

Customer Churn Prediction with AutoML

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Telco: Telecommunications Company

Business Problem: Customer Churning

Impact: Lost Revenue & Increased Marketing Costs

Goal: Build predictive model to identify at-risk customers

Benefits: Proactive Intervention, Targeted Retention,
Resource Optimization, & Enhanced Customer Relationships

Telco Customer Churn Dataset

Description: Customer Metrics for 7043 customers

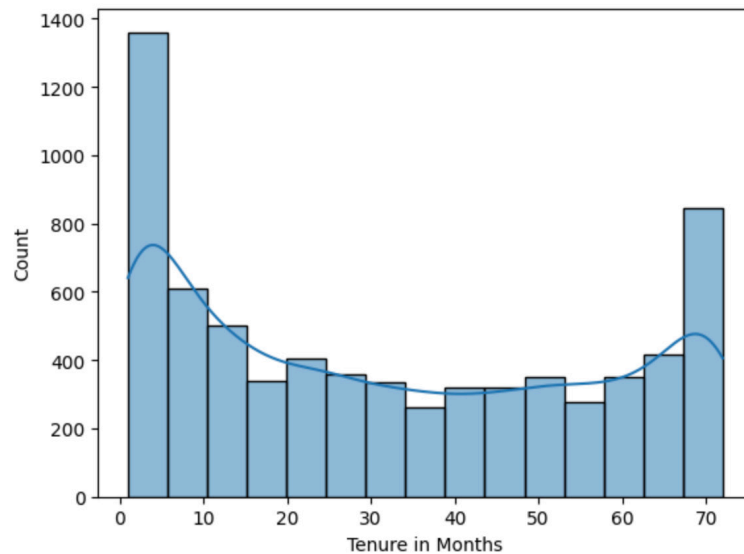
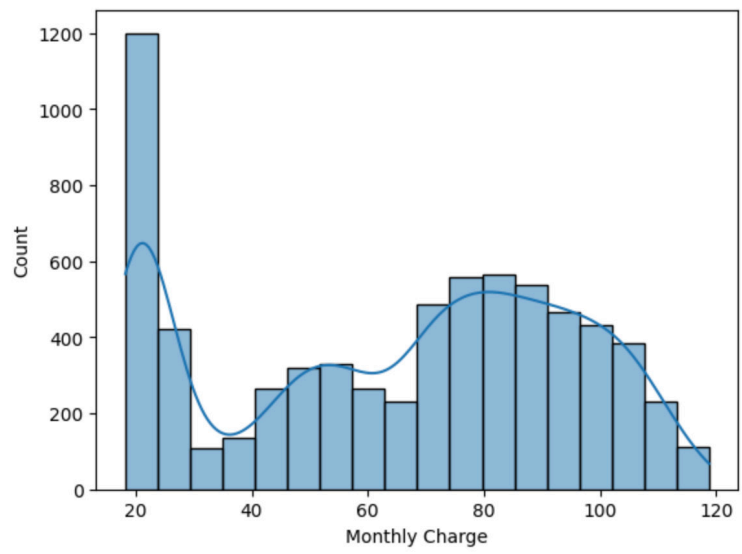
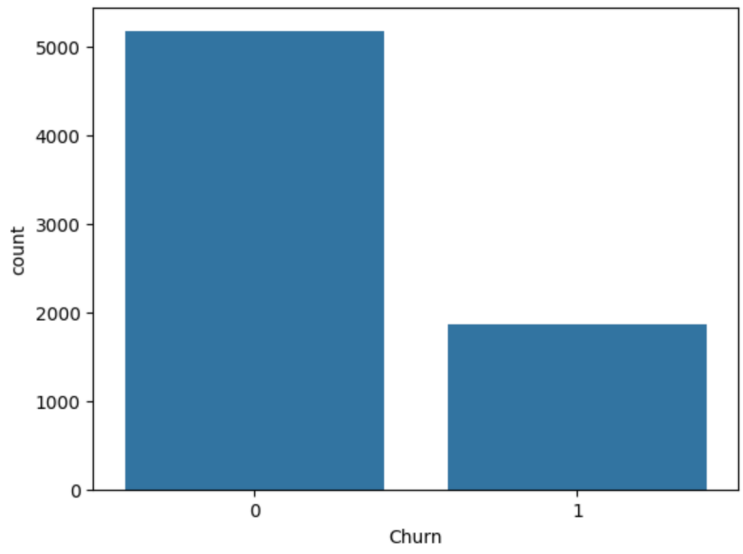
Demographics: gender, age, senior citizen status, marital status, dependents

Location: country, state, city, zip code, latitude, longitude

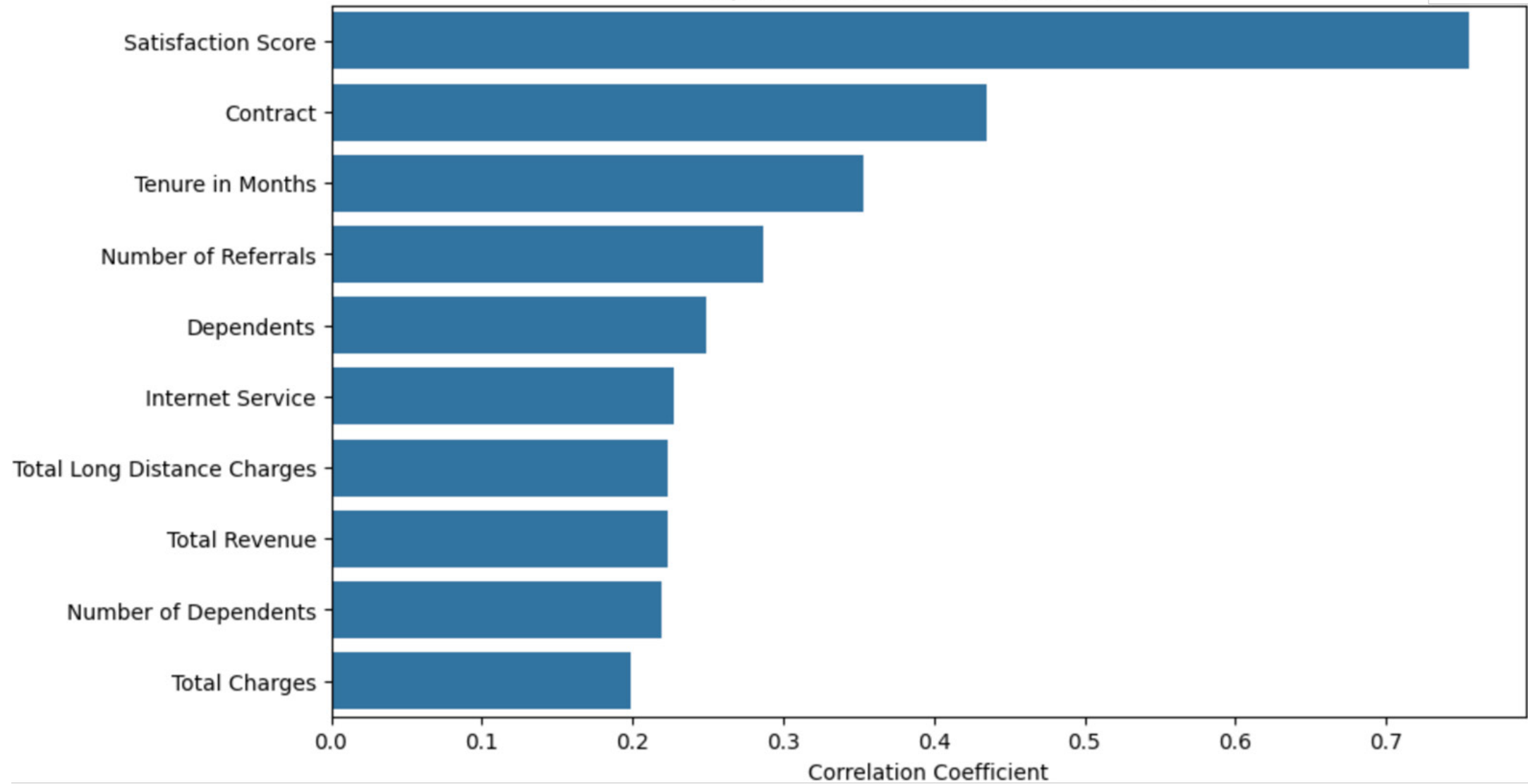
Population: zip code, population estimates

Services: service types, tenure, charges, contract type

Status: satisfaction score, churn label, churn score



Top Features Correlated with Churn



AutoGluon: The Winning Solution

AutoGluon is an AutoML Library

Automatically selects best-performing model
from a diverse set of algorithms.

Best Model: Weighted Ensemble L3

Ensemble model

Combined strengths of multiple models

Best Model: Weighted Ensemble L3

| ROC AUC | Accuracy | Precision | Recall | F1 Score | MCC |
|---------|----------|-----------|--------|----------|--------|
| 0.995 | 0.9411 | 0.875 | 0.9098 | 0.8921 | 0.9154 |

Alternative Solutions

Decision Tree Classifier

XGBoost Classifier

Deep Neural Network

Results

| Model | Accuracy | Precision | Recall | F1 Score |
|---------------------|----------|-----------|--------|----------|
| Decision Tree | 0.9411 | 0.875 | 0.9098 | 0.8921 |
| Deep Learning (MLP) | 0.9489 | 0.9155 | 0.8912 | 0.9032 |
| XGBoost | 0.9581 | 0.9517 | 0.8886 | 0.9191 |

Ethical, Business, & Regulatory Risks

Ethics: Bias/Fairness & Privacy

Business: Recall & Proactive Engagement

Regulatory: Cybersecurity & Data Governance

Recommendations

Proactive Retention

Personalized Offers

Enhanced Support

Monitor Feedback

Targeted Campaigns

Contract Optimizations

Conclusion & Accomplishments

**Built Predictive Customer Churn Model
+ Business Recommendations**

**↓ Churn + ↑ Customer Relationships
= Boost Profitability**