**AERO TRAVEL ANALYTICS**

**Insights into Flight Performance**

**Objective**:

To analyze and gain insights from historical flight data, including departure and arrival times, delays, cancellations, and other relevant factors, to identify patterns, trends, and potential areas for improvement in airline operations. The project aims to utilize data-driven approaches to enhance flight punctuality, minimize delays, improve customer satisfaction, and optimize overall airline performance.

**Git hub Link**: <https://github.com/komatineniapoorva/Aero-Travel-Analytics>

**Dataset Description:**

The flight data set contains essential columns providing details such as flight dates, airline information (name, DOT identifier, code), flight numbers, origin and destination airport codes, scheduled and actual departure/arrival times, departure and arrival delays, taxiing times, wheels-off and wheels-on times, elapsed times, air times, distances traveled, and various delay reasons (carrier, weather, NAS, security, late aircraft arrival). Additionally, it includes indicators for flight cancellations and diversions, along with cancellation reasons when applicable. This dataset facilitates in-depth analysis of flight operations, performance metrics, delay factors, and overall operational efficiency.

**Observations:**

* There are a total of 18 airlines operating in the dataset, managing a combined total of 7064 flights.
* Cancellations are quite high, accounting for 91% of planned flights, but there has been a decrease post-2020. Diversions stand at 39% of all flights. average, flights last 95 minutes.
* Southwest Airlines stands out with nearly 7000 flights managed efficiently and with minimal diversions. In contrast, United Airlines experiences longer average flight times, exceeding 100 minutes per flight.
* The top departure cities are Chicago, Atlanta, Dallas, Charlotte, and Denver, while the most frequented destinations are Atlanta, Chicago, Dallas, Denver, and New York.
* Sundays, Saturdays, and Mondays are the busiest days for flights, and there is a consistent increase in activity from February to December, with the lowest activity seen in May, March, and August.
* The average flight distance has peaked in recent years, averaging around 750 minutes.
* Among the top departure cities are Chicago, Dallas, New York, Denver, Atlanta, Houston, Washington, Newark, Las Vegas, Orlando, Phoenix, Boston, Dallas, and Baltimore. Correspondingly, the most cancelled departures occur in these cities as well.

**Recommendations:**

* Continue the trend of reducing diversions by optimizing flight planning, considering alternate routes, and enhancing crew training for diverse scenarios.
* Collaborate with stakeholders to reduce average flight times, particularly for airlines like United, through better airspace management, optimized flight paths, and improved ground operations.
* Streamline ground handling processes, improve turnaround times, and leverage technology for real-time monitoring and decision-making to enhance overall operational efficiency.
* Adjust flight schedules based on historical data to distribute workload evenly across days and months, reducing congestion on busiest days and optimizing resources throughout the year.
* Focus on passenger communication during disruptions, providing real-time updates, and implementing customer-centric policies to mitigate the impact of flight disruptions on travelers.

**Dashboard:**

**Flight Overview:**

A close-up of a graph

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**Flight Metrics:**

A close-up of a chart

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