Data Science Internship – FutureXcel:

Airline Passenger SatisfactionAnalysis

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Objective:

The objective of this project is to analyze airline passenger satisfaction using real-world data. The focus is to understand how different factors such as travel class, customer type, and service quality influence overall passenger satisfaction.

Data Preparation:

The dataset used in this analysis was cleaned and preprocessed in a prior task. Missing values were handled, data types were standardized, and the dataset was prepared in an analysis-ready format before performing visualization and analysis.

```
df = pd.read_csv('/content/cleaned_airline_satisfaction (1).csv')
df.head()
```

	Unnamed: 0	id	Gender	Customer Type	Age	Type of Travel	Class	Flight Distance	Inflight wifi service	Departure/Arrival time convenient	...	Inflight entertainment	On-board service	Leg room service	Baggage handling	Chec serv
0	0	70172	Male	Loyal Customer	13	Personal Travel	Eco Plus	460	3	4	...	5	4	3	4	
1	1	5047	Male	disloyal Customer	25	Business travel	Business	235	3	2	...	1	1	5	3	
2	2	110028	Female	Loyal Customer	26	Business travel	Business	1142	2	2	...	5	4	3	4	
3	3	24026	Female	Loyal Customer	25	Business travel	Business	562	2	5	...	2	2	5	3	
4	4	119299	Male	Loyal Customer	61	Business travel	Business	214	3	3	...	3	3	4	4	

5 rows × 25 columns

id	0
Gender	0
Customer Type	0
Age	0
Type of Travel	0
Class	0
Flight Distance	0
Inflight wifi service	0
Departure/Arrival time convenient	0
Ease of Online booking	0
Gate location	0
Food and drink	0
Online boarding	0
Seat comfort	0
Inflight entertainment	0

Visualization & Key Insights:

Several visualizations were created to answer important business questions:

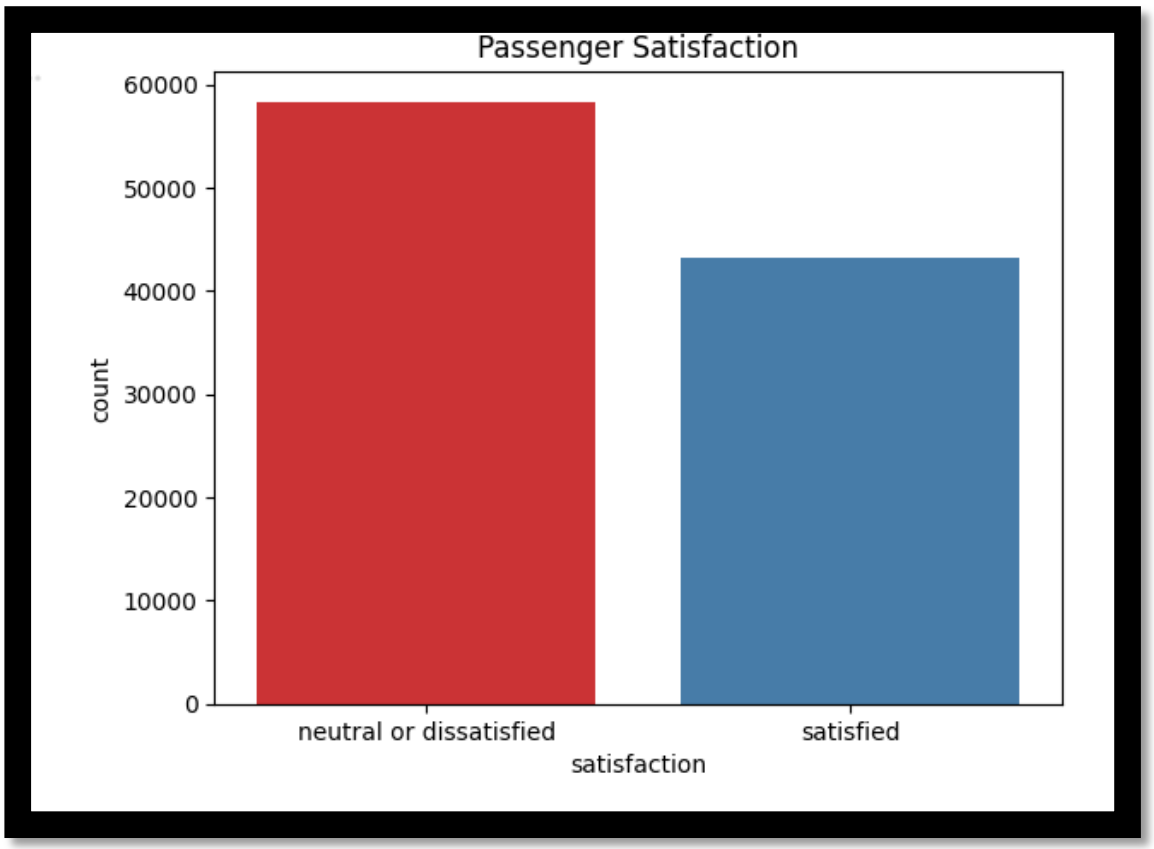
Passenger satisfaction distribution across different categories

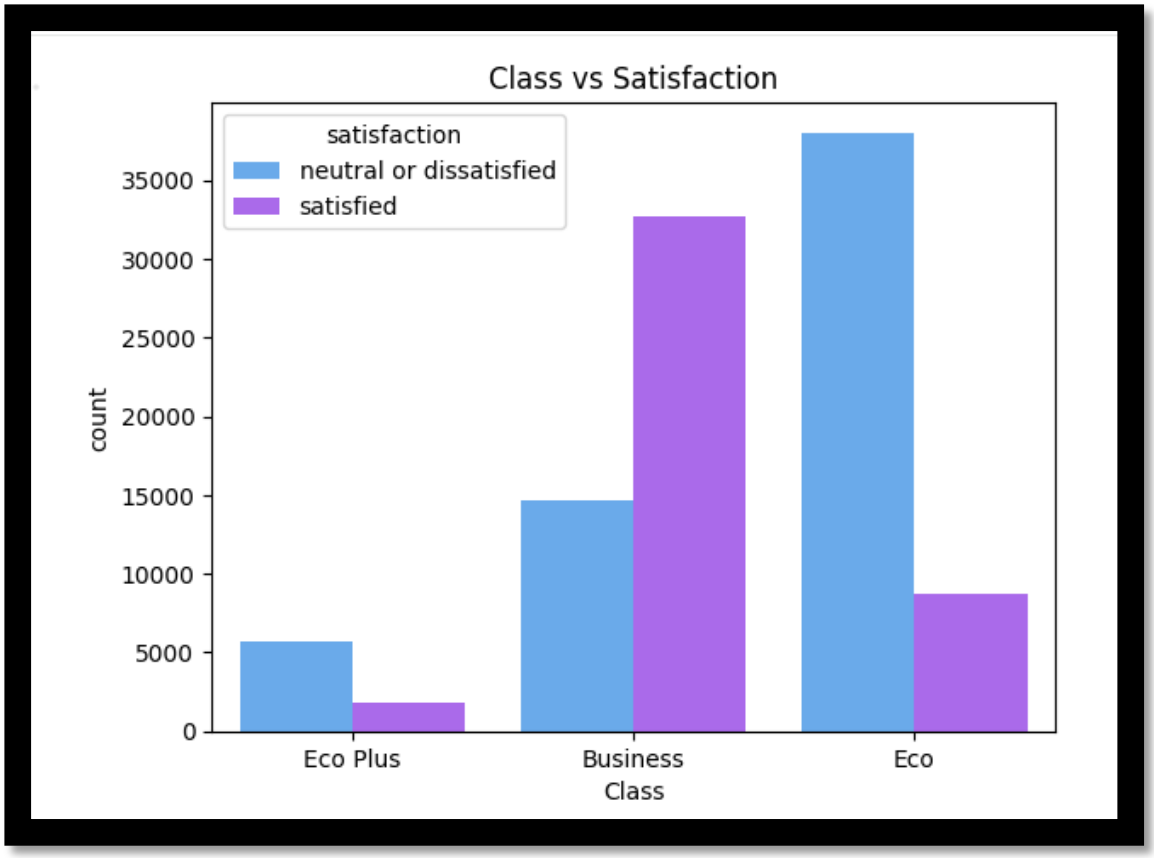
Comparison of satisfaction levels by travel class

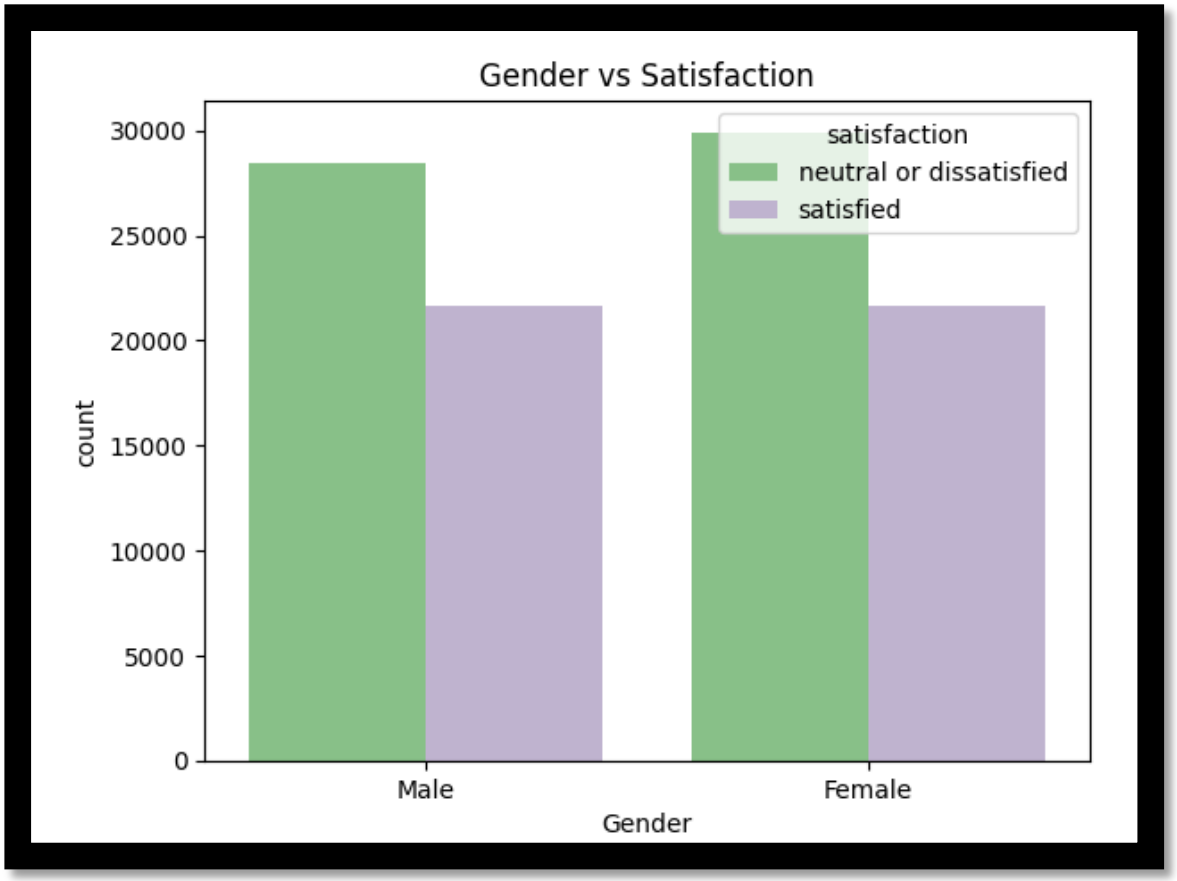
Impact of customer type on satisfaction

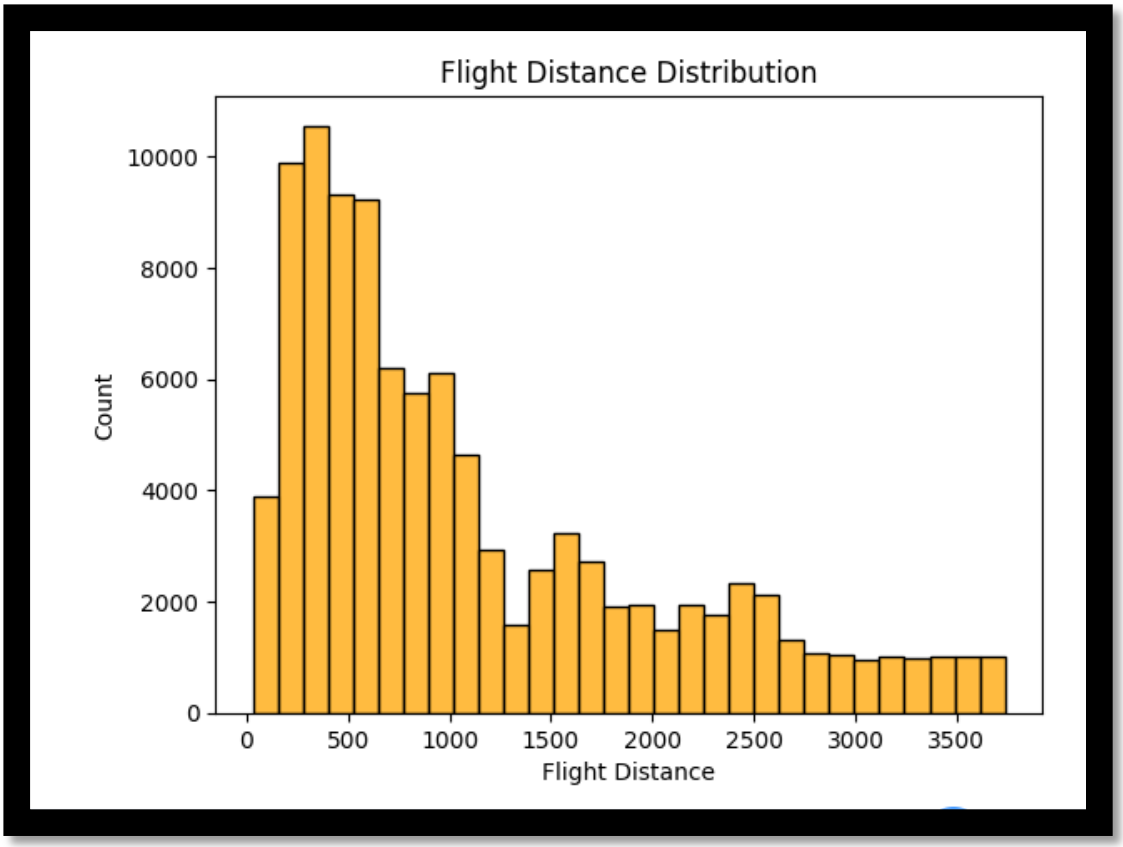
Relationship between service quality and passenger satisfaction

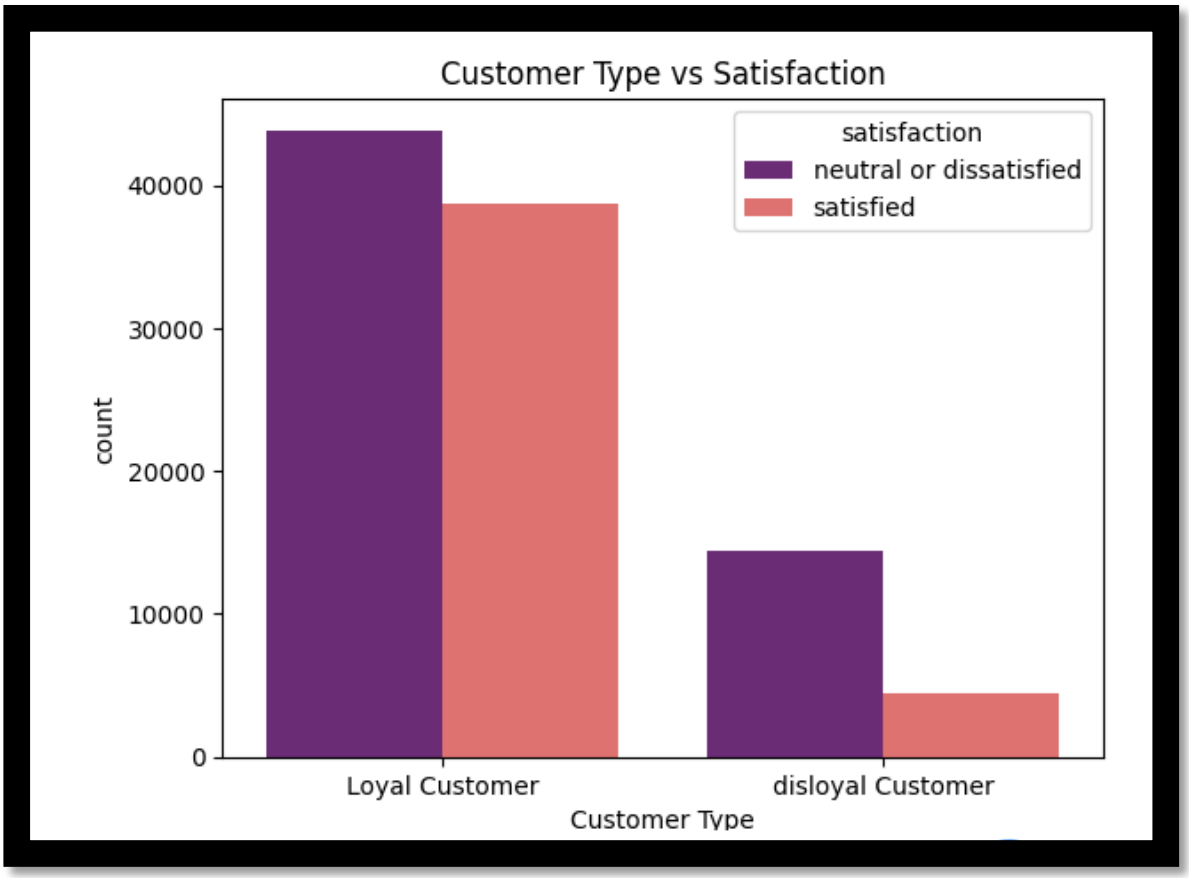
These visualizations provide clear insights into passenger behavior and service performance.

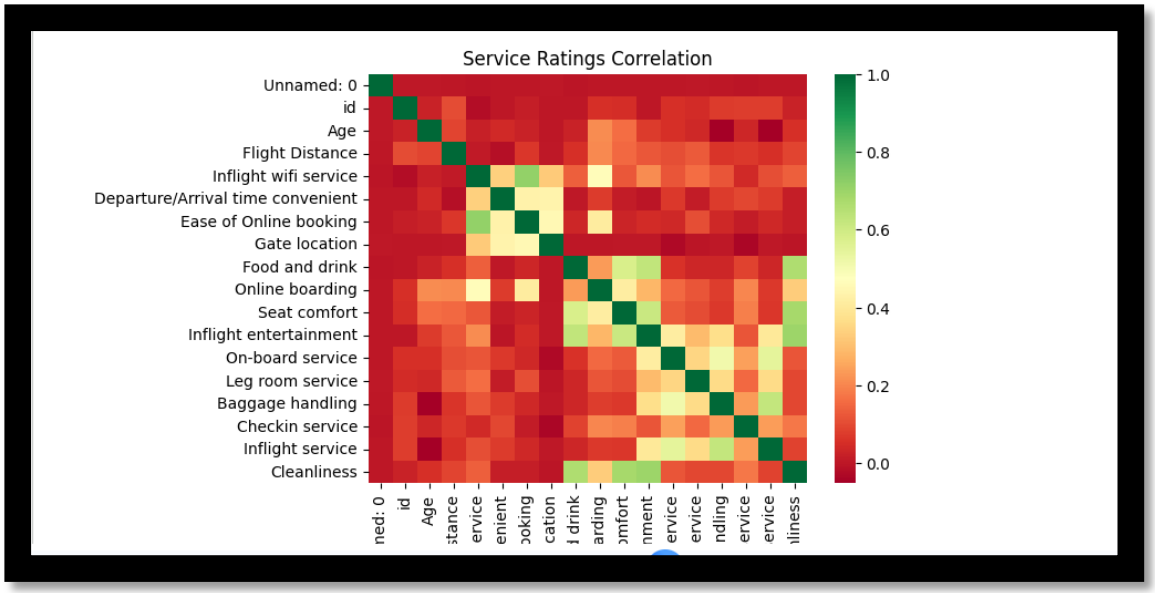



Class vs Satisfaction
satisfaction
neutral or dissatisfied
satisfied
count
35000
30000
25000
20000
15000
10000
5000
0
Eco Plus
Business
Eco
Class


Gender vs Satisfaction
satisfaction
neutral or dissatisfied
satisfied
count
30000
25000
20000
15000
10000
5000
0
Male
Female
Gender


Flight Distance Distribution
Count
Flight Distance
0
2000
4000
6000
8000
10000
0
500
1000
1500
2000
2500
3000
3500


Customer Type vs Satisfaction
satisfaction
neutral or dissatisfied
satisfied
count
Customer Type
0
10000
20000
30000
40000
Loyal Customer
disloyal Customer



Chatbot Implementation:

A simple rule-based chatbot was developed to allow users to interact with the airline dataset. Users can ask predefined questions related to passenger satisfaction, travel class, gender, and customer type. The chatbot continues interaction until the user chooses to exit.

```
        else:
            print("Please ask about satisfaction, class, gender, or customer type.")

Ask airline question (type 'bye' to exit): how many passengers are satisfied
satisfaction
neutral or dissatisfied    58345
satisfied                  43268
Name: count, dtype: int64
Ask airline question (type 'bye' to exit): which class has the highest satisfaction
Business class has the highest satisfaction.
Ask airline question (type 'bye' to exit): gender wise satisfaction
Gender  satisfaction
Female  neutral or dissatisfied    29917
        satisfied                  21644
Male    neutral or dissatisfied    28428
        satisfied                  21624
Name: count, dtype: int64
Ask airline question (type 'bye' to exit): Are loyal customers more satisfied
Customer Type      satisfaction
Loyal Customer     neutral or dissatisfied    43866
                   satisfied                  38780
disloyal Customer  neutral or dissatisfied    14479
                   satisfied                   4488
Name: count, dtype: int64
Ask airline question (type 'bye' to exit): bye
Chatbot closed.
```

Conclusion:

The analysis shows that passenger satisfaction is strongly influenced by service quality, travel class, and customer loyalty. Business-class passengers and loyal customers tend to report higher satisfaction. These insights can help airlines improve customer experience and service quality