📄 Project Report: Customer Segmentation & Advanced Churn Analysis

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Role: Business Analyst Intern
Tools Used: Python, Pandas, NumPy, Matplotlib
Domain: Telecom Customer Analytics

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1. Project Overview

This project focuses on analyzing telecom customer data to understand **churn behavior** and identify customer segments that are at higher risk of leaving the service. Using segmentation and exploratory analysis, the project reveals insights that can help businesses build better **retention strategies** and improve customer satisfaction.

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2. Business Objective

The primary objective of this project was to answer a key business question:
"Which customer segments are most likely to churn, and what factors contribute to their behavior?"

Telecom companies lose significant revenue due to high churn rates. By identifying patterns and segmenting customers, we aim to:

- Reduce churn
- Improve customer experience
- Increase customer loyalty
- Support business decision-making with data-backed insights

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3. Dataset Description

The dataset contains telecom customer records with features such as:

- **Demographics:** Gender, SeniorCitizen, Dependents
- **Services:** InternetService, TechSupport, Streaming
- **Account Information:** Contract, PaymentMethod, MonthlyCharges, TotalCharges
- **Tenure:** Number of months with the company

- **Churn Label:** Whether the customer left or stayed

Rows: **7,043**
Columns: **21**

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4. Data Cleaning & Preprocessing

To ensure accurate analysis, the dataset was cleaned using Python:

✓ Missing Values Handled

- "TotalCharges" contained blank strings → converted to numeric
- Missing values imputed using **median/mode** where necessary

✓ Incorrect Data Types Fixed

- Converted TotalCharges → float
- Ensured numeric columns were in correct format

✓ Customer Segmentation Created

A new column **'tenure_bucket'** was created to group customers:

- **0–12 Months** (New customers)
- **13–36 Months** (Mid-term customers)
- **37+ Months** (Loyal customers)

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5. Exploratory Data Analysis (EDA)

5.1 Visualizations Used

- **Donut Chart:** Customer Segmentation by Tenure
- **Bar Chart:** Average Monthly Charges per Segment
- **Churn Rate Comparison:** Based on gender, senior citizens, contract type, payment method

5.2 Key Observations

✓ Customer Segmentation Share

- 50.6% → Loyal customers (37+ months)
- 29.5% → Mid-tenure customers
- 20.9% → New customers

✓ **Average Monthly Charges by Segment**

- 0–12 months: **$61**
- 13–36 months: **$66.5**
- 37+ months: **$49.1**

✓ **Churn Behavior Patterns**

- **Month-to-month contract** customers churn the most
- **Higher monthly charges** strongly correlate with higher churn
- **Senior citizens** show a higher churn probability
- **Electronic check** payment method is associated with higher churn
- **Long-tenure customers (37+)** are less likely to churn

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6. Business Insights & Interpretation

Based on the analysis, several important insights can be drawn:

Insight 1: Contract Type is the Strongest Predictor of Churn

Short-term (month-to-month) customers are more likely to leave.
Recommendation: Offer discounts or incentives for annual contracts.

Insight 2: High Bills Increase Churn Likelihood

Customers with higher MonthlyCharges tend to leave faster.
Recommendation: Provide personalized plans or usage-based billing.

Insight 3: Senior Citizens Are High-Risk Customers

Elderly users may require better customer support.
Recommendation: Create senior-friendly service packages.

Insight 4: Loyal Customers Generate Long-Term Value

Customers with 37+ months stay longer and churn less.
Recommendation: Implement loyalty programs to increase retention.

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7. Conclusion

The project successfully highlights the **key factors contributing to churn** and identifies which customer groups require immediate attention. The combination of segmentation, visualization, and churn analysis provides a clear picture of customer behavior—helping businesses make **data-driven retention strategies**.

This project strengthened my skills in:

- Business Analysis
- Data Cleaning & Preprocessing
- Customer Segmentation
- Insight Generation
- Visualization & Storytelling

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8. Repository Link

Add your GitHub link here:
👉 https://github.com/Disha-Tarlekar/Customer-Segmentation-Visualization-Advanced-Analysis

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