Initial Findings

Logistic Regression

No Oversample vs Oversample

Class Imbalance

27% **Average Rate of Churn**

73% **Negative class (Typically problematic at 80%)**

- **Addressed class imbalance with oversampling**
- **Optimizing for recall metric**

Scores

Oversampling improves the model's ability to determine customers that are churning

Model: No Oversampling (LogReg)

- ROC AUC .83
  - Excellent discrimination
- Recall .51
  - Establishes a benchmark

Model: Oversampling (LogReg)

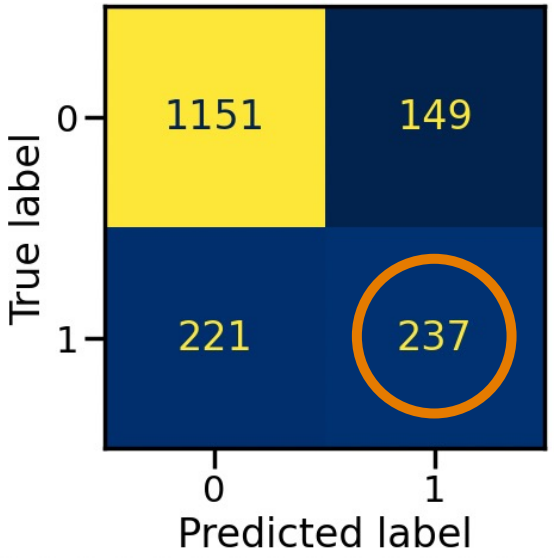
- ROC AUC .75
  - Acceptable discrimination
- Recall .80
  - Improvement over no oversampling

Confusion Matrix

Compare models using default threshold

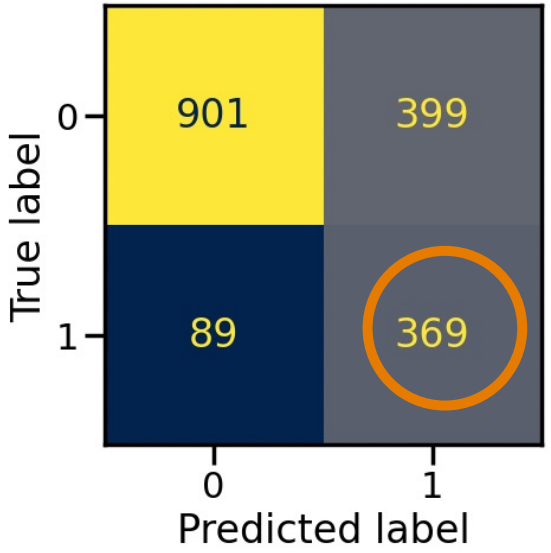
Oversampling improves the model's ability to identify people who cancelled their subscription

Model: No Oversampling (LogReg)



- Correctly classified 1151 customers who didn't cancel their subscription.
- Correctly classified 237 customers as people who did cancel their subscription.
- Incorrectly classified 149 customers as cancelled their subscription when they kept their subscription.
- Incorrectly classified 221 customers as people who kept their subscription but actually cancelled it.

Model: Oversampling (LogReg)



- Correctly classified 901 customers who didn't cancel their subscription.
- Correctly classified 369 customers as people who did cancel their subscription.
- Incorrectly classified 399 customers as cancelled their subscription when they kept their subscription.
- Incorrectly classified 89 customers as customers who kept their subscription but actually cancelled it.