Classification Report 2022-07-04-23-21-19

## ========== Initializing fit\_ensemble\_voting\_classifier ==========

## Model : LogisticRegression

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 70.39 %

Loss: 29.61 %

Hamming\_loss: 7.93 %

Classification\_report: precision recall f1-score support  
  
 0 0.76 0.59 0.67 824  
 1 0.45 0.15 0.22 475  
 2 0.90 0.89 0.89 320  
 3 1.00 0.93 0.96 73  
 4 0.87 0.91 0.89 540  
  
 micro avg 0.80 0.63 0.71 2232  
 macro avg 0.80 0.69 0.73 2232  
weighted avg 0.75 0.63 0.67 2232  
 samples avg 0.29 0.27 0.27 2232

Classification on Testing dataset :

Accuracy\_score: 73.05 %

Loss: 26.95 %

Hamming\_loss: 7.49 %

Classification\_report: precision recall f1-score support  
  
 0 0.79 0.60 0.68 350  
 1 0.53 0.22 0.31 201  
 2 0.92 0.92 0.92 144  
 3 1.00 0.83 0.91 30  
 4 0.88 0.91 0.89 247  
  
 micro avg 0.82 0.65 0.73 972  
 macro avg 0.82 0.70 0.74 972  
weighted avg 0.78 0.65 0.70 972  
 samples avg 0.31 0.29 0.29 972

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-07-04-23-21-19\Models\MultiLabelModel\_LogisticRegression.pkl

Model data: {'Accuracy': 70.39, 'Loss': 29.61, 'Hamming\_loss': 7.93, 'Model\_name': 'LogisticRegression', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-07-04-23-21-19\\Models\\MultiLabelModel\_LogisticRegression.pkl'}

## Model : KNeighborsClassifier

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 88.1 %

Loss: 11.9 %

Hamming\_loss: 2.99 %

Classification\_report: precision recall f1-score support  
  
 0 0.89 0.79 0.84 824  
 1 0.88 0.89 0.89 475  
 2 0.96 0.98 0.97 320  
 3 0.98 0.75 0.85 73  
 4 0.94 0.98 0.96 540  
  
 micro avg 0.91 0.88 0.90 2232  
 macro avg 0.93 0.88 0.90 2232  
weighted avg 0.91 0.88 0.90 2232  
 samples avg 0.37 0.37 0.37 2232

Classification on Testing dataset :

Accuracy\_score: 87.47 %

Loss: 12.53 %

Hamming\_loss: 3.12 %

Classification\_report: precision recall f1-score support  
  
 0 0.91 0.78 0.84 350  
 1 0.93 0.84 0.88 201  
 2 0.94 0.99 0.96 144  
 3 0.95 0.63 0.76 30  
 4 0.91 0.99 0.95 247  
  
 micro avg 0.92 0.87 0.90 972  
 macro avg 0.93 0.85 0.88 972  
weighted avg 0.92 0.87 0.89 972  
 samples avg 0.37 0.37 0.37 972

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-07-04-23-21-19\Models\MultiLabelModel\_KNeighborsClassifier.pkl

Model data: {'Accuracy': 88.1, 'Loss': 11.9, 'Hamming\_loss': 2.99, 'Model\_name': 'KNeighborsClassifier', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-07-04-23-21-19\\Models\\MultiLabelModel\_KNeighborsClassifier.pkl'}

## Model : GaussianNB

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 62.51 %

Loss: 37.49 %

Hamming\_loss: 14.35 %

Classification\_report: precision recall f1-score support  
  
 0 0.53 0.67 0.59 824  
 1 0.44 0.82 0.57 475  
 2 0.53 0.99 0.70 320  
 3 0.24 0.97 0.38 73  
 4 0.68 0.97 0.80 540  
  
 micro avg 0.52 0.83 0.64 2232  
 macro avg 0.48 0.89 0.61 2232  
weighted avg 0.54 0.83 0.65 2232  
 samples avg 0.21 0.33 0.24 2232

Classification on Testing dataset :

Accuracy\_score: 62.96 %

Loss: 37.04 %

Hamming\_loss: 13.57 %

Classification\_report: precision recall f1-score support  
  
 0 0.52 0.70 0.60 350  
 1 0.44 0.81 0.57 201  
 2 0.58 0.97 0.72 144  
 3 0.26 0.97 0.41 30  
 4 0.72 0.98 0.83 247  
  
 micro avg 0.54 0.84 0.66 972  
 macro avg 0.51 0.89 0.63 972  
weighted avg 0.56 0.84 0.66 972  
 samples avg 0.22 0.34 0.25 972

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-07-04-23-21-19\Models\MultiLabelModel\_GaussianNB.pkl

Model data: {'Accuracy': 62.51, 'Loss': 37.49, 'Hamming\_loss': 14.35, 'Model\_name': 'GaussianNB', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-07-04-23-21-19\\Models\\MultiLabelModel\_GaussianNB.pkl'}

## Model : SVC

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 97.33 %

Loss: 2.67 %

Hamming\_loss: 0.55 %

Classification\_report: precision recall f1-score support  
  
 0 0.99 0.94 0.97 824  
 1 0.99 0.97 0.98 475  
 2 1.00 1.00 1.00 320  
 3 1.00 0.89 0.94 73  
 4 1.00 1.00 1.00 540  
  
 micro avg 1.00 0.97 0.98 2232  
 macro avg 1.00 0.96 0.98 2232  
weighted avg 1.00 0.97 0.98 2232  
 samples avg 0.41 0.41 0.41 2232

Classification on Testing dataset :

Accuracy\_score: 98.11 %

Loss: 1.89 %

Hamming\_loss: 0.41 %

Classification\_report: precision recall f1-score support  
  
 0 1.00 0.96 0.98 350  
 1 0.99 0.98 0.98 201  
 2 1.00 1.00 1.00 144  
 3 1.00 0.90 0.95 30  
 4 1.00 1.00 1.00 247  
  
 micro avg 1.00 0.98 0.99 972  
 macro avg 1.00 0.97 0.98 972  
weighted avg 1.00 0.98 0.99 972  
 samples avg 0.43 0.42 0.42 972

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-07-04-23-21-19\Models\MultiLabelModel\_SVC.pkl

Model data: {'Accuracy': 97.33, 'Loss': 2.67, 'Hamming\_loss': 0.55, 'Model\_name': 'SVC', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-07-04-23-21-19\\Models\\MultiLabelModel\_SVC.pkl'}

## Model : DecisionTreeClassifier

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 100.0 %

Loss: 0.0 %

Hamming\_loss: 0.0 %

Classification\_report: precision recall f1-score support  
  
 0 1.00 1.00 1.00 824  
 1 1.00 1.00 1.00 475  
 2 1.00 1.00 1.00 320  
 3 1.00 1.00 1.00 73  
 4 1.00 1.00 1.00 540  
  
 micro avg 1.00 1.00 1.00 2232  
 macro avg 1.00 1.00 1.00 2232  
weighted avg 1.00 1.00 1.00 2232  
 samples avg 0.43 0.43 0.43 2232

Classification on Testing dataset :

Accuracy\_score: 100.0 %

Loss: 0.0 %

Hamming\_loss: 0.0 %

Classification\_report: precision recall f1-score support  
  
 0 1.00 1.00 1.00 350  
 1 1.00 1.00 1.00 201  
 2 1.00 1.00 1.00 144  
 3 1.00 1.00 1.00 30  
 4 1.00 1.00 1.00 247  
  
 micro avg 1.00 1.00 1.00 972  
 macro avg 1.00 1.00 1.00 972  
weighted avg 1.00 1.00 1.00 972  
 samples avg 0.44 0.44 0.44 972

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-07-04-23-21-19\Models\MultiLabelModel\_DecisionTreeClassifier.pkl

Model data: {'Accuracy': 100.0, 'Loss': 0.0, 'Hamming\_loss': 0.0, 'Model\_name': 'DecisionTreeClassifier', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-07-04-23-21-19\\Models\\MultiLabelModel\_DecisionTreeClassifier.pkl'}

## Model : RandomForestClassifier

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 100.0 %

Loss: 0.0 %

Hamming\_loss: 0.0 %

Classification\_report: precision recall f1-score support  
  
 0 1.00 1.00 1.00 824  
 1 1.00 1.00 1.00 475  
 2 1.00 1.00 1.00 320  
 3 1.00 1.00 1.00 73  
 4 1.00 1.00 1.00 540  
  
 micro avg 1.00 1.00 1.00 2232  
 macro avg 1.00 1.00 1.00 2232  
weighted avg 1.00 1.00 1.00 2232  
 samples avg 0.43 0.43 0.43 2232

Classification on Testing dataset :

Accuracy\_score: 99.92 %

Loss: 0.08 %

Hamming\_loss: 0.02 %

Classification\_report: precision recall f1-score support  
  
 0 1.00 1.00 1.00 350  
 1 1.00 1.00 1.00 201  
 2 1.00 1.00 1.00 144  
 3 1.00 1.00 1.00 30  
 4 1.00 1.00 1.00 247  
  
 micro avg 1.00 1.00 1.00 972  
 macro avg 1.00 1.00 1.00 972  
weighted avg 1.00 1.00 1.00 972  
 samples avg 0.44 0.44 0.44 972

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-07-04-23-21-19\Models\MultiLabelModel\_RandomForestClassifier.pkl

Model data: {'Accuracy': 100.0, 'Loss': 0.0, 'Hamming\_loss': 0.0, 'Model\_name': 'RandomForestClassifier', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-07-04-23-21-19\\Models\\MultiLabelModel\_RandomForestClassifier.pkl'}

## Model : GradientBoostingClassifier

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 98.04 %

Loss: 1.96 %

Hamming\_loss: 0.44 %

Classification\_report: precision recall f1-score support  
  
 0 0.98 0.98 0.98 824  
 1 0.95 0.98 0.96 475  
 2 1.00 1.00 1.00 320  
 3 1.00 1.00 1.00 73  
 4 1.00 1.00 1.00 540  
  
 micro avg 0.98 0.99 0.99 2232  
 macro avg 0.99 0.99 0.99 2232  
weighted avg 0.98 0.99 0.99 2232  
 samples avg 0.42 0.42 0.42 2232

Classification on Testing dataset :

Accuracy\_score: 99.13 %

Loss: 0.87 %

Hamming\_loss: 0.17 %

Classification\_report: precision recall f1-score support  
  
 0 0.99 1.00 0.99 350  
 1 0.99 0.99 0.99 201  
 2 1.00 1.00 1.00 144  
 3 1.00 1.00 1.00 30  
 4 1.00 1.00 1.00 247  
  
 micro avg 0.99 1.00 0.99 972  
 macro avg 0.99 1.00 1.00 972  
weighted avg 0.99 1.00 0.99 972  
 samples avg 0.44 0.44 0.44 972

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-07-04-23-21-19\Models\MultiLabelModel\_GradientBoostingClassifier.pkl

Model data: {'Accuracy': 98.04, 'Loss': 1.96, 'Hamming\_loss': 0.44, 'Model\_name': 'GradientBoostingClassifier', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-07-04-23-21-19\\Models\\MultiLabelModel\_GradientBoostingClassifier.pkl'}

## Model : AdaBoostClassifier

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 97.03 %

Loss: 2.97 %

Hamming\_loss: 0.68 %

Classification\_report: precision recall f1-score support  
  
 0 0.98 0.96 0.97 824  
 1 0.94 0.96 0.95 475  
 2 1.00 1.00 1.00 320  
 3 1.00 1.00 1.00 73  
 4 1.00 1.00 1.00 540  
  
 micro avg 0.98 0.98 0.98 2232  
 macro avg 0.98 0.98 0.98 2232  
weighted avg 0.98 0.98 0.98 2232  
 samples avg 0.41 0.41 0.41 2232

Classification on Testing dataset :

Accuracy\_score: 97.64 %

Loss: 2.36 %

Hamming\_loss: 0.47 %

Classification\_report: precision recall f1-score support  
  
 0 0.96 0.98 0.97 350  
 1 0.98 0.98 0.98 201  
 2 1.00 1.00 1.00 144  
 3 1.00 1.00 1.00 30  
 4 1.00 1.00 1.00 247  
  
 micro avg 0.98 0.99 0.98 972  
 macro avg 0.99 0.99 0.99 972  
weighted avg 0.98 0.99 0.98 972  
 samples avg 0.43 0.43 0.43 972

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-07-04-23-21-19\Models\MultiLabelModel\_AdaBoostClassifier.pkl

Model data: {'Accuracy': 97.03, 'Loss': 2.97, 'Hamming\_loss': 0.68, 'Model\_name': 'AdaBoostClassifier', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-07-04-23-21-19\\Models\\MultiLabelModel\_AdaBoostClassifier.pkl'}

## Ensemble\_Voting\_Classifier\_Result >>>

Classification Report on Training dataset :

Accuracy\_score: 94.25 %

Loss: 5.75 %

Hamming\_loss: 1.32 %

ML\_confusion\_matrix:  
[[[2115 19]  
 [ 82 742]]  
  
 [[2465 18]  
 [ 60 415]]  
  
 [[2637 1]  
 [ 4 316]]  
  
 [[2885 0]  
 [ 7 66]]  
  
 [[2418 0]  
 [ 4 536]]]

Classification Report on Testing dataset :

Accuracy\_score: 99.76 %

Loss: 0.24 %

Hamming\_loss: 0.05 %

ML\_confusion\_matrix:  
[[[ 919 0]  
 [ 1 349]]  
  
 [[1068 0]  
 [ 2 199]]  
  
 [[1125 0]  
 [ 0 144]]  
  
 [[1239 0]  
 [ 0 30]]  
  
 [[1022 0]  
 [ 0 247]]]