**Customer Churn Capstone – Project Summary**

**Project Overview**

The **Customer Churn Capstone Project** analyzes telecom customer churn using **Python (Colab)** and **SQL**. The goal is to understand why customers leave and which factors influence churn.

I investigated patterns in:

* **Contract types** (month-to-month, 1 year, 2 years)
* **Tenure groups** (how long customers have been with the company)
* **Payment methods** (electronic check, bank transfer, credit card, mailed check)
* **Internet service types** (Fiber optic, DSL, None)

Visualizations and a detailed **PDF report** summarize insights, including financial impact and recommendations for customer retention.

**My Role**

* Executed the **data analysis workflow** in Python and SQL.
* **Cleaned and organized** the dataset, calculated churn metrics, and created **visualizations**.
* **Summarized findings** in a comprehensive **PDF report** for presentation.

**Tools Used**

* **Python** (pandas, matplotlib, seaborn) for data analysis and visualization
* **SQL** for querying the dataset and performing exploratory analysis
* **Jupyter/Colab notebooks** for step-by-step analysis
* **PDF report** to document insights clearly

**Step-by-Step Approach**

1. **Understanding Churn (like a kid explanation):**
   * Imagine a club with 100 kids. Every month, some leave. Those who leave are called **“churned”**, and those who stay are **“retained”**.
   * In business: customers leaving = churn, customers staying = retention.
2. **Loaded the dataset in Python:**
   * Used **pandas** to read CSV data.
   * Looked at total customers, missing data, and basic statistics.
3. **Explored churn patterns:**
   * **Overall churn rate:** 26.54%
   * **By contract type:** month-to-month contracts have the highest churn.
   * **By tenure group:** new customers (0-12 months) churn the most.
   * **By payment method:** electronic check users churn the most.
   * **By internet service:** fiber optic users churn more than DSL or no internet.
4. **Calculated financial impact:**
   * Total monthly revenue lost due to churn: **$139,130.85**
5. **Visualized the data:**
   * Created charts for churn by contract type, tenure group, payment method, and internet service.
   * Generated a **correlation heatmap** to understand relationships between numerical variables (e.g., monthly charges and churn).
6. **Generated final report:**
   * PDF file with key insights, charts, tables, and actionable recommendations for retention strategies.

**Key Insights**

* **Overall churn rate:** 26.54% → about **1 in 4 customers leaves**.
* **Contract type:** Month-to-month contracts have the highest churn, long-term contracts help retain customers.
* **Tenure group:** New customers churn the most (nearly 50% in their first year). Retention improves with time.
* **Payment method:** Electronic check users are more likely to churn; auto-pay methods improve retention.
* **Internet service:** Fiber optic users churn more than DSL or no internet.
* **Financial impact:** Churn results in a significant **~$139k monthly revenue loss**.

**Lessons Learned**

* Focus retention strategies on **short-term contracts, new customers, and payment methods**.
* **Early intervention** can reduce churn, saving revenue and improving customer loyalty.
* Using Python and SQL together enables efficient **analysis and reporting**.
* Understanding the dataset and translating numbers into **actionable business insights** is crucial for decision-making.