**San Francisco Flights**

**Introduction:**

When traveling great distances, air travel is the quickest mode of transportation; cars, buses, and even high-speed trains cannot compete—adding to that the fact that flying allows planes to avoid geographical obstacles such as oceans, rivers, and mountains, as well as manufactured ones such as traffic jams. Until the latter half of the twentieth century, flying was considered an expensive luxury. Nowadays, it's an inexpensive means of transportation, and prices are still dropping in some areas, thanks to larger passenger aircraft and technology advancements. Flying between cities is typically cheaper than taking the train in many world regions.

According to USA Today, when the road statistics from the National Highway Traffic Safety Administration are combined with the aviation data from the National Transportation Safety Board, the average odds of dying in a motor vehicle accident throughout a lifetime is 1 in 98. The equivalent probabilities for air travel were 1 in 7,178.

I've had numerous unpleasant experiences standing on crowded trains or subways because I couldn't find a rack for my luggage. Over long distances, driving can be physically demanding, and there is also emotional tension for the driver, who can never totally rest. On a plane, at least, you don't have to do anything other than reading, watching movies, and sleeping.

Unlike driving, where the driver must concentrate almost wholly on the road, airline travel allows passengers to do other things. Business travelers, for example, can read and produce reports. College students can study and perform some background reading. While the circumstances may not be ideal, flying often allows for sound, practical, and helpful behaviors.

Flying is a thrilling and enjoyable activity. Even though I've flown numerous flights, the pleasure of lifting off into the air, flying above the clouds, and looking down on the landscapes below has never left me. That is something that no other form of transportation can match. There's also something magical about taking a long flight and landing in a place with entirely different weather, buildings, culture, and languages from the one you boarded at.

The last time when I took my air travel the flight had delayed for almost 6 hours and this motivated me to know about how flight delay happens and follow are the research questions which came across my mind

1. From which Origin Flight delays happens most?
2. Which carrier has the most flight delays?

**Methodology:**

To do this San Fransisco airlines project, I have considered 2 datasets from online sources. I have tuned them to my requirements so that I can get the accurate results.

The attributes are: Flight number, Origin, Tail number, Unique carrier, Cancellation code,   
Year, Air-time, Air-delay, Distance, Dep delay, Dep time, CRS Arr time and CRS Dep time.

**Analysis:**

**Effects of delayed flight:**

Flight delays cause passengers inconvenience, but they also cost airlines billions of money. A flight is considered delayed by the Federal Aviation Administration (FAA) when it arrives 15 minutes after its scheduled departure time. Still, a cancellation happens when the airline does not fly the aircraft for a specific reason. Flight delays are attributed to various factors, including adverse weather, airport congestion, airspace congestion, and airlines' usage of smaller planes. The airline's brand is tarnished because of these delays and cancellations, which typically decrease passenger demand. Furthermore, the inefficiency of the air transportation system may have an indirect influence since it necessitates a more significant number of personnel and ground staff, raising the cost of conducting business.

Passengers and airlines alike are affected by delays and cancellations. Passengers are stressed because of the extended travel time and more extraordinary expenses for food and hotel. Furthermore, they detract from the aim of air travel — to be quick, inexpensive, and safe — and cause people to distrust airlines. On the other side, airline fleet and personnel schedules are primarily based on scheduled times; airlines face additional crew costs, expenditures associated with accommodating interrupted passengers, and aircraft repositioning. There may be an indirect cyclic influence on the rest of the economy and the costs borne by passengers and airlines. As airline expenses rise, travelers will pay a higher fee, which will harm leisure travel and sectors that rely on air transportation for their operations. This indirect influence subsequently has a spillover effect on the rest of the economy, snowballing airline costs already high.

**Top 10 flights delayed:**

To create a visualization for analyzing the top 10 flights delayed using the bar chart. For the bar chart, o or more dimensions and one or more measures are required. Drop the flight number into the column shelf from the data pane. Drop the aggregate sum of arriving delay measure value in row shelf and filter the top 10 delayed flights by flight number.

Chart, bar chart

Description automatically generated

As a result of this bar chart, flight number 378 is usually the most delayed flight out of all the other flights in the available data.

**Number of Flights from Origin:**

This chart depicts the information about flights and their origin. From that, it can be easy to analyze the flight delay. To do this analysis treemap has been used. A treemap requires one or more dimension values and one or two measure values. Drop the aggregate count of flight numbers in size and color option in the mark card and drop the origin data in the text option in the mark card. It displays the treemap with flight count and its origin.

Table, treemap chart

Description automatically generated

As the result of this treemap, ATL's origin is in first place with 2368 flights. In the second place, the source is called ORD, with 1,832 flights.

**Top 10 Origins with highest flights diverted:**

The pilot or the Air Traffic Controllers can decide whether to divert or land somewhere else. It may be necessary to return to the departing airport in specific circumstances. Things like this happen for a variety of reasons. One of the most common reasons for airline cancellations is terrible weather. Another common reason for flight cancellations is technical difficulties. Medical emergencies can occur in the air as well. Flights are occasionally diverted due to rowdy passengers. Armed warfare, "bomb danger," terrorism threat, and other security concerns are all present.

As we mentioned before, the origin dimension and aggregate count of flight number measure value in column and row shelf, respectively. To make the chart more appealing, drop the origin dimension value in the color option in the mark card and filter the chart by dropping the diverted data into their filter.

.Chart, bar chart

Description automatically generated

The result of this bar chart clearly says that the Origin named ORD has the record for highest flight diverted. The Origin named ATL is in second place, with 137 flights getting delayed.

**Categorization for flights:**

As we discussed above, there are many reasons behind the flight delay. This chart analyzes the corresponding flight numbers and the number of delay reasons. A text table chart is used to make a plot for this big data. For the text table chart, one or more-dimension values and one or more measurement values are needed. Drop the flight number data from the data pane to the Rows shelf. Drop the aggregate sum of a carrier delay, dep delay, late aircraft delay, NAS delay, security delay, and weather delay measure values in the column shelf.

Table

Description automatically generated

As the result of this text table visualization, based on the flight number the number flight delays is categorised in the table format.

Graphical user interface, text, application, email

Description automatically generated

Based on the above chart, the aggregate sum of each delay category is shown in this chart. As the result of this chart, the dep delay is the highest occurring delay with 44,871,706.

Chart, bar chart

Description automatically generated

**Number of Diverted flights based on Unique Carrier:**

Nowadays, there are a lot of flights that get diverted from their exact destination to different locations. There is a lot of reason for this diversion, like bad weather. As per the study developed by Unique Carrier, WN airways have done 574 flights to be diverted in one single year. Meanwhile, HA airways were able to control their flight diversion to reduce to the number of 4 per year. As per a study, the primary reason for diversion is the lack of coordination of each airway. The action that each airway takes plays a significant role in keeping the wrong flight direction. Most airways could control the number of flight diversions to be restricted to below 150. Since the number of flights diversion is affecting the reputation of each Carrier, each Carrier is taking a better plan to reduce this number.

**Dashboards:**

Chart, bar chart

Description automatically generated

The first dashboard indicates the top 10 flights delayed. The delay of flights is indicated in seconds; the horizontal axis indicates the flight numbers, and the flight number 36 indicates that that is the most delayed flight in the whole dataset.

Chart, treemap chart

Description automatically generated

This dashboard indicates the number of flights from Origins, and the ATL is the maximum number of origins to which the flights are operated. The top 10 origin dot plot indicates the top 10 places the flights originated from.

The following bar chart indicates the top 10 origins with the maximum number of flights diverted. The total flight delayed is from the origin ORD.

Table

Description automatically generated

The above summary dashboard indicates all flight delays, departure delays, late aircraft, their delay, security delay, and weather delay. The below summary table show the total delay times for each category for AVE. The air delay is around 57,232, and the carrier delay is 17,303, and so on.

Chart, bar chart

Description automatically generated

The above dashboard indicates the number of flights diverted based on unique careers. It seems that the career WN has the highest number of flights slows. The below bar chart shows the month-wise flight cancellation. This graph demonstrates that December month has the highest number of flights canceled for that particular year.

**Conclusion:**

Flying is the best mode of transportation available in the world. Like a coin that has two sides, flying has both advantages and disadvantages. The significant drawbacks are delayed flights and diverted flights. In this project, we discuss these disadvantages deeply and compare different Carriers controlling these factors to make their airways the best. Almost every company concentrates on these disadvantages and tries to develop another method to reduce these disadvantages to their specific extent. We found precious insights about the flights from and to San Francisco by analyzing all the data. Once again, flying is the top mode of transportation, and it depends on each Carrier to make it better. People decide to select a suitable Carrier to get the best travel experience.