

Exploratory Data Analysis Report of Telecompany Customer Churn Dataset

Title Page

Overview

Attributes

Univariate Analysis

Univariate - Demographic (Category)



ISE 543
Telecompany Customer Churn Analytics
EDA Report

Group member:
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Overview



Project Objective:

- Conduct exploratory data analysis about the dataset beforehand to have a comprehensive review on key statistics.
- Deep dive into what drives customers churn.
- Develop a marketing strategy for improving customer retention.
- The audiences should be the leaders of the telecom company who need to make data-driven decisions and grab insights from our visualizations.

Data Sources:

- Two Tables: Customer Churn Table and Zip Code Population Table.
- Customer Churn Table: Dataset with 38 columns with information on 7,043 customers.

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Univariate Analysis

Univariate - Demographic (Categorical)



Attributes Summary



Demographic(Numerical):

Age
Number of Dependents

Service Details(Numerical):

Number of Referrals
Tenure in Months
Avg Monthly GB Download

Bill Information(Numerical):

Monthly Charge
Total Charges
Total Refunds
Total Revenue
Total Extra Data Charges
Total Long Distance Charges
Avg Monthly Long Distance Charges

Demographic (Categorical):

Gender
Married
City
Zip Code
Latitude
Longitude

Service Details (Categorical):

Offer
Phone Service
Multiple Lines
Internet Service
Internet Type
Online Security
Online Backup
Device Protection Plan
Premium Tech Support
Streaming TV
Streaming Movies
Streaming Music
Unlimited DataContract

Bill Information (Categorical):

Paperless Billing
Payment Method

Churn Information (Response variable):

Customer Status
Churn Category
Churn Reason

Exploratory Data Analysis Report of Telecompany Customer Churn Dataset

Overview

Attributes

Univariate Analysis

Univariate - Demographic (Categorical)

Univariate - Service Details (Categorical)



Univariate Analysis

Exploratory Data Analysis Report of Telecompany Customer Churn Dataset

Attributes

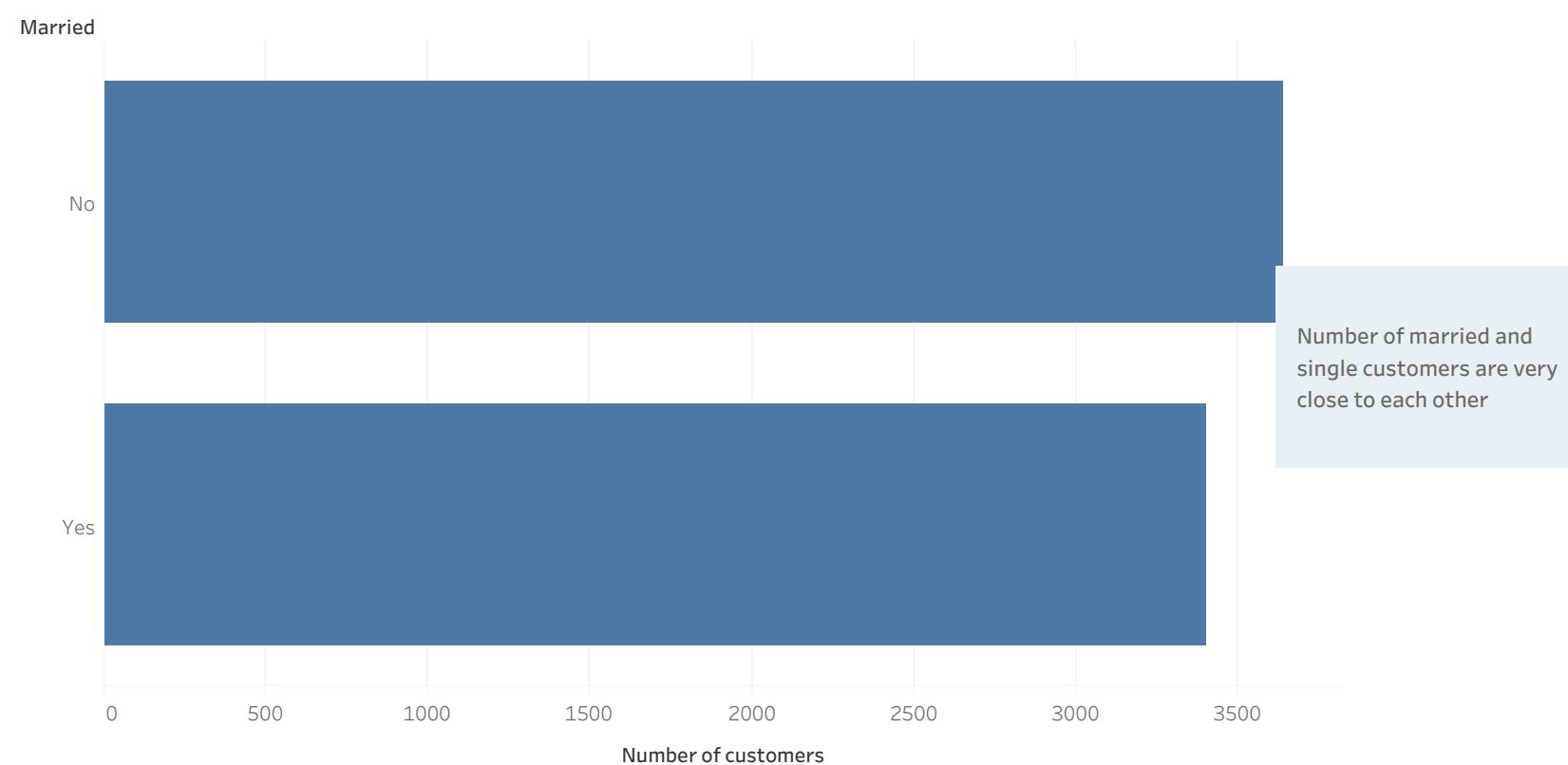
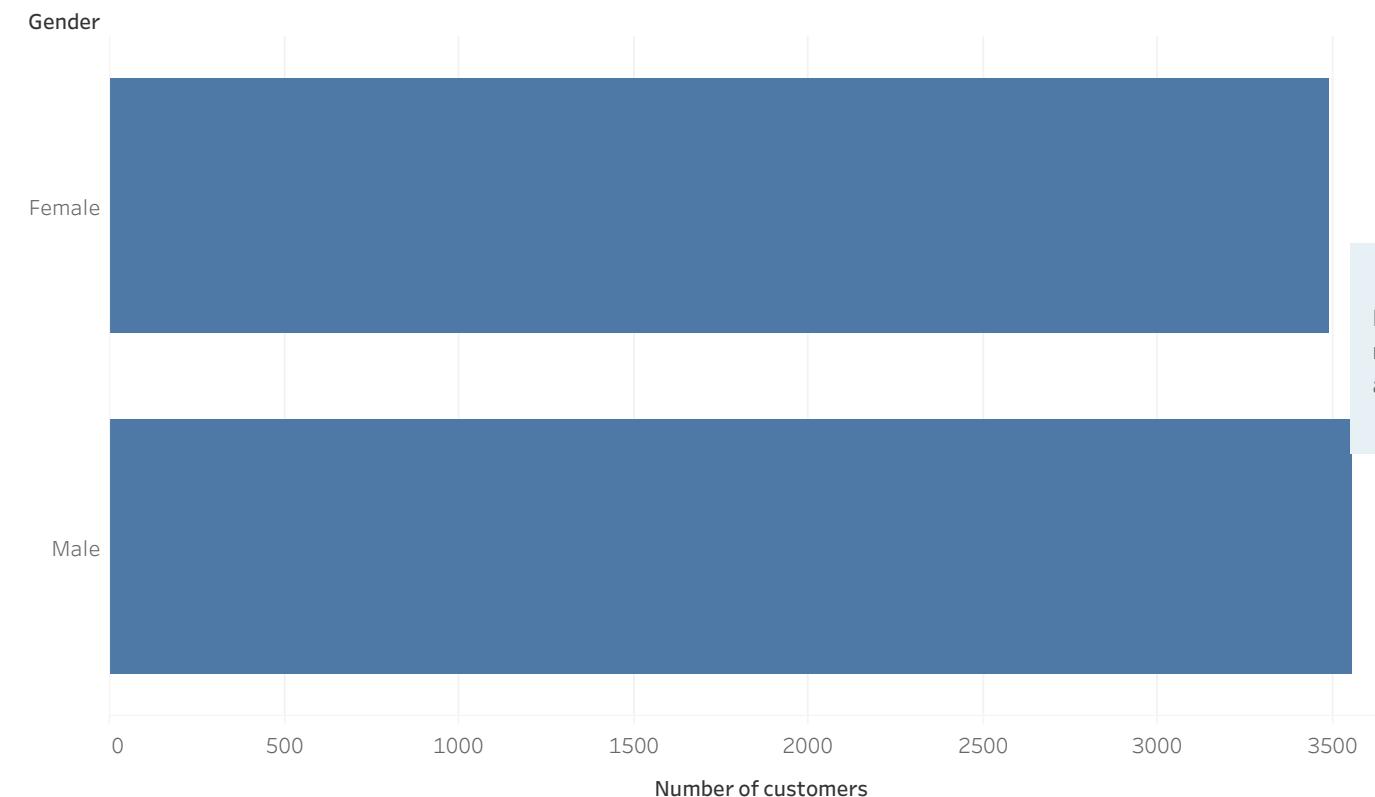
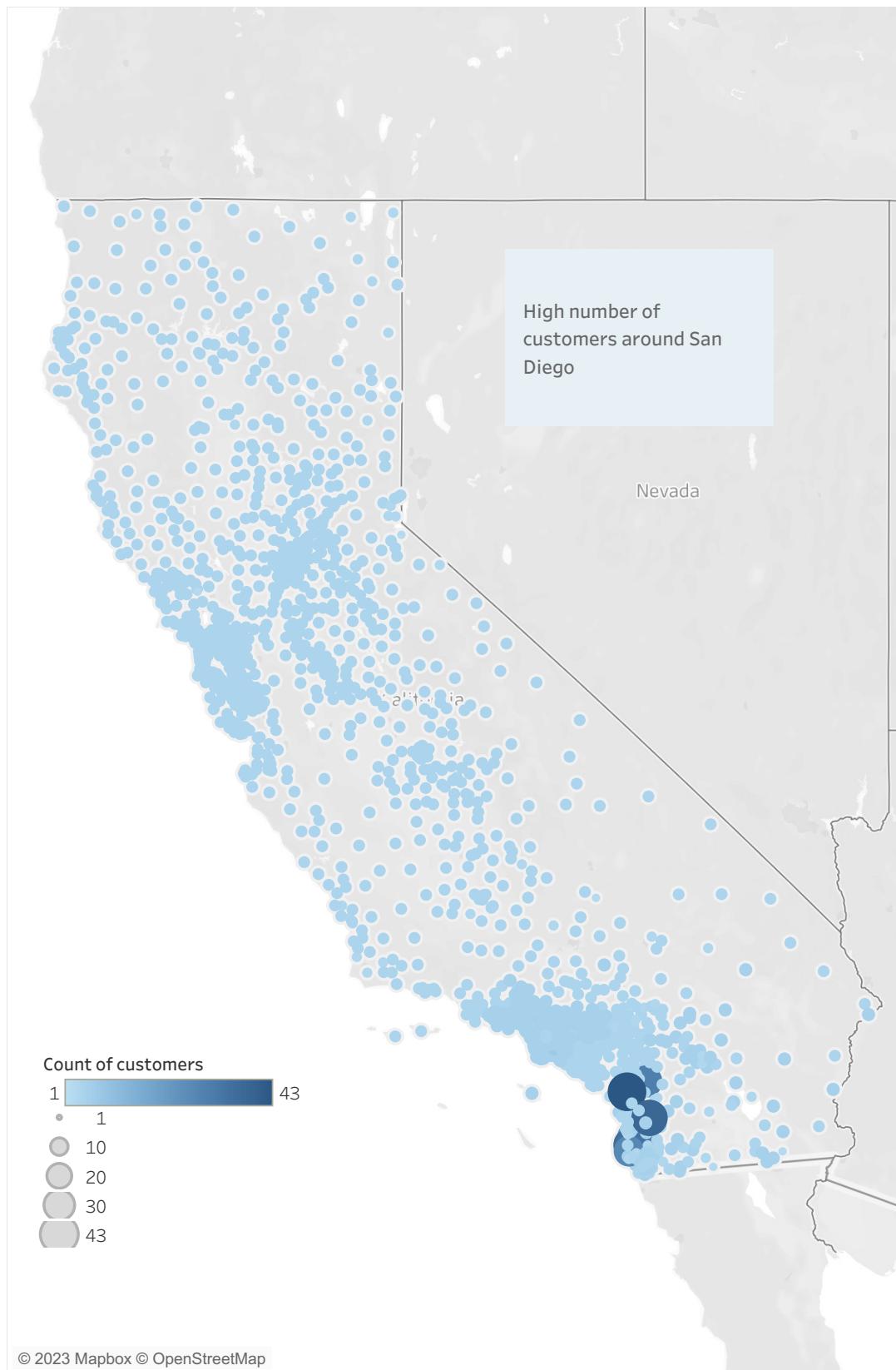
Univariate Analysis

Univariate - Demographic (Categorical)

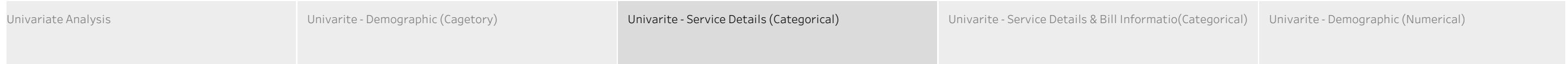
Univariate - Service Details (Categorical)

Univariate - Service Details & Bill Information (Categorical)

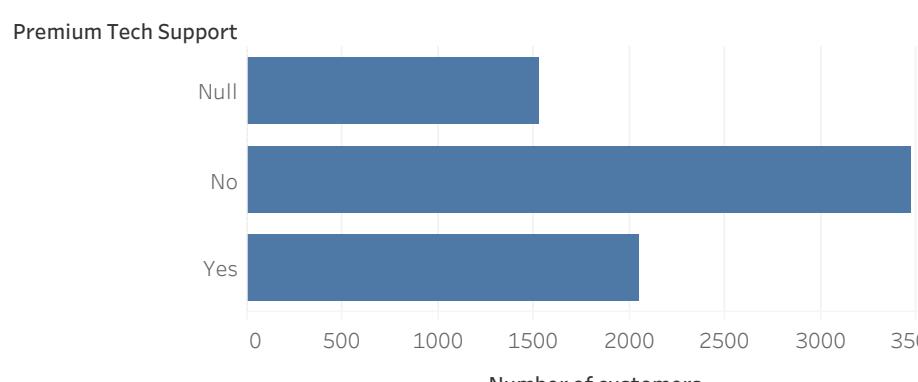
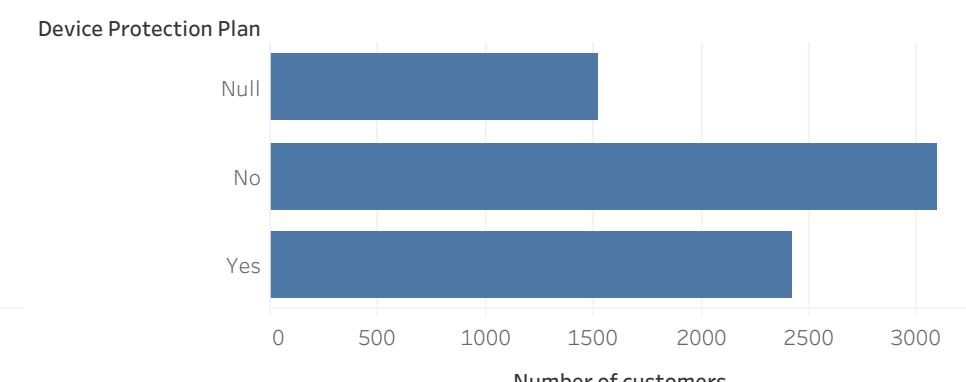
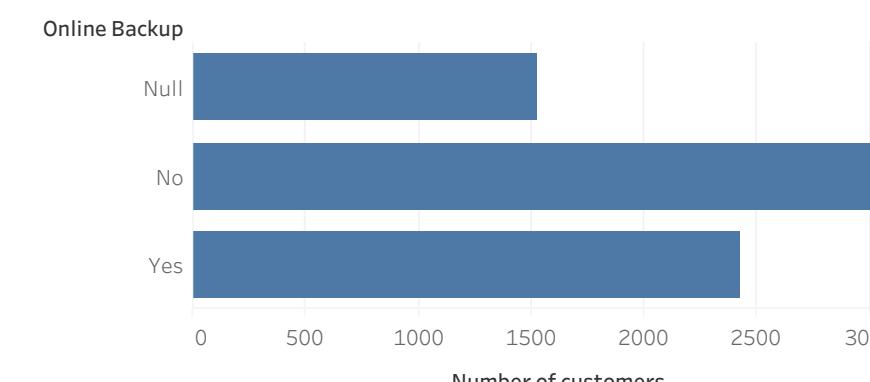
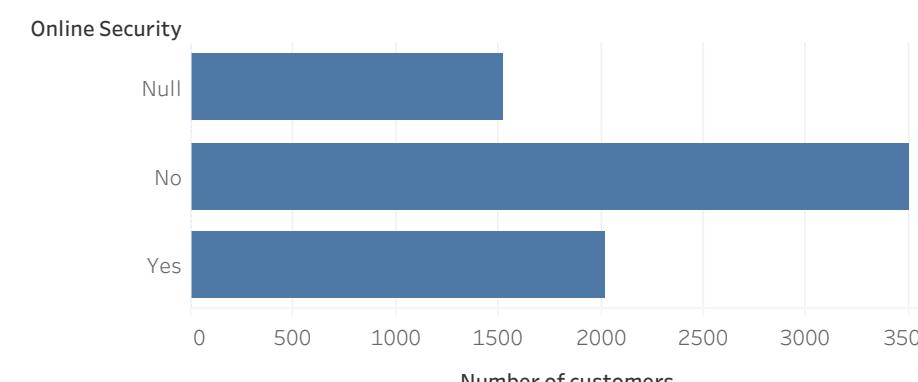
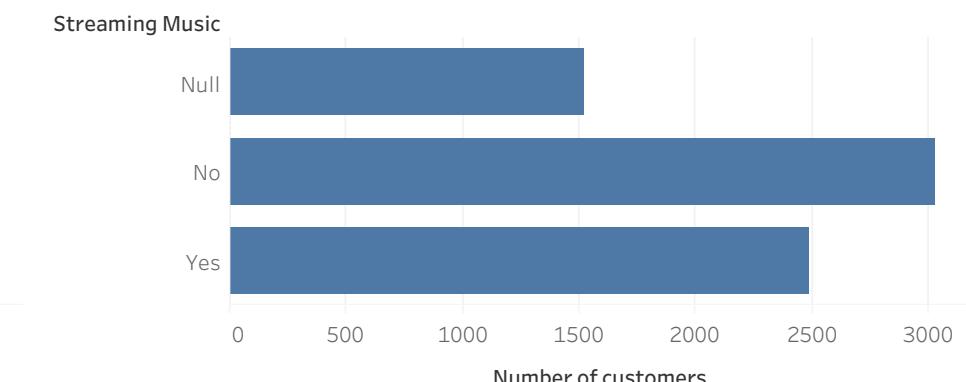
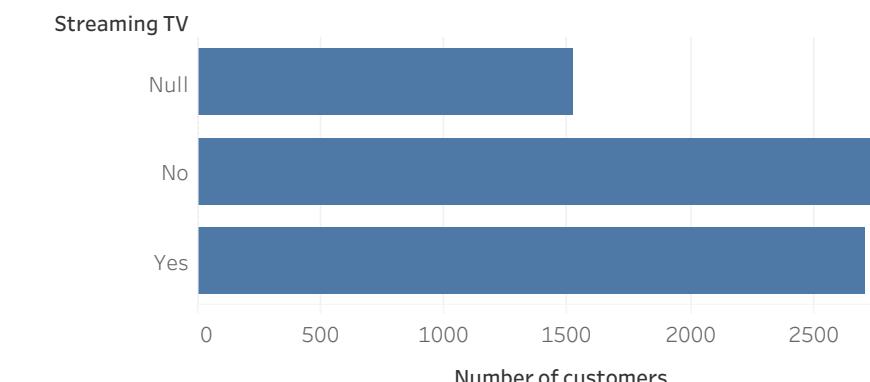
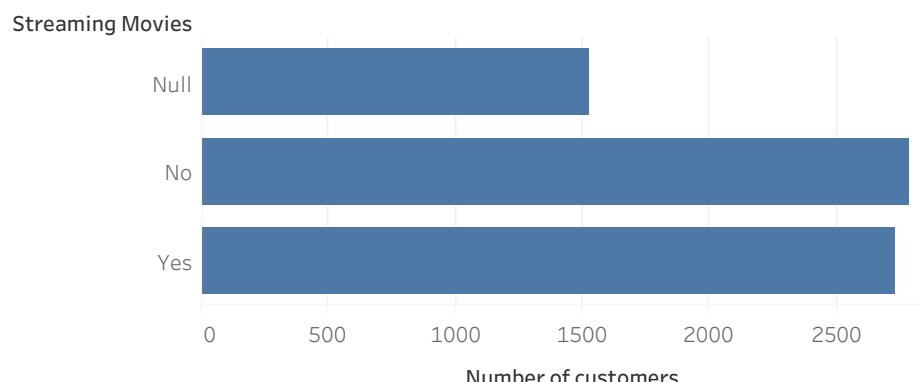
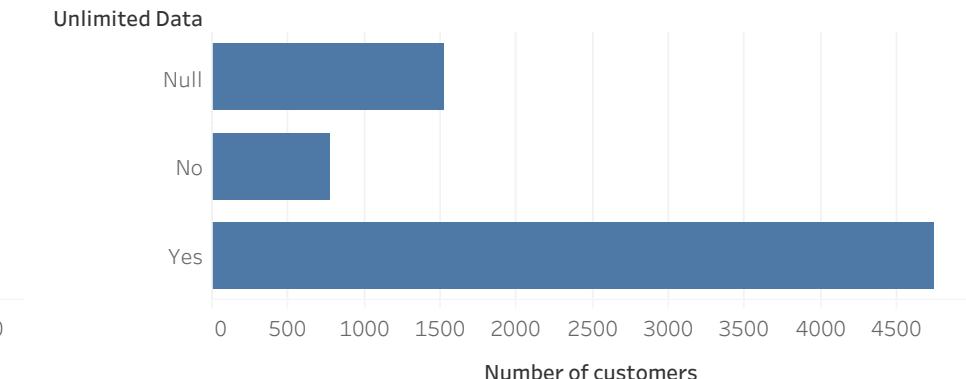
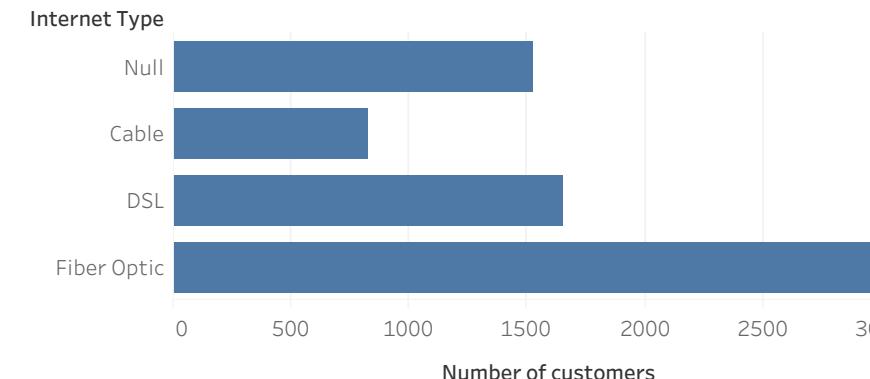
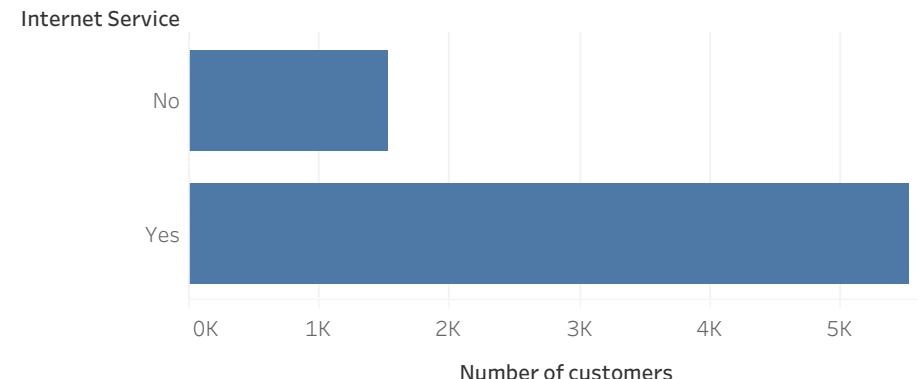
Univariate Analysis of Customer Demographic Dimensions



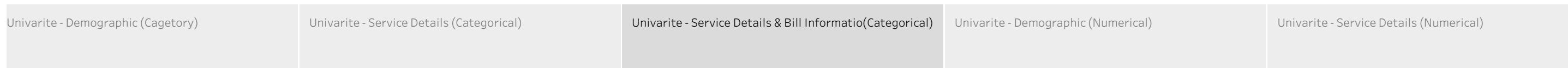
Exploratory Data Analysis Report of Telecompany Customer Churn Dataset



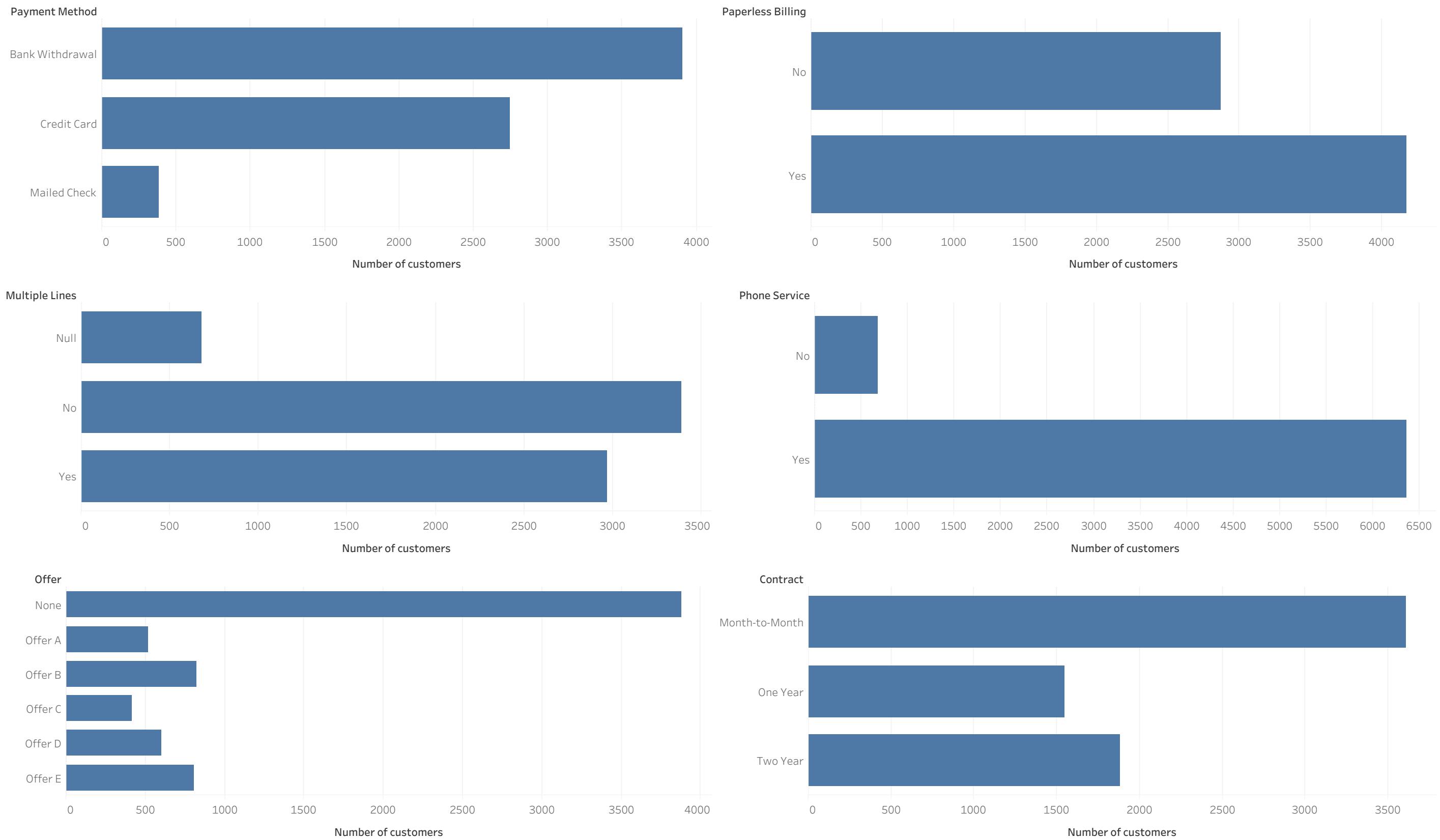
Univariate Analysis of Service Detail Dimensions



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Univariate Analysis of Service Detail & Bill Information Dimensions



Exploratory Data Analysis Report of Telecompany Customer Churn Dataset

Univariate - Service Details (Categorical)

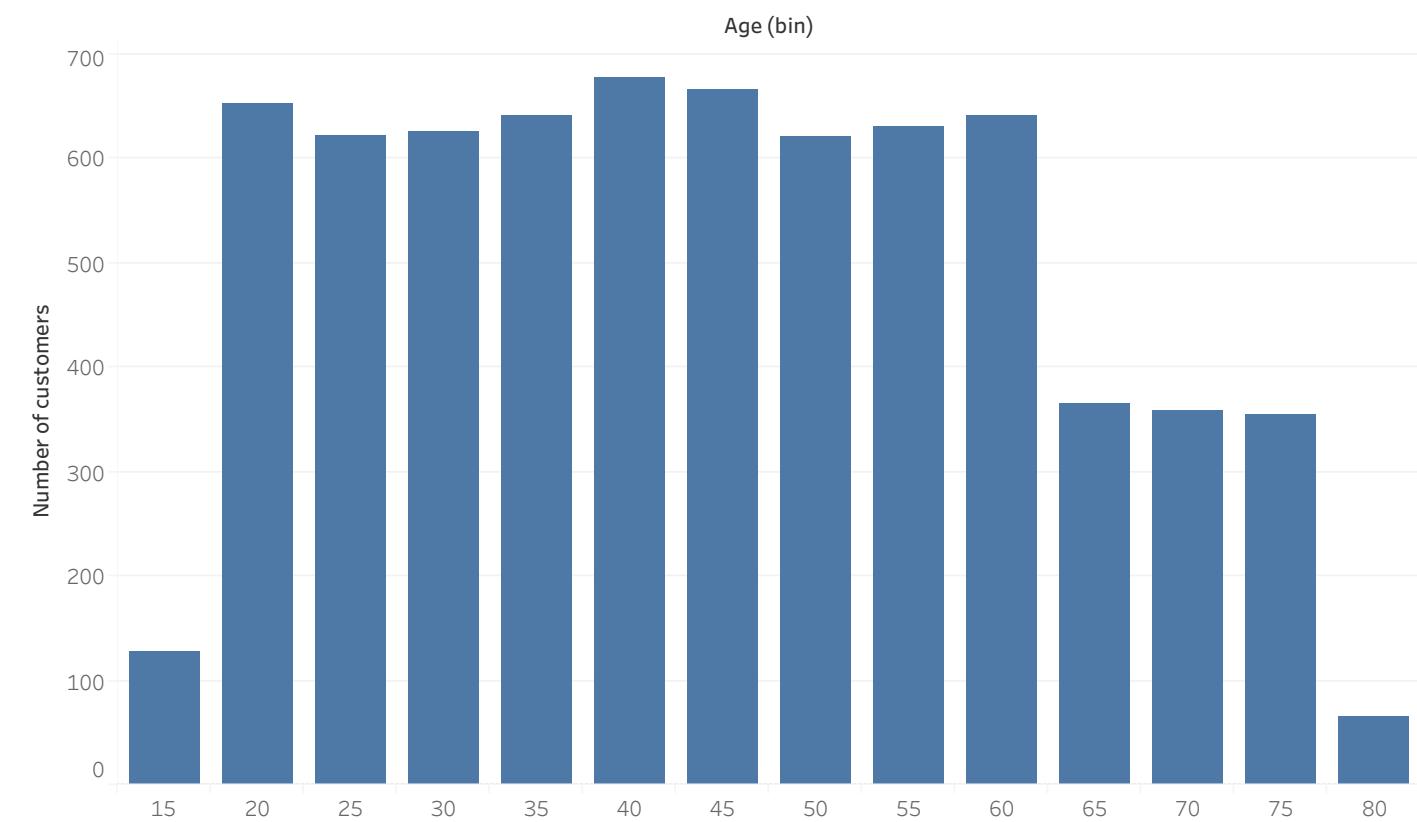
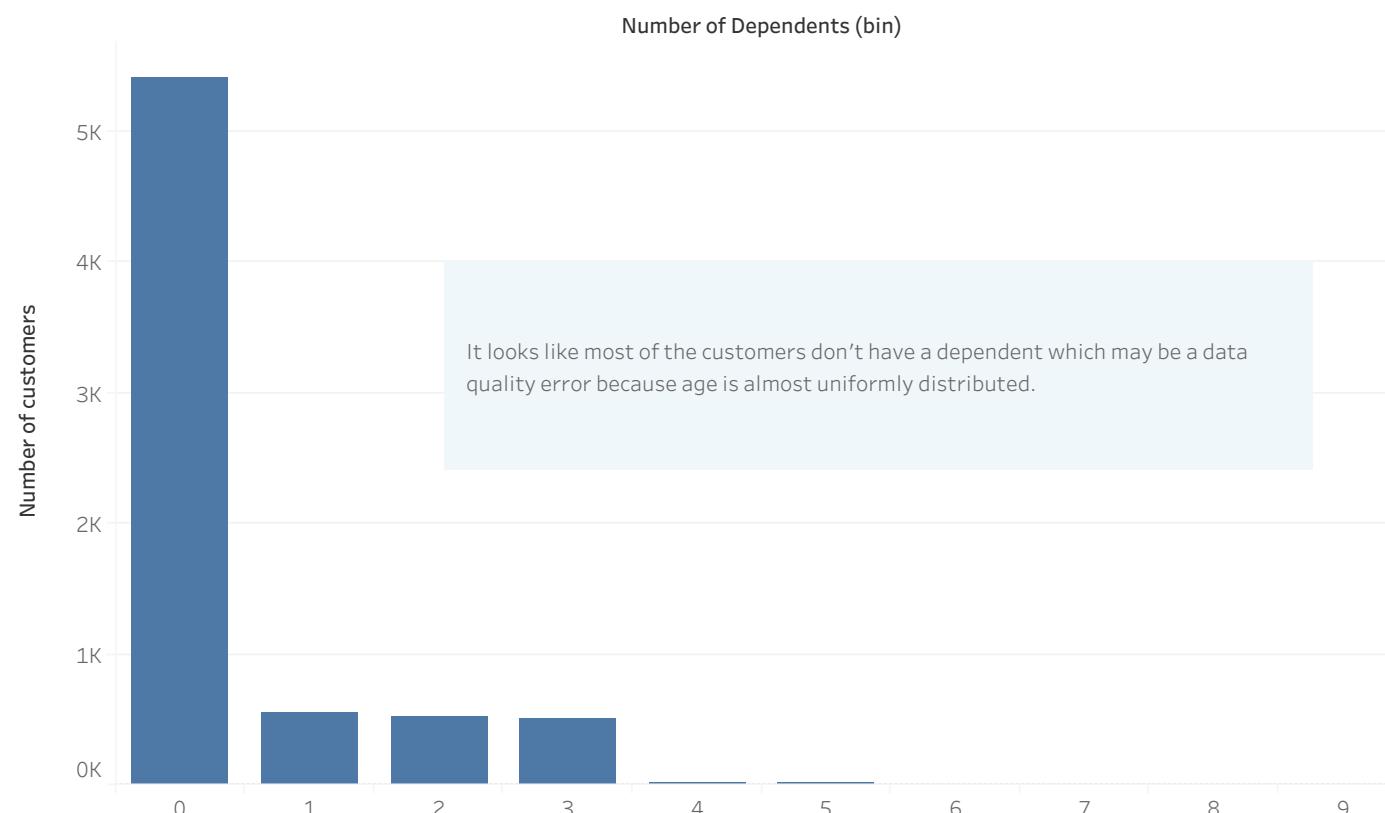
Univariate - Service Details & Bill Information (Categorical)

Univariate - Demographic (Numerical)

Univariate - Service Details (Numerical)

Univariate - Bill Information (Numerical)

Univariate Analysis of Customer Demographic Measures



Exploratory Data Analysis Report of Telecompany Customer Churn Dataset

Univariate - Service Details & Bill Information (Categorical)

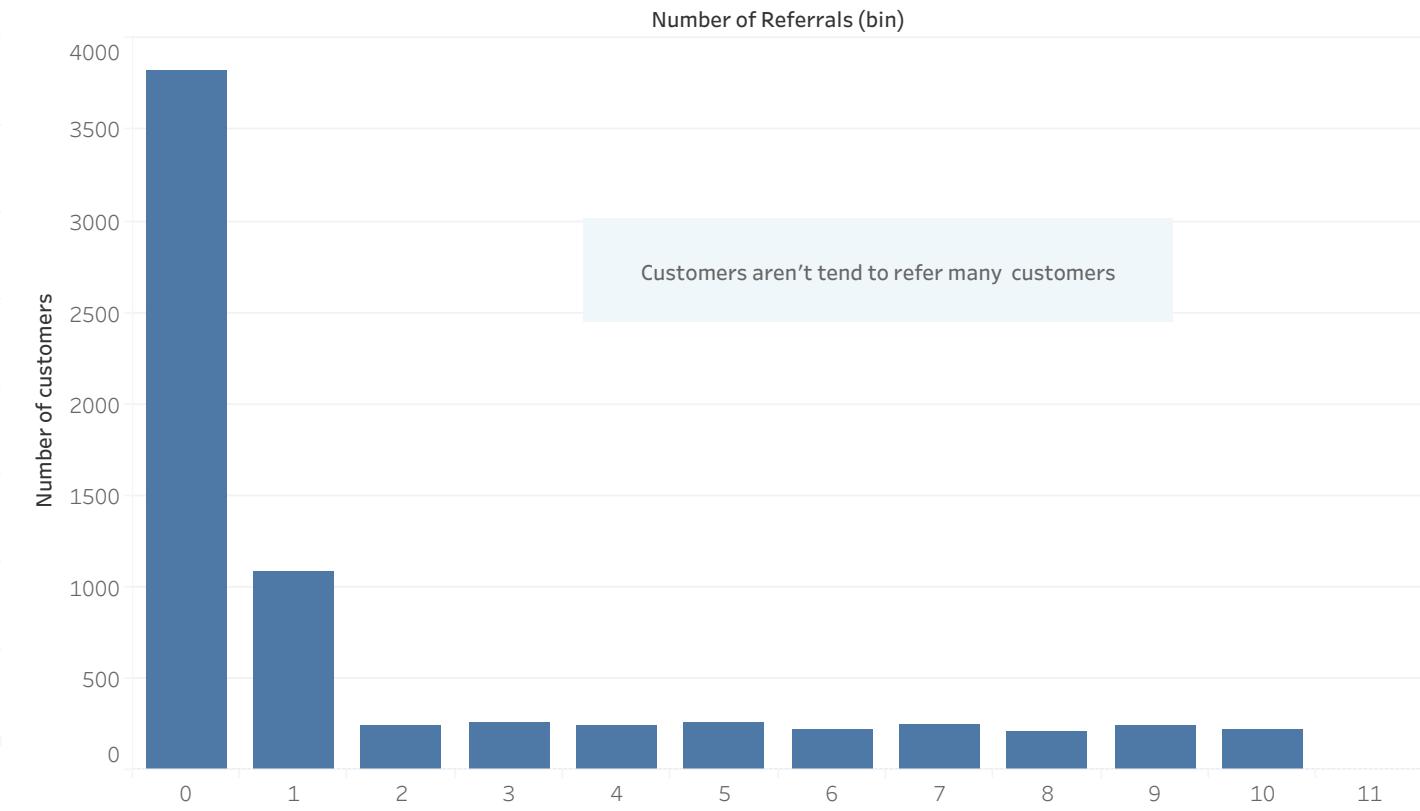
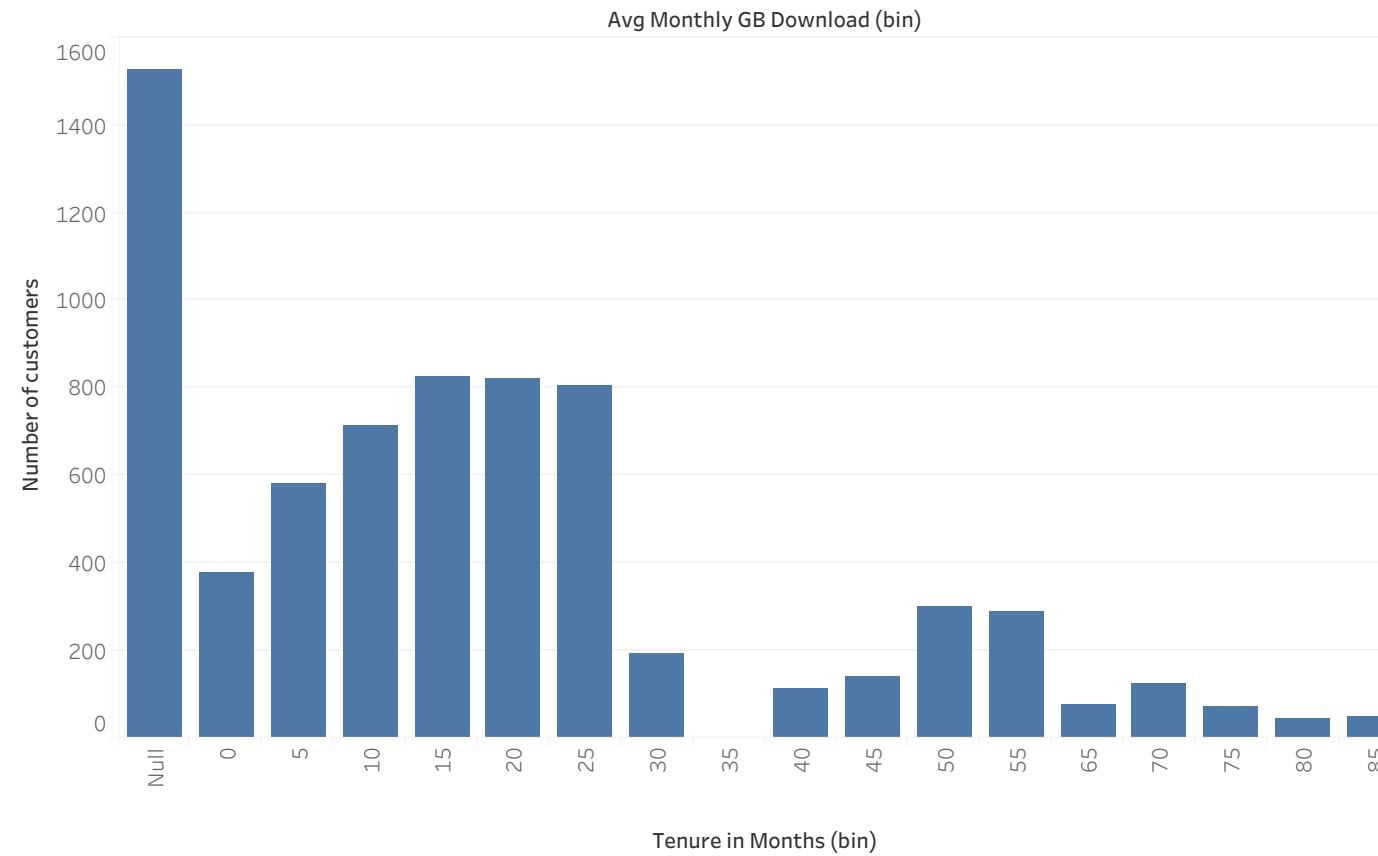
Univariate - Demographic (Numerical)

Univariate - Service Details (Numerical)

Univariate - Bill Information (Numerical)

Bivariate Analysis

Univariate Analysis of Service Detail Measures



Exploratory Data Analysis Report of Telecompany Customer Churn Dataset

Univariate - Demographic (Numerical)

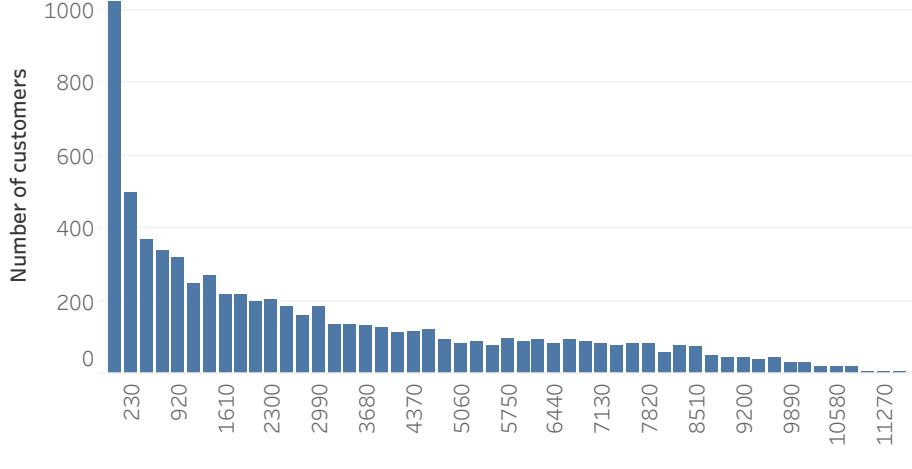
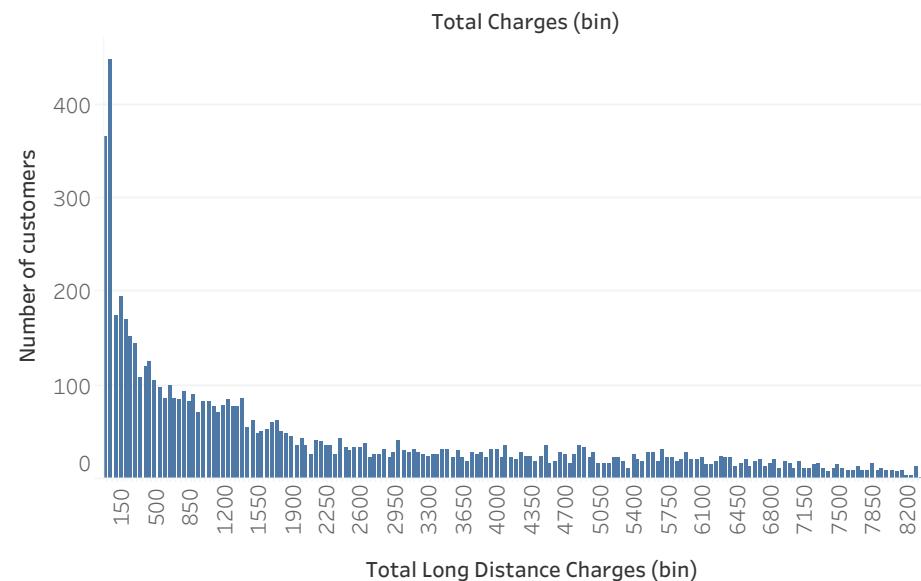
Univariate - Service Details (Numerical)

Univariate - Bill Information (Numerical)

Bivariate Analysis

Correlation Matrix

Univariate Analysis of Bill Information Measures



Exploratory Data Analysis Report of Telecompany Customer Churn Dataset

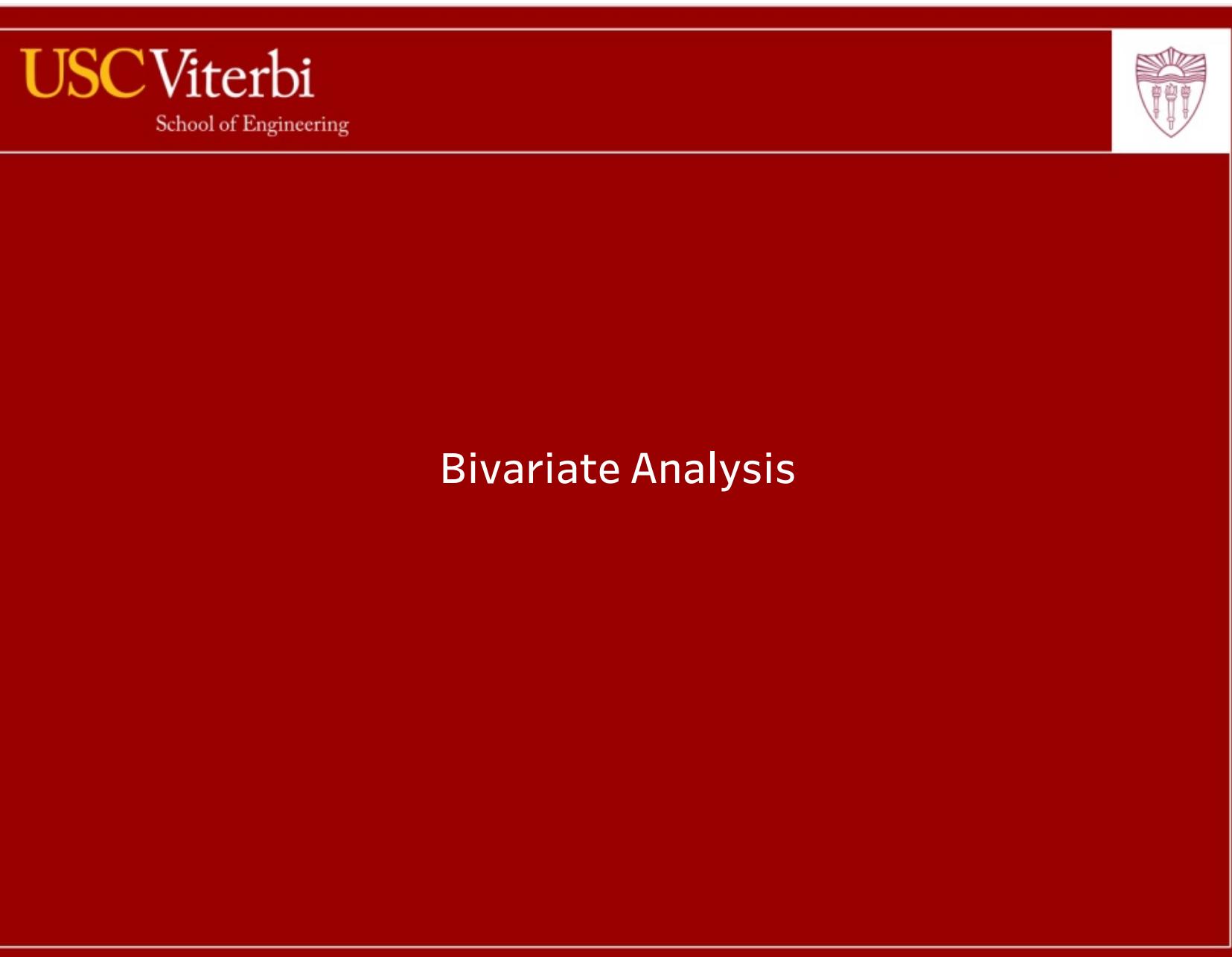
Univariate - Service Details (Numerical)

Univariate - Bill Information (Numerical)

Bivariate Analysis

Correlation Matrix

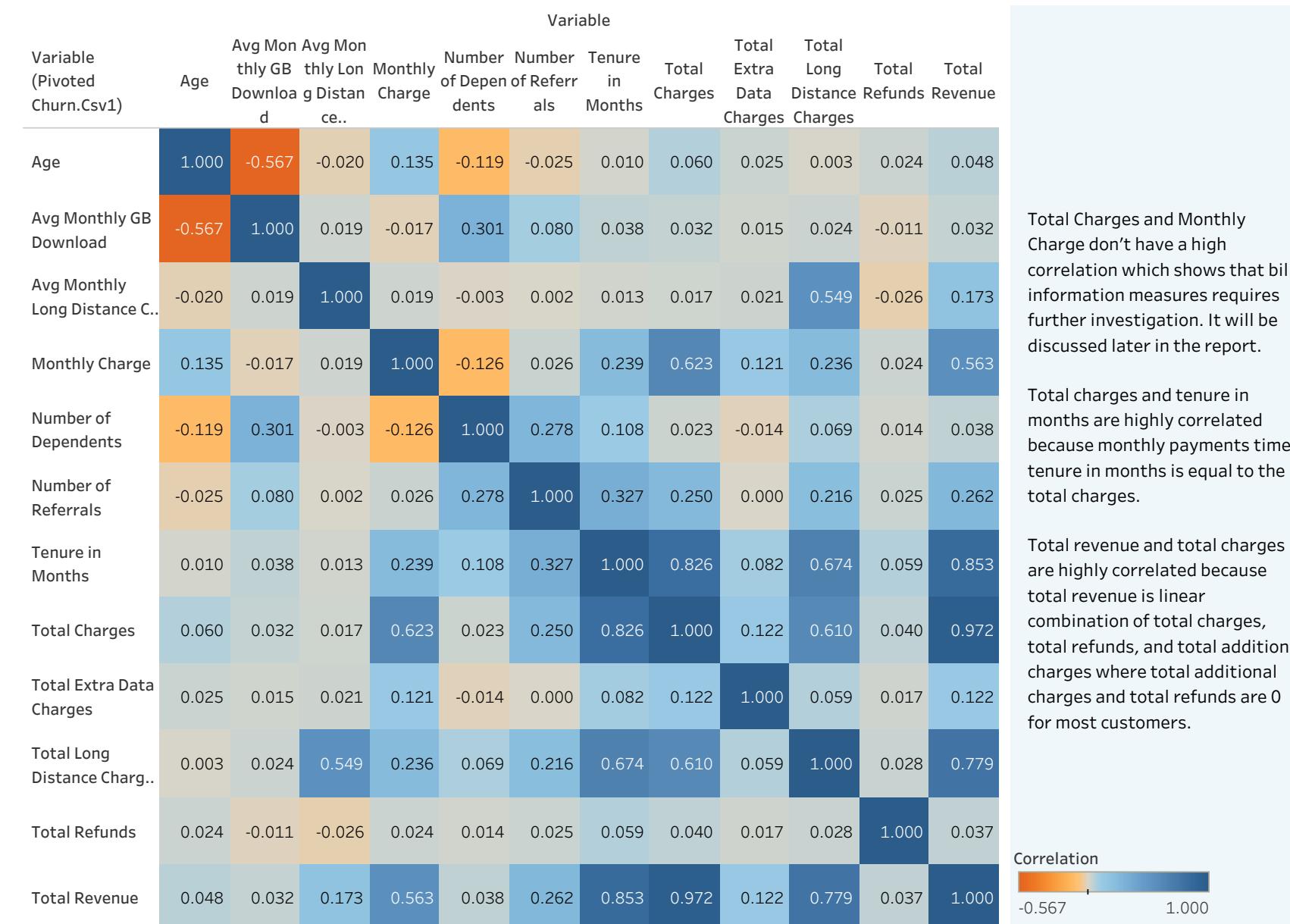
Bivariate - Age vs. Bill Info



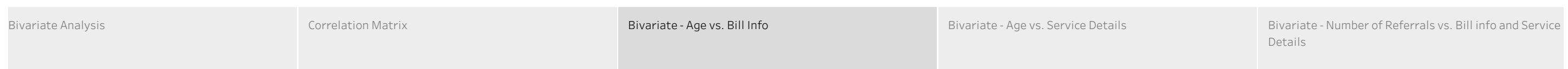
Exploratory Data Analysis Report of Telecompany Customer Churn Dataset



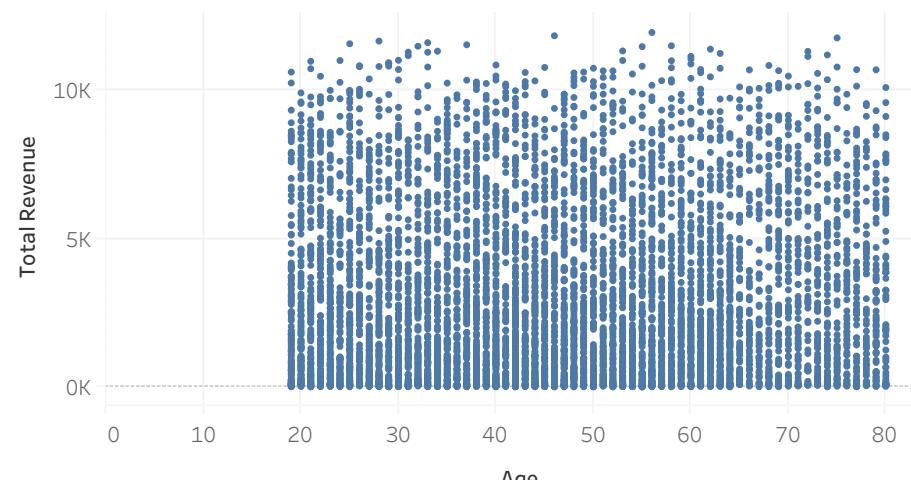
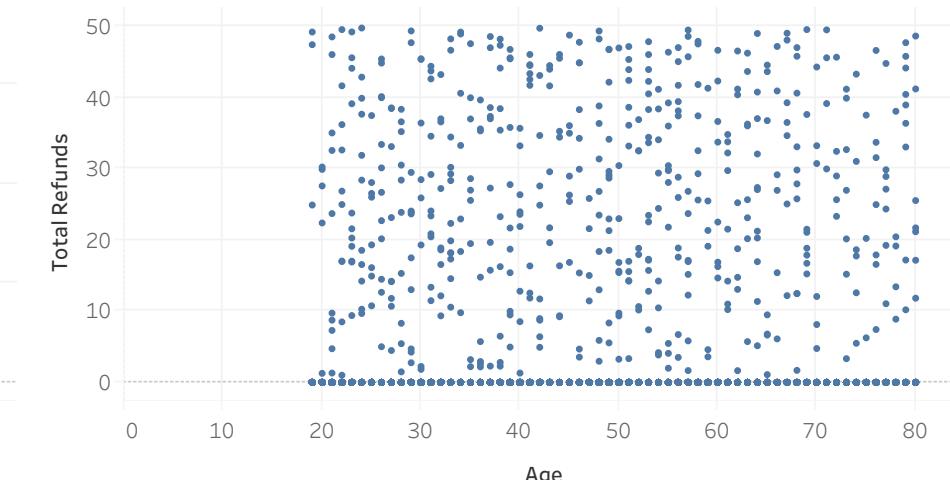
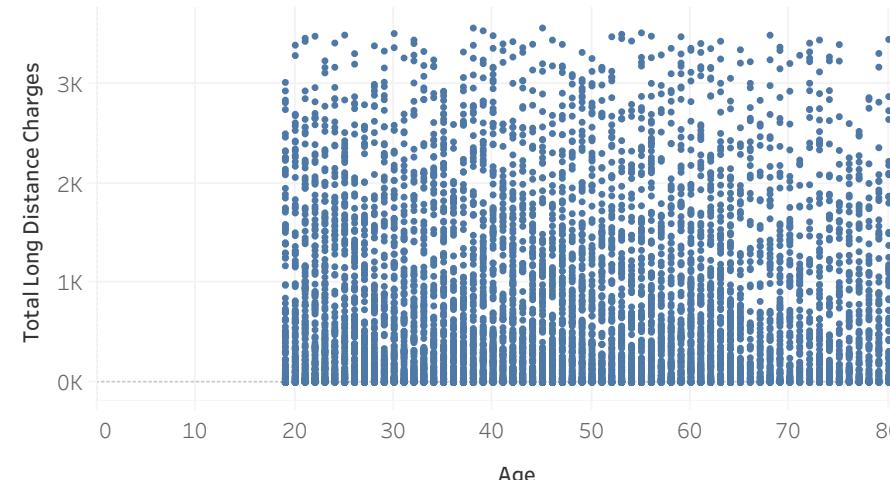
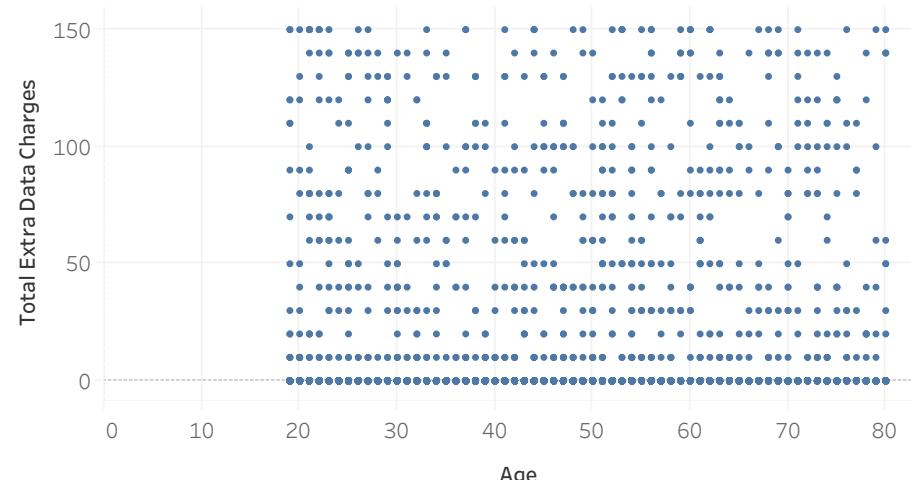
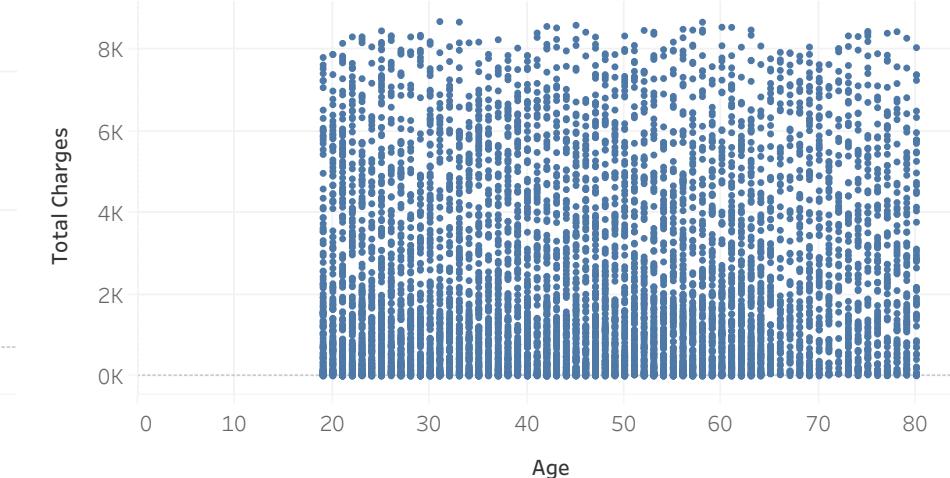
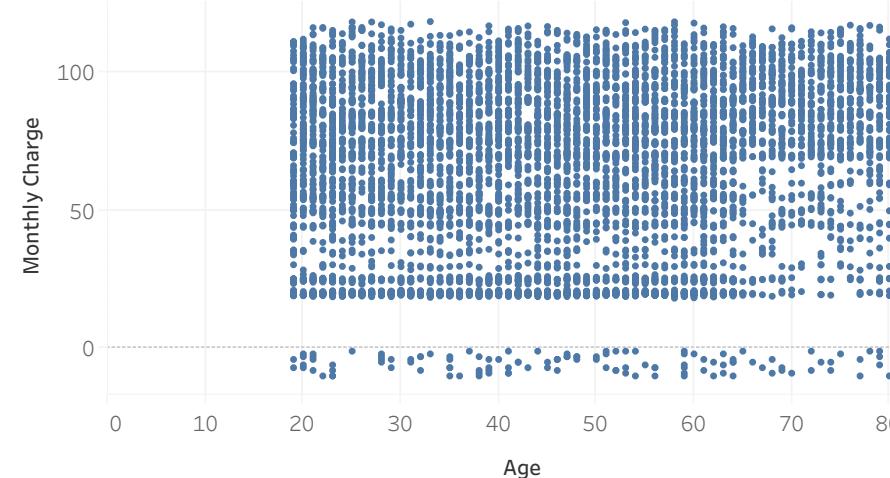
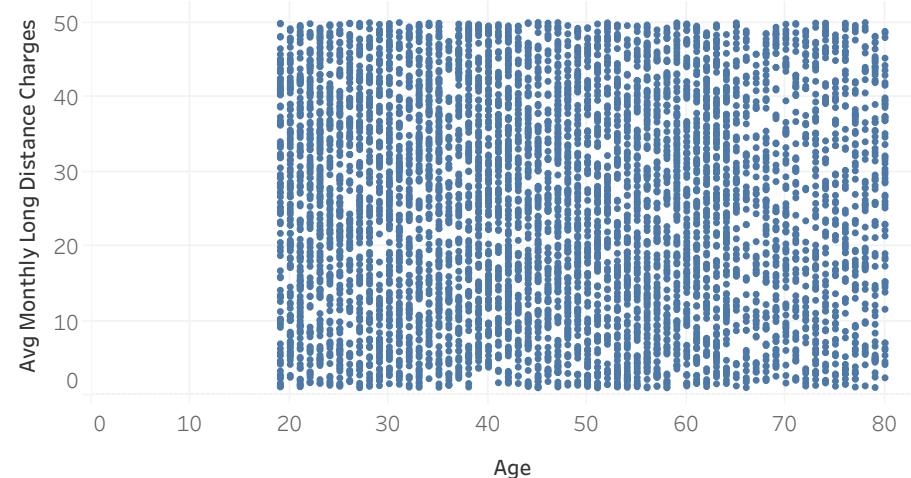
Correlation Matrix Heatmap of All Measures



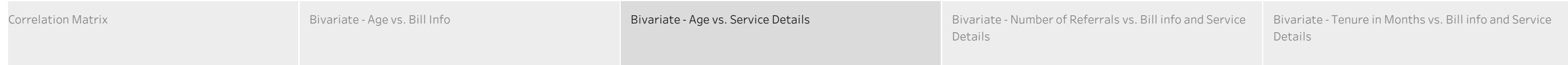
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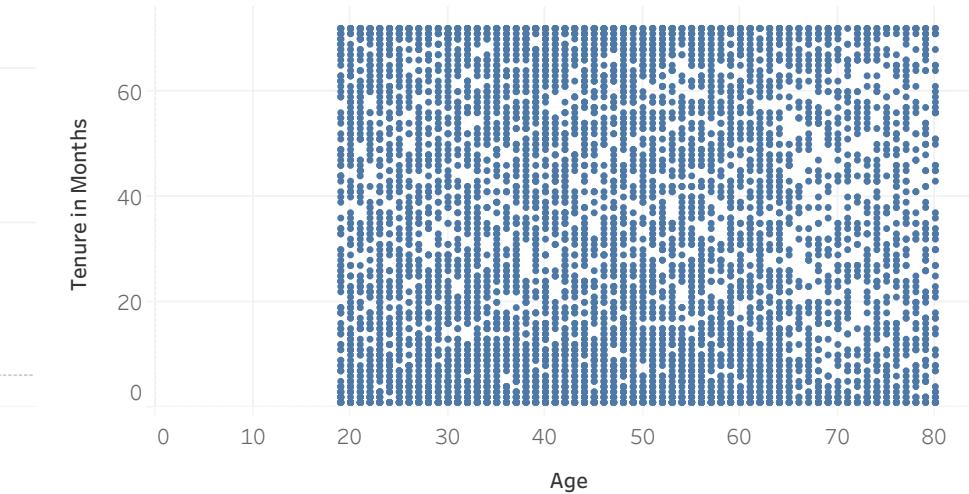
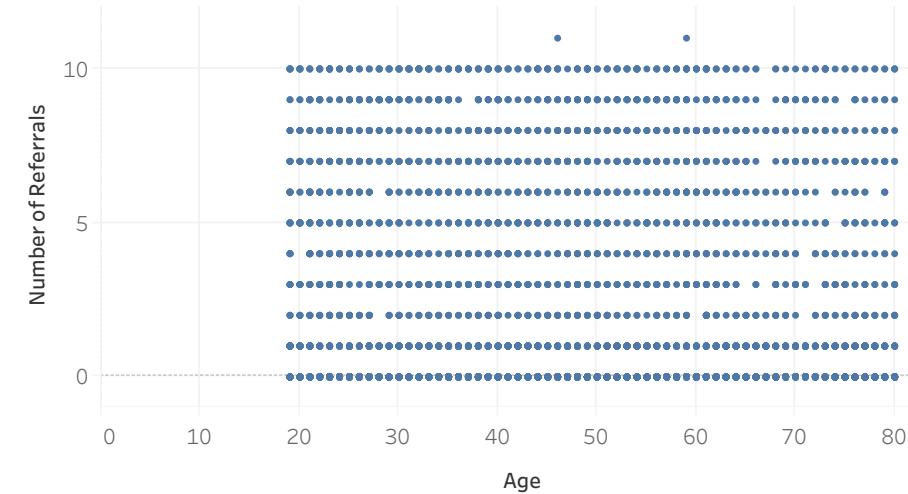
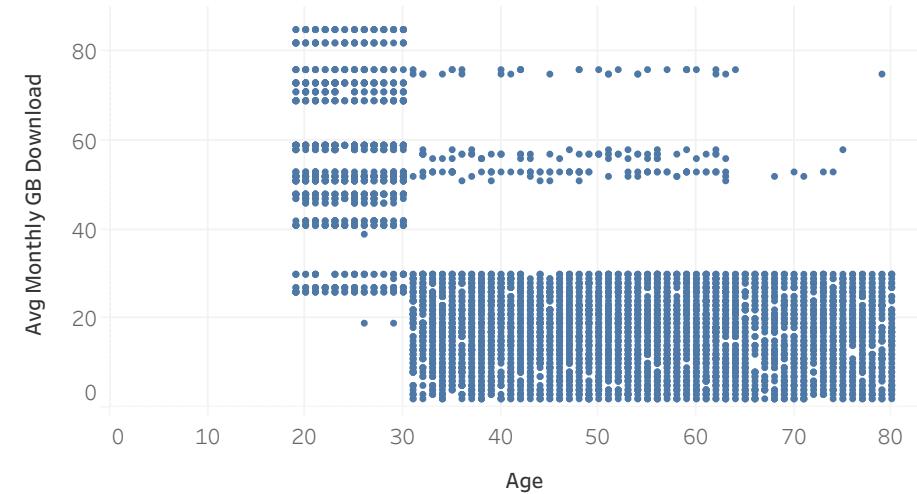
Bivariate Analysis of Age vs Bill Information Measures



Exploratory Data Analysis Report of Telecompany Customer Churn Dataset



Bivariate Analysis of Age vs Service Detail Measures



Exploratory Data Analysis Report of Telecompany Customer Churn Dataset

Bivariate - Age vs. Bill Info

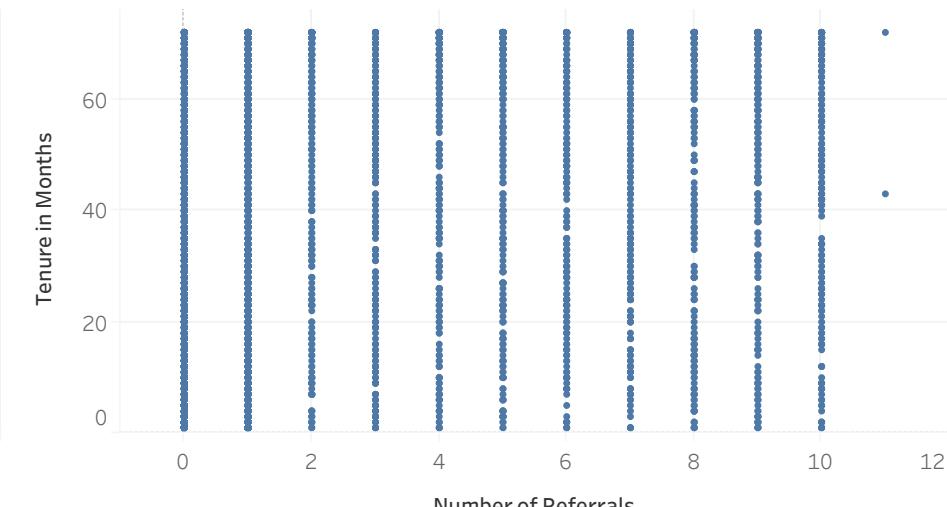
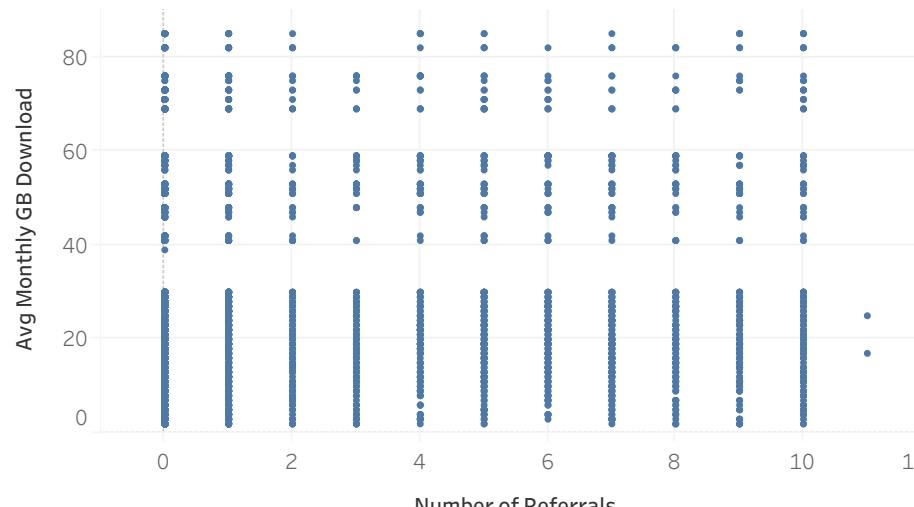
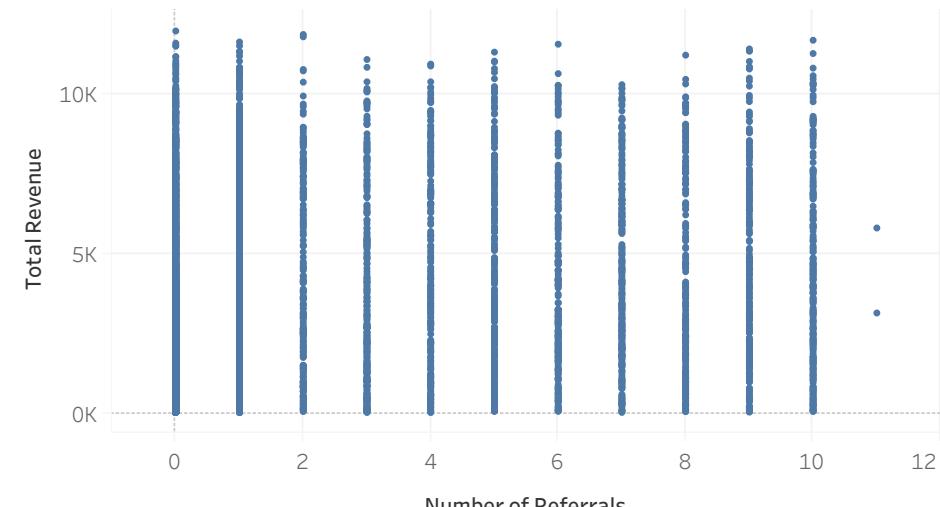
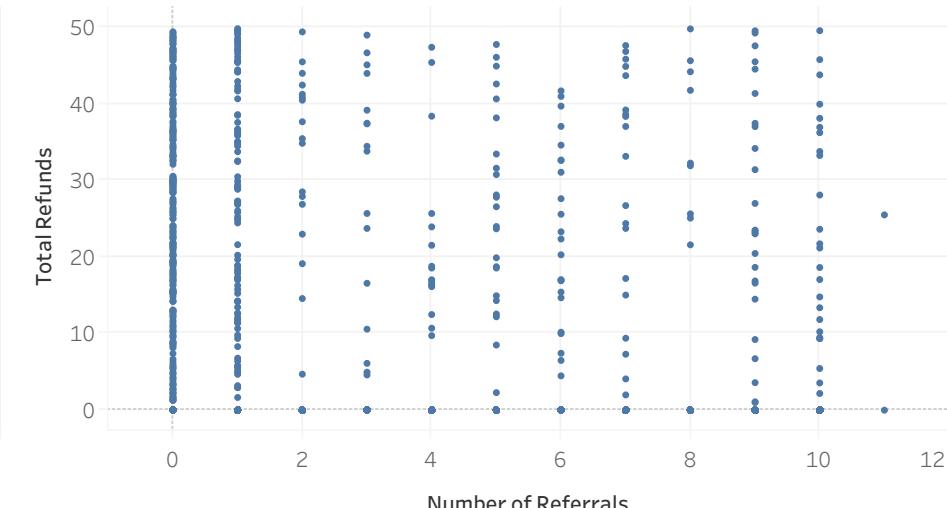
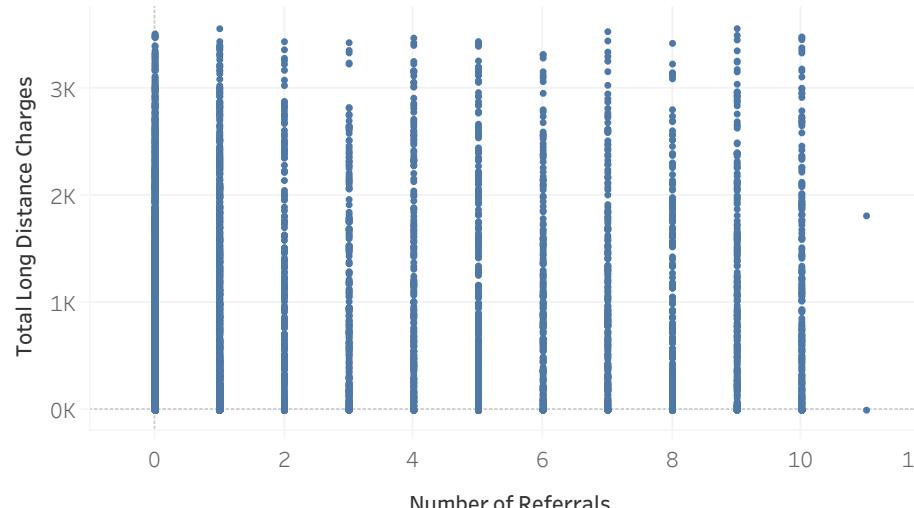
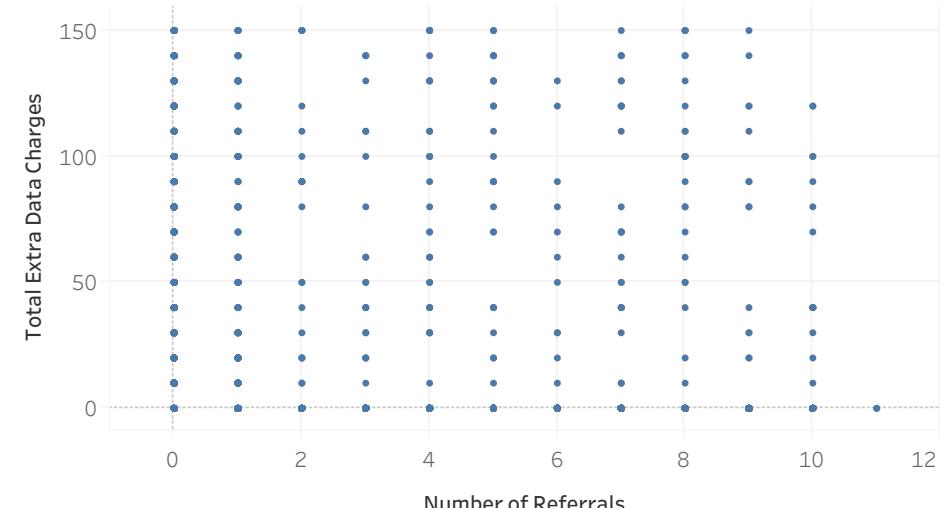
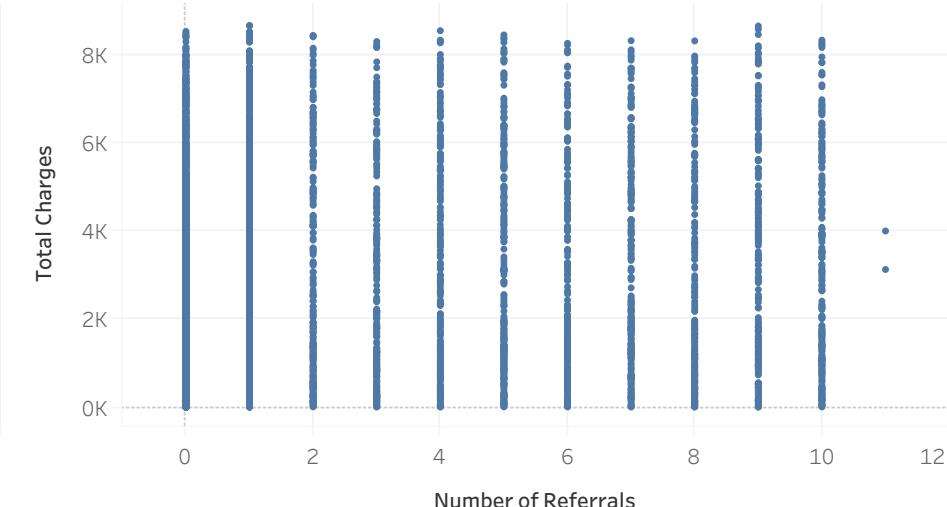
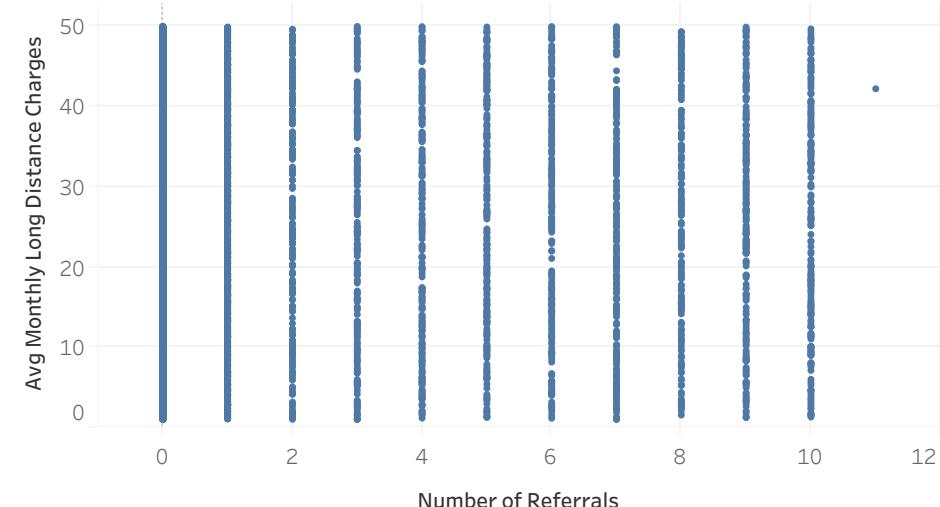
Bivariate - Age vs. Service Details

Bivariate - Number of Referrals vs. Bill info and Service Details

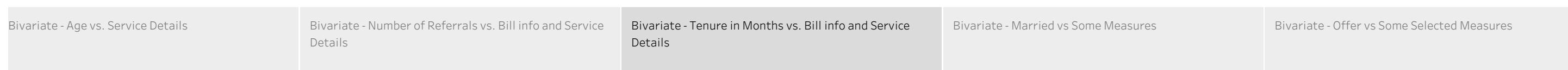
Bivariate - Tenure in Months vs. Bill info and Service Details

Bivariate - Married vs Some Measures

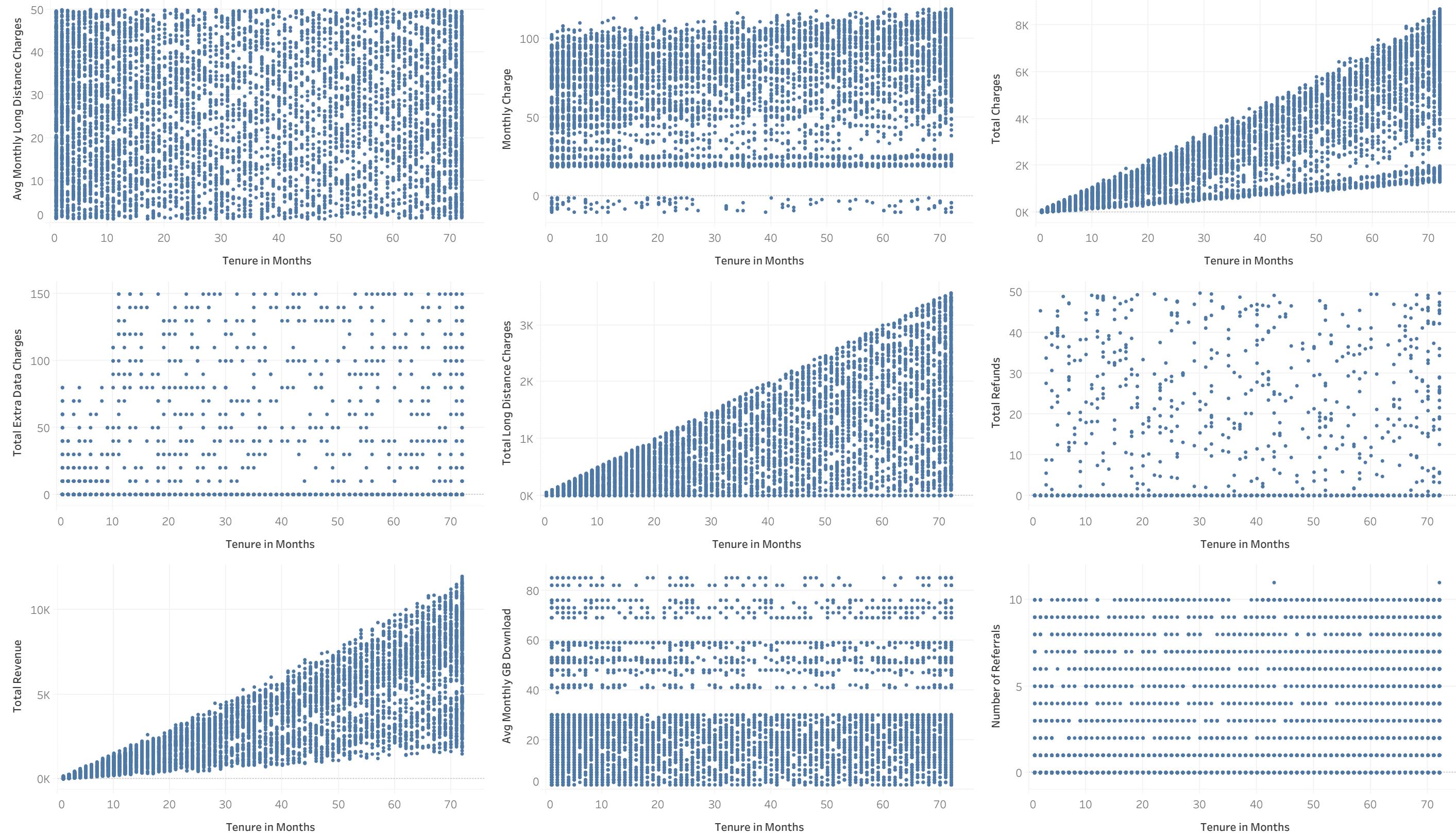
Bivariate Analysis of Number of Referrals vs Bill Info and Service Details



Exploratory Data Analysis Report of Telecompany Customer Churn Dataset



Bivariate Analysis Tenure in Months vs Bill Info and Service Details



Exploratory Data Analysis Report of Telecompany Customer Churn Dataset

Bivariate - Number of Referrals vs. Bill info and Service Details

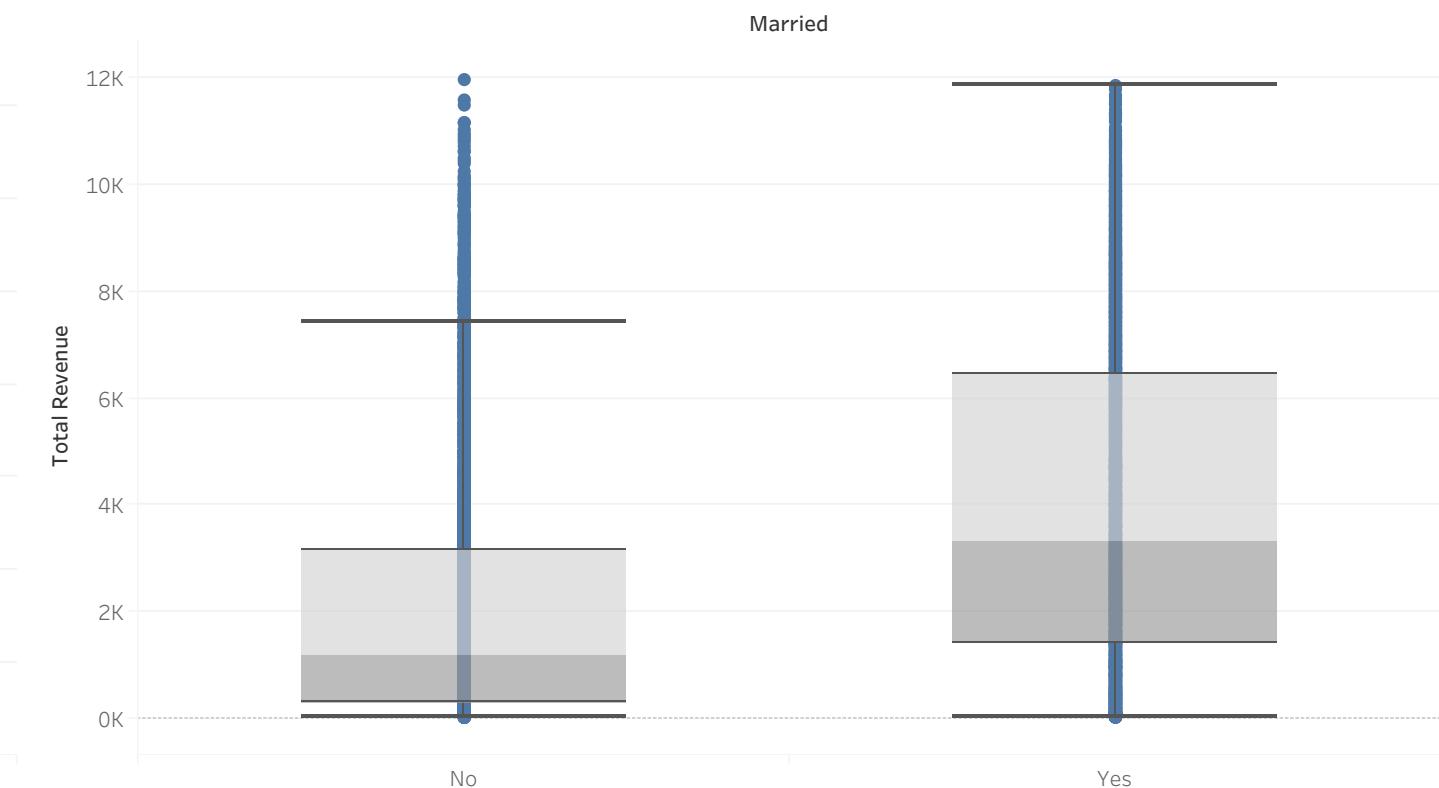
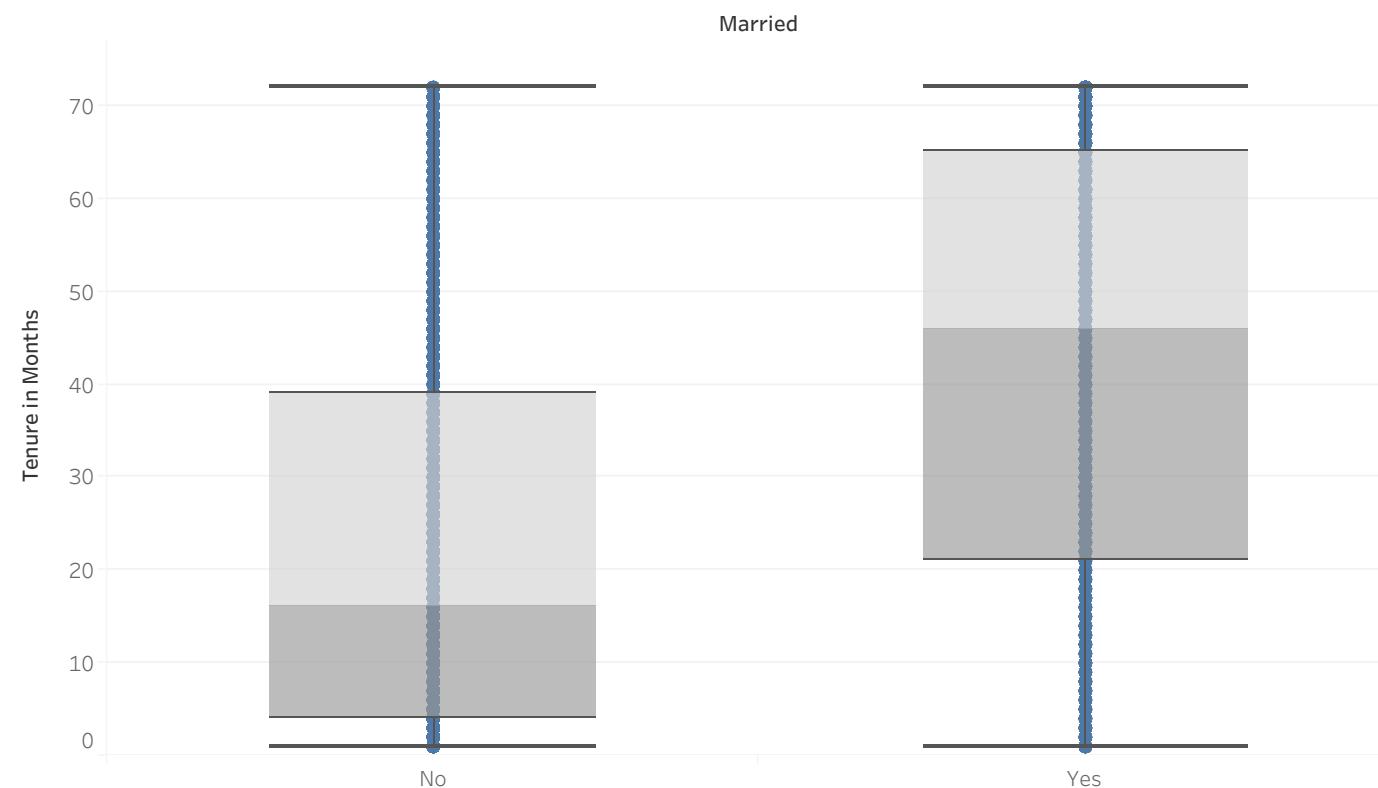
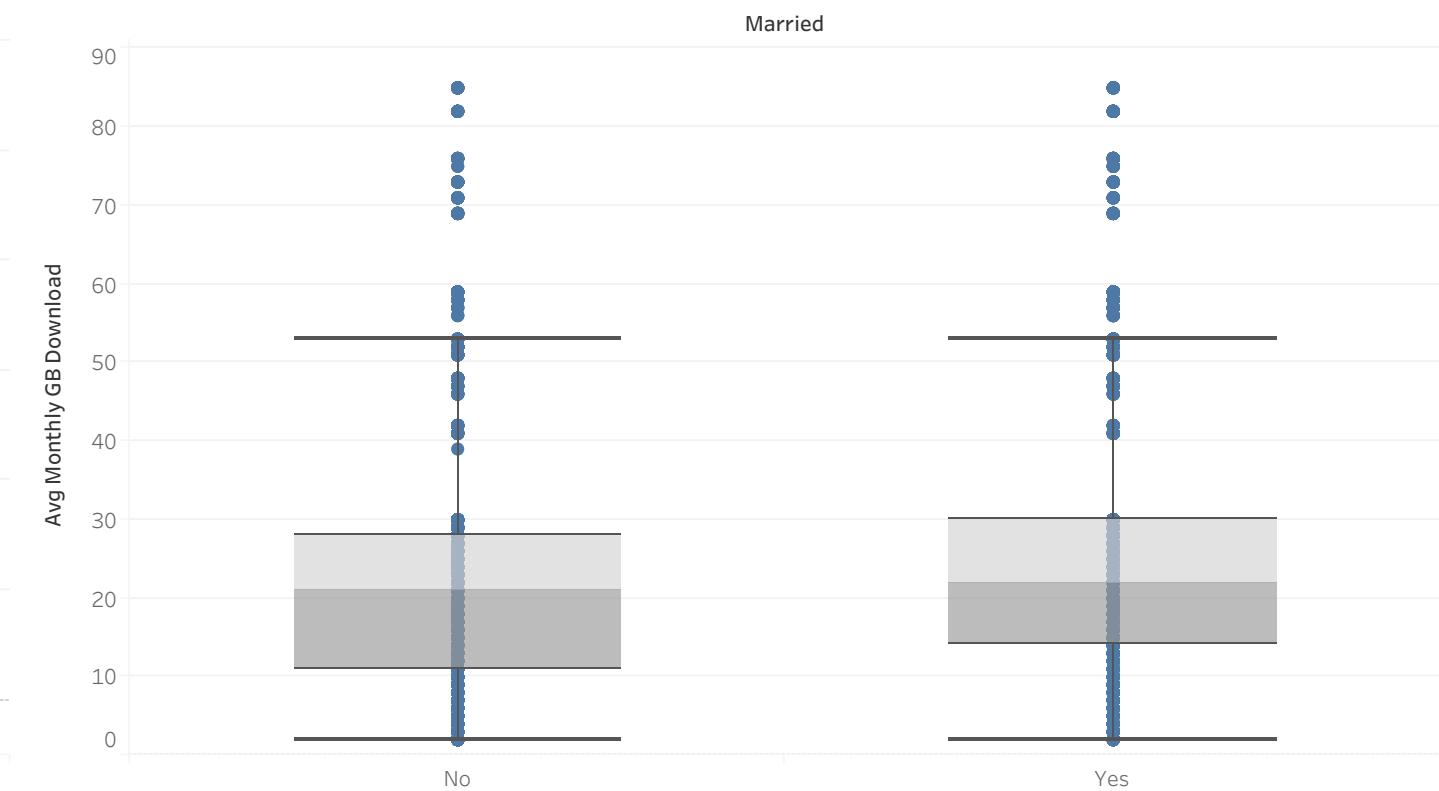
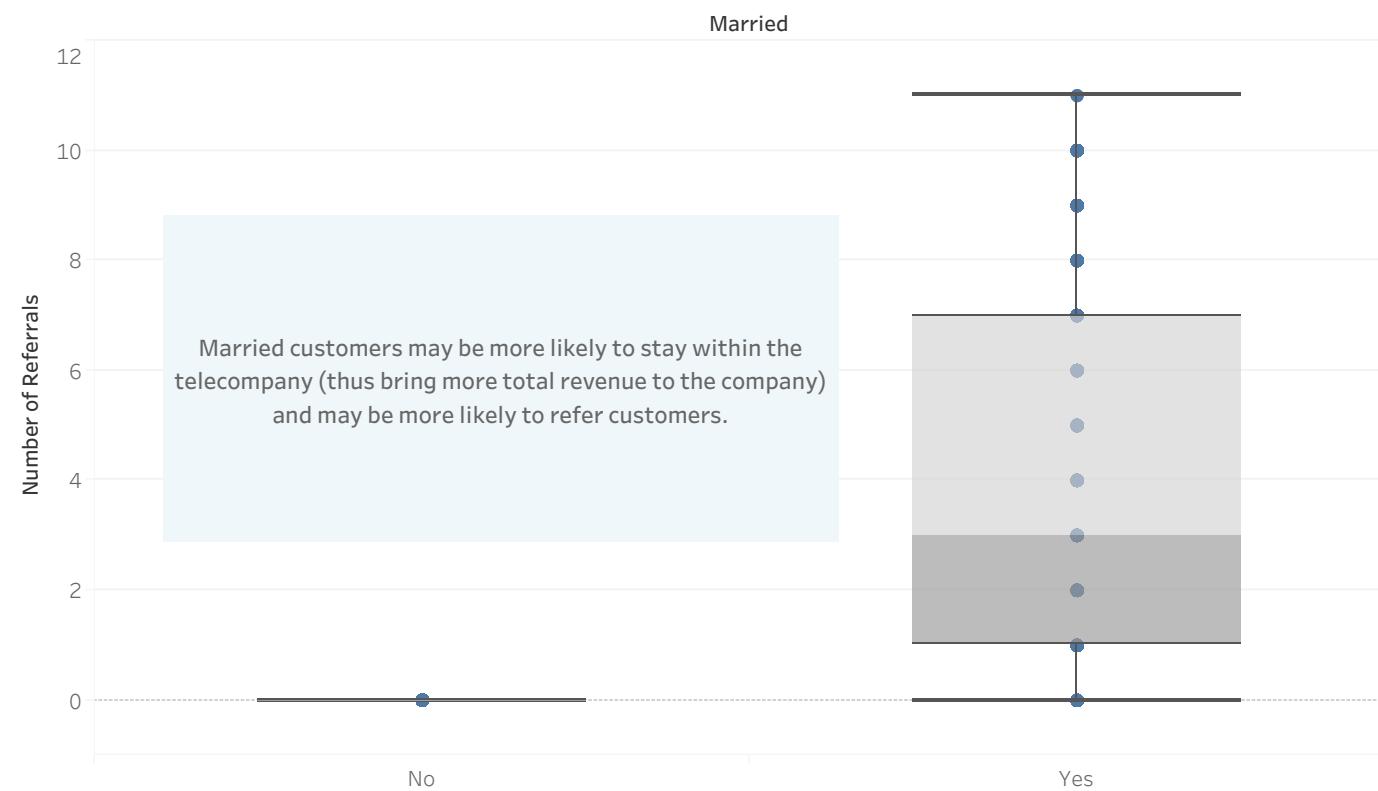
Bivariate - Tenure in Months vs. Bill info and Service Details

Bivariate - Married vs Some Measures

Bivariate - Offer vs Some Selected Measures

Bivariate - Multiple Lines vs Measures

Bivariate Analysis of Married Dimension vs Some Measures



Exploratory Data Analysis Report of Telecompany Customer Churn Dataset

Bivariate - Tenure in Months vs. Bill info and Service Details

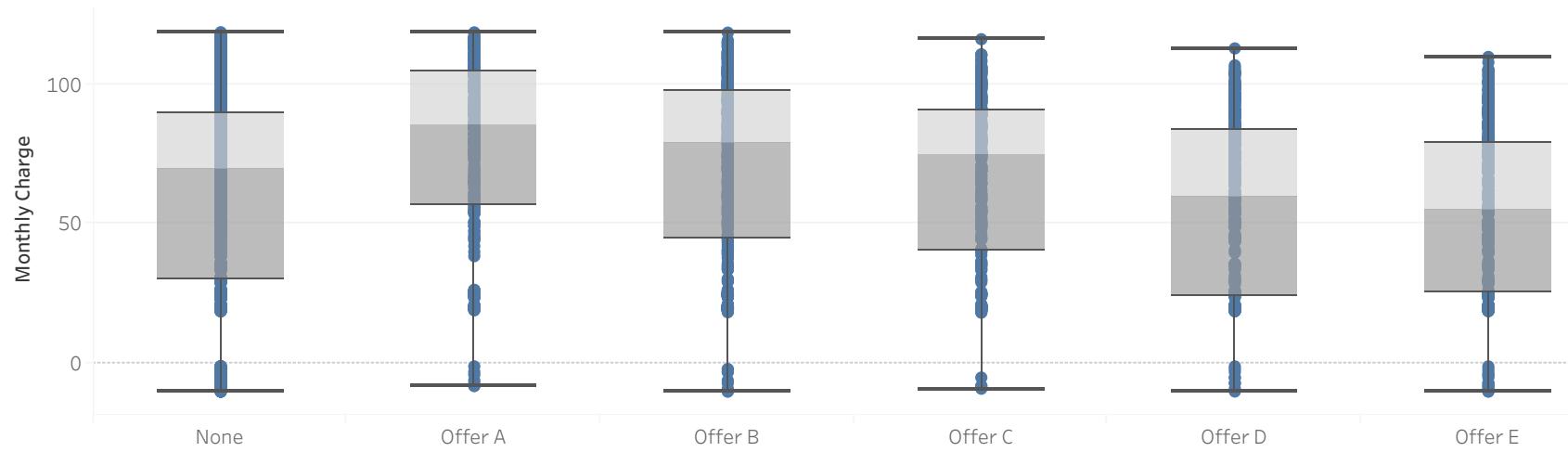
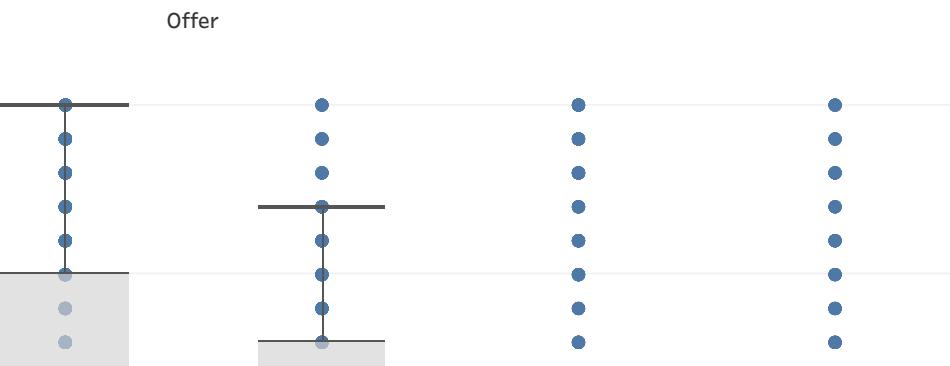
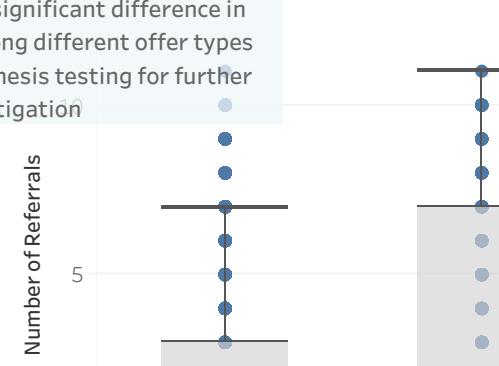
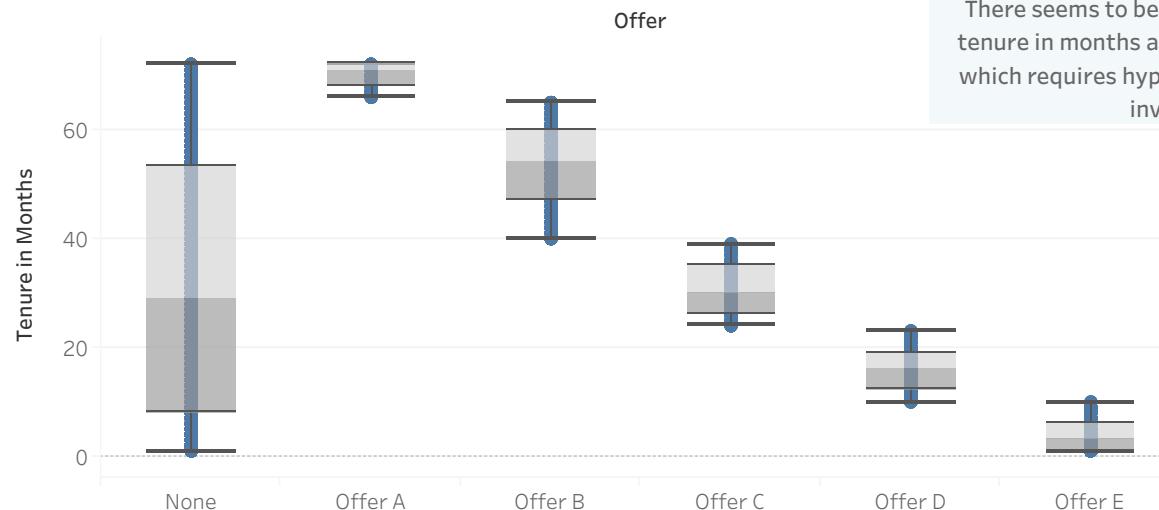
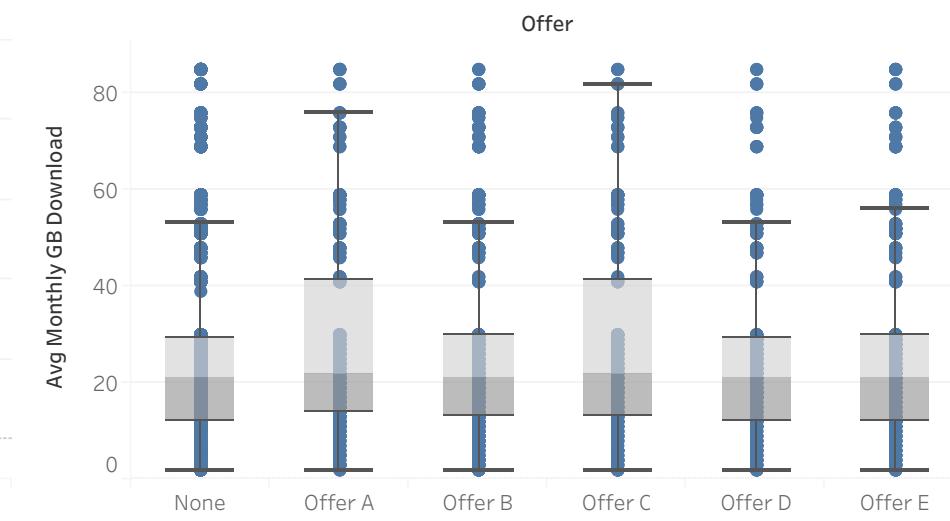
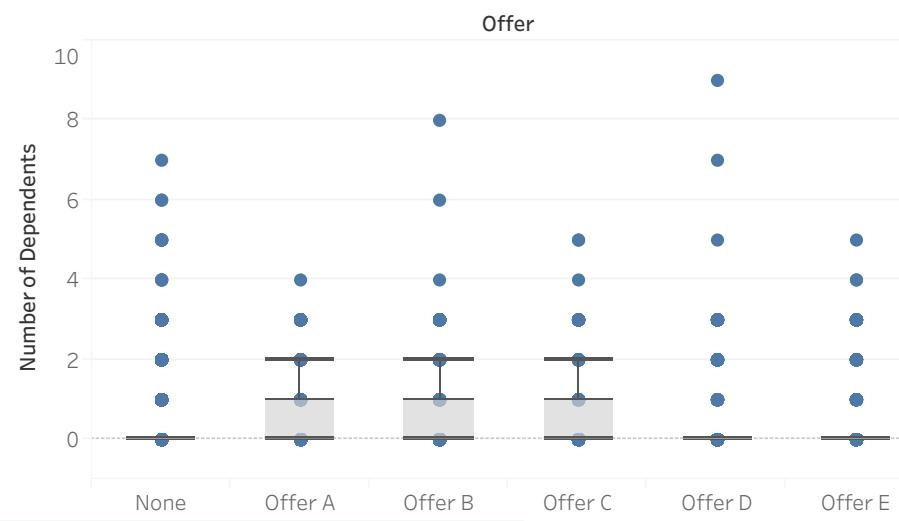
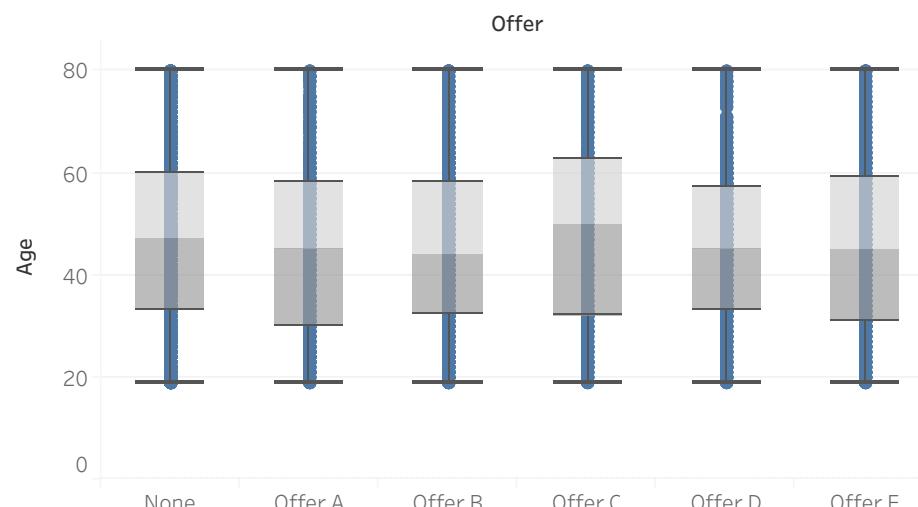
Bivariate - Married vs Some Measures

Bivariate - Offer vs Some Selected Measures

Bivariate - Multiple Lines vs Measures

Bivariate - Response Variable vs. Service Detail

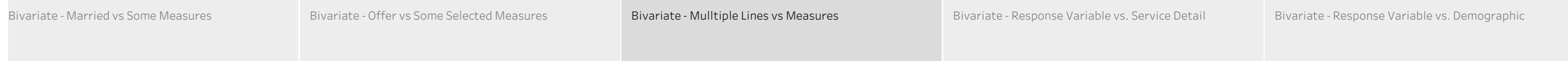
Bivariate Analysis of Offer Dimension vs Some Measures



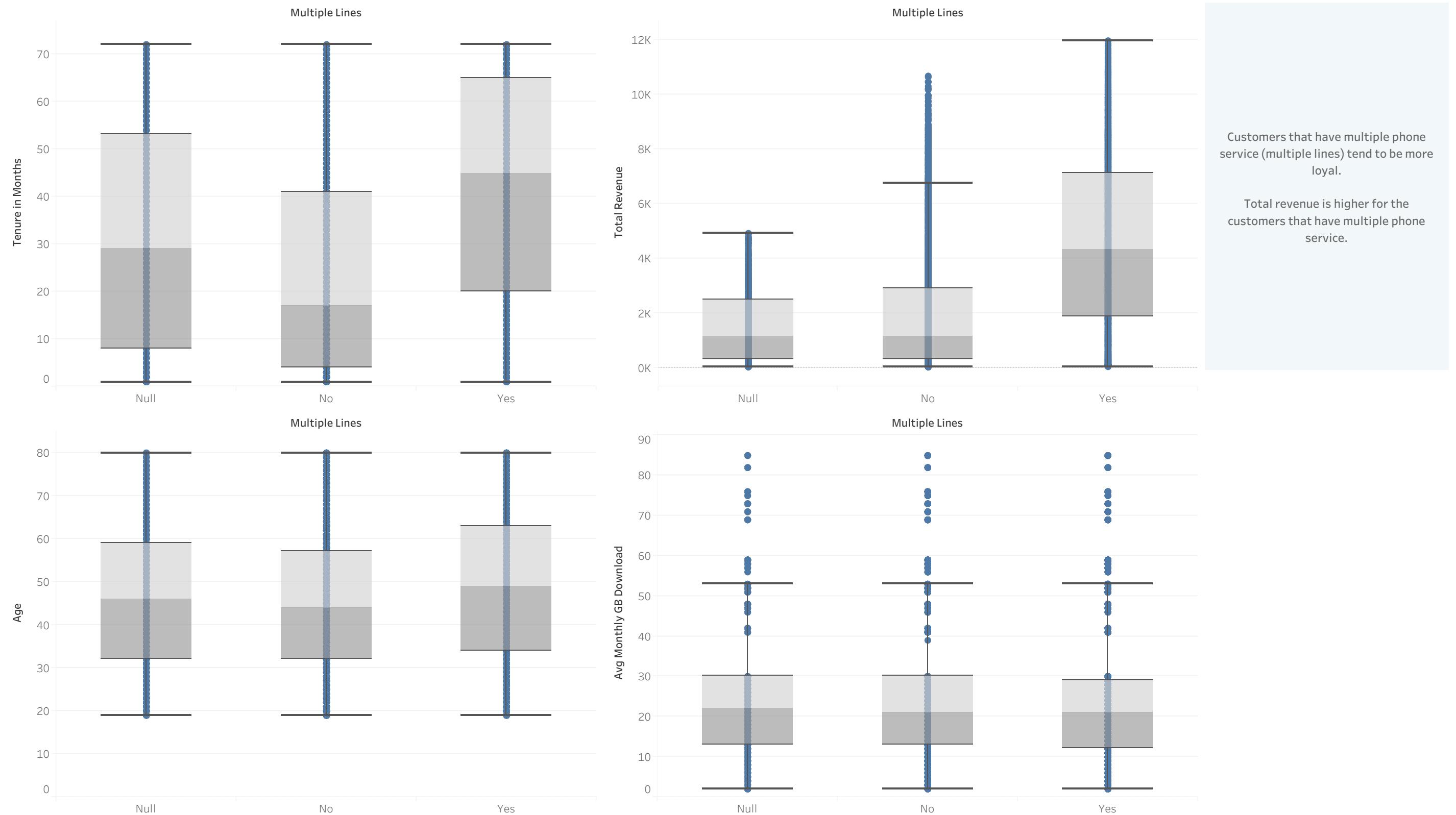
There seems to be a significant difference in tenure in months among different offer types which requires hypothesis testing for further investigation

The range of monthly charge for each offer is very wide and we are not able to infer the price of offers. The wide range of price can't be explained with the inflation rate, it could be because additional charges and/or other attributes like the city, age, number of referrals or being a recent customer may be causing some discounts in the price of the offer.

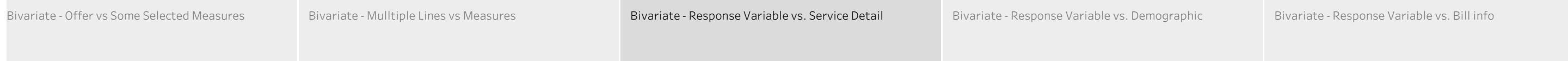
Exploratory Data Analysis Report of Telecompany Customer Churn Dataset



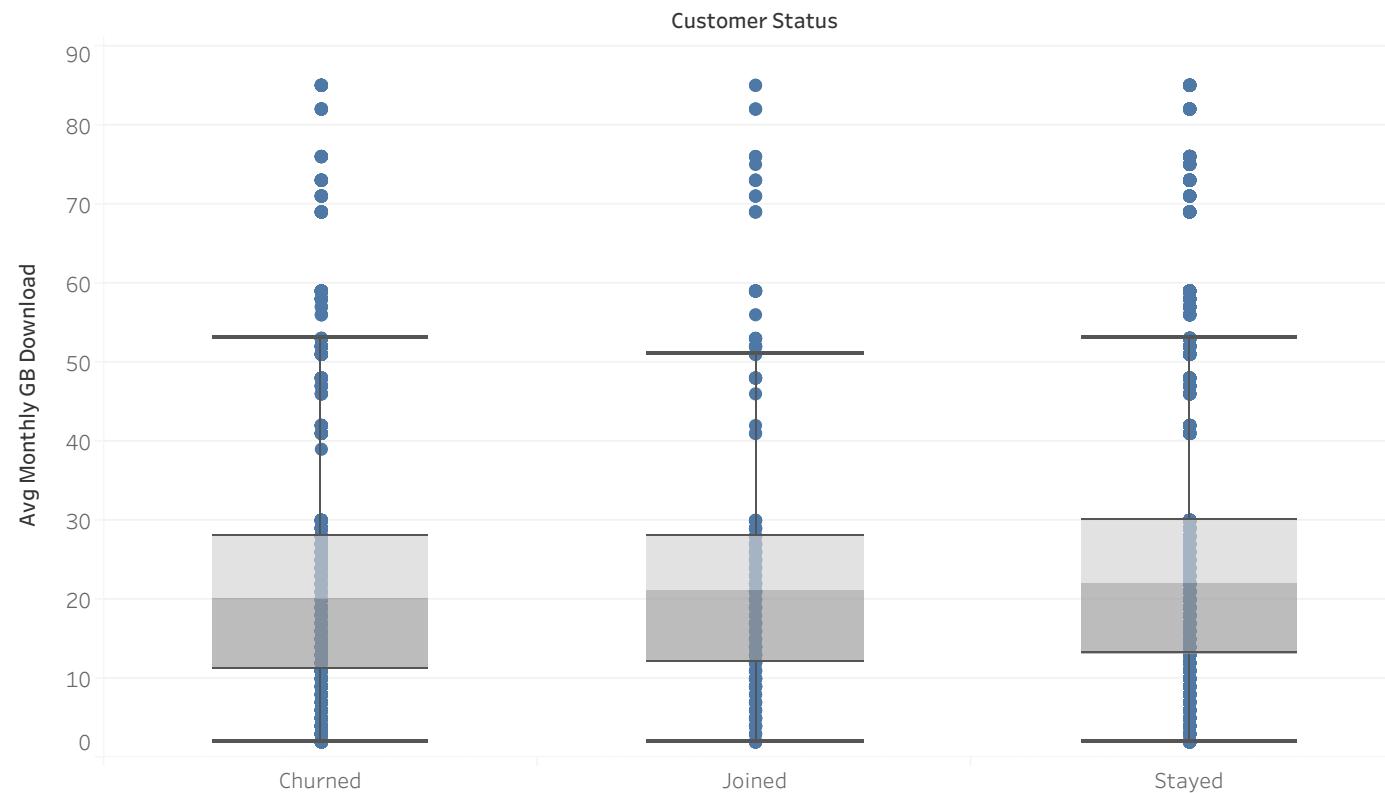
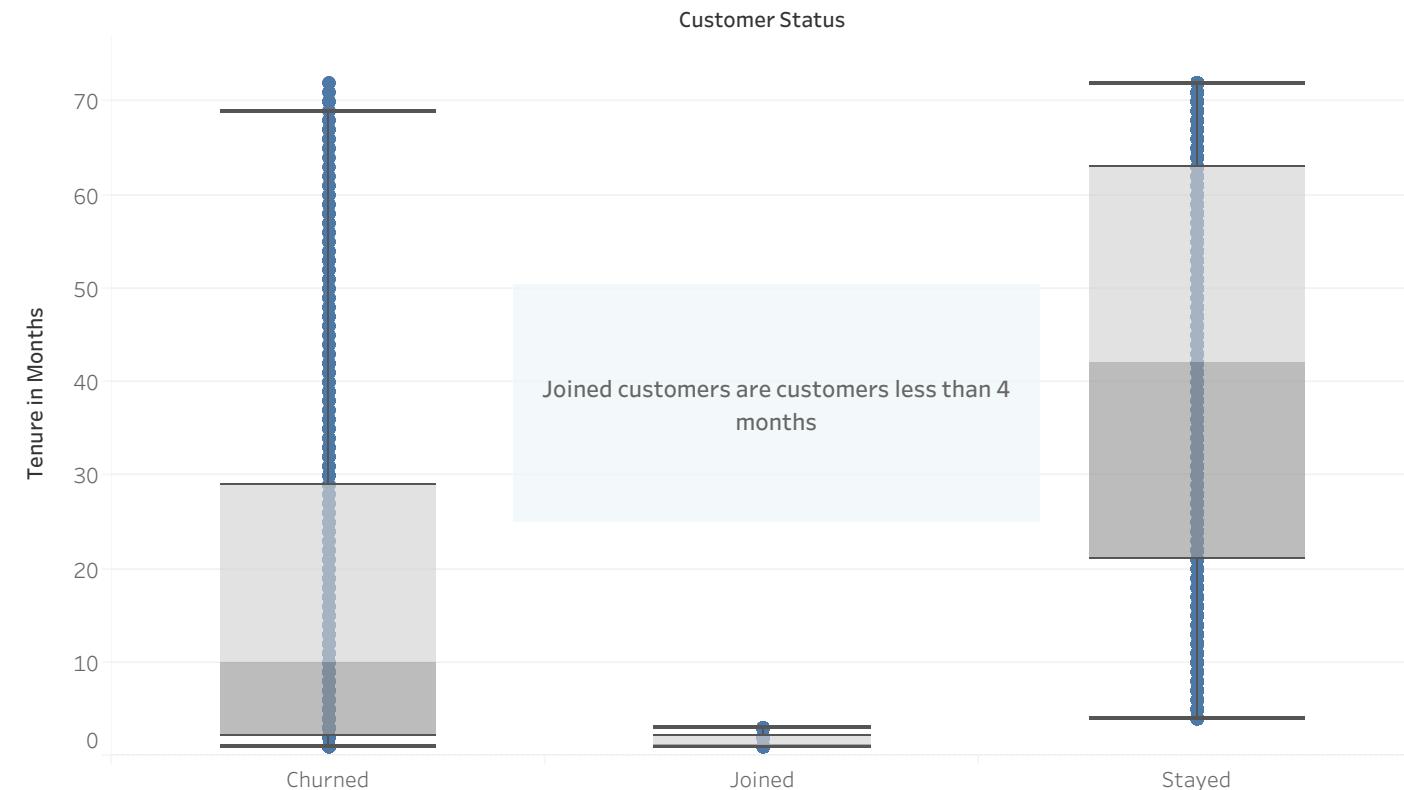
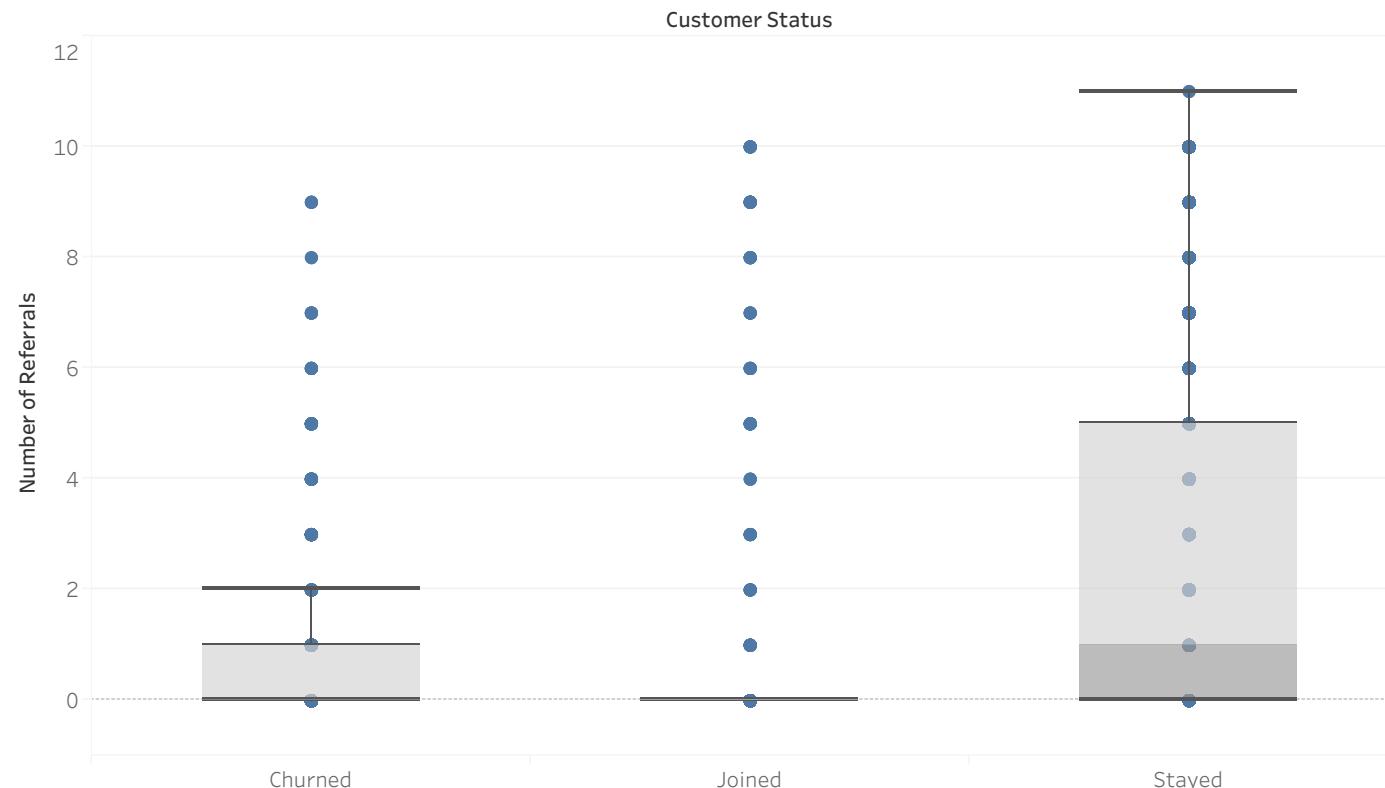
Bivariate Analysis of Multiple Lines vs Some Measures



Exploratory Data Analysis Report of Telecompany Customer Churn Dataset



Bivariate Analysis of Customer Status (Response Variable) vs Service Detail Measures



Exploratory Data Analysis Report of Telecompany Customer Churn Dataset

Bivariate - Multiple Lines vs Measures

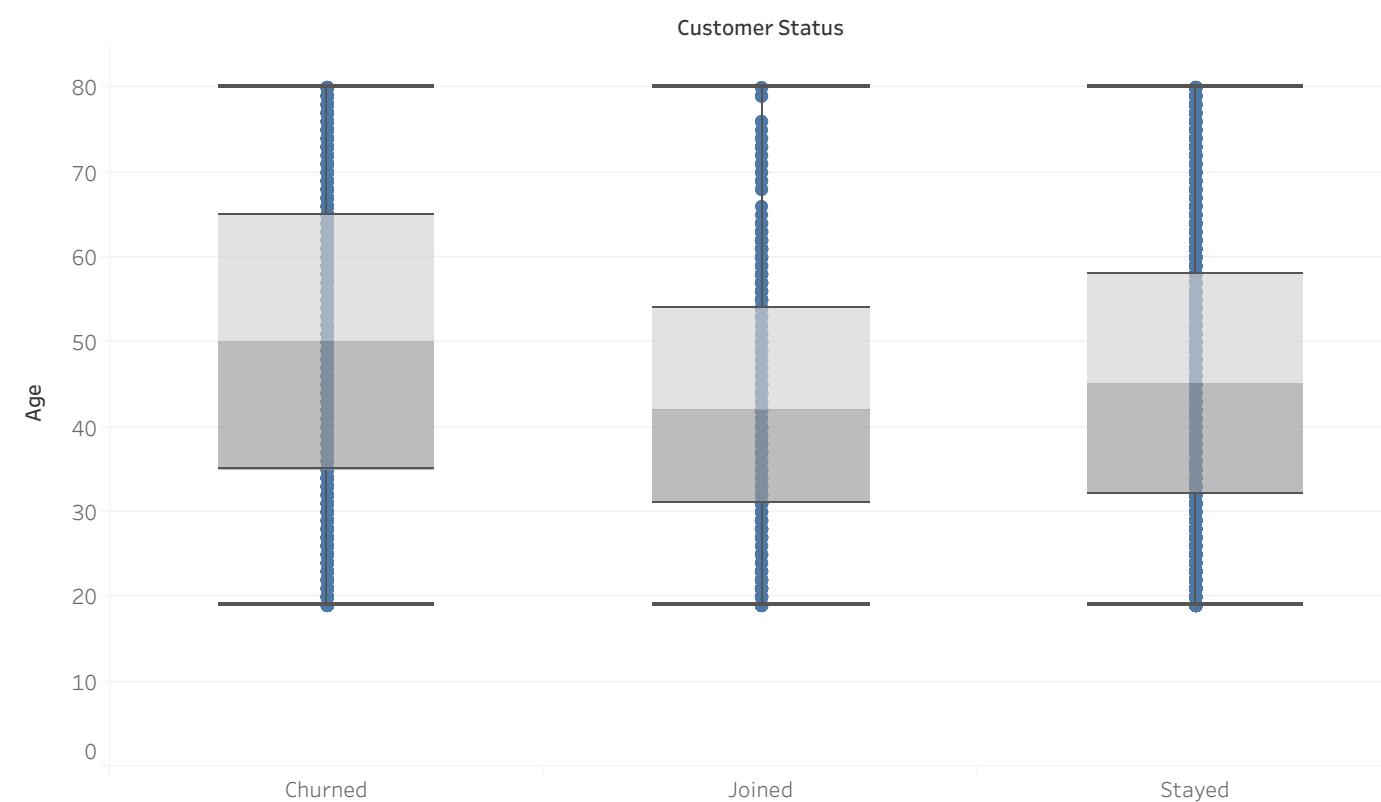
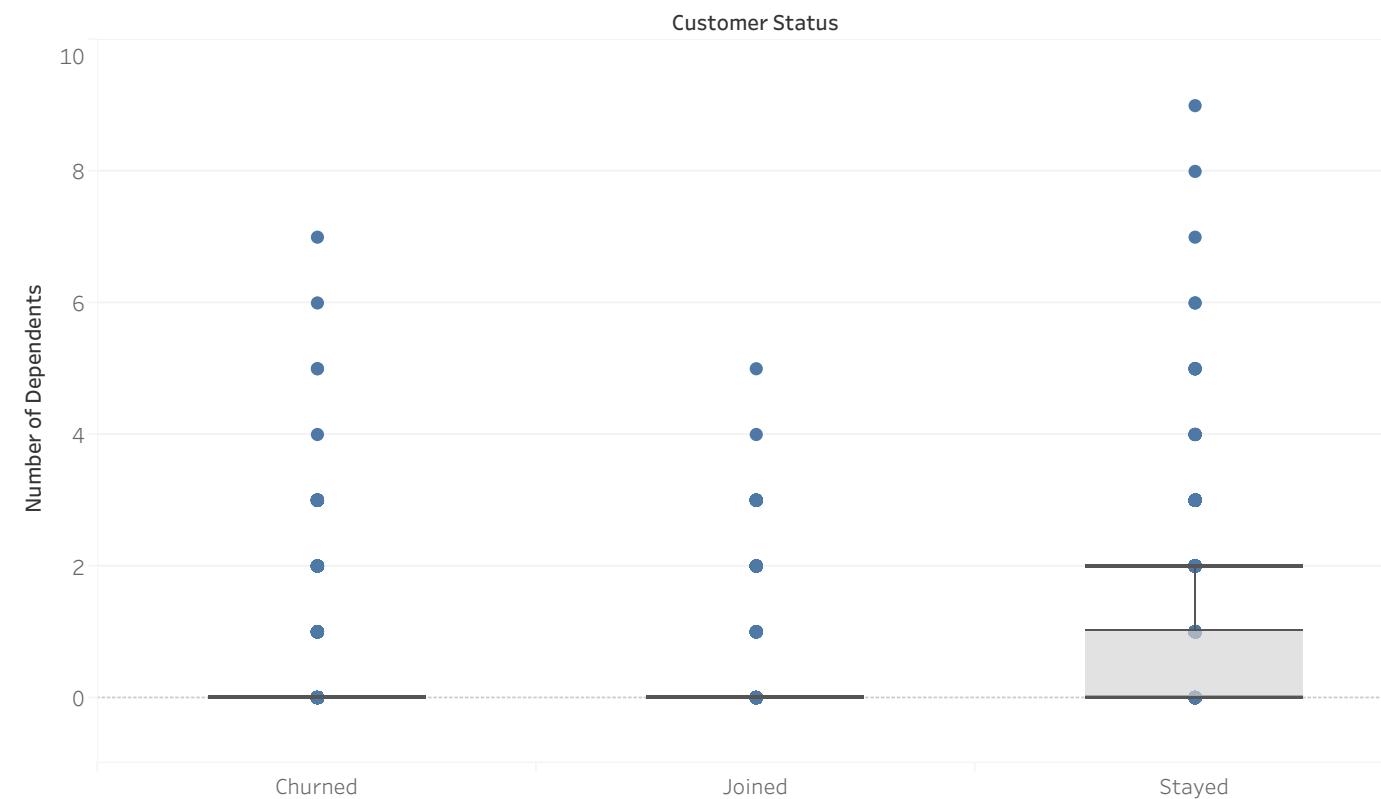
Bivariate - Response Variable vs. Service Detail

Bivariate - Response Variable vs. Demographic

Bivariate - Response Variable vs. Bill info

Bivariate - Churn Detail (Customer Status) vs. Service Detail

Bivariate Analysis of Customer Status (Response Variable) vs Demographic Measures



Exploratory Data Analysis Report of Telecompany Customer Churn Dataset

Bivariate - Response Variable vs. Service Detail

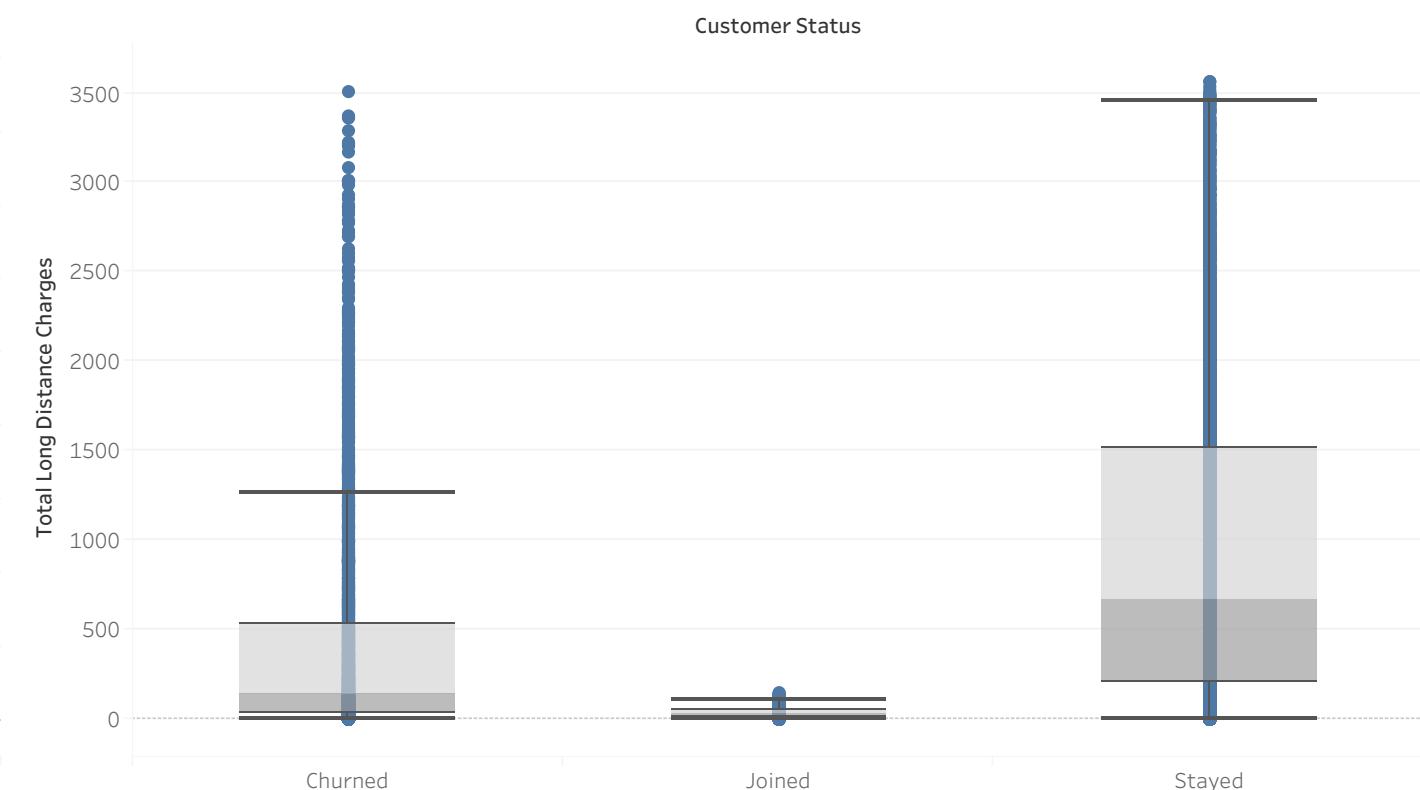
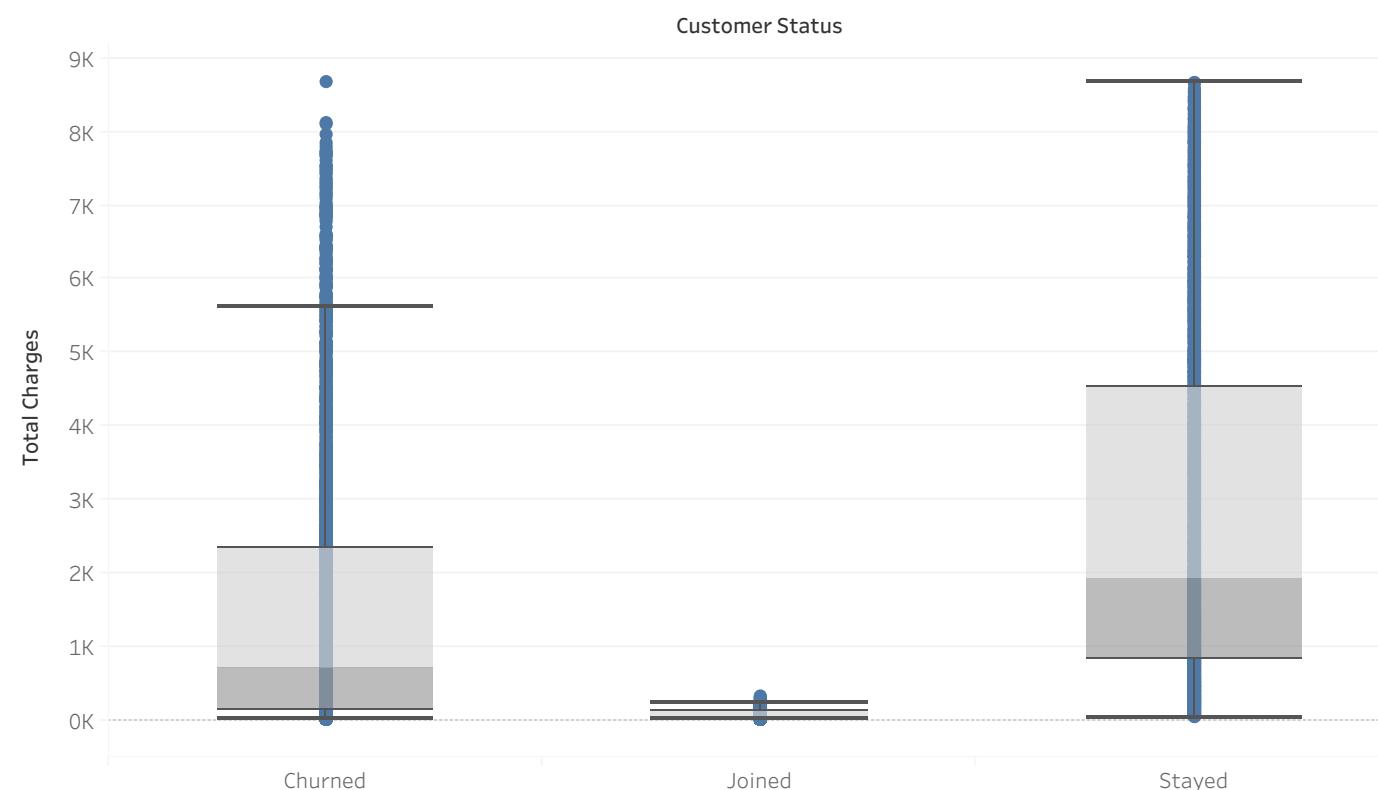
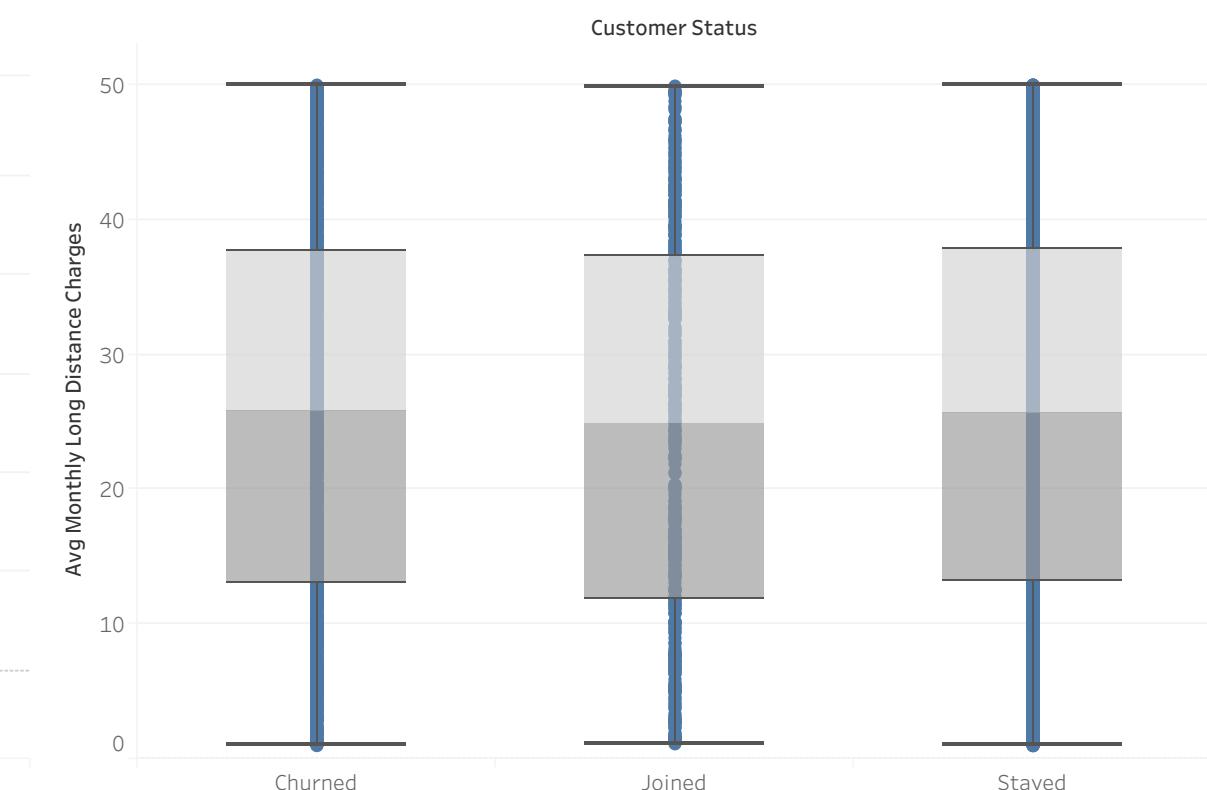
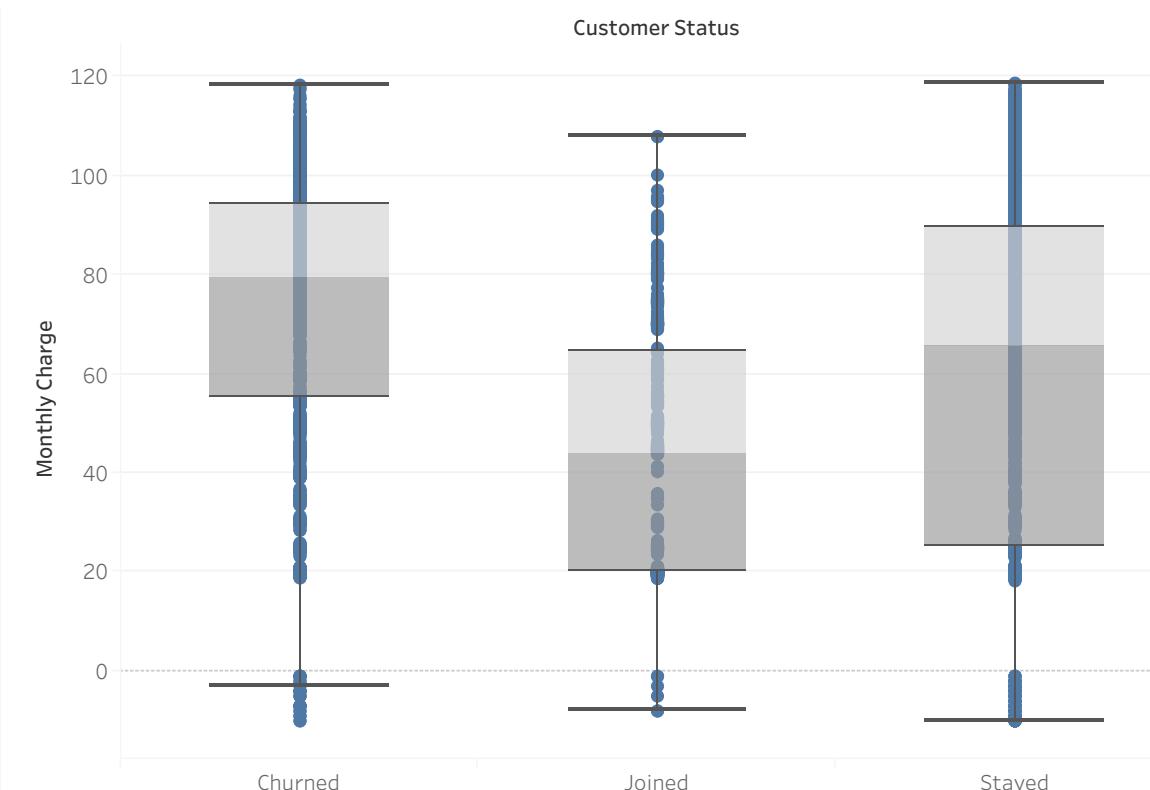
Bivariate - Response Variable vs. Demographic

Bivariate - Response Variable vs. Bill info

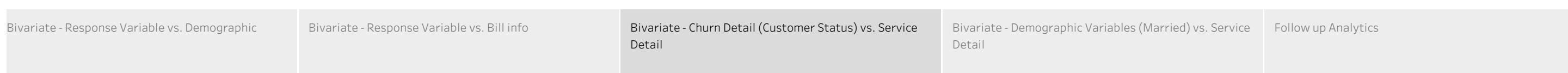
Bivariate - Churn Detail (Customer Status) vs. Service Detail

Bivariate - Demographic Variables (Married) vs. Service Detail

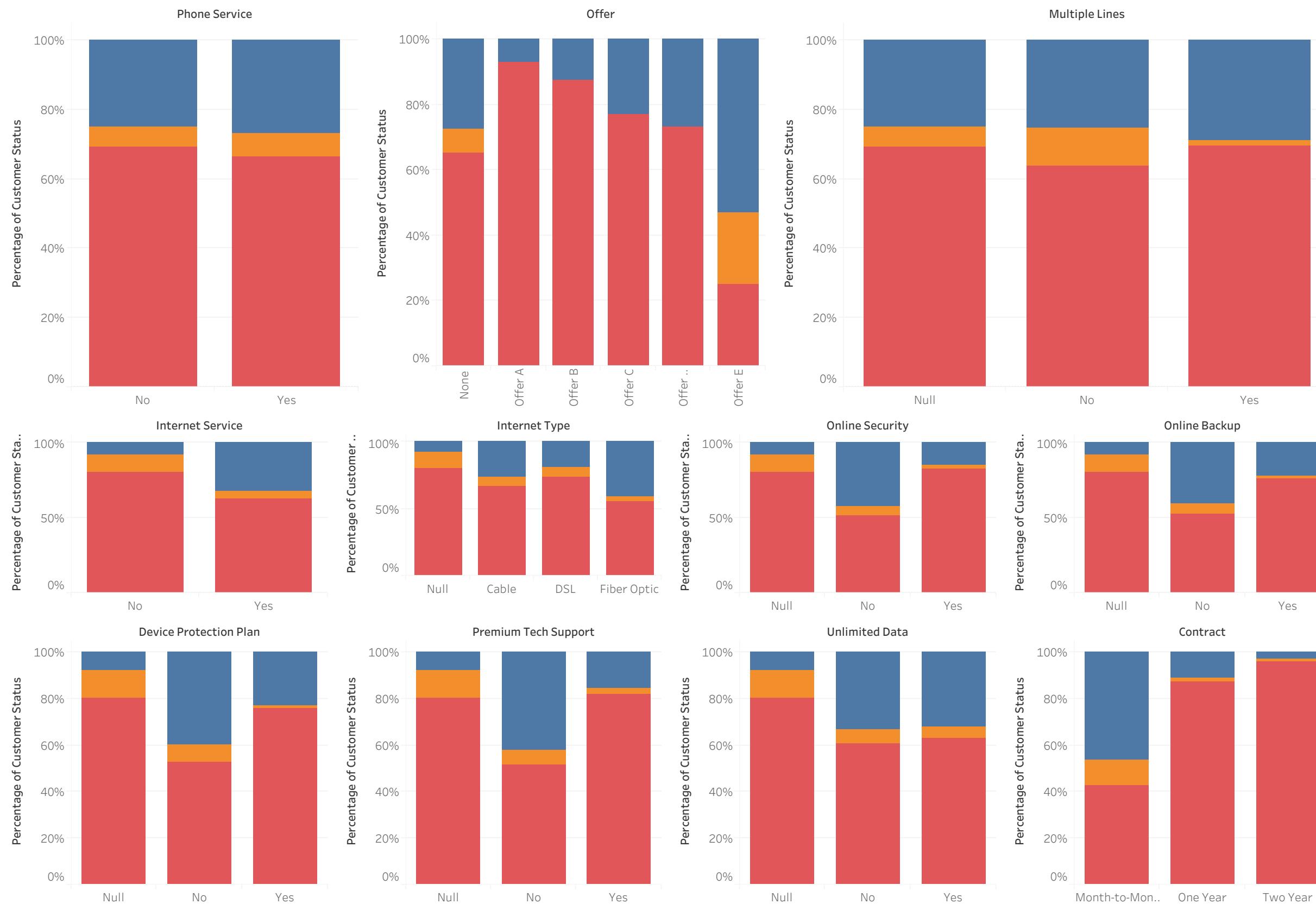
Bivariate Analysis of Customer Status (Response Variable) vs Some Bill Information Measures



Exploratory Data Analysis Report of Telecompany Customer Churn Dataset



Bivariate Analysis of Service Detail vs Customer Status (Reponse Variable)



Customers choosing offer E and month-to-month pay may be more likely to churn.

Customers who have internet service but no online security, online backup, device protection plan and premium tech support may be more likely to churn.

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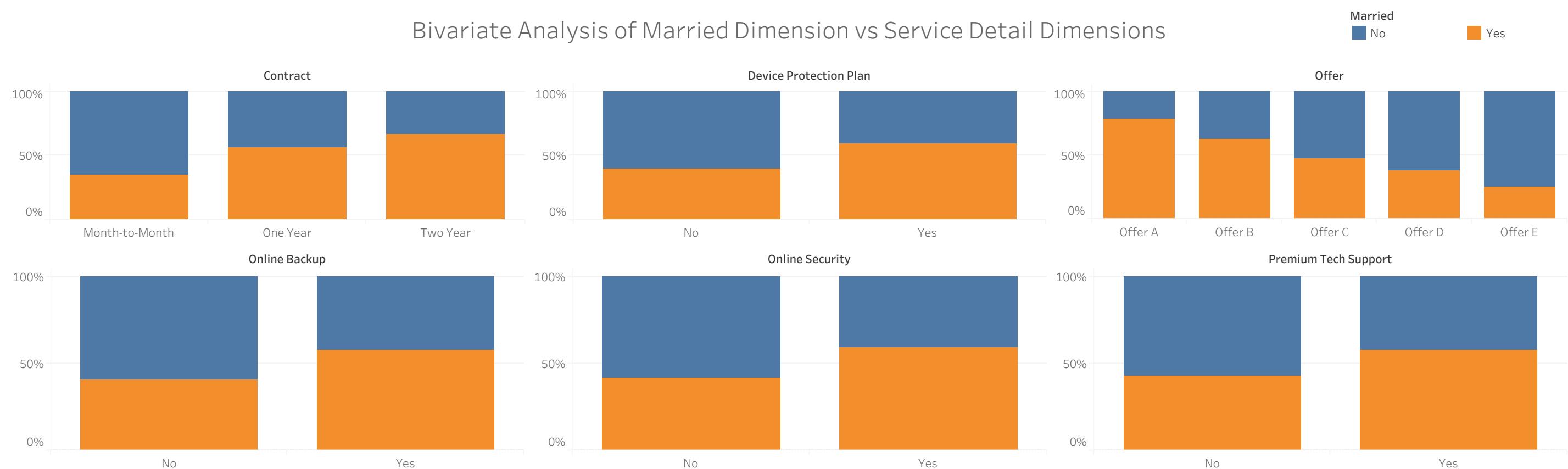
Bivariate - Response Variable vs. Bill info

Bivariate - Churn Detail (Customer Status) vs. Service Detail

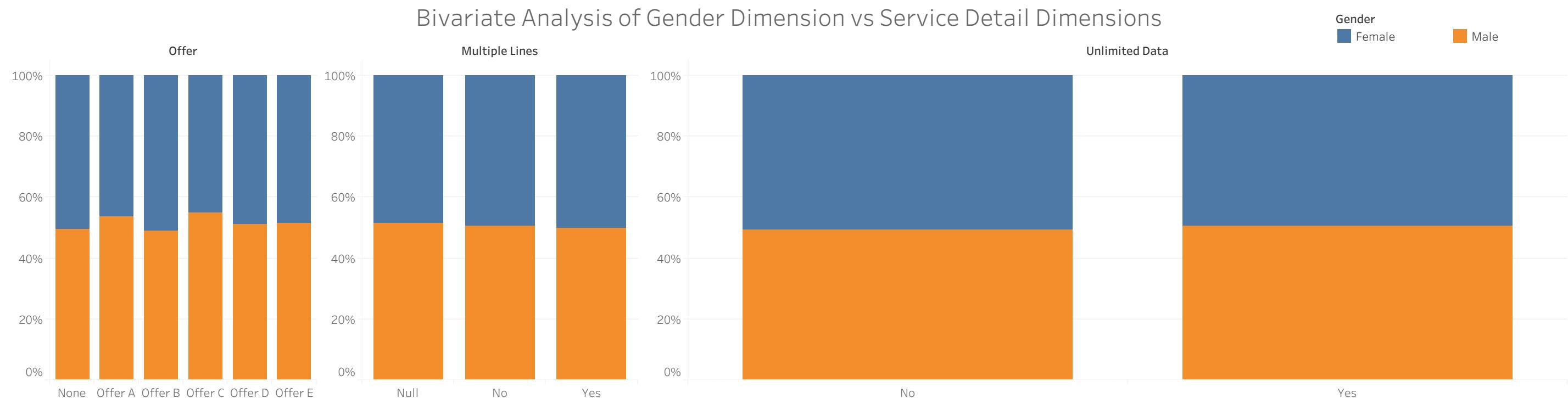
Bivariate - Demographic Variables (Married) vs. Service Detail

Follow up Analytics

Better Indicators for Monthly Payments



Married customers may be tend to choose offer A, two year contract, device protection plan, online backup, online security and premium tech support



Exploratory Data Analysis Report of Telecompany Customer Churn Dataset

Bivariate - Response Variable vs. Bill info

Bivariate - Churn Detail (Customer Status) vs. Service Detail

Bivariate - Demographic Variables (Married) vs. Service Detail

Follow up Analytics

Better Indicators for Monthly Payments



The slide features a dark red background with white text. In the top left corner, the USC Viterbi School of Engineering logo is displayed, consisting of the words "USC Viterbi" in yellow and "School of Engineering" in white, with a small red shield icon to the right. The main title "Follow up Analytics: Find Better Indicator for Monthly Payment" is centered in the middle of the slide in a large, white, sans-serif font.

Follow up Analytics: Find Better Indicator for Monthly Payment

Exploratory Data Analysis Report of Telecompany Customer Churn Dataset

Bivariate - Response Variable vs. Bill info

Bivariate - Churn Detail (Customer Status) vs. Service Detail

Bivariate - Demographic Variables (Married) vs. Service Detail

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