Classification Evaluation Metrics

Problem Statement or Requirement:

A requirement from the Hospital, Management asked us to create a predictive model which will predict the Chronic Kidney Disease (CKD) based on the several parameters. The Client has provided the dataset of the same.

- Machine Learning -> Supervised -> Classification

Dataset Details:

Number of rows: 399

Number of Columns: 25

Categorical data Exist: Yes

Data Pre Processing:

Categorical data Exist in the given dataset so need to convert the data into numeric.

Classification Model Details:

Model Name: LogisticRegressionCV

F1 Score average: 0.99

roc_auc Percentage: 0.99

Report Details:

	precision	recall	f1-score	support
0	1.00	0.98	0.99	45
1	0.99	1.00	0.99	75
accuracy			0.99	120
macro avg	0.99	0.99	0.99	120
weighted avg	0.99	0.99	0.99	120

Model Name: DecisionTreeClassifier

F1 Score Average: 0.95

roc_auc Percentage: 0.96

Report Details:

	precision	recall	f1-score	support
0	0.92	0.98	0.95	45
1	0.99	0.95	0.97	75
accuracy			0.96	120
macro avg	0.95	0.96	0.96	120
weighted avg	0.96	0.96	0.96	120

Model Name: SVC

F1 Score average: 0.52

roc_auc Percentage: 0.38

Report Details:

	precision	recall	f1-score	support
0	0.36	0.33	0.34	45
1	0.62	0.64	0.63	75
accuracy			0.53	120
macro avg	0.49	0.49	0.49	120
weighted avg	0.52	0.53	0.52	120

Model Name: RandomForestClassifier

F1 Score average: 0.99

roc_auc Percentage: 0.99

Report Details:

	precision	recall	f1-score	support
0	0.98	1.00	0.99	45
1	1.00	0.99	0.99	75
accuracy			0.99	120
macro avg	0.99	0.99	0.99	120
weighted avg	0.99	0.99	0.99	120

Model Name: KNeighborsClassifier

F1 Score average: 0.78

roc_auc Percentage: 0.70

Report Details:

	precision	recall	f1-score	support
0	0.56	0.89	0.69	45
1	0.90	0.59	0.71	75
accuracy			0.70	120
macro avg	0.73	0.74	0.70	120
weighted avg	0.77	0.70	0.70	120

Model Name: GaussianNB

F1 Score average: 0.98

roc_auc Percentage: 1.0

Report Details:

	precision	recall	f1-score	support
0	0.96	1.00	0.98	45
1	1.00	0.97	0.99	75
accuracy			0.98	120
macro avg	0.98	0.99	0.98	120
weighted avg	0.98	0.98	0.98	120

Model Name: MultinomialNB

F1 Score average: 0.81

roc_auc Percentage: 0.90

Report Details:

	precision	recall	f1-score	support
0	0.67	0.98	0.79	45
1	0.98	0.71	0.82	75
accuracy			0.81	120
macro avg	0.82	0.84	0.81	120
weighted avg	0.86	0.81	0.81	120

Model Name: BernoulliNB

F1 Score average: 0.93

roc_auc Percentage: 0.99

Report Details:

	precision	recall	f1-score	support
0	0.85	1.00	0.92	45
1	1.00	0.89	0.94	75
accuracy			0.93	120
macro avg	0.92	0.95	0.93	120
weighted avg	0.94	0.93	0.93	120

Model Name: ComplementNB

F1 Score average: 0.81

roc_auc Percentage: 0.90

Report Details:

	precision	recall	f1-score	support
0	0.67	0.98	0.79	45
1	0.98	0.71	0.82	75
accuracy			0.81	120
macro avg	0.82	0.84	0.81	120
weighted avg	0.86	0.81	0.81	120

Conclusion:

Based on roc_auc & f1 score result GaussianNB model performing very well.

F1 Score average: 0.98

roc_auc Percentage: 1.0