**Customer Churn Analysis Case Study (10,000 Customers)**

**Objective**

To analyze patterns in customer churn and identify actionable insights for improving retention using data from 10,000 customers of a retail bank operating across France, Spain, and Germany.

**1. Business Problem**

Customer churn poses a significant challenge in the banking sector, where acquiring new customers is more costly than retaining existing ones. Understanding the factors that lead to churn enables targeted interventions, improving customer satisfaction and long-term profitability.

**2. Dataset Overview**

* **Total Records**: 10,000 customers
* **Features**:
  + **Demographics**: Geography, Gender, Age, Surname
  + **Account Info**: CreditScore, Tenure, Balance, NumOfProducts, HasCrCard, IsActiveMember
  + **Financials**: EstimatedSalary
  + **Target**: Exited (1 = churned, 0 = retained)

**3. Exploratory Data Analysis (EDA)**

**🧮 Churn Rate**

* **Overall Churn**: ~20.4% (≈2,040 customers)
* Churn rate consistent with industry averages.

**🌍 Churn by Geography**

| **Geography** | **Churn Rate** |
| --- | --- |
| France | 16% |
| Spain | 19% |
| Germany | **32%** |

**Insight**: Customers in Germany churn at double the rate compared to France. Indicates possible dissatisfaction or strong competition in the German market.

**🧓 Age vs Churn**

* **Avg Age of Churned Customers**: ~45 years
* **Avg Age of Retained Customers**: ~37 years
* Customers over 45 age account for 50% of churners despite being only 30% of the population.

**Insight**: Older customers are significantly more likely to leave. Tailored loyalty programs or advisory services may help.

**💳 Product Holding**

| **Num of Products** | **Churn Rate** |
| --- | --- |
| 1 Product | 8% |
| 2 Products | 17% |
| **3+ Products** | **50%+** |

**Insight**: Customers with more than 2 products tend to churn more—possibly due to dissatisfaction, complexity, or upselling fatigue.

**🔒 Customer Engagement**

| **IsActiveMember** | **Churn Rate** |
| --- | --- |
| No | **27%** |
| Yes | 14% |

**Insight**: Inactive customers churn at nearly double the rate. Engagement campaigns are crucial.

**📉 Credit Score and Churn**

* Churn rate rises for customers with Credit Score < 600.
* However, very high scorers (>800) also show modest churn.

**Insight**: Low scores = risky; high scores = attractive to competitors.