**The dataset is a publicly available data from Department of Transportation detailing the on-time performance of US airlines for the month of August 2022.**

**Definition: A flight is considered departure delay when Dep Delay column records more than 0 minutes with each number representing how many minutes a flight is early or late. Vis-à-vis for arrival delay.**

**Please use the provided dataset (but not limited to) to offer insights for the operations performance of various airlines. Please note that to be considered for the position, the visualizations will have to be in Tableau.**

**1/. Daily trend of how different airlines perform in terms of on-time departures and cancellations.**

**a). Trend rate of departure delays per flight flown.**

The line chart shows the comparison of the trend rate of departure delays per flight flown for every carrier. One can hover over any day of the month to find the average departure delay associated with that flight during that time.

Chart, line chart

Description automatically generated

**b). Trend rate of cancellations per flight.**

Chart

Description automatically generated

**c). Trend rate of departure delay minutes per delayed flight flown.**

This line chart has been drawn by filtering out only the delayed flights.

Chart, histogram

Description automatically generated

**2/. Comparing two Texas city hubs, United’s operations at George Bush Intercontinental Airport & American’s at DFW:**

**a). compare each airline’s flights’ departure delays on shorter routes (distance <=500nm) vs longer (>500nm).**

The below bubble chart is utilized for comparison of the departure delays on shorter routes vs longer routes for the two Texas city hubs, United’s operations at George Bush International Airport(IAH) & American’s at Dallas Fort Worth(DFW). We see that the average departure delay is more for both the cases on shorter distances than longer distances.

Chart, bubble chart

Description automatically generated

**b). What time of day and day of week do we see more departure delays?**

The below tree map shows that most departure delays happen during Wednesdays and that mostly during 23:00PM-2:00AM. One can hover over any rectangle or node of the tree map to see the average departure delay and time of the day and weekday to gain useful insights to improve functioning.

Chart, treemap chart

Description automatically generated

**3/.**

1. **Top and bottom 5 on-time departure performing airports for each regional airline.**

Through this vis, we can determine the top 5 on-time performing airports based on the count of on-time departures happening in those airports. We see that the top performing airports in CA are LAX, SFO, SAN, OAK, and SJC, we can also hover over to the regional airlines at these airports or regions and know their counts of on-time departures as well.   
We can also see the bottom 5 on-time departure airports in CA which are ACV, BIH, SCK, RDD, BFL with very less number of on time departures but we can also say this data to be biased as more number of flights take off from bigger airports like SFO, SAN hence it is possible for them to have more number of on-time departures as well.

We can scroll down in the chart and get the vis and insights in detail for every region or state and airports performance in terms of the count of on-time departures and the count of on-time departures for their regional flights as well by hovering over to them to see the details on tooptip for analysis.

Chart, waterfall chart

Description automatically generated

1. **Any problem-child aircrafts that consistently underperform?**

We see the problem-child aircraft that consistently underperform is YV, i.e., Mesa Airlines which have an highest overall average departure delay compared to other competing airlines.

Chart, bar chart

Description automatically generated

Extra 4/. Daily trend of how AA performs vs other airlines combined at our hubs

**a). Trend rate of departure delay per flight flown.**

From the below side by side comparison we can easily comparison the monthly departure delays between the American Airlines and all other airlines by their average departure delay values.

Chart, bar chart, histogram

Description automatically generated

**b). Trend rate of cancellation per flight.**

We can easily compare the rate of cancellation per flight flown for American Airlines vs All other airlines by the overlapping trend graph depicted below during the whole month time period.

Chart, line chart

Description automatically generated

**c). Trend rate of departure delay minutes per delayed flight flown.**

We can compare from the below side by side horizontal bar charts comparison of rate of departure delay minutes per delayed flight flown for American Airlines vs All other airlines based on the average departure delay during the whole month timeperiod.

Chart, bar chart

Description automatically generated

**Extra 5/. Situation challenge:**

**a). I am a business traveler and I want to take a direct flight to make sure I get to NYC on-time for my meetings. I am willing to fly any airline and I can fly out of either airport in Dallas-Fort Worth metro area. What top 5 options do I have for a Tuesday morning flight?**

Based on the situation challenge, I have made one assumption where in order to reach NYC I have only considered into account the 3 airports in NYC mainly JFK, LGA and EWR since they are In close vicinity to main new York city; and other NY airports have been discarded for the purpose of analysis in order to consider the best possible way to reach NYC on a Tuesday morning.So as per the below analysis, the business traveler can opt for any suitable flight option from these to reach early on time for the meeting. But as per me, the top 5 options for a Tuesday morning flight could be chosen from these:

1. DAL->LGA (WN756) / DFW->LGA (DL421)/DFW ->LGA(AA1563) around 10’o clock in the morning. Traveler can use any of these options as their first preference based on the exact arrival time whichever option offers him/her the earliest arrival possible and seeing which departure airport is closest to his/her home and other possible factors.
2. DFW->EWR(UA698) around 10’o clock in the morning.
3. DFW->JFK(DL2103)/DFW->JFK(B6610) around 11’o clock in the morning. Traveler can use any of these two options possible based on the exact arrival time whichever option offers him/her the earliest arrival possible and seeing which departure airport is closest to his/her home and other possible factors.
4. DFW->LGA(NK718)/DFW->LGA(AA1435) around 11’o clock in the morning. Traveler can use any of these two options possible based on the exact arrival time whichever option offers him/her the earliest arrival possible and seeing which departure airport is closest to his/her home and other possible factors.

Table

Description automatically generated

**b). Expand the options above to account for travel analysis between any two cities with user inputs.**

By the below graph, it is one can find the best possible travel options between any origin city to any destination city by looking at their suitable Arrival and Departure times, their preferred airlines and departure day.

Note: This graph filters out on-time arrival flights.

Table

Description automatically generated

**Extra points on any meaningful additional insight/viz/feature you’d like to add.**

Through this vis, one can compare the potential causes and the amounts of delays happening due to various potential causes for different airline carriers and can take relevant measures to solve these problems to avoid associated delays.

A screenshot of a computer

Description automatically generated with medium confidence

Link to the dataset:

https://docs.google.com/spreadsheets/d/1JRMy7hh9s14YS5wmRO0anKQ4u2sn5zc7/edit?usp=sharing& ouid=102979264305411939125&rtpof=true&sd=true