LOGISTIC REGRESSION:

```
Generalized Linear Model

1361 samples
  81 predictor
   2 classes: 'no_complication', 'complication'

Pre-processing: centered (81), scaled (81)
Resampling: Cross-Validated (10 fold)
Summary of sample sizes: 1224, 1225, 1225, 1226, 1225, 1225, ...
Resampling results:


  Accuracy   Kappa
  0.7964713  0.310814
```

```
print(confusion_matrix)
```

```
Confusion Matrix and Statistics

                Reference
Prediction        no_complication complication
  no_complication             252           52
  complication                  9           26

               Accuracy : 0.8201
                 95% CI : (0.7749, 0.8595)
    No Information Rate : 0.7699
    P-Value [Acc > NIR] : 0.01479

                  Kappa : 0.3704

 Mcnemar's Test P-Value : 7.551e-08

            Sensitivity : 0.9655
            Specificity : 0.3333
         Pos Pred Value : 0.8289
         Neg Pred Value : 0.7429
             Prevalence : 0.7699
         Detection Rate : 0.7434
   Detection Prevalence : 0.8968
      Balanced Accuracy : 0.6494

       'Positive' Class : no_complicationprint(logistic_model)
```

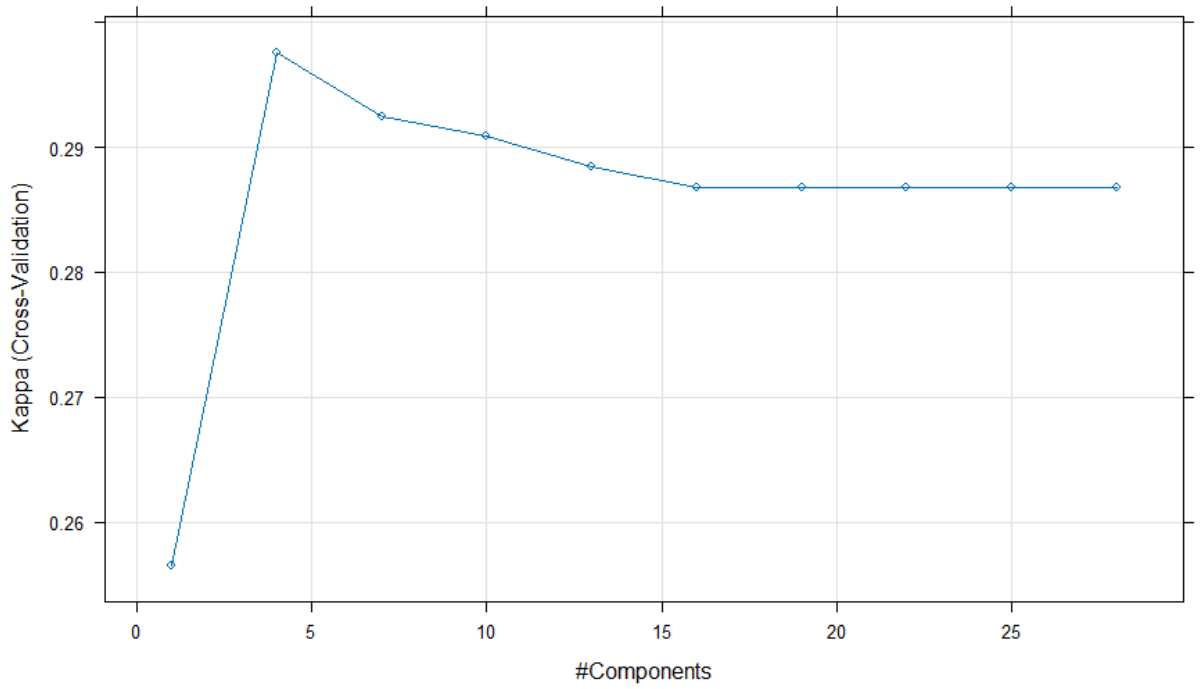
LDA

```
print(lda_model)
Linear Discriminant Analysis

1361 samples
  81 predictor
   2 classes: 'no_complication', 'complication'

Pre-processing: centered (81), scaled (81)
Resampling: Cross-Validated (10 fold)
Summary of sample sizes: 1224, 1225, 1225, 1226, 1225, 1225, ...
Resampling results:

  Accuracy   Kappa
  0.7993911  0.302796
print(confusion_matrix)
Confusion Matrix and Statistics

                Reference
```

```
Prediction        no_complication complication
  no_complication             254           54
  complication                  7           24

               Accuracy : 0.8201
                 95% CI : (0.7749, 0.8595)
    No Information Rate : 0.7699
    P-Value [Acc > NIR] : 0.01479

                  Kappa : 0.3561

 Mcnemar's Test P-Value : 3.869e-09

            Sensitivity : 0.9732
            Specificity : 0.3077
         Pos Pred Value : 0.8247
         Neg Pred Value : 0.7742
             Prevalence : 0.7699
         Detection Rate : 0.7493
   Detection Prevalence : 0.9086
      Balanced Accuracy : 0.6404

       'Positive' Class : no_complication
```

PLSDA:

```
print(plsda_model)
Partial Least Squares

1361 samples
  81 predictor
   2 classes: 'no_complication', 'complication'

Pre-processing: centered (81), scaled (81)
Resampling: Cross-Validated (10 fold)
Summary of sample sizes: 1224, 1225, 1225, 1226, 1225, 1225, ...
Resampling results across tuning parameters:

  ncomp  Accuracy   Kappa
   1     0.7935520  0.2565033
   4     0.8045114  0.2975687
   7     0.8008403  0.2924411
  10     0.8001050  0.2908365
  13     0.8001050  0.2884129
  16     0.7993697  0.2868083
  19     0.7993697  0.2868083
  22     0.7993697  0.2868083
  25     0.7993697  0.2868083
  28     0.7993697  0.2868083

Kappa was used to select the optimal model using the largest value.
The final value used for the model was ncomp = 4.
```



```
print(confusion_matrix_plsda)
Confusion Matrix and Statistics

                Reference
Prediction        no_complication complication
  no_complication             252           51
  complication                  9           27

               Accuracy : 0.823
                 95% CI : (0.7781, 0.8621)
    No Information Rate : 0.7699
    P-Value [Acc > NIR] : 0.01037

                  Kappa : 0.3842

 Mcnemar's Test P-Value : 1.203e-07

            Sensitivity : 0.9655
            Specificity : 0.3462
         Pos Pred Value : 0.8317
         Neg Pred Value : 0.7500
             Prevalence : 0.7699
         Detection Rate : 0.7434
   Detection Prevalence : 0.8938
      Balanced Accuracy : 0.6558

       'Positive' Class : no_complication
```

PM:

```
print(pm_model)
glmnet

1361 samples
  81 predictor
   2 classes: 'no_complication', 'complication'

Pre-processing: centered (81), scaled (81)
Resampling: Cross-Validated (10 fold)
Summary of sample sizes: 1224, 1225, 1225, 1225, 1225, 1225, ...
Resampling results across tuning parameters:

  alpha  lambda        Accuracy   Kappa
  0.0    1.000000e-04  0.8089826  0.344218437
  0.0    3.593814e-04  0.8089826  0.344218437
  0.0    1.291550e-03  0.8089826  0.344218437
```

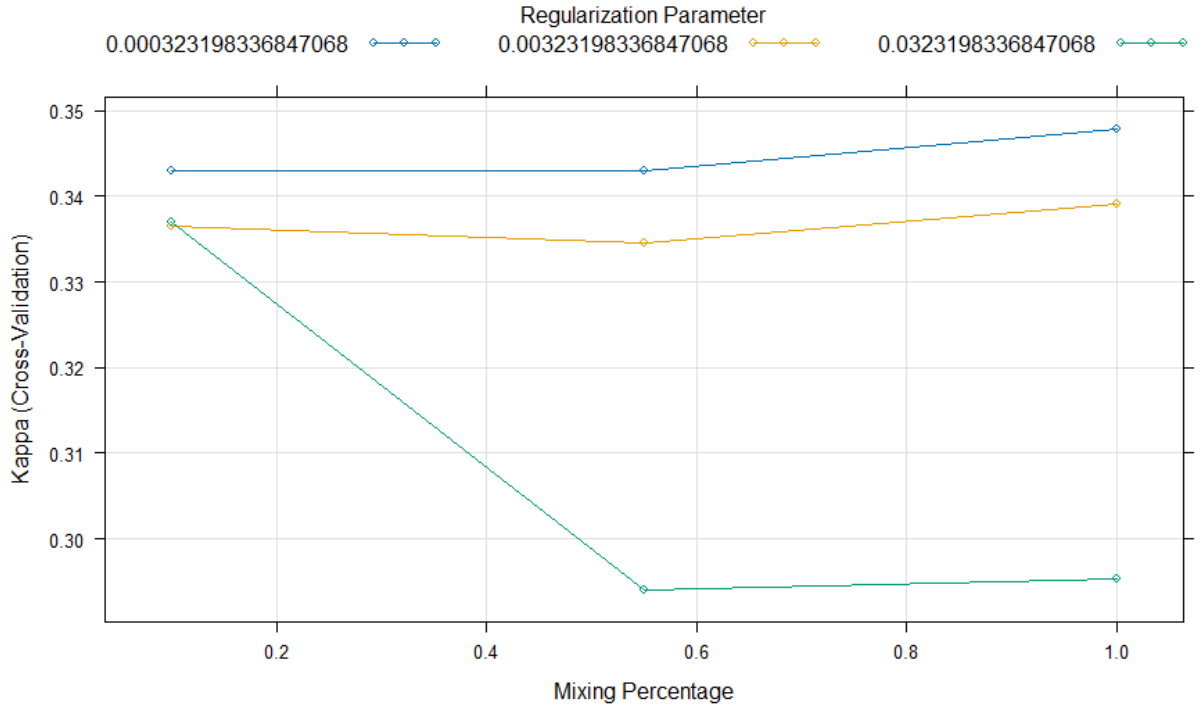
0.0	4.641589e-03	0.8089826	0.344218437
0.0	1.668101e-02	0.8089826	0.344218437
0.0	5.994843e-02	0.8097181	0.324030943
0.0	2.154435e-01	0.7928169	0.195795498
0.0	7.742637e-01	0.7692869	0.009413317
0.0	2.782559e+00	0.7678217	0.000000000
0.0	1.000000e+01	0.7678217	0.000000000
0.1	1.000000e-04	0.8038462	0.343034500
0.1	3.593814e-04	0.8038462	0.343034500
0.1	1.291550e-03	0.8038462	0.343211836
0.1	4.641589e-03	0.8038355	0.336474456
0.1	1.668101e-02	0.8111886	0.343933387
0.1	5.994843e-02	0.8119024	0.311634310
0.1	2.154435e-01	0.7950120	0.192975714
0.1	7.742637e-01	0.7678217	0.000000000
0.1	2.782559e+00	0.7678217	0.000000000
0.1	1.000000e+01	0.7678217	0.000000000
0.2	1.000000e-04	0.8038462	0.343034500
0.2	3.593814e-04	0.8038462	0.343034500
0.2	1.291550e-03	0.8038462	0.343211836
0.2	4.641589e-03	0.8045708	0.335993543
0.2	1.668101e-02	0.8126485	0.341944903
0.2	5.994843e-02	0.8111618	0.296033166
0.2	2.154435e-01	0.7700330	0.036627516
0.2	7.742637e-01	0.7678217	0.000000000
0.2	2.782559e+00	0.7678217	0.000000000
0.2	1.000000e+01	0.7678217	0.000000000
0.3	1.000000e-04	0.8038462	0.343034500
0.3	3.593814e-04	0.8038462	0.343034500
0.3	1.291550e-03	0.8045708	0.344781689
0.3	4.641589e-03	0.8053115	0.336067419
0.3	1.668101e-02	0.8119240	0.336592916
0.3	5.994843e-02	0.8126323	0.297373998
0.3	2.154435e-01	0.7678217	0.000000000
0.3	7.742637e-01	0.7678217	0.000000000
0.3	2.782559e+00	0.7678217	0.000000000
0.3	1.000000e+01	0.7678217	0.000000000
0.4	1.000000e-04	0.8031109	0.341337975
0.4	3.593814e-04	0.8031109	0.341337975
0.4	1.291550e-03	0.8031002	0.336576550
0.4	4.641589e-03	0.8067820	0.335969586
0.4	1.668101e-02	0.8119024	0.325285399
0.4	5.994843e-02	0.8126323	0.295285343
0.4	2.154435e-01	0.7678217	0.000000000
0.4	7.742637e-01	0.7678217	0.000000000
0.4	2.782559e+00	0.7678217	0.000000000
0.4	1.000000e+01	0.7678217	0.000000000
0.5	1.000000e-04	0.8031109	0.341337975
0.5	3.593814e-04	0.8045815	0.344702776

0.5	1.291550e-03	0.8045708	0.339615409
0.5	4.641589e-03	0.8097071	0.344168354
0.5	1.668101e-02	0.8111618	0.317835869
0.5	5.994843e-02	0.8126323	0.295285343
0.5	2.154435e-01	0.7678217	0.000000000
0.5	7.742637e-01	0.7678217	0.000000000
0.5	2.782559e+00	0.7678217	0.000000000
0.5	1.000000e+01	0.7678217	0.000000000
0.6	1.000000e-04	0.8031109	0.341337975
0.6	3.593814e-04	0.8045815	0.344702776
0.6	1.291550e-03	0.8038355	0.336474456
0.6	4.641589e-03	0.8089718	0.342450712
0.6	1.668101e-02	0.8111618	0.314156365
0.6	5.994843e-02	0.8126323	0.295285343
0.6	2.154435e-01	0.7678217	0.000000000
0.6	7.742637e-01	0.7678217	0.000000000
0.6	2.782559e+00	0.7678217	0.000000000
0.6	1.000000e+01	0.7678217	0.000000000
0.7	1.000000e-04	0.8031109	0.341337975
0.7	3.593814e-04	0.8045815	0.344702776
0.7	1.291550e-03	0.8038355	0.336474456
0.7	4.641589e-03	0.8097126	0.342541100
0.7	1.668101e-02	0.8111672	0.305923786
0.7	5.994843e-02	0.8126323	0.295285343
0.7	2.154435e-01	0.7678217	0.000000000
0.7	7.742637e-01	0.7678217	0.000000000
0.7	2.782559e+00	0.7678217	0.000000000
0.7	1.000000e+01	0.7678217	0.000000000
0.8	1.000000e-04	0.8031109	0.341337975
0.8	3.593814e-04	0.8053115	0.347808222
0.8	1.291550e-03	0.8031002	0.332979566
0.8	4.641589e-03	0.8097126	0.338928178
0.8	1.668101e-02	0.8111672	0.300164086
0.8	5.994843e-02	0.8126323	0.295285343
0.8	2.154435e-01	0.7678217	0.000000000
0.8	7.742637e-01	0.7678217	0.000000000
0.8	2.782559e+00	0.7678217	0.000000000
0.8	1.000000e+01	0.7678217	0.000000000
0.9	1.000000e-04	0.8031109	0.341337975
0.9	3.593814e-04	0.8053115	0.347808222
0.9	1.291550e-03	0.8038355	0.334588278
0.9	4.641589e-03	0.8119185	0.342261697
0.9	1.668101e-02	0.8104265	0.296394387
0.9	5.994843e-02	0.8126323	0.295285343
0.9	2.154435e-01	0.7678217	0.000000000
0.9	7.742637e-01	0.7678217	0.000000000
0.9	2.782559e+00	0.7678217	0.000000000
0.9	1.000000e+01	0.7678217	0.000000000
1.0	1.000000e-04	0.8031109	0.341337975

```
  1.0    3.593814e-04  0.8053115  0.347808222
  1.0    1.291550e-03  0.8031056  0.331463093
  1.0    4.641589e-03  0.8119185  0.342261697
  1.0    1.668101e-02  0.8104265  0.294490810
  1.0    5.994843e-02  0.8126323  0.295285343
  1.0    2.154435e-01  0.7678217  0.000000000
  1.0    7.742637e-01  0.7678217  0.000000000
  1.0    2.782559e+00  0.7678217  0.000000000
  1.0    1.000000e+01  0.7678217  0.000000000

Kappa was used to select the optimal model using the largest value.
The final values used for the model were alpha = 0.8 and lambda = 0.0003593814.
```

PM:

```
print(pm_model)
glmnet

1361 samples
  81 predictor
   2 classes: 'no_complication', 'complication'

Pre-processing: centered (81), scaled (81)
Resampling: Cross-Validated (10 fold)
Summary of sample sizes: 1224, 1225, 1225, 1225, 1225, 1225, ...
Resampling results across tuning parameters:

  alpha  lambda        Accuracy   Kappa
  0.10   0.0003231983  0.8038462  0.3430345
  0.10   0.0032319834  0.8038355  0.3364745
  0.10   0.0323198337  0.8126593  0.3369634
  0.55   0.0003231983  0.8038462  0.3430063
  0.55   0.0032319834  0.8053115  0.3344751
  0.55   0.0323198337  0.8111618  0.2940654
  1.00   0.0003231983  0.8053115  0.3478082
  1.00   0.0032319834  0.8082365  0.3391610
  1.00   0.0323198337  0.8126323  0.2952853

Kappa was used to select the optimal model using the largest value.
The final values used for the model were alpha = 1 and lambda = 0.0003231983.
```



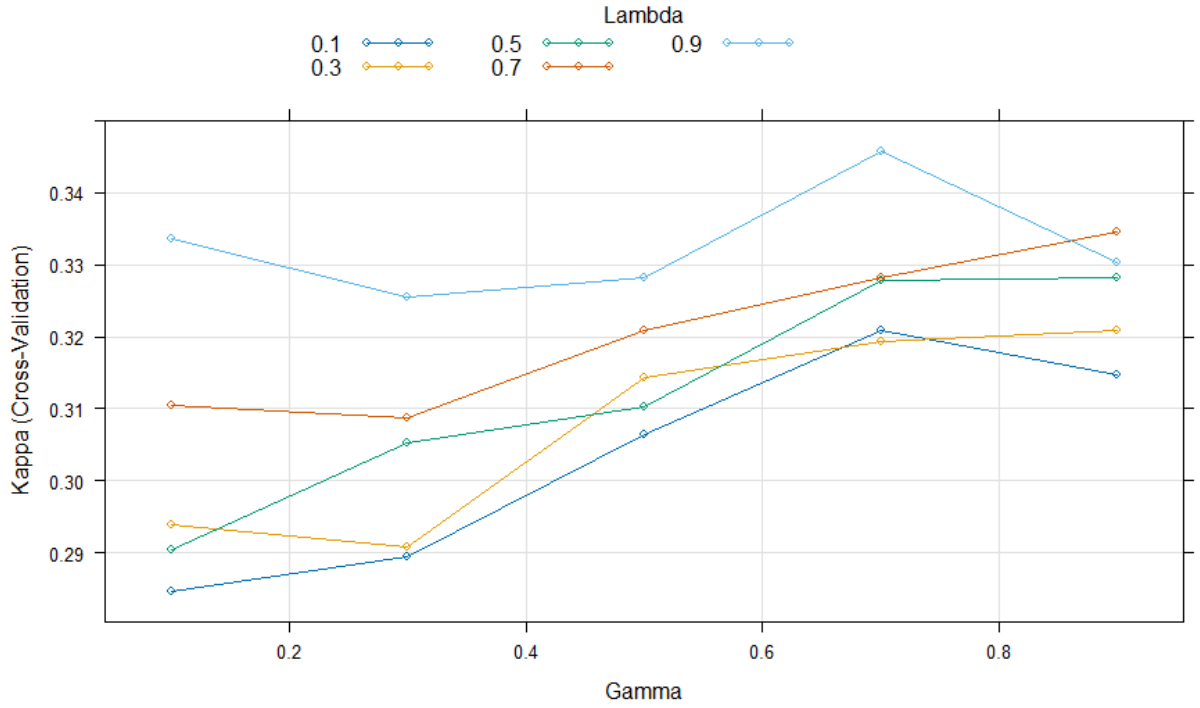

```
print(confusion_matrix_pm)
Confusion Matrix and Statistics

                Reference
Prediction        no_complication complication
  no_complication             251            60
  complication                 10            18

               Accuracy : 0.7935
                 95% CI : (0.7465, 0.8353)
    No Information Rate : 0.7699
    P-Value [Acc > NIR] : 0.1667

                  Kappa : 0.2482

 Mcnemar's Test P-Value : 4.724e-09

            Sensitivity : 0.9617
            Specificity : 0.2308
         Pos Pred Value : 0.8071
         Neg Pred Value : 0.6429
             Prevalence : 0.7699
         Detection Rate : 0.7404
   Detection Prevalence : 0.9174
      Balanced Accuracy : 0.5962
```

'Positive' Class : no_complication

NON-LINEAR MODELS:

RDA:

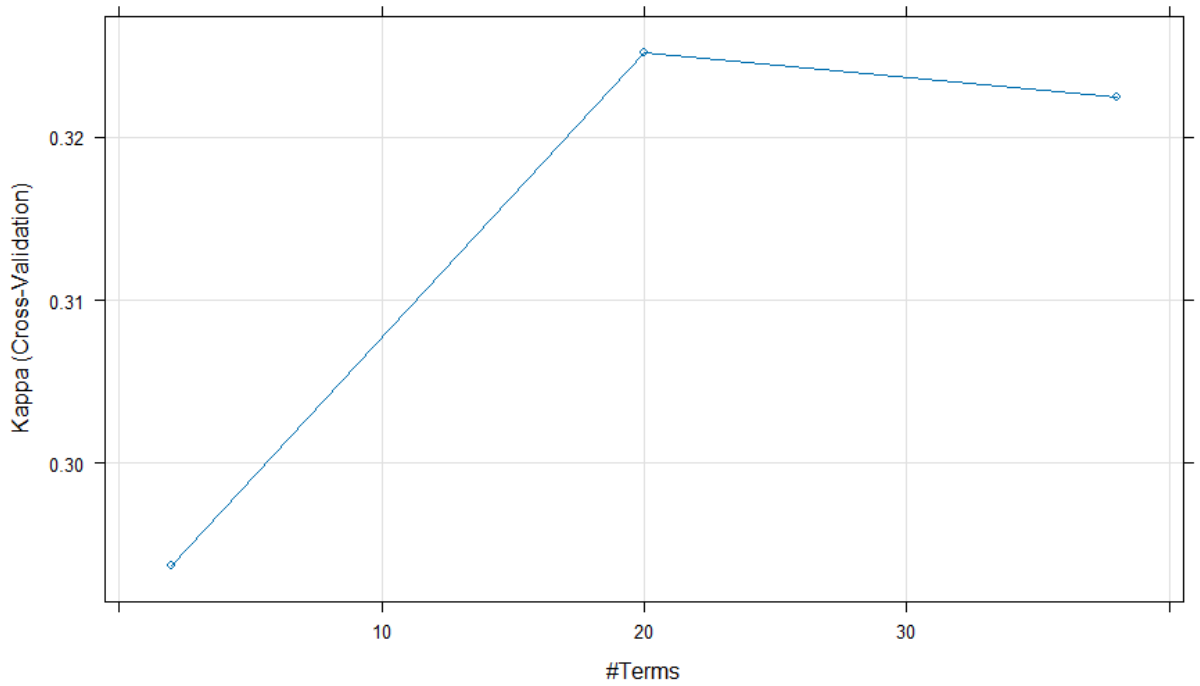
```
print(rda_model)
Regularized Discriminant Analysis

1361 samples
  81 predictor
   2 classes: 'no_complication', 'complication'

Pre-processing: centered (81), scaled (81)
Resampling: Cross-Validated (10 fold)
Summary of sample sizes: 1224, 1226, 1225, 1225, 1226, 1225, ...
Resampling results across tuning parameters:
The
  gamma  lambda  Accuracy   Kappa
  0.1    0.1     0.7626532  0.2846853
  0.1    0.3     0.7582413  0.2938922
  0.1    0.5     0.7575006  0.2904087
  0.1    0.7     0.7670596  0.3104340
  0.1    0.9     0.7935473  0.3336677
  0.3    0.1     0.7575003  0.2894921
  0.3    0.3     0.7582194  0.2907668
  0.5    0.3     0.7641075  0.3142871
  0.5    0.5     0.7670379  0.3102348
  0.5    0.7     0.7788520  0.3209666
  0.5    0.9     0.7943479  0.3281710
  0.7    0.1     0.7641563  0.3207889
  0.7    0.3     0.7663352  0.3192700
  0.7    0.5     0.7722233  0.3279077
  0.7    0.7     0.7803173  0.3281934
  0.7    0.9     0.7980193  0.3457431
  0.9    0.1     0.7596960  0.3146620

Kappa was used to select the optimal model using the largest value.
The final values used for the model were gamma = 0.7 and lambda = 0.9.
```




```
print(confusion_matrix_rda)
Confusion Matrix and Statistics

                Reference
Prediction        no_complication complication
  no_complication             241           50
  complication                 20           28

               Accuracy : 0.7935
                 95% CI : (0.7465, 0.8353)
    No Information Rate : 0.7699
    P-Value [Acc > NIR] : 0.1667140

                  Kappa : 0.3263

 Mcnemar's Test P-Value : 0.0005279

            Sensitivity : 0.9234
            Specificity : 0.3590
         Pos Pred Value : 0.8282
         Neg Pred Value : 0.5833
             Prevalence : 0.7699
         Detection Rate : 0.7109
   Detection Prevalence : 0.8584
      Balanced Accuracy : 0.6412

       'Positive' Class : no_complication
```

FDA:

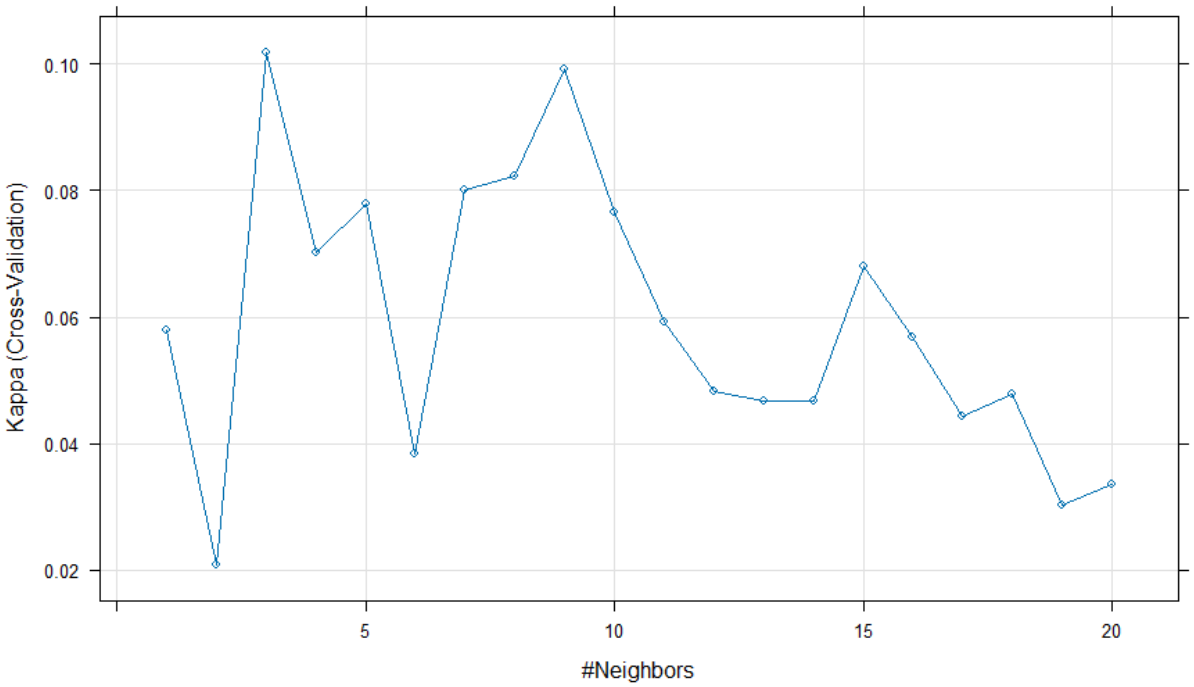
```
print(fda_model)
Flexible Discriminant Analysis

1361 samples
  81 predictor
   2 classes: 'no_complication', 'complication'

Pre-processing: centered (81), scaled (81)
Resampling: Cross-Validated (10 fold)
Summary of sample sizes: 1224, 1226, 1225, 1225, 1226, 1225, ...
Resampling results across tuning parameters:

  nprune  Accuracy   Kappa
   2      0.8134336  0.2937060
  20      0.8089892  0.3251865
  38      0.8075077  0.3224468

Tuning parameter 'degree' was held constant at a value of 1
Kappa was used to select the optimal mod using the largest value.
The final values used for the model were degree = 1 and nprune = 20.
```



```
print(confusion_matrix_fda)
Confusion Matrix and Statistics

                Reference
Prediction        no_complication complication
  no_complication             254           57
  complication                  7           21

               Accuracy : 0.8112
                 95% CI : (0.7654, 0.8515)
    No Information Rate : 0.7699
    P-Value [Acc > NIR] : 0.0385

                  Kappa : 0.3127

 Mcnemar's Test P-Value : 9.068e-10

            Sensitivity : 0.9732
            Specificity : 0.2692
         Pos Pred Value : 0.8167
         Neg Pred Value : 0.7500
             Prevalence : 0.7699
         Detection Rate : 0.7493
   Detection Prevalence : 0.9174
      Balanced Accuracy : 0.6212

       'Positive' Class : no_complication
```

KNN

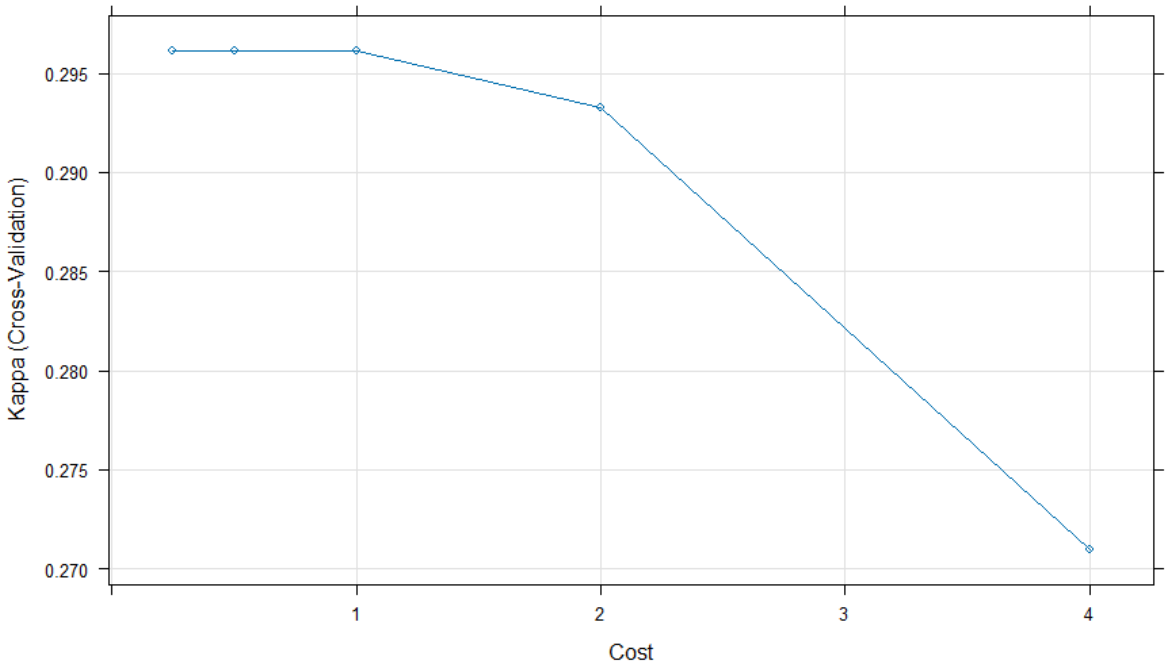
```
print(knn_model)
k-Nearest Neighbors

1361 samples
  81 predictor
   2 classes: 'no_complication', 'complication'

Pre-processing: centered (81), scaled (81)
Resampling: Cross-Validated (10 fold)
Summary of sample sizes: 1226, 1226, 1225, 1225, 1226, 1225, ...
Resampling results across tuning parameters:

  k   Accuracy   Kappa
   1  0.6913320  0.05799704
   2  0.6804483  0.02083376
   3  0.7465245  0.10184021
   4  0.7384147  0.07012538
   5  0.7582684  0.07796487
   6  0.7502232  0.03846270
   7  0.7685845  0.08000863
   8  0.7671030  0.08230773
   9  0.7736993  0.09915661
  10  0.7700550  0.07660979
  11  0.7700010  0.05922164
  12  0.7692820  0.04831329
  13  0.7700173  0.04678443
  14  0.7700065  0.04678594
  15  0.7759053  0.06799653
  16  0.7751916  0.05691059
  17  0.7737102  0.04436763
  18  0.7737156  0.04774323
  19  0.7715042  0.03028619
  20  0.7714880  0.03359363

Kappa was used to select the optimal model using the largest value.
The final value used for the model was k = 3.
```


Kappa (Cross-Validation)
0.10
0.08
0.06
0.04
0.02
5
10
15
20
#Neighbors

```
print(confusion_matrix_knn)
Confusion Matrix and Statistics

                Reference
Prediction        no_complication complication
  no_complication             238           61
  complication                 23           17

               Accuracy : 0.7522
                 95% CI : (0.7027, 0.7973)
    No Information Rate : 0.7699
    P-Value [Acc > NIR] : 0.8002

                  Kappa : 0.1566

 Mcnemar's Test P-Value : 5.413e-05

            Sensitivity : 0.9119
            Specificity : 0.2179
         Pos Pred Value : 0.7960
         Neg Pred Value : 0.4250
             Prevalence : 0.7699
         Detection Rate : 0.7021
   Detection Prevalence : 0.8820
      Balanced Accuracy : 0.5649

       'Positive' Class : no_complication
```

SVM:

```
print(svm_model)
Support Vector Machines with Radial Basis Function Kernel

1361 samples
  81 predictor
   2 classes: 'no_complication', 'complication'

Pre-processing: centered (81), scaled (81)
Resampling: Cross-Validated (10 fold)
Summary of sample sizes: 1226, 1225, 1225, 1224, 1225, 1224, ...
Resampling results across tuning parameters:

  C     Accuracy   Kappa
  0.25  0.8126379  0.2961295
  0.50  0.8126379  0.2961295
  1.00  0.8126379  0.2961295
  2.00  0.8089612  0.2932952
  4.00  0.7986884  0.2709781

Tuning parameter 'sigma' was held constant at a value of 0.006848174
Kappa was used to select the optimal model using the largest value.
The final values used for the model were sigma = 0.006848174 and C = 0.25.
```


Kappa (Cross-Validation)
0.295
0.290
0.285
0.280
0.275
0.270
1
2
3
4
Cost

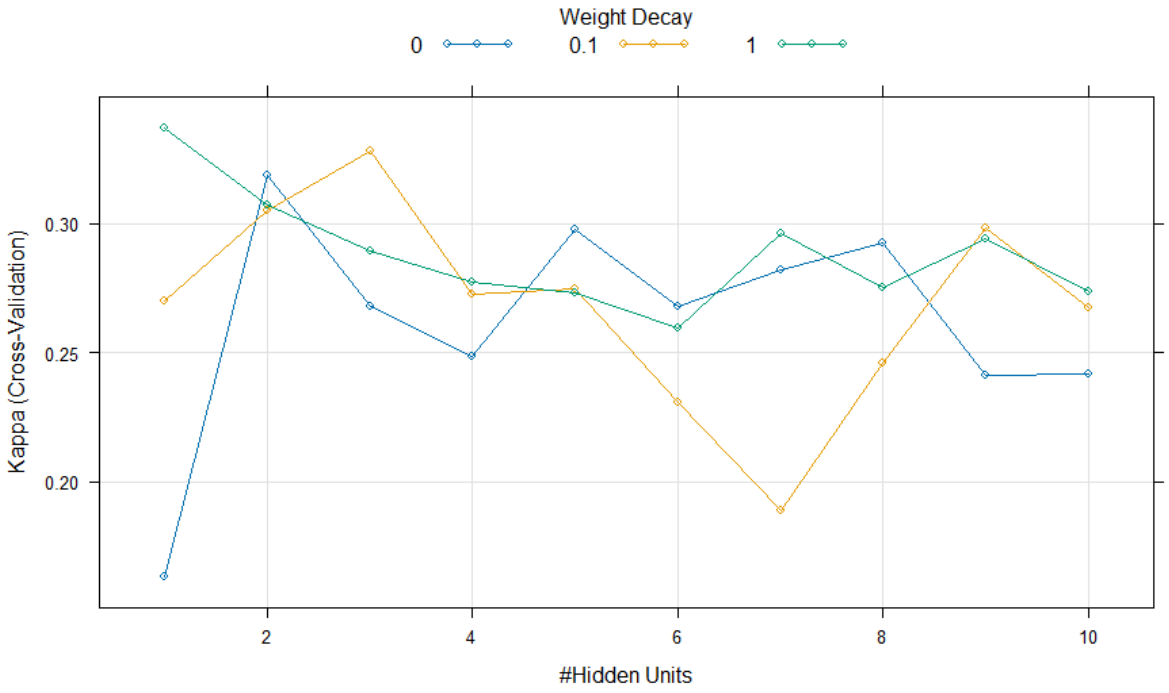
```
print(confusion_matrix_svm)
Confusion Matrix and Statistics

                Reference
Prediction        no_complication complication
  no_complication             260            62
  complication                  1            16

               Accuracy : 0.8142
                 95% CI : (0.7686, 0.8541)
    No Information Rate : 0.7699
    P-Value [Acc > NIR] : 0.02848

                  Kappa : 0.2773

 Mcnemar's Test P-Value : 4.053e-14

            Sensitivity : 0.9962
            Specificity : 0.2051
         Pos Pred Value : 0.8075
         Neg Pred Value : 0.9412
             Prevalence : 0.7699
         Detection Rate : 0.7670
   Detection Prevalence : 0.9499
      Balanced Accuracy : 0.6006

       'Positive' Class : no_complication
```

NEURAL NETWORK

```
print(nn_model)
Neural Network

1361 samples
  81 predictor
   2 classes: 'no_complication', 'complication'

Pre-processing: centered (81), scaled (81)
Resampling: Cross-Validated (10 fold)
Summary of sample sizes: 1226, 1226, 1225, 1224, 1224, 1224, ...
Resampling results across tuning parameters:

  size  decay  Accuracy   Kappa
   1    0.0    0.7026372  0.1632912
```

1	**0.1**	**0.7194312**	**0.2698016**
1	**1.0**	**0.7869730**	**0.3368665**
2	**0.0**	**0.7766676**	**0.3188308**
2	**0.1**	**0.7826044**	**0.3051195**
2	**1.0**	**0.7877572**	**0.3073594**
3	**0.0**	**0.7451673**	**0.2676168**
3	**0.1**	**0.7707581**	**0.3280214**
3	1.0	0.7620100	0.2893253
4	0.0	0.7413718	0.2483162
4	0.1	0.7480383	0.2726982
4	1.0	0.7560573	0.2773100
5	0.0	0.7590577	0.2975018
5	0.1	0.7362522	0.2745838
5	1.0	0.7554135	0.2730082
6	0.0	0.7457950	0.2676973
6	0.1	0.7237139	0.2309199
6	1.0	0.7575547	0.2595515
7	0.0	0.7465416	0.2819026
7	0.1	0.7038869	0.1885885
7	1.0	0.7737154	0.2959227
8	0.0	0.7509481	0.2923611
8	0.1	0.7370521	0.2457429
8	1.0	0.7642050	0.2749357
9	0.0	0.7318831	0.2412454
9	0.1	0.7539160	0.2984685
9	1.0	0.7664380	0.2941891
10	0.0	0.7348405	0.2415662
10	0.1	0.7545755	0.2670860
10	1.0	0.7633778	0.2735275

Kappa was used to select the optimal model using the largest value.
The final values used for the model were size = 1 and decay = 1.




```
print(confusion_matrix_nn)
Confusion Matrix and Statistics

                Reference
Prediction        no_complication complication
  no_complication             235            53
  complication                 26            25

               Accuracy : 0.767
                 95% CI : (0.7183, 0.8109)
    No Information Rate : 0.7699
    P-Value [Acc > NIR] : 0.581093

                  Kappa : 0.2514

 Mcnemar's Test P-Value : 0.003442
```

```
            Sensitivity : 0.9004
            Specificity : 0.3205
         Pos Pred Value : 0.8160
         Neg Pred Value : 0.4902
             Prevalence : 0.7699
         Detection Rate : 0.6932
   Detection Prevalence : 0.8496
      Balanced Accuracy : 0.6104

       'Positive' Class : no_complication
```

NAIVE BAYES:

```
print(nb_model)
Naive Bayes

1361 samples
  81 predictor
   2 classes: 'no_complication', 'complication'

Pre-processing: centered (81), scaled (81), Box-Cox transformation (7),
spatial sign transformation (81)
Resampling: Cross-Validated (10 fold)
Summary of sample sizes: 1226, 1226, 1225, 1224, 1224, 1224, ...
Resampling results:

  Accuracy   Kappa
  0.6318629  0.1342675

Tuning parameter 'fL' was held constant at a value of 2
Tuning parameter 'usekernel' was held constant at a
 value of TRUE
Tuning parameter 'adjust' was held constant at a value of TRUE
```

```
print(confusion_matrix_nb)
Confusion Matrix and Statistics

                Reference
Prediction        no_complication complication
  no_complication             194            47
  complication                 67            31

               Accuracy : 0.6637
                 95% CI : (0.6107, 0.7139)
    No Information Rate : 0.7699
    P-Value [Acc > NIR] : 1.00000

                  Kappa : 0.1291

 Mcnemar's Test P-Value : 0.07516

            Sensitivity : 0.7433
            Specificity : 0.3974
         Pos Pred Value : 0.8050
         Neg Pred Value : 0.3163
             Prevalence : 0.7699
         Detection Rate : 0.5723
   Detection Prevalence : 0.7109
      Balanced Accuracy : 0.5704

       'Positive' Class : no_complication
```

QDA

Performed PCA : 65 remaining

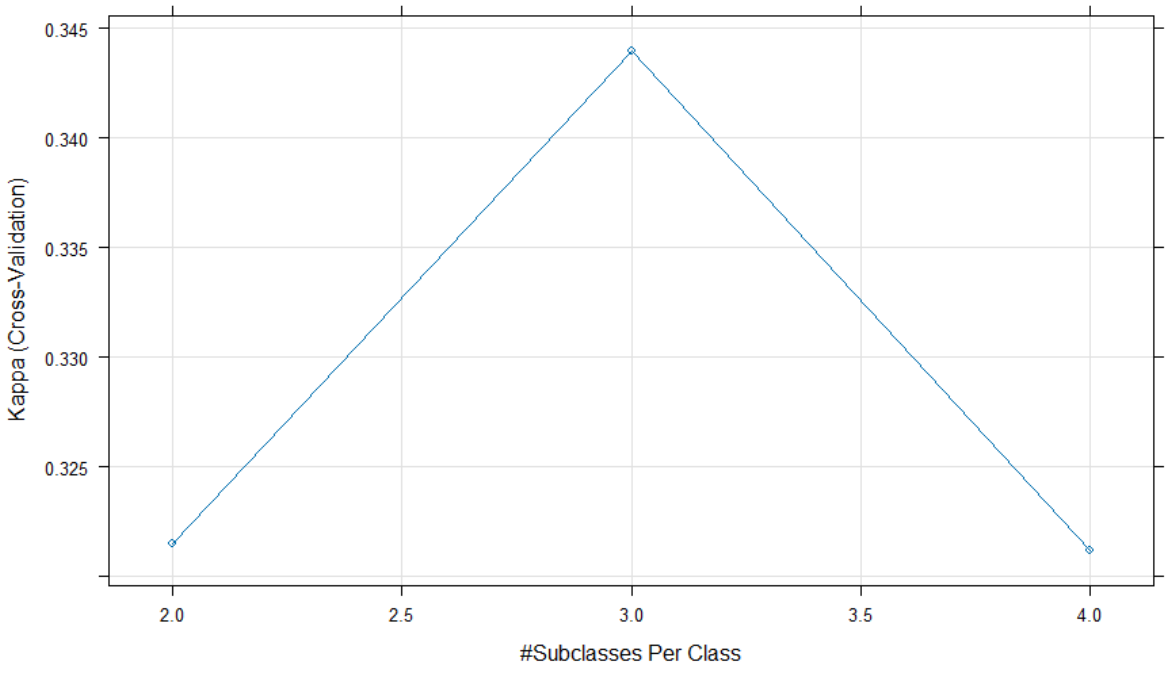
```
print(qda_model_pca)
Quadratic Discriminant Analysis

1361 samples
  65 predictor
   2 classes: 'no_complication', 'complication'

No pre-processing
Resampling: Cross-Validated (10 fold)
Summary of sample sizes: 1225, 1225, 1226, 1225, 1224, 1226, ...
Resampling results:
```

```
  Accuracy   Kappa
  0.7280959  0.2814712
```

```
print(confusion_matrix_qda_pca)
Confusion Matrix and Statistics

                Reference
Prediction        no_complication complication
  no_complication             191            51
  complication                 70            27

               Accuracy : 0.6431
                 95% CI : (0.5895, 0.6941)
    No Information Rate : 0.7699
    P-Value [Acc > NIR] : 1.0000

                  Kappa : 0.0718

 Mcnemar's Test P-Value : 0.1018

            Sensitivity : 0.7318
            Specificity : 0.3462
         Pos Pred Value : 0.7893
         Neg Pred Value : 0.2784
             Prevalence : 0.7699
         Detection Rate : 0.5634
   Detection Prevalence : 0.7139
      Balanced Accuracy : 0.5390

       'Positive' Class : no_complication
```

MDA: AFTER PCA

```
print(mda_model_pca)
Mixture Discriminant Analysis

1361 samples
  65 predictor
   2 classes: 'no_complication', 'complication'

No pre-processing
Resampling: Cross-Validated (10 fold)
Summary of sample sizes: 1225, 1225, 1226, 1225, 1224, 1226, ...
Resampling results across tuning parameters:

  subclasses  Accuracy   Kappa
  2           0.7971454  0.3215133
  3           0.8016114  0.3439618
  4           0.7854448  0.3211742

Kappa was used to select the optimal model using the largest value.
The final value used for the model was subclasses = 3.
```



```
print(confusion_matrix_mda_pca)
Confusion Matrix and Statistics

                Reference
Prediction        no_complication complication
  no_complication             234            66
  complication                 27            12

               Accuracy : 0.7257
                 95% CI : (0.6749, 0.7725)
    No Information Rate : 0.7699
    P-Value [Acc > NIR] : 0.9755

                  Kappa : 0.0611

 Mcnemar's Test P-Value : 8.134e-05

            Sensitivity : 0.8966
            Specificity : 0.1538
         Pos Pred Value : 0.7800
         Neg Pred Value : 0.3077
             Prevalence : 0.7699
         Detection Rate : 0.6903
   Detection Prevalence : 0.8850
      Balanced Accuracy : 0.5252

       'Positive' Class : no_complication
```