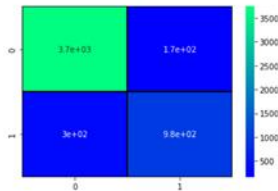


Project Development Phase Model Performance Test

Date	18 November 2022
Team ID	PNT2022TMID32530
Project Name	Smart Lender-Applicant credibility prediction for loan approval.
Maximum Marks	10 Marks

Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Values	Screenshot																														
1.	Metrics	Classification Model: Confusion Matrix – , Accuray Score- & Classification Report -	<pre>In [46]: from sklearn.metrics import confusion_matrix, accuracy_score, classification_report pred=rf.predict(x_test) cm=confusion_matrix(y_test, pred) plt.figure(figsize=(6,4)) sns.heatmap(cm, annot=True, cmap='winter', linewidths=0.3, linecolor='black', annot_kws={"size": 10}) TP=cm[0][0] TN=cm[1][1] FN=cm[1][0] FP=cm[0][1] print('Testing Sensitivity for Random Forest',(TP/(TP+FN))) print('Testing Specificity for Random Forest',(TN/(TN+FP))) print('Testing Precision for Random Forest',(TP/(TP+FP))) print('Testing accuracy for Random Forest',accuracy_score(y_test, pred))</pre> <p>Testing Sensitivity for Random Forest 0.9263940520446097 Testing Specificity for Random Forest 0.8546409807355516 Testing Precision for Random Forest 0.9574795081967213 Testing accuracy for Random Forest 0.9105659648445046</p>  <pre>In [47]: print(classification_report(y_test, pred))</pre> <table><thead><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr></thead><tbody><tr><td>0</td><td>0.93</td><td>0.96</td><td>0.94</td><td>3904</td></tr><tr><td>1</td><td>0.85</td><td>0.77</td><td>0.81</td><td>1273</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.91</td><td>5177</td></tr><tr><td>macro avg</td><td>0.89</td><td>0.86</td><td>0.87</td><td>5177</td></tr><tr><td>weighted avg</td><td>0.91</td><td>0.91</td><td>0.91</td><td>5177</td></tr></tbody></table>		precision	recall	f1-score	support	0	0.93	0.96	0.94	3904	1	0.85	0.77	0.81	1273	accuracy			0.91	5177	macro avg	0.89	0.86	0.87	5177	weighted avg	0.91	0.91	0.91	5177
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2.	Tune the Model	Hyperparameter Tuning - Validation Method -	<pre>In [54]: from sklearn.model_selection import KFold, GridSearchCV, cross_val_score kf= KFold(n_splits=5, shuffle=True, random_state=42) param={ 'max_depth':[4,5,7], 'max_leaf_nodes':[2,3], 'random_state':[42,56,72], 'criterion':['gini','entropy','log_loss'] } In [55]: grcv=GridSearchCV(rf,param,cv=kf) grcv.fit(x_train,y_train) grcv.best_params_ In [56]: cv_result=cross_val_score(rf,x_train,y_train,cv=kf) cv_result Out[56]: array([0.88477254, 0.88967584, 0.88586216, 0.89264305, 0.88692098])</pre>
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