Customer Churn Analysis

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Introduction:

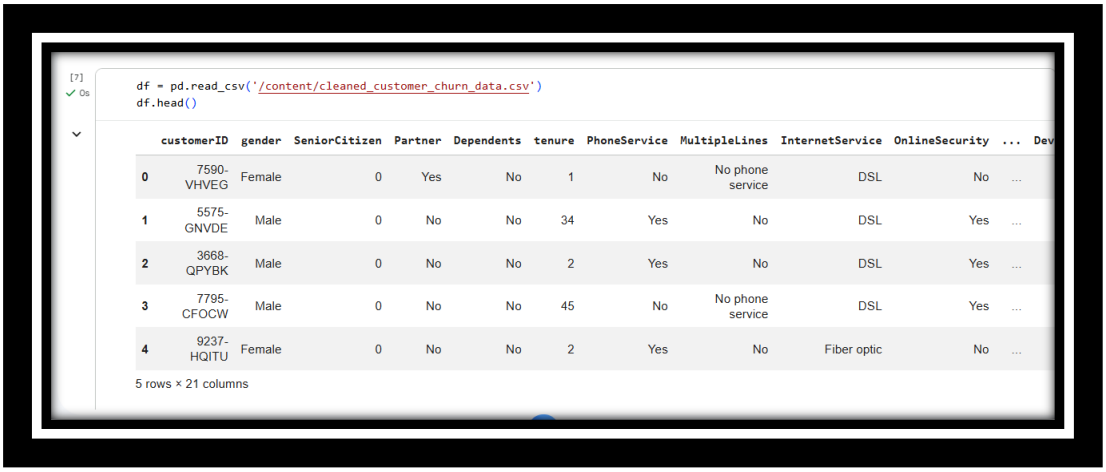
The objective of this project is to analyze customer churn behavior and identify key factors that influence customer retention. Understanding churn helps businesses improve customer experience and reduce revenue loss**.**

Dataset Overview:

The dataset contains customer demographic details, service usage information, contract types, monthly charges, tenure, and churn status. This dataset reflects real-world customer behavior in subscription-based businesses.

Data Preparation:

The dataset used in this analysis was cleaned and prepared in a prior task. All missing values were handled, and data types were standardized before performing visualization and analysis.



```
[7]
✓ 0s
df = pd.read_csv('/content/cleaned_customer_churn_data.csv')
df.head()
```

	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	InternetService	OnlineSecurity	...	Dev
0	7590-VHVEG	Female	0	Yes	No	1	No	No phone service	DSL	No	...	
1	5575-GNVDE	Male	0	No	No	34	Yes	No	DSL	Yes	...	
2	3668-QPYBK	Male	0	No	No	2	Yes	No	DSL	Yes	...	
3	7795-CFOCW	Male	0	No	No	45	No	No phone service	DSL	Yes	...	
4	9237-HQITU	Female	0	No	No	2	Yes	No	Fiber optic	No	...	

5 rows × 21 columns

	0
customerID	0
gender	0
SeniorCitizen	0
Partner	0
Dependents	0
tenure	0
PhoneService	0
MultipleLines	0
InternetService	0
OnlineSecurity	0
OnlineBackup	0
DeviceProtection	0

Visualization & Key Insights:

Several visualizations were created to analyze churn patterns:

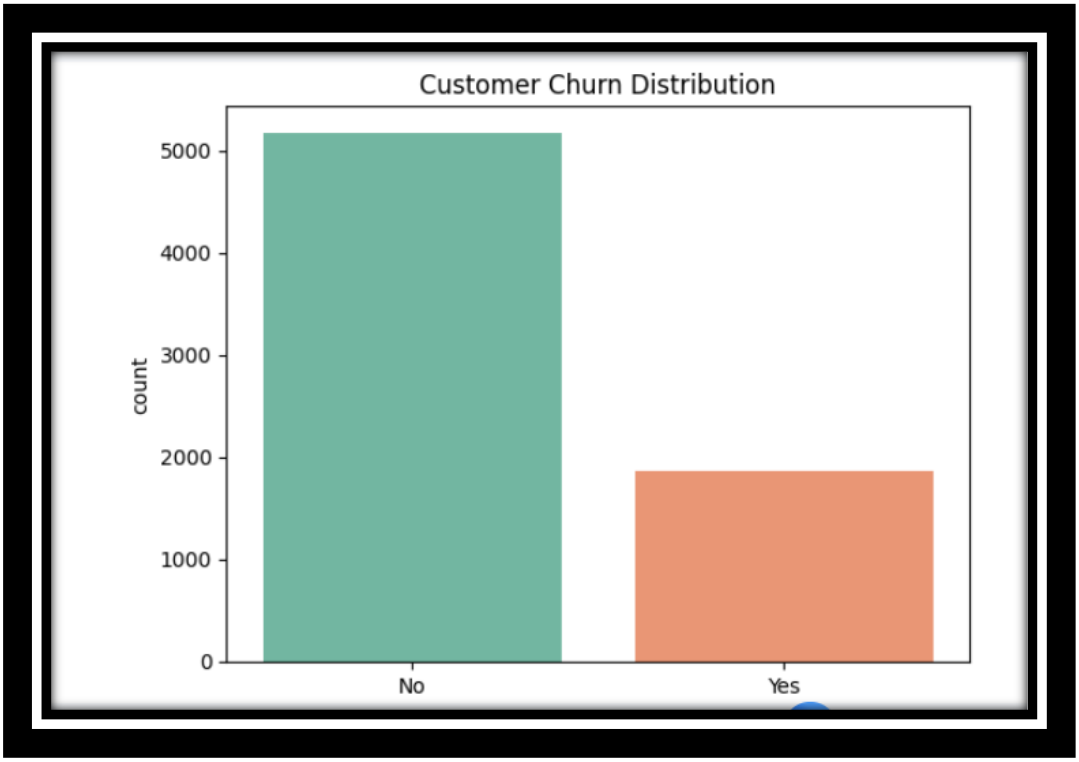
Churn distribution among customers

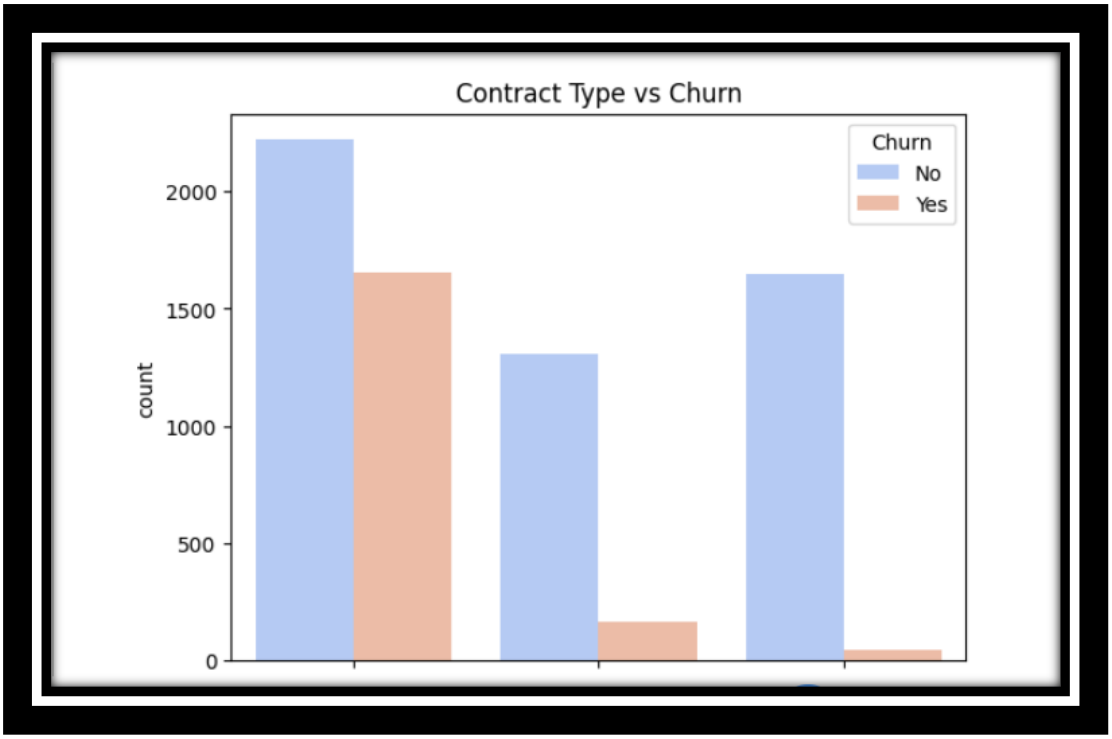
Relationship between contract type and churn

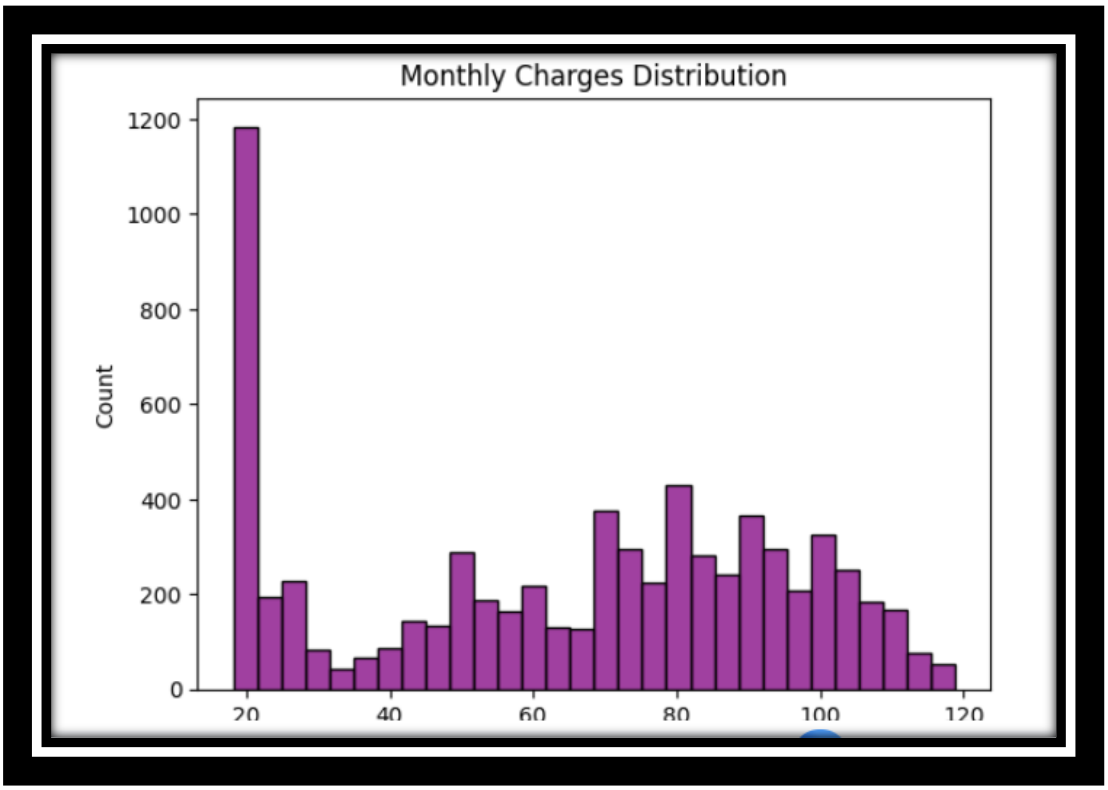
Impact of tenure on churn behavior

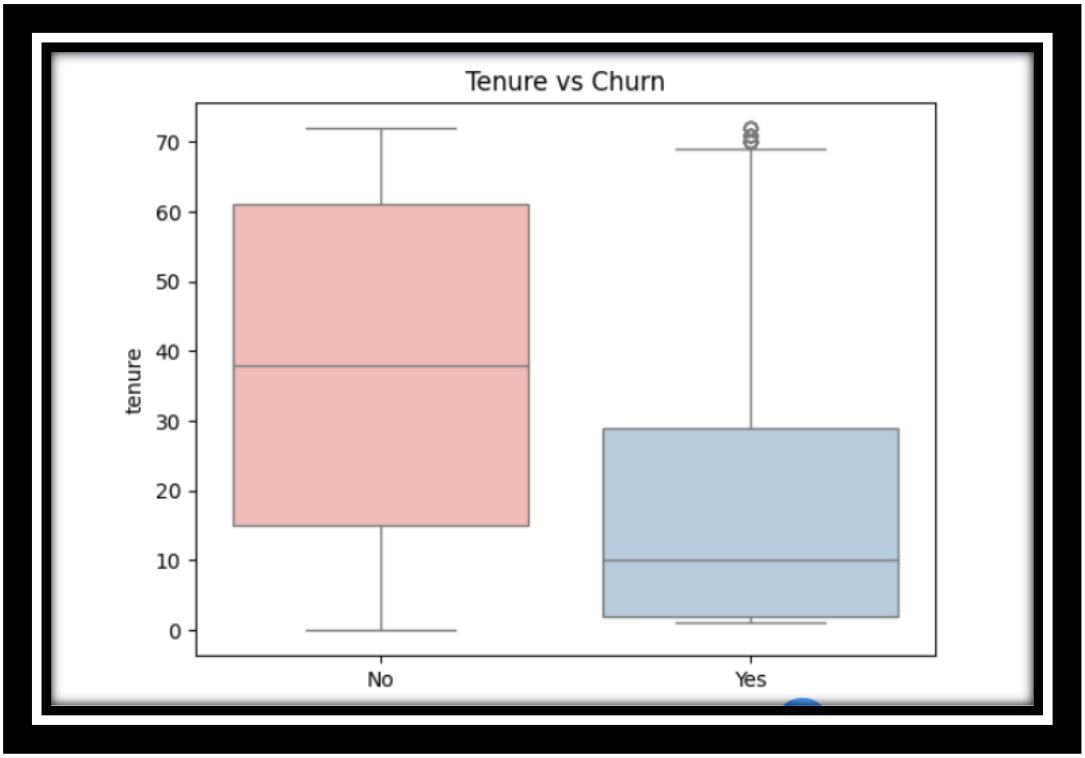
Correlation between numeric features

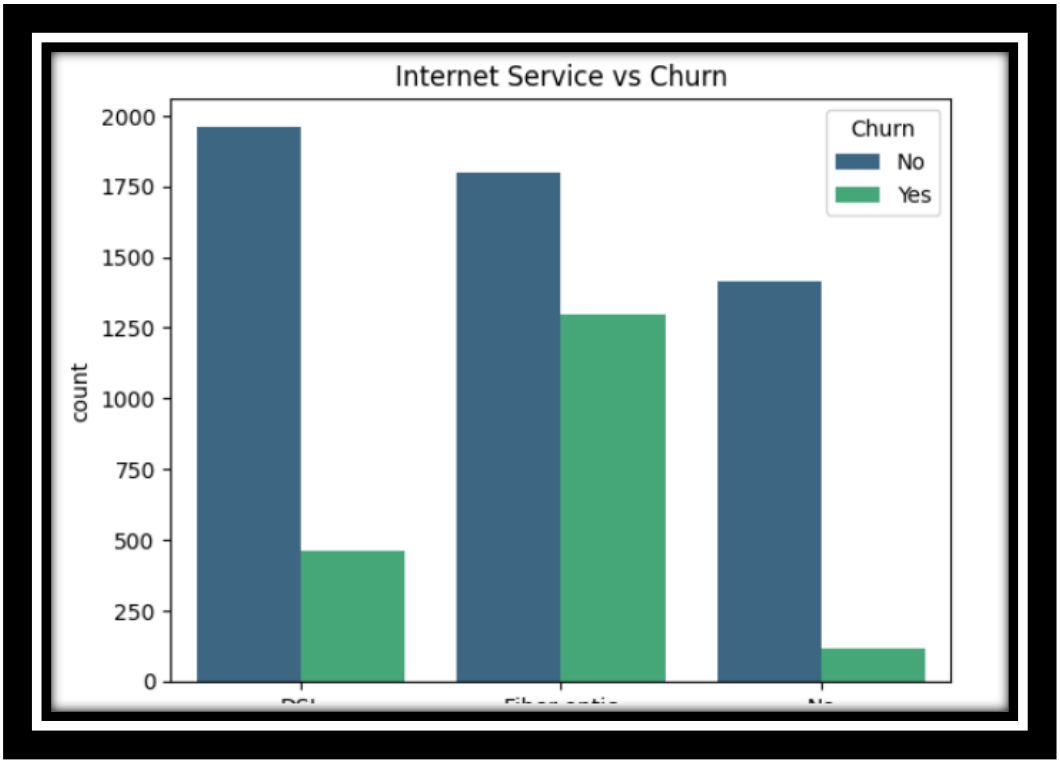
These insights help identify high-risk customer segments.

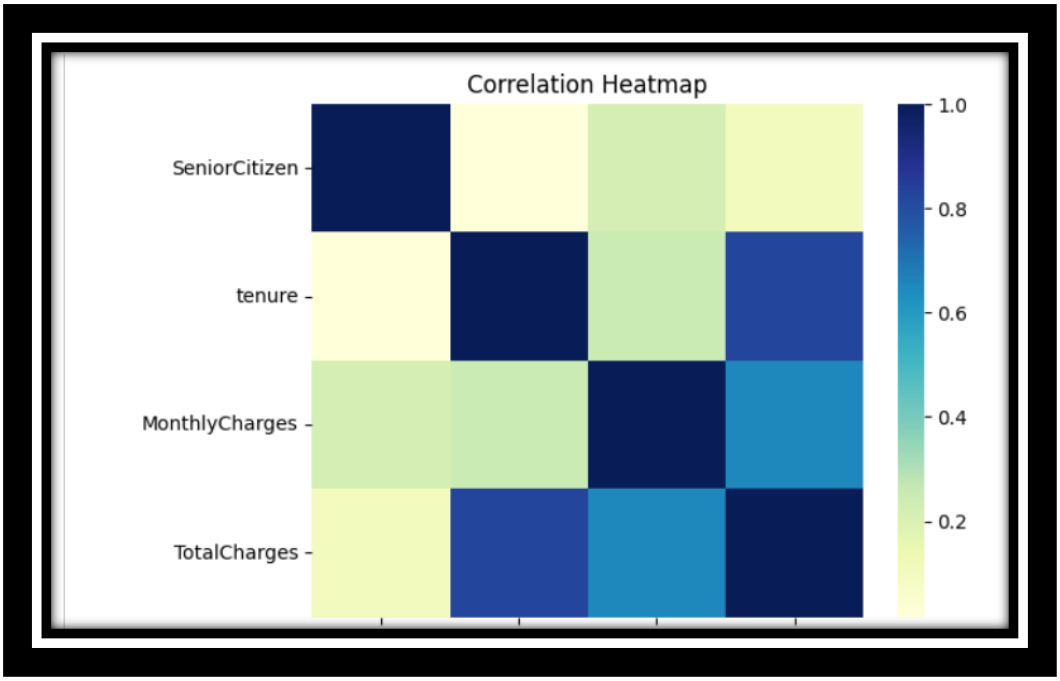



Contract Type vs Churn
Churn
No
Yes
count
2000
1500
1000
500
0


Monthly Charges Distribution
Count
1200
1000
800
600
400
200
0
20
40
60
80
100
120


Tenure vs Churn
tenure
70
60
50
40
30
20
10
0
No
Yes


Internet Service vs Churn
count
2000
1750
1500
1250
1000
750
500
250
0
Churn
No
Yes



Chatbot Implementation:

A simple rule-based chatbot was developed to allow users to ask basic questions related to customer churn, such as churn rate, contract-wise churn, and average charges. The chatbot interacts with the user until they choose to exit.

```
Ask churn question (type 'bye' to exit): How many customers churned
Customers Churned: 1869
Ask churn question (type 'bye' to exit): How many customers did not churn?
Customers Retained: 5174
Ask churn question (type 'bye' to exit): What is the churn rate?
Churn
No     73.463013
Yes    26.536987
Name: proportion, dtype: float64
Ask churn question (type 'bye' to exit): Churn by contract?
Contract        Churn
Month-to-month  No       2220
                Yes      1655
One year        No       1307
                Yes       166
Two year        No       1647
                Yes         48
Name: count, dtype: int64
Ask churn question (type 'bye' to exit): bye
Chatbot closed.
```

Conclusion:

The analysis shows that customers with short-term contracts and higher monthly charges are more likely to churn. These insights can help organizations design effective retention strategies.