Classification Report 2022-09-02-21-31-53

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

## Model : LogisticRegression

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 75.65 %

Loss: 24.35 %

Zero\_one\_loss: 24.35 %

Hamming\_loss: 6.32 %

Classification\_report: precision recall f1-score support  
  
 0 0.80 0.68 0.73 819  
 1 0.66 0.44 0.53 471  
 2 0.93 0.94 0.94 309  
 3 1.00 1.00 1.00 43  
 4 0.88 0.93 0.90 549  
  
 micro avg 0.83 0.73 0.78 2191  
 macro avg 0.85 0.80 0.82 2191  
weighted avg 0.81 0.73 0.77 2191  
 samples avg 0.33 0.32 0.31 2191

Classification on Testing dataset :

Accuracy\_score: 78.71 %

Loss: 21.29 %

Zero\_one\_loss: 21.29 %

Hamming\_loss: 5.39 %

Classification\_report: precision recall f1-score support  
  
 0 0.79 0.67 0.73 321  
 1 0.71 0.52 0.60 186  
 2 0.96 0.97 0.96 128  
 3 1.00 1.00 1.00 16  
 4 0.88 0.96 0.92 226  
  
 micro avg 0.84 0.76 0.80 877  
 macro avg 0.87 0.82 0.84 877  
weighted avg 0.83 0.76 0.79 877  
 samples avg 0.31 0.31 0.30 877

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-09-02-21-31-53\Models\MultiLabelModel\_LogisticRegression.pkl

Model data: {'Accuracy': 75.65, 'Loss': 24.35, 'Hamming\_loss': 6.32, 'Model\_name': 'LogisticRegression', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-09-02-21-31-53\\Models\\MultiLabelModel\_LogisticRegression.pkl'}

## Model : KNeighborsClassifier

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 87.38 %

Loss: 12.62 %

Zero\_one\_loss: 12.62 %

Hamming\_loss: 3.24 %

Classification\_report: precision recall f1-score support  
  
 0 0.90 0.79 0.84 819  
 1 0.88 0.89 0.89 471  
 2 0.95 0.94 0.94 309  
 3 1.00 0.53 0.70 43  
 4 0.91 0.98 0.94 549  
  
 micro avg 0.91 0.88 0.89 2191  
 macro avg 0.93 0.83 0.86 2191  
weighted avg 0.91 0.88 0.89 2191  
 samples avg 0.37 0.37 0.37 2191

Classification on Testing dataset :

Accuracy\_score: 85.81 %

Loss: 14.19 %

Zero\_one\_loss: 14.19 %

Hamming\_loss: 3.68 %

Classification\_report: precision recall f1-score support  
  
 0 0.87 0.76 0.81 321  
 1 0.86 0.83 0.85 186  
 2 0.92 0.94 0.93 128  
 3 1.00 0.19 0.32 16  
 4 0.90 0.98 0.94 226  
  
 micro avg 0.88 0.85 0.87 877  
 macro avg 0.91 0.74 0.77 877  
weighted avg 0.89 0.85 0.86 877  
 samples avg 0.34 0.34 0.33 877

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-09-02-21-31-53\Models\MultiLabelModel\_KNeighborsClassifier.pkl

Model data: {'Accuracy': 87.38, 'Loss': 12.62, 'Hamming\_loss': 3.24, 'Model\_name': 'KNeighborsClassifier', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-09-02-21-31-53\\Models\\MultiLabelModel\_KNeighborsClassifier.pkl'}

## Model : GaussianNB

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 63.1 %

Loss: 36.9 %

Zero\_one\_loss: 36.9 %

Hamming\_loss: 14.66 %

Classification\_report: precision recall f1-score support  
  
 0 0.56 0.73 0.63 819  
 1 0.45 0.89 0.59 471  
 2 0.46 1.00 0.63 309  
 3 0.13 0.98 0.23 43  
 4 0.69 0.99 0.82 549  
  
 micro avg 0.51 0.87 0.64 2191  
 macro avg 0.46 0.92 0.58 2191  
weighted avg 0.55 0.87 0.66 2191  
 samples avg 0.22 0.35 0.25 2191

Classification on Testing dataset :

Accuracy\_score: 64.11 %

Loss: 35.89 %

Zero\_one\_loss: 35.89 %

Hamming\_loss: 14.26 %

Classification\_report: precision recall f1-score support  
  
 0 0.54 0.72 0.62 321  
 1 0.42 0.85 0.57 186  
 2 0.48 1.00 0.64 128  
 3 0.11 0.94 0.20 16  
 4 0.69 1.00 0.82 226  
  
 micro avg 0.49 0.86 0.63 877  
 macro avg 0.45 0.90 0.57 877  
weighted avg 0.54 0.86 0.65 877  
 samples avg 0.20 0.33 0.24 877

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-09-02-21-31-53\Models\MultiLabelModel\_GaussianNB.pkl

Model data: {'Accuracy': 63.1, 'Loss': 36.9, 'Hamming\_loss': 14.66, 'Model\_name': 'GaussianNB', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-09-02-21-31-53\\Models\\MultiLabelModel\_GaussianNB.pkl'}

## Model : SVC

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 99.86 %

Loss: 0.14 %

Zero\_one\_loss: 0.14 %

Hamming\_loss: 0.03 %

Classification\_report: precision recall f1-score support  
  
 0 1.00 1.00 1.00 819  
 1 1.00 1.00 1.00 471  
 2 1.00 1.00 1.00 309  
 3 1.00 0.98 0.99 43  
 4 1.00 1.00 1.00 549  
  
 micro avg 1.00 1.00 1.00 2191  
 macro avg 1.00 0.99 1.00 2191  
weighted avg 1.00 1.00 1.00 2191  
 samples avg 0.43 0.43 0.43 2191

Classification on Testing dataset :

Accuracy\_score: 99.92 %

Loss: 0.08 %

Zero\_one\_loss: 0.08 %

Hamming\_loss: 0.02 %

Classification\_report: precision recall f1-score support  
  
 0 1.00 1.00 1.00 321  
 1 1.00 1.00 1.00 186  
 2 1.00 1.00 1.00 128  
 3 1.00 0.94 0.97 16  
 4 1.00 1.00 1.00 226  
  
 micro avg 1.00 1.00 1.00 877  
 macro avg 1.00 0.99 0.99 877  
weighted avg 1.00 1.00 1.00 877  
 samples avg 0.41 0.41 0.41 877

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-09-02-21-31-53\Models\MultiLabelModel\_SVC.pkl

Model data: {'Accuracy': 99.86, 'Loss': 0.14, 'Hamming\_loss': 0.03, 'Model\_name': 'SVC', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-09-02-21-31-53\\Models\\MultiLabelModel\_SVC.pkl'}

## Model : DecisionTreeClassifier

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 100.0 %

Loss: 0.0 %

Zero\_one\_loss: 0.0 %

Hamming\_loss: 0.0 %

Classification\_report: precision recall f1-score support  
  
 0 1.00 1.00 1.00 819  
 1 1.00 1.00 1.00 471  
 2 1.00 1.00 1.00 309  
 3 1.00 1.00 1.00 43  
 4 1.00 1.00 1.00 549  
  
 micro avg 1.00 1.00 1.00 2191  
 macro avg 1.00 1.00 1.00 2191  
weighted avg 1.00 1.00 1.00 2191  
 samples avg 0.43 0.43 0.43 2191

Classification on Testing dataset :

Accuracy\_score: 100.0 %

Loss: 0.0 %

Zero\_one\_loss: 0.0 %

Hamming\_loss: 0.0 %

Classification\_report: precision recall f1-score support  
  
 0 1.00 1.00 1.00 321  
 1 1.00 1.00 1.00 186  
 2 1.00 1.00 1.00 128  
 3 1.00 1.00 1.00 16  
 4 1.00 1.00 1.00 226  
  
 micro avg 1.00 1.00 1.00 877  
 macro avg 1.00 1.00 1.00 877  
weighted avg 1.00 1.00 1.00 877  
 samples avg 0.41 0.41 0.41 877

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-09-02-21-31-53\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\\2022-09-02-21-31-53\\Models\\MultiLabelModel\_DecisionTreeClassifier.pkl'}

## Model : RandomForestClassifier

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 100.0 %

Loss: 0.0 %

Zero\_one\_loss: 0.0 %

Hamming\_loss: 0.0 %

Classification\_report: precision recall f1-score support  
  
 0 1.00 1.00 1.00 819  
 1 1.00 1.00 1.00 471  
 2 1.00 1.00 1.00 309  
 3 1.00 1.00 1.00 43  
 4 1.00 1.00 1.00 549  
  
 micro avg 1.00 1.00 1.00 2191  
 macro avg 1.00 1.00 1.00 2191  
weighted avg 1.00 1.00 1.00 2191  
 samples avg 0.43 0.43 0.43 2191

Classification on Testing dataset :

Accuracy\_score: 100.0 %

Loss: 0.0 %

Zero\_one\_loss: 0.0 %

Hamming\_loss: 0.0 %

Classification\_report: precision recall f1-score support  
  
 0 1.00 1.00 1.00 321  
 1 1.00 1.00 1.00 186  
 2 1.00 1.00 1.00 128  
 3 1.00 1.00 1.00 16  
 4 1.00 1.00 1.00 226  
  
 micro avg 1.00 1.00 1.00 877  
 macro avg 1.00 1.00 1.00 877  
weighted avg 1.00 1.00 1.00 877  
 samples avg 0.41 0.41 0.41 877

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-09-02-21-31-53\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\\2022-09-02-21-31-53\\Models\\MultiLabelModel\_RandomForestClassifier.pkl'}

## Model : GradientBoostingClassifier

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 99.35 %

Loss: 0.65 %

Zero\_one\_loss: 0.65 %

Hamming\_loss: 0.14 %

Classification\_report: precision recall f1-score support  
  
 0 0.99 1.00 0.99 819  
 1 0.98 0.99 0.99 471  
 2 1.00 1.00 1.00 309  
 3 1.00 1.00 1.00 43  
 4 1.00 1.00 1.00 549  
  
 micro avg 0.99 1.00 1.00 2191  
 macro avg 1.00 1.00 1.00 2191  
weighted avg 0.99 1.00 1.00 2191  
 samples avg 0.43 0.43 0.43 2191

Classification on Testing dataset :

Accuracy\_score: 99.92 %

Loss: 0.08 %

Zero\_one\_loss: 0.08 %

Hamming\_loss: 0.02 %

Classification\_report: precision recall f1-score support  
  
 0 1.00 1.00 1.00 321  
 1 1.00 0.99 1.00 186  
 2 1.00 1.00 1.00 128  
 3 1.00 1.00 1.00 16  
 4 1.00 1.00 1.00 226  
  
 micro avg 1.00 1.00 1.00 877  
 macro avg 1.00 1.00 1.00 877  
weighted avg 1.00 1.00 1.00 877  
 samples avg 0.41 0.41 0.41 877

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-09-02-21-31-53\Models\MultiLabelModel\_GradientBoostingClassifier.pkl

Model data: {'Accuracy': 99.35, 'Loss': 0.65, 'Hamming\_loss': 0.14, 'Model\_name': 'GradientBoostingClassifier', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-09-02-21-31-53\\Models\\MultiLabelModel\_GradientBoostingClassifier.pkl'}

## Model : AdaBoostClassifier

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 98.5 %

Loss: 1.5 %

Zero\_one\_loss: 1.5 %

Hamming\_loss: 0.33 %

Classification\_report: precision recall f1-score support  
  
 0 0.99 0.98 0.98 819  
 1 0.98 0.99 0.98 471  
 2 1.00 1.00 1.00 309  
 3 1.00 1.00 1.00 43  
 4 1.00 1.00 1.00 549  
  
 micro avg 0.99 0.99 0.99 2191  
 macro avg 0.99 0.99 0.99 2191  
weighted avg 0.99 0.99 0.99 2191  
 samples avg 0.43 0.43 0.43 2191

Classification on Testing dataset :

Accuracy\_score: 100.0 %

Loss: 0.0 %

Zero\_one\_loss: 0.0 %

Hamming\_loss: 0.0 %

Classification\_report: precision recall f1-score support  
  
 0 1.00 1.00 1.00 321  
 1 1.00 1.00 1.00 186  
 2 1.00 1.00 1.00 128  
 3 1.00 1.00 1.00 16  
 4 1.00 1.00 1.00 226  
  
 micro avg 1.00 1.00 1.00 877  
 macro avg 1.00 1.00 1.00 877  
weighted avg 1.00 1.00 1.00 877  
 samples avg 0.41 0.41 0.41 877

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-09-02-21-31-53\Models\MultiLabelModel\_AdaBoostClassifier.pkl

Model data: {'Accuracy': 98.5, 'Loss': 1.5, 'Hamming\_loss': 0.33, 'Model\_name': 'AdaBoostClassifier', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-09-02-21-31-53\\Models\\MultiLabelModel\_AdaBoostClassifier.pkl'}

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

Classification Report on Training dataset :

Accuracy\_score: 57.93 %

Loss: 42.07 %

Zero\_one\_loss: 42.07 %

Hamming\_loss: 14.55 %

ML\_confusion\_matrix:  
 precision recall f1-score support  
  
 0 1.00 0.01 0.02 819  
 1 1.00 0.01 0.01 471  
 2 1.00 0.03 0.06 309  
 3 0.00 0.00 0.00 43  
 4 1.00 0.07 0.14 549  
  
 micro avg 1.00 0.03 0.06 2191  
 macro avg 0.80 0.03 0.05 2191  
weighted avg 0.98 0.03 0.06 2191  
 samples avg 0.02 0.01 0.02 2191

Classification Report on Testing dataset :

Accuracy\_score: 99.92 %

Loss: 0.08 %

Zero\_one\_loss: 0.08 %

Hamming\_loss: 0.02 %

ML\_confusion\_matrix:  
 precision recall f1-score support  
  
 0 1.00 1.00 1.00 321  
 1 1.00 1.00 1.00 186  
 2 1.00 1.00 1.00 128  
 3 1.00 0.94 0.97 16  
 4 1.00 1.00 1.00 226  
  
 micro avg 1.00 1.00 1.00 877  
 macro avg 1.00 0.99 0.99 877  
weighted avg 1.00 1.00 1.00 877  
 samples avg 0.41 0.41 0.41 877

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

## Model : LogisticRegression

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 74.78 %

Loss: 25.22 %

Zero\_one\_loss: 25.22 %

Hamming\_loss: 6.57 %

Classification\_report: precision recall f1-score support  
  
 0 0.78 0.66 0.71 824  
 1 0.68 0.48 0.57 475  
 2 0.90 0.90 0.90 320  
 3 1.00 0.99 0.99 73  
 4 0.88 0.90 0.89 540  
  
 micro avg 0.82 0.73 0.77 2232  
 macro avg 0.85 0.79 0.81 2232  
weighted avg 0.81 0.73 0.76 2232  
 samples avg 0.32 0.31 0.31 2232

Classification on Testing dataset :

Accuracy\_score: 76.67 %

Loss: 23.33 %

Zero\_one\_loss: 23.33 %

Hamming\_loss: 5.94 %

Classification\_report: precision recall f1-score support  
  
 0 0.81 0.72 0.76 350  
 1 0.69 0.47 0.56 201  
 2 0.93 0.96 0.94 144  
 3 1.00 0.97 0.98 30  
 4 0.87 0.92 0.90 247  
  
 micro avg 0.84 0.76 0.80 972  
 macro avg 0.86 0.81 0.83 972  
weighted avg 0.82 0.76 0.79 972  
 samples avg 0.34 0.33 0.33 972

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-09-02-21-31-53\Models\MultiLabelModel\_LogisticRegression.pkl

Model data: {'Accuracy': 74.78, 'Loss': 25.22, 'Hamming\_loss': 6.57, 'Model\_name': 'LogisticRegression', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-09-02-21-31-53\\Models\\MultiLabelModel\_LogisticRegression.pkl'}

## Model : KNeighborsClassifier

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 86.41 %

Loss: 13.59 %

Zero\_one\_loss: 13.59 %

Hamming\_loss: 3.48 %

Classification\_report: precision recall f1-score support  
  
 0 0.87 0.80 0.83 824  
 1 0.87 0.88 0.88 475  
 2 0.94 0.95 0.94 320  
 3 0.97 0.51 0.67 73  
 4 0.92 0.98 0.95 540  
  
 micro avg 0.90 0.87 0.88 2232  
 macro avg 0.91 0.82 0.85 2232  
weighted avg 0.90 0.87 0.88 2232  
 samples avg 0.37 0.37 0.36 2232

Classification on Testing dataset :

Accuracy\_score: 86.29 %

Loss: 13.71 %

Zero\_one\_loss: 13.71 %

Hamming\_loss: 3.55 %

Classification\_report: precision recall f1-score support  
  
 0 0.91 0.79 0.85 350  
 1 0.90 0.85 0.87 201  
 2 0.92 0.93 0.93 144  
 3 1.00 0.23 0.38 30  
 4 0.89 0.98 0.93 247  
  
 micro avg 0.91 0.86 0.88 972  
 macro avg 0.93 0.76 0.79 972  
weighted avg 0.91 0.86 0.87 972  
 samples avg 0.37 0.37 0.37 972

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-09-02-21-31-53\Models\MultiLabelModel\_KNeighborsClassifier.pkl

Model data: {'Accuracy': 86.41, 'Loss': 13.59, 'Hamming\_loss': 3.48, 'Model\_name': 'KNeighborsClassifier', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-09-02-21-31-53\\Models\\MultiLabelModel\_KNeighborsClassifier.pkl'}

## Model : GaussianNB

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 62.61 %

Loss: 37.39 %

Zero\_one\_loss: 37.39 %

Hamming\_loss: 15.38 %

Classification\_report: precision recall f1-score support  
  
 0 0.57 0.72 0.63 824  
 1 0.46 0.89 0.61 475  
 2 0.47 1.00 0.64 320  
 3 0.15 0.97 0.26 73  
 4 0.67 0.99 0.80 540  
  
 micro avg 0.49 0.87 0.63 2232  
 macro avg 0.46 0.91 0.59 2232  
weighted avg 0.54 0.87 0.66 2232  
 samples avg 0.21 0.35 0.25 2232

Classification on Testing dataset :

Accuracy\_score: 62.57 %

Loss: 37.43 %

Zero\_one\_loss: 37.43 %

Hamming\_loss: 15.84 %

Classification\_report: precision recall f1-score support  
  
 0 0.53 0.72 0.61 350  
 1 0.42 0.86 0.56 201  
 2 0.49 1.00 0.66 144  
 3 0.14 0.97 0.25 30  
 4 0.72 1.00 0.84 247  
  
 micro avg 0.49 0.87 0.63 972  
 macro avg 0.46 0.91 0.59 972  
weighted avg 0.54 0.87 0.66 972  
 samples avg 0.21 0.36 0.25 972

File saved: D:\test\Basic\_Python\Project POMO\data scraping\Artifact\2022-09-02-21-31-53\Models\MultiLabelModel\_GaussianNB.pkl

Model data: {'Accuracy': 62.61, 'Loss': 37.39, 'Hamming\_loss': 15.38, 'Model\_name': 'GaussianNB', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-09-02-21-31-53\\Models\\MultiLabelModel\_GaussianNB.pkl'}

## Model : SVC

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 99.7 %

Loss: 0.3 %

Zero\_one\_loss: 0.3 %

Hamming\_loss: 0.06 %

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 0.92 0.96 73  
 4 1.00 1.00 1.00 540  
  
 micro avg 1.00 1.00 1.00 2232  
 macro avg 1.00 0.98 0.99 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 %

Zero\_one\_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\2022-09-02-21-31-53\Models\MultiLabelModel\_SVC.pkl

Model data: {'Accuracy': 99.7, 'Loss': 0.3, 'Hamming\_loss': 0.06, 'Model\_name': 'SVC', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-09-02-21-31-53\\Models\\MultiLabelModel\_SVC.pkl'}

## Model : DecisionTreeClassifier

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 100.0 %

Loss: 0.0 %

Zero\_one\_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 %

Zero\_one\_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\2022-09-02-21-31-53\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\\2022-09-02-21-31-53\\Models\\MultiLabelModel\_DecisionTreeClassifier.pkl'}

## Model : RandomForestClassifier

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 100.0 %

Loss: 0.0 %

Zero\_one\_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 %

Zero\_one\_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\2022-09-02-21-31-53\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\\2022-09-02-21-31-53\\Models\\MultiLabelModel\_RandomForestClassifier.pkl'}

## Model : GradientBoostingClassifier

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 99.43 %

Loss: 0.57 %

Zero\_one\_loss: 0.57 %

Hamming\_loss: 0.11 %

Classification\_report: precision recall f1-score support  
  
 0 1.00 1.00 1.00 824  
 1 0.98 0.99 0.99 475  
 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 0.99 1.00 1.00 2232  
 macro avg 1.00 1.00 1.00 2232  
weighted avg 0.99 1.00 1.00 2232  
 samples avg 0.43 0.43 0.43 2232

Classification on Testing dataset :

Accuracy\_score: 99.84 %

Loss: 0.16 %

Zero\_one\_loss: 0.16 %

Hamming\_loss: 0.03 %

Classification\_report: precision recall f1-score support  
  
 0 1.00 0.99 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\2022-09-02-21-31-53\Models\MultiLabelModel\_GradientBoostingClassifier.pkl

Model data: {'Accuracy': 99.43, 'Loss': 0.57, 'Hamming\_loss': 0.11, 'Model\_name': 'GradientBoostingClassifier', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-09-02-21-31-53\\Models\\MultiLabelModel\_GradientBoostingClassifier.pkl'}

## Model : AdaBoostClassifier

Initializing builMultiLabelModels

Classification on Training dataset :

Accuracy\_score: 98.04 %

Loss: 1.96 %

Zero\_one\_loss: 1.96 %

Hamming\_loss: 0.43 %

Classification\_report: precision recall f1-score support  
  
 0 0.98 0.97 0.97 824  
 1 0.98 0.98 0.98 475  
 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 0.99 0.98 0.99 2232  
 macro avg 0.99 0.99 0.99 2232  
weighted avg 0.99 0.98 0.99 2232  
 samples avg 0.42 0.42 0.42 2232

Classification on Testing dataset :

Accuracy\_score: 99.76 %

Loss: 0.24 %

Zero\_one\_loss: 0.24 %

Hamming\_loss: 0.05 %

Classification\_report: precision recall f1-score support  
  
 0 1.00 0.99 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\2022-09-02-21-31-53\Models\MultiLabelModel\_AdaBoostClassifier.pkl

Model data: {'Accuracy': 98.04, 'Loss': 1.96, 'Hamming\_loss': 0.43, 'Model\_name': 'AdaBoostClassifier', 'Filename': 'D:\\test\\Basic\_Python\\Project POMO\\data scraping\\Artifact\\2022-09-02-21-31-53\\Models\\MultiLabelModel\_AdaBoostClassifier.pkl'}

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

Classification Report on Training dataset :

Accuracy\_score: 57.94 %

Loss: 42.06 %

Zero\_one\_loss: 42.06 %

Hamming\_loss: 14.75 %

ML\_confusion\_matrix:  
 precision recall f1-score support  
  
 0 1.00 0.03 0.05 824  
 1 1.00 0.00 0.01 475  
 2 1.00 0.02 0.04 320  
 3 0.00 0.00 0.00 73  
 4 1.00 0.04 0.08 540  
  
 micro avg 1.00 0.02 0.04 2232  
 macro avg 0.80 0.02 0.03 2232  
weighted avg 0.97 0.02 0.04 2232  
 samples avg 0.01 0.01 0.01 2232

Classification Report on Testing dataset :

Accuracy\_score: 99.84 %

Loss: 0.16 %

Zero\_one\_loss: 0.16 %

Hamming\_loss: 0.03 %

ML\_confusion\_matrix:  
 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