Exploring Customer's Churn
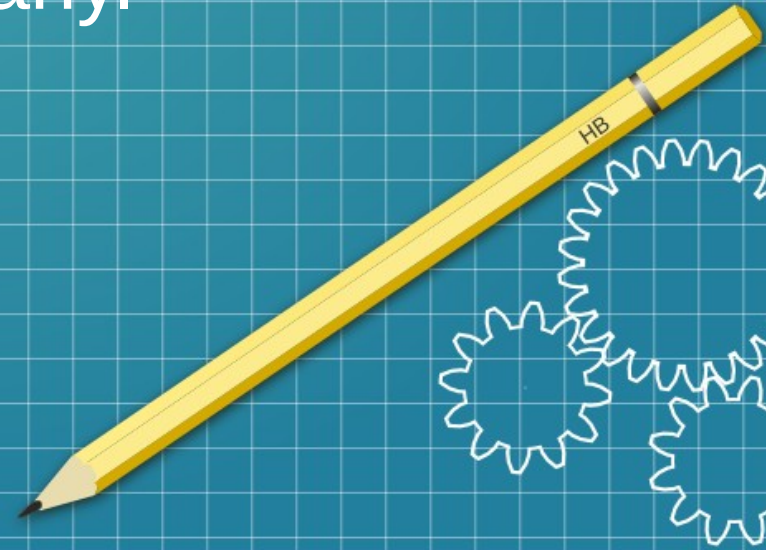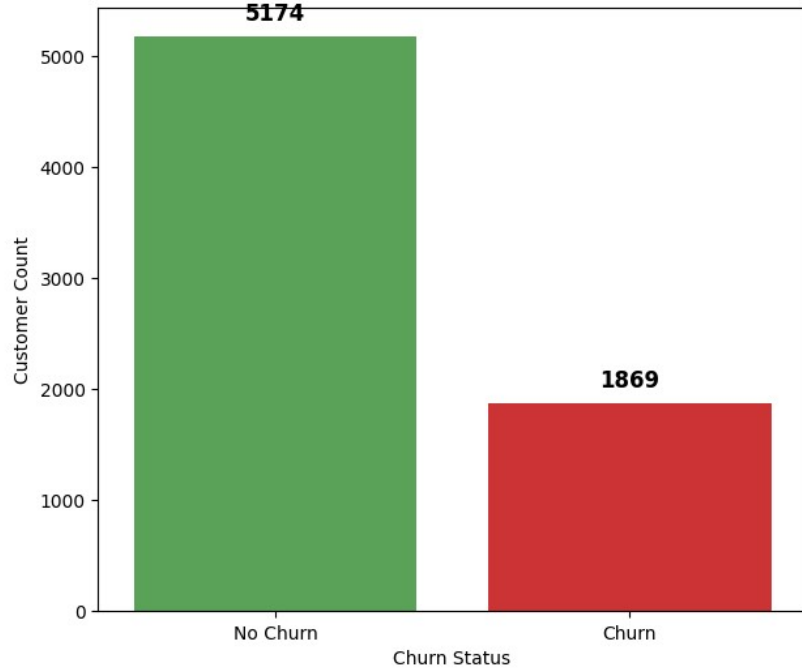
in a Telecom Company.

Made by Christos Vamvakousis.
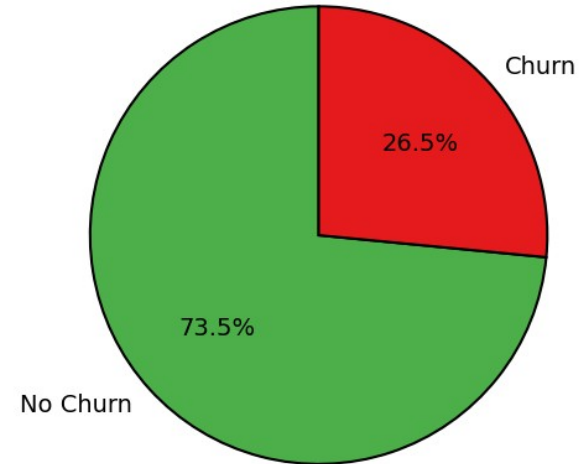
Customer Churn Overview
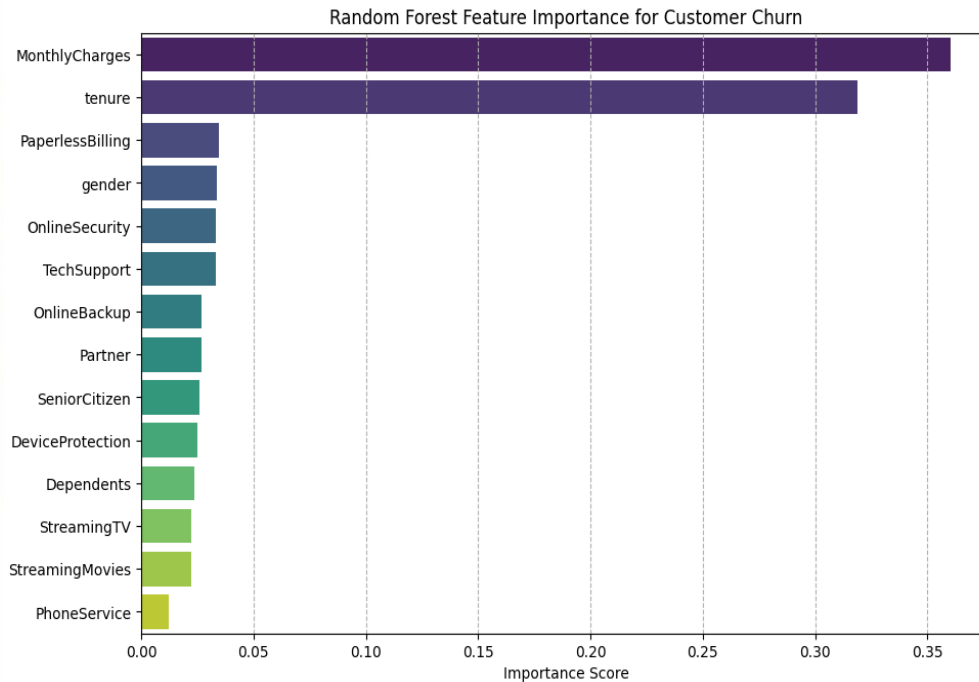

Count of Customers Who Churned vs. Did Not Churn

Percentage of Customer Churn

Key Drivers of Customer Churn

Random Forest Feature Importance for Customer Churn

A *26.5%* churn rate signals significant customer instability. To mitigate this risk, we must now move to identify the underlying causal factors revealed by our analysis.

Dominant Predictors: MonthlyCharges and tenure outperform all other features combined, driving the majority of the model's predictive power.

Price Sensitivity: High monthly costs represent the primary trigger for customer attrition.

Lifecycle Risk: Low tenure identifies the first year as the critical period for retention efforts.

Top 2 Churn Drivers: <u>Cost</u> and <u>Lifecycle Risk</u>

Simplified Correlation Matrix of Features (Feature Engineered TotalCharges)
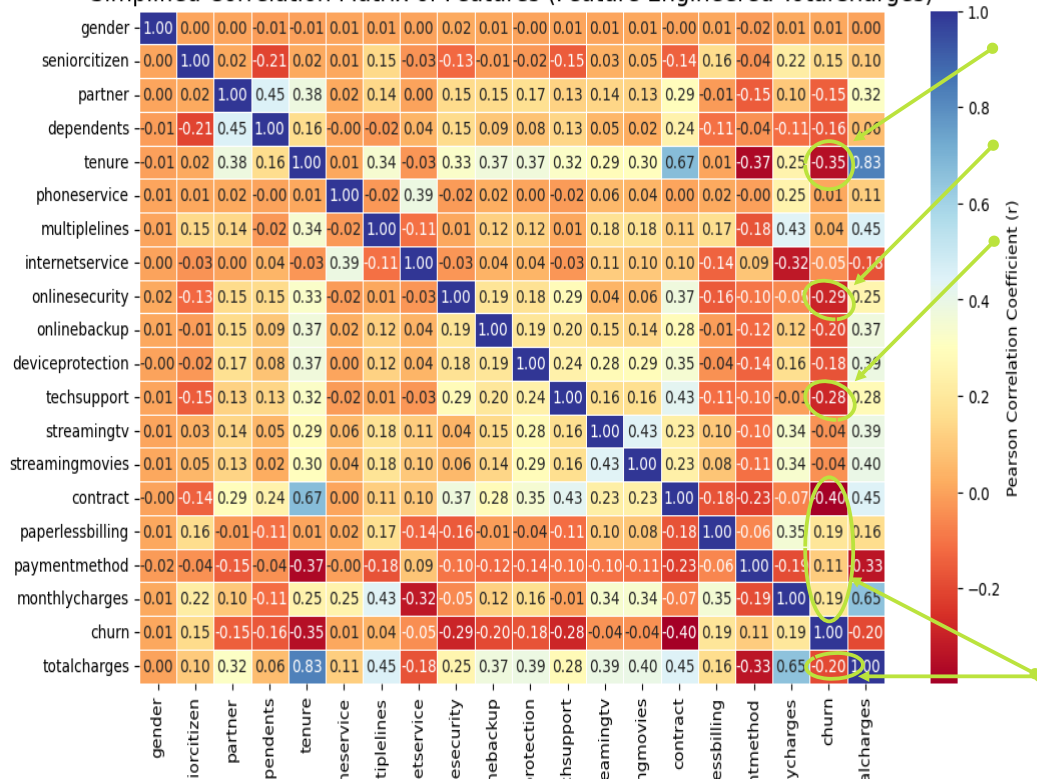
- 1. Price Sensitivity and Digital Risk

  i. Proof: Strong positive correlation with both TotalCharges, <u>MonthlyCharges</u> and <u>PaperlessBilling</u> (r=0.20 and r=0.19).

  ii. <u>Observation</u>: Customers with higher costs and digital billing habits are the most susceptible to churn.

  iii. Risk: This indicates overpricing is a major issue, driving customers who monitor their bills closely to switch providers.

- 2. Onboarding Friction (<u>Tenure</u> and <u>contract</u>)

  i. Proof: Strongest negative correlations in the dataset (r=-0.35 and r=-0.40). <u>Time builds loyalty.</u>

  ii. Critical Window: The highest churn risk is concentrated in the first 12 months of the customer lifecycle.

  iii. Diagnosis: The early customer experience is failing to establish perceived value, leading to rapid early defection.

Tenure & Contract: The Early-Life Risk Window

Correlation of Contract Type vs. Churn
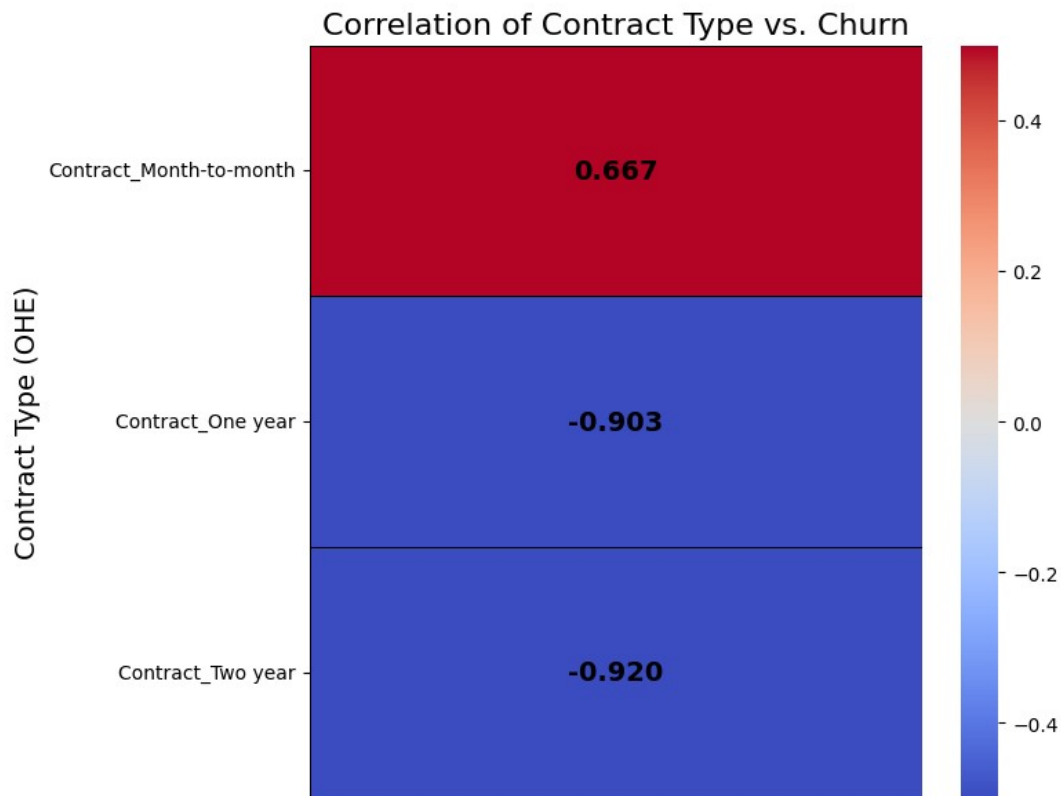
- **The Critical 12-Month Churn Window:**

  i. **Tenure Risk:** Our strongest negative correlation (r=-0.35) proves that loyalty is earned through time. The majority of attrition occurs within the first 12 months of the customer lifecycle.

  ii. **The Root Cause:** This high early risk is enabled by the Month-to-Month contract (r=0.667), which provides an easy, low-friction exit route.

  iii. **The Profile:** Our most likely churner is a New Customer on a Month-to-Month Contract

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What specific services cause these problems?

Having identified Cost as a primary driver, we now analyze the specific services generating those costs to pinpoint the product-level root cause.

Pearson Correlation of Encoded Features with Churn
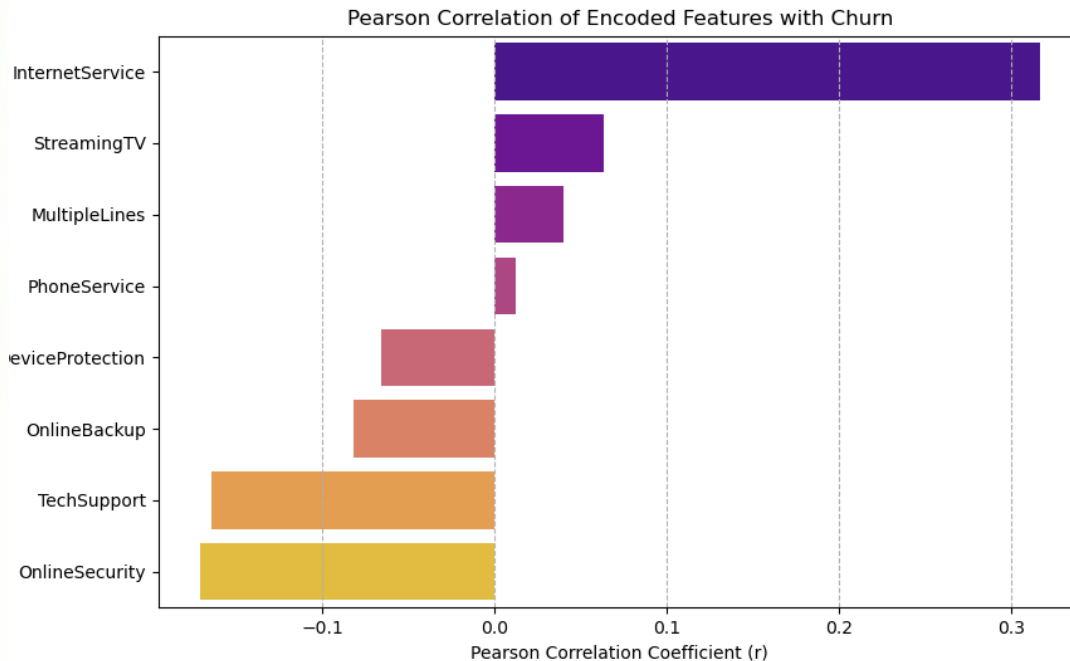
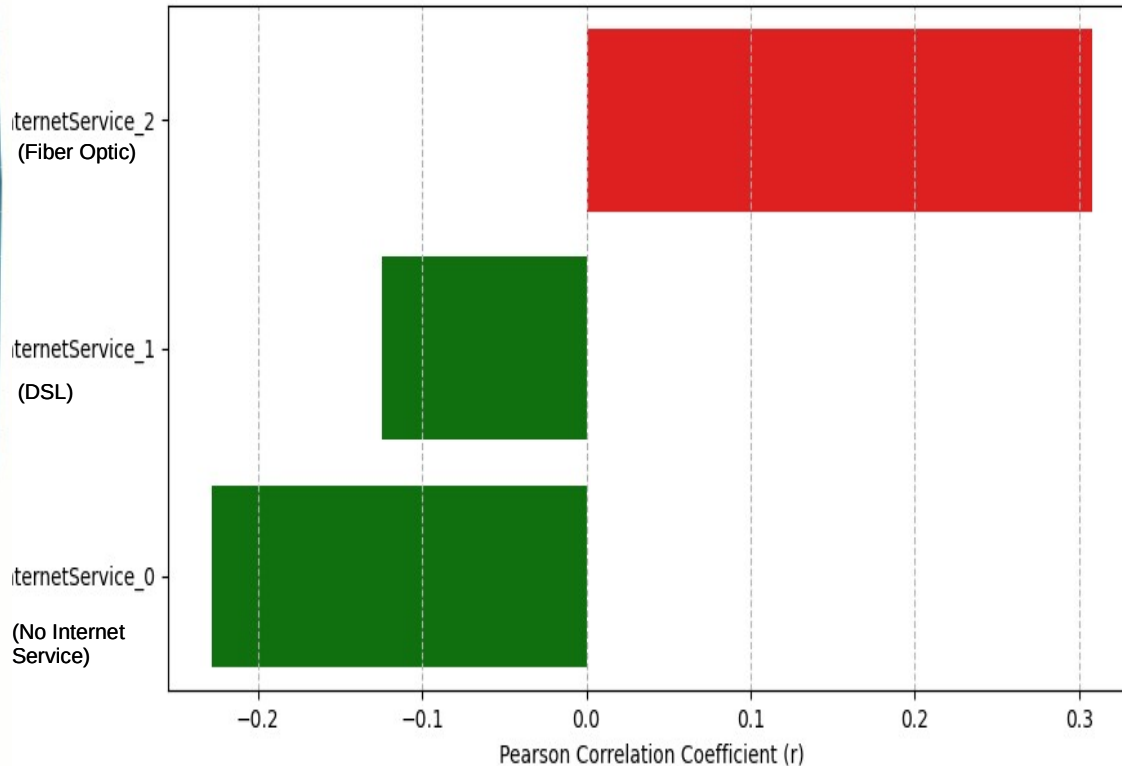- **The Internet Service Factor:** Among all service categories, <u>InternetService</u> is the strongest differentiator between churners and loyal customers.

- **The Value-Add Anchors (Retention):** Tech Support and Online Security show consistent negative correlations, customers who engage with them are significantly "less likely to churn".

Deep Dive: The Fiber Optic Disconnect
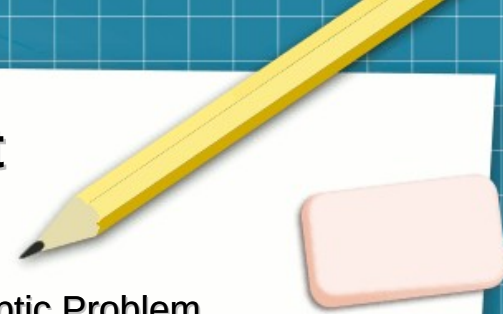
Isolated Correlation of Internet Service Types with Churn

InternetService_2
(Fiber Optic)

InternetService_1
(DSL)

InternetService_0
(No Internet Service)

−0.2   −0.1   0.0   0.1   0.2   0.3

Pearson Correlation Coefficient (r)

- **The Fiber Optic Problem**
  i. **Positive Correlation:** The strongest positive correlation is found with Fiber Optic.
  ii. **Diagnosis:** This confirms the churn problem is isolated to our flagship, premium service.
  iii. **Implication:** High pricing for Fiber Optic is not matched by perceived value, leading to a critical Price-to-Value Mismatch.

- **The Stability Contrast (Retention Anchors)**
  i. **Negative Correlation:** Both DSL and No Internet show strong negative correlations.
  ii. **Insight:** These lower-cost options act as crucial Retention Anchors, proving that stability and affordability generate strong loyalty.
  iii. **Conclusion:** We must stabilize the Fiber Optic customer base or the current price structure will continue to erode the digital segment of our market.

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Cause Summary: The Early-Life Risk Window

- **The High-Risk Profile:**

  i. The "When": Churn spikes in the first 12 months (Onboarding Friction).

  ii. The "How": The "Month-to-Month" contract enables immediate exit (r=0.667).

  iii. The "Why": The high cost associated with Fiber Optic services indicates a crucial price-to-value mismatch.

- **The Missed Opportunity:**

  High-risk customers are failing to adopt the proven retention anchors: Tech Support and Online Security.

Strategic Recommendations
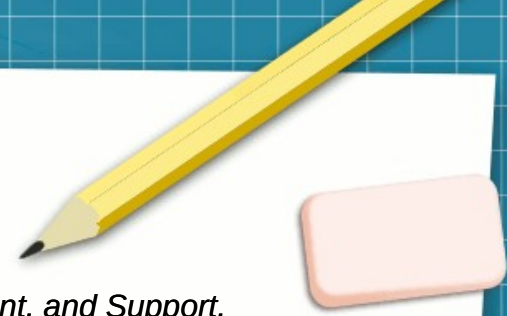
To reduce the 26.5% churn rate, we propose a three-pillared strategy focused on Value, Commitment, and Support.

A) Restructure Fiber Pricing

➢ Address the Price-to-Value Mismatch. Introduce a "Starter Fiber" tier or a 6-month promotional rate to bridge the value gap for new users.

B) Incentivize Contracts

➢ Target high-risk Month-to-Month customers. Offer a 15% Loyalty Discount for upgrading to a 1-Year committed contract.

C) Deploy "Safety Net" Bundle

➢ Leverage proven anchors. Automatically bundle Tech Support & Security for free during the first 6 months to reduce onboarding friction.

THANK YOU

Technical Stack

- **Language**: Python
- **Libraries**: Pandas, Numpy, Scikit-Learn (RF), Matplotlib/seaborn