Hospital, Management Asked Us To Create A Predictive Model Which Will Predict The Chronic Kidney Disease (Ckd)

Not Equal Dataset its InBalanced Dataset
Classification=249
Not Classification=150

Test Daset Size
Classification=82
Not Classification=51

Decition Tree Classification Method Best Model is

Best Model = {'criterion': 'gini', 'random_state': 0, 'splitter': 'random'}

Accuracy = 0.98

Roc_Score=0.98

Precision = {Not-classification:0.94, classification: 1.00,}
Recall ={Not-classification:1.00, classification: 0.96,}
F1_Score ={Not-classification:0.94, classification: 0.98,}
Confusion_Matrics_Score= [[51 0] [3 79]]

Random Forest Classification Method Best Model is

Best Model = {'criterion': 'gini', 'max_features': 'log2', 'n_estimators': 100, 'random_state': 0}

Accuracy = 0.99

Roc_Score=1.00

Precision = {Not-classification:0.98, classification: 1.00,}
Recall ={Not-classification:1.00, classification: 0.99,}
F1_Score ={Not-classification:0.99, classification: 0.99,}
Confusion_Matrics_Score=[[51 0] [1 81]]

Support Vector Machine Classification Method Best Model is

Best Model = {'C': 3000, 'gamma': 'scale', 'kernel': 'rbf', 'probability': True, 'random_state': 0}

Accuracy = 0.87

Roc_Score=0.94

Precision = {Not-classification:0.79, classification: 0.93,}
Recall ={Not-classification:0.90, classification: 0.85,}
F1_Score ={Not-classification:0.84, classification: 0.89,}
Confusion_Matrics_Score=[[46 5] [12 70]]

Logistic Regression Classification Method Best Model is

Best Model = {'multi_class': 'auto', 'penalty': 'l2'}
Accuracy = 0.94
Roc_Score=0.98
Precision = {Not-classification:0.91, classification: 0.96,}
Recall ={Not-classification:0.94, classification: 0.94,}
F1_Score ={Not-classification:0.92, classification: 0.95,}
Confusion_Matrics_Score= [[48 3] [5 77]]

SGD Classification Method Best Model is

Best Model = {'loss': 'log_loss', 'penalty': 'l1'}
Accuracy = 0.81
Precision = {Not-classification:0.68, classification: 0.97,}
Recall ={Not-classification:0.96, classification: 0.72,}
F1_Score ={Not-classification:0.80, classification: 0.83,}
Confusion_Matrics_Score= [[49 2] [23 59]]

KNeighbors Classification Method Best Model is

Best Model = {'loss': 'log_loss', 'penalty': 'l1'}
Accuracy = 0.76
Roc_Score=0.83
Precision = {Not-classification:0.63, classification: 0.92,}
Recall ={Not-classification:0.90, classification: 0.67,}
F1_Score ={Not-classification:0.74, classification: 0.77,}
Confusion_Matrics_Score= [[46 5] [27 55]]

GaussianNB Classification Method Best Model is

Best Model = {}

Accuracy = 0.98

Roc_Score=1.00

Precision = {Not-classification:0.94, classification: 1.00,}
Recall ={Not-classification:1.96, classification: 0.96,}
F1_Score ={Not-classification:0.97, classification: 0.98,}
Confusion_Matrics_Score= [[51 0] [3 79]]

ComplementNB Classification Method Best Model is

Best Model = {}

Accuracy = 0.82

Roc_Score=0.92

Precision = {Not-classification:0.68, classification: 0.98,}
Recall ={Not-classification:0.98, classification: 0.72,}
F1_Score ={Not-classification:0.81, classification: 0.83,}
Confusion_Matrics_Score= [[50 1] [23 59]]

MultinomialNB Classification Method Best Model is

Best Model = {'loss': 'log_loss', 'penalty': 'l1'}

Accuracy = 0.82

Roc_Score=0.92

Precision = {Not-classification:0.68, classification: 0.98,}
Recall ={Not-classification:0.98, classification: 0.72,}
F1_Score ={Not-classification:0.81, classification: 0.83,}
Confusion_Matrics_Score= [[50 1] [23 59]]

KNeighbors Classification Method Best Model is

Best Model = {'loss': 'log_loss', 'penalty': 'l1'}

Accuracy = 0.94

Roc_Score=1.00

Precision = {Not-classification:0.86, classification: 1.00,}

Recall ={Not-classification:1.00, classification: 0.90,}
F1_Score ={Not-classification:0.93, classification: 0.95,}
Confusion_Matrics_Score= [[51 0] [8 74]]

Random Forest offers the best balance and highest scores across all key metrics, making it the best model choice here.