

If you need a **Housefull** - Know your passengers! ✈️

In this data analysis project, I have delved into airline passenger data to identify crucial traits that enable airlines to effectively acquire and retain passengers.

By analyzing various factors and patterns, I aim to provide valuable insights for airlines to optimize their strategies and enhance passenger satisfaction, loyalty, and long-term engagement.

Situation: Airliner planning to see good revenue in the next fiscal cycle.

Task: Analyze historical passenger data and derive insights to enhance passenger acquisition and retention.

Available Data: Historical booked ticket data.

Motivation: Air travel is considered a marvel of engineering making humans capable of flying in the open sky. With the evolution and current technological pace, every human is trying to speed up and save time, even for traveling. With the need to save time and enjoy flying, there is a race between all airline carriers to provide best-in-class luxuries to people traveling with them. This project aims to enhance passenger satisfaction which in return helps Airliner with increased revenue.

Apart from this, the project is highly associated with the real-world scenario which gave me another reason to dive deep into it.

What does the data look like?

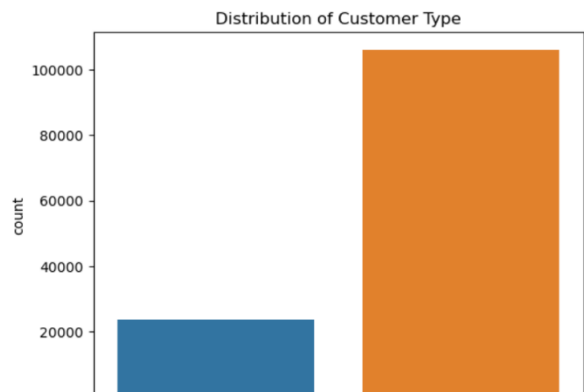
Data columns (total 24 columns):

#	Column	Non-Null Count	Dtype
0	ID	129880 non-null	int64
1	Gender	129880 non-null	object
2	Age	129880 non-null	int64
3	Customer Type	129880 non-null	object
4	Type of Travel	129880 non-null	object
5	Class	129880 non-null	object
6	Flight Distance	129880 non-null	int64
7	Departure Delay	129880 non-null	int64
8	Arrival Delay	129487 non-null	float64
9	Departure and Arrival Time Convenience	129880 non-null	int64
10	Ease of Online Booking	129880 non-null	int64
11	Check-in Service	129880 non-null	int64
12	Online Boarding	129880 non-null	int64
13	Gate Location	129880 non-null	int64
14	On-board Service	129880 non-null	int64
15	Seat Comfort	129880 non-null	int64
16	Leg Room Service	129880 non-null	int64
17	Cleanliness	129880 non-null	int64
18	Food and Drink	129880 non-null	int64
19	In-flight Service	129880 non-null	int64
20	In-flight Wifi Service	129880 non-null	int64
21	In-flight Entertainment	129880 non-null	int64
22	Baggage Handling	129880 non-null	int64
23	Satisfaction	129880 non-null	object

Report

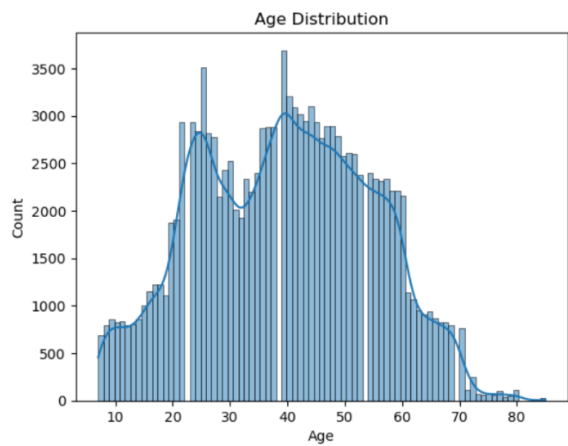
Age and gender-based Approach:

- Returning Passengers are 4 times First-time travelers with the airline.

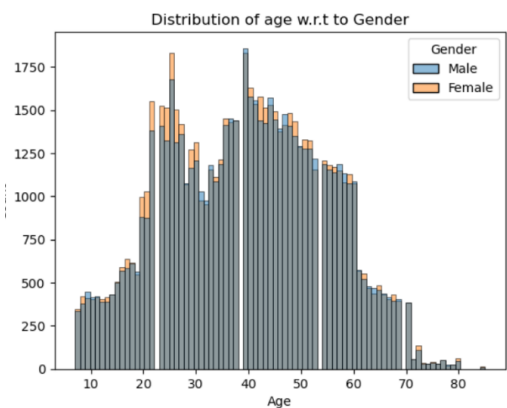




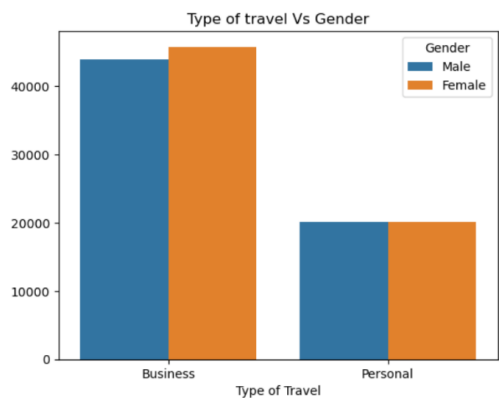
- The majority of passengers belong to the age in between 20 years to 60 years which means people of nearly all age group tends to fly with the airline.



In all age groups, females tend to fly in a higher ratio.

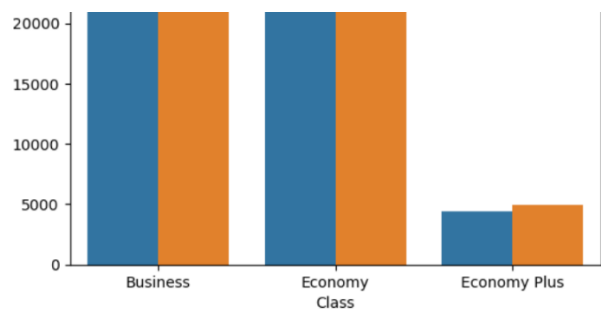


- Both gender equally participates in personal travel while females travel higher than males for business purpose.



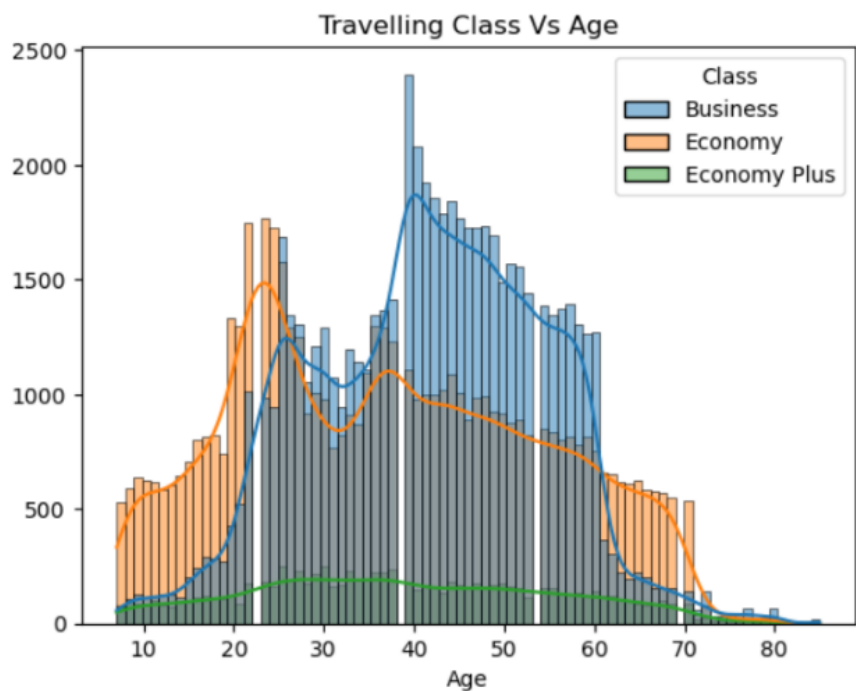
- There are 3 traveling class on the Airline, business, economy & economy plus- in all females tends to fly higher than males.





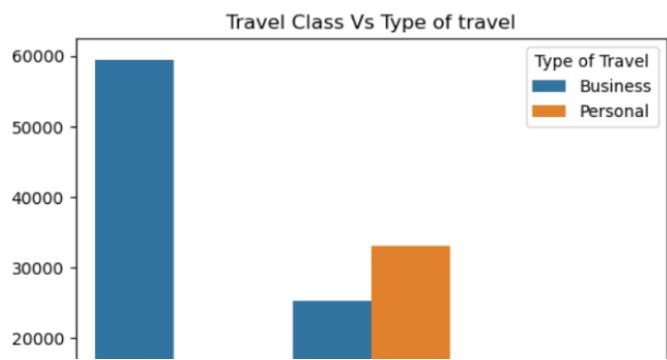
Traveling Class Approach: Business Class, Economy Class & Economy Plus

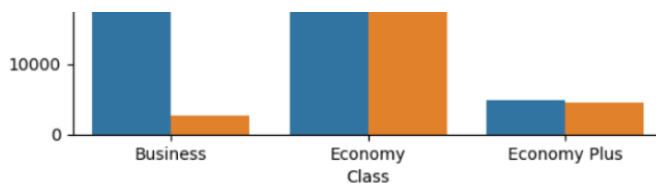
- The Economy Class is used majorly by people between the age group 15 - 26 years.
- Business Class is most preferred by people within the age bin of 30 - 55 years.
- Economy Plus is used by nearly all age groups but in a very less margin compared to other classes. The Green Shaded area highlights the portion.



Class Vs Travel Type

- Business class was highly preferred for business trips.

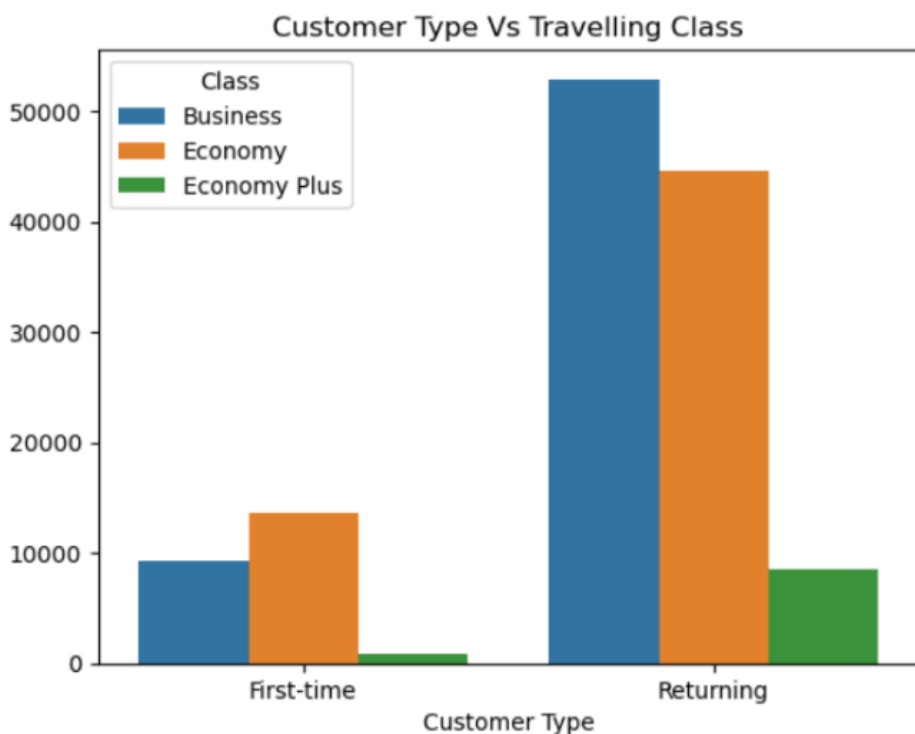




- Economy class dominates in personal travel.
- Whereas, Economy Plus equally participates in travel options.

Traveling Class Vs Type of Travel

- First-timers usually prefer economy class over business class.
- The second choice for first-timers is business class.
- While Economy Plus is rarely used for travel by first-time travelers.



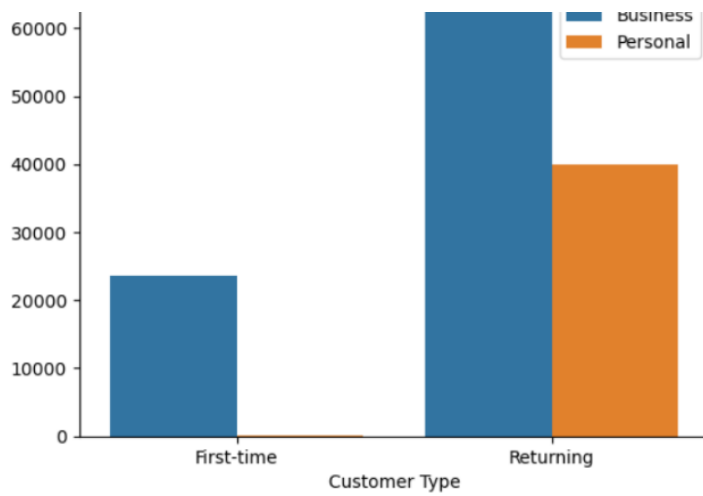
Whereas

- Returning passengers prefer Business Class > Economy > Economy Plus.

Travel Type VS Purpose Of Passengers.

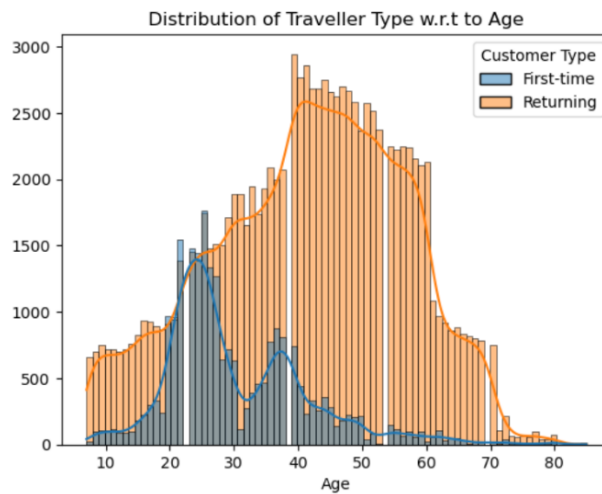
- Almost all first-time passengers are business-purpose travelers.



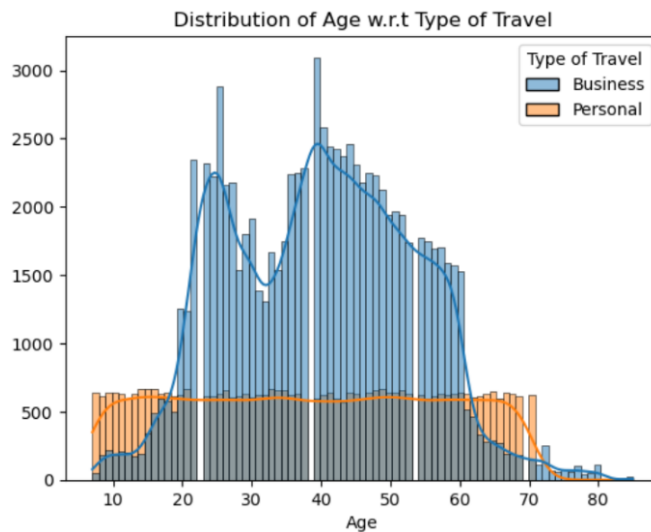


- Returning passengers include both types of passengers however, business-purpose travelers remain at the higher end.

- The majority of first-timers belong to the age group of 20 - 30 years.



- Nearly all age groups tend to use airlines majorly for business purposes.



Satisfaction:

Assuming 3.5 as the average rating, below which factors that need improvement.

	ID	Age	Flight Distance	Departure Delay	Arrival Delay	Departure and Arrival Time Convenience	Ease of Online Booking	Check-in Service	Online Boarding	Gate Location	On-board Service
count	129880.000000	129880.000000	129880.000000	129880.000000	129880.000000	129880.000000	129880.000000	129880.000000	129880.000000	129880.000000	129880.000000
mean	64940.500000	39.427957	1190.316392	14.713713	15.090853	3.057599	2.756876	3.306267	3.252633	2.976925	3.383023
std	37493.270818	15.119360	997.452477	38.071126	38.407410	1.526741	1.401740	1.266185	1.350719	1.278520	1.287099
min	1.000000	7.000000	31.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
25%	32470.750000	27.000000	414.000000	0.000000	0.000000	2.000000	2.000000	3.000000	2.000000	2.000000	2.000000
50%	64940.500000	40.000000	844.000000	0.000000	0.000000	3.000000	3.000000	3.000000	3.000000	3.000000	4.000000
75%	97410.250000	51.000000	1744.000000	12.000000	13.000000	4.000000	4.000000	4.000000	4.000000	4.000000	4.000000
max	129880.000000	85.000000	4983.000000	1592.000000	1584.000000	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000

✓Analyzing the above numbers following factors need improvement:

- Ease of Online Booking
- Boarding Gate Location
- Inflight WiFi Service
- Online Boarding
- Cleanliness &
- Food and Drinks.

Looking at the numbers, these factors also have maximum ratings of 5, and 75% have rated 4.

This means with little improvement overall experience could be enhanced.

Conclusion:

- Numbers suggest females travel more than males in all age groups with the Airline.
- The majority of first-time travelers belong age group between 20 - 30 years.
- First-time travelers prefer economy class even for business trips.
- Business class is used by returning passengers more than first-time travelers.
- The airline is heavily used for business purpose travel.
- The average rating for customer satisfaction is 3.5
- Airlines need to improve boarding and cabin services.
- The airline should enhance entertainment services with flights.

For detailed EDA code, please check **README.md** file.

thank
you

