

# Project Development Phase

## Model Performance Test

### Model Performance Testing:

Parameter	Values	Screenshot
Metrics	<b>Classification Model:</b> Confusion Matrix , Accuracy Score & Classification Report	<p>1) Decision tree</p> <pre> precision    recall  f1-score   support  0           0.95      0.95      0.95        3116 1           0.95      0.95      0.95        3030  accuracy          0.95        6146 macro avg         0.95      0.95      0.95        6146 weighted avg      0.95      0.95      0.95        6146  roc_auc_dt : 0.9508299546257578 cm_dt: [[2970  146]  [ 156 2874]] as_dt: 0.9508623494956069 </pre> <p>2) KNN</p> <pre> precision    recall  f1-score   support  0           0.94      0.93      0.94        3116 1           0.93      0.94      0.93        3030  accuracy          0.94        6146 macro avg         0.94      0.94      0.94        6146 weighted avg      0.94      0.94      0.94        6146  roc_auc_knn : 0.9352104754763024 confusion_matrix : [[2885  231]  [ 168 2862]] Accuracy score : 0.9350797266514806 </pre> <p>3) Logistic Regression</p> <pre> precision    recall  f1-score   support  0           0.93      0.91      0.92        3116 1           0.91      0.93      0.92        3030  accuracy          0.92        6146 macro avg         0.92      0.92      0.92        6146 weighted avg      0.92      0.92      0.92        6146  roc_auc_lpr : 0.9196978651652071 confusion_matrix : [[2849  267]  [ 227 2803]] Accuracy score : 0.919622518711357 </pre> <p>4) Naïve Bayes Classification</p>

	precision	recall	f1-score	support
0	0.93	0.88	0.90	3116
1	0.88	0.93	0.90	3030
accuracy			0.90	6146
macro avg	0.90	0.90	0.90	6146
weighted avg	0.90	0.90	0.90	6146

roc\_auc\_gnb : 0.9032067006443905  
 confusion\_matrix : [[2738 378]  
 [ 219 2811]]  
 Accuracy score : 0.9028636511552229

### 5) Random Forest

	precision	recall	f1-score	support
0	0.98	0.54	0.70	3116
1	0.68	0.99	0.81	3030
accuracy			0.76	6146
macro avg	0.83	0.77	0.75	6146
weighted avg	0.83	0.76	0.75	6146

```
print( Accuracy score : ,as_rfc)
```

roc\_auc\_rfc : 0.7675142032816888  
 confusion\_matrix : [[1698 1418]  
 [ 30 3000]]  
 Accuracy score : 0.7643996095021152

### 6) SVM

	precision	recall	f1-score	support
0	0.92	0.95	0.94	3116
1	0.95	0.92	0.93	3030
accuracy			0.94	6146
macro avg	0.94	0.94	0.94	6146
weighted avg	0.94	0.94	0.94	6146

roc\_auc\_svc : 0.9364689646114804  
 confusion\_matrix : [[2971 145]  
 [ 244 2786]]  
 Accuracy score : 0.9367068011714936

		7) XGBoost																														
		<table><tr><td></td><td>precision</td><td>recall</td><td>f1-score</td><td>support</td></tr><tr><td>0</td><td>0.99</td><td>0.73</td><td>0.84</td><td>3116</td></tr><tr><td>1</td><td>0.78</td><td>0.99</td><td>0.87</td><td>3030</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.86</td><td>6146</td></tr><tr><td>macro avg</td><td>0.89</td><td>0.86</td><td>0.86</td><td>6146</td></tr><tr><td>weighted avg</td><td>0.89</td><td>0.86</td><td>0.86</td><td>6146</td></tr></table> <p>roc_auc_xgb : 0.9584778022089757</p> <p>confusion_matrix : [[2281 835]</p> <p>[ 27 3003]]</p> <p>Accuracy score : 0.8597461763748779</p>		precision	recall	f1-score	support	0	0.99	0.73	0.84	3116	1	0.78	0.99	0.87	3030	accuracy			0.86	6146	macro avg	0.89	0.86	0.86	6146	weighted avg	0.89	0.86	0.86	6146
	precision	recall	f1-score	support																												
0	0.99	0.73	0.84	3116																												
1	0.78	0.99	0.87	3030																												
accuracy			0.86	6146																												
macro avg	0.89	0.86	0.86	6146																												
weighted avg	0.89	0.86	0.86	6146																												