Telecom Customer Churn Prediction

Fayzulla Abdurakhimov

Maneesh Mashetty

Prithivanandh Chinnaswamy

Siddharth kumar

About dataset

- **The Customer Churn** table contains information on all 7,043 customers from a Telecommunications company in California in Q2 2022

- **Data Source :** Kaggle

- **Number of Rows :** 7,043

- **Number of Columns :** 38

- **Missing columns:** Multiple lines, Internet type, Online security, Online backup, etc. (can be found in appendix)

- **Highest % of missing cells :** Internet type, etc. - 22%

| Columns name	Number of missing values	Percentage of missing values
Avg Monthly Long-Distance Charges	682	10%
Multiple Lines	682	10%
Internet Type	1526	22%
Avg Monthly GB Download	1526	22%
.....	.....	.....

How do we handle missing values?

- **Categorical fields:** As all fields were related to internet service (Yes, No) we changed all missing values to "No" variables

- **Numerical fields:** As all numerical fields were related to internet service (Yes, No) all missing values were changed to 0

Approximately $3.7M will be lost because of churned customers
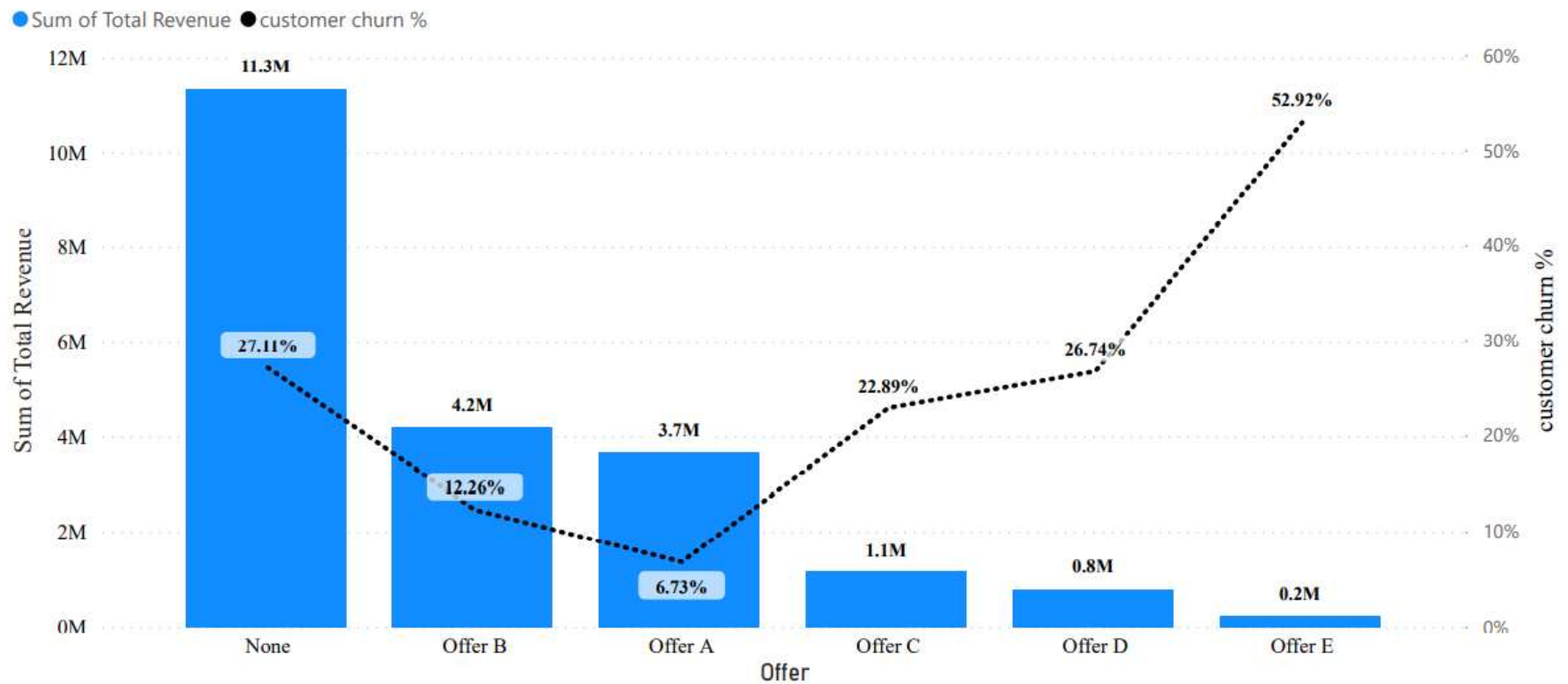
Sum of Total Revenue by Customer Status
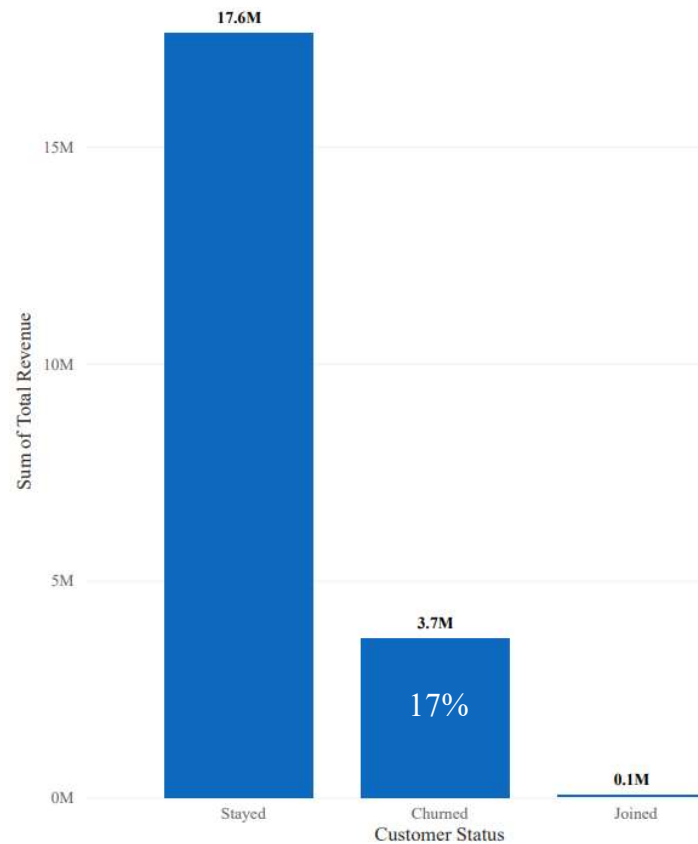
Count of Customers by Customer Status

454 (6.45%)

1869 (26.54%)

Customer Status
- Stayed
- Churned
- Joined

4720 (67.02%)
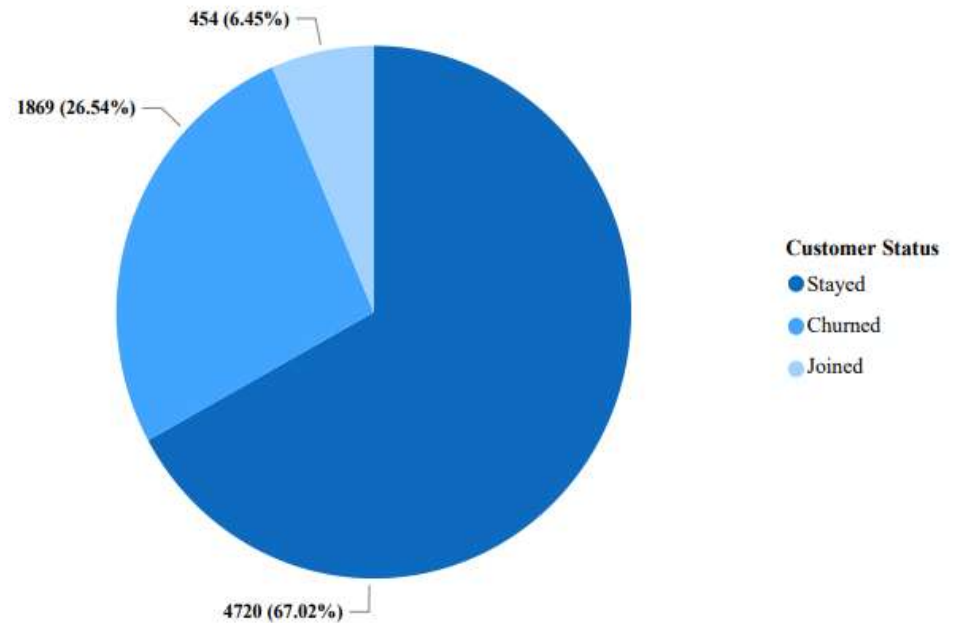
27% of our customers churned while only **7%** new customers joined

Almost 52% of customers who get Offer E churned

Sum of Total Revenue and customer churn % by Offer

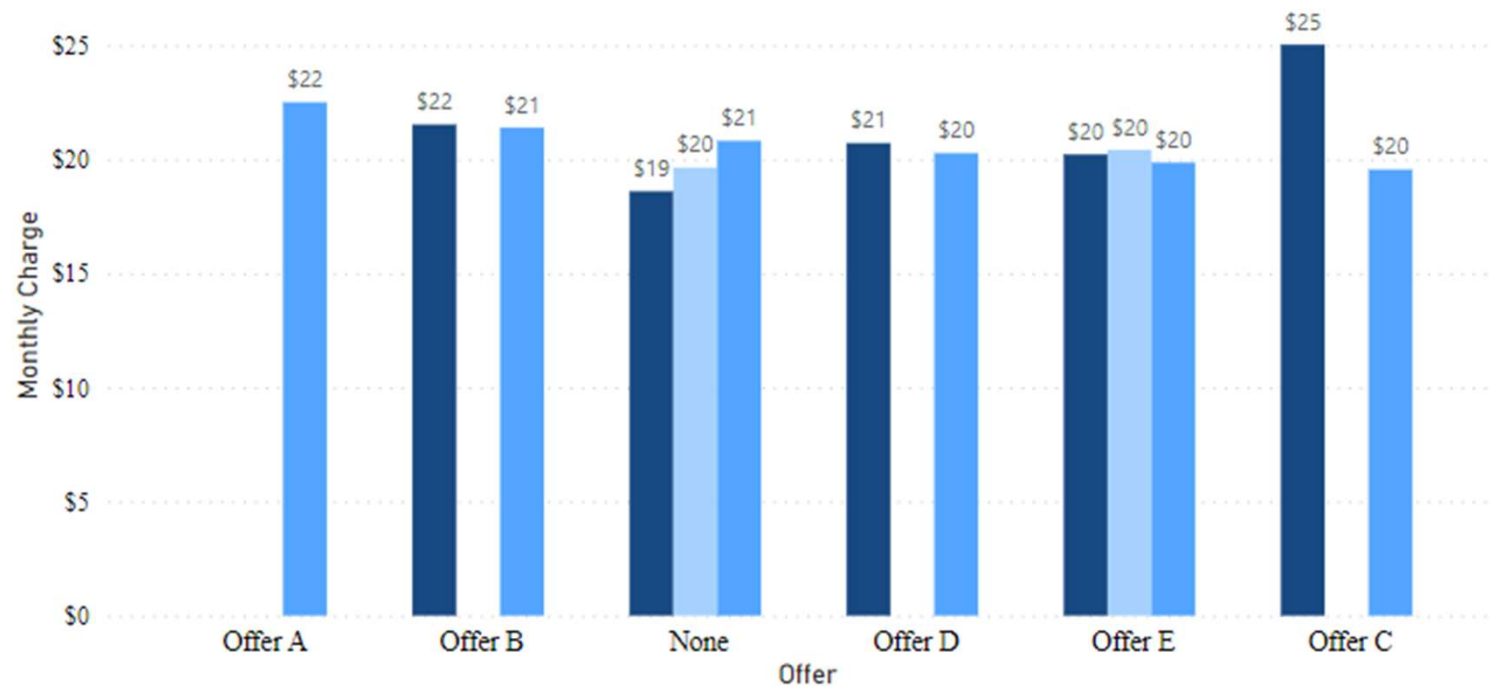● Sum of Total Revenue ● customer churn %

Customers who choose offer E have the lowest monthly charges, therefore it's not about money but the quality of the offer
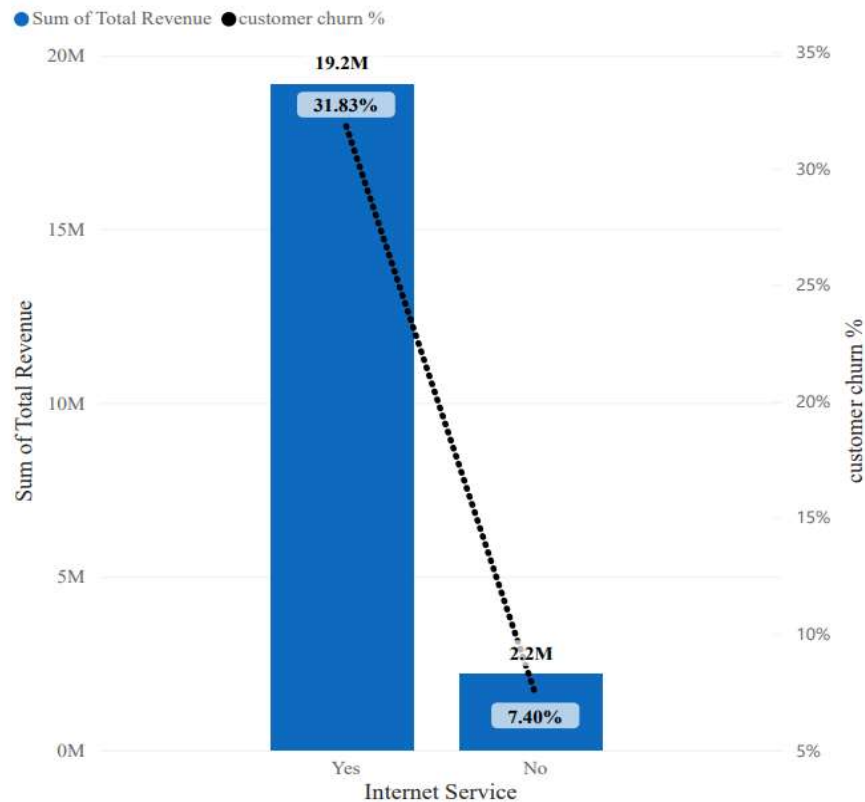

Monthly Charge by Offer and Customer Status
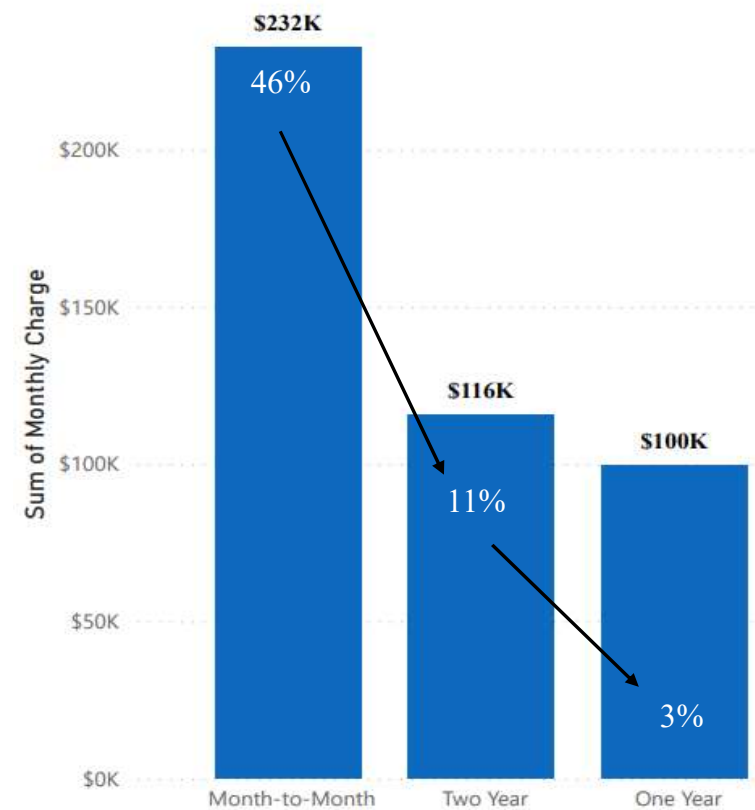
Customer Status ● Churned ● Joined ● Stayed

Internet services are generating $19M and 46% of customers with month-to-months contracts churned

Revenue & Customer Churn by Internet Service

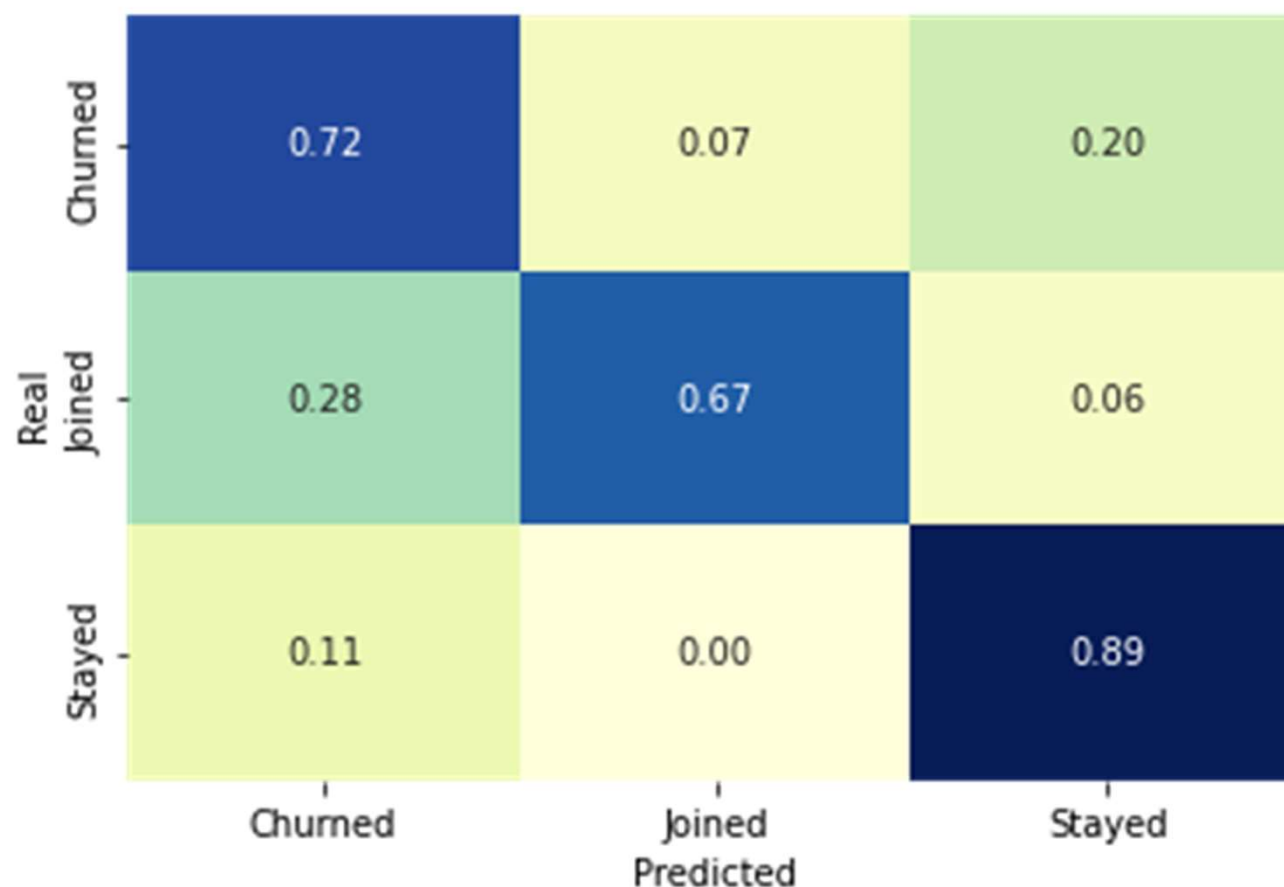● Sum of Total Revenue ● customer churn %

Sum of Monthly Charge by Contract

Logistics regression model predicts that 28% of recently joined people will churn if the necessary steps will not be taken

How do we decrease churn rate and make people use our services?

The odds-ratios from the model suggest that a monthly charges drive people away

- **Dependent variable:**

  Did customers churn in Q2 of 2022?

- **Independent variable:**

  All other variables

No. Observations:	5538	R-squared:	0.365
Model accuracy	0.86	Adj. R-squared:	0.361

Predictor variable	dummy	Odds Ratio	P>|t|	SD	OR/OR^SD	Effect	IMP
Monthly Charge	0	1.36982	0	2.083697	1.926485	Positive	1.926485
Internet Service	1	0.739107	0	4.688318		Negative	1.352985
Contract - Two Year	1	0.793797	0	1.190684		Negative	1.259767
Phone Service	1	0.797926	0	2.232532		Negative	1.253249
Contract One Year	1	0.820979	0	1.041848		Negative	1.218058
Streaming Movies_Yes	1	0.914105426	0	1.786025756		Negative	1.093965719
Premium Tech Support_Yes	1	0.925810746	0	0.967430618		Negative	1.080134363
Offer E	1	1.076695	0	1.265102		Positive	1.076695

Monthly charges should be reduced and offer E should be eliminated from a gift program

Reduce monthly charges

Upgrade or reconsider offer E

Negative and actionable

Provide diverse different types internet services

Negative and actionable

Offer long lasting programs

Problem: Monthly charges are biggest factor influencing our churn.
Solution: Decrease monthly charges and the costs compensate in other programs

Problem: Offer E is making people to churn despite the low monthly charges. **Solution:** Consider giving Offer D to the customers as it most likely to decrease the churn

Situation: These customers are loyal
Solution: Internet services positively impact churn and offering streaming movies and premium tech support will make customers to stay
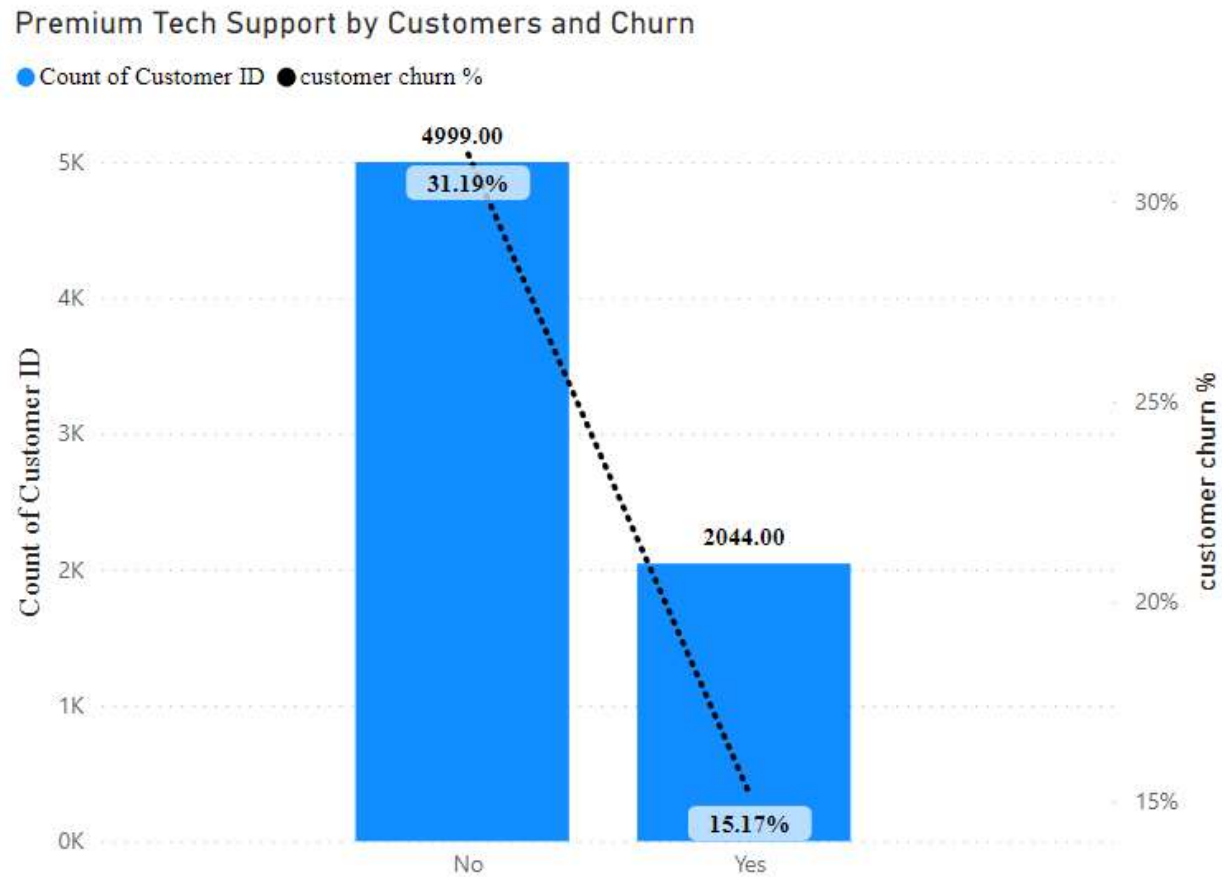
Situation: One-year or two-year contracts make customers to stay
Solution: Offer subscribers with month-to-month contracts one-year contract with reduced monthly charges

Appendix

31% of people who doesn't have premium support

Premium Tech Support by Customers and Churn

● Count of Customer ID ● customer churn %

After thirty months the customer tends to remain loyal to the company
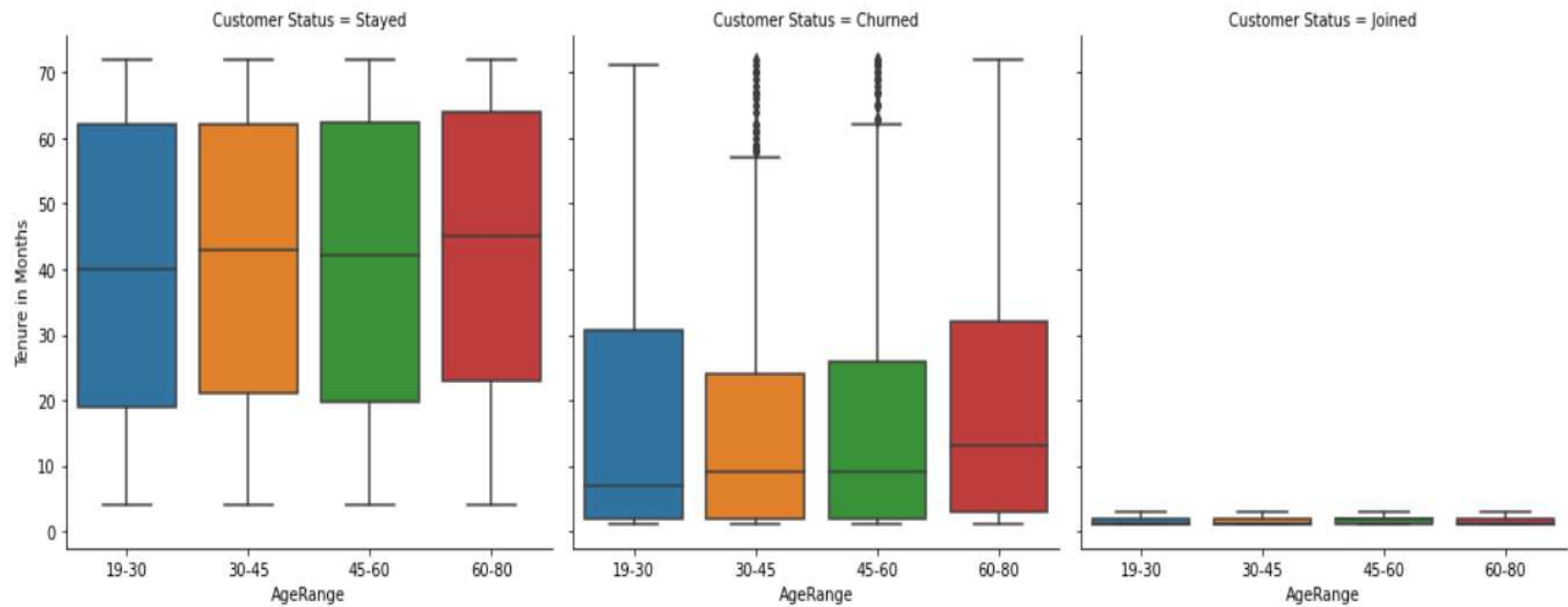
Logistics regression model has 86% accuracy rate

No. Observations:	5538	R-squared:	0.365
Model accuracy	0.86	Adj. R-squared:	0.361

	coef	std err	t	P>|t|
const	0.8401	0.081	10.426	0
Monthly Charge	0.3147	0.028	11.237	0
Married_Yes	0.1446	0.014	10.624	0
Payment Method_Mailed Check	0.0985	0.022	4.518	0
Offer_Offer E	0.0739	0.017	4.282	0
Offer_Offer A	0.0609	0.021	2.851	0.004
Streaming Music_Yes	0.0516	0.021	2.463	0.014
---	---	---	---	---