# Telco Customer Churn Report

## What We Did

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We built a churn classifier on the Telco dataset using an 80/20 train–test split.

Categorical fields were one-hot encoded, numeric fields were imputed and scaled,

and we trained a Logistic Regression model with class balancing.

The objective was to predict whether a customer would churn.

## How the Model Performed (Test Set)

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* Accuracy: 0.7381
* Precision (Churn): 0.5043
* Recall (Churn): 0.7834
* F1 Score (Churn): 0.6136
* ROC–AUC: 0.8413

Interpretation:

* The AUC of 0.8413 indicates strong ranking ability.
* High recall (0.7834) means the model is effective at catching most churners.
* Precision (0.5043) suggests some over-targeting in outreach.
* Overall, this is a solid baseline when the priority is not missing at-risk customers.

## Key Drivers of Churn

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* Higher churn risk: month-to-month contracts, higher monthly charges, shorter tenure,

electronic check payments, fiber internet, and lack of add-on services.

* Lower churn risk: longer contracts, automatic payments, higher tenure,

and having support/security services.

## Mistakes the Model Makes

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* False Positives: Loyal customers flagged as churners (cost is extra outreach).
* False Negatives: Actual churners missed (more costly since they represent lost customers).

## Recommendations

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1. Contract offers for month-to-month users to shift them to yearly plans.
2. Early engagement programs for new customers in their first 1–3 months.
3. Promote autopay methods with incentives to reduce churn.
4. Encourage adoption of support/security add-ons.
5. Prioritize high-risk, high-value customers for targeted retention.

## Modeling Next Steps

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* Threshold tuning to adjust the precision/recall trade-off.
* Compare Logistic Regression with Random Forest or Gradient Boosting.
* Add engineered features like tenure buckets or interaction terms.

## Conclusion

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The model ranks churn risk well (AUC 0.8413) and emphasizes recall (0.7834).

With threshold tuning and targeted campaigns, it is ready to support

business strategies to retain at-risk customers.