CUSTOMER CHURN ANALYSIS

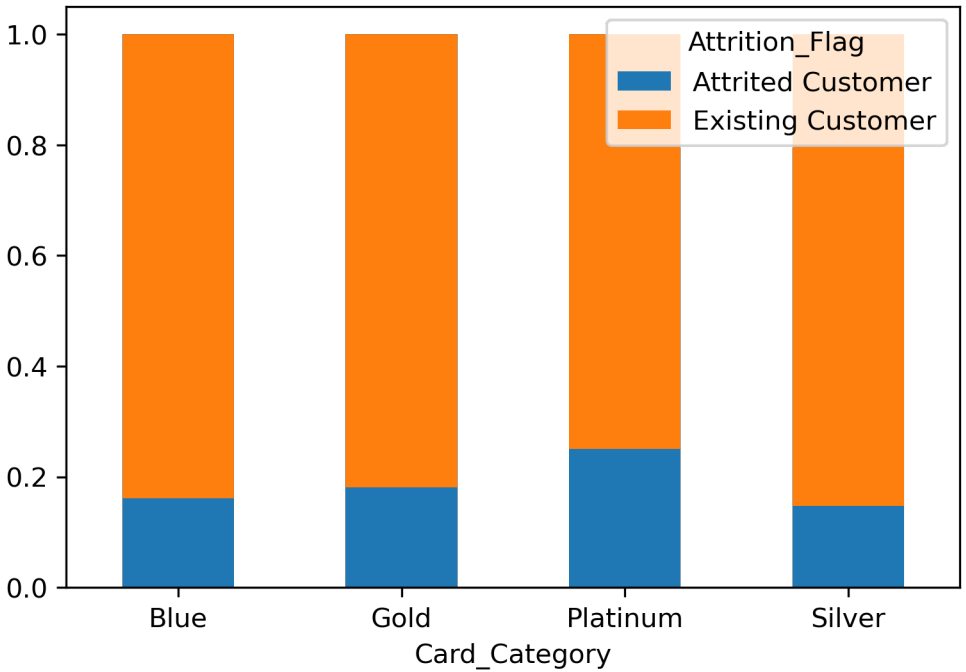
OUTLINE

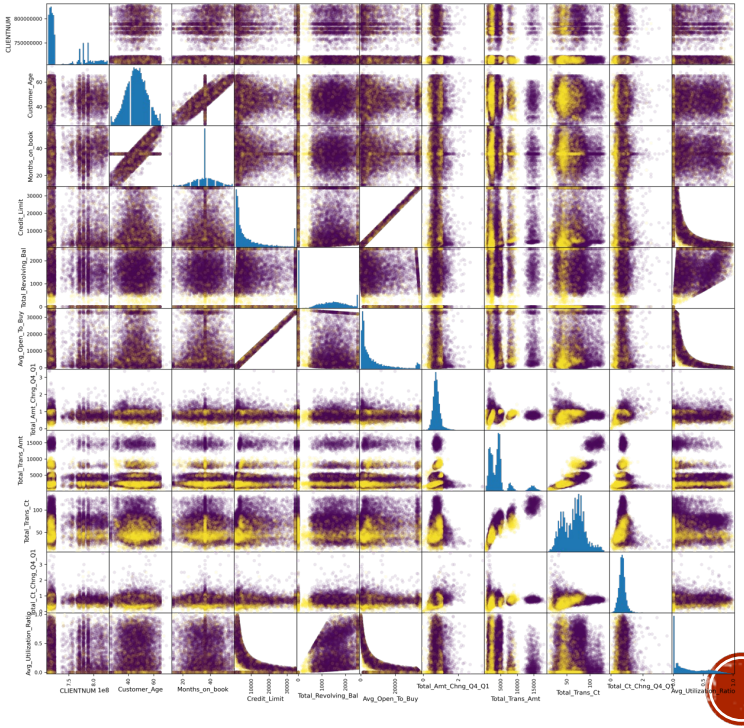
- [illegible]
- [illegible]
- [illegible]
- [illegible]

BACKGROUND

- **Customer Churn Prediction Analysis:** [illegible]
- **Importance and Data Overview:** [illegible]

EDA


Attrition_Flag
Attrited Customer
Existing Customer
1.0
0.8
0.6
0.4
0.2
0.0
Blue
Gold
Platinum
Silver
Card_Category



PREPROCESSING

- [illegible]
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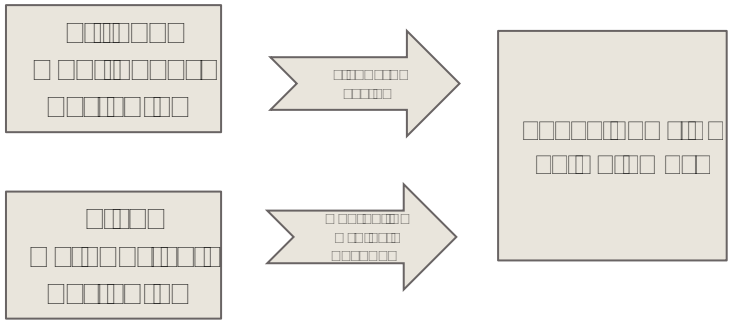

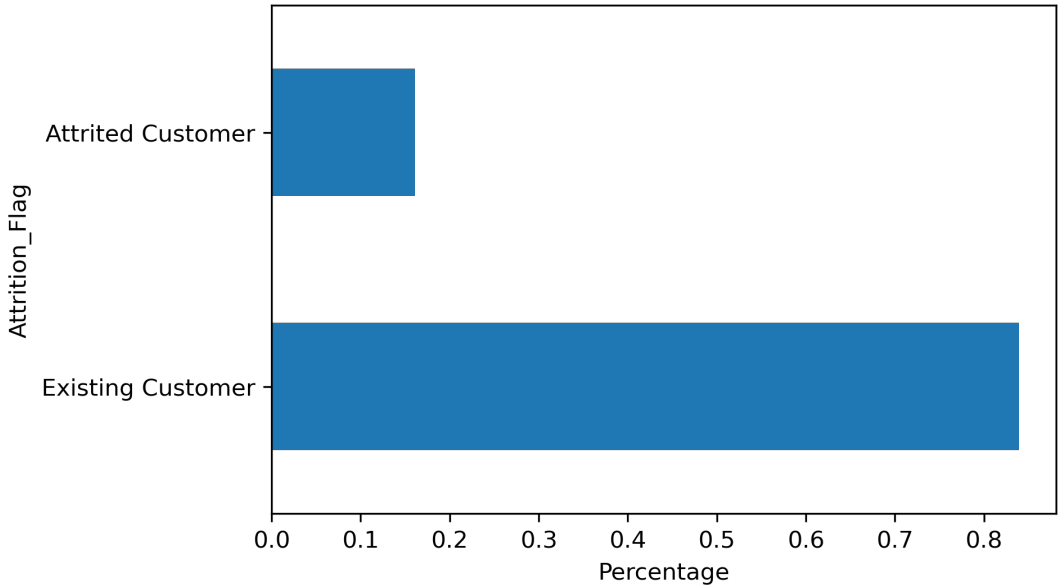

CROSS VALIDATION PIPELINE

- **Random State Selection**
- **Data Splitting**
- **Preprocessing**
- **Hyperparameter Tuning**
- **Model Evaluation**

PARAMETER TUNING

- [illegible]
  - [illegible]
  - [illegible]
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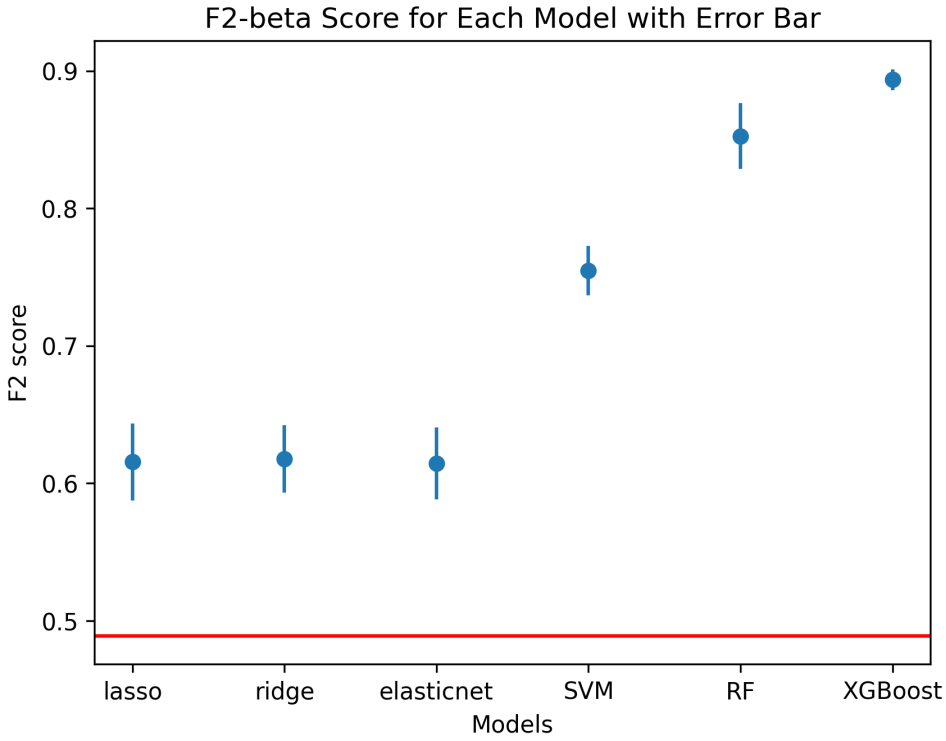
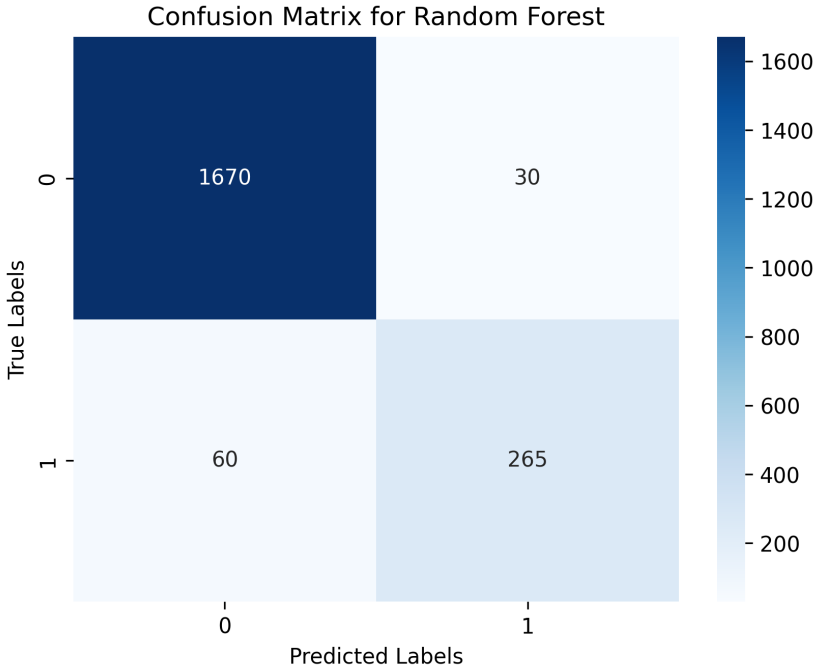
Model	Hyperparameter	Search Space
L1	C	10 values of logspace from -5 to 5 with base 10
L2	C	10 values of logspace from -5 to 5 with base 10
ElasticNet	C	10 values of logspace from -5 to 5 with base 10
	l1_ratio	[0.1, 0.3, 0.5, 0.7, 0.9]
RandomForest	max_depth	[1, 2, 3, 5, 10, 15, 20, 30, 50]
	max_features	[2, 5, 10, 15, 20]
SVM	C	[0.001, 0.01, 0.1, 1, 10, 100, 1000]
	gamma	[0.001, 0.01, 0.1, 1, 10, 100, 1000]
XGBoost	learning_rate	[0.03]
	n_estimators	[10000]
	min_child_weight	[1, 3, 5, 7]
	gamma	[0, 0.1, 0.2, 0.3, 0.4]
	max_depth	[2]
	colsample_bytree	[0.3, 0.4, 0.5, 0.7, 1]
	subsample	[0.5, 0.66, 0.75, 1]

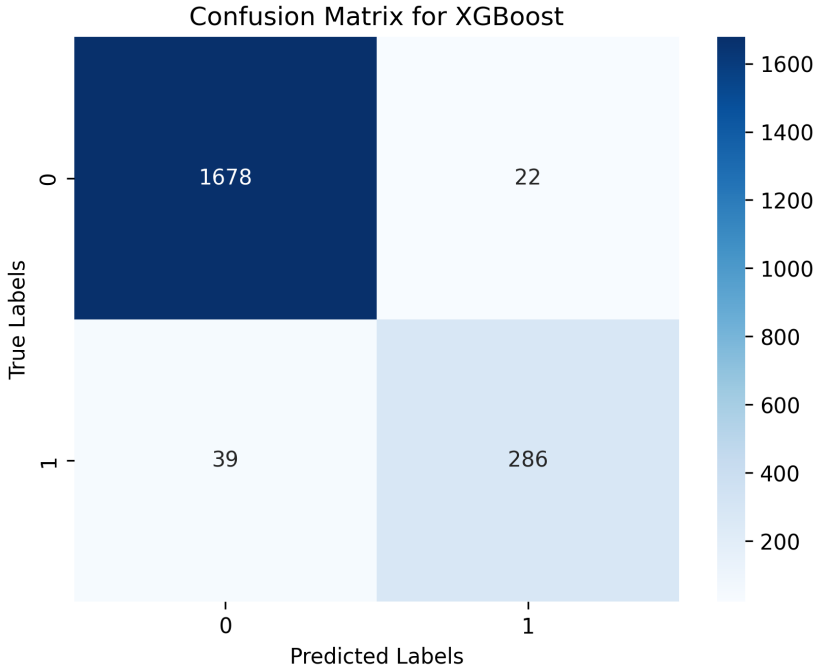
RESULTS

	Model	F2 Beta Score (Mean ± Std)
0	Lasso Logistic Regression	0.616 ± 0.031
1	Ridge Logistic Regression	0.618 ± 0.027
2	SVM	0.755 ± 0.02
3	Random Forest	0.853 ± 0.027
4	XGBoost	0.894 ± 0.008
5	Baseline	0.489



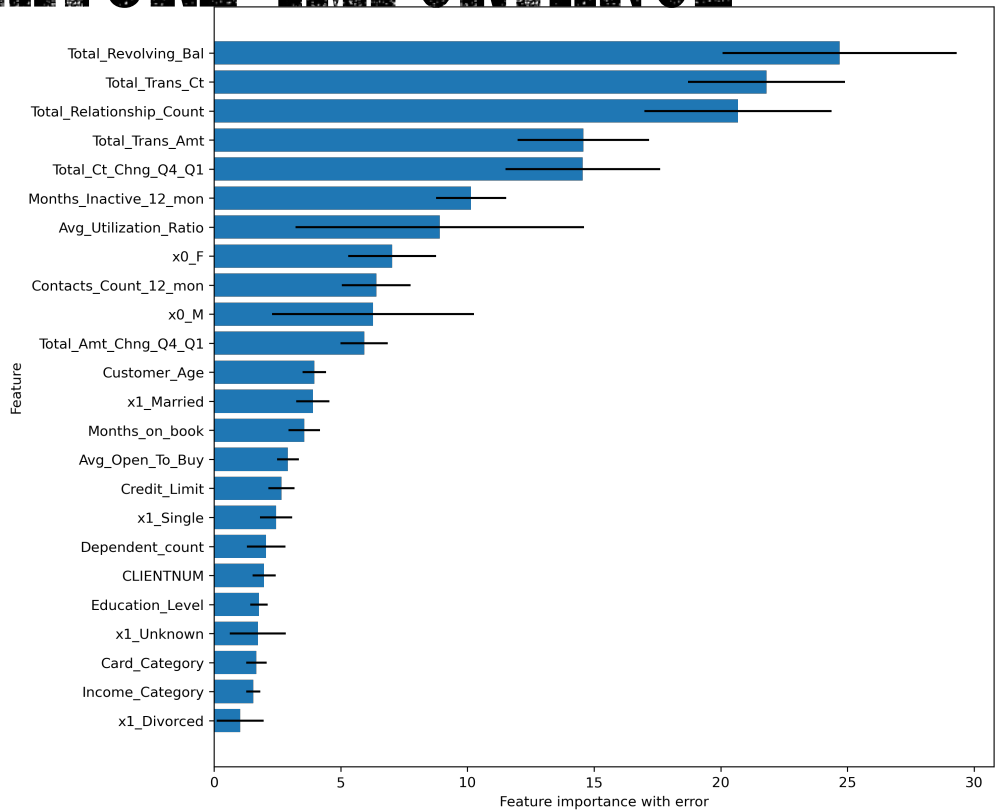
RESULTS CONTINUE



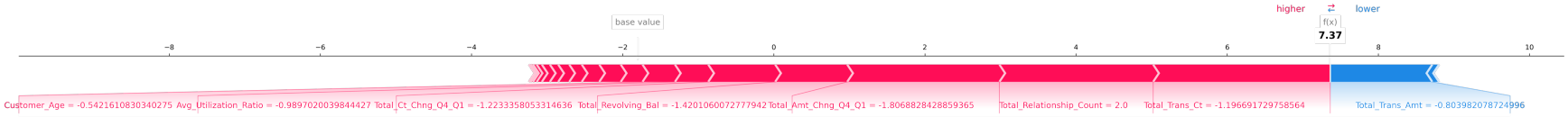


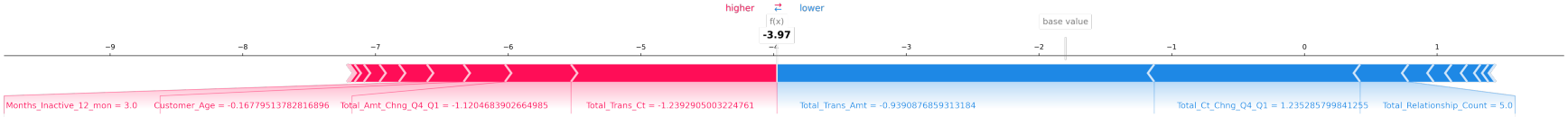
GLOBAL FEATURE IMPORTANCE

- Total_Revolving_Bal is the most influential feature when predicting whether a customer will churn using XGBoost and ‘Gain’ as the importance metric.



LOCAL IMPORTANCE





OUTLOOK

- **Expand Dataset:** [illegible]
- **Enhanced Hyperparameter Tuning:** [illegible]
- **Advanced Models:** [illegible]
- **Interpretability:** [illegible]

Q & A