Tableau Calculation Documentation for Customer Segmentation and Churn Analysis

This document provides a concise technical overview of the Tableau calculations used to segment customers and calculate churn rates, as shown in the "Top N Clusters with High Churn Rate" chart. Calculations are ordered by dependency to reflect their logical sequence (e.g., "Combined Segment" depends on "Service Usage Level," "Spending Level," and "Tenure Group"). Note: "Categorize" refers to clustering for segmentation.

Overview of Clustering

Clustering groups customers into segments based on traits like usage, spending, and tenure (e.g., "High Usage|High Spending|Short-Term"). These segments are analyzed for churn rates to identify patterns, as visualized in the chart.

1. Service Usage Level (Clustering Component)

Calculation:

```
IF (
    (IF [Phone Service] = 'Yes' THEN 1 ELSE 0 END) +

    (IF [Multiple Lines] = 'Yes' THEN 1 ELSE 0 END) +
```

```
        (IF [Internet Service] != 'No' THEN 1 ELSE 0 END) +

        (IF [Online Security] = 'Yes' THEN 1 ELSE 0 END) +

        (IF [Online Backup] = 'Yes' THEN 1 ELSE 0 END) +

        (IF [Device Protection] = 'Yes' THEN 1 ELSE 0 END) +

        (IF [Tech Support] = 'Yes' THEN 1 ELSE 0 END) +

        (IF [Streaming TV] = 'Yes' THEN 1 ELSE 0 END) +

        (IF [Streaming Movies] = 'Yes' THEN 1 ELSE 0 END)

) >= 5 THEN 'High Usage'

ELSEIF (

        (IF [Phone Service] = 'Yes' THEN 1 ELSE 0 END) +

        (IF [Multiple Lines] = 'Yes' THEN 1 ELSE 0 END) +

        (IF [Internet Service] != 'No' THEN 1 ELSE 0 END) +

        (IF [Online Security] = 'Yes' THEN 1 ELSE 0 END) +

        (IF [Online Backup] = 'Yes' THEN 1 ELSE 0 END) +

        (IF [Device Protection] = 'Yes' THEN 1 ELSE 0 END) +

        (IF [Tech Support] = 'Yes' THEN 1 ELSE 0 END) +

        (IF [Streaming TV] = 'Yes' THEN 1 ELSE 0 END) +

        (IF [Streaming Movies] = 'Yes' THEN 1 ELSE 0 END)

) >= 2 THEN 'Medium Usage'
```

```
ELSE 'Low Usage'

END
```

Purpose: Counts the number of services used (e.g., phone, internet, streaming). Outputs "High Usage" (≥5 services), "Medium Usage" (2–4 services), or "Low Usage" (0–1 services).

Role: Forms the "Usage" component of the "Combined Segment" clustering.

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2. Spending Level (Clustering Component)

Calculation:

```
IF [Monthly Charges] > 80 THEN 'High Spending'
ELSEIF [Monthly Charges] > 50 THEN 'Medium Spending'

ELSE 'Low Spending'

END
```

Purpose: Segments customers by monthly charges: >$80 ("High Spending"), $50–$80 ("Medium Spending"), ≤$50 ("Low Spending").

Role: Forms the "Spending" component of the "Combined Segment" clustering.

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3. Tenure Group (Clustering Component)

Calculation:

```
IF [Tenure] > 36 THEN 'Long-Term'
ELSEIF [Tenure] > 12 THEN 'Medium-Term'

ELSE 'Short-Term'

END
```

Purpose: Segments customers by tenure: >36 months ("Long-Term"), 12–36 months ("Medium-Term"), ≤12 months ("Short-Term").

Role: Forms the "Term" component of the "Combined Segment" clustering.

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4. Combined Segment (Clustering)

Calculation:

```
[Service Usage Level] + '|' + [Spending Level] + '|' + [Tenure Group]
```

Purpose: Concatenates "Service Usage Level," "Spending Level," and "Tenure Group" with "|" separators to create a single segment label (e.g., "High Usage|High Spending|Short-Term").

Role: Defines the clusters on the Y-axis of the chart. Depends on the previous three calculations.

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5. Churn Rate

Calculation:

```
SUM(IF [Churn] = 'Yes' THEN 1 ELSE 0 END) / COUNT([Customer ID]) * 100
```

Purpose: Calculates the churn rate (%) for each cluster by dividing the number of customers who churned ("Churn" = "Yes") by the total number of customers, then multiplying by 100.

Role: Provides the churn rate values on the X-axis of the chart, applied after clustering.

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6. Age Category

Calculation:

```
IF [Senior Citizen] = 0 THEN 'NON-SENIOR CITIZEN'
ELSE 'SENIOR CITIZEN'

END
```

Purpose: Segments customers as "Senior Citizen" (if [Senior Citizen] ≠ 0) or "Non-Senior Citizen" (if [Senior Citizen] = 0).

Role: Independent of clustering; used for additional analysis of churn by age group.

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7. Has Protection

Calculation:

```
IF [Online Security] = 'Yes' OR [Online Backup] = 'Yes' OR [Device Protection]
= 'Yes' THEN 'Yes'
ELSE 'No'

END
```

Purpose: Labels customers as "Yes" if they have any protective services (Online Security, Backup, or Device Protection), otherwise "No."

Role: Independent of clustering; used to analyze if protective services impact churn.

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8. Has Streaming

Calculation:

```
IF [Streaming TV] = 'Yes' OR [Streaming Movies] = 'Yes' THEN 'Yes'
ELSE 'No'

END
```

Purpose: Labels customers as "Yes" if they use streaming (TV or Movies), otherwise "No."

Role: Independent of clustering; used to analyze if streaming services affect churn.

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9. Has Multiple Services

Calculation:

```
IF [Internet Service] != 'No' AND [Phone Service] != 'No' THEN 'Yes'
ELSE 'No'
```

Purpose: Labels customers as "Yes" if they have both internet and phone services, otherwise "No."

Role: Independent of clustering; used to analyze if having multiple services impacts churn.