

Project Development Phase Model Performance Test

Date	10 November 2022
Team ID	PNT2022TMID07028
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	<p>Classification Model:</p> <p>Accuracy Score- Xgboost Model Testing Accuracy 0.905135135135135 Xgboost Model Training Accuracy 0.905135135135135</p> <p>Classification Report -</p> <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>1.00</td><td>0.76</td><td>0.87</td><td>68</td></tr><tr><td>1</td><td>0.88</td><td>1.00</td><td>0.94</td><td>117</td></tr></tbody></table> <table><tbody><tr><td>accuracy</td><td></td><td></td><td>0.91</td><td>185</td></tr><tr><td>macro avg</td><td>0.94</td><td>0.88</td><td>0.90</td><td>185</td></tr><tr><td>weighted avg</td><td>0.92</td><td>0.91</td><td>0.91</td><td>185</td></tr></tbody></table>		precision	recall	f1-score	support	0	1.00	0.76	0.87	68	1	0.88	1.00	0.94	117	accuracy			0.91	185	macro avg	0.94	0.88	0.90	185	weighted avg	0.92	0.91	0.91	185	<div><pre>Loan_ID 614 Gender 2 Married 2 Dependents 4 Education 2 Self_Employed 2 Property_Area 3 Loan_Status 2</pre></div> <div><pre>("XGB", XGBClassifier(learning_rate=0.1, n_estimators=100, max_depth=6, min_child_weight = 1, gamma=0., subsample=0.8, scale_pos_weight=1, random_state=27)),) for model_name, model in models: print('\nModel %s: %s model_name) full_pipeline = Pipeline(steps=[('preprocessor', preprocessor), ('model', model)</pre></div> <div><pre>Model XGB. accuracy score: 0.8211382113821138 classification_report: precision recall f1-score support 0 0.78 0.58 0.63 33 1 0.85 0.91 0.88 90 accuracy 0.82 123 macro avg 0.78 0.74 0.76 123 weighted avg 0.81 0.82 0.82 123 cross_val_score: [0.74796748 0.73170732 0.75609756 0.78861789 0.78688525] mean of scores: 0.7622550979688156 *****</pre></div>
	precision	recall	f1-score	support																													
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2.

Tune the Model

Hyperparameter Tuning

- No tuning is performed as we have got 91% accuracy

Parameters used-

n_estimators=5000,max_depth=80,max_features='log2'

Validation Method

- In-sample validation

```
df = pd.read_csv("C:\\Users\\mural\\OneDrive\\Desktop\\Surya_project-main\\Surya_project-main\\Loan_Approval.csv")
print(df.info())
df.head()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 614 entries, 0 to 613
Data columns (total 13 columns):
 #   Column                Non-Null Count  Dtype  ---
 0   Loan_ID               614 non-null    object
 1   Gender                601 non-null    object
```

Loan_ID	Gender	Married	Dependents	Education	Self_Employed	ApplicantIncome	CoapplicantIncome	LoanAmount	Loan_Amount_Term
LP001002	Male	No	0	Graduate	No	5849	0.0	NaN	
LP001003	Male	Yes	1	Graduate	No	4593	1500.0	120.0	
LP001005	Male	Yes	0	Graduate	Yes	3000	0.0	66.0	
LP001006	Male	Yes	0	Not Graduate	No	2583	2350.0	120.0	
LP001008	Male	No	0	Graduate	No	6000	0.0	141.0	