



Churn Analysis Report

1. Introduction

The dataset contains customer-level information from a retail bank, including demographics, financial indicators, and customer activity status. The primary goal is to identify patterns in customer churn and highlight the key drivers that influence churn behavior.

2. Methodology

- Created an **enriched dataset** by engineering features such as:
 - Age ranges
 - Balance ranges
 - Salary ranges
 - Tenure buckets
 - Conducted **SQL-based exploratory data analysis (EDA)**.
 - Analysis performed at two levels:
 - a. **Single-feature analysis** (univariate churn insights).
 - b. **Cross-feature analysis** (interaction between features).
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3. Findings

3.1 Single-Feature Analysis

- **Credit Score**
 - Most customers fall in the *550–750* range.
 - Highest churn rate (~33%) in the *350–450* range.
- **Geography**
 - ~50% of customers are from France.
 - Germany shows the highest churn rate (~32%), significantly above France and Spain.

- **Gender**
 - Distribution nearly equal.
 - Females churn more (25%) than males.
- **Age**
 - Customers aged 50–59 and 60–69 are highly vulnerable, with churn rates >50%.
 - In contrast, 30–39 range churns only ~10%.
- **Tenure**
 - Tenure has little effect — churn rate is ~20% across ranges.
- **Balance**
 - Customers with 200k+ *balances* churn the most (~55%).
 - “No balance” group also shows significant churn (~49%).
- **Number of Products**
 - 1–2 products dominate distribution (~9.5k).
 - Churn increases as products rise:
 - 1 product → 27% churn.
 - 3 products → 82% churn.
 - 4 products → 100% churn.
- **Credit Card Ownership**
 - Majority hold a credit card (~70%).
 - Churn is not strongly influenced by credit card ownership.
- **Active Membership**
 - Balanced distribution.
 - Inactive members churn more (~27%).
- **Estimated Salary**
 - Salary does not show major churn variation — ~20% across ranges.

3.2 Cross-Feature Analysis

- **Age × Geography**
 - German customers aged 50–69 churn at ~66%.
 - French customers aged 50–59 churn ~51%.
 - Spanish customers aged 50–59 churn ~46%.
 - **Age × Balance**
 - Customers aged 50+ with **medium to high balances** churn disproportionately more than any other group.
 - **Age × Active Membership**
 - Inactive customers aged 50+ churn heavily.
 - **Balance × Active Membership**
 - Inactive members with medium-to-high balances are at highest risk.
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4. Key Insights

1. **High churn segments** are concentrated in:
 - Customers aged **50+**.
 - Customers with **medium to high balances**.
 - **Inactive members** in older age groups.
 - German customers in the **50–69** age group.
 2. **Tenure and salary** do not significantly influence churn.
 3. **Product holding** is a critical churn driver: churn skyrockets with more than 2 products.
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5. Business Implications

- **Targeted Retention**
 - Design retention offers for **German customers aged 50+** with medium-high balances.
 - Special focus on **inactive members** with high balances.
- **Product Strategy**
 - Re-evaluate customers holding 3–4 products — investigate why multi-product holders churn at such high rates.

- **Engagement**

- Encourage **active membership programs** for customers above 50.