0 395 0]

[ 0 0 0 0 0 0 0 0 0 384]]

precision in Train: 1.00

recall in Train: 1.00

f1-score in Train: 1.00

cohen's kappa in Train: 1.00

accuracy in Validation: 0.14

confusion matrix

[[17 24 0 24 33 5 0 2 5 3]

[21 44 1 5 33 2 5 12 2 8]

[ 3 24 2 8 69 0 1 26 0 3]

[10 18 1 7 77 1 1 17 0 1]

[ 5 16 0 9 64 0 2 28 0 2]

[ 3 11 0 20 72 0 1 13 0 0]

[ 5 25 2 1 48 2 1 42 4 2]

[20 13 0 4 31 0 2 44 0 0]

[ 2 3 0 6 78 0 0 24 1 2]

[16 30 2 8 38 0 2 31 0 0]]

precision in Validation: 0.12

recall in Validation: 0.15

f1-score in Validation: 0.10

cohen's kappa in Validation: 0.05

accuracy in Test: 0.74

confusion matrix

[[87 2 4 0 1 1 1 2 0 2]

[ 2 88 2 1 0 0 3 2 2 0]

[ 3 5 68 4 5 5 3 0 4 3]

[ 0 0 8 58 22 2 2 2 3 3]

[ 0 1 4 15 64 3 6 3 4 0]

[ 3 0 8 2 4 77 0 0 3 3]

[ 1 0 3 6 6 0 75 7 1 1]

[ 2 1 4 3 3 0 9 72 5 1]

[ 0 1 4 3 2 6 7 3 74 0]

[ 2 1 2 2 1 4 1 3 2 82]]

precision in Test: 0.75

recall in Test: 0.74

f1-score in Test: 0.75

cohen's kappa in Test: 0.72

######## Model: mlp\_0 ########

Train on 3750 samples, validate on 1250 samples

Epoch 1/5

3750/3750 [==============================] - 8s 2ms/step - loss: 0.0024 - acc: 1.0000 - val\_loss: 1.9766 - val\_acc: 0.7008

Epoch 2/5

3750/3750 [==============================] - 9s 2ms/step - loss: 0.0019 - acc: 1.0000 - val\_loss: 1.9792 - val\_acc: 0.7016

Epoch 3/5

3750/3750 [==============================] - 9s 2ms/step - loss: 0.0015 - acc: 1.0000 - val\_loss: 1.9754 - val\_acc: 0.7016

Epoch 4/5

3750/3750 [==============================] - 9s 2ms/step - loss: 0.0014 - acc: 0.9997 - val\_loss: 1.9777 - val\_acc: 0.7000

Epoch 5/5

3750/3750 [==============================] - 9s 2ms/step - loss: 0.0012 - acc: 1.0000 - val\_loss: 1.9768 - val\_acc: 0.6992

accuracy in Train: 1.00

confusion matrix

[[359 0 0 0 0 0 0 0 0 0]

[ 0 367 0 0 0 0 0 0 0 0]

[ 0 0 370 0 0 0 0 0 0 0]

[ 0 0 0 381 0 0 0 0 0 0]

[ 0 0 0 0 365 0 0 0 0 0]

[ 0 0 0 0 0 362 0 0 0 0]

[ 0 0 0 0 0 0 381 0 0 0]

[ 0 0 0 0 0 0 0 386 0 0]

[ 0 0 0 0 0 0 0 0 395 0]

[ 0 0 0 0 0 0 0 0 0 384]]

precision in Train: 1.00

recall in Train: 1.00

f1-score in Train: 1.00

cohen's kappa in Train: 1.00

accuracy in Validation: 0.70

confusion matrix

[[104 0 4 0 2 0 1 0 0 2]

[ 19 96 2 1 3 5 2 4 1 0]

[ 5 4 87 4 7 8 5 2 5 9]

[ 0 2 5 65 33 2 5 14 5 2]

[ 0 2 13 10 82 3 3 12 1 0]

[ 2 2 7 1 3 96 1 0 3 5]

[ 5 1 7 8 1 0 84 17 7 2]

[ 4 1 2 6 1 1 14 76 8 1]

[ 0 1 5 3 4 2 4 9 84 4]

[ 3 0 3 2 3 10 3 3 0 100]]

precision in Validation: 0.70

recall in Validation: 0.70

f1-score in Validation: 0.70

cohen's kappa in Validation: 0.67

accuracy in Test: 0.73

confusion matrix

[[89 1 4 0 1 0 0 1 0 4]

[ 2 85 3 1 0 1 2 3 3 0]

[ 6 6 61 4 6 4 3 1 4 5]

[ 0 0 6 53 23 4 3 2 4 5]

[ 0 2 3 13 62 4 5 5 4 2]

[ 2 1 8 1 5 71 1 0 4 7]

[ 0 1 3 5 4 0 72 9 2 4]

[ 1 3 3 3 6 0 8 70 4 2]

[ 0 2 2 1 1 4 7 5 76 2]

[ 0 0 2 3 0 3 1 3 1 87]]

precision in Test: 0.73

recall in Test: 0.73

f1-score in Test: 0.72

cohen's kappa in Test: 0.70

######## Model: mlp\_1 ########

Train on 3750 samples, validate on 1250 samples

Epoch 1/5

3750/3750 [==============================] - 9s 2ms/step - loss: 9.0699 - acc: 0.4371 - val\_loss: 13.1266 - val\_acc: 0.1856

Epoch 2/5

3750/3750 [==============================] - 9s 2ms/step - loss: 9.3340 - acc: 0.4208 - val\_loss: 13.1008 - val\_acc: 0.1872

Epoch 3/5

3750/3750 [==============================] - 9s 2ms/step - loss: 10.1529 - acc: 0.3699 - val\_loss: 13.0879 - val\_acc: 0.1880

Epoch 4/5

3750/3750 [==============================] - 9s 2ms/step - loss: 10.5054 - acc: 0.3477 - val\_loss: 13.0621 - val\_acc: 0.1896

Epoch 5/5

3750/3750 [==============================] - 9s 2ms/step - loss: 9.3657 - acc: 0.4189 - val\_loss: 13.0621 - val\_acc: 0.1896

C:\Users\jonat\Anaconda3\lib\site-packages\sklearn\metrics\classification.py:1135: UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels with no predicted samples.

'precision', 'predicted', average, warn\_for)

C:\Users\jonat\Anaconda3\lib\site-packages\sklearn\metrics\classification.py:1135: UndefinedMetricWarning: F-score is ill-defined and being set to 0.0 in labels with no predicted samples.

'precision', 'predicted', average, warn\_for)

accuracy in Train: 0.43

confusion matrix

[[196 0 98 0 0 0 65 0 0 0]

[ 0 0 156 0 0 64 123 0 24 0]

[ 0 0 311 0 0 33 22 0 4 0]

[ 0 0 37 0 0 116 167 0 61 0]

[ 0 0 44 0 21 126 94 0 80 0]

[ 0 0 14 0 0 344 4 0 0 0]

[ 0 0 2 0 0 2 367 0 10 0]

[ 0 0 11 0 0 17 281 0 77 0]

[ 0 0 2 0 0 19 8 0 366 0]

[ 4 0 59 0 0 148 169 0 4 0]]

precision in Train: 0.37

recall in Train: 0.43

f1-score in Train: 0.31

cohen's kappa in Train: 0.36

accuracy in Validation: 0.19

confusion matrix

[[ 96 0 0 0 0 0 8 0 9 0]

[ 70 0 0 0 0 0 26 0 37 0]

[ 22 0 0 0 1 0 19 0 94 0]

[ 4 0 0 0 0 0 41 0 88 0]

[ 5 0 0 0 4 2 41 0 74 0]

[ 33 0 2 0 3 2 5 0 75 0]

[ 5 0 0 0 0 0 19 0 108 0]

[ 7 0 0 0 0 0 22 0 85 0]

[ 0 0 0 0 0 0 0 0 116 0]

[ 42 0 0 0 1 2 40 0 42 0]]

precision in Validation: 0.14

recall in Validation: 0.20

f1-score in Validation: 0.10

cohen's kappa in Validation: 0.10

accuracy in Test: 0.36

confusion matrix

[[51 0 32 0 0 0 17 0 0 0]

[ 0 0 40 0 0 14 37 0 9 0]

[ 0 0 69 0 0 15 13 0 3 0]

[ 0 0 12 0 0 31 37 0 20 0]

[ 0 0 12 0 1 32 30 0 25 0]

[ 0 0 16 0 0 78 5 0 1 0]

[ 0 0 3 0 0 3 85 0 9 0]

[ 0 0 4 0 0 5 68 0 23 0]

[ 0 0 6 0 0 11 9 0 74 0]

[ 3 0 20 0 0 37 36 0 4 0]]

precision in Test: 0.33

recall in Test: 0.36

f1-score in Test: 0.25

cohen's kappa in Test: 0.29

######## Model: mlp\_2 ########

Train on 3750 samples, validate on 1250 samples

Epoch 1/5

3750/3750 [==============================] - 5s 1ms/step - loss: 0.0063 - acc: 0.9997 - val\_loss: 1.3876 - val\_acc: 0.7256

Epoch 2/5

3750/3750 [==============================] - 4s 1ms/step - loss: 0.0054 - acc: 1.0000 - val\_loss: 1.3843 - val\_acc: 0.7240

Epoch 3/5

3750/3750 [==============================] - 4s 1ms/step - loss: 0.0052 - acc: 1.0000 - val\_loss: 1.3876 - val\_acc: 0.7256

Epoch 4/5

3750/3750 [==============================] - 4s 1ms/step - loss: 0.0046 - acc: 1.0000 - val\_loss: 1.3860 - val\_acc: 0.7272

Epoch 5/5

3750/3750 [==============================] - 4s 1ms/step - loss: 0.0047 - acc: 0.9997 - val\_loss: 1.3866 - val\_acc: 0.7248

accuracy in Train: 1.00

confusion matrix

[[359 0 0 0 0 0 0 0 0 0]

[ 0 367 0 0 0 0 0 0 0 0]

[ 0 0 370 0 0 0 0 0 0 0]

[ 0 0 0 381 0 0 0 0 0 0]

[ 0 0 0 0 365 0 0 0 0 0]

[ 0 0 0 0 0 362 0 0 0 0]

[ 0 0 0 0 0 0 381 0 0 0]

[ 0 0 0 0 0 0 0 386 0 0]

[ 0 0 0 0 0 0 0 0 395 0]

[ 0 0 0 0 0 0 0 0 0 384]]

precision in Train: 1.00

recall in Train: 1.00

f1-score in Train: 1.00

cohen's kappa in Train: 1.00

accuracy in Validation: 0.72

confusion matrix

[[ 97 3 7 1 0 0 1 0 0 4]

[ 4 108 4 1 4 6 3 1 1 1]

[ 2 8 88 4 7 15 4 3 1 4]

[ 0 3 7 73 27 1 8 6 6 2]

[ 0 1 11 19 82 4 2 6 1 0]

[ 1 1 7 0 3 103 0 0 1 4]

[ 2 1 8 8 1 0 96 5 9 2]

[ 3 1 2 7 3 1 15 69 11 2]

[ 0 0 4 2 4 4 5 4 92 1]

[ 2 3 5 3 0 9 4 2 1 98]]

precision in Validation: 0.73

recall in Validation: 0.73

f1-score in Validation: 0.73

cohen's kappa in Validation: 0.69

accuracy in Test: 0.73

confusion matrix

[[87 1 4 0 1 1 0 2 0 4]

[ 2 87 2 1 0 1 2 2 2 1]

[ 5 6 62 3 6 3 6 1 4 4]

[ 0 1 7 59 20 4 1 2 3 3]

[ 0 2 3 15 61 3 7 4 4 1]

[ 4 1 5 1 5 75 1 0 3 5]

[ 1 0 4 5 3 0 74 8 2 3]

[ 2 3 3 1 5 0 6 71 7 2]

[ 0 2 3 2 1 6 6 4 73 3]

[ 3 0 3 3 1 6 0 1 2 81]]

precision in Test: 0.73

recall in Test: 0.73

f1-score in Test: 0.73

cohen's kappa in Test: 0.70

######## Model: mlp\_3 ########

Train on 3750 samples, validate on 1250 samples

Epoch 1/5

3750/3750 [==============================] - 1s 135us/step - loss: 0.0303 - acc: 1.0000 - val\_loss: 1.2258 - val\_acc: 0.6888

Epoch 2/5

3750/3750 [==============================] - 1s 135us/step - loss: 0.0267 - acc: 1.0000 - val\_loss: 1.2275 - val\_acc: 0.6880

Epoch 3/5

3750/3750 [==============================] - 1s 143us/step - loss: 0.0239 - acc: 1.0000 - val\_loss: 1.2296 - val\_acc: 0.6880

Epoch 4/5

3750/3750 [==============================] - 0s 132us/step - loss: 0.0217 - acc: 1.0000 - val\_loss: 1.2327 - val\_acc: 0.6872

Epoch 5/5

3750/3750 [==============================] - 0s 131us/step - loss: 0.0197 - acc: 1.0000 - val\_loss: 1.2358 - val\_acc: 0.6872

accuracy in Train: 1.00

confusion matrix

[[359 0 0 0 0 0 0 0 0 0]

[ 0 367 0 0 0 0 0 0 0 0]

[ 0 0 370 0 0 0 0 0 0 0]

[ 0 0 0 381 0 0 0 0 0 0]

[ 0 0 0 0 365 0 0 0 0 0]

[ 0 0 0 0 0 362 0 0 0 0]

[ 0 0 0 0 0 0 381 0 0 0]

[ 0 0 0 0 0 0 0 386 0 0]

[ 0 0 0 0 0 0 0 0 395 0]

[ 0 0 0 0 0 0 0 0 0 384]]

precision in Train: 1.00

recall in Train: 1.00

f1-score in Train: 1.00

cohen's kappa in Train: 1.00

accuracy in Validation: 0.69

confusion matrix

[[ 99 1 6 1 1 0 0 2 0 3]

[ 6 104 1 1 4 8 3 4 1 1]

[ 4 5 81 4 7 10 9 3 3 10]

[ 0 2 6 61 35 1 9 13 4 2]

[ 1 3 5 22 71 5 2 12 2 3]

[ 2 3 6 1 2 96 0 0 3 7]

[ 2 2 7 8 2 1 88 13 7 2]

[ 2 5 1 5 3 0 10 76 11 1]

[ 0 0 3 3 8 7 3 5 86 1]

[ 3 2 4 1 2 12 3 3 0 97]]

precision in Validation: 0.69

recall in Validation: 0.69

f1-score in Validation: 0.69

cohen's kappa in Validation: 0.65

accuracy in Test: 0.72

confusion matrix

[[84 2 6 0 1 1 0 2 0 4]

[ 2 85 3 1 0 1 2 3 2 1]

[ 5 6 65 4 5 2 5 1 4 3]

[ 0 0 6 57 21 3 3 1 4 5]

[ 0 2 5 18 59 3 5 3 4 1]

[ 2 1 6 0 4 77 1 1 4 4]

[ 1 1 3 4 3 0 71 11 4 2]

[ 2 1 2 3 3 0 10 68 6 5]

[ 0 2 4 2 1 4 7 2 76 2]

[ 1 1 4 2 1 5 1 2 1 82]]

precision in Test: 0.72

recall in Test: 0.72

f1-score in Test: 0.72

cohen's kappa in Test: 0.69

######### Model: rfe #########

accuracy in Train: 1.00

confusion matrix

[[359 0 0 0 0 0 0 0 0 0]

[ 0 367 0 0 0 0 0 0 0 0]

[ 0 0 370 0 0 0 0 0 0 0]

[ 0 0 0 381 0 0 0 0 0 0]

[ 0 0 0 0 365 0 0 0 0 0]

[ 0 0 0 0 0 362 0 0 0 0]

[ 0 0 0 0 0 0 381 0 0 0]

[ 0 0 0 0 0 0 0 386 0 0]

[ 0 0 0 0 0 0 0 0 395 0]

[ 0 0 0 0 0 0 0 0 0 384]]

precision in Train: 1.00

recall in Train: 1.00

f1-score in Train: 1.00

cohen's kappa in Train: 1.00

accuracy in Validation: 0.08

confusion matrix

[[ 0 8 6 30 3 16 1 3 1 45]

[ 4 14 35 1 6 24 5 4 2 38]

[ 2 7 43 4 7 57 1 1 2 12]

[ 0 2 61 1 10 28 21 2 4 4]

[ 0 1 83 1 9 23 6 1 2 0]

[ 3 16 28 7 17 27 8 2 0 12]

[ 0 7 64 2 0 36 2 1 0 20]

[ 1 4 53 2 3 32 4 1 2 12]

[ 0 0 54 0 3 55 0 0 0 4]

[ 0 15 32 14 14 33 5 3 4 7]]

precision in Validation: 0.06

recall in Validation: 0.08

f1-score in Validation: 0.06

cohen's kappa in Validation: -0.02

accuracy in Test: 0.66

confusion matrix

[[83 5 5 0 0 0 6 0 0 1]

[ 7 76 4 2 2 0 3 0 6 0]

[ 4 9 64 0 3 8 3 1 4 4]

[ 0 0 4 56 17 2 2 8 8 3]

[ 0 2 3 21 53 4 2 3 10 2]

[ 8 4 10 1 4 65 2 1 4 1]

[ 1 3 2 4 9 1 65 12 3 0]

[ 1 2 2 7 2 2 13 60 10 1]

[ 1 3 2 5 5 4 5 2 73 0]

[ 4 0 8 5 2 4 6 3 3 65]]

precision in Test: 0.67

recall in Test: 0.66

f1-score in Test: 0.66

cohen's kappa in Test: 0.62

######## Model: xgbc #########

accuracy in Train: 1.00

confusion matrix

[[359 0 0 0 0 0 0 0 0 0]

[ 0 367 0 0 0 0 0 0 0 0]

[ 0 0 370 0 0 0 0 0 0 0]

[ 0 0 0 381 0 0 0 0 0 0]

[ 0 0 0 0 365 0 0 0 0 0]

[ 0 0 0 0 0 362 0 0 0 0]

[ 0 0 0 0 0 0 381 0 0 0]

[ 0 0 0 0 0 0 0 386 0 0]

[ 0 0 0 0 0 0 0 0 395 0]

[ 0 0 0 0 0 0 0 0 0 384]]

precision in Train: 1.00

recall in Train: 1.00

f1-score in Train: 1.00

cohen's kappa in Train: 1.00

accuracy in Validation: 0.08

confusion matrix

[[12 2 12 20 1 18 2 3 15 28]

[64 0 3 2 7 20 2 2 15 18]

[11 3 20 6 0 70 1 0 9 16]

[16 3 38 2 2 25 4 4 16 23]

[ 9 2 50 1 7 36 1 1 5 14]

[15 4 30 5 8 33 8 4 3 10]

[ 8 6 46 3 0 27 4 2 4 32]

[10 2 37 2 2 18 5 2 2 34]

[10 2 28 3 1 48 1 0 1 22]

[ 5 4 24 10 3 40 12 2 9 18]]

precision in Validation: 0.08

recall in Validation: 0.08

f1-score in Validation: 0.06

cohen's kappa in Validation: -0.02

accuracy in Test: 0.70

confusion matrix

[[88 2 4 0 0 0 4 0 0 2]

[ 7 79 4 2 2 0 1 1 3 1]

[ 6 5 64 1 1 10 5 0 4 4]

[ 0 0 5 58 15 2 3 5 7 5]

[ 0 2 9 22 52 2 2 3 6 2]

[ 7 4 5 1 4 68 1 2 5 3]

[ 1 2 1 4 5 0 76 7 3 1]

[ 0 1 2 4 2 2 15 63 10 1]

[ 1 4 3 5 1 1 5 3 77 0]

[ 2 0 4 4 1 4 2 4 4 75]]

precision in Test: 0.70

recall in Test: 0.70

f1-score in Test: 0.70

cohen's kappa in Test: 0.67

######### Model: adb #########

accuracy in Train: 0.64

confusion matrix

[[308 9 14 1 2 5 4 3 0 13]

[ 49 232 15 8 10 19 10 6 14 4]

[ 16 13 213 19 14 46 13 4 11 21]

[ 1 12 16 243 50 10 8 15 13 13]

[ 0 6 29 87 180 10 12 13 26 2]

[ 10 17 46 13 8 241 4 0 6 17]

[ 9 6 13 25 12 0 238 37 32 9]

[ 5 10 4 31 29 2 36 206 54 9]

[ 0 8 13 11 37 2 16 11 297 0]

[ 21 8 18 23 0 27 17 10 4 256]]

precision in Train: 0.65

recall in Train: 0.64

f1-score in Train: 0.64

cohen's kappa in Train: 0.60

accuracy in Validation: 0.09

confusion matrix

[[ 4 21 23 31 8 3 0 5 2 16]

[54 12 12 3 8 7 0 8 4 25]

[14 5 39 9 17 23 1 7 2 19]

[13 6 41 6 9 16 4 7 4 27]

[13 1 53 11 11 11 1 3 2 20]

[ 7 9 30 20 28 4 4 7 1 10]

[12 9 40 5 4 9 7 2 1 43]

[ 2 2 36 7 3 12 3 7 0 42]

[15 0 41 8 9 8 1 0 1 33]

[ 3 10 36 14 18 9 9 1 3 24]]

precision in Validation: 0.10

recall in Validation: 0.09

f1-score in Validation: 0.08

cohen's kappa in Validation: -0.01

accuracy in Test: 0.59

confusion matrix

[[84 4 4 0 0 1 4 0 0 3]

[15 61 9 3 0 2 2 2 5 1]

[15 7 48 2 1 12 6 1 2 6]

[ 0 1 8 55 18 3 4 4 4 3]

[ 0 0 12 24 44 1 5 5 8 1]

[ 7 2 11 2 5 59 4 1 4 5]

[ 1 4 2 5 12 0 62 8 3 3]

[ 3 1 3 7 9 0 11 51 13 2]

[ 1 4 5 10 6 3 4 3 64 0]

[ 4 1 5 8 1 6 3 4 1 67]]

precision in Test: 0.60

recall in Test: 0.59

f1-score in Test: 0.59

cohen's kappa in Test: 0.55

######### Model: gbc #########