



FLIGHT PRICE PREDICTION

8

Count of airline

2

Count of class

6

Count of destination

1569

Count of flight

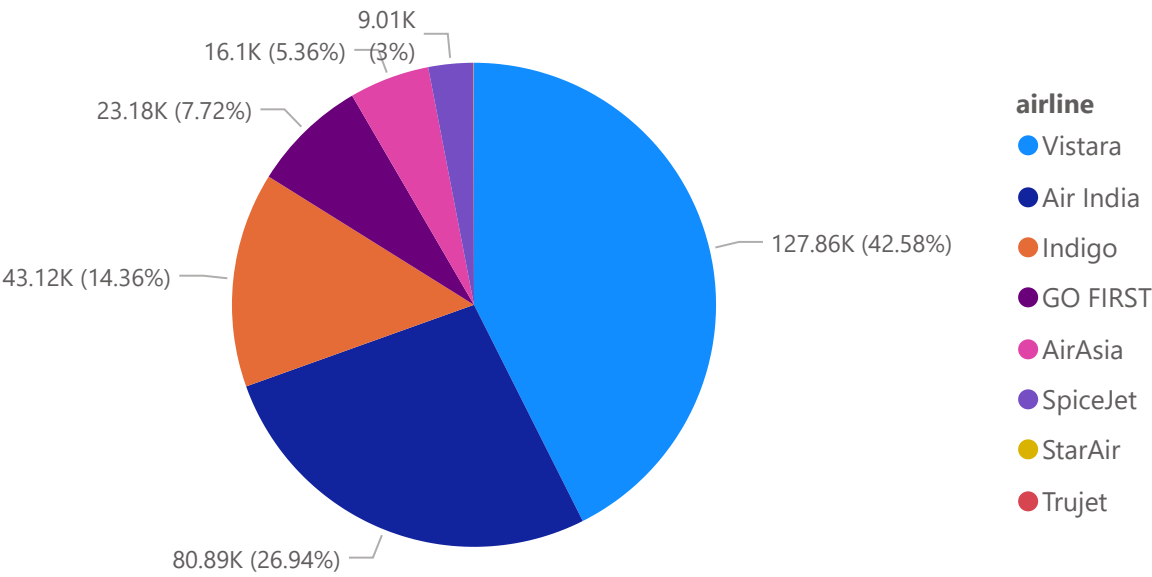
20.88K

Average of price

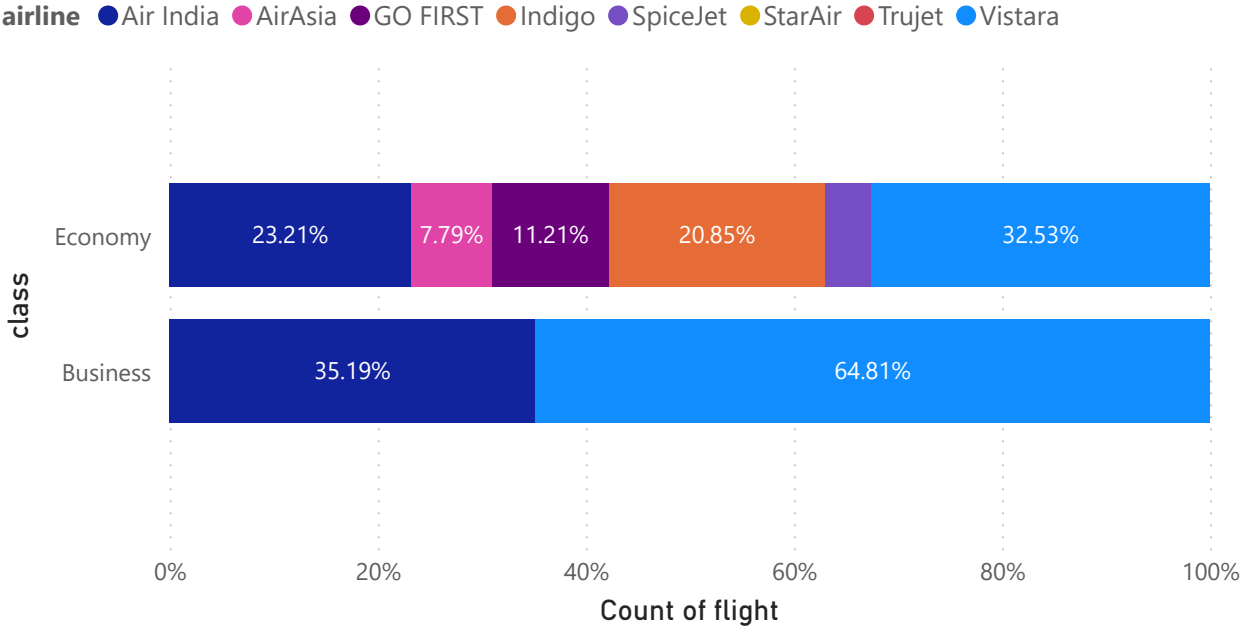
3

Count of stops

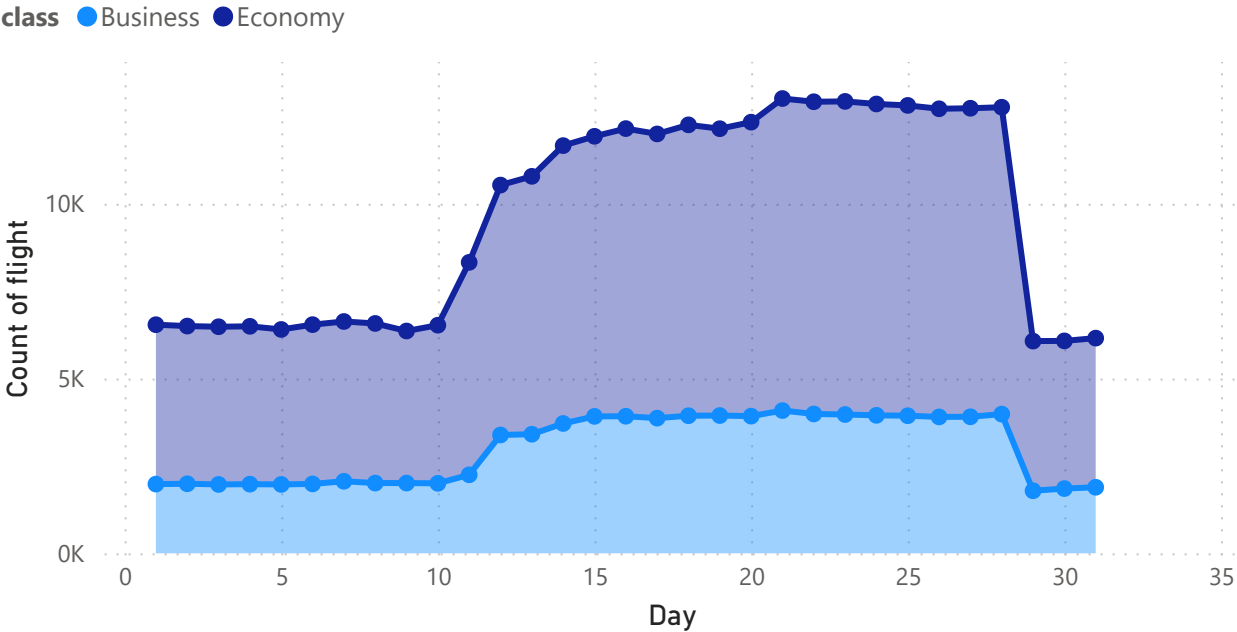
Distribution of airlines



Distribution of airlines by class



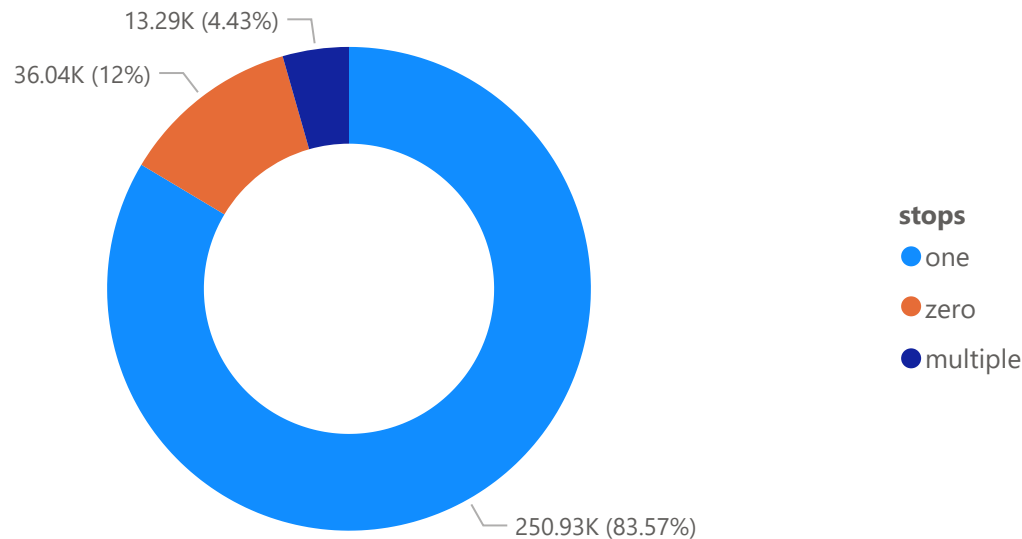
Count of flights available by Day and class



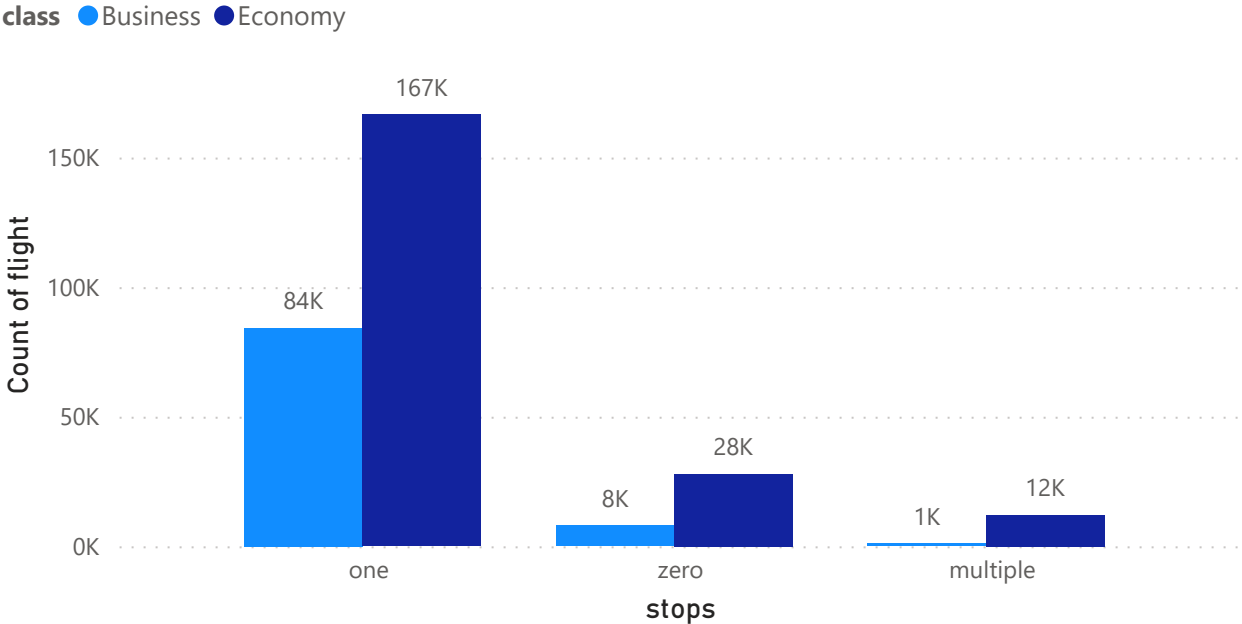
Observations:

- Vistara is the leading airline, making up 42.58% of the total flights, with a particularly strong presence in the business class at 64.81%. It is followed by Air India in both the economy and business class flights.
- We can observe that only two airlines (Vistara and Air India) are available with the business class flights operating between our destinations.
- Economy class flights are more frequent than business class flights across all airlines and days, indicating a higher demand for economy travel.
- Flights activity shows a generally stable pattern from 21st day with a significant peak around the 28th day, followed by a sharp decline.
- We can observe that there are a lot of flights available during the middle of the month, than that at the end/ start of the month.
- The airline SpiceJet has an very low presence in the airlines operating between our destinations.

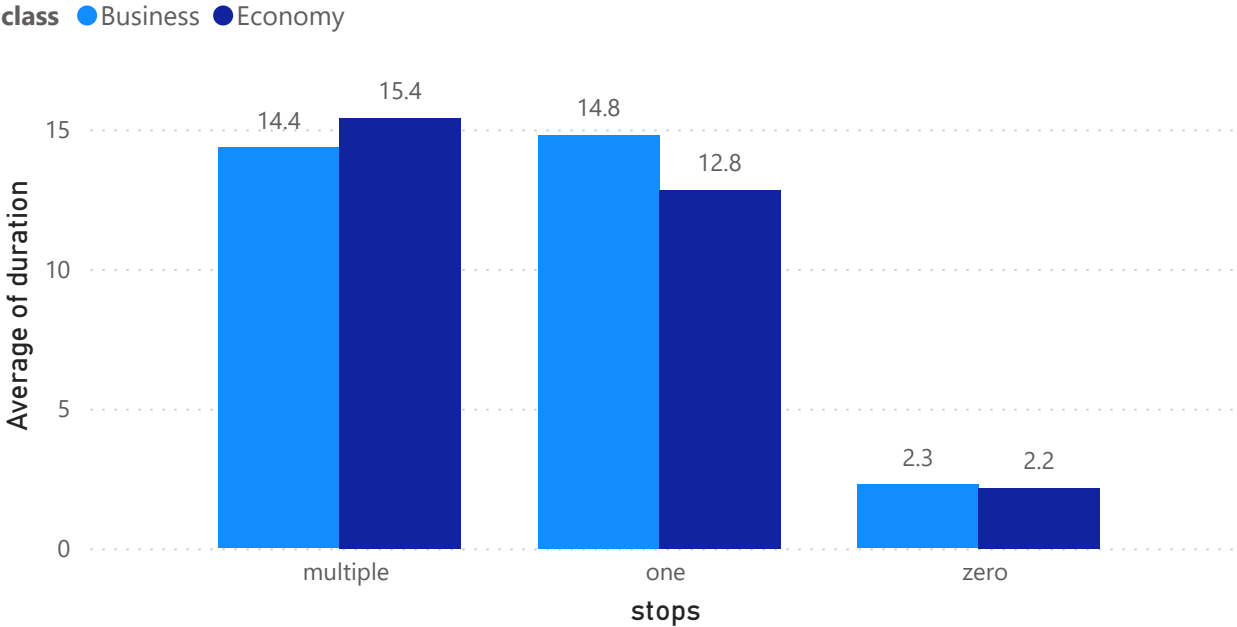
Distribution of stops



number of flights by stops and class



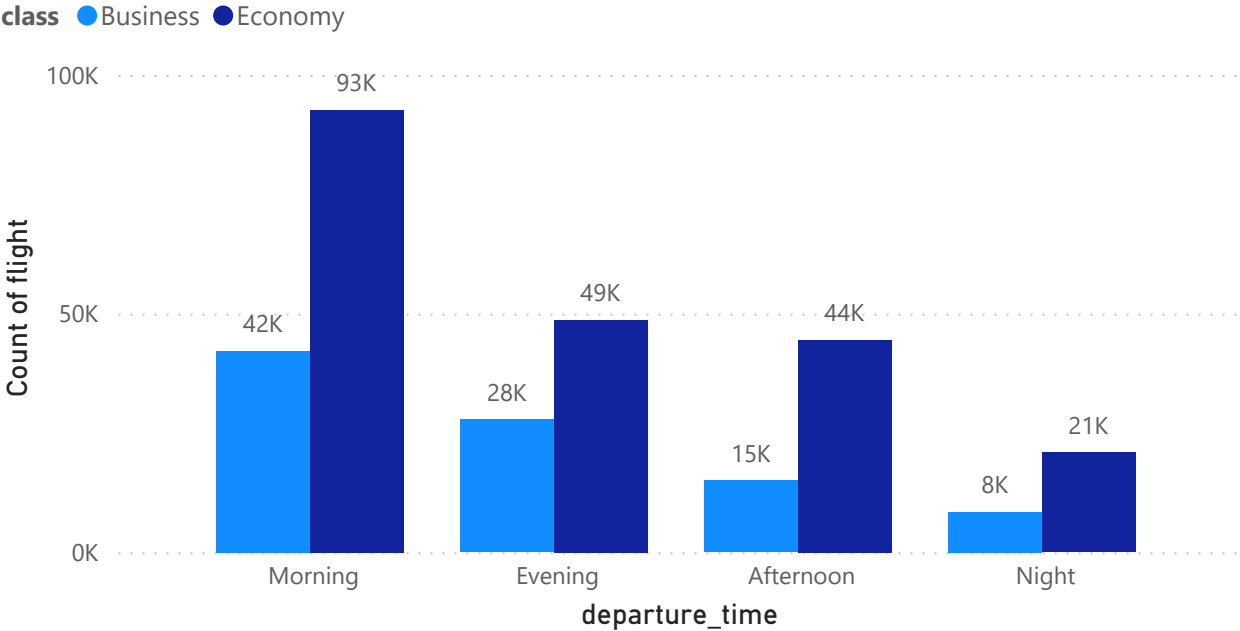
Average of duration by stops and class



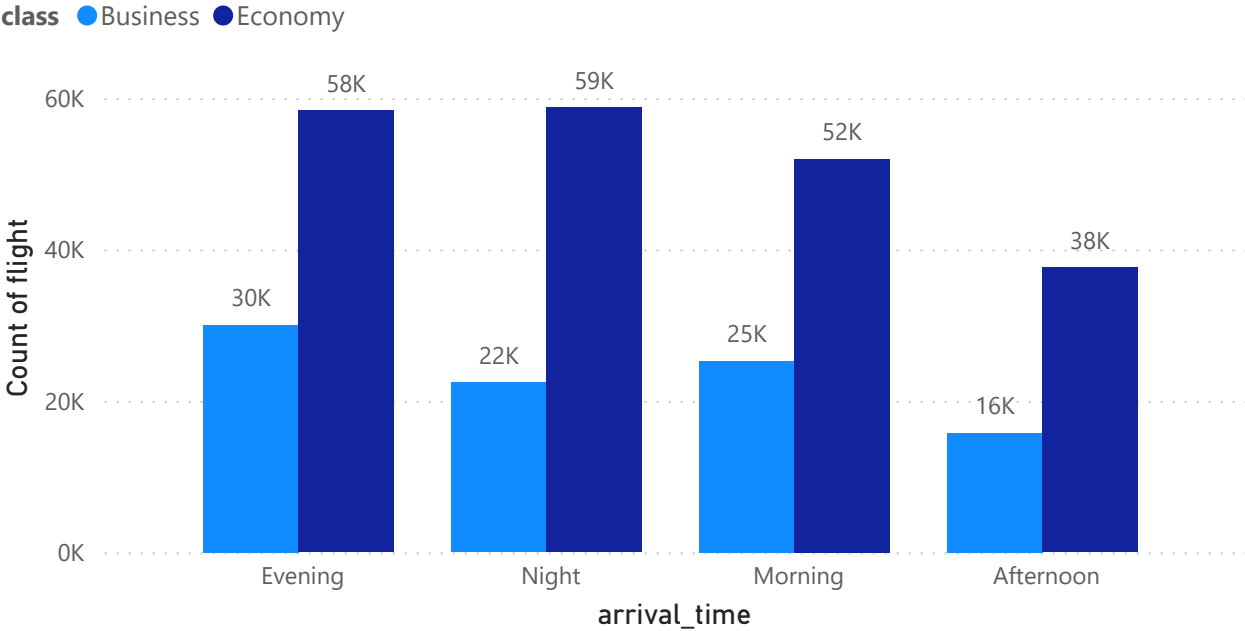
Observations:

- We can observe that majority of the flights with one stop are the most common, making up 83.57% of the total.
- Direct (zero stop) flights account for 12% of the total, while multiple-stop flights are rare, comprising only 4.43% of the total.
- Flights with multiple stops have the longest average duration for economy class, while flights with single stop have the longest average duration for the business class.
- Direct flights have the shortest duration, with similar durations for both business and economy classes.

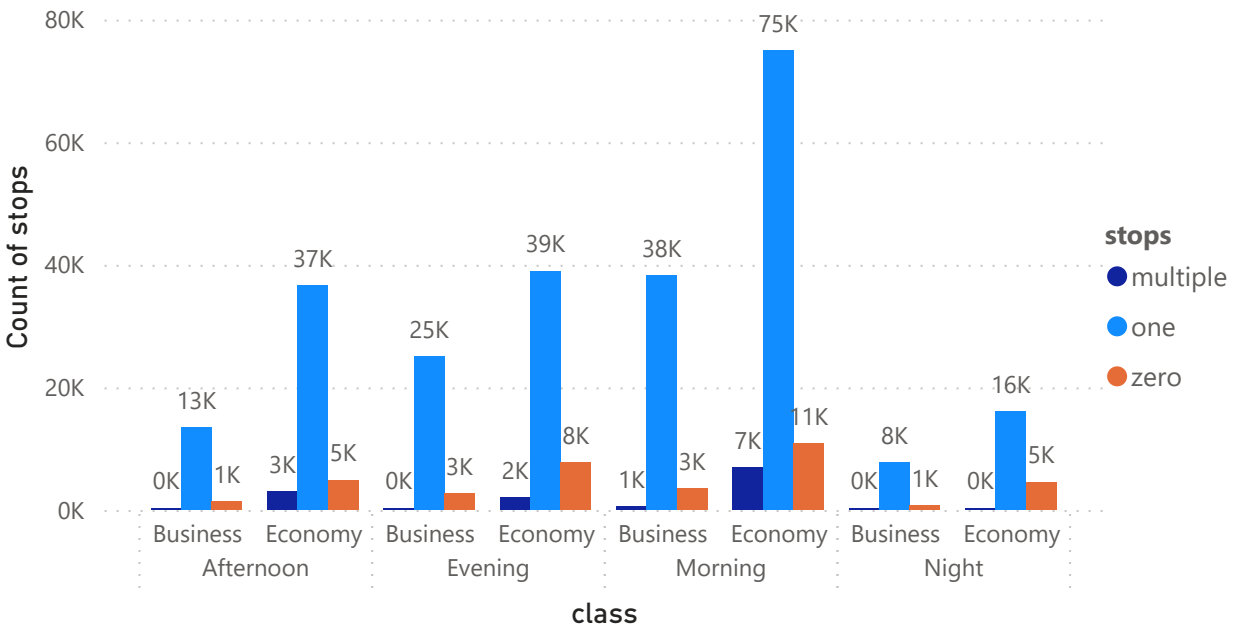
Count of flight by departure_time and class



Count of flight by arrival_time and class



Count of stops by class and departure_time

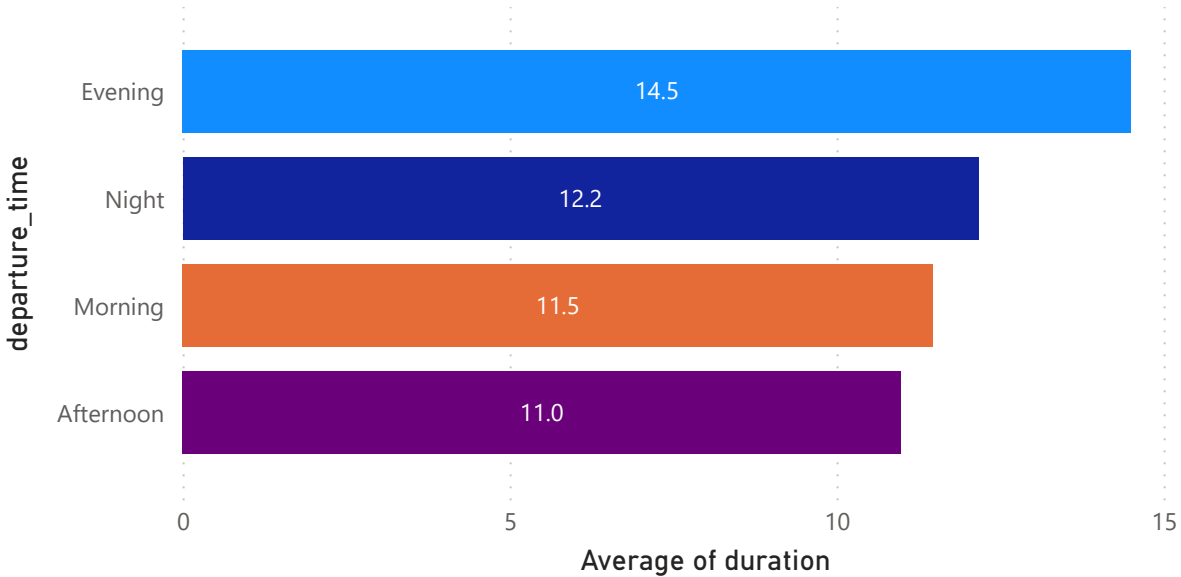


Observations:

- The highest no. of flights by departure time and class is for economy class in the morning, with 93K flights. This significantly outnumbers any other category.
- The lowest no. of flights by departure time and class is for business class in the night, with 8K flights.
- The evening arrival time sees the highest count of flights across both classes, with a total of 58K flights for economy and 30K flights for business, totaling 88K flights.
- Business class flights are most frequent in the evening in terms of arrivals. While the economy class flights are almost equal during evening and nights in terms of arrival.
- The economy class flights have a lot of stops which depart in the morning and the least during the night.

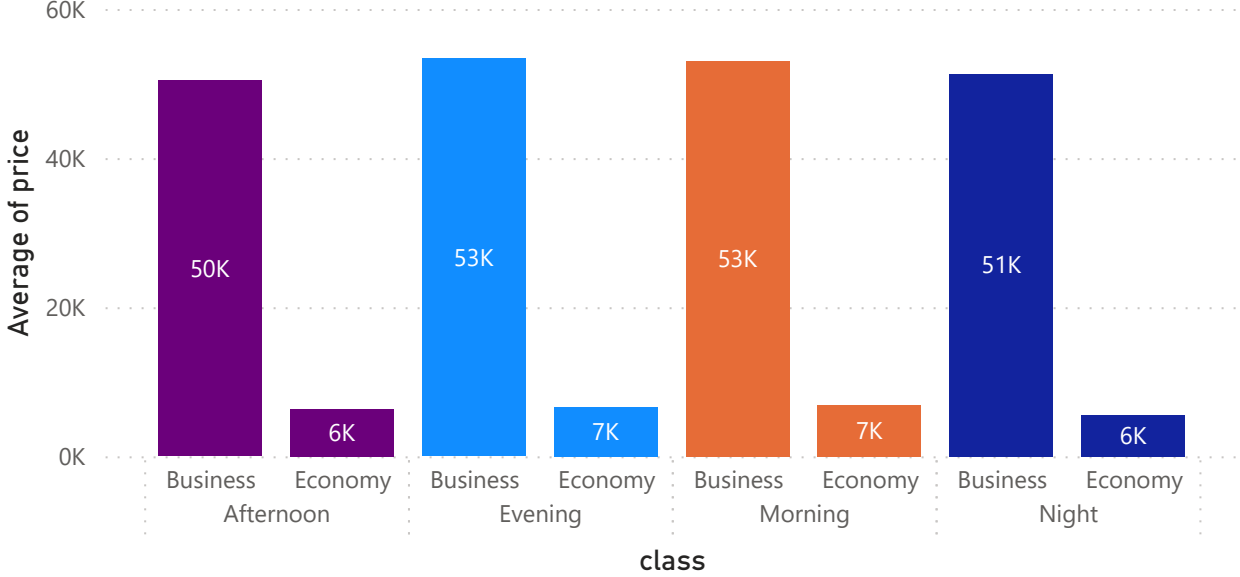
Average of duration by departure_time

departure_time Evening Night Morning Afternoon



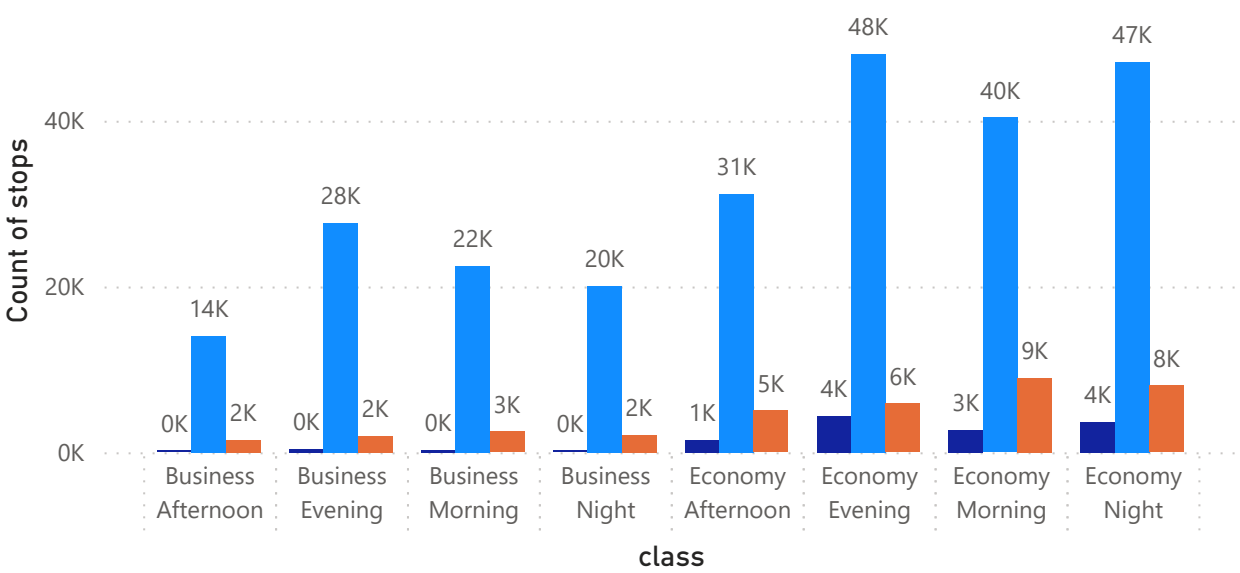
Average of price by departure time and class

departure_time Afternoon Evening Morning Night



Count of stops by arrival time and class

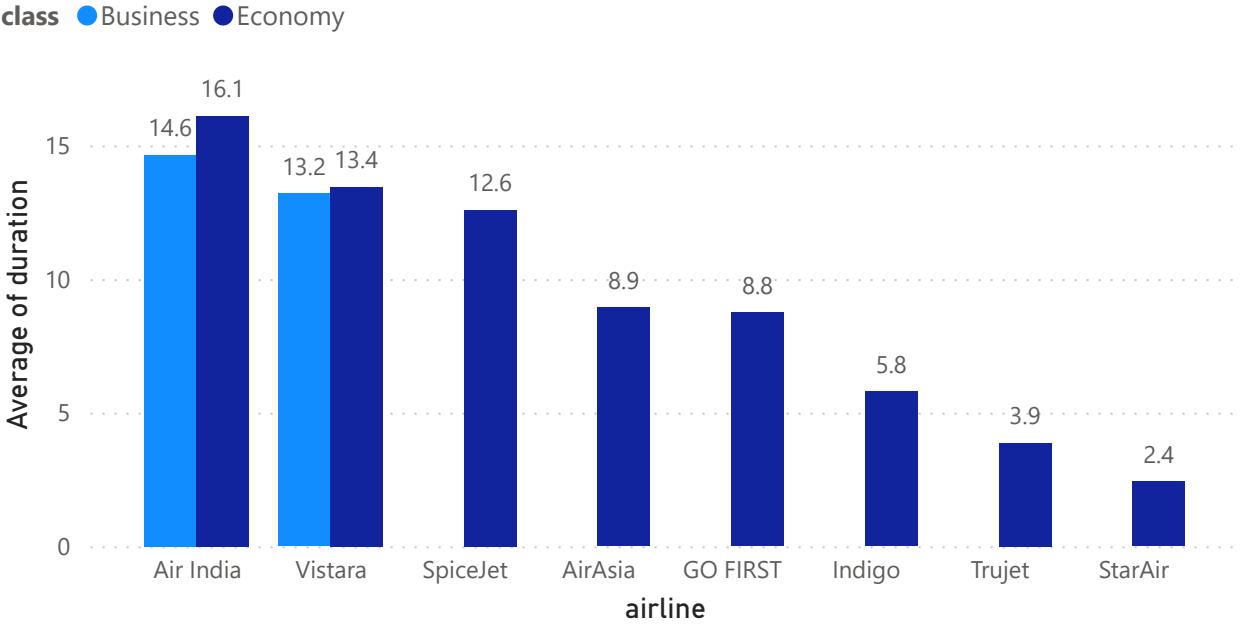
stops multiple one zero



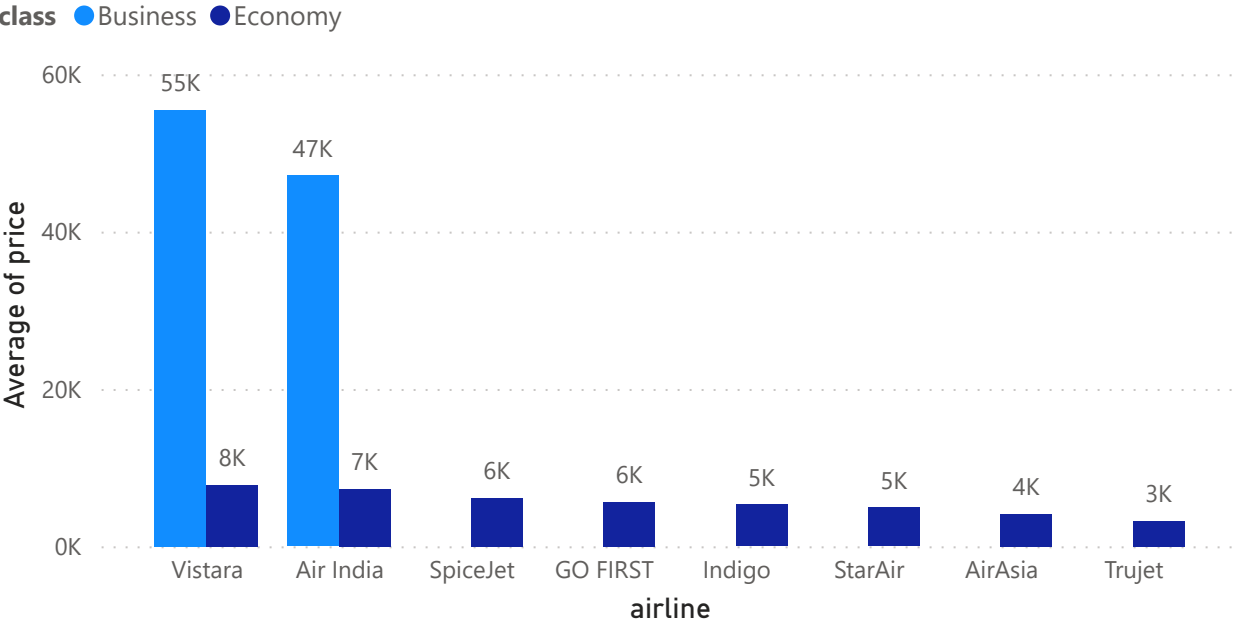
Observations:

- Flights departing in the evening have the highest average duration of 14.5 hours, significantly longer than flights at other times of the day.
- Flights departing in the morning and afternoon have the shortest average durations, at 11.5 hours and 11.0 hours respectively.
- The average price for business class flights is fairly consistent across departure times, ranging from 50K to 53K. In contrast, economy class flights are consistently cheaper, averaging between 6K and 7K across all times.
- Economy class flights in the evening and night have a high count of stops, with evening flights having 48K stops and night flights having 47K stops. In contrast, business class flights have fewer stops, with lowest no. of multiple-stop flights recorded.

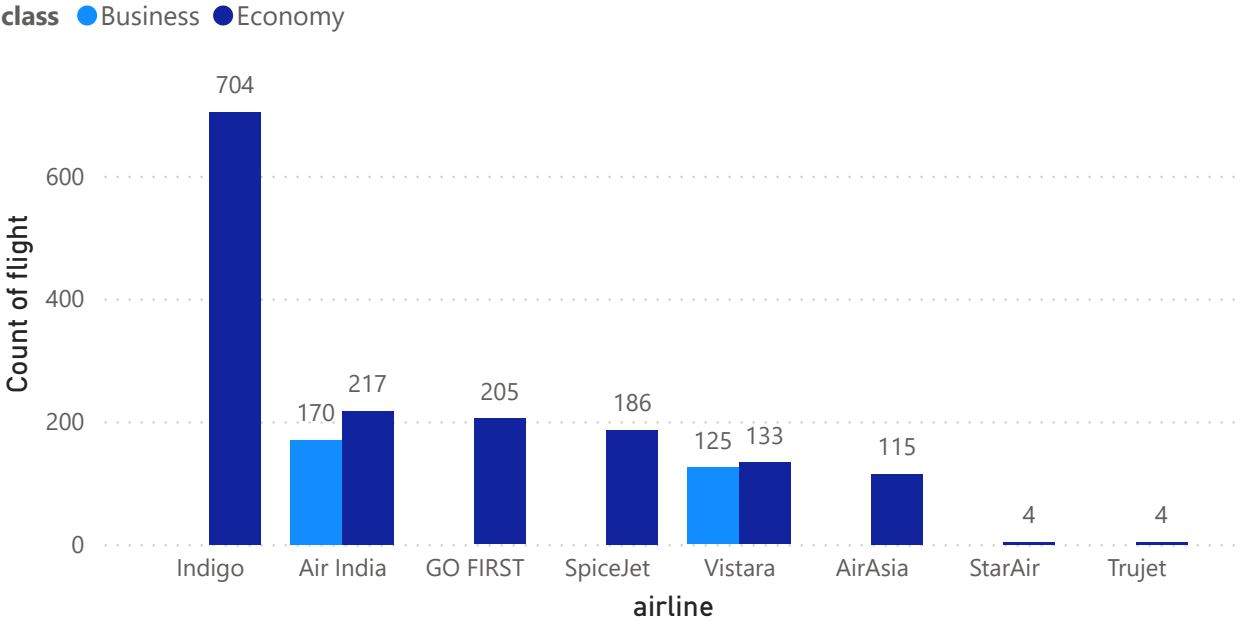
Average of duration by airline and class



Average of price by airline and class



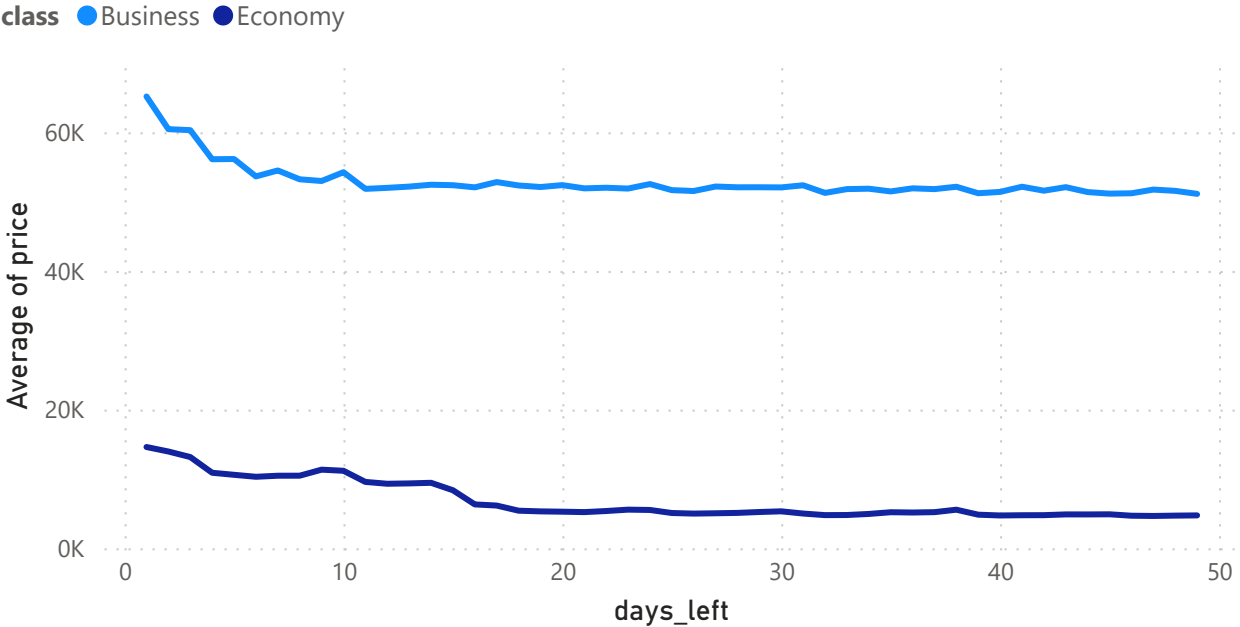
Count of flight by airline and class



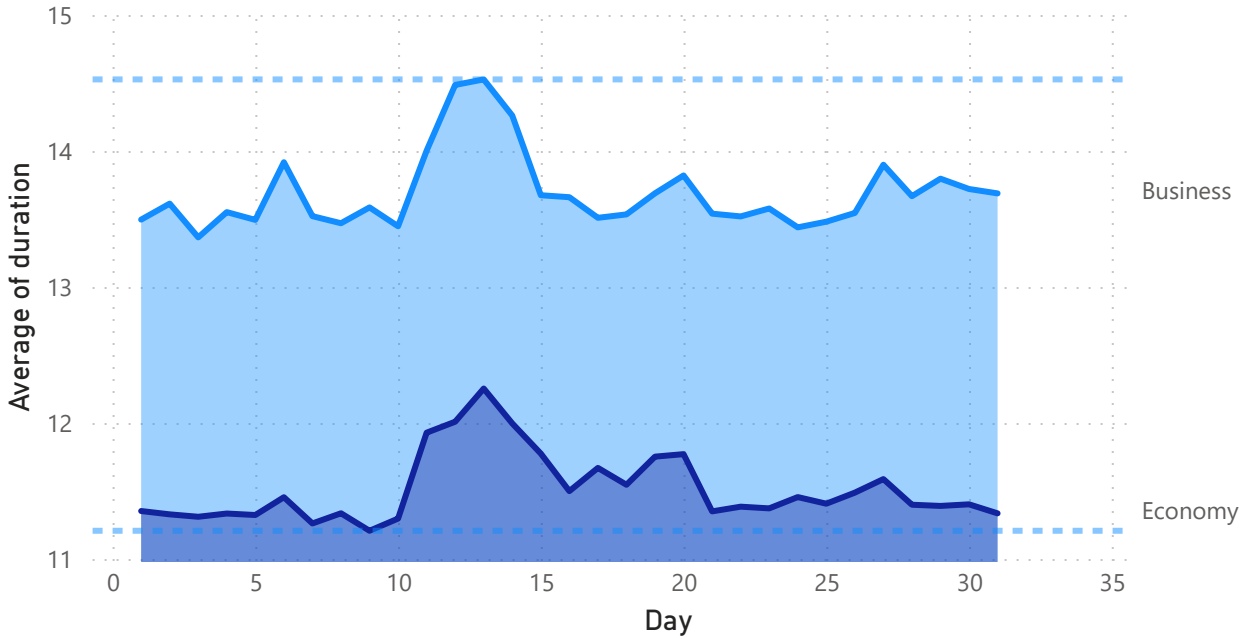
Observations:

- Vistara has the highest average duration for economy class flights, with an average of 16.1 hours. This is higher than any other airline for either class.
- The average price for business class flights on Vistara is the highest, at 55K. This is significantly higher compared to other airlines, with the next highest being Air India at 47K. While they're at a similar range in economy class flights.
- StarAir and Trujet have the shortest average durations for economy class flights, with StarAir at 2.4 hours and Trujet at 3.9 hours.
- Across all airlines, economy class flights have significantly lower average prices compared to business class flights. The average price for economy class flights remains below 8K for all airlines, whereas business class prices are much higher in Vistara and Air India.
- The StarAir and Trujet have the lowest count of flights with different travel routes. The Indigo airlines have the highest no. of flight routes among all the airlines. It's followed by Air India with the 2nd highest highest no. of travel routes available.

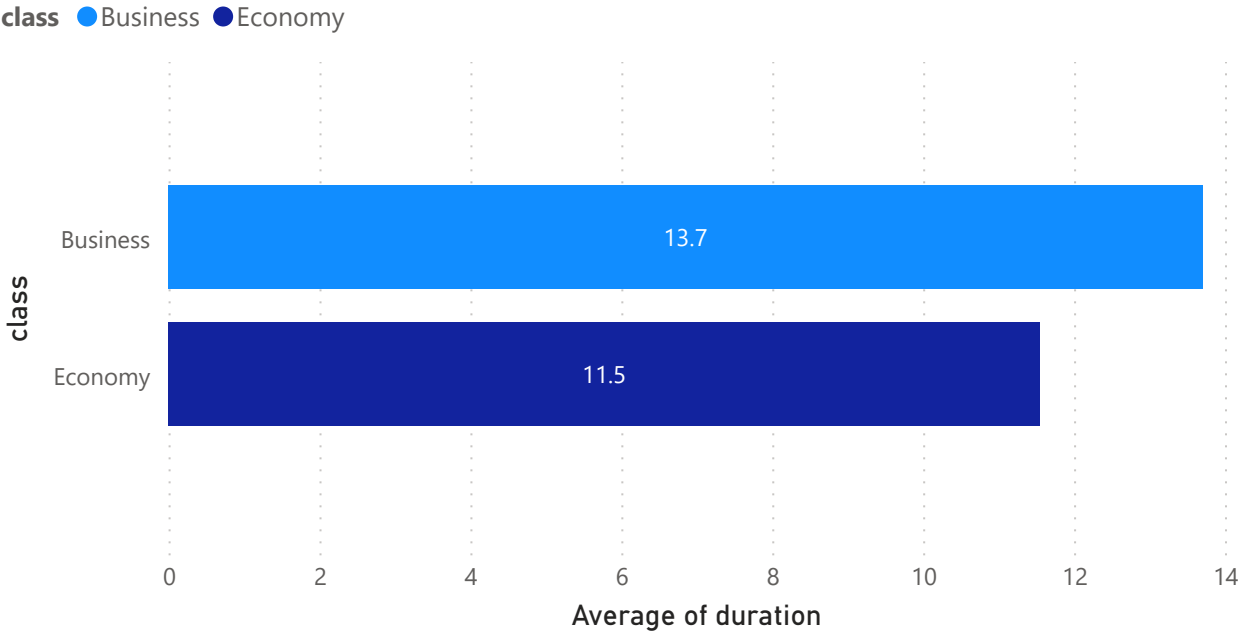
Average of price by days_left and class



Average of duration by Day and class



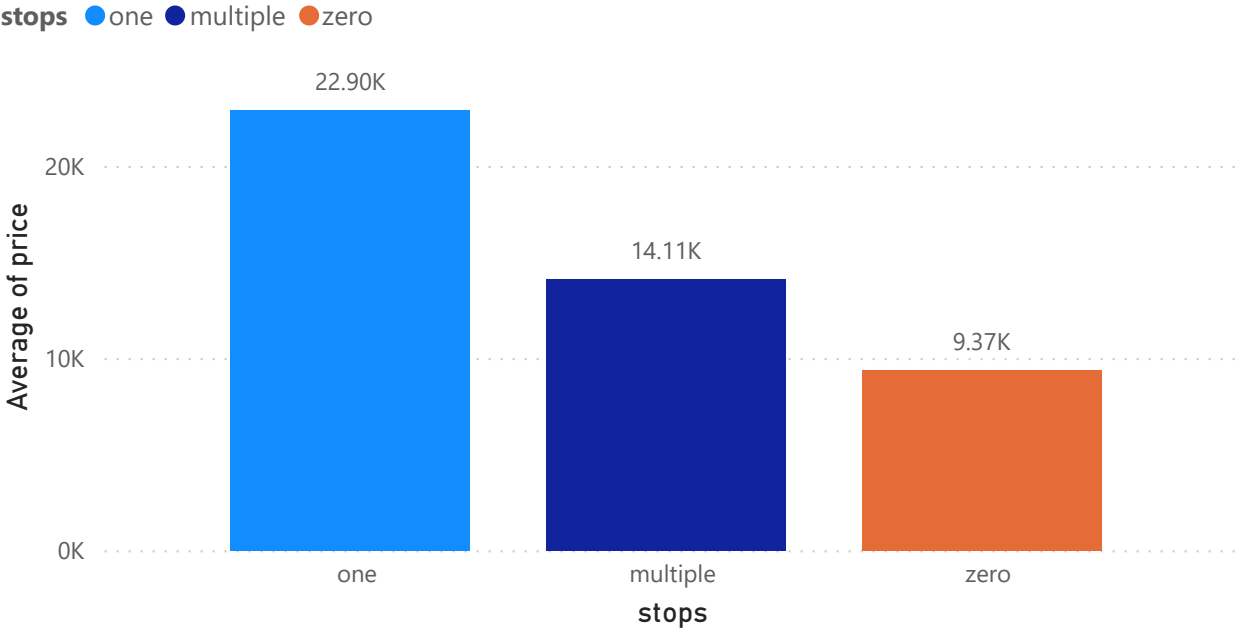
Average of duration by class and class



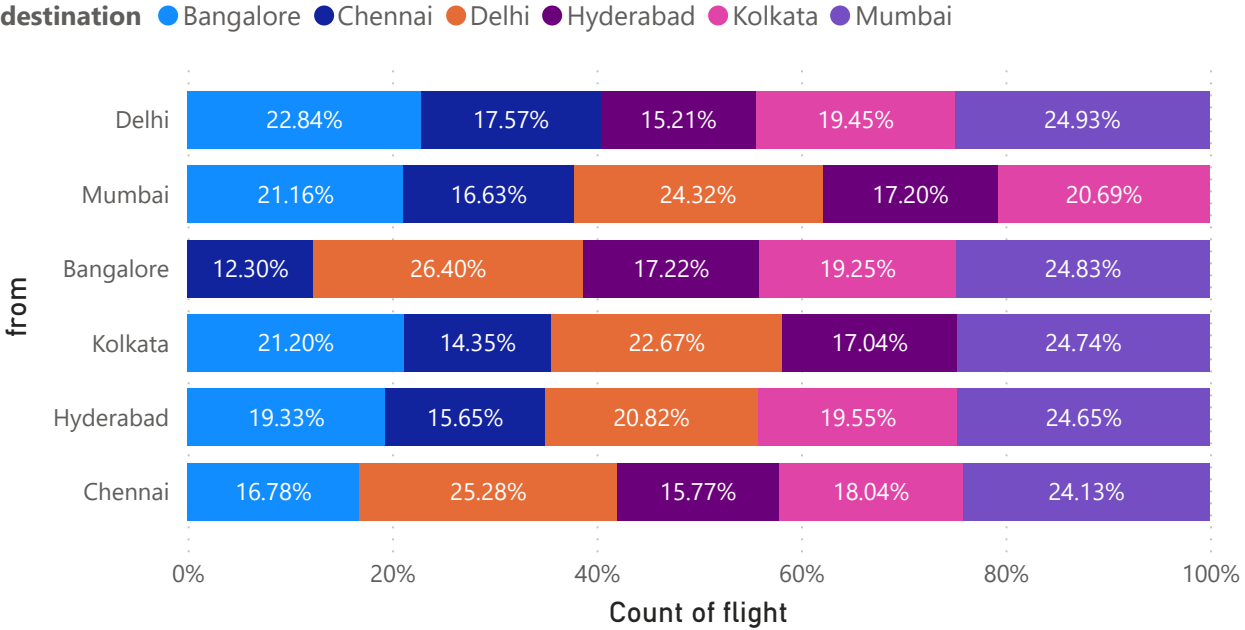
Observations:

- The average price of flights decreases as the days left until departure increase. This trend is evident for both business and economy classes, with a steeper decline for business class prices.
- Business class flights consistently have higher average prices compared to economy class across all days left until departure.
- On average, business class flights have a longer duration (13.7 hours) compared to economy class flights (11.5 hours). This might be due to the no. of stops for the respective flights.
- The average duration of flights varies significantly day-to-day for both business and economy classes. We can observe that it get longer in the middle of the month around 10th to 16th.
- While both classes show variations in flight duration over days, economy class durations are more consistent and show fewer fluctuations compared to business class durations.

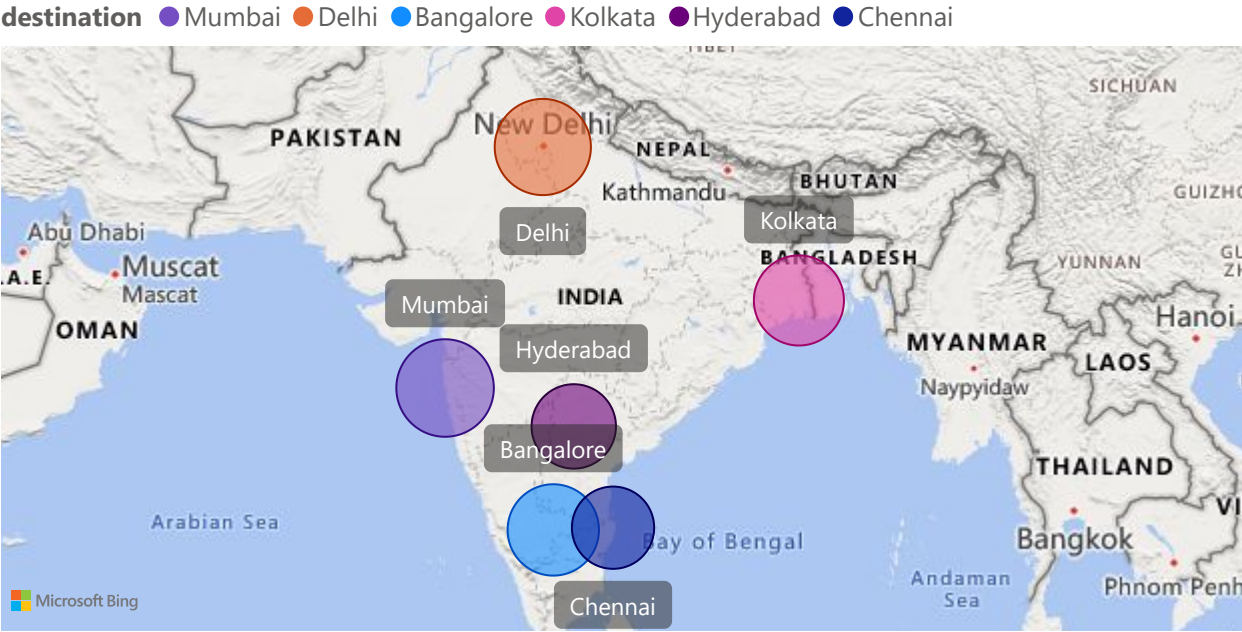
Average of price by stops



Count of flight by from and destination



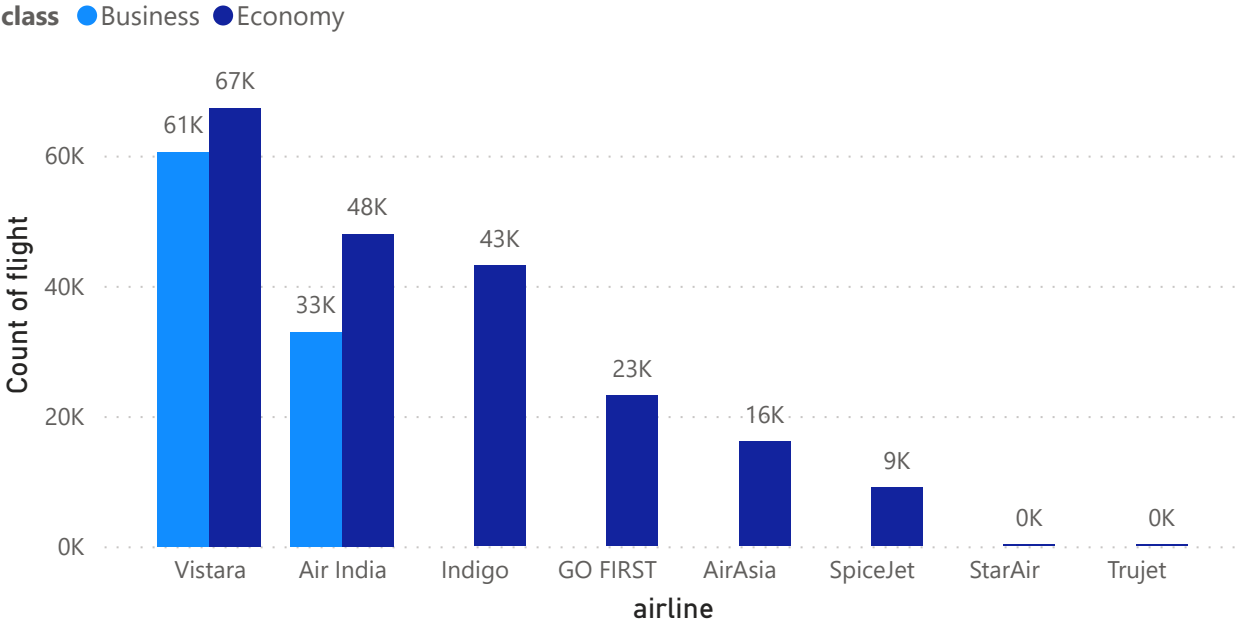
Count of flight by destination



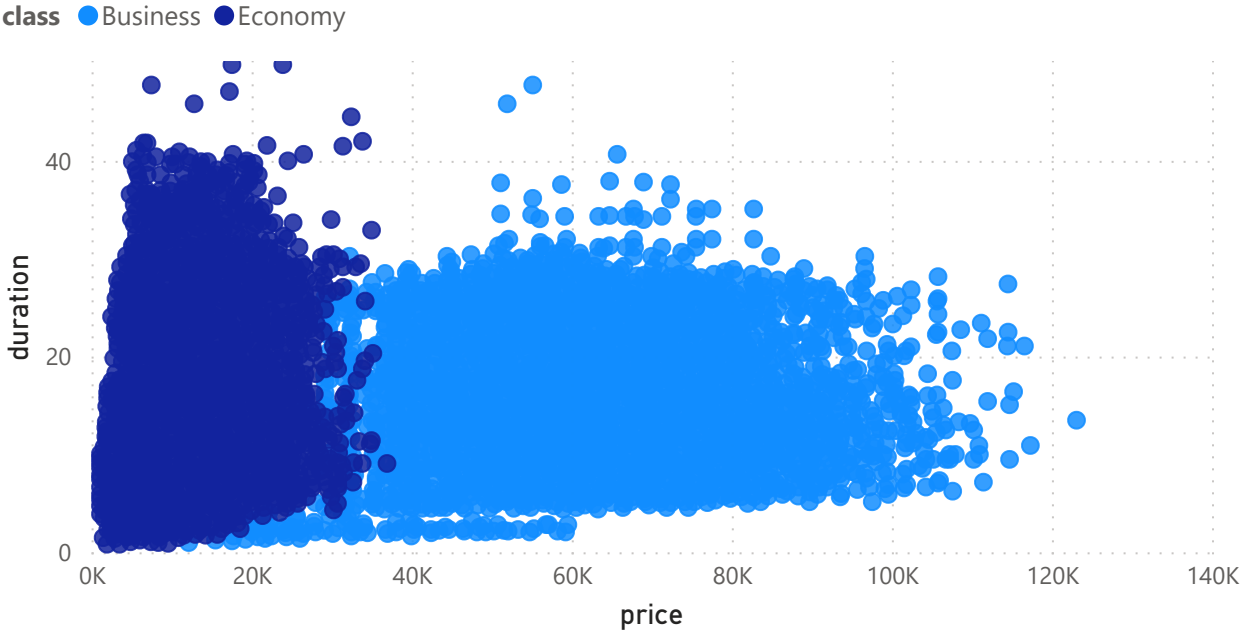
Observations:

- Flights with one stop have the highest average price, at 22.9K. This is significantly higher compared to flights with multiple stops (14.11K) and non-stop flights (9.37K).
- A notable percentage of flights from Bangalore are destined for Delhi, with 26.40% of flights heading there. This is the highest percentage for any destination from Bangalore.
- A notable percentage of flights from Bangalore are destined for Chennai, with 12.30% of flights heading there. This is the lowest percentage for any destination from Bangalore.
- Delhi receives a high proportion of flights from multiple origins, with notable percentages from Bangalore (26.40%), Chennai (25.28%), and Mumbai (24.32%).
- The geographical distribution plot shows that Mumbai and Delhi are major hubs with significant flight activity. They have a substantial number of flights to and from various destinations, indicating their importance in the flight network.
- The flights to Mumbai from different locations have an almost same distribution maintaining consistency.

Count of flight by airline and class



price vs duration by class



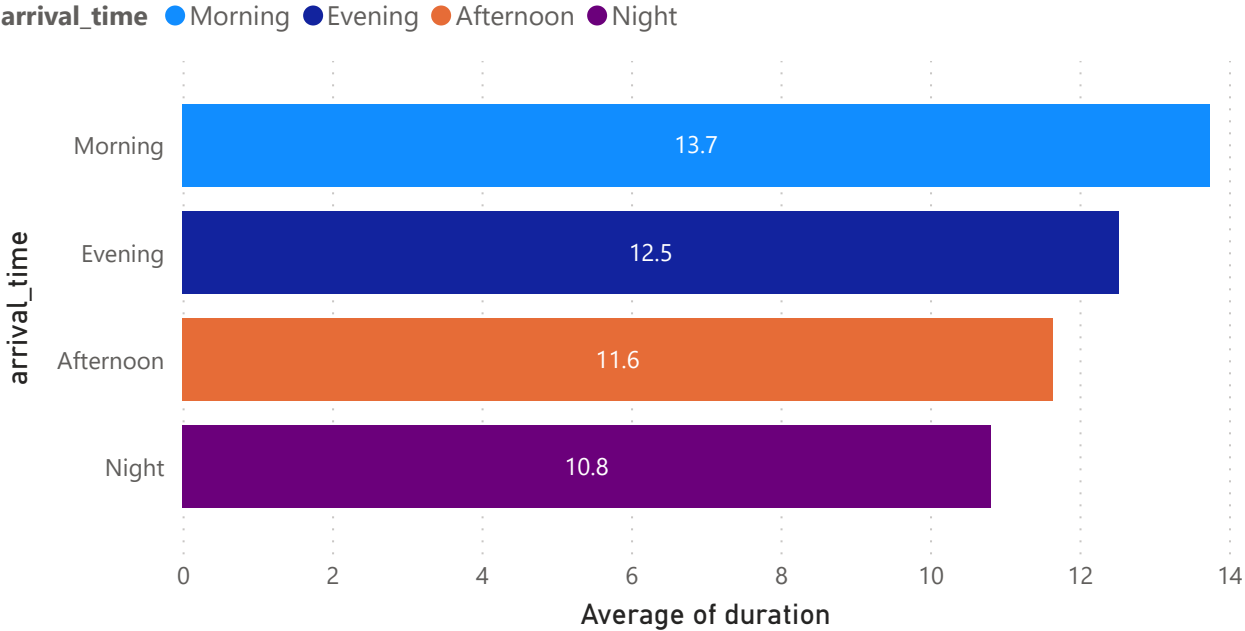
descriptive statistics table on price based on the departure location to destination

from	No. of Flights	Average price	Max	Median	Min	S.D of price
⊕ Mumbai	60903	21481.71	114523	7413	1890	23393.42
⊕ Kolkata	46347	21746.24	123071	7958	2436	23439.72
⊕ Hyderabad	40860	20133.24	115211	6799	1543	21714.79
⊕ Delhi	61345	18950.98	117307	6840	1998	20920.00
⊕ Chennai	38700	21995.34	114704	7846	1105	23526.92
⊕ Bangalore	52106	21455.88	111883	7488	1603	23165.99
Total	300261	20883.72	123071	7425	1105	22695.87

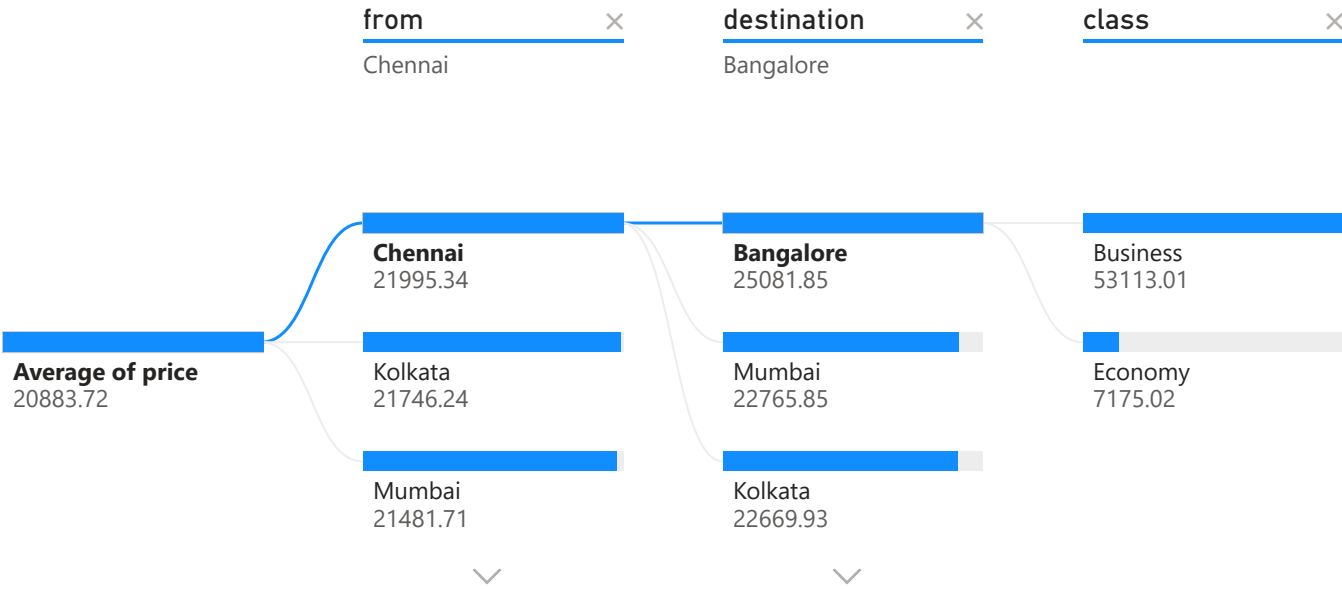
Observations:

- Vistara operates the highest number of flights overall, with 67K economy flights and 61K business flights, making it the leading airline in terms of flight count.
- Air India and Indigo also have a substantial number of flights, with Air India operating 48K economy and 33K business flights, and Indigo operating 43K economy flights. This positions them as significant players in the airline market.
- There is a visible clustering of flight durations around shorter times, with economy flights generally priced lower than business flights. However, some business flights have much higher prices, indicating a broader price range for this class.
- The table reveals significant variability in flight prices across different cities. Chennai has the highest average price at 21,995.34, followed by Kolkata and Mumbai. Delhi has the lowest average price at 18,950.98 among the major cities listed.
- The standard deviation of prices is relatively high for all cities, indicating considerable price variability. Kolkata has the highest standard deviation (23,439.72), followed closely by Chennai and Mumbai, suggesting a wide range of pricing options within these cities.

Average of duration by arrival_time



Average of price by class



Observations:

- From the bar graph we can observe that on a most of the flights arrive either in the morning or the evening, meaning it's the most crowded times in the airport.
- The business class flights cost around 8 times more than economy class flights on an average. It can be a major factor to be considered based on the urgency of the person.
- The tree diagram shows the avg. costs of flights along with their duration when hovered from one place to another with in detail of travelling class division too.

Based on the observations from the various plots and data provided, here are some recommendations for booking flight tickets:

Recommendations:

Book Economy Class for Cost Savings:

- Economy class consistently has lower prices compared to business class across all airlines and times of day. If budget is a priority, opt for economy tickets.

Optimal Departure and Arrival Times:

- Morning and evening flights are the most common, but afternoon flights have the shortest average duration (11.0 hours). If duration is a concern, consider booking flights that depart in the afternoon.
- For arrivals, evening flights tend to have the highest counts, but if avoiding busy times is a priority, consider arriving in the morning or afternoon.

Choosing Airlines:

- Vistara and Air India offer the highest number of flights and a good balance of price and duration. For a balance between frequency and cost, these airlines are recommended.
- For the lowest prices, consider airlines like GO FIRST, Indigo, and AirAsia, but be aware that these may also have longer average durations and fewer flight options.

Direct vs. Stopover Flights:

- Direct flights (zero stops) are generally cheaper than flights with one or multiple stops. If cost is a major factor, prioritize booking direct flights.
- Multiple stops significantly increase the duration and sometimes the cost of the flight. If possible, avoid flights with multiple stops.

Booking Based on City and Destination:

- Flights to and from Chennai and Kolkata have higher average prices. If flying to these destinations, book well in advance to secure the best rates.
- For destinations like Delhi and Hyderabad, which have lower average prices, you might have more flexibility in booking without as much of a price increase closer to the departure date.

Leverage Price and Duration Insights:

- For business travelers prioritizing time, choosing business class might be more beneficial despite the higher cost, especially during morning or evening times.
- For personal travel, where budget might be more critical, evening flights in economy class can offer a good balance between cost and convenience.

Consider Flight Durations:

- Flights from airlines like Vistara and Air India have longer average durations but might provide better service and reliability. If comfort and reliability are important, these airlines are preferable.
- For shorter durations, SpiceJet and AirAsia can be good choices, but ensure you check for any additional costs or less frequent flights.

Flexibility with Stops:

- If you are flexible with travel times and can manage longer travel durations, flights with multiple stops can sometimes be cheaper. However, if time is a constraint, prioritize direct flights even if they are slightly more expensive.

Book Early for Peak Times:

- During peak travel seasons or times (e.g., holidays, weekends), flights, especially in the morning and evening, fill up quickly. Booking early can help you secure better prices and preferred times.
- Booking at-least 10 days early can help you cut down the costs for any pre-planned occasions. Booking the flights at the middle of the month can be budget friendly as more flights are available at that time.