**Test Report Results**

Model 1: Logistic Regression Untuned

Classification Report:

precision recall f1-score support

0 0.97 0.99 0.98 2077

1 0.64 0.32 0.43 108

accuracy 0.96 2185

macro avg 0.80 0.66 0.70 2185

weighted avg 0.95 0.96 0.95 2185

Confusion matrix:

[[2057 20]

[ 73 35]]

Model 2: Logistic Regression Tuned

Classification report:

precision recall f1-score support

0 0.97 0.99 0.98 2077

1 0.64 0.32 0.43 108

accuracy 0.96 2185

macro avg 0.80 0.66 0.70 2185

weighted avg 0.95 0.96 0.95 2185

Confusion matrix:

[[2057 20]

[ 73 35]]

Model 3: Decision Tree Tuned

precision recall f1-score support

0 0.97 0.98 0.97 2077

1 0.42 0.33 0.37 108

accuracy 0.94 2185

macro avg 0.69 0.65 0.67 2185

weighted avg 0.94 0.94 0.94 2185

Confusion matrix:

[[2028 49]

[ 72 36]]

Model 4: Random Forest Untuned

Classification report:

precision recall f1-score support

0 0.96 0.99 0.98 2077

1 0.53 0.26 0.35 108

accuracy 0.95 2185

macro avg 0.75 0.62 0.66 2185

weighted avg 0.94 0.95 0.94 2185

Confusion matrix:

[[2052 25]

[ 80 28]]

Model 5: Random Forest Tuned

Classification report:

precision recall f1-score support

0 0.96 0.99 0.98 2077

1 0.53 0.26 0.35 108

accuracy 0.95 2185

macro avg 0.75 0.62 0.66 2185

weighted avg 0.94 0.95 0.94 2185

Confusion matrix:

[[2052 25]

[ 80 28]]

Model 6: Logistic Regression SMOTE

Classification report:

precision recall f1-score support

0 0.98 0.94 0.96 2077

1 0.36 0.69 0.47 108

accuracy 0.92 2185

macro avg 0.67 0.81 0.72 2185

weighted avg 0.95 0.92 0.94 2185

Confusion matrix:

[[1946 131]

[ 34 74]]

Model 7: Decision Trees SMOTE

Classification report:

precision recall f1-score support

0 0.99 0.91 0.95 2077

1 0.31 0.83 0.46 108

accuracy 0.90 2185

macro avg 0.65 0.87 0.70 2185

weighted avg 0.96 0.90 0.92 2185

Confusion matrix:

[[1880 197]

[ 18 90]]

Model 8: Random Forest SMOTE

Classification report:

precision recall f1-score support

0 0.97 0.97 0.97 2077

1 0.47 0.51 0.49 108

accuracy 0.95 2185

macro avg 0.72 0.74 0.73 2185

weighted avg 0.95 0.95 0.95 2185

Confusion matrix:

[[2014 63]

[ 53 55]]