Customer Churn Prediction Report

This report summarizes the preprocessing, model evaluation, and findings from the customer churn prediction project.

Data Summary:

Number of data points: 7043

Missing values handled and categorical data encoded.

Features scaled for modeling.

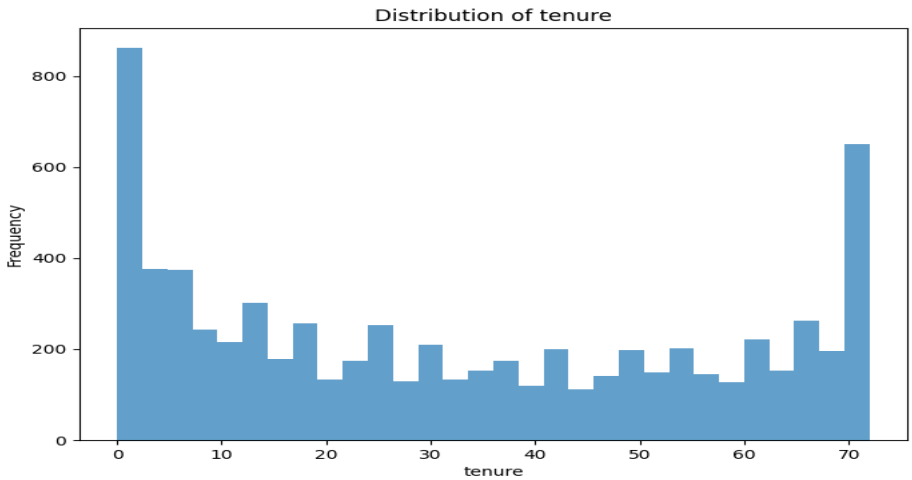
Exploratory Data Analysis (EDA):

The following features were visualized using histograms:

- tenure

- MonthlyCharges

- TotalCharges



Model Evaluation:

Model: Random Forest

Accuracy: 0.82

Metric	Precision	Recall	F1-Score	Support

No	0.86	0.91	0.88	1061
Yes	0.66	0.53	0.59	348
macro avg	0.76	0.72	0.73	1409
weighted avg	0.81	0.82	0.81	1409

Model: Logistic Regression

Accuracy: 0.81

Metric	Precision	Recall	F1-Score	Support
No	0.87	0.89	0.88	1061
Yes	0.63	0.59	0.61	348
macro avg	0.75	0.74	0.74	1409
weighted avg	0.81	0.81	0.81	1409

Model: Decision Tree

Accuracy: 0.78

Metric	Precision	Recall	F1-Score	Support
No	0.86	0.85	0.86	1061
Yes	0.56	0.58	0.57	348
macro avg	0.71	0.72	0.71	1409
weighted avg	0.79	0.78	0.79	1409

Model: SVM

Accuracy: 0.81

Metric	Precision	Recall	F1-Score	Support
No	0.85	0.91	0.88	1061
Yes	0.65	0.52	0.58	348
macro avg	0.75	0.72	0.73	1409
weighted avg	0.80	0.81	0.81	1409

Conclusion:

The model performance has been evaluated for several classifiers, including Random Forest, Logistic Regression, and Decision Tree. The best-performing model based on accuracy and other metrics will be used for predicting customer churn.