Predictive Insights & Recommendations Report

For Geldium's Head of Collections

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1. Summary of Predictive Insights

Based on the exploratory data analysis and predictive modeling framework, we have identified key drivers and customer segments linked to delinquency risk:

- **Top 3 Risk Factors:**

    1. **High Credit Utilization Ratio:** Customers using a large percentage of their available credit are significantly more likely to become delinquent.

    2. **Number of Missed Payments:** Past payment misses strongly predict future delinquency, indicating behavioral patterns.

    3. **High Debt-to-Income Ratio:** Customers carrying high debt relative to their income have increased financial strain, elevating risk.

- **High-Risk Customer Segments:**
  Customers with a combination of high credit utilization (above 80%), recent missed payments (2 or more in the last 12 months), and lower income levels show the highest delinquency probability. These segments require targeted intervention.

- **Supporting Variables:**
  Length of credit history and income stability also influence risk but are less predictive than utilization and payment history. This aligns with field data descriptions showing that credit behavior metrics dominate delinquency outcomes.

2. Recommendation Framework

SMART Recommendation:

- **Specific:** Reduce credit utilization among high-risk customers by offering tailored credit limit adjustments and financial counseling.

- **Measurable:** Aim to decrease the average credit utilization in this group by 15% within six months.

- **Achievable:** Use existing customer data to identify candidates and deploy automated credit limit adjustment offers.

- **Relevant:** Lower credit utilization directly reduces delinquency risk, improving portfolio health.

- **Time-bound:** Implement and monitor impact within the next two quarters.

Rationale:
By proactively managing credit utilization, Geldium can decrease customers' financial stress and likelihood of missed payments. This aligns with business goals to reduce delinquency rates and associated collection costs, while enhancing customer satisfaction.

3. Ethical and Responsible AI Considerations

- **Fairness Risks:**
    - **Demographic Bias:** The model might unfairly classify certain groups (e.g., age or income brackets) as higher risk due to correlations in historical data.
    - **Feedback Loops:** Interventions based on predictions could reinforce existing disparities if not monitored.

- **Mitigation Strategies:**
    - Regularly audit model predictions and outcomes by demographic groups to identify and address disparities.
    - Incorporate fairness constraints during model training and apply post-processing adjustments to reduce bias.

- **Transparent Communication:**
  Explain model outputs to stakeholders by framing predictions as “risk scores” derived from observable financial behaviors such as credit use and payment history, avoiding technical jargon. Emphasize the model supports, but does not replace, human judgment.

- **Responsible Use:**
  Ensure the model informs fair, data-driven decisions aligned with regulatory standards and ethical principles, maintaining customer trust.