Telco Churn Prediction

Lindsay Read

Telco Customer Churn

- ● **What is Telco?**
  - ○ Telecommunication Company

- ● **Why Predict Churn?**
  - ○ Customer Satisfaction
    - ■ Areas we could improve our business
    - ■ Attain and Retain Customers

Process

Choose a Metric

F1

- Balance of Precision and Recall
- Class imbalance

Process

Choose a Metric ▸ **Fit a model** ▸

F1

- Balance of Precision and Recall
- Class imbalance

Random Forest

- F1 score $= 0.624$
- Features used

Process

| Choose a Metric | Fit a model | Identify Feature Importance |

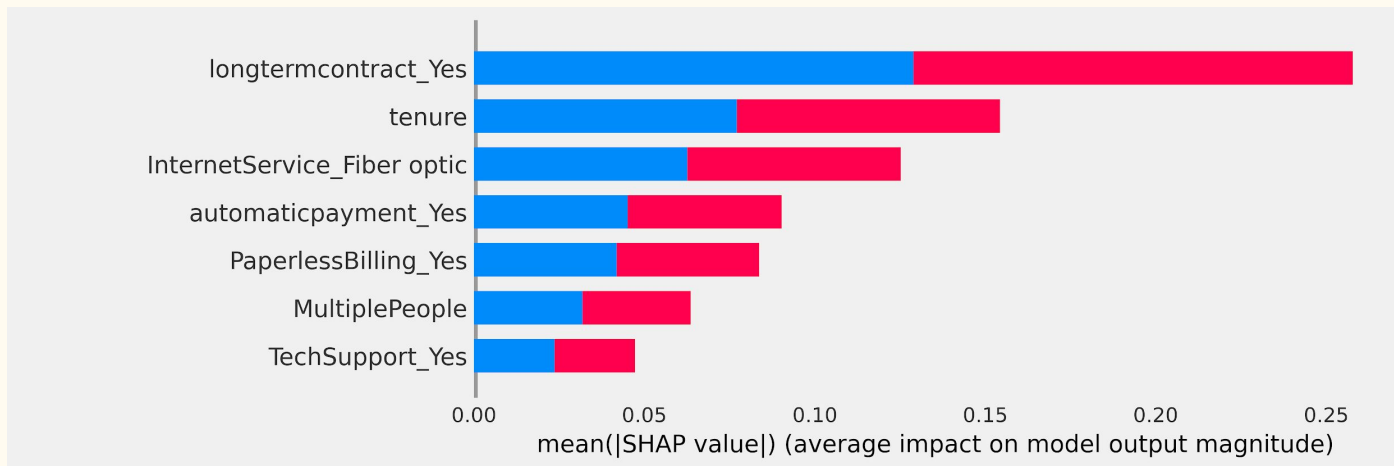**F1**

- Balance of Precision and Recall
- Class imbalance

Random Forest

- F1 score $= 0.624$
- Features used

Feature Importance

- Long-term Contract
- Tenure
- Internet (Fiber Optic)
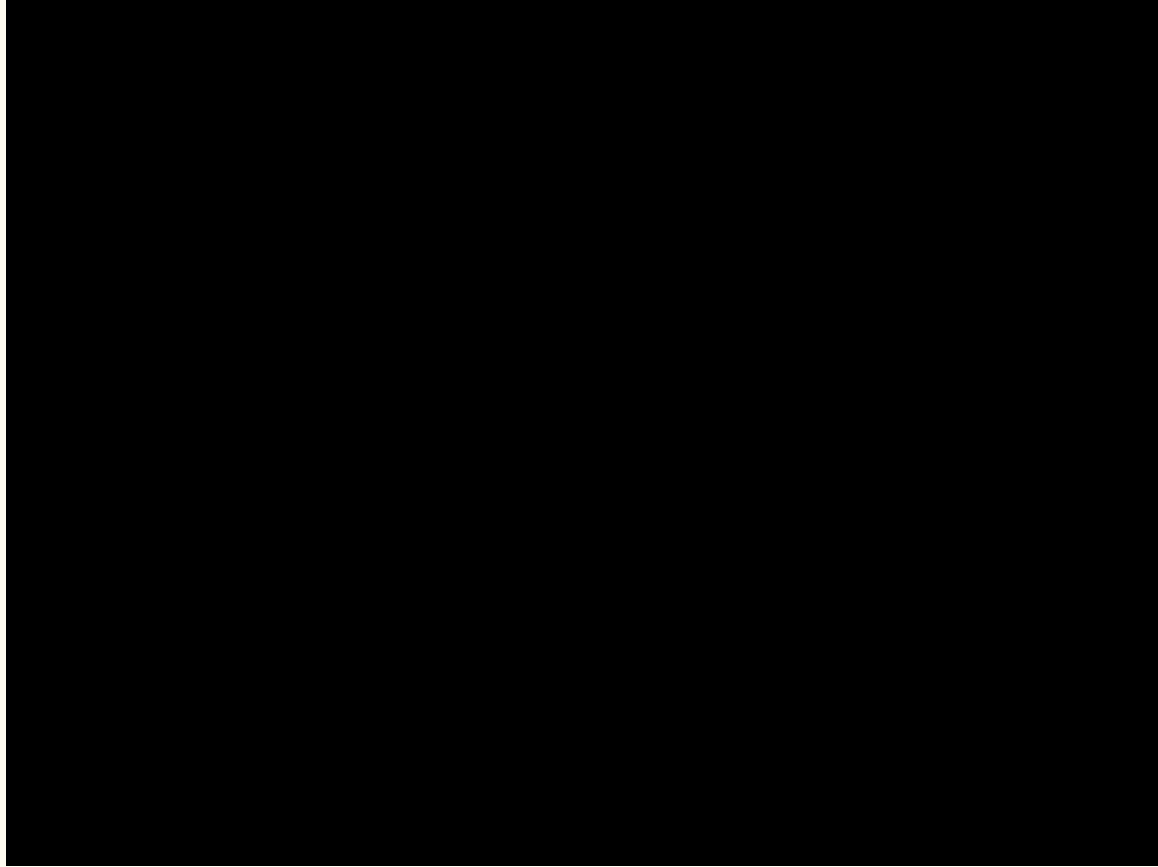- Autopay
- Paperless
- Multiple People
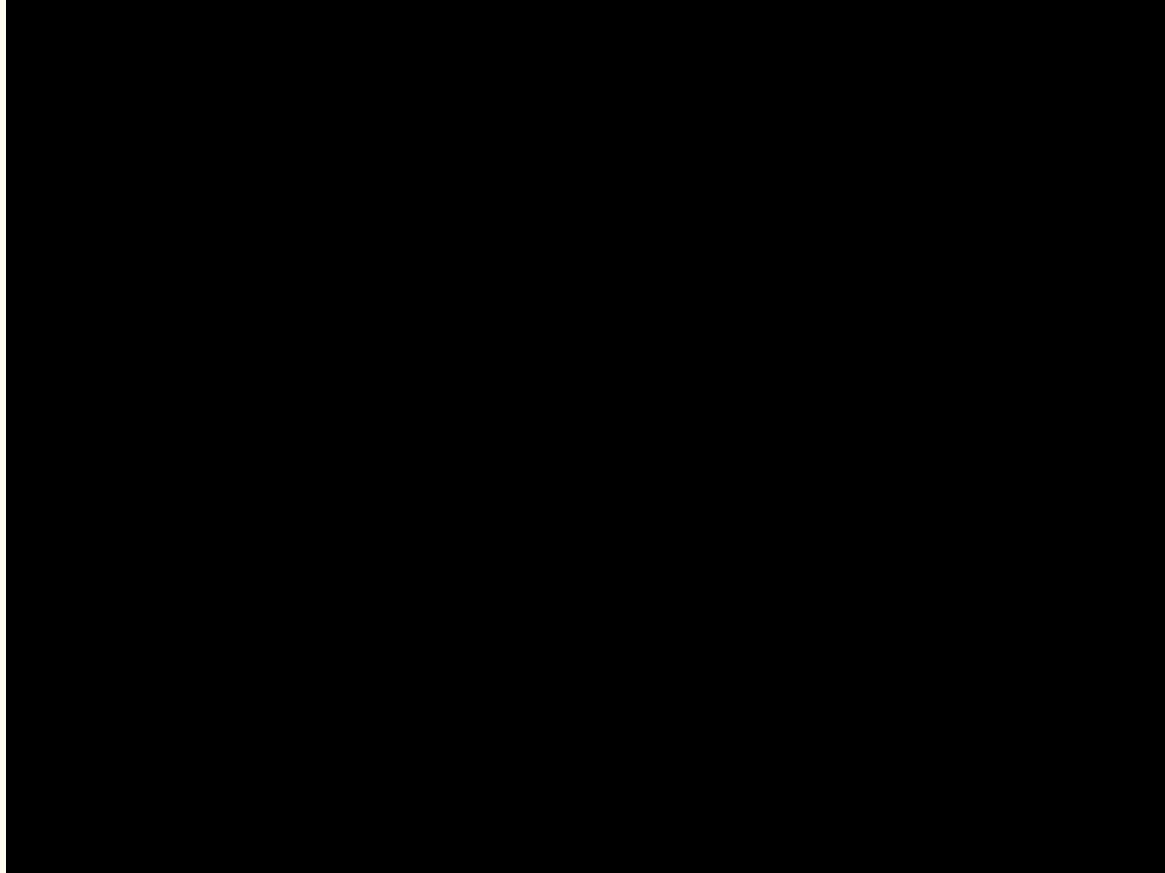- Tech Support

Most Impactful Features

Blue = Stay

Red = Leave

Customer Likely to Leave

Customer Likely to Stay

Cost-Benefit Analysis

Confusion Matrix

	Predicted Churn	Predicted Stay
Actual Churn	280	101
Actual Stay	245	781

Red = False Positive (Costs $20 to invest in customer to get them to stay)

Blue = False Negative (Costs $100 to find new customer)

Black = True Positive or True Negative

Cost-Benefit Analysis

Confusion Matrix

	Predicted Churn	Predicted Stay
Actual Churn	280	101
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Black = True Positive or True Negative

Predict All Customers to Stay

	Predicted Churn	Predicted Stay
Actual Churn	0	381
Actual Stay	0	1026

Cost of False Negative:
$100 * 381 = $38,100
No Effort Retaining Customers:
$20 * 0 = $0

Cost = $38,100

Benefit:
$50 * 1026 =
Benefit = $51,300

Total Profit:
$51,300 - $38,100 =
Profit = $13,200

Cost-Benefit Analysis

Confusion Matrix

	Predicted Churn	**Predicted Stay**
Actual Churn	280	101
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Black = True Positive or True Negative

Take Action Based on Predictions

	Predicted Churn	**Predicted Stay**
Actual Churn	280	101
Actual Stay	245	781

Cost of False Negative:
$100 * 101 = $10,100
Cost of Retaining Customer:
$20 * 245 = $4,900

Cost = $15,000

Benefit:
$50 * 1026 =
Benefit = $51,300

Total Profit:
$51,300 - $15,000 =
Profit = $36,300

Cost-Benefit Analysis - Summary

Predict All Customers to Stay

	Predicted Churn	Predicted Stay
Actual Churn	0	381
Actual Stay	0	1026

Cost = $38,100

Benefit = $51,300

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Total Profit = $13,200
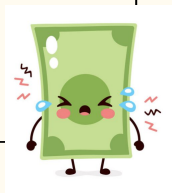
Take Action Based on Predictions

	Predicted Churn	Predicted Stay
Actual Churn	280	101
Actual Stay	245	781

Cost = $15,000

Benefit = $51,300

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Total Profit = $36,300

Thank you!

Most Impactful Features