

Customer Churn Analysis using Power BI



-Kshetrimayum Galax Singh

(galaxkshetrimayum16@gmail.com)

<https://github.com/galax19ksh/Customer-churn-analysis>

What is Customer Churn?

Customer churn, also known as customer attrition, refers to the loss of customers over time. It's basically when customers stop using your product or service and decide not to return. It's important for businesses to track and understand their churn rate, as it can have a significant impact on their bottom line.



Telecom industry:

Customers in the telecom industry can choose from a variety of service providers and actively switch from one to the next. The telecommunications business has an annual churn rate of 15-25 percent in this highly competitive market.

Causes of churn:

- **Poor customer service:** Long wait times, unhelpful interactions, unresolved issues.
- **Product dissatisfaction:** Product not meeting expectations, lack of features, bugs.
- **Competitor offerings:** Better options available at competitive prices.
- **Pricing issues:** Prices perceived as too high, hidden fees, unexpected charges.
- **Changes in customer needs:** Needs evolve, your offering doesn't adapt.

Customer retention:

Keeping your customers happy while managing a large crowd can feel like juggling flaming bowling pins. Time and resources are limited, making it impossible to shower everyone with personalized attention. But what if you could predict who's about to jump ship?

Here's where customer churn prediction comes in. Just like a weather forecast, it uses data to tell you which customers are at high risk of leaving. This lets you focus your efforts on saving the "at-risk" ones, maximizing your impact and saving precious resources.

Think of it like this: Instead of sending everyone a generic umbrella, you only give them to those caught in a downpour.

Objectives:

- Finding the % of Churn Customers and customers that keep in with the active services.
- Analysing the data in terms of various features responsible for customer Churn
- Finding a most suited machine learning model for correct classification of Churn and non-churn customers.

Data Source:

https://drive.google.com/file/d/1wSOU_MYqbDanEf_BkypegNKkxzOfbJXU/view?usp=drive_link

Tools used:

- Power BI
- Google Colab

Libraries used:

Pandas, numpy, matplotlib, sklearn, seaborn

Visualization using Power BI:

- Load CSV file into Power BI desktop

- Check if there is any missing values
- Remove unnecessary columns

File Origin: 1252: Western European (Windows) | Delimiter: Comma | Data Type Detection: Based on first 200 rows

customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	InternetService	OnlineSecurity
7590-VHVEG	Female	0	Yes	No	1	No	No phone service	DSL	No
5575-GNVDE	Male	0	No	No	34	Yes	No	DSL	Yes
3668-QPYBK	Male	0	No	No	2	Yes	No	DSL	Yes
7795-CFOCW	Male	0	No	No	45	No	No phone service	DSL	Yes
9237-HQITU	Female	0	No	No	2	Yes	No	Fiber optic	No
9305-CDSCC	Female	0	No	No	8	Yes	Yes	Fiber optic	No
1452-KIOVK	Male	0	No	Yes	22	Yes	Yes	Fiber optic	No
6713-OKDMC	Female	0	No	No	10	No	No phone service	DSL	Yes
7882-POOKP	Female	0	Yes	No	28	Yes	Yes	Fiber optic	No
6388-TABGU	Male	0	No	Yes	62	Yes	No	DSL	Yes
9763-GRSKD	Male	0	Yes	Yes	13	Yes	No	DSL	Yes
7469-LXBIC	Male	0	No	No	16	Yes	No	No	No internet service
8091-TTVAX	Male	0	Yes	No	58	Yes	Yes	Fiber optic	No
0280-XUGEX	Male	0	No	No	49	Yes	Yes	Fiber optic	No
5129-JLPIS	Male	0	No	No	25	Yes	No	Fiber optic	Yes
3655-SNQYZ	Female	0	Yes	Yes	69	Yes	Yes	Fiber optic	Yes
8191-XWSZG	Female	0	No	No	52	Yes	No	No	No internet service
9959-WOFKT	Male	0	No	Yes	71	Yes	Yes	Fiber optic	Yes
4190-MFLUW	Female	0	Yes	Yes	10	Yes	No	DSL	No
4183-MYFRB	Female	0	No	No	21	Yes	No	Fiber optic	No

Buttons: Load, Transform Data, Cancel

Query: Table.TransformColumnTypes(#Promoted Headers,{"customerID", type text}, {"gender", type text}, {"SeniorCitizen", type text}, {"Partner", type text}, {"Dependents", type text}, {"tenure", type text})

Applied Steps: Source, Promoted Headers, Changed Type

Properties: Name: Telco_Customer_Churn_Dataset (2)

Untitled - Power Query Editor

File Home Transform Add Column View Tools Help

Query Settings

Layout Data Preview Columns Parameters Advanced Dependencies

Queries [1]

Table.RemoveColumns(#"Changed Type",{"customerID"})

20 COLUMNS, 999+ ROWS Column profiling based on top 1000 rows

PREVIEW DOWNLOADED AT 08:04

Table.TransformColumnTypes(#"Promoted Headers",{"customerID", type text}, {"gender", type text})

21 COLUMNS, 999+ ROWS Column profiling based on top 1000 rows

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Page 1 of 1

82%

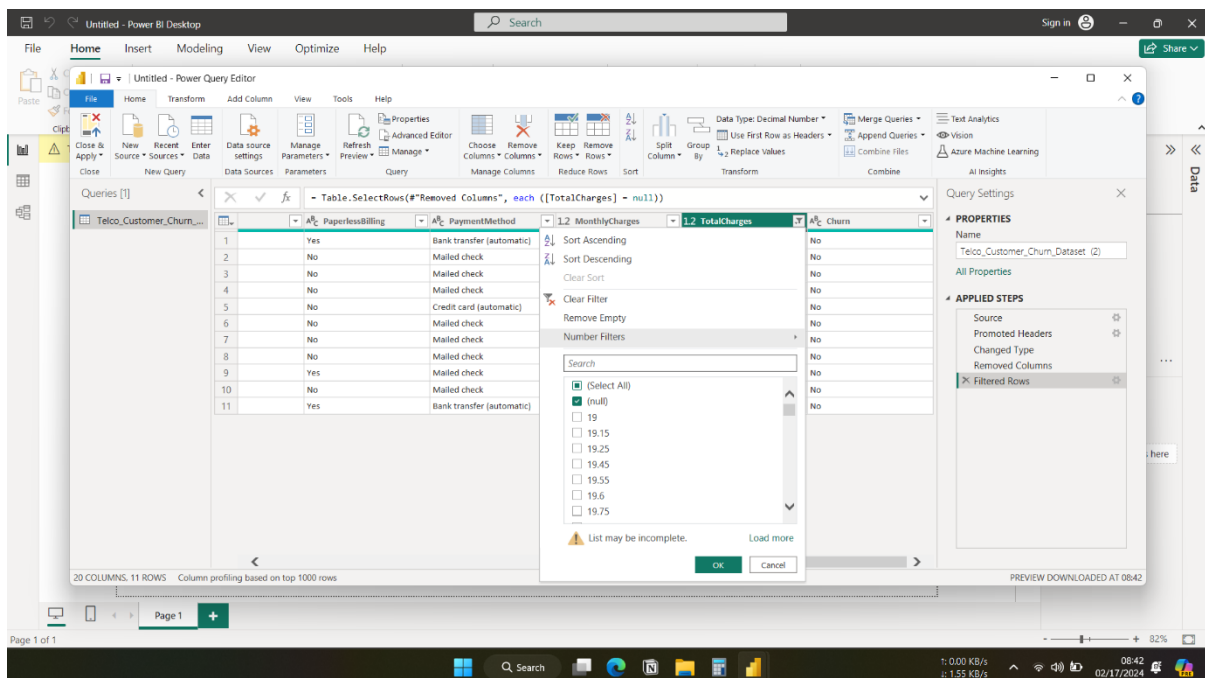
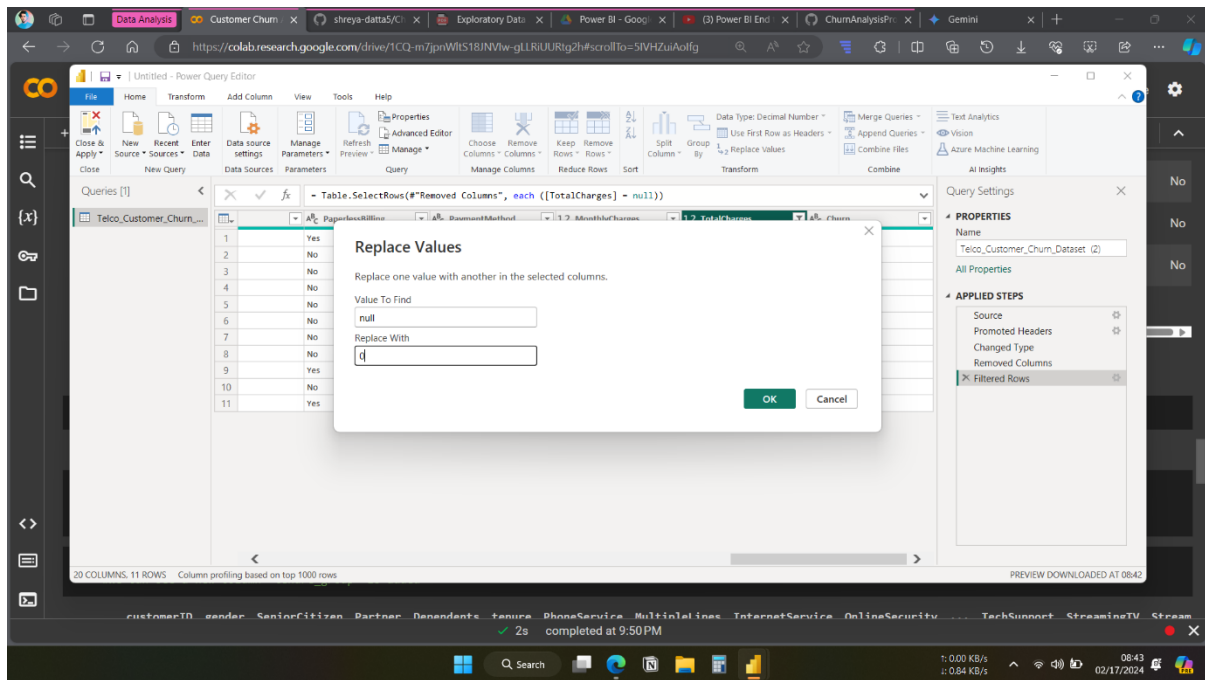
08:25 02/17/2024

Table

	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines
1	Female	0	Yes	No	1	No	No phone ser
2	Male	0	No	No	34	Yes	No
3	Male	0	No	No	2	Yes	No
4	Male	0	No	No	45	No	No phone ser
5	Female	0	No	No	2	Yes	No
6	Female	0	No	No	8	Yes	Yes
7	Male	0	No	Yes	22	Yes	Yes
8	Female	0	No	No	10	No	No phone ser
9	Female	0	Yes	No	28	Yes	Yes
10	Male	0	No	Yes	62	Yes	No
11	Male	0	Yes	Yes	13	Yes	No
12	Male	0	No	No	16	Yes	No
13	Male	0	Yes	No	58	Yes	Yes
14	Male	0	No	No	49	Yes	Yes
15	Male	0	No	No	25	Yes	No
16	Female	0	Yes	Yes	69	Yes	Yes
17	Female	0	No	No	52	Yes	No
18	Male	0	No	Yes	71	Yes	Yes
19	Female	0	Yes	Yes	10	Yes	No
20	Female	0	No	No	21	Yes	No
21	Male	1	No	No	1	No	No phone ser
22	Male	0	Yes	No	12	Yes	No
23	Male	0	No	No	1	Yes	No
24	Female	0	Yes	No	58	Yes	Yes
25	...	...	...	...	...	...	...

Table

	customerID	SeniorCitizen	Partner	Dependents	tenure
1	7590-VHVE	0	Yes	No	
2	5575-GNVD	0	No	No	
3	3668-QPVB	0	No	No	
4	7795-CFOC	0	No	No	
5	9237-HQTL	0	No	No	
6	9905-CDSK	0	No	No	
7	1452-KIOX	0	No	Yes	
8	6713-OKON	0	No	No	
9	7892-PQOK	0	Yes	No	
10	6388-TABG	0	No	Yes	
11	9763-GRSK	0	Yes	Yes	
12	7469-LXBC	0	No	No	
13	8091-TTVA	0	Yes	No	
14	0280-XJGE	0	No	No	
15	5129-JLPS	0	No	No	
16	3635-SNQY	0	Yes	Yes	
17	8191-XWSZ	0	No	No	
18	9959-WOFN	0	No	Yes	
19	4190-MFLU	0	Yes	Yes	
20	...	...	...	...



Power Query Editor interface showing a data table with columns: PaperlessBilling, PaymentMethod, MonthlyCharges, TotalCharges, and Churn. The table contains 11 rows of data. The interface includes a ribbon with various data transformation options and a right-hand pane for query settings.

Query Name: Telco_Customer_Churn...

Formula Bar: `=Table.ReplaceValue(#"Filtered Rows",null,0,Replacer.ReplaceValue,{"TotalCharges"})`

	PaperlessBilling	PaymentMethod	MonthlyCharges	TotalCharges	Churn
1	Yes	Bank transfer (automatic)	52.55	0	No
2	No	Mailed check	20.25	0	No
3	No	Mailed check	80.85	0	No
4	No	Mailed check	25.75	0	No
5	No	Credit card (automatic)	56.05	0	No
6	No	Mailed check	19.85	0	No
7	No	Mailed check	25.35	0	No
8	No	Mailed check	20	0	No
9	Yes	Mailed check	19.7	0	No
10	No	Mailed check	73.35	0	No
11	Yes	Bank transfer (automatic)	61.9	0	No

20 COLUMNS, 11 ROWS Column profiling based on top 1000 rows

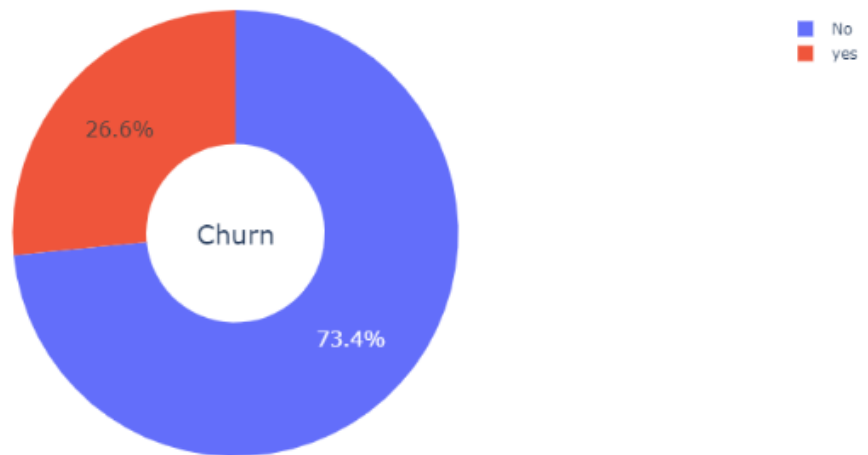
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customerID_gender_SeniorCitizen_Partner_Dependents_tenure_PhoneService_MultilineInternetService_OnlineSecurity_TechSupport_StreamlineTV_Stream... completed at 9:50 PM

Exploratory Data Analysis:

1. Churn distribution

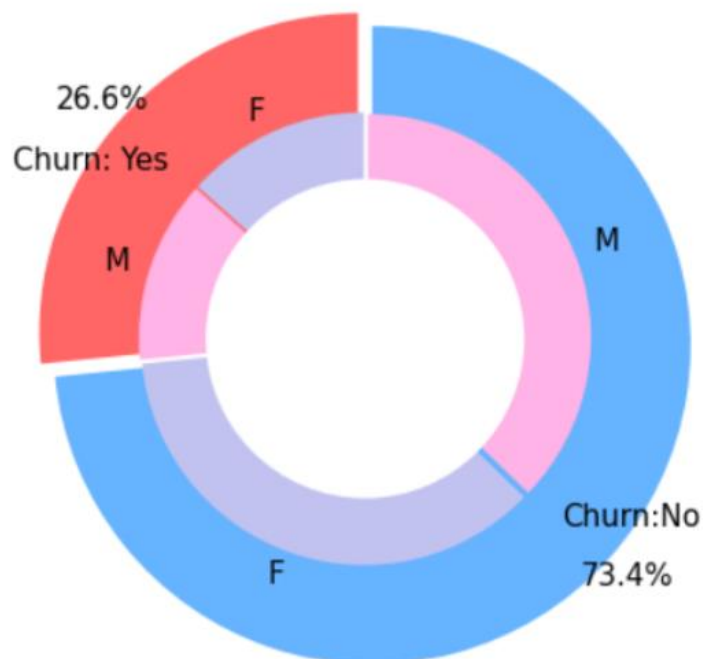
Churn Distributions



26.6 % of customer switched to another firm.

2. churn distribution with respect to gender

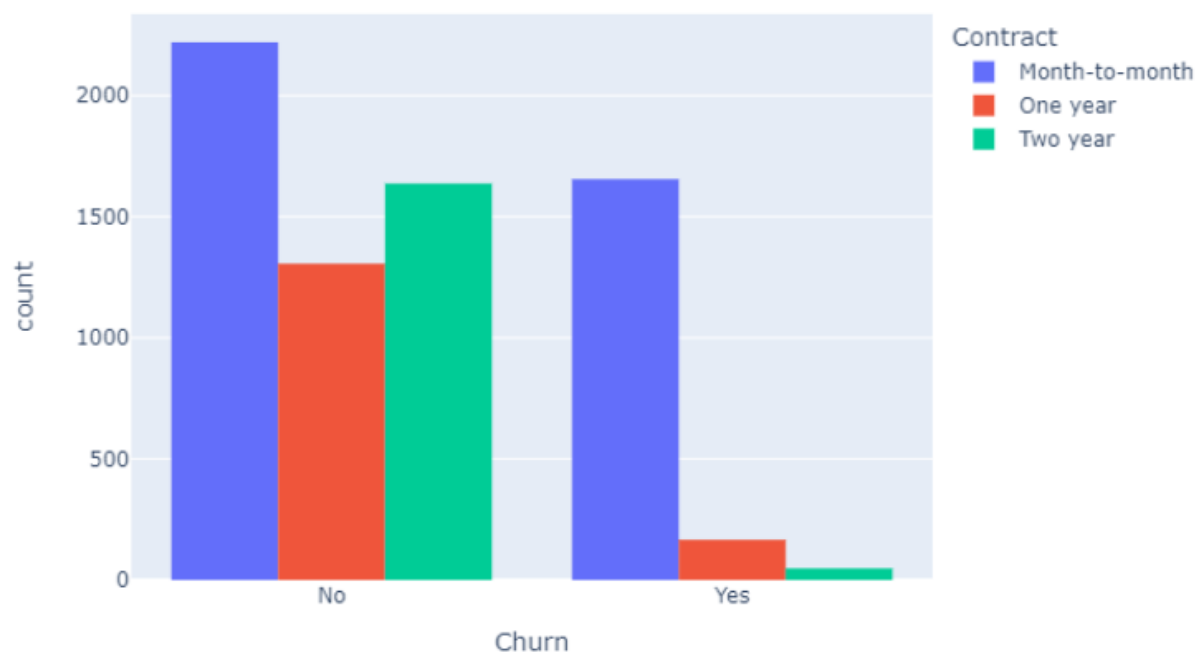
Churn Distribution w.r.t Gender: Male(M), Female(F)



There is negligible difference in customer percentage/count who changed the service provider. Both genders behaved in similar fashion when it comes to migrating to another service provider/firm.

3. Customer contract distribution:

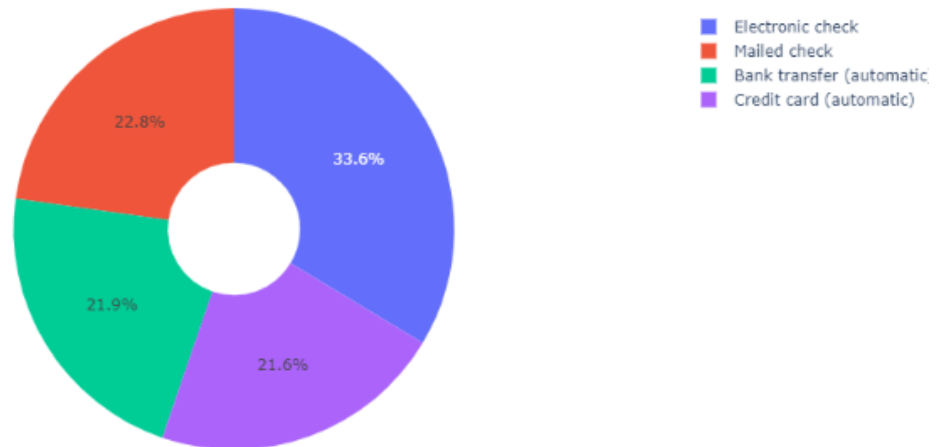
Customer contract distribution



About 75% of customer with Month-to-Month Contract opted to move out as compared to 13% of customers with One Year Contract and 3% with Two Year Contract

4. Payment methods:

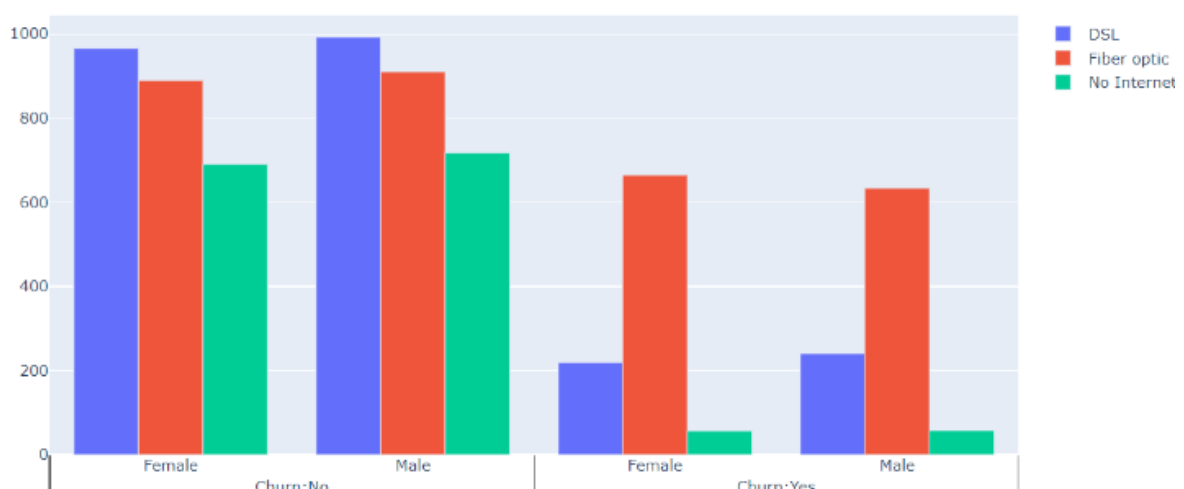
Payment Method Distribution



Major customers who moved out were having Electronic Check as Payment Method. Customers who opted for Credit-Card automatic transfer or Bank Automatic Transfer and Mailed Check as Payment Method were less likely to move out.

5. Internet services:

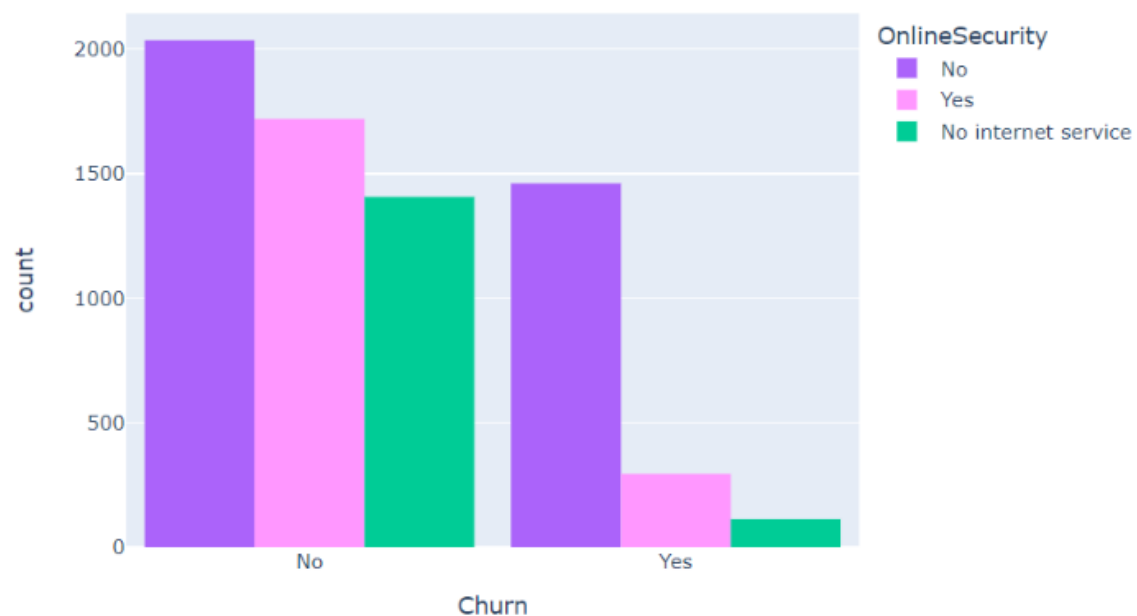
Churn Distribution w.r.t. Internet Service and Gender



Several customers choose the Fiber optic service and it's also evident that the customers who use Fiber optic have high churn rate, this might suggest a dissatisfaction with this type of internet service. Customers having DSL service are majority in number and have less churn rate compared to Fibre optic service.

6. Online Security:

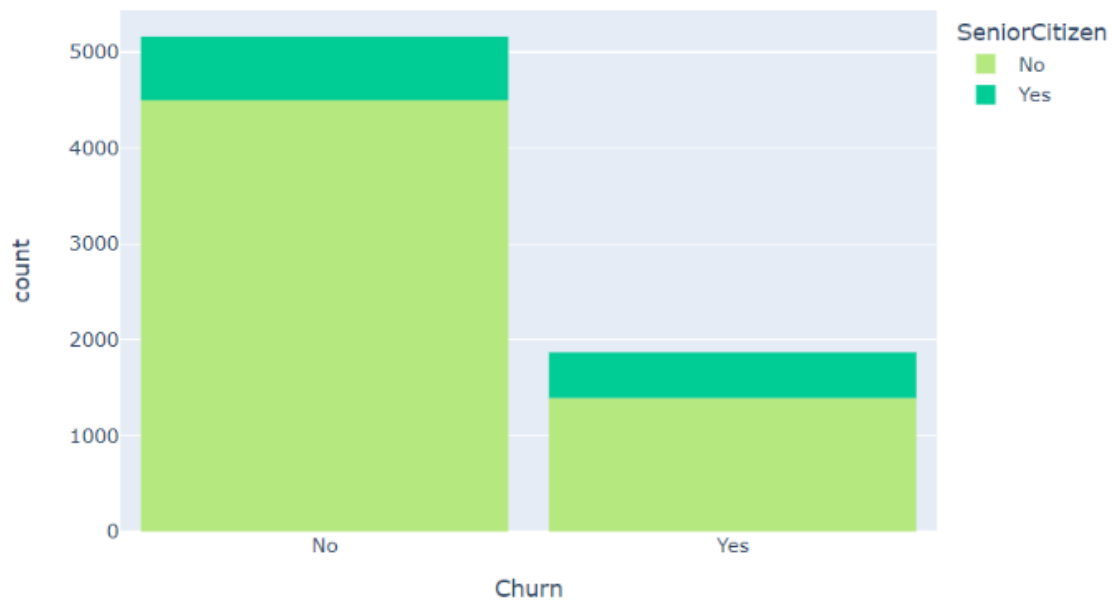
Churn w.r.t Online Security



Majority of churners don't have online security.

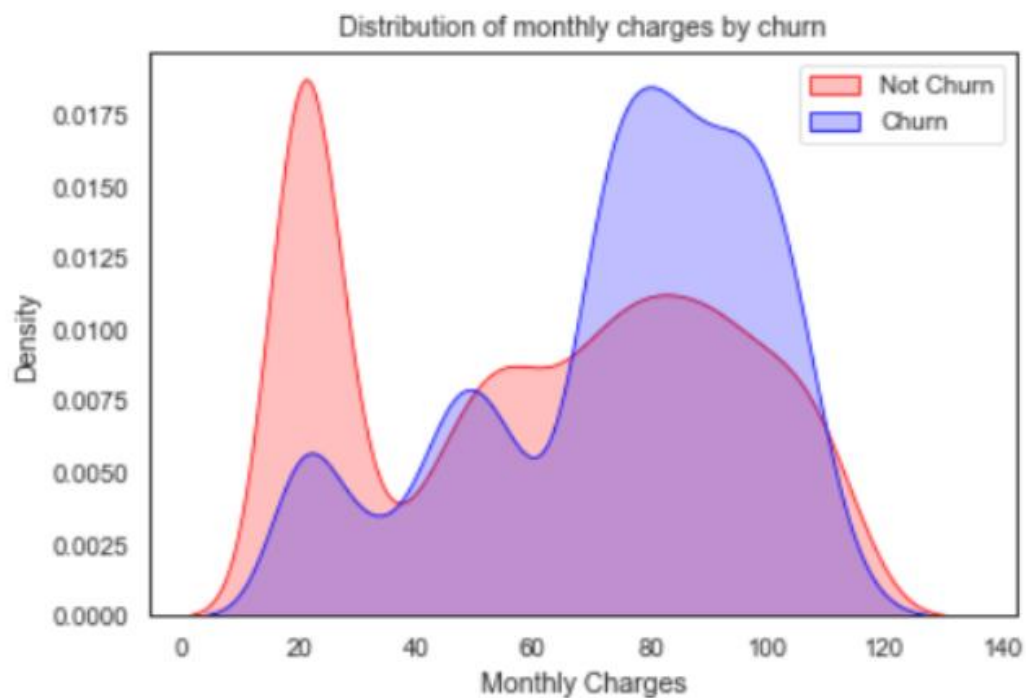
7. Senior Citizen:

Churn distribution w.r.t. Senior Citizen

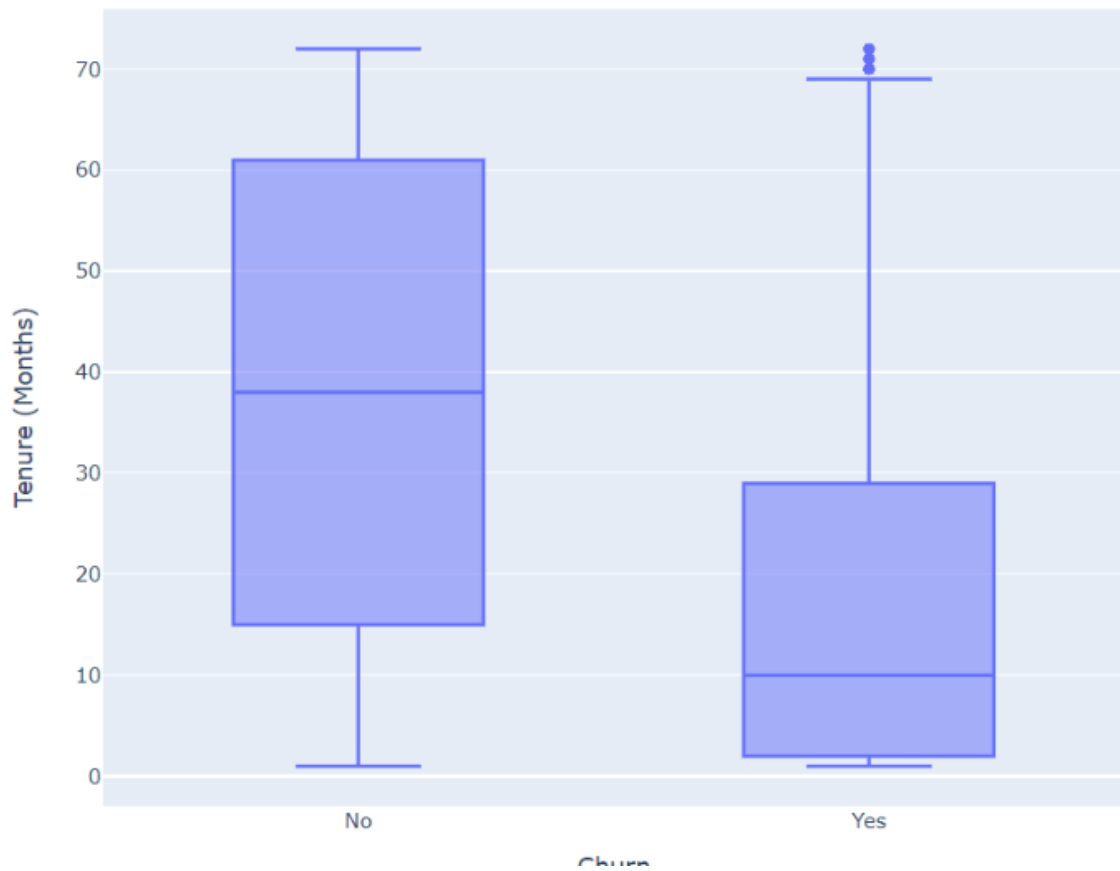


Most of the senior citizens churn; the number of senior citizens are very less in over all customer base.

8. Distribution with Charges and tenure:



Tenure vs Churn



Customers with higher Monthly Charges are also more likely to churn.

New customers are more likely to churn.