

Assignment 3 – Data Visualization

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Course: Applied Data Science with AI

Week #: 3

Project Title: Customer Churn Prediction

1. Reading Summary

Reading Material:

- Storytelling with Data resources
- Matplotlib and Seaborn tutorials

Key Learnings:

- Different plots (bar, histogram, boxplot, heatmap) explain customer behavior.

Reflection:

I learned how to use visualizations to detect trends in churn, such as the effect of contract type and monthly charges.

2. Classroom Task Documentation

Task Performed:

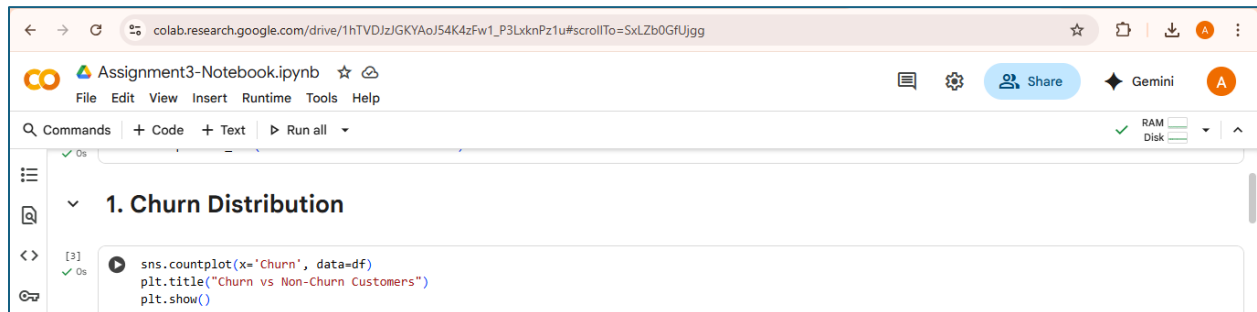
- Created bar charts, histograms, boxplots, and heatmaps using sample datasets in class.

3. Weekly Assignment Submission

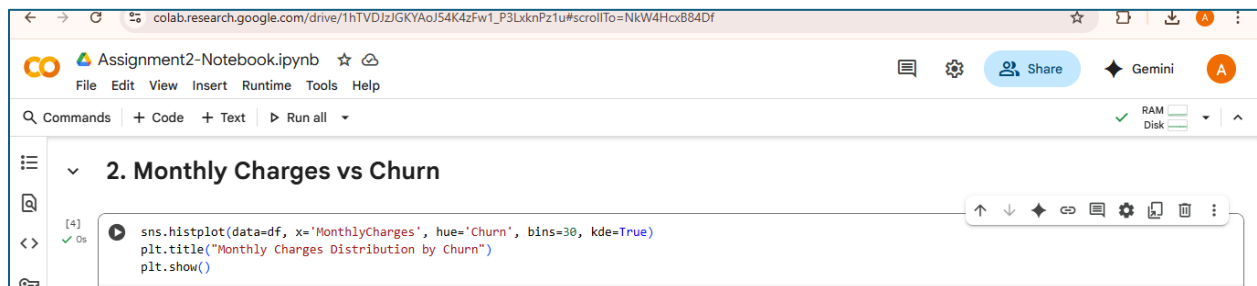
Assignment Title: Data Visualization and Exploratory Data Analysis

Steps Taken:

1. Loaded cleaned Telco Churn dataset.



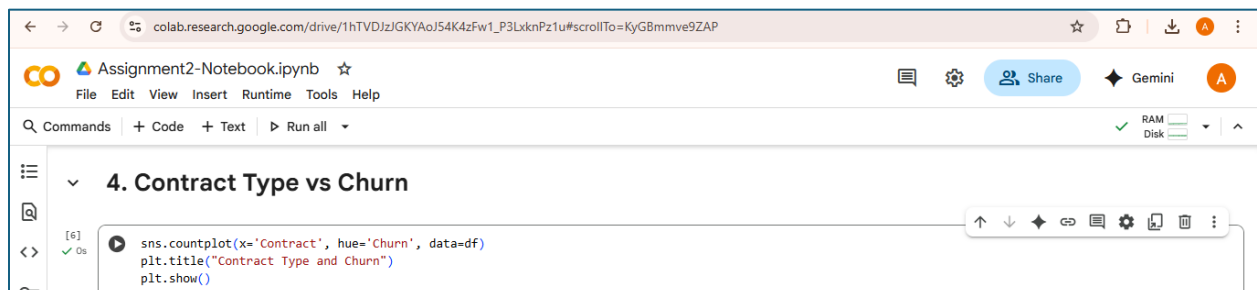
```
[3] In [3]: sns.countplot(x='Churn', data=df)
plt.title("Churn vs Non-Churn Customers")
plt.show()
```



```
[4] In [4]: sns.histplot(data=df, x='MonthlyCharges', hue='Churn', bins=30, kde=True)
plt.title("Monthly Charges Distribution by Churn")
plt.show()
```



```
[5] In [5]: sns.boxplot(x='Churn', y='tenure', data=df)
plt.title("Tenure vs Churn")
plt.show()
```



```
[6] In [6]: sns.countplot(x='Contract', hue='Churn', data=df)
plt.title("Contract Type and Churn")
plt.show()
```

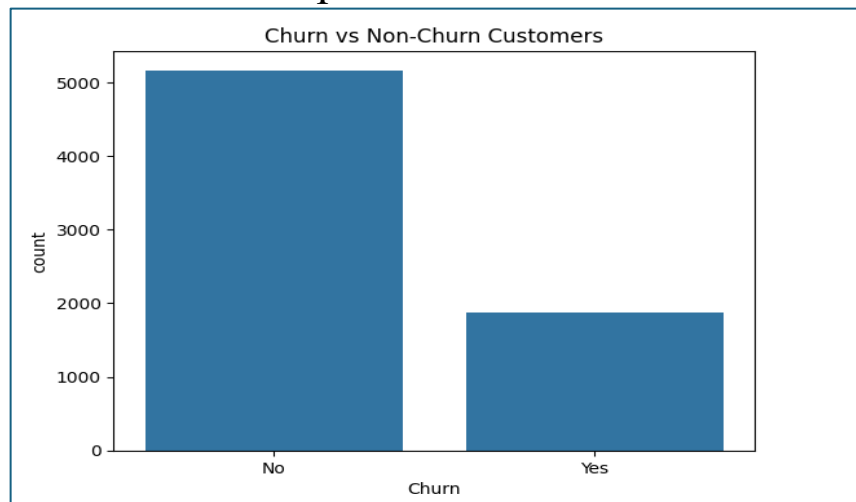
```
Assignment2-Notebook.ipynb ☆ Saving...
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[9] ✓ 0s
plt.figure(figsize=(10,8))

# select only numeric columns
numeric_df = df.select_dtypes(include=['int64','float64'])

sns.heatmap(numeric_df.corr(), annot=True, cmap="coolwarm", fmt=".2f")
plt.title("Correlation Heatmap (Numeric Features)")
plt.show()
```

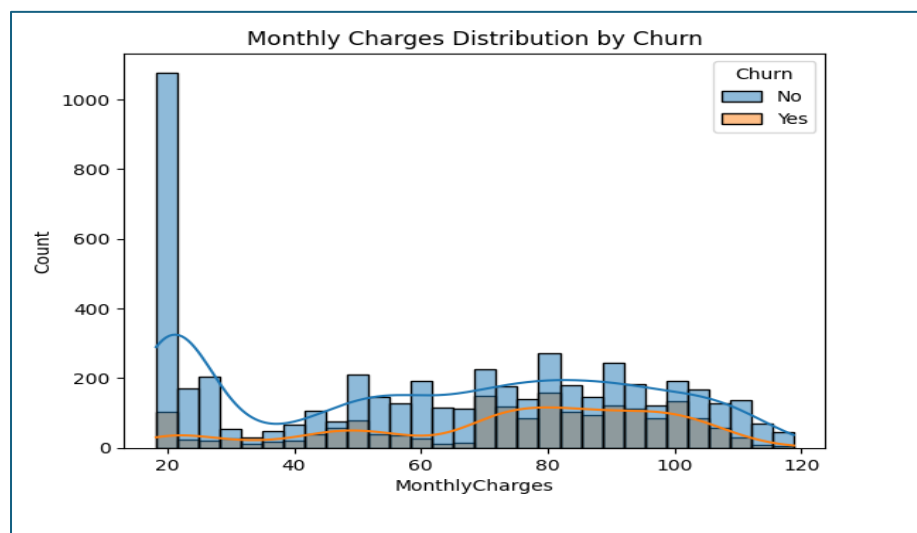
2. Plotted churn distribution, monthly charges, tenure, contract type, and correlation heatmap.

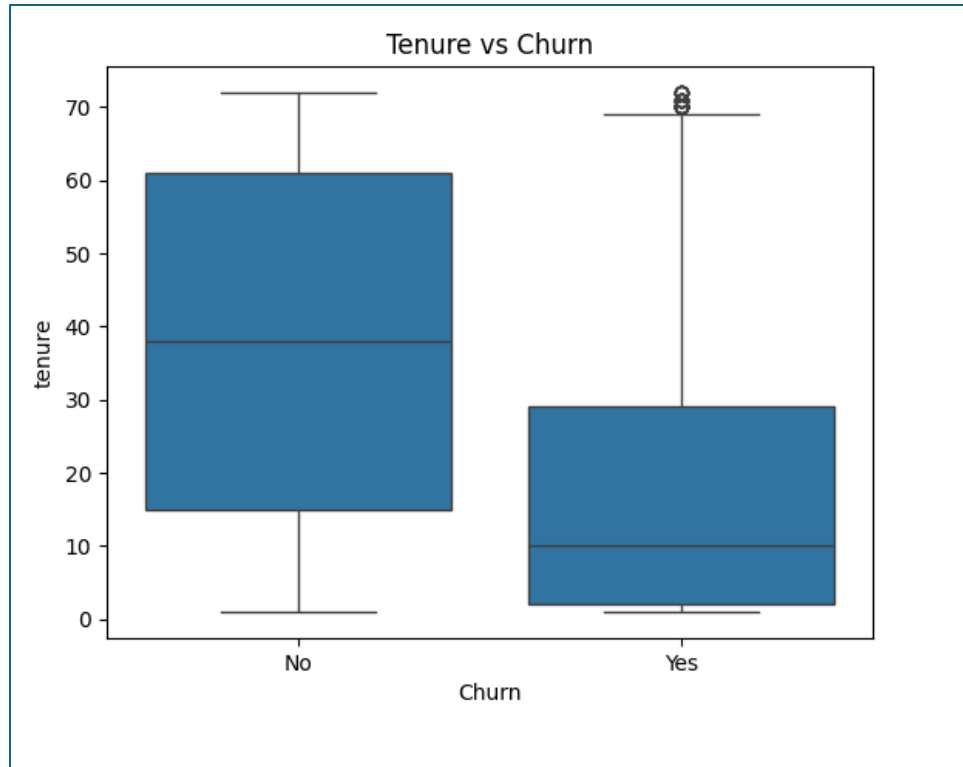


Insight: More customers stayed than left, but churn is still significant.

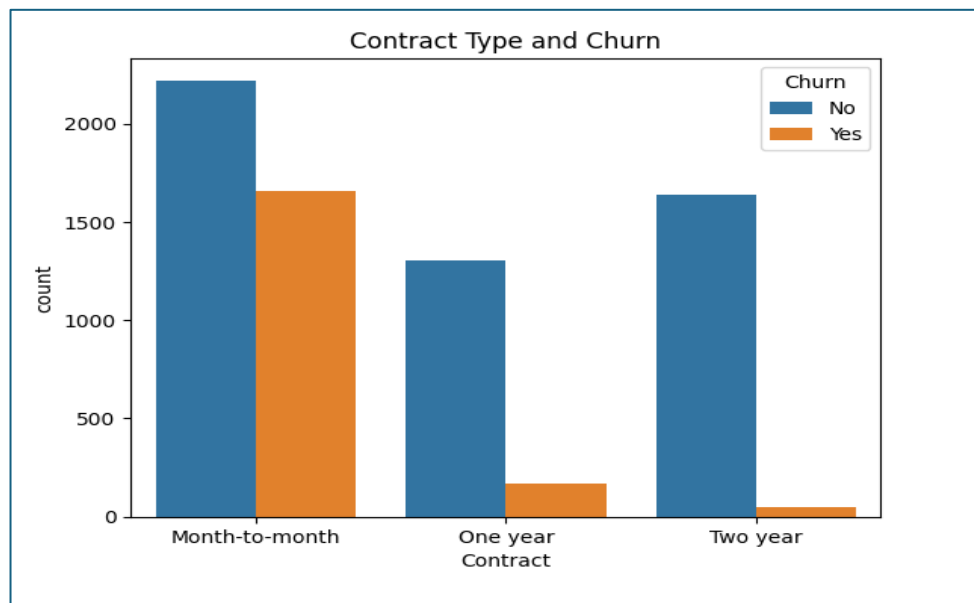
Insight:

Customers with higher monthly charges are more likely to churn.

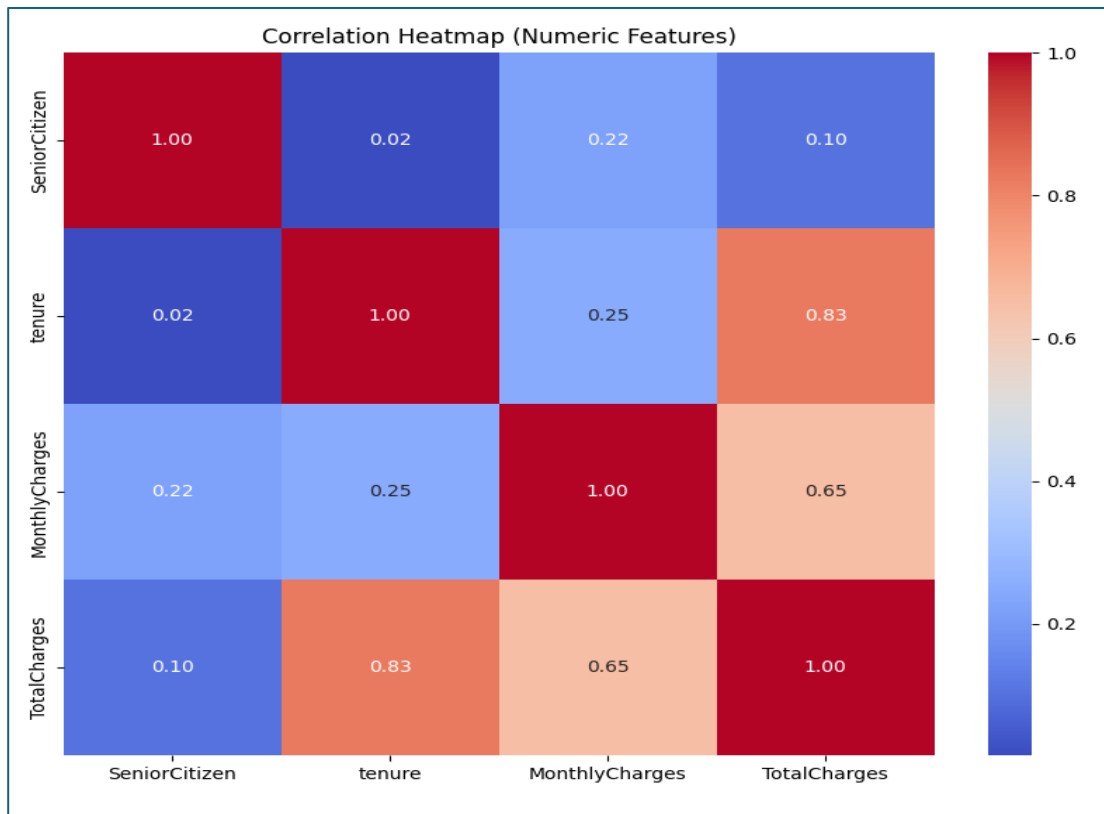




Insight: Customers with short tenure (new customers) tend to churn more than long-term customers.



Insight: Month-to-month contract customers churn much more compared to one-year or two-year contracts.



Insights: Churn has a negative correlation with Tenure ,customers with shorter tenure are more likely to churn.

3. Wrote short insights under each plot.

Output:

- Visual patterns showed churn is higher in short-tenure, month-to-month, and high-charge customers.

Challenges Faced:

- Some variables had long labels, adjusted using `plt.xticks(rotation=45)`.

GitHub Link:

<https://github.com/amannadeem126/Customer-Churn-Prediction>

4. Project Progress Milestone

- Completed first Exploratory Data Analysis (EDA).
- Next week's goal: Perform correlation analysis to identify key features related to churn.

5. Self-Evaluation

☒ I completed all tasks on time.