Telecom Customer Churn Analysis

Skill Assessment Documentation

1. Project Overview

This project analyzes customer churn for a fictional telecommunications company in California, based on a dataset downloaded from Maven Analytics. The goal is to build an interactive, insight-driven Power BI dashboard and deliver business recommendations, including RFM segmentation and churn driver analysis.

2. Data Source

- **Dataset:** Maven Analytics – 7,043 fictional customers.
- **Files Used:**
  - `telecom_customer_churn.csv`
  - `telecom_zipcode_population.csv`
  - `telecom_data_dictionary.csv`
- **Key Features:** Customer demographics, subscription details, usage metrics, financial data, and churn status.

3. Data Modeling Process

Step 1: Data Import & Clean-Up

- Imported all datasets to Power BI with Power Query.
- Cleaned missing/invalid values and unified formats.

Step 2: Building a Star Schema

Transformed flat files into relational tables for efficient reporting.

Created the following tables:

- **Fact_Churn:** Core numeric metrics (revenue, charges, tenure) and foreign keys.
- **Dim_Customer:** Demographics (age, gender, marital status, dependents, referrals).
- **Dim_Location:** Geographical and ZIP-code-based demographics (merged with population data).
- **Dim_Service:** Package/service details (internet, phone, add-ons).
- **Dim_Contract:** Contract type and payment options.
- **Dim_Churn:** Status and churn reason/category.

- **Dim_RFM:** RFM segment for customer value classification.

Linked tables to ensure 1:N relationships and a performant, organized model.

4. Dashboard Structure

The final dashboard contains three main analytic pages:

a. Descriptive Analysis

- **Purpose:** Give a macro view of sales, customer distribution, and high-level KPIs.
- **Visuals:** Total revenue, number of customers, churn rate, revenue by segment, customer demographics.

b. RFM Analysis

- **Purpose:** Segment customers by value using Recency, Frequency, and Monetary metrics.
- **Approach:**
  - Calculated RFM scores for all customers.
  - Identified "Champions", "At Risk", "Potential Loyalists", etc.
  - Visualized segment size and segment-specific churn.

c. Churn Analysis

- **Purpose:** Pinpoint churn drivers, compare characteristics of churned, retained, and new customers.
- **Visuals:**
  - Churn rate by contract type, service type, tenure band, and demographics.
  - Key difference analysis (e.g., fiber contracts have the highest churn).

5. Key Insights & Findings

1. Over 50% of subscriptions are month-to-month, and this segment drives risk

Customers on "month-to-month" contracts represent the majority of churn, showing a churn rate of **46%**, compared to just **0.03%** for customers with two-year contracts. Retention is dramatically higher among customers on two-year plans, who make up most of the "champions" group.

2. The majority of customers have not engaged with any promotional offers (55%)

Offer E has the highest churn rate (**53%**), followed by Offer C (**27%**), while the majority with "None" as offer still represent a retention gap and unused marketing potential.

3. Payment method and internet type drive churn

- Customers paying via "Bank Withdrawal" experience a high churn rate of **34%**.
- Fiber optic internet users are at the highest risk, with a churn rate of **41%**, indicating possible issues with network satisfaction or pricing for this segment.

4. The highest churn by city is in San Diego at 65%

Despite the high churn, San Diego also accounts for substantial total revenue (~$738,000). This points to an urgent opportunity to investigate local retention challenges in San Diego's customer base, especially as it includes a significant number of high-value customers.

5. Age is a significant churn predictor

Customers aged **66–80** exhibit the highest churn rate (**42%**). This may be linked to shifting service needs, dissatisfaction, or other demographic-specific reasons requiring targeted research and strategy.

6. RFM segmentation exposed valuable customer segments

A large "champions" segment (RFM=555 or 554, n=1,519) is largely retained, but also a notable group of "churned lovers" (RFM=155/154/145, n=201) that were previously high-value but left. Losing these formerly loyal, high-value customers is a strategic concern—focused win-back campaigns are recommended for this segment.

7. Overall churn rate stands at 27%

1,869 churned out of 7,043 customers, which is above best-practice benchmarks for telecom and points to an urgent retention challenge.

6. Recommendation Highlights

- **Contract Upgrades:** Launch focused campaigns to convert month-to-month customers to annual or longer contracts, especially targeting younger and highly mobile segments.
- **Offer Optimization:** Reevaluate the structure and delivery of offers (notably Offer E and C), and increase awareness/promotions for current customers not using any offers.
- **Revenue Risk Mitigation in San Diego:** Conduct a root-cause analysis for high churn and lost high value in San Diego—implement city-specific loyalty and support campaigns.
- **Fiber Optic Experience:** Benchmark fiber optic satisfaction against competitors to address network or price-based churn.
- **Senior Retention Strategy:** Create targeted messaging and product options to retain older customers, leveraging insights about their unique needs and churn triggers.
- **Win-Back of Churned Lovers:** Employ personalized win-back campaigns targeting the "churned lovers" RFM segment, as this group is most likely to respond positively if re-engaged.

7. Submission Attachments

- Power BI `.pbix` file (dashboard and model)
- Dataset CSV files (original from Maven Analytics)
- This documentation (brief summary, model, and insights)